Draft Glasgow City Region Appraisal Summary Table

A draft Appraisal Summary Table (AST) has been developed for each of the eleven STPR Regions alongside the National AST. The ASTs are set out to provide:

- Regional/National Context, Problems and Opportunities - drawing on data presented in the Initial Appraisal: Case for Change reports[1] this summarises geographic, social, economic, environmental and transport matters in the region as well as the identified problems and opportunities. In line with STAG, appraisals are expected to explore location-specific problems and opportunities. Local problems and opportunities have been considered and presented to gain a full understanding of the regional and national issues, however some options to address these may not be within the scope of this strategic study.
- Package description – this presents the groupings (interventions) that were included in the detailed appraisal for the region.
- Fit with Policy – provides a summary of how well the appraised packages fit with key national policies including the second National Transport Strategy, Climate Change Plan Update, the draft National Planning Framework 4 and relevant regional policies.
- Transport Planning Objectives (TPO) Assessment - An assessment against each of the five TPOs is provided with quantified metrics provided, where appropriate, under the low traffic / emissions demand and high traffic / emissions demand scenarios (further information about these scenarios is provided in Appendix F). A seven point scoring scale is adopted for each TPO which is:
    - + + + = major positive (3 plus signs)
    - + + = moderate positive
    - + = minor positive
    - 0 = neutral
    - - = minor negative
    - - - = moderate negative
    - - - = major negative (3 minus signs)
- STAG Criteria assessment - as above for the TPO assessment, key points regarding the performance of the package against each of the STAG criteria is presented with quantified metrics provided where appropriate.
- Deliverability – commentary is provided on the assessment of the package in terms of its feasibility, affordability and public acceptability. Note that due to the nature of a number of the STPR2 interventions, and this presenting the Strategic Case it has not been possible to derive cost estimates on a regional basis. However, broad capital spending ranges have been estimated over the period 2022 to 2042 at a national level.

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[1] https://www.transport.gov.scot/our-approach/strategy/strategic-transport-projects-review-2/
https://www.transport.gov.scot/publication/borders-transport-corridors-pre-appraisal/
https://www.transport.gov.scot/publication/north-east-region-option-sifting-update-report-feb-2021-stpr2/
https://www.transport.gov.scot/publication/south-west-scotland-region-option-sifting-update-feb-2021-stpr2/

- Other Criteria Assessment – a summary of the performance of the packages against the Strategic Environment Assessment (SEA), the Equalities Impact Assessment (EqIA), Island Communities Impact Assessment (ICIA), Fairer Scotland Duty Act (FSDA), Child Rights and Wellbeing Impact Assessment (CRWIA) is provided. The seven-point scale is adopted in these assessments where appropriate.

The assessments contained in the ASTs assume all interventions in the packages are progressed. However, it should be noted that not all interventions taken through the detailed appraisal will form a recommendation within STPR2.

The National AST is broadly similar to the regional documents, but presents the performance of the full package of interventions taken through detailed appraisal, relying on a combination of quantitative and qualitative information.

Summary of Assumptions

Quantification of the costs and benefits in the packages has been provided through a modelling exercise. Further information has been provided in Appendix F to Technical Report on the modelling scenarios that have informed the assessment of the STPR2 interventions. A summary of key assumptions is provided here:

- Population projections are based on the NRS Population Projections (2018-based).
- Economic projections are a combination of projections by Oxford Economics bought in 2019, the Scottish Fiscal Commission forecasts and more recently the OBR post-COVID estimates
- Land-use plans are based on data collected for Transport Scotland's Assembly of Planning Policy Inputs in 2018 from Scotland's 34 Planning Authorities.
- Permitting of vacant office and retail floorspace to be converted or redeveloped as housing post 2030.
- Working age is taken to be 16-64 (as a constant) to avoid difficulties with changing state pension age (and to reflect non-mandatory retirement)
- The economic results are presented, as is standard within appraisal as discounted values in 2010 prices. As a simple rule of thumb, presenting the numbers in current (2022) prices and discounted to 2022 only would cause the values to approximately double.

Modelling Tools

For the purposes of modelling accessibility by public transport, NaPTAT (National Public Transport Accessibility Tool) has been used. This allows an assessment of journey time to be compared between with and without STPR package.

Due to the strategic and national nature of STPR2, the national Transport Model for Scotland (TMfS) has been used. TMfS is a national scale mode with a focus on inter-urban trips. As such, whilst TMfS provides a suitable level of robustness at this stage of the appraisal for the larger infrastructure based interventions, there are limitations associated with modelling of smaller/discrete

interventions and those that are more urban in nature. As the recommended interventions are developed through the business case process, more detailed modelling will be undertaken using regional and / or local models as appropriate.

When considering the outputs presented in this AST the following should be considered

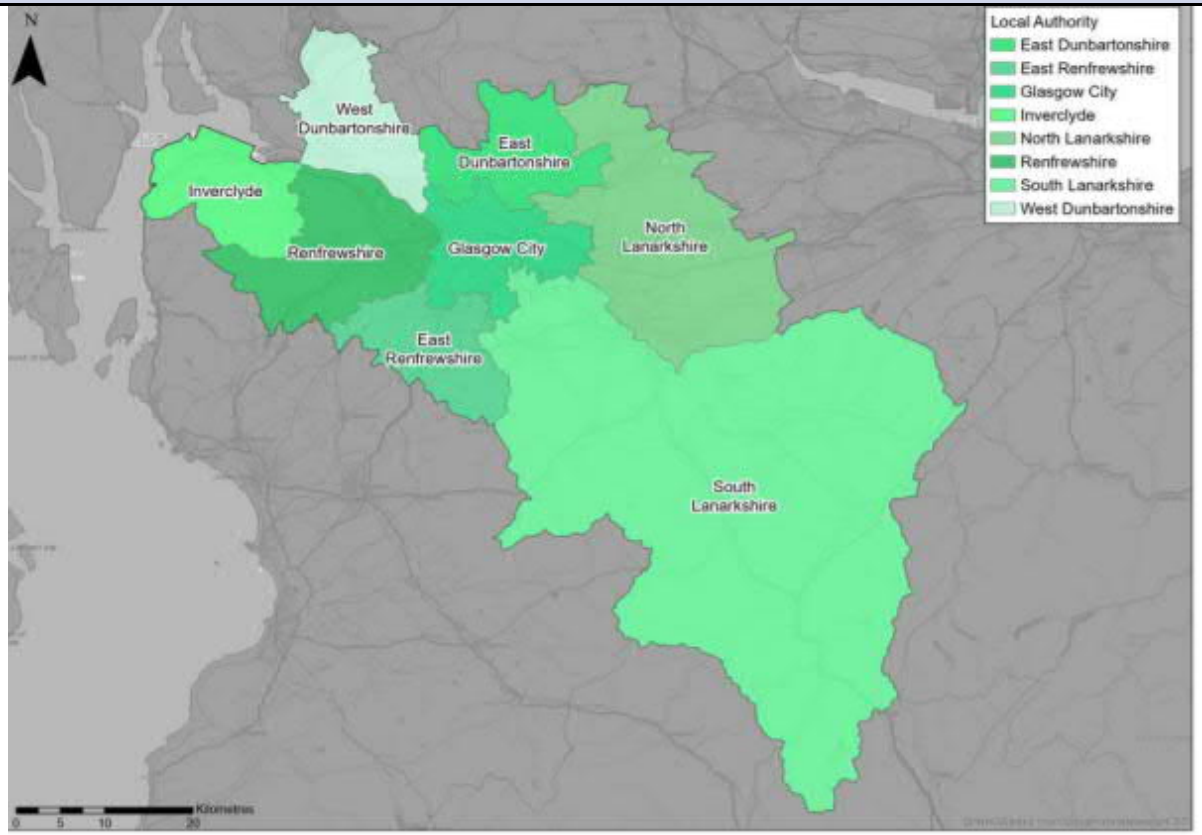
Metric	Comment/Consideration
CO_2 emissions	Likely to underestimate the benefits associated with public transport interventions due to the more limited representation of transport systems in urban areas and a degree of insensitivity to mode shift in TMfS.
Mode Share	Likely shift to public transport modes underestimated in the urban areas due to the more limited representation of urban transport systems and a degree of insensitivity to mode shift mode in TMfS.
Change in veh-km travelled	Likely to underestimate the benefits of reducing vehicle-kilometres travelled particularly for short distance journeys due to the more limited representation of urban transport systems and the relative coarseness of the model zone system.
Lost Time due to congestion	Likely to underestimate the benefits associated with interventions that would reduce roadspace due to the under-representation of the local/secondary road network in TMfS
Change in accidents	Likely to underestimate the benefits associated with mode shift to public transport interventions due to the more limited representation of urban transport systems and a degree of insensitivity to mode shift in TMfS.
Present Value of Benefits	Likely to underestimate the benefits to public transport users due to the more limited representation of urban transport systems. Likely to overestimate the dis-benefits to car-based trips due to the under-representation of the junctions and local/secondary road network in TMfS.

Draft Detailed Appraisal Summary Table

Region:	Glasgow City Region

Regional Context

Geographic Context: The Glasgow City Region (herein referred to as 'the Region') comprises the eight local authorities of East Dunbartonshire, East Renfrewshire, Glasgow City, Inverclyde, North Lanarkshire, Renfrewshire, South Lanarkshire and West Dunbartonshire, and is a mix of urban and rural settlements and areas.



The Scottish Government Urban Rural Six-Fold Classification identifies the regional population residing in each category as follows: Large Urban Areas (55%), Other Urban Areas (35%), Accessible Small Towns (6%), Accessible Rural (4%) and Remote Rural (>1%). This demonstrates that whilst the Region is dominated by the large densely populated urban area of Glasgow City and the immediate adjacent areas, there are also areas of geographical remoteness and of rural nature within the Region. A number of 'accessible small towns' are spread across the Region, for example Lanark, Strathaven, Moodiesburn, Bridge of Weir, Kilmalcolm, Bishopton and Lennoxtown.

The region has an extensive transport network, including active travel, rail, subway, bus and road networks, park and ride facilities, ferry links to Dunoon, Bute, Kilcreggan and the internal ferry route between Renfrew and Yoker, as well as Glasgow International Airport. It has two major ports at Greenock and Gourock McInroy's Point.

Social Context: The total population in the Region was 1,845,020 in 2019: approximately one-third of the Scottish population. The Regional population has increased by 3.2% since 2011. Glasgow is the largest settlement with approximately one-third of the Region's population. In terms of age structure (2019 mid-year estimate), 17.2% of regional residents were children (15 and under), 65.6% were of working age (aged 16 to 64), and

17.2% were 65 and over. The proportion of people aged 65 and over within the Region was 1.9 percentage points lower than the national benchmark, whilst the proportion of people within working age was 1.6 percentage points higher than the national benchmark.

Performance against socio-economic indicators varies across the Region. Overall, the proportion of households with access to a car is lower in the Region compared to Scotland as a whole (62.5% compared to 69.5%, based on 2011 Census), however travel to work by car is the dominant mode with over 60% of people commuting by car. Driving to work makes up 45.2% of trips less than 5km. Bus carries a total of 11.6% of commuting trips, and rail carries 6.7%, whilst 8.1% of people walk and less than 1% of people cycle. Travel for work within the Region tends to be within the local authority area or into Glasgow City from the surrounding areas. Movements between the other seven local authorities is also noted.

Within the Region 13.2% of people had no qualifications in 2019; which was 3.3 percentage points higher than the national benchmark. There are pockets of deprivation across the Region, most notably in Glasgow City and Inverclyde. Within the whole Region, 32.0% (747) of SIMD data zones are within the 20% most deprived and 18.2% (425) are within the 10% most deprived. SIMD Health rankings indicate that health quality throughout the Region is varied: in Glasgow City, 48% of data zones are ranked within the lowest quintile (20% most deprived) for health in Scotland, whilst in contrast East Renfrewshire and East Dunbartonshire respectively have 7% and 8% of data zones within the lowest quintile.

Economic Context: The Region has approximately one-third of the Scottish population and contributes approximately one-third of the Scottish GVA but also suffers from high levels of deprivation including transport poverty, higher number of benefit claimants, lower educational attainment relative to other regions and high levels of economic inactivity. Economic activity refers to an estimation of whether usual residents aged 16 to 64 were in work or actively looking for work. Economic activity was 75.3% in 2019, compared to 77.5% nationally, and the Region had a slightly higher rate of unemployment (4.0% compared to 3.5% nationally). The Region accounted for 40.5% of Scotland's total benefits claimants despite making up 33.7% of the country's population. The Region's economy has a wide spread of activity with high levels of employment in human health and social work, and administration and defence.

Environmental Context: Within the Region, there are many areas classified as environmentally sensitive, with varying levels of statutory protection. Environmental designations within the Region include biodiversity, landscape and heritage designations which fall either wholly or partly within the Region. In addition, the Region contains a significant number of historic assets, including two designated World Heritage Sites (the Antonine Wall World Heritage Site located at the northern extent of the Region and the village of New Lanark in South Lanarkshire) as well as 8,209 Category A-C Listed buildings. The city of Glasgow has a high concentration of designated cultural heritage assets as expected of a large urban area. The greatest modelled noise levels are located around Glasgow City, primarily associated with the strategic road corridors and Glasgow Airport, together with the rail routes through this area. Settlements at greatest risk of coastal flooding are located along the Firth of Clyde, River Leven and River Clyde. Areas at medium and high risk of river flooding are predominantly located in the vicinity of the River Endrick, River Kelvin, North Calder Water, River Clyde, White Cart Water, Black Cart Water and Gryfe Water. Areas at high and medium risk of surface water flooding are scattered throughout the Region. These are typically associated with surface water features, such as lochs, and are located predominantly within less populated areas of the Region. There are 15 Air Quality Management Areas (AQMAs) within the Region and Low Emission Zone in Glasgow City Centre. In 2018, CO_2 emissions from transport within the Region equated to 31.1% of Scotland's total transport emissions overall.

Problems:

- **Social Exclusion:** the Region has the highest levels of deprivation across the STPR2 regions in Scotland, and a wide variance in deprivation levels. This is contributed to by transport provision which can act as a barrier for people accessing employment. Child poverty is notable in the Region with around 1 in 4 children living in poverty.
- **Transport Poverty:** the Region demonstrates wide variance in transport poverty and proportion of expenditure spent on transport. Those further away from Glasgow City are most at risk of transport poverty. South Lanarkshire has the highest proportion of high-risk data zones in the Region (51%), followed by North Lanarkshire (50%). Glasgow City has the lowest proportion of high-risk data zones in the Region (13%).
- **Physical Activity and Health:** the SIMD health indicators show that the Region suffers from relatively poor health with a mixed picture across the area. In Glasgow City, 48% of data zones are ranked within the lowest quintile (20% most deprived) for health in Scotland, whilst in contrast East Renfrewshire and East Dunbartonshire respectively have 7% and 8% of data zones within the lowest quintile. Between 32% and 36% of data zones within East Renfrewshire and East Dunbartonshire fall within the top quintile in Scotland, whilst Glasgow City, North Lanarkshire and West Dunbartonshire only have 10%, 4% and 5% respectively.
- **Air Pollution:** air pollution is a problem and there are a number of AQMAs and a Low Emission Zone in place to tackle this. Particulate concentration is particularly prevalent in Glasgow City and immediately surrounding areas, with highest concentrations along key road links (M8 and M74) and the surrounding area.
- **Accessibility:** levels of access vary considerably with many parts of the Region in the lowest decile of SIMD Geographic Access, particularly South Lanarkshire and areas of East Renfrewshire, Renfrewshire and North Lanarkshire. During consultation, physical access issues relating mostly to the walking environment were reported by some groups. Bus decline is of concern, with the highest levels of decline experienced in this region when compared to the rest of the UK.
- **Connectivity:** whilst connectivity into Glasgow City is generally good, cross-regional connections are considered by stakeholders to be poor. This is reported to limit options for people, resulting in car being the mode of choice which in turn leads to higher levels of congestion. A gap exists between Queen Street and Glasgow Central rail stations that acts as a barrier to integrated travel.
- **Active Travel:** despite relatively good levels of possible penetration of the Region by bicycle, cycling is poorly represented in the mode share for the Region. Reasons given for this in the consultation were largely down to safety concerns. Walking is also slightly lower in this region when compared to other relevant benchmarks which is backed up by physical activity data.
- **Safety:** despite safety across road-based modes improving in the Region, targets for the reduction in serious casualties were not met. Additionally, accident statistics show an 18% increase in annual average accidents involving a bicycle in the 2014 to 2018 period compared to the 2004 to 2008 period although anecdotal reports suggest the level of cycling has increased.

- **Capacity constraints:** key points on the trunk road and motorway network have capacity issues. This is reported to cause problems for bus operators and make bus travel less attractive. Pre-Covid-19 overcrowding on peak time rail services was identified within Network Rail's Scotland Route Study and echoed through consultation. This serves to deter mode shift to public transport.

Opportunities:

- **Climate Emergency:** the Climate Emergency is considered to provide a base upon which sustainable interventions that do not favour private car use would be more publicly acceptable.
- **Economic Base:** the Region has a strong economic base that offers a solid asset to build upon.
- **Technology:** technology offers potential for better ways to work, connect and inform people of transport choices, alongside advances in lower emission fuels.
- **Night Time Economy:** the night-time economy in the Region offers a good base of economic activity that could benefit from improved access.
- **Transport (Scotland) Act 2019:** the Transport (Scotland) Act 2019 alters the powers available to Local Authorities allowing them the opportunity to address some transport problems in their area.
- **Clyde Mission:** Clyde Mission is a Government-supported aspect of the 2019-20 Economic Action Plan to encourage investment in the Clyde area, has the potential to have an impact on large numbers of people and businesses within the Region. This is also identified in NPF4 as a national development.

Detailed Appraisal Package Description			
Package Groupings: Refer to Annex A for further grouping details			
Active Travel	• Improving Access to Bikes • Connected Neighbourhoods • Improving Active Travel on Trunk Roads through Communities	• Increasing Active Travel to School • Active Freeways • Village – Town Active Travel Connections	• Long-distance Active Travel Network • Connecting Towns by Active Travel • Cycle Parking Hubs
Bus	• Bus Priority Infrastructure • Decarbonisation of the Bus Network	• Demand Responsive Transport (DRT) / Community Transport	
Rail	• Inter-7-Cities Strategic Corridor Enhancements • Corridor Enhancements: Central Belt	• Decarbonisation of the Rail Network • High Speed Rail	

Detailed Appraisal Package Description		
Package Groupings: Refer to Annex A for further grouping details		
Interchange	• Mobility Hubs and Multi-modal Interchanges • Region Passenger Facilities/Station Enhancements	
Mass Transit	• Clyde Metro	
Behaviour Change	• Behaviour Change Initiatives	• Expansion of 20mph Zones and Limits
Ferries and Ports	• Decarbonisation of CHFS and NIFS Ferry Network	
Freight	• Decarbonisation of Freight Deliveries • Railway Freight Terminals and Facilities • Freight Reliability and Efficiency Improvements	• Freight Consolidation and Last-Mile Logistics • Freight Incentives and Freight Best Practice • Rail Freight Enhancements
Resilience	• Improve Routes to Major Ports and Airports • Trunk Road and Motorway Network: Renewal for Reliability, Resilience and Safety	• Trunk Road and Motorway Climate Change Adaptation and Resilience
Technology	• Incident Management Software (IMS) Upgrade • Control Centre of the Future	• Intelligent Transport Systems (ITS) Roadside Infrastructure • Integrated Public Transport Ticketing
Road	• South West Trunk Road and Motorway Network Improvements • South East Trunk Road and Motorway Network Improvements • North West Trunk Road and Motorway Network Improvements	• A National Action Plan to support the shift to Low Emission/Ultra Low Emission/Electric Vehicles and help deliver Scottish Government's net zero targets • Changing Road User Behaviour

Fit with Established Policy

Package Performance Against NTS2 Priorities and Outcomes:

Reduces inequalities	Reduces inequalities	Major Positive
	Will be easy to use for all	Major Positive
	Will be affordable for all	Minor Positive
Takes climate action	Will help deliver our net-zero target	Major Positive
	Will adapt to the effects of climate change	Minor Positive
	Will promote greener, cleaner choices	Major Positive
Helps deliver inclusive economic growth	Will get people and goods where they need to get to	Major Positive
	Will be reliable, efficient and high quality	Major Positive
	Will use beneficial innovation	Major Positive
Improves our Health and Wellbeing	Will be safe and secure for all	Major Positive
	Will enable us to make healthy travel choices	Major Positive
	Will help make our communities great places to live	Major Positive

The interventions included within this package support a wide range of national, regional and local policy documents in which transport improvements play a key role in both the enabling and delivery of outcomes.

Key policies supported include the Programme for Government, Infrastructure Investment Plan, NTS2, the Climate Change Plan Update 2018 – 2032, SPT's Regional Transport Strategy including the objectives set out in their Case for Change for the Regional Transport Strategy currently in development and due for publication 2022, the Strategic Development Plan 'Clydeplan', and SPT's Freight Strategy, as well as non-transport-specific plans, such as the Glasgow City Region Economic Strategy and Action Plan, and the Glasgow City Region Tourism Strategy 2018-2023.

Interventions included in this package will also support more resilient connections to the draft National Planning Framework 4 national development at Clyde Mission as well as supporting development of a low carbon mass transit system for the Region.

The policy framework for the Region has a strong emphasis on improved connectivity, addressing inequality, and addressing barriers to employment, to help deliver well-connected, sustainable communities, promote modal shift away from private car, increase walking and cycling opportunities, and provide an attractive place for visitors and for businesses to invest and grow. Therefore, the package closely aligns with established policy directives.

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
A sustainable strategic transport system that contributes significantly to the Scottish Government's net-zero emissions target.	Change in CO_2eq (non-traded and traded emissions from regional road transport inc. grid emissions from charging light-duty vehicles).	27,700 tonnes decrease of 0.5% in 2030 21,600 tonnes decrease of 2.8% in 2045. 1.3m tonnes reduction, of which -1.1m were traded, for the 60-year appraisal period from 2030 to 2089. The net economic benefits for the 60-year appraisal period in 2010 prices and values would be in the range £10m to £25m for the Low Travel Demand scenario.	31,300 tonnes decrease of 0.4% in 2030 65,300 tonnes decrease of 1.3% in 2045. 3.7m tonnes reduction, of which 452,000 were traded, for the 60-year appraisal period from 2030 to 2089. The net economic benefits for the 60-year appraisal period in 2010 prices and values would be in the range £100m to £250m for the High Travel Demand scenario.	CO_2eq is treated as a nationally important pollutant so it has not been appraised for individual regions. National CO_2eq emissions decrease year-on year. This is due to decreasing vehicle exhaust (non-traded) emissions as numbers of internal combustion engine vehicles reduces. This is reflected in increasing traded grid emissions from charging increased numbers of battery-electric vehicles, and specifically in the Low Travel Demand scenario. The electricity grid is expected to be using predominantly renewable sources in the future and so increasing adoption of electric vehicles and a shift from direct, non-traded, emission to traded grid-based technology (i.e. battery) will support reducing CO_2eq emissions. Across both scenarios the interventions would reduce emissions of CO_2eq. There are predicted to be significantly higher overall emissions in the High Travel Demand scenario, either with, or without, the package. There is a relatively smaller overall reduction of emissions due to the interventions in the Low Travel Demand scenario due to the lower overall emissions. The economic impacts associated with air quality were assessed using the Department for
	Change in mode share by active travel for all journeys	Potential increase in walking from 21% mode share to 27% mode share (6 percentage points) Potential increase in cycling from 0.6% mode share to 20% (over 19 percentage points) The package will increase significantly the proportions of journeys undertaken by active modes. If all the active travel and behaviour change interventions were fully implemented in every relevant location in the Region, rates of walking and cycling are anticipated to increase as shown below.		

STPR2 Transport Planning Objectives (TPOs) Assessment

STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	

	Walking	
Local Authority	Without package	With STPR2 package
East Dunbartonshire	22%	28%
East Renfrewshire	23%	30%
Glasgow City	24%	30%
Inverclyde	19%	24%
North Lanarkshire	18%	23%
Renfrewshire	22%	29%
South Lanarkshire	19%	24%
West Dunbartonshire	21%	28%
Regional Average	**21%**	**27%**

	Cycling	
Local Authority	Without package	With STPR2 package
East Dunbartonshire	0.5%	22%
East Renfrewshire	0.6%	23%
Glasgow City	1.2%	26%
Inverclyde	0.7%	15%
North Lanarkshire	0.3%	19%
Renfrewshire	0.6%	21%
South Lanarkshire	0.3%	18%
West Dunbartonshire	0.4%	19%
Regional total	**0.6%**	**20%**

Note that the cycling and walking growth forecasts have been developed independently. Growth in use of one active mode is likely to abstract at least some trips from

Environment Food & Rural Affairs (DEFRA) Damage Costs Appraisal Toolkit. The larger benefit from the High Travel Demand scenario is due to the greater overall emissions with, or without, the package, although the proportional change is lower.

The package overall will contribute significantly to the net-zero emissions target by:

- Enabling more passenger journeys to be made by active modes and public transport
- Decarbonising most if not all public transport operations
- Facilitating uptake of electric vehicles
- Enabling road freight to switch to rail or other low carbon modes

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
		the other, but this effect is not accounted for within these forecasts.		
	Change in motorised veh-kms travelled	222 million veh km 3% decrease (see Annex C)	245 million veh km 2% decrease (see Annex C)	
	Scoring	**+++**	**+++**	
An inclusive strategic transport system that improves the affordability and accessibility of public transport.	Change in transport poverty risk	Although the STPR2 interventions don't impact on the direct costs of travel (e.g. fares, fuel price), the package of interventions would see small reduction in transport poverty, due to the overall improvements to access and connectivity between modes.		The package will improve the inclusiveness of the transport system by: • Improving conditions for people walking, wheeling and cycling, the most inclusive transport modes, with particular benefits for people most often excluded (including children, older and disabled people, and people on low incomes) • Providing a step changes in improved inclusive accessibility to public transport stops/stations through the delivery of Clyde Metro • Seeking to promote public transport use and reduce operating costs, hence enhancing network sustainability • Provision of Clyde Metro will greatly enhance accessibility and connectivity in the Region providing a high level of service and significantly improved interchange opportunities providing greater ease for cross region movements as well as better access to Glasgow City Centre.
	Change in Accessibility - population catchments increases to key services by journey time by public transport.	• Major Hospital Accessibility: The largest change in population accessibility of all the destination types considered was for major hospitals, whereby an additional 54,000 of the population in the Region would be able to access the nearest site in a journey time of 30 minutes or less by public transport with the package. This represents a 7% improvement compared to that in the without package assessment. • Higher Education Accessibility: The accessibility of higher education sites by public transport also observed improved population accessibility, with an additional 39,000 people able to access the nearest site by public transport journeys in under 30 minutes. This represents a 3% increase in population accessibility compared to that in the without package. • Large Food Stores		

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
		Population of 7,500 now able to access a large food store by public transport in under 30 minutes compared to that in the without package. (See Annex B for mapping)		
	Scoring	**+++**	**+++**	
A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.	Change in mode share by active travel	Potential increase in walking from 21% mode share to 27% (6 percentage points) Potential increase in cycling from 0.6% mode share to 20% (over 19 percentage points) These forecasts are subject to all active travel interventions being delivered in all relevant areas of the Region.		The package will improve communities as places, supporting health and wellbeing by enabling more journeys to be made by active and sustainable modes, and by improving road safety. This will: • Improve many people's physical health and mental wellbeing, with particular benefits for people most often excluded (including children, older and disabled people, and people on low incomes) • Reduce the adverse impacts of car use on communities and health (including reduced air pollution, noise, accident risk and perceived road danger) The analysis shows that through improved uptake of walking and cycling, there would be a forecast annual reduction of around 100 premature deaths due to the health benefits arising from active travel.
	Potential for Change in 'Place'	The package will tend to improve the quality of the Region's places by improving local accessibility and reducing the adverse impacts of road traffic. Particular benefits may arise through Connected Neighbourhoods where active travel allows easier walking and cycling conditions in more pleasant and secure conditions. Development around Clyde Metro should be considered to ensure the transport provision enhances the sense of place.		
	Change in Health Benefits	The health benefits of increased rates of walking and cycling as a result of the package have been quantified using the WHO's HEAT tool. This shows the following benefits by Local Authority:		

<table>
<tr><th colspan="4">STPR2 Transport Planning Objectives (TPOs) Assessment</th></tr>
<tr><td rowspan="2">STPR2 TPOs</td><td colspan="2">Appraisal Metrics</td><td rowspan="2">Performance Summary</td></tr>
<tr><td>Metric</td><td colspan="2">Low / High</td></tr>
<tr><td rowspan="2"></td><td></td><td colspan="2"><table>
<tr><td>Local Authority</td><td>Premature deaths prevented per annum</td></tr>
<tr><td>East Dunbartonshire</td><td>6.2</td></tr>
<tr><td>East Renfrewshire</td><td>6.0</td></tr>
<tr><td>Glasgow City</td><td>36.1</td></tr>
<tr><td>Inverclyde</td><td>4.9</td></tr>
<tr><td>North Lanarkshire</td><td>16.8</td></tr>
<tr><td>Renfrewshire</td><td>9.7</td></tr>
<tr><td>South Lanarkshire</td><td>14.6</td></tr>
<tr><td>West Dunbartonshire</td><td>4.7</td></tr>
<tr><td>Regional total</td><td>99.0</td></tr>
</table></td><td></td></tr>
<tr><td>Scoring</td><td>+++</td><td>+++</td></tr>
<tr><td>An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.</td><td>Increased labour catchment by sustainable travel (PT/Active Travel)</td><td colspan="2">• Access to local employment, which represents accessibility of employment located in the surrounding area of an origin within a 40 minute public transport journey time, showed improvements in Renfrewshire, Glasgow City and East Dunbartonshire, with an average increase of at least 10,000 additional jobs

• Access to regional employment, which represents accessibility of employment located within a 60 minute public transport journey time improved in all local authorities within the Region. The modelling shows that the regional package allows an additional 5,000 to 20,000 jobs to be accessed within an hours' journey</td><td>The package will contribute to sustainable inclusive growth in Scotland by:
• Improving integration of transport modes (especially between active modes and public transport) and between transport and major developments
• Improving journey time reliability
• Enabling more people to travel by improving the accessibility and affordability of the transport system, so enabling more people to access local retail and services, and opportunities for employment and education/training</td></tr>
</table>

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
		time by public transport as an average across the local authorities. • The rural population observed little change in journey times to the nearest employment site by public transport. (See Annex B for mapping)		Encouraging modal shift to sustainable modes and reducing the volume of vehicles on network is anticipated to improve journey time reliability for all vehicles, whilst this is likely to provide benefits to businesses across the Region under the high growth scenario where traffic volumes are higher, a negligible reduction in business and commercial vehicle hours is anticipated under the low growth scenario as levels of congestion are not as great under the without package scenario. A reduction in vehicles hours of approximately 212,000 hours is anticipated in the high growth scenario for business and commercial travel, contributing towards sustainable inclusive growth in Scotland.
	Change in lost time due to congestion (for business/ commercial transport)	Negligible impact on veh hours	Reduction of 212,000 hours, 1% decrease	
	Scoring	**++**	**+++**	
A reliable and resilient strategic transport system that is safe and secure for users.	Change in accidents	A 4% accident reduction due to reduced veh-km is forecast.	A 3% accident reduction due to reduced veh-km is forecast.	The package will improve reliability, safety and personal security on the transport system by: • Improving journey time reliability, including through reduced likelihood of significant network disruptions • Reducing the risk of road accidents at hotspot locations on the Trunk Road network • Reducing perceived risks to road safety and to personal security, so enabling more people
		Whilst the number of accidents involving motorised vehicles is anticipated to reduce following the introduction of the interventions within this package, it is anticipated that it would increase walking and cycling journeys. The number of accidents involving these modes is therefore anticipated to increase, although each individual journey is anticipated to be significantly safer.		

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
	Change in lost time due to congestion	Reduction of 490 thousand hours, 4% decrease	Reduction of 2.1 million hours, 4% decrease	(particularly children, women and older people) to travel independently
	Journey Time Reliability/ Availability of alternatives (modes/ routes)	This package is forecast to reduce overall motorised vehicle kilometres by 3% and 2% under the low and high growth scenarios respectively. This reduces the risk of accidents occurring as a result of reducing travel, whilst improving resilience by reducing the number of road closures associated with accidents. Targeted improvements on the trunk road and motorway network where safety is a problem is forecast to reduce accidents and the associated reduction in road closures from such incidents would also help improve reliability. Improvements in terms of renewals and climate change adaptation to protect the operation of the trunk road and motorway network would also positively impact on the reliability of the network. Bus priority and Clyde Metro interventions are anticipated to provide greater reliability to public transport journeys particularly at peak times when current bus services are often hampered by congestion. Encouraging modal shift to sustainable modes and reducing the volume of vehicles on the network is anticipated to improve journey time reliability, as indicated by reducing time lost to congestion of 490,000 and 2,130,000 hours in the low and high growth scenarios respectively		

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
	Scoring	**++**	**++**	

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
Environment	Air Quality	+	+	Total emissions of NO_X were predicted to decrease in future in both the High and Low scenario. Total emissions of NO_X were predicted to be effectively zero in 2045 in the Low scenario, and 2052 in the High scenario either with, or without, the proposed package. Total emissions of PM were predicted to increase in future predominantly due to non-exhaust emissions from road, tyre and brake-wear. However, the package will reduce harmful emissions slightly. Over the 60-year appraisal period there was a predicted 100% reduction in NO_X, 2.6% reduction in PM_{10} and 2.7% reduction in $PM_{2.5}$ in the Low scenario, and a 4.7% reduction in PM_{10} and a 4.8% reduction in $PM_{2.5}$ in the High scenario.
	Noise and Vibration	+	+	The anticipated modal shift is also expected to reduce levels of noise and vibration associated with the transport network. There is potential for a localised negative effect on noise and vibration due to the construction and operation of specific interventions including Glasgow Metro and High Speed 2 however the magnitude of effect will depend on the design and location of the intervention

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
	Biodiversity and Habitats	Please refer to SEA performance summary text in the 'Other Criteria Assessment' section below. Please note, the scoring has been based on the SEA methodology for scoring, which has been agreed with the SEA Consultation Authorities.		
	Geology and Soils			
	Land Use (including Agriculture and Forestry)			
	Water, Drainage and Flooding			
	Historic Environment			
	Landscape			
Climate Change	Greenhouse Gas Emissions	+	+	CO_2eq is treated as a nationally important pollutant so it has not been appraised for individual regions. National CO_2eq emissions decrease year-on year, with decreasing direct (non-traded) emissions and increasing traded grid emissions with increased adoption of battery-electric vehicles, and specifically in the Low Travel Demand scenario. The package provides an opportunity to adapt the transport network to the predicted effects of climate change, with one intervention specifically focused on adaptation.
	Vulnerability to Effects of Climate Change	+	+	
	Potential to Adapt to Effects of Climate Change	+	+	
Health, Safety & Wellbeing	Accidents	A 4% accident reduction due to reduced veh-km is forecast.	A 3% accident reduction due to reduced veh-km is forecast.	The package will reduce the number and severity of accidents through targeted infrastructure improvements and by encouraging modal shift away from private car, resulting in reduced accident risk due to reduced

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
				conflicts. Mode shift to sustainable modes will, by improving natural surveillance, make paths, stops, stations and services less isolated and this, accompanied by improved quality of facilities will improve perceived security. The package will improve communities as places, supporting health and wellbeing, by encouraging modal shift away from private car and towards active travel. This will improve placemaking through reduced noise and better air quality due to reduced traffic, and reduced accident risk. It will also benefit many people's physical health and mental wellbeing.
	Security	The package will, by increasing the number of people travelling actively and by public transport, tend to improve natural surveillance and will, through improvements to lighting and urban realm, tend to reduce the number of locations at which security is a concern. Clyde Metro would consider security as part of station design and may provide improved security through higher frequency services than that currently provided by rail.		
	Health Outcomes	The package will, by increasing rates of active travel and hence physical activity, improve both health and wellbeing outcomes. The estimated value of health benefits to the Region's population, appraised over a 60-year period, is in the range £5bn to £10bn. The package will also tend, by encouraging car journeys to switch to less polluting modes, to improve local air quality, and hence health outcomes. This would be of particular benefit In those areas with identified AQMAs		
	Access to Health and Wellbeing Infrastructure	• Major Hospital Accessibility: The largest change in population accessibility of all the destination types		

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
		considered was for major hospitals, whereby an additional ~54,000 of the population in the Region able to access the nearest site under a journey time of 30 minutes by public transport compared to the without package. This represents a 7% improvement compared to that in the without package assessment. • Public transport journey times to the nearest major hospital site showed a minor improvement across all local authorities within the Region but particularly in Renfrewshire, with a reduction of 3 minutes shown across the authority using the population weighted average.		
	Visual Amenity	The package should have a positive impact on visual amenity through improvements to walking and cycling infrastructure and an improved sense of 'place'. Clyde Metro would require to be designed to enhance the sense of place and not act as a visual barrier. Care would be required in the development of any rail freight facilities to ensure they did not detrimentally impact nearby communities.		

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
Economy *(Transport Economic Efficiency)*	User Benefits (2010 prices and values for a 60 year appraisal period)	Present Value of Benefits (PVB) of approximately £1bn to £5bn Accidents Present Value of Benefits (PVB) of approximately £50m to £100m	Present Value of Benefits (PVB) of approximately £1bn to £5bn Accidents Present Value of Benefits (PVB) of approximately £50m to £100m	The majority of economic benefits that accrue are as a result of the sustainable transport interventions in the Region's package to enable and encourage mode shift to public transport modes. The Clyde Metro mass transit intervention, in conjunction with the Bus Priority Infrastructure, Interchange and Rail interventions are the main contributors to the public transport user benefits total in the Low scenario. The remainder of the benefits are largely due to the increase in public transport operator revenue as a result of the increased patronage levels arising from the mode shift away from car. The level of public transport user benefits reduces in the High motorised demand scenario. The High scenario also has a slight reduction in public transport operator revenue. In terms of accident savings, the level of benefits is larger in the High scenario. The benefits arise as a result of the reduction in road-based vehicle-kilometres travelled in the Region, with the mass transit, active travel and public transport interventions encouraging a mode shift away from private car. As the absolute reduction in vehicle-kilometres as a result of the interventions is larger in the High scenario, this directly equates to the increase in the value of accident benefits. Note that due to the nature of a number of the STPR2 interventions it has not been possible to derive indicative cost estimates on a regional basis.

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
Equality & Accessibility	Public Transport Network Coverage	The Region is expected to see major benefits from public transport coverage through the provision of Clyde Metro. This will extend Public Transport to areas not currently served or not well served and provide connections to key services including hospitals and higher education as well as better connections for employment. This will also free up capacity on the heavy rail network which will facilitate better services for those areas as well as potential high speed connections south.		The package will significantly improve accessibility to public transport by improving the coverage of the walking, cycling and public transport networks. This will provide particular benefits for people often excluded from transport, including older and young people, women, disabled people, and people living in more deprived communities. The package will also improve affordability by reducing car ownership, and situations where taxi is the only viable mode for people without access to a car. By encouraging modal shift to more sustainable modes, the package has the potential to increase demand for public transport and improve commercial performance/viability.
	Active Travel Network Coverage	Improvements to the Region's active travel network, both within and between settlements, mean that many more people will have convenient, high-quality and safe infrastructure for walking, wheeling and cycling journeys.		
	Comparative Access by People Group	Improvements to active travel networks and public transport will provide positive impacts on groups who are less likely to have access to car and more likely rely on public transport, walking and cycling for their journeys. This includes women, children and young people, older people, some ethnic minority groups and disabled people.		

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
	Comparative Access by Geographic Location	For deprived areas in the Region, an additional 18,000 people can now access the nearest major hospital site under 30 minutes by public transport representing a 6% improvement on those that could do so in the without package assessment. Similarly, 8,800 people residing in deprived areas can now access their nearest higher education site by public transport within 30 minutes journey time. For access to employment, the average number of additional jobs that could be accessed by public transport from data zones in the Region increased by approximately 8,700 locally and approximately 12,500 to employment located in Glasgow for areas found within the 20% most deprived in Scotland. There were significant improvements in access to additional jobs by public transport for many suburbs containing deprived areas. Particular examples include Bellshill with an increase in access to approximately 44,300 additional jobs located in Glasgow urban area within an hour's journey, and Renfrew with an additional 49,800 jobs approximately that could be accessed within 40 minutes by public transport,		

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
		both reported as an average of the deprived data zones within the localities. (See Annex B for mapping)		
	Affordability	Although the STPR2 interventions don't impact on the direct costs of travel (e.g. fares, fuel price), the package of interventions would see small reduction in transport poverty, due to the overall improvements to access and connectivity between modes.		

Deliverability	
Criterion	Summary Assessment
Feasibility	The package has been developed with feasibility considerations in mind. The package mostly makes use of existing, proven technology and would generally be expected to largely operate inside existing design standards. There will be further work required on the feasibility of larger infrastructure provision including Clyde Metro and High Speed Rail Connections. Additionally, road space allocation across modes will need consideration if multiple modes are competing for similar road space. Overall the package is expected to have a minor positive impact against this criterion.
Affordability	The package would require substantial capital and operational funding. Some aspects of the package may generate revenue, which could be used to offset some of these costs. However, whilst the funding of this package is likely to be substantial, it has to be considered in the context of the scale of the interventions being delivered as well as the number of likely users. Overall the package is expected to have a moderate negative impact against this criterion.
Public Acceptability	Public acceptability of the package is likely to be mixed. The package is expected to improve accessibility, connectivity, and choice and to make transport cleaner, more efficient and more attractive and would be positively received. There may be acceptability concerns in areas of congestion where road space reallocation or priority interventions are proposed, however the behavioural change elements of the package should also help to mitigate this. There may also be acceptability concerns where construction works are expected to cause disruption or require land-take. Overall the package is expected to have a minor positive impact against this criterion.

Other Criteria Assessment	
Criterion	Performance Summary
SEA	The package supports modal shift to more sustainable modes of transport. Rail interventions including Clyde Metro increase resilience to climate change effects and promoting a modal shift to more sustainable transport options. As a result, there is an expected reduction in air pollution and carbon emissions. The creation of mobility hubs/interchanges and improved passenger facilities would also support a modal shift. The decarbonisation of bus and rail networks and freight deliveries will reduce greenhouse gas emissions and improvement in air quality. Positive effects are anticipated on Population and Human Health due to an expected increase in sustainable access to essential services, increased travel choice and improved connectivity and planning for the future capacity of public transport. There is potential for negative environmental effects during construction and operation of the interventions particularly Clyde Metro and High Speed 2 on the Population and Human Health (noise and vibration, public realm, safety), the Water Environment, Biodiversity, Soil, Historic Environment and Landscape and Visual Amenity. In addition, significant quantities of materials and construction related trips would be required. Depending on the source and type of materials/natural resources used, there is the potential for negative effects on Material Assets Road interventions are anticipated to result in minor negative effects on air quality as a some of the interventions proposed have the potential to increase capacity for the number of vehicles on the trunk road network, thus increasing associated transport emissions and potentially reducing air quality. Additionally, the improvement to the South West Trunk Road and Motorway Network considered within the Region would be anticipated to result in minor negative effects on population and human health with the potential for in an increase in noise and vibration during construction and operation and material assets due to the use of natural resources.. Positive effects on safety are anticipated from the road's interventions. Many of the interventions in this region, particularly the active travel ones, will have positive outcomes for the SEA Population and Human Health topic - for example through expected improvements in air quality and increased uptake of physical exercise through walking, wheeling and cycling.
EqIA	The package would improve public transport and active travel accessibility to key destinations and services including employment, education, healthcare and shopping for people living in the area. This will have a major positive impact on certain protected characteristic groups who are less likely to have access to a car and more likely to depend on public transport and active travel to make their journeys. This includes women, children and young people, older people, disabled people and people from certain ethnic minority groups.

	By encouraging modal shift to more sustainable modes, this package would also contribute to improving local air quality. Improved health outcomes, as a result of better air quality, are of particular benefit to those who are more vulnerable to air pollution, including children, older people, disabled people and pregnant women. The package will reduce the severity of accidents through targeted infrastructure improvements and by encouraging modal shift away from private car, resulting in reduced accident risk due to reduced conflicts. Whilst the number of accidents involving motorised vehicles is anticipated to reduce following the introduction of the interventions within this package, it is anticipated that it would increase walking and cycling journeys. The number of accidents involving these modes is therefore anticipated to increase, although each individual journey is anticipated to be significantly safer. Some protected characteristic groups are more likely to be involved in road accidents, for example, children as pedestrian casualties and young males involved as car drivers and as such would have positive impacts on these groups. Mode shift to sustainable modes will reduce the perception of isolation on paths, bus stops, stations and services, accompanied by improved quality of facilities will improve perceived security. This is likely to provide some benefit to those for whom security is of particular concern including women, the LGBTQ+ community and those from religious backgrounds most subject to hate crime. The package would therefore be anticipated to have a moderate positive impact on addressing this criterion.
ICIA	The package is not relevant to islands and would therefore have an overall negligible impact on addressing this criterion.. However, there could be a minor positive impact for those from island communities visiting the mainland for services through improved accessibility to key services within the Region.
CRWIA	By encouraging modal shift to more sustainable modes, this package could contribute to improving local air quality. Improved health outcomes as a result of better air quality are of particular benefit to those who are more vulnerable to air pollution, including children. The package could also improve public transport and active travel accessibility to higher education institutions and employment opportunities for young people living in the area. Safety is a key issue for children with regards to transport with child pedestrian casualties recorded in Scotland in 2019, accounting for 44% of all pedestrian casualties. In particular children from deprived areas and certain ethnic groups are more at risk. The package will reduce the severity of accidents through targeted infrastructure improvements and by encouraging modal shift away from private car, resulting in reduced accident risk due to reduced conflicts. The package would therefore be anticipated to have a minor positive impact on addressing this criterion.
FSDA	The Glasgow City Region has the highest percentage of deprived areas in Scotland. The package is expected to improve public transport connectivity and can therefore support regeneration and economic development and reduce inequalities caused by socio-economic disadvantage by improving accessibility for deprived communities or communities where transport options are limited.

	Modelling data shows that for access to employment, the average number of additional jobs that could be accessed by public transport from data zones in the Region increased by approximately 8,700 locally and approximately 12,500 to employment located in Glasgow for areas found within the 20% most deprived in Scotland. The package would therefore be expected to have a major positive impact on addressing this criterion.

Annex A: Grouping Interventions

Glasgow City Region	
Grouping Title	**Regional Description**
Improving Access to Bikes	Improve access to bikes through a multi-faceted programme of interventions to enable people to cycle (and also to support walking/wheeling as appropriate), and to give them confidence and skills to do so, such that they can make use of new or existing active travel infrastructure. Measures would be designed to meet local community needs, and address inequality.
Connected Neighbourhoods	The transport components of 20-minute neighbourhoods within towns and cities. This would include, for example, packages of improvements to footways, road crossings and urban realm, aiming to make walking, wheeling and cycling more attractive, inclusive and safe.
Improving Active Travel on Trunk Roads through Communities	Packages of measures to reduce the adverse effects of Trunk Road traffic on people walking, wheeling and cycling in those communities that have a Trunk Road passing through them (for example by reducing traffic speed and improving road crossing facilities).
Increasing Active Travel to School	Improved walking, wheeling and cycling routes to schools, accompanied by traffic speed reduction measures and School Streets schemes where appropriate, as well as behaviour change measures. The types of interventions would often be the same as those of Connected Neighbourhoods, but this recommendation is distinct because not all schools are within/close to town/neighbourhood centres.
Active Freeways	High-quality segregated infrastructure for people walking, wheeling and cycling on radial routes and other high-demand corridors in Scotland's large urban areas, with priority given initially to the larger cities.
Village – Town Active Travel Connections	Active travel routes, segregated from busy roads but making use of quiet roads where appropriate, to connect smaller communities to nearby towns.
Long-Distance Active Travel Network:	Interurban active travel routes, segregated from busy roads but making use of quiet roads where appropriate, connecting Scotland's cities and regions. The grouping would enhance the existing National Cycle Network to create a strategic national network of active travel routes mirroring in part the Trunk Road and rail networks.
Connecting Towns by Active Travel:	Segregated active travel routes on interurban connections between adjacent towns in locations where demand is expected to be high. Complements the Long-Distance Network and existing links on the National Cycle Network.
Cycle Parking Hubs	High-quality, high-capacity cycle parking facilities in urban centres and at other key trip attractors to cater for increased demand in locations where Active Freeway networks are implemented ((in Scotland's large urban areas, with priority given initially to the larger cities).

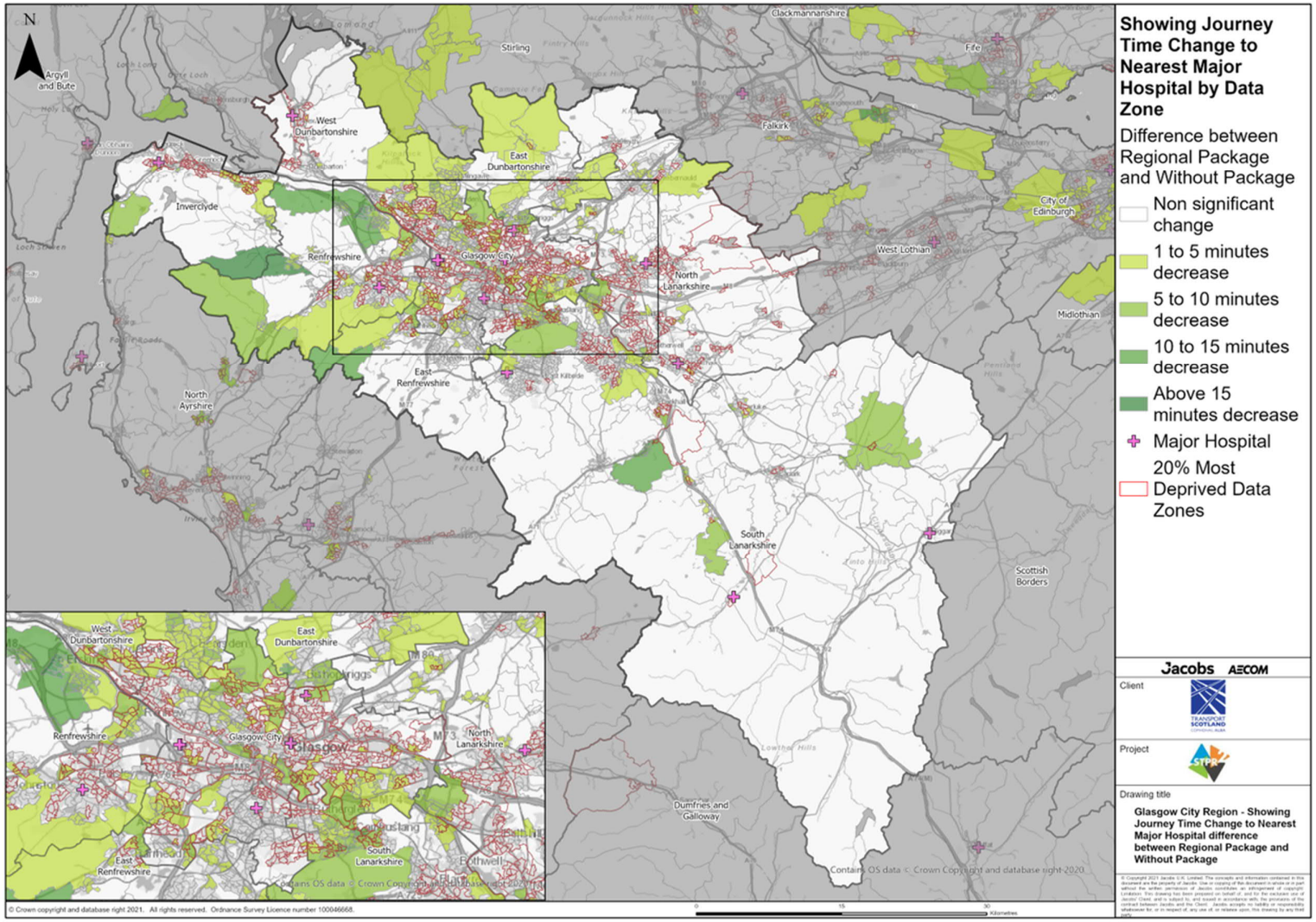
Behaviour Change Initiatives	Delivery of activities which provide encouragement, enablement and incentivisation for more people to make use of active and sustainable transport choices more often. The initiatives would complement many other interventions being considered for implementation by STPR2 by raising awareness of, and encouraging individuals to use, the most appropriate transport choice for their journey.
Expansion of 20mph limits and zones	Provision of new or expanded 20mph schemes across Scotland on appropriate roads in cities, towns and villages. This would reduce traffic speeds and create safer environments which promote and encourage active travel choices.
Bus Priority Infrastructure	Bus priority to deliver faster and more reliable journey times for bus passengers, particularly within Scotland's cities and towns where congestion is highest. For GCR: - Support for local/regional schemes to improve bus priority, funding for initial appraisal in some areas is currently being provided through the Bus Partnership Fund -Continue to progress plans for motorway priority on the M8, M77 and M80
Decarbonisation of the Bus Network	Support the decarbonisation of the bus network through continuation of support funding schemes to introduce zero emission vehicles.
Demand Responsive Transport (DRT) / Community Transport	Consideration of whether the outcomes from pilot studies funded through Phase 1 of STPR2 would enable capital funding to be used to support Demand Responsive Transport/Community Transport in providing improved public transport connectivity in rural, island and peripheral areas.
Decarbonisation of Freight Deliveries	Interventions to support the decarbonisation of freight deliveries, including awareness and education activities, alternative fuel infrastructure and alternative fuel HGV trials.
Railway Freight Terminals and Facilities	Improving the modal shift of freight from road to rail primarily for trunk haul movements (but not exclusively) through a network of rail freight terminals and facilities to include direct connections to manufacturing facilities and warehousing. For GCR, this could include development of Ravenscraig terminal and Mossend International Railfreight Park
Freight reliability, resilience and efficiency improvements	Includes options on how the road freight industry can be supported by implementing a variety of hard and soft measures that will reduce overall disruption, improving journey times and reducing costs for operators.
Freight Consolidation and Last-Mile Logistics	Introduction of measures to improve freight connectivity within urban and rural areas, such as improved access to cargo bikes, approaches to consolidation centres to aid 'last-mile' logistics and use of innovative technologies.
Freight Incentives and Freight Best Practice	Evaluation of future of Freight Facilities Grant and Mode Shift Revenue Support to encourage more efficient, environmentally friendly practices within the freight industry, including promoting sustainable transport options

Rail Freight Enhancements:	Rail freight enhancements required as outlined as part of the Scottish Strategic Freight Network (SSFN) by the Scotland Freight Joint Board in 2017. This infrastructure enables more efficient mode shift from road to rail. Specifically, for GCR: Central Belt - Gretna via Glasgow South West Line Increased train length, improved route availability (axle weight), better freight schedules and clearance for taller and wider wagons
Decarbonisation of CHFS and NIFS Ferry Network	Decarbonisation of the CHFS and NIFS ferry networks.
Improve Access to Major Ports and Airports:	Introduction of a series of infrastructure and public transport service improvements that will provide better-quality surface connections to Scotland's major ports and airports by road, rail and public transport to allow Scotland to maximise the potential afforded by all its major ports and airports.
Trunk Road and Motorway Network Renewal for Reliability, Resilience and Safety:	Renew and improve the resilience of the trunk road and motorway network. This would include preventative and programmed structural renewals of carriageways and network structures for consideration.
Trunk Road and Motorway Climate Change Adaptation and Resilience:	This focuses on the areas on the trunk road and motorway network most at risk of disruption due to weather events. This would involve identification of priorities and measures to strengthen the resilience of Scotland's trunk road and motorway network to adapt to a changing climate and unplanned events.
Clyde Metro:	A metro transport system that improves connectivity in the Glasgow City Region up to around 15km from the city centre. Would target areas where connections are currently poor, including places where there is deprivation.
Mobility Hubs and Multi-modal Interchanges:	Construction of new or upgrades to existing mobility hubs, P&R sites and other multi-modal interchanges to improve interchanges between modes.
Regional Passenger Facilities/Station Enhancements:	Building on the Phase 1 recommendation, improvements to public transport passenger facilities, focusing on bus stations seeking to improve passenger facilities both in terms of improved quality and in terms of improved accessibility for those with reduced mobility.

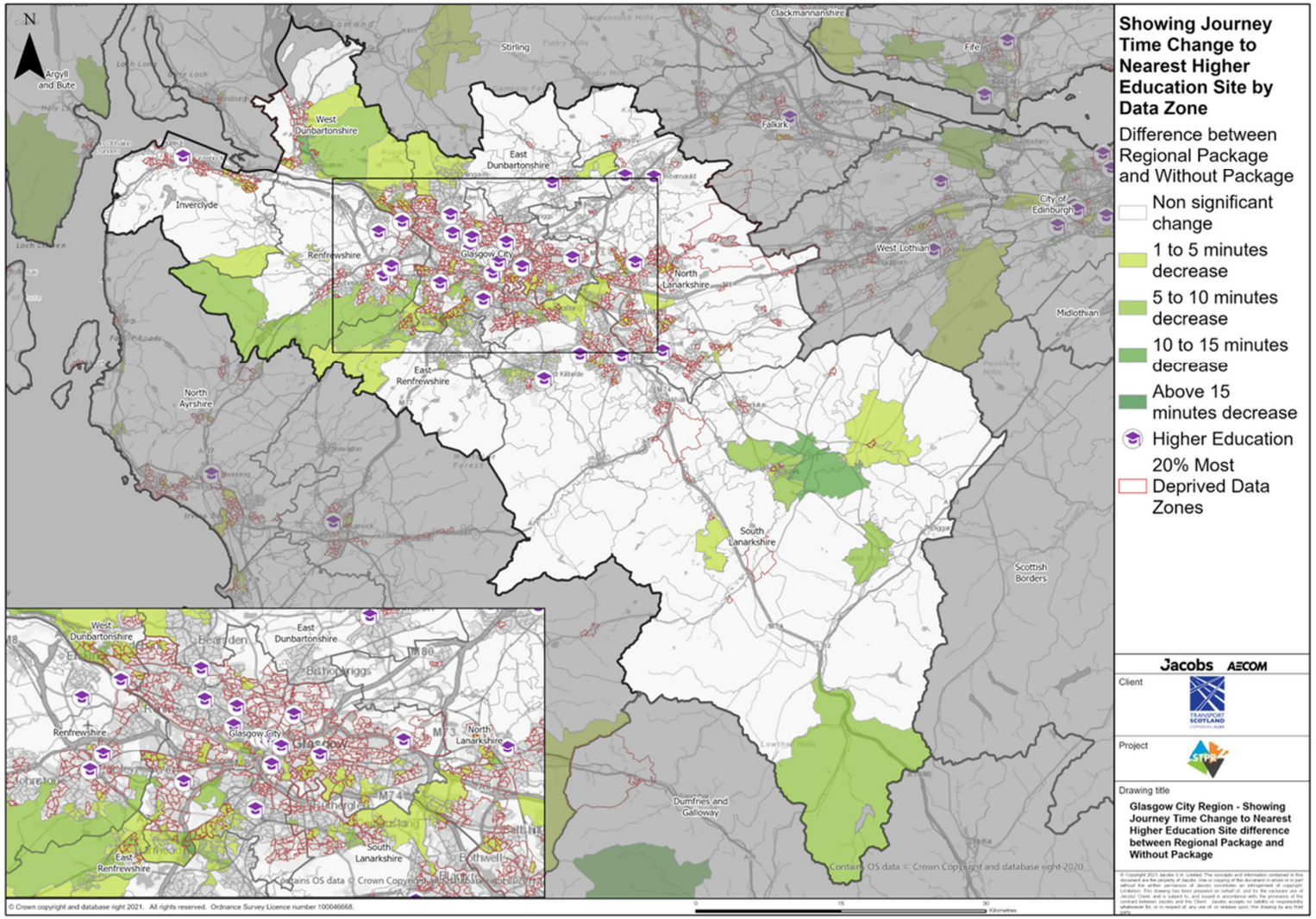
South West Trunk Road and Motorway Network Improvements:	Improving trunk and motorway network road safety and strategic access to National Developments and Key Gateways. Road safety improvements will focus on route sections where calculated local KSI and/or PIA accident rates are over 2 times greater than the national rates for routes of a similar nature and standard, over the period 2015 to 2019. Improvements are anticipated to include widening / realignment on single carriageway sections, targeted overtaking opportunities and junction improvements, with a primary focus on helping to achieve the Scottish Government's Target of 'Vision Zero' by 2050.
South East Trunk Road and Motorway Network Improvements:	Improving trunk and motorway network road safety and strategic access to National Developments and Key Gateways. Road safety improvements will focus on route sections where calculated local KSI and/or PIA accident rates are over 2 times greater than the national rates for routes of a similar nature and standard, over the period 2015 to 2019. Improvements are anticipated to include widening / realignment on single carriageway sections, targeted overtaking opportunities and junction improvements, with a primary focus on helping to achieve the Scottish Government's Target of 'Vision Zero' by 2050.
North West Trunk Road and Motorway Network Improvements:	Improving trunk and motorway network road safety and strategic access to National Developments and Key Gateways. Road safety improvements will focus on route sections where calculated local KSI and/or PIA accident rates are over 2 times greater than the national rates for routes of a similar nature and standard, over the period 2015 to 2019. Improvements are anticipated to include widening / realignment on single carriageway sections, targeted overtaking opportunities and junction improvements, with a primary focus on helping to achieve the Scottish Government's Target of 'Vision Zero' by 2050.
A National Action Plan to support the transition to Low Emission/Ultra Low Emission/Electric Vehicles:	A National Action Plan to support the transition to Low Emission/Ultra Low Emission/Electric Vehicles to support the delivery of the Scottish Government's net zero targets through a multi-faceted programme of interventions. Measures include funding streams to support the delivery of infrastructure and innovative schemes to allow an equitable transition across the country.
Speed Management (Vision Zero) Measures	Implementation of speed enforcement technology and national road safety behaviour change campaigns, education and training initiatives to enable all road users to understand their road safety responsibilities, allowing them to improve their attitudes and behaviours for the safety of themselves and others.
Changing Road User Behaviour	Implementation of speed enforcement technology and national road safety behaviour change campaigns, education and training initiatives to enable all road users to understand their road safety responsibilities, allowing them to improve their attitudes and behaviours for the safety of themselves and others.

Inter-7-Cities Strategic Corridor Enhancements	Provision of enhancements on the Inter-7 Cities strategic rail network seeking to improve connectivity by reducing rail journey times on these corridors. Whilst nothing physically changed in the Region, this grouping would provide improved connectivity to Glasgow.
Corridor Enhancements: Central Belt	Provision of a platform for rail network enhancements within the Central Belt and on cross-border routes. This covers the Central Belt of Scotland (Glasgow-Edinburgh), communities within a commutable distance of these city regions and the two main rail routes for cross-border travel to England (East and West Coast Mainlines). Enhancements to reduce capacity constraints on the West Coast Main Line including interventions across the wider network such as the Glasgow-Dumfries-Carlisle route
Decarbonisation of the Rail Network	Delivery of a continued, rolling programme of rail decarbonisation, including consideration of batteries and alternative fuel sources, in line with Transport Scotland's Rail Services Decarbonisation Action Plan (DAP).
High Speed Rail:	Investment in measures to complement the introduction of cross border High Speed Rail, including options which are required to facilitate Scotland to England rail journeys including HS2 services and options which will facilitate new HSR services within Scotland. Options that will support the introduction of higher speed connections to reduce journey time between Glasgow/Edinburgh and London
Incident Management Software (IMS) Upgrade	Incident Management System replacement to maintain the current level of service across the trunk road network.
Control Centre of the Future	This would involve investment enhancement of the capabilities of the Traffic Scotland National Control Centre, and how to plan for the future renewal and replacement of equipment, systems and services to maximise network operations.
Intelligent Transport Systems (ITS) Roadside Infrastructure	Investment in ITS which helps to ensure the availability, resilience, safety and quality of the transport infrastructure that is used to actively manage and control traffic during incidents and hazardous weather conditions.
Integrated Public Transport Ticketing	Integration of ticketing across public transport (bus, rail and ferries).

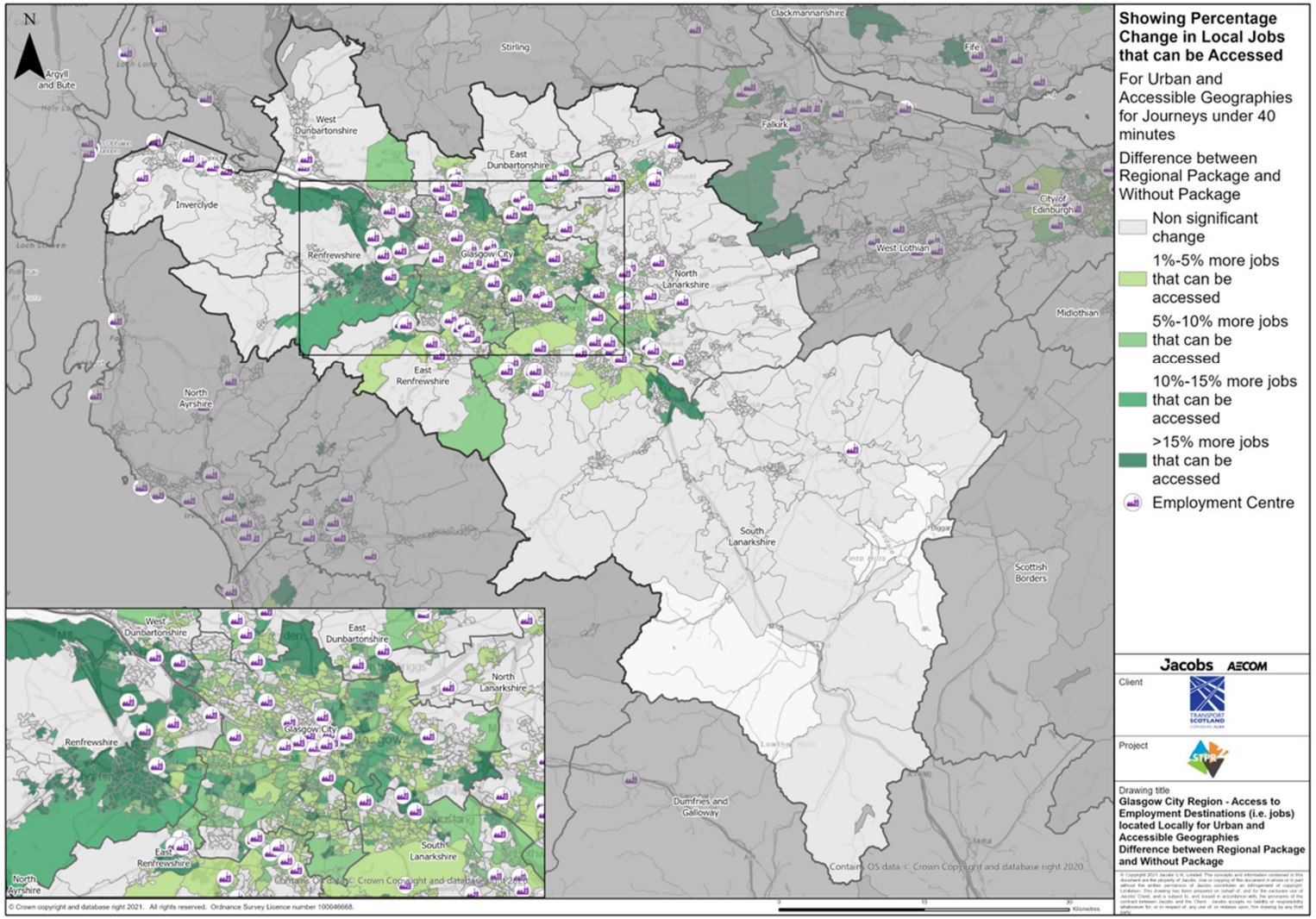
Annex B: NAPTAT MAPPING



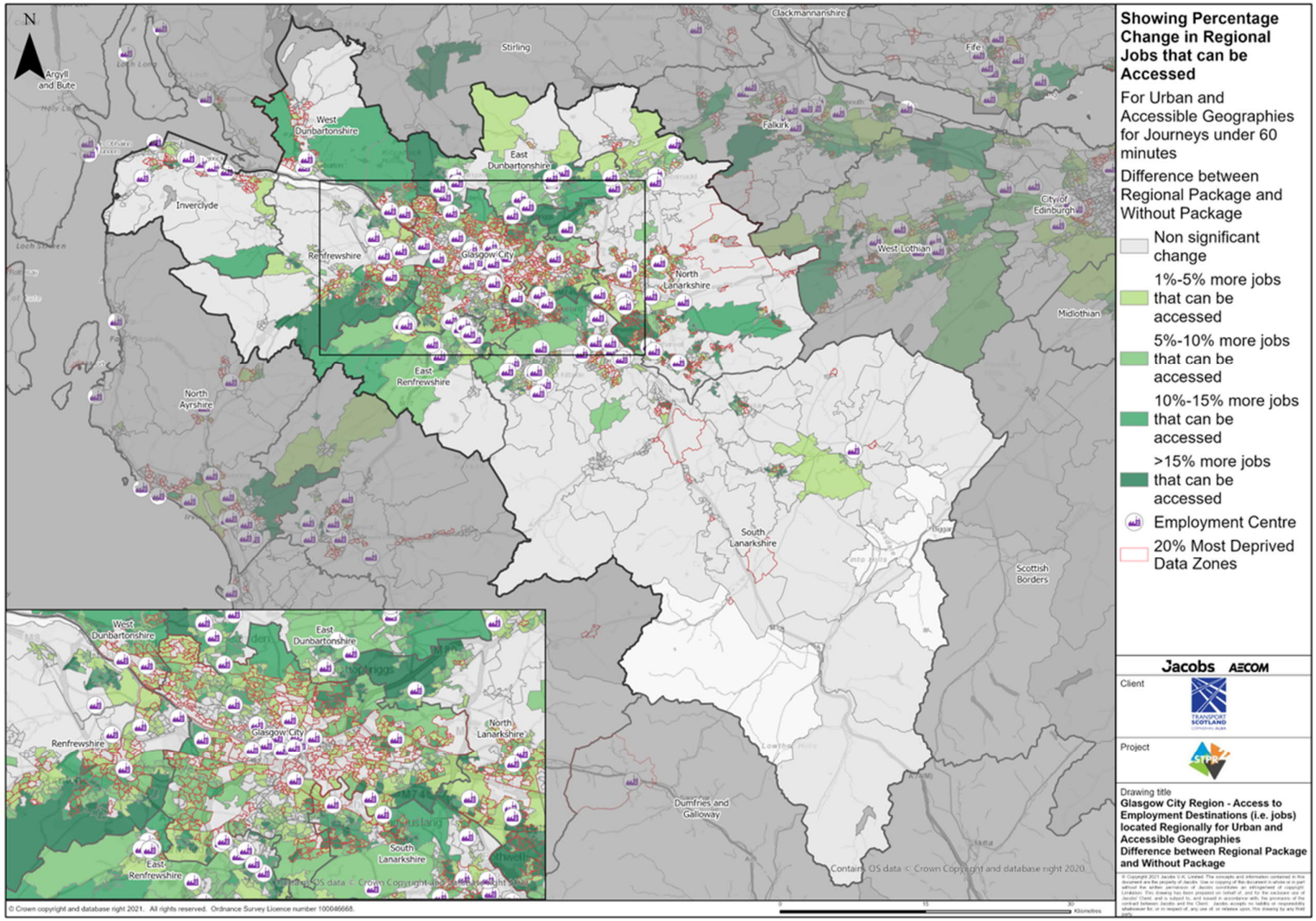
Glasgow City Region Journey Time Change Forecast to Nearest Major Hospital



Glasgow City Region Journey Time Change Forecast to Nearest Higher Education Site



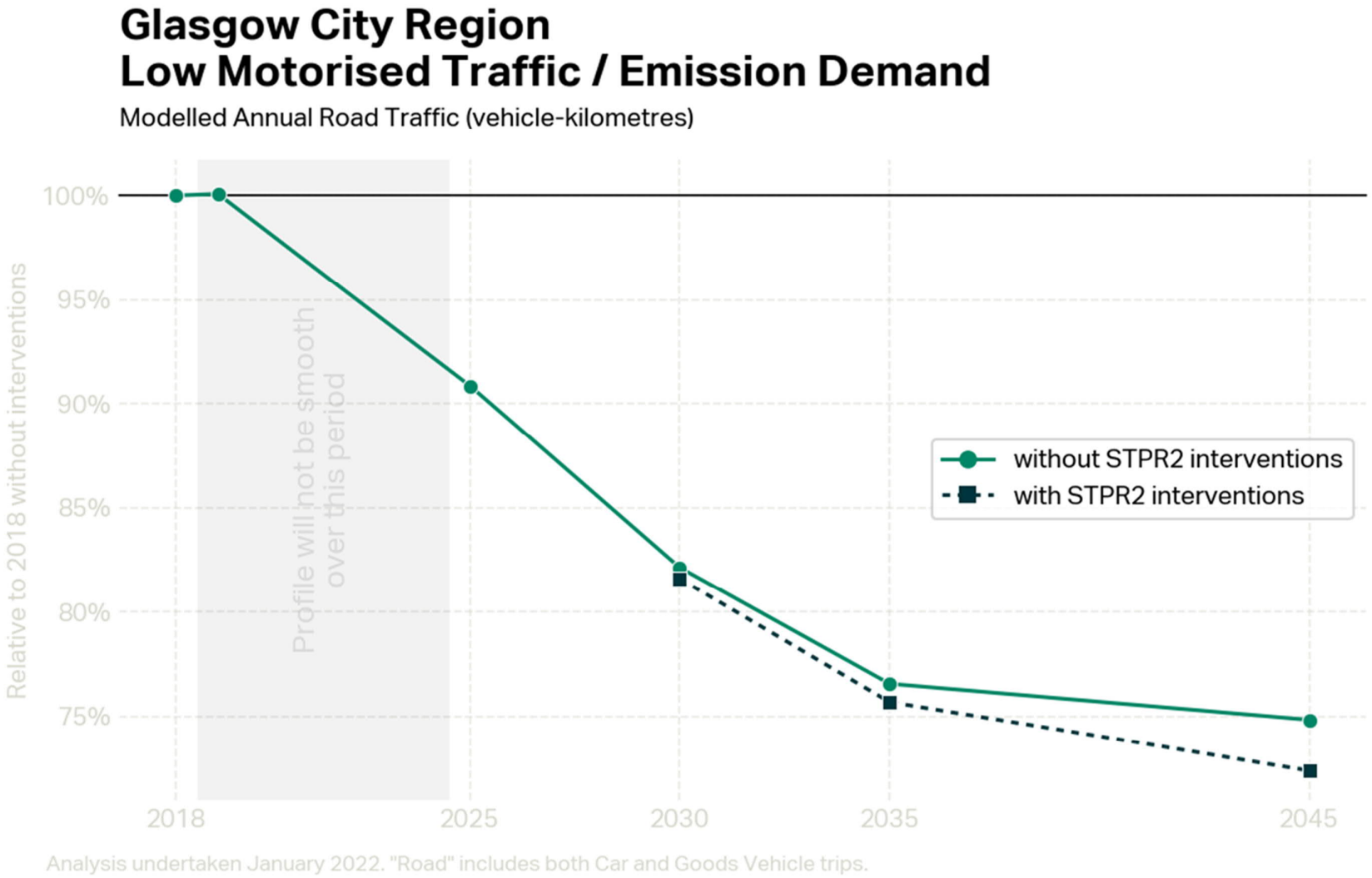
Glasgow City Region Journey Time Change Forecast to Local Employment Destinations



Glasgow City Region Journey Time Change Forecast to Nearest Regional Employment Destinations

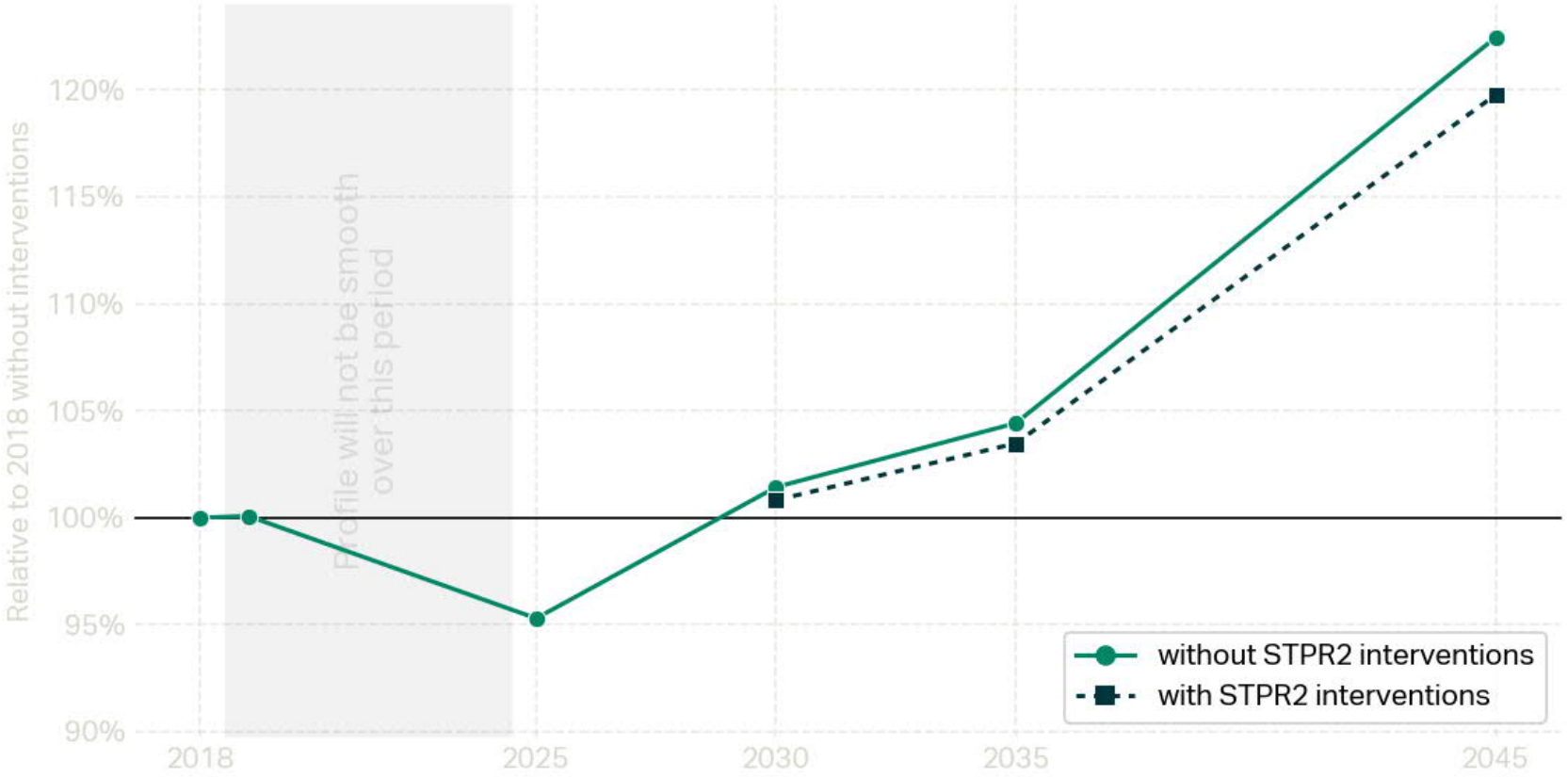
Annex C: Detailed Appraisal Outputs

Traffic Modelling Outputs



Glasgow City Region
High Motorised Traffic / Emission Demand

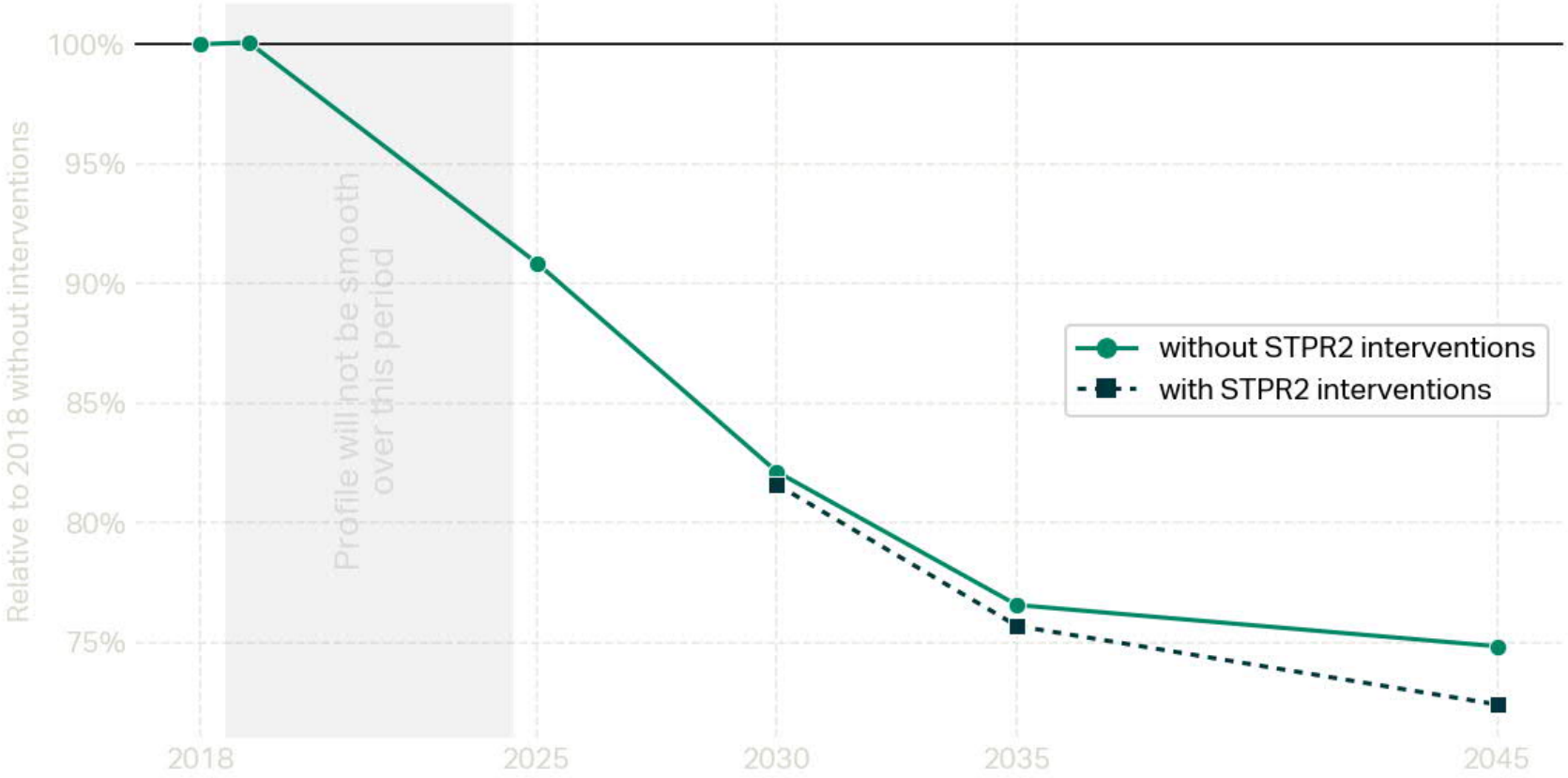
Modelled Annual Road Traffic (vehicle-kilometres)



Analysis undertaken January 2022. "Road" includes both Car and Goods Vehicle trips.

Glasgow City Region
Low Motorised Traffic / Emission Demand

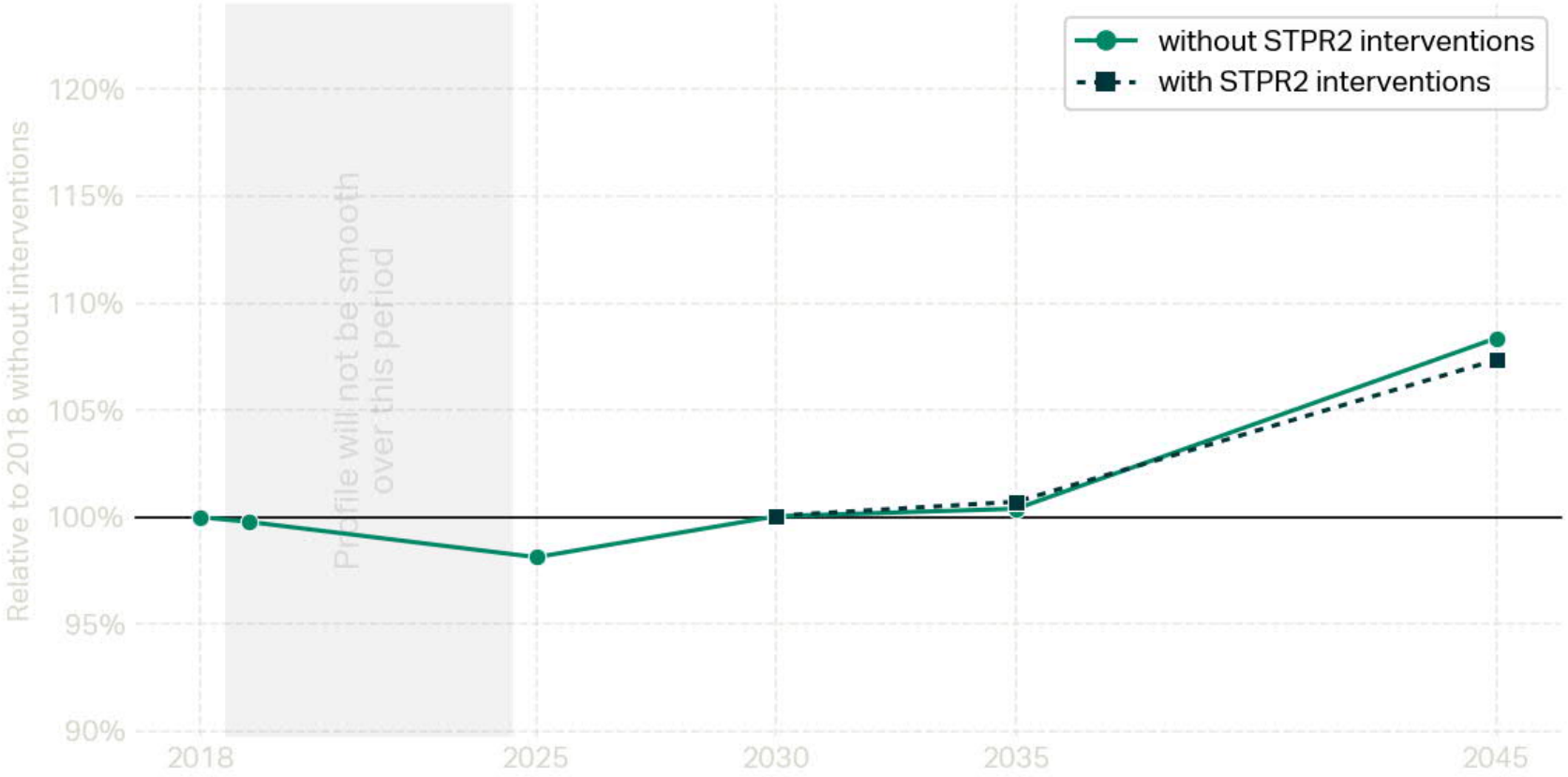
Modelled Annual Road Traffic (vehicle-kilometres)



Analysis undertaken January 2022. "Road" includes both Car and Goods Vehicle trips.

Glasgow City Region
High Motorised Traffic / Emission Demand

Modelled Road Journey Time (minutes per km)



Analysis undertaken January 2022. "Road" includes both Car and Goods Vehicle trips.