Draft Tay Cities 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

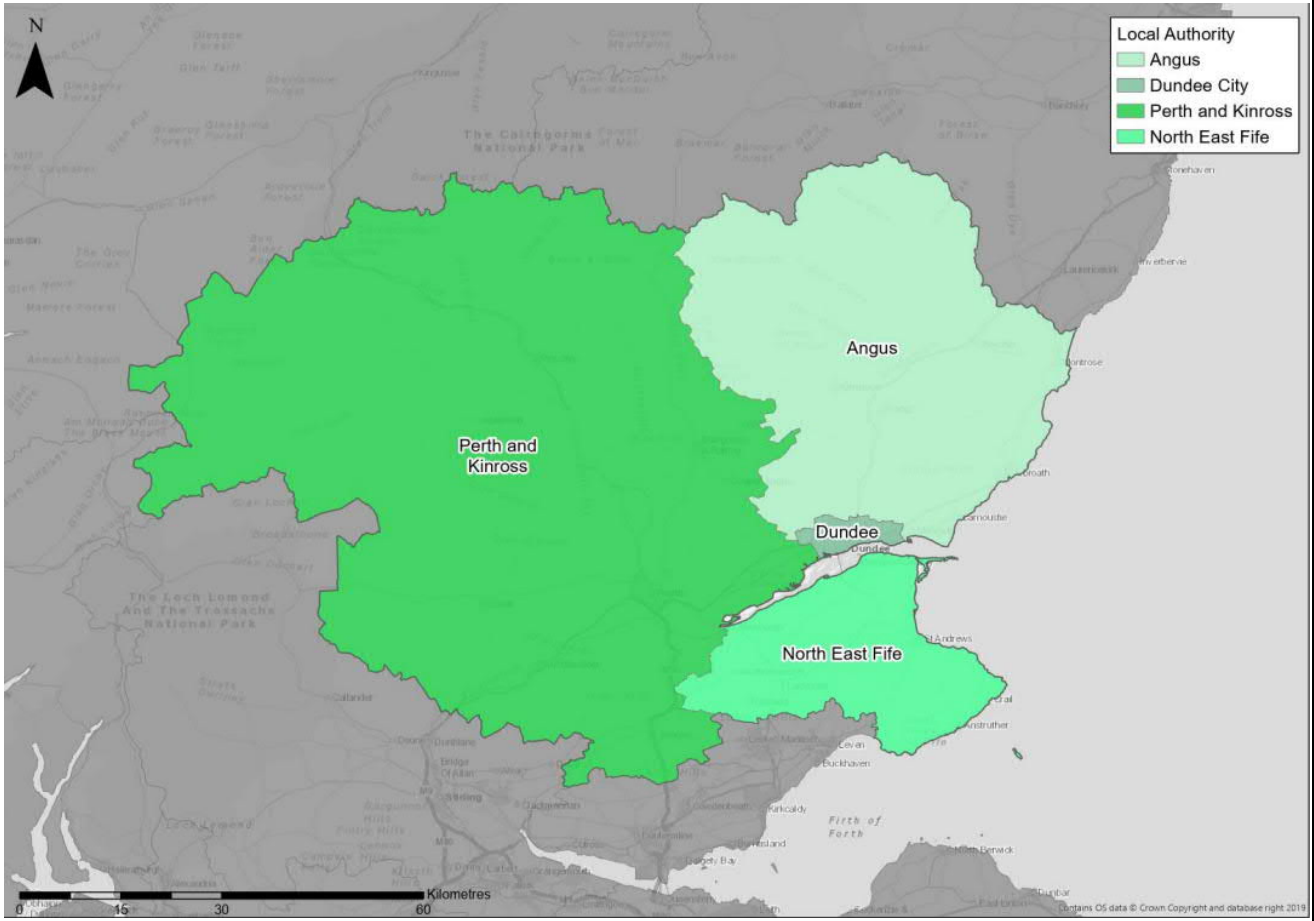
Metric	Comment/Consideration
CO_2 emissions	Likely to underestimate the benefits associated with public transport interventions due to the more limited representation of transport systems in urban areas and a degree of insensitivity to mode shift in TMfS.
Mode Share	Likely shift to public transport modes 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: Tay Cities Region

Regional Context

Geographic Context: The Tay Cities Region (herein referred to as 'the Region') comprises the three local authority areas of Perth & Kinross, Angus and Dundee City, plus the north-east part of Fife (which predominantly looks towards Dundee and/or Perth for major services), and includes 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 (31%), Other Urban Areas (27%), Accessible Small Towns (11%), Remote Small Towns (3%), Accessible Rural (23%) and Remote Rural (4%).

The transport network provides connectivity for the Region and between the Central Belt and the north and northeast of Scotland. It includes a diverse range of off-road and on-road active travel routes and an extensive bus network, although the frequency of service differs widely depending on time and location. There are 20 rail stations in the Region. Rail journey times are competitive compared to the car for some journeys to and within the Region, but on other routes (notably to/from Edinburgh), rail journey times can be long. The Region has one major port at Dundee.

The Region has an extensive trunk road network, including parts of the A9, M90, A90, A92 and A85. Congestion is a frequent peak-time occurrence at some locations, especially around Dundee and Perth. This causes delays and increases traffic levels and pollution on less suitable routes.

Social Context: The total population of the Region is 493,136 (2019 mid-year estimate) which is approximately 9% of the total population of Scotland. The largest settlements within the Region are Dundee (148,280) and Perth (47,430), but much of the Region's population lives in smaller urban areas. Whilst many of these are located along the Perth-Dundee-Carnoustie-Arbroath-Montrose coastal corridor, the Region also has towns in more rural settings, such as Forfar and Blairgowrie to the north, and Cupar and St Andrews to the south of the Tay. The Region (excluding Dundee City) has a smaller proportional working age population than the Scottish Regional average (61% compared to 63%); there are fewer people aged 15 and under (16% compared to 18%, 2019 mid-year estimate), and more people aged over 65 (23% compared to 19%).

Deprivation levels in Dundee City are nearly twice the national average; 37% of Scottish Index of Multiple Deprivation (SIMD) data zones in Dundee City are in the most deprived quintile nationally. Pockets of significant deprivation also exist outwith Dundee City: parts of Arbroath, Perth and Blairgowrie are in the most deprived 10% of Scottish data zones.

Health outcomes throughout the Region are varied; 37% of data zones in Dundee City are ranked by the SIMD Health rankings in the lowest 20% for health in Scotland, whereas in contrast, North East Fife has 1%, Angus 2% and Perth and Kinross 3%.

The proportion of households in the Region (excluding Dundee City) with access to one or more cars is higher than the national average (78% compared to 69.5%, based on 2011 Census), and travel to work (excluding Dundee City) by car is the dominant mode with 66% of people commuting by car. In Dundee City, 57% of households have access to one or more cars and travel to work by car is 60%, more than 10% greater than the Scottish Cities benchmark. Bus use for travel to work varies widely throughout the Region with Dundee City having 14.4% mode share while the other parts of the Region (i.e. excluding Dundee City) have 6.1%.

Economic Context: Total Gross Value Added (GVA) by the Region in 2018 was £17,047 million, which was 12.0% of Scotland's GVA (for 14.4% of the country's population). Regional GVA increased by 9.2% between 2013 and 2018, which was 5.3% less than the national benchmark increase. The average employment rate in Dundee City was 68.6% in 2019, which was 3.9% lower than the Scottish Cities benchmark and noticeably lower than the rest of the Region, which has an employment rate of 76.3%. The Region contributed 9.0% of Scotland's total benefits claimants in 2019. The number of claimants in the area increased by 21.8% between January 2015 and December 2019. The on-going redevelopment of the Waterfront in Dundee is classed as a National Development within both the existing National Planning Framework (NPF3) and the draft NPF4.

Environmental Context: Within the Region there are many areas classified as environmentally sensitive, with varying levels of statutory protection. Environmental designations include those for biodiversity, landscape and heritage. In addition, the Region contains a significant number of historic assets, including five Battlefield sites and 1,231 Scheduled Monuments. The greatest modelled noise levels are located in the east of the Region around Dundee (from road, industry and rail noise sources, as well as Dundee Airport), and those associated with the trunk road, motorway and rail corridors near/through Perth.

There are four Air Quality Management Areas (AQMAs) within the region, located in Dundee, Perth, Crieff and Cupar. Each of these AQMAs has been declared due to concerns regarding emissions of both Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}). In 2018, Carbon Dioxide (CO_2) emissions from transport within the Region was 16% of Scotland's total transport emissions.

Problems:

- **Transport Exclusion:** 27% of the population of Scotland does not travel anywhere on any given day. This proportion varies with age; nearly half of Scots aged 80 and over do not travel on any given day. According to the 2017 Scottish Health Survey, more than a quarter of the Region's population (and nearly a third of that of Dundee City) has a long-term physical or mental health condition. The Region has a higher proportion of older people than the Scottish average, who are more likely to suffer health problems and less able to use all transport options.
- **Physical Activity and Health:** Physical activity levels of much of the Region's population fall below recommended guidelines: 34% of adults living in the NHS Tayside area (which excludes north east Fife) do not achieve recommended amounts of physical activity. The proportion of people walking on a regular basis in the Region has been decreasing quickly in recent years.
- **Limited Transport Choice:** Parts of the Region suffer from relatively poor accessibility: 20% of data zones in Perth & Kinross, 21% in Angus and 18% in north east Fife are within the bottom decile for geographic access (SIMD). 28% of the Region's households have no access to a car or van.
- **Active Travel Infrastructure:** The Region's local authorities are working to improve facilities for walking, cycling and wheeling, but many gaps in provision remain. Cycling Scotland's research into the barriers to cycling, in which "not safe enough on the roads, bad drivers, etc" was by far the most common reason for not cycling, being quoted as the one main reason by 25% of respondents.
- **Air Pollution:** Although air quality is good in most of the Region, air pollution from road transport exceeds legal standards near some main roads in Dundee, Perth Cupar and Crieff, resulting in the declaration of four Air Quality Management Areas (AQMAs).
- **Carbon Emissions:** Carbon emissions from transport in the Region have been increasing in recent years, broadly in line with national trends. Between 2014 and 2018 inclusive, emissions from transport in the Region increased by 6.2%, similar to the average for Scotland (5.9% increase).
- **Freight Movements:** The Region's transport network caters for local and cross-regional freight movements. The Region's ports are targeting growth, but intermodal transfer facilities in the Region are currently very limited. There are no road/rail or sea/rail freight transhipment facilities in the Region, and rail capacity within the Region constrains the potential efficiency of rail freight.
- **Inter- and Cross-Regional Connectivity:** Cross-regional movements add to congestion and air pollution levels in the Region.

Opportunities:

- **Technological Opportunities:** The Region is showing willingness to respond to new opportunities to promote inclusive, sustainable transport choices, including Dundee City Council's work to increase electric vehicle use and Tactran's MaaS Pilot Project ENABLE.
- **Behavioural Change:** There are good examples of programmes that demonstrate the willingness of the Region's population to use active and sustainable modes, and are making changes as a result.
- **Development of the Active Travel Network:** Development of the active travel network was highlighted by stakeholders as a key opportunity for both leisure and functional trips.
- **Supporting Economic Change:** The Tay Cities Deal aspires for the Region "to be one of the most productive, knowledge-led economies in Europe". 'Connected Tay' is one of the key themes of the Deal, seeking to improve digital and real connectivity of the Region.

- **Public Transport Growth:** Many residents of the Region state that they could use public transport to commute to work: 59% of residents of Dundee City, along with 49%, 33% and 25% of Fife, Angus and Perth & Kinross respectively. Yet at the 2011 Census, less than 10% of the Region's employees commuted by public transport. Rail timetable changes have improved both service frequency and passenger capacity in recent years, increasing rail capacity and patronage. This was (pre-Covid) generating growth for demand for rail travel in the region.
- **Tourism Growth:** The Tay Cities Region's 2019 Tourism Strategy aspires to deliver approximately 3% growth year on year in the number of overnight stays. The strategy highlights transport's role in helping deliver this, and particularly the need to facilitate tourist movements by public transport as a greater proportion of visitors seek lower-carbon activities.

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	• Decarbonisation of the Rail Network
Interchange	• Mobility Hubs and Multi-Modal Interchanges	• Region Passenger Facilities/Station Enhancements
Behaviour Change	• Behavioural Change Initiatives	• Expansion of 20mph Limits and Zones
Ports	• Improve Access to Major Ports and Airports	
Freight	• Decarbonisation of Freight Deliveries • Railway Freight Terminals and Facilities • Freight Reliability, Resilience and Efficiency Improvements	• Freight Consolidation and Last-Mile Logistics • Freight Incentives and Freight Best Practice • Rail Freight Enhancements
Resilience	• Motorway and Trunk Road 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	• North West Trunk Road and Motorway Network Improvements • North East Trunk Road and Motorway Network Improvements	• Changing Road User Behaviour • A National Action Plan to support the shift to Low Emission/Ultra Low Emission/Electric Vehicles

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, Tactran Regional Transport Strategy 2015 (currently being updated), Angus Local Transport Strategy 2010, Shaping Perth's Transport Future 2010, and Dundee Local Transport Strategy, as well as non-transport-specific plans, such as the TAYplan Strategic Development Plan 2016 and Tay Cities Region Economic Strategy 2019.

The interventions also support the implementation of the Draft Fourth National Planning Framework (draft NPF4), including the proposed continuing designation of Dundee Waterfront as a National Development.

The policy framework for the Region has a strong emphasis on improved connectivity and addressing inequality, to help deliver well-connected, sustainable communities, promote modal shift away from private car, increase walking and cycling opportunities, and provide attractive places for visitors and for businesses to invest and grow, thereby 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.
	Change in mode share by active travel for all journeys	Potential increase in walking from 19% mode share to 24% mode share (5 percentage points) Potential increase in cycling from 0.6% mode share to 19% (over 18 percentage points) The package will increase 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 by around the following proportions:		

STPR2 Transport Planning Objectives (TPOs) Assessment

STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	

Local Authority	**Walking**	
	Baseline	With package
Angus	17%	22%
Dundee City	24%	30%
Fife (that part in Tay Cities Region)	18%	22%
Perth & Kinross	17%	20%
Regional average	**19%**	**24%**

Local Authority	**Cycling**	
	Baseline	With package
Angus	0.7%	19%
Dundee City	0.7%	23%
Fife (that part in Tay Cities Region)	0.6%	18%
Perth & Kinross	0.5%	15%
Regional average	**0.6%**	**19%**

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 the other, but this effect is not accounted for within these forecasts.

The economic impacts associated with air quality were assessed using the Department for 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 will contribute to the net-zero emissions target by:

- Enabling more passenger journeys to be made by active modes and public transport
- Decarbonising most public transport operations
- Facilitating uptake of electric vehicles
- Enabling some 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	
	Change in motorised veh-kms travelled	80 million veh km 3% decrease (see Annex C)	85 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 do not impact on the direct costs of travel (e.g. fares, fuel price), the package of interventions would see a 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) • Improving inclusive accessibility to public transport stops/stations • Seeking to promote public transport use and reduce operating costs, hence enhancing network sustainability
	Change in accessibility - population catchments increases to key services by journey time by public transport	The greatest population accessibility improvements observed in the Region across the destination types assessed were to both the nearest major hospital and nearest higher education site. With the regional package in place, each destination would see similar increases with around 2,200 people now able to access their nearest site by public transport within 30 minutes that were previously unable to do so. These benefits for both destinations were observed in Perth & Kinross, most specifically in the suburbs and communities around Perth. Accessibility to major food stores was also assessed but the impacts were found to be negligible. See Annex B for more information.		
	Scoring	**++**	**++**	

<table>
<tr><th colspan="4">STPR2 Transport Planning Objectives (TPOs) Assessment</th></tr>
<tr><th rowspan="2">STPR2 TPOs</th><th colspan="3">Appraisal Metrics</th><th rowspan="2">Performance Summary</th></tr>
<tr><th>Metric</th><th>Low</th><th>High</th></tr>
<tr><td rowspan="4">A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.</td><td>Change in mode share by active travel for all journeys</td><td colspan="2">Potential increase in walking from 19% mode share to 24% mode share (5 percentage points)

Potential increase in cycling from 0.6% mode share to 19% (over 18 percentage points)

These forecasts are subject to all active travel interventions being delivered in all relevant areas of the Region.</td><td rowspan="4">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 reduction in 24 premature deaths per year due to the health benefits arising from active travel.</td></tr>
<tr><td>Potential for Change in 'Place'</td><td colspan="2">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.</td></tr>
<tr><td>Change in Health Benefits</td><td colspan="2">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>Local Authority</th><th>Premature deaths prevented per annum</th></tr><tr><td>Angus</td><td>5.1</td></tr><tr><td>Dundee City</td><td>8.6</td></tr><tr><td>Fife (that part in Region)</td><td>5.4</td></tr><tr><td>Perth & Kinross</td><td>5.8</td></tr><tr><td>Regional average</td><td>23.6</td></tr></table></td></tr>
<tr><td>Scoring</td><td>+++</td><td>+++</td></tr>
</table>

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.	Increased labour catchment by sustainable travel (PT/Active Travel)	The regional package would create small benefits for accessibility to employment by public transport in some parts of the Region (see Annex B for more information): between 500 and 2,000 people are anticipated to have their journey time to a regionally-important employment centre reduced from more than one hour to less. Accessibility to higher education and major food stores was also assessed but the impacts were found to be negligible. Improvements to active travel infrastructure throughout the Region, however, would enable many more people to access local employment opportunities by low-cost and sustainable means.		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 Encouraging modal shift to sustainable modes and reducing the volume of vehicles on the network is anticipated to improve journey time reliability for all vehicles, providing benefits to businesses in the Region and to those elsewhere in Scotland that are reliant on the Region's transport system.
	Change in lost time due to congestion (for business/ commercial transport)	Reduction of 46,000 hours per annum (9%)	Reduction of 98,000 hours per annum (7%)	
	Scoring	**++**	**++**	
A reliable and resilient strategic transport system that is safe and secure for users.	Change in accidents Accident reduction percentage related to veh	Accident reduction related to motorised veh km - 3% (6,970) Sections of Realignment/ Widening - reduction of 23% to 59%	Accident reduction related to motorised veh km - 2% (7,150) Sections of Realignment/ Widening - reduction of 23% to 59%	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

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
	km – PIA and 'Damage-only' All other accident reduction percentages – PIA only	Sections of Overtaking Opportunities - reduction of 35% to 73% Locations of Junction Improvements – change of 42% (increase) to 64% (decrease)	Sections of Overtaking Opportunities - reduction of 35% to 73% Locations of Junction Improvements – change of 42% (increase) to 64% (decrease)	• Reducing the risk of road accidents at hotspot locations on the trunk road and motorway network • Reducing perceived risks to road safety and to personal security, so enabling more people (particularly children, women and older people) to travel independently • Changing attitudes of road users, through behavioural change campaigns. This is anticipated to increase awareness of interactions with those walking, wheeling and cycling • Improving active travel provision and providing more dedicated and segregated routes for walking, cycling and wheeling
		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 be significantly safer.		
	Change in lost time due to congestion	Reduction of 170,000 hours per annum (12%) (see Annex C)	Reduction of 500,000 hours per annum (9%) (see Annex C)	
	Journey Time Reliability/ Availability of alternatives (modes/ routes)	This package is forecast to reduce overall motorised vehicle kilometres by 2% and 1% under the Low and High Travel Demand scenarios respectively (see Annex C), hence reduce 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 at junctions where safety is a problem is forecast to reduce accidents and associated road closures thereby improving reliability.		

STPR2 Transport Planning Objectives (TPOs) Assessment				
STPR2 TPOs	Appraisal Metrics			Performance Summary
	Metric	Low	High	
		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 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 network is anticipated to improve journey time reliability, as indicated by reducing time lost to congestion.		
	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 Low and High Travel Demand scenarios. Total emissions of NO_X were predicted to be effectively zero in 2045 in the Low Travel Demand scenario, and 2051 in the High Travel Demand 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, 4.3% reduction in PM_{10} and 4.5% reduction in $PM_{2.5}$ in the Low package, and a 4.1% reduction in PM_{10} and a 4.2% reduction in $PM_{2.5}$ in the High.
	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 effects on noise and vibration due to the construction and operation of specific interventions including north west and north east trunk road improvements and rail improvements, 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) exhaust emissions and increasing traded grid emissions associated with increased adoption and charging of battery-electric vehicles, and specifically in the Low Travel Demand scenario. Across both scenarios the package will reduce emissions of CO_2eq, although the change is greater in the High scenario due to overall higher emissions.
	Vulnerability to Effects of Climate Change	+	+	

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
	Potential to Adapt to Effects of Climate Change	+	+	The package provides an opportunity to adapt the transport network to the predicted effects of climate change, with one intervention specifically focused on adaptation.
Health, Safety & Wellbeing	Accidents	Accident reduction related to motorised veh km is forecast to be 3%	Accident reduction related to motorised veh km is forecast to be 2%	The package will reduce the number and severity of accidents through targeted infrastructure improvements and, by encouraging modal shift away from private car, result in reduced accident risk due to reduced conflicts. Mode shift to sustainable modes will, by improving natural surveillance, make paths, stops, stations and services, and reduce the perception of isolation 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, reduce the number of locations at which security is a concern.		
	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 £1bn to £5bn. 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.		

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
	Access to Health and Wellbeing Infrastructure	The package will make minor improvements to public transport and active travel accessibility to some healthcare facilities in the Region.		
	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'. Any infrastructure interventions would be required to be designed to ensure they did not detrimentally impact nearby communities.		
Economy *(Transport Economic Efficiency)*	User Benefits (2010 prices and values for a 60 year appraisal period)	Present Value of Benefits (PVB) of approximately £250m to £500m Accidents Present Value of Benefits (PVB) of approximately £10m to £25m	Present Value of Benefits (PVB) of approximately £100m to £250m Accidents Present Value of Benefits (PVB) of approximately £10m to £25m	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 public transport interventions including Bus Priority Infrastructure, and to a lesser extent the Rail and Interchange interventions, are the main contributors to the public transport user benefits total in the Low Travel Demand 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 are reduced in the High Travel Demand scenario. The High Travel Demand scenario also has a reduction in public transport operator revenue. Nevertheless, even under this High Travel Demand scenario the sustainable transport interventions contribute to the majority of user benefits.

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
				In terms of accident savings, the level of benefits is similar in both planning demand scenarios. This is due to the reduction in road-based vehicle-kilometres travelled in the Region, as a result of the active travel and public transport interventions encouraging a mode shift away from private car. 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.
Equality & Accessibility	Public Transport Network Coverage	The package will make improvements to public transport journey time reliability, and modest improvements in network coverage, courtesy of improved journey times. Improved local active travel infrastructure will make more public transport stops/stations accessible to more people.		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 forced 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, improving commercial performance/viability, which could indirectly reduce ticket costs.
	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 a car and more likely to rely on public transport,		

STAG Assessment				
STAG Criteria	Sub Criteria	Scoring		Performance Summary
		Low	High	
		walking and cycling for their journeys. This includes women, children and young people, older people, some ethnic minority groups and disabled people.		
	Comparative Access by Geographic Location	Some areas will benefit from modest improvements to public transport accessibility and hence gain some benefits for better access to jobs and services. Deprived areas in Dundee City, for example, are forecast to receive a 5% to 10% improvement in access to employment by public transport.		
	Affordability	Although the STPR2 interventions do not 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 solutions, and would be expected to largely operate inside existing design standards. 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. 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, as such, would be positively received. There may be concerns in areas of congestion where road space reallocation or priority measures 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. Improved access to major ports and airports, the creation of mobility hubs/interchanges, improvements to the strategic rail network and the improvements to passengers' services and facilities seek to encourage modal shift and, as a result, reduce levels of transport related air pollution and carbon emissions. The decarbonisation of the rail and bus network and freight deliveries will also support a reduction in greenhouse gas emissions and improvement in air quality. The package provides an opportunity to adapt the transport network to the predicted effects of climate change, and includes one specific intervention focused on this adaptation, as well as others which promote more sustainable usage of the existing transport network 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. Active travel interventions will also have positive outcomes on population and human health through expected improvements in air quality and increased uptake of physical exercise through walking, wheeling and cycling. Road interventions are anticipated to have positive effects on safety. Trunk road improvements which are focused on junction improvements, realignment / widening and overtaking opportunities are also not anticipated to have a notable impact on traffic volumes or mode share and subsequently transport-based emissions, in the majority of locations. The construction and operation of these interventions may result in minor negative effects on population and human health with the potential for an increase in noise and vibration during construction and operation. This is dependent on the location and design of individual schemes. There is also potential for a negative effect on material assets due to the use of natural resources. The freight interventions are anticipated to result in minor negative effects on material assets as several interventions proposed involve enhancements to rail freight, terminals and facilities and therefore will require the use of natural resources. Where new infrastructure is required this could result in negative effects on biodiversity, soil, landscape, water, historic environment and material assets however the magnitude of effect is uncertain at this stage and will be determined by the design (and physical footprint) of the interventions.
EqIA	The package would improve public transport and active travel accessibility to key destinations and services 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 could 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. 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, the package would have positive impacts on these groups. Mode shift to sustainable modes will make paths, stops, stations and services less isolated and this, 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 a negligible impact on addressing this criterion.
CRWIA	By encouraging modal shift to more sustainable modes, this package would 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 would 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, result 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	Deprivation levels in Dundee City are nearly twice the national average; 37% of Scottish Index of Multiple Deprivation (SIMD) data zones in Dundee City are in the most deprived quintile nationally. Pockets of significant deprivation also exist outwith Dundee City: parts of Arbroath, Perth and Blairgowrie are in the most deprived 10% of Scottish data zones. The package has the potential to improve public transport connectivity, including through strategic rail corridor enhancements, 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. The package would therefore be expected to have a minor positive impact on addressing this criterion.

Annex A: Grouping Interventions

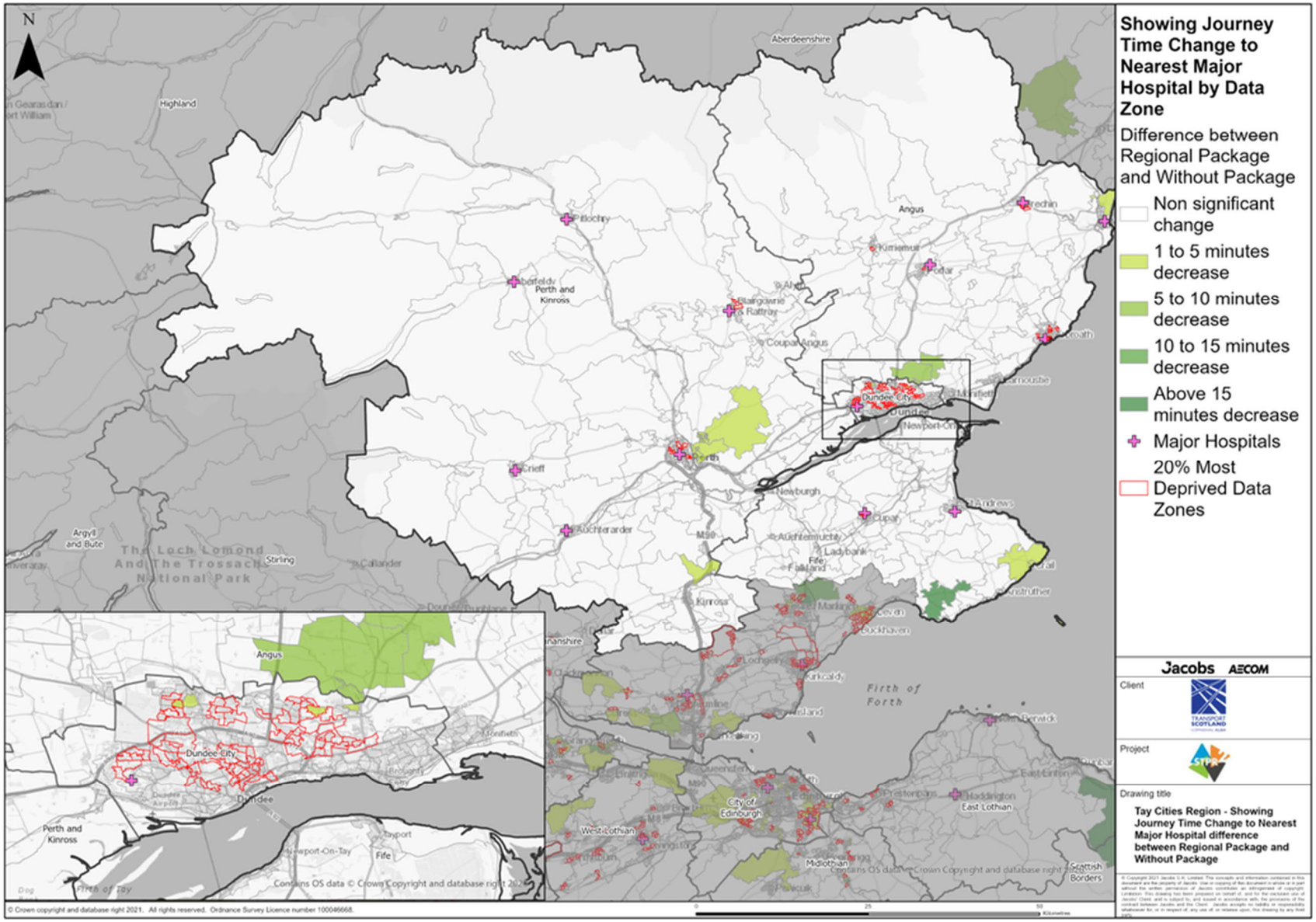
Tay Cities Region	
Grouping Title	**Regional Description**
Improving Access to Bikes	Improve access to bikes through a multi-faceted programme of interventions to enable people to cycle (and also to support walking/wheeling as appropriate), and to give them confidence and skills to do so, such that they can make use of new or existing active travel infrastructure. Interventions 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 interventions to reduce the adverse effects of trunk toad 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 interventions and School Streets schemes where appropriate, as well as behaviour change interventions. 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 recommendations 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. - 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. -Consideration of whether bus priority infrastructure provides a cost-effective solution for St Andrews BRT system as an alternative to the rail link from Leuchars -Consider trunk road priority on the A90 Forfar Road southbound at the Kingsway in Dundee
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.
Freight reliability, resilience and efficiency improvements	Sets out options on how the road freight industry can be supported by implementing a variety of hard and soft interventions that will reduce overall disruption, improving journey times and reducing costs for operators.
Freight Consolidation and Last-Mile Logistics	Introduction of interventions 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. Central Belt - Aberdeen, improved route availability (axle weight), better freight schedules and clearance for taller and wider wagons.
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 fully maximise the potential afforded by all its major ports and airports.

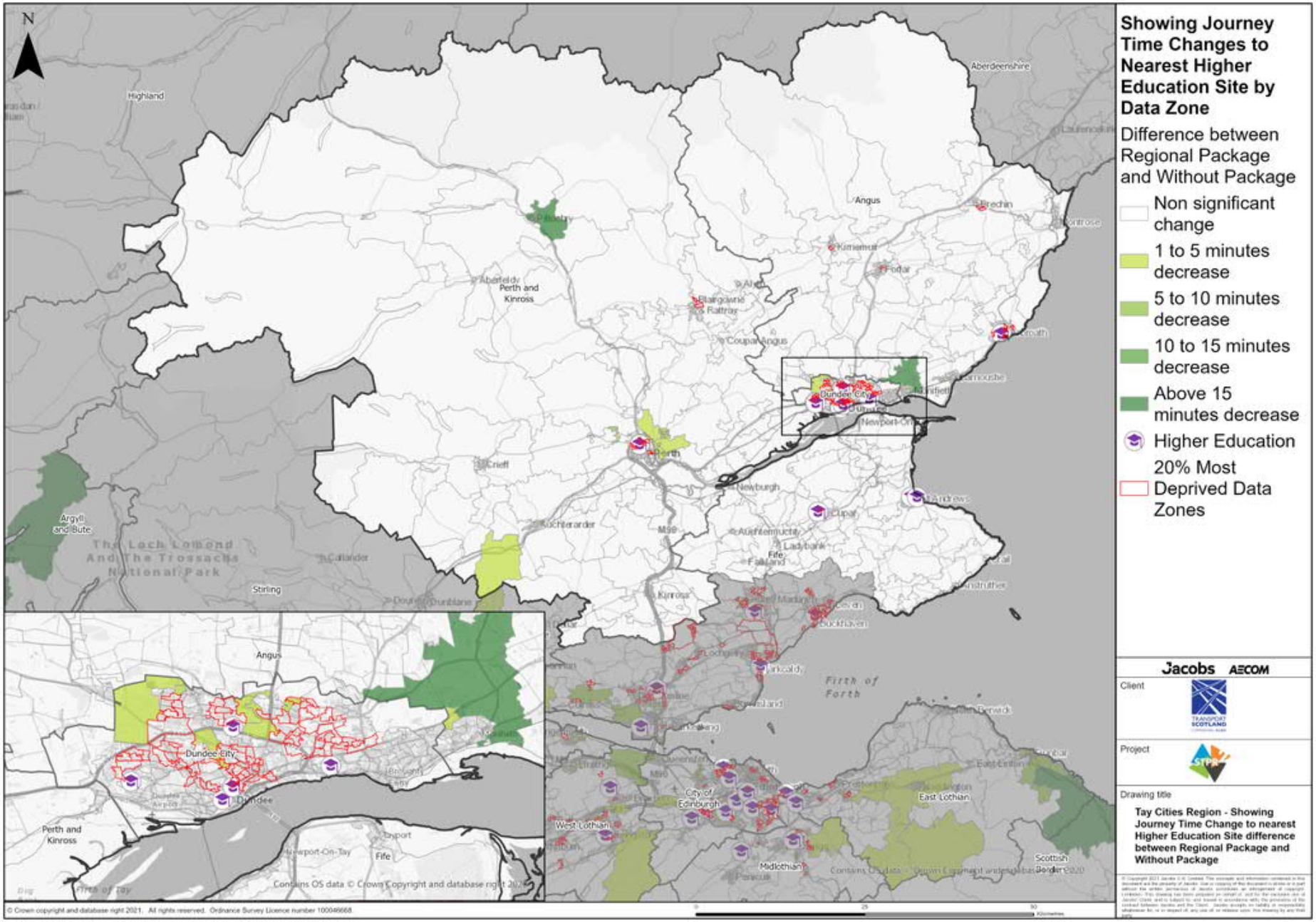
Trunk Road and Motorway Network Renewal for Reliability, Resilience and Safety	Renew and improve the resilience of the trunk road and motorway network. This would include preventative and programmed structural renewals of carriageways and network structures for consideration.
Trunk Road and Motorway 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 interventions to strengthen the resilience of Scotland's trunk road and motorway network to adapt to a changing climate and unplanned events.
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.
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.
North 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.
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. Interventions include funding streams to support the delivery of infrastructure and innovative schemes to allow an equitable transition across the country.
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, including: -Glasgow to Perth -Perth to Dundee -Dundee to Aberdeen -Perth to Inverness -Dundee to Edinburgh -Perth to Edinburgh

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).
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).

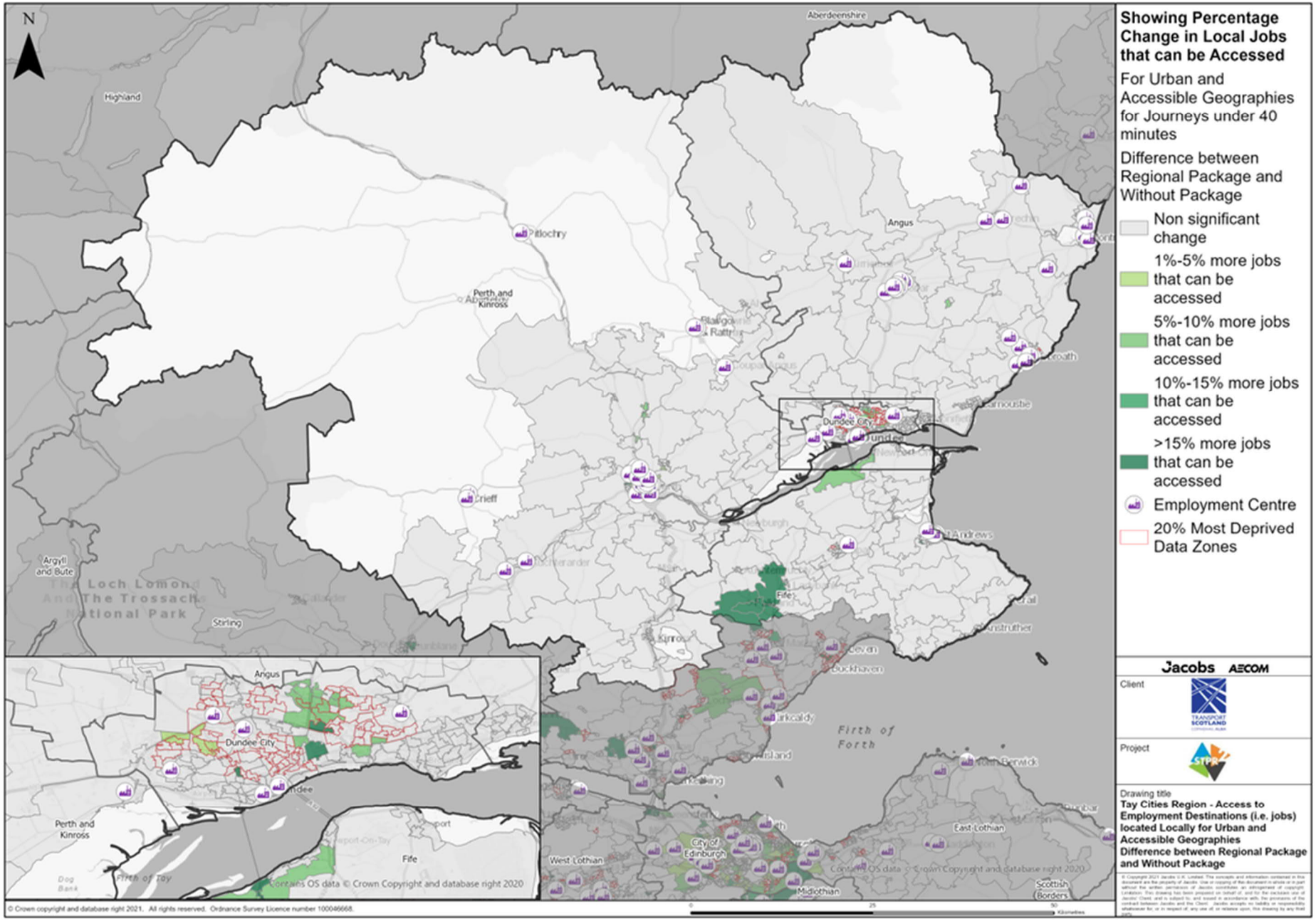
Annex B: NAPTAT MAPPING



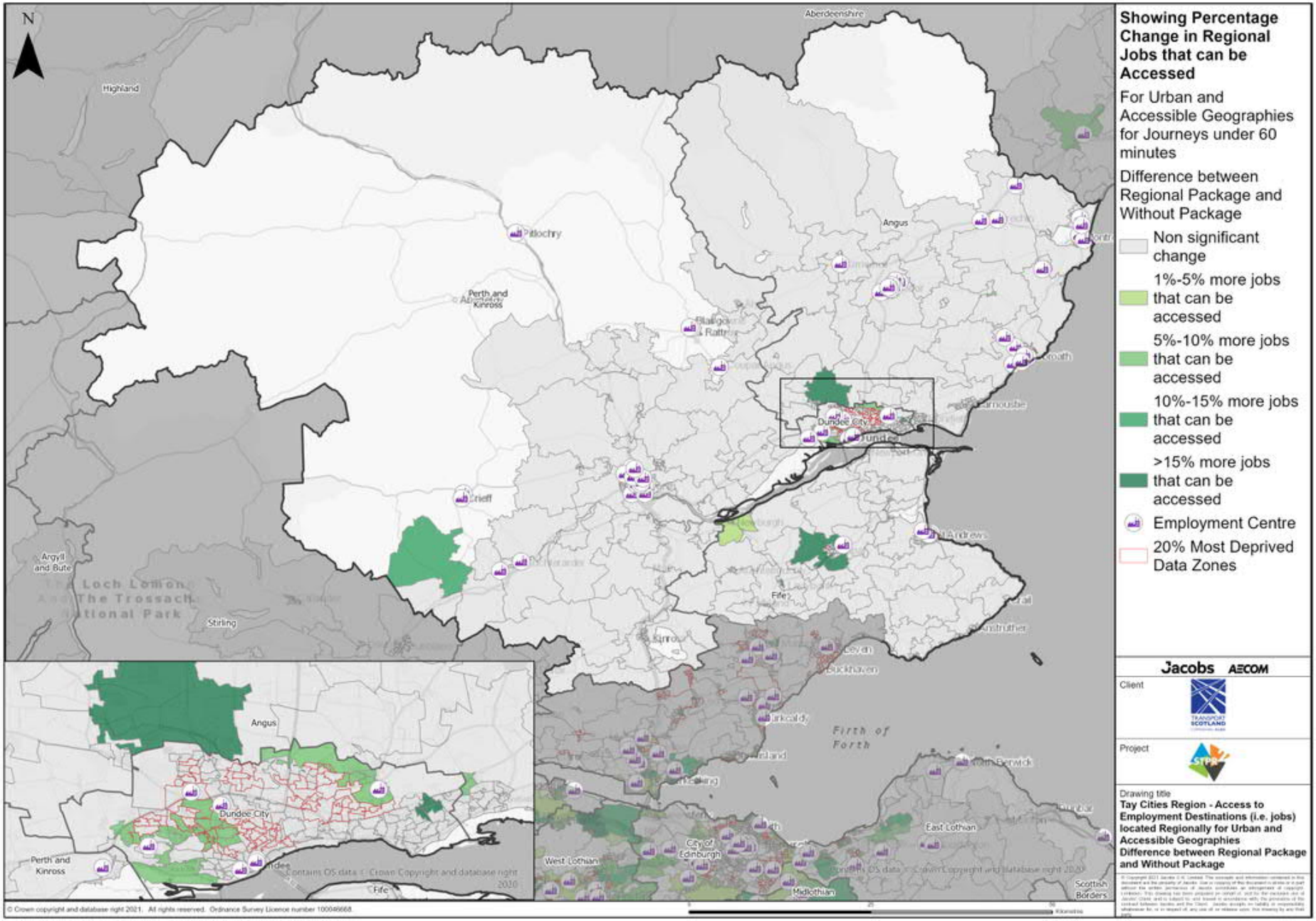
Tay Cities Region Journey Time Change Forecast to Nearest Major Hospital



Tay Cities Region Journey Time Change Forecast to Nearest Higher Education Site



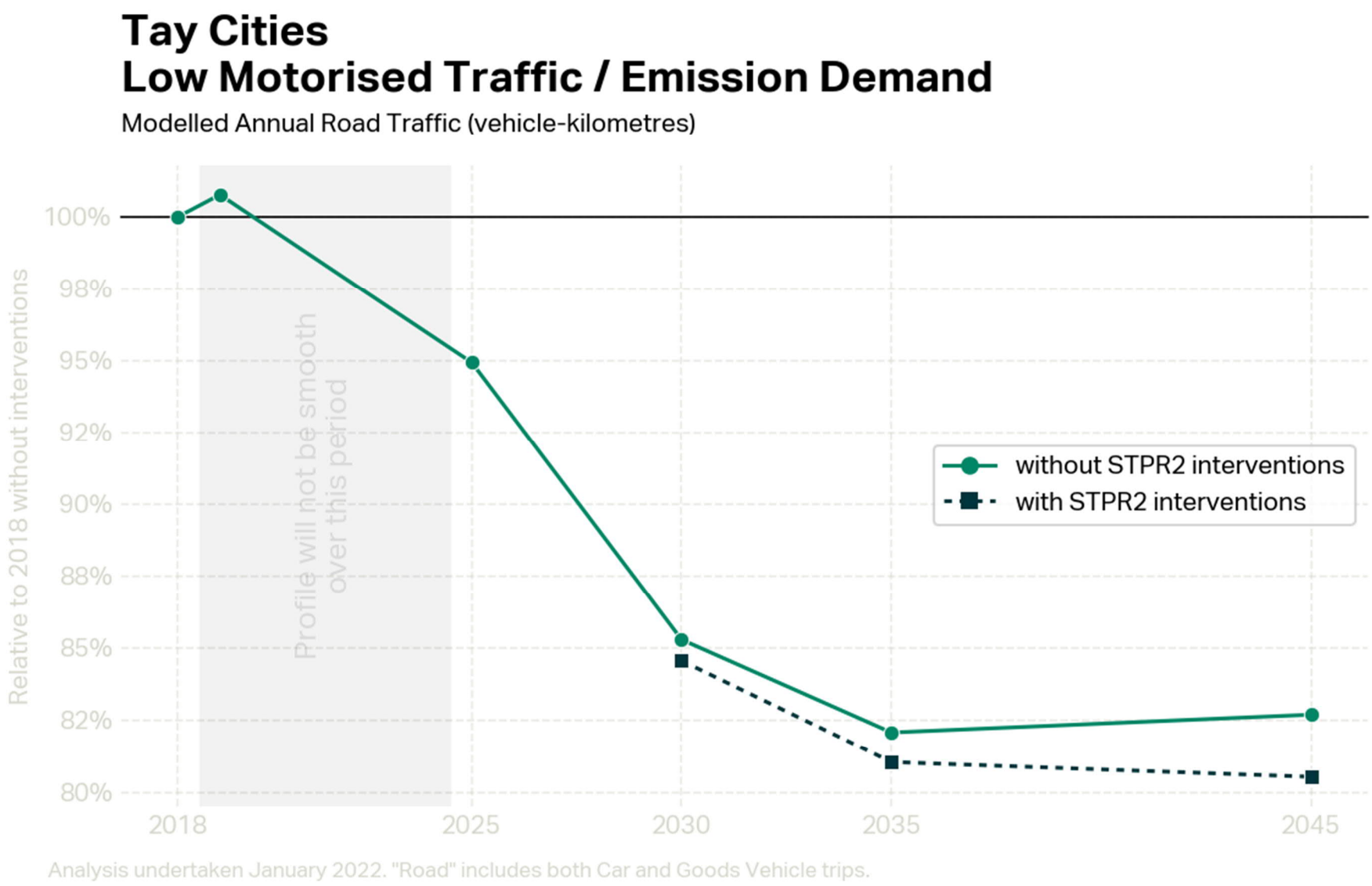
Tay Cities Region Journey Time Change Forecast to Local Employment Destinations



Tay Cities Region Journey Time Change Forecast to Nearest Regional Employment Destinations

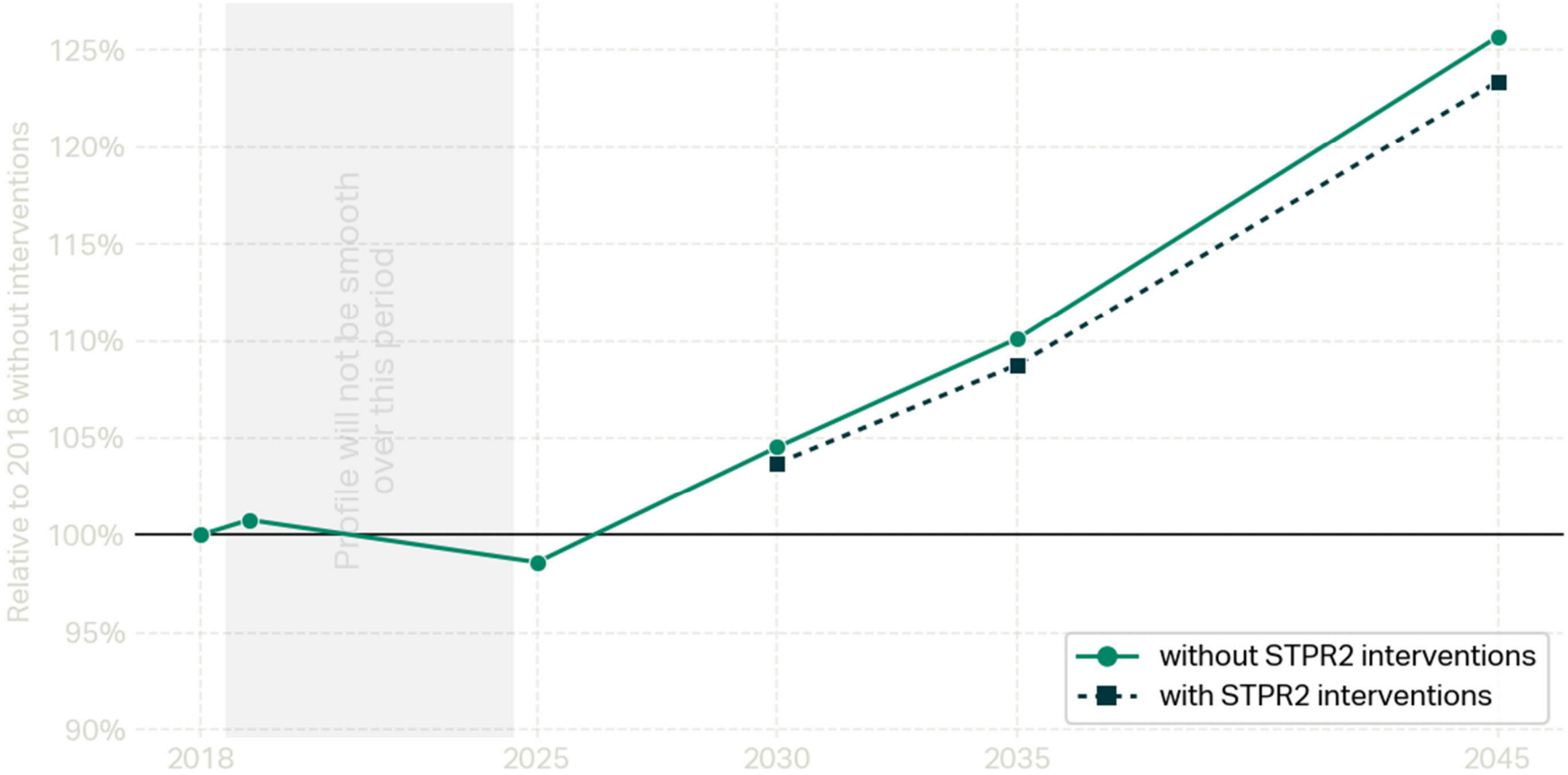
Annex C: Detailed Appraisal Outputs

Traffic Modelling Outputs



Tay Cities
High Motorised Traffic / Emission Demand

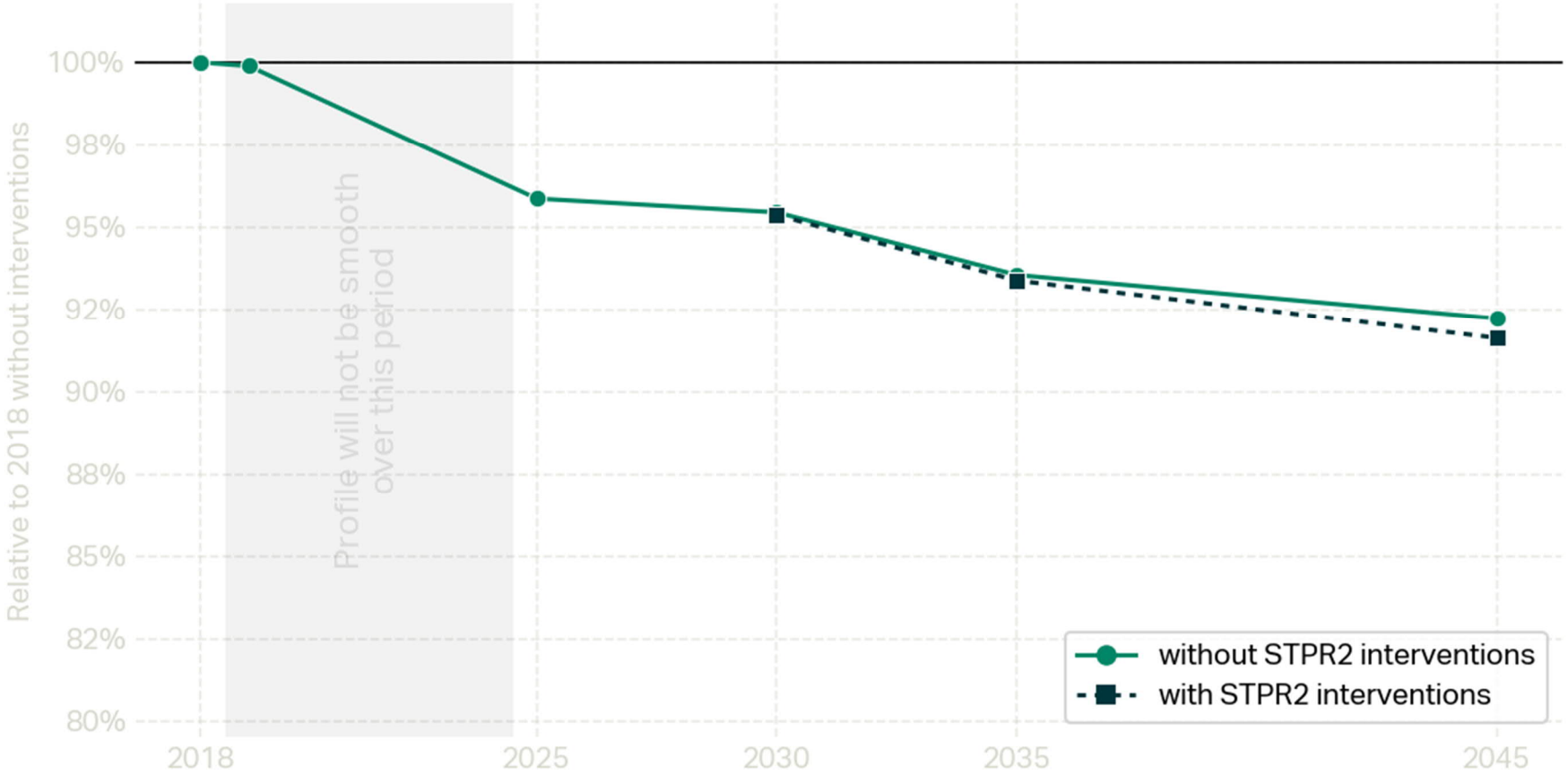
Modelled Annual Road Traffic (vehicle-kilometres)



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

Tay Cities
Low Motorised Traffic / Emission Demand

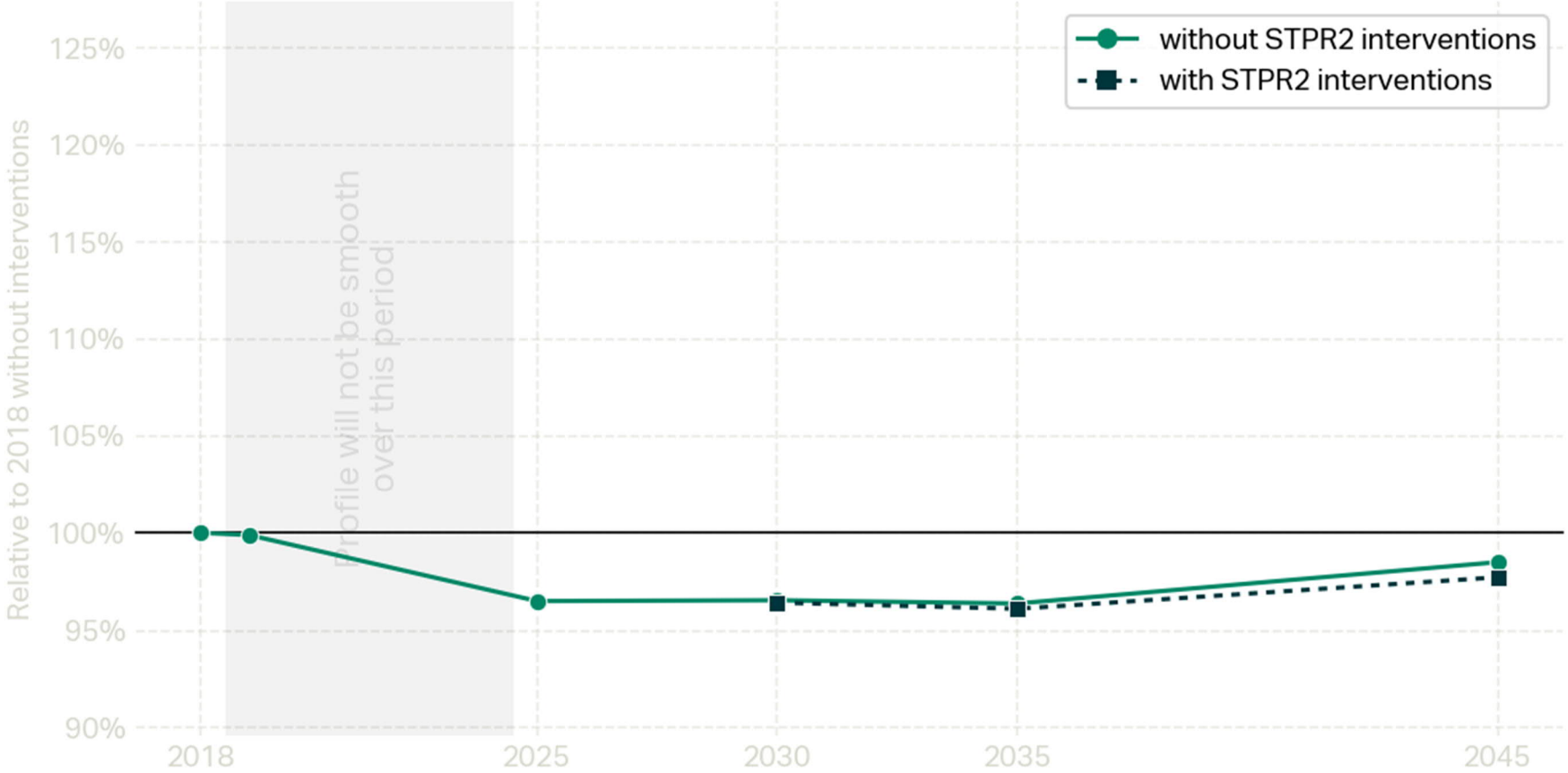
Modelled Road Journey Time (minutes per km)



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

Tay Cities
High Motorised Traffic / Emission Demand

Modelled Road Journey Time (minutes per km)



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