Evaluation of the Levenmouth Rail Link Reopening

Baseline Data Collection and Analysis – Technical Appendices

Appendix A: Evaluation framework

For the baseline evaluation of the reopening of the Levenmouth Rail Link project, three transport planning objectives (TPO) were set out along with a series of research questions (RQ), indicators, outputs and outcomes. These are outlined in more detail below.

Transport Planning Objective 1

TPO 1: Improve transport access to employment and key services, including education, health and leisure facilities, within the Levenmouth area via rail.

Research questions

The research questions aligned to this objective (TPO 1) are:

- RQ1 – What are the current habits/behaviours for travel WITHIN Levenmouth?
- RQ2 – What are current user perceptions on the usability and accessibility of transport, employment and key services WITHIN Levenmouth?
- RQ3 – What are users intentions to use the Levenmouth Rail Link for travel WITHIN Levenmouth?
- RQ5 – What is the current status of the local economy WITHIN the Levenmouth area?
- RQ6 – What would happen WITHIN the Levenmouth area if the Levenmouth Rail Link was not implemented?

Indicators

The indicators for this objective (TPO 1) are:

- Evidence on access to Leven and Cameron Bridge stations
- Evidence on the length of trips and mode(s) taken (distance, time and mode) to employment and key destinations.
- Evidence on trip purpose and destination.
- Evidence on perceptions of transport services from residents and businesses
- Evidence on intentions to use the Rail Link
- Evidence on the performance of the local economy

Outputs

The outputs for this objective (TPO 1) are:

- Number of people travelling within Levenmouth
- Reduction in journey times to key destinations e.g. schools, health services etc.

- Increased population catchment to employment and key services within Levenmouth
- Attitudes towards transport services.
- Differences according to demographic indicators

Outcomes

The outcomes for this objective (TPO 1) are:

- Improved access to different transport options.
- Improved access to employment and local services within Levenmouth

Transport Planning Objective 2

TPO 2: Improve transport access and connectivity to and from the Levenmouth area for businesses, visitors and the resident population via rail.

Research questions

The research questions aligned to this objective (TPO 2) are:

- RQ1 – What are the current habits/behaviours for travel TO/FROM Levenmouth?
- RQ2 – What are current user perceptions on the usability and accessibility of transport, employment and key services TO/FROM Levenmouth?
- RQ3 – What are users intentions to use the Levenmouth Rail Link for travel TO/FROM Levenmouth?
- RQ4 – What are current levels of tourism activity in the Levenmouth area?
- RQ5 – What is the current status of the local economy in the Levenmouth area?
- RQ6 – What would happen WITHIN the Levenmouth area if the Levenmouth Rail Link was not implemented?

Indicators

The indicators for this objective (TPO 2) are:

- Evidence on perceptions of transport services from residents, visitors and businesses
- Evidence on the length of trips (distance & time) to employment and key destinations
- Evidence on trip purpose and destination.

- Evidence on access to Leven and Cameron Bridge stations by various metrics.
- Evidence on intentions to use the Rail Link
- Evidence on the performance of the local economy

Outputs

The outputs for this objective (TPO 2) are:

- Number of people travelling to Levenmouth using rail.
- Increased population catchment to employment and key services within Levenmouth
- Reduced journey times to and from Levenmouth area.
- Attitudes towards transport services.
- Differences according to demographic indicators

Outcomes

The four outcomes for this objective (TPO 2) are:

- Improved access to different transport options
- Improved access to employment and local services outwith Levenmouth
- Improved perceptions of rail travel in Levenmouth area.
- Economic benefits

Transport Planning Objective 3

TPO 3: Increase the sustainable mode share for the residents and workforce in the Levenmouth area.

Research questions

The research questions aligned to this objective (TPO 3) are:

- RQ1 – What are the current habits/behaviours for travel TO/FROM Levenmouth?
- RQ3 – What are users intentions to use the Levenmouth Rail Link for travel TO/FROM Levenmouth?
- RQ4 – What are current levels of tourism activity in the Levenmouth area?
- RQ5 – What is the current status of the local economy WITHIN the Levenmouth area?

- RQ6 – What would happen in the Levenmouth area if the Levenmouth Rail Link was not implemented?

Indicators

The indicators for this objective (TPO 3) are:

- Evidence on mode share by purpose of trip.
- Evidence on the reduction in number of trips made by car.
- Evidence on intentions to use the Rail Link

Outputs

The outputs for this objective (TPO 3) are:

- Reduction in the car mode share.
- Number of visitors and residents choosing to travel by rail.
- Number visitors and residents choosing to travel by bus.
- Differences according to demographic indicators

Outcomes

The outcome for this objective is:

- Reduction in carbon emissions.

Appendix B: Resident survey sample selection methodology

This Appendix describes the methodology used to define the sample selection or the residents survey. This covers:

- the impact area definition; and
- Community Profile definition.

Impact area definition

The table below provides a breakdown of the areas to be targeted for the residents' survey, with the number of houses to obtain completed responses from.

The residents' survey focussed on households within Levenmouth, plus settlements in the immediate surrounding area to understand the how the Levenmouth Rail Link may affect the way they travel. Those areas include villages in the East Neuk (Pittenweem and Anstruther), Upper Largo, Lower Largo, Lundin Links and the Wemyss Villages, Kirkcaldy, Glenrothes and Cupar.

A minimum sample size of 400 responses was determined as it would provide a satisfactory level of statistical confidence (95%) in the results (providing a margin of error of +/4.9% - see notes below) for the population of the Levenmouth area of 30,700 people.

Note 1 – this is based on a 50% estimate and 95% confidence level. This means that, if 50% of the sample answer a question in a given way, then we can be 95% certain that the figure for the population as a whole would be between 45.1% and 54.9% (i.e. 4.9% either way of the 50% figure).

Note 2 – a total of 432 resident surveys were completed, exceeding the 400 target. This resulted in a margin of error of +/-4.7%.

The spatial distribution of the household responses is shown in Table B-1 below and accompanying map in Figure B-1 below. A full breakdown of the target spatial distribution (at the settlement level) is provided in Table B-3. To ensure the majority of responses were received from households within Levenmouth, weightings were applied and the total number of households were based on a range of factors, including:

- National Records of Scotland (NRS) and Scotland Census 2011 to determine area population and household distribution and Travel to Work (TTW) flows.

- Journey time accessibility data.
- Information from the Levenmouth Sustainable Transport Study Case for Change.

Table B-1 Resident Survey - Respondent profile by location (note – numbers are rounded, as such sums of these numbers do not match their rounded totals).

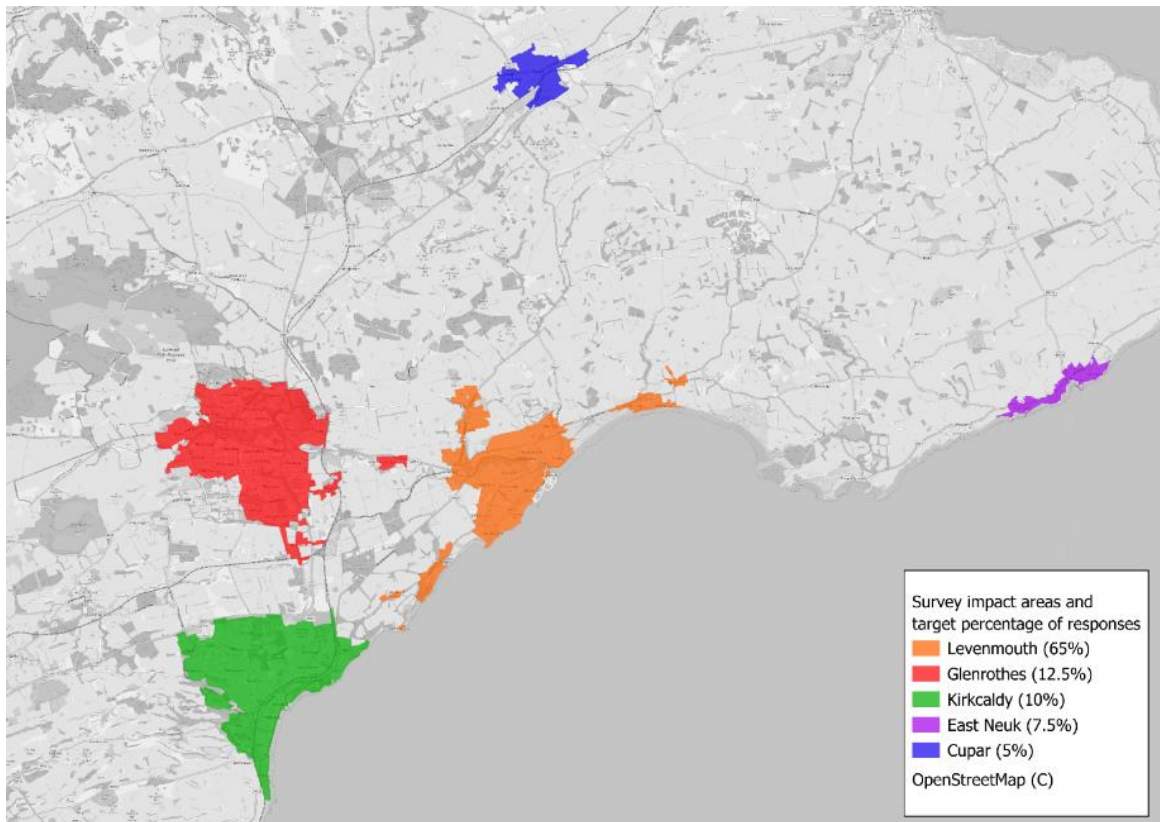| Location	Target (%)	Actual (%)
Leven	16%	18%
Methil	19%	16%
Buckhaven	9%	8%
Kennoway	8%	7%
Other Levenmouth (including Windygates, East Wemyss, West Wemyss, Coaltown of Wemyss, Lower Largo, Upper Largo, Lunin Links)	12%	13%
Total Levenmouth	*64%*	*63%*
East Neuk (Anstruther and Pittenweem)	8%	7%
Glenrothes, Markinch and Thornton	13%	16%
Kirkcaldy	10%	9%
Cupar	5%	5%
Base	**400**	**432**

Figure B-1: Map of household survey impact areas boundaries and target percentage of survey responses

In summary:

- **Levenmouth** (based on Fife Council Wards 21 and 22) includes the Wemyss Villages, Lundin Links and Largo. Whilst the TTW data indicated over 70% of trips to work were undertaken internally within Levenmouth, this weighting has been reduced to 65% to ensure a statistically sufficient minimum sample size can be collected for the remaining areas.

- **Glenrothes** (including Thornton and Markinch) and Kirkcaldy cumulatively represent approximately two-thirds of the responses from locations outwith Levenmouth (with Glenrothes having a slightly higher proportion based on TTW data than Kirkcaldy).

- **East Neuk**, whilst having a smaller TTW percentage, accounts for 7.5% of the responses. This is higher than the other TTW areas due to the potential propensity to use the Rail Link from the East Neuk (due to shorter travel time to access their nearest rail station (i.e. Kirkcaldy, Markinch, Glenrothes; or stations to the North such as Ladybank).

- **North Fife**, the TTW data indicated some level of demand between Leven and north Fife – namely Cupar. In addition, the ScotRail's 'Fife and Tay Cities Timetable Consultation' feedback indicated a small amount of demand for direct/better connections between Leven and north Fife (And

beyond to Perth and Dundee). To reflect this in the survey responses, Cupar (with its own station on the East Coast Main Line) has been selected as a proxy for these areas, as most of the TTW trips from north Fife originate from here, and with being a town with a rail station commuters could make the trip between Cupar and Leven through interchange at Kirkcaldy. It is noted however:

- o There is currently an hourly, direct bus service between Cupar and Leven with an approximate journey time of 35 to 40 minutes; and
- o Based on the interim/draft ScotRail timetable, the journey time between Cupar and Leven rail stations would be between approximately 60 to 70 minutes, including an approximate 20 to 25 minute interchange time at Kirkcaldy.

The survey did not extend beyond these areas as the TTW data suggested there are not many locations or significant number of people beyond the areas identified making trips to work in Levenmouth, as well as the potential for double-counting responses as the business survey questions employers (in Levenmouth) where their employees are travelling from.

Table B-2: List of areas, towns and settlements and the target number of households to survey in each (based on weighted proportions)

Area	Town	Town/Settlement	Number of Dwellings	Number of Households to Survey	Percentage of total responses
Levenmouth	Leven	Leven East	1,649	25	6.3%
Levenmouth	Leven	Leven North	1,188	17	4.3%
Levenmouth	Leven	Leven West	1,420	20	5.0%
Levenmouth	Methil	Methil East	1,607	24	6.0%
Levenmouth	Methil	Methil Methilhill	1,994	30	7.5%
Levenmouth	Methil	Methil West	1,262	20	5.0%
Levenmouth	Buckhaven	Buckhaven	2,465	35	8.8%
Levenmouth	Kennoway	Kennoway	1,981	30	7.5%
Levenmouth	Windygates	Windygates	795	11	2.8%
Levenmouth	East Wemyss	East Wemyss	931	13	3.3%
Levenmouth	West Wemyss	West Wemyss	107	**5**	1.3%
Levenmouth	Coaltown of Wemyss	Coaltown of Wemyss	295	**5**	1.3%
Levenmouth	Largo	Lower Largo	503	**10**	2.5%
Levenmouth	Largo	Largo	207	**5**	1.3%
Levenmouth	Levenmouth	Lundin Links	399	**10**	2.5%
East Neuk	Anstruther	Anstruther	1,558	20	5.1%
East Neuk	Pittenweem	Pittenweem	725	10	2.4%

Area	Town	Town/Settlement	Number of Dwellings	Number of Households to Survey	Percentage of total responses
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Auchmuty	1,572	2	0.5%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Balfarg Pitcairn and Coul	1,250	2	0.5%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Balgeddie and Town Park	1,480	2	0.5%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Cadham and Pitcoudie	1,029	2	0.6%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Caskieberran and Rimbleton	2,027	2	0.5%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Collydean	1,019	2	0.6%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Macedonia and Tanshall	1,912	3	0.8%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Pitteuchar	2,129	3	0.8%

Area	Town	Town/Settlement	Number of Dwellings	Number of Households to Survey	Percentage of total responses
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes South Parks	1,004	2	0.6%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Stenton and Finglassie	1,435	3	0.8%
Glenrothes, Markinch and Thornton	Glenrothes	Glenrothes Woodside	1,162	3	0.7%
Glenrothes, Markinch and Thornton	Glenrothes	Leslie and Newcastle	1,873	3	0.8%
Glenrothes, Markinch and Thornton	Markinch	Markinch	1,571	5	1.3%
Glenrothes, Markinch and Thornton	Milton of Balgonie	Milton of Balgonie	113	5	1.3%
Glenrothes, Markinch and Thornton	Coaltown of Balgonie	Coaltown of Balgonie	453	5	1.3%
Glenrothes, Markinch and Thornton	Thornton	Thornton	924	5	1.3%
Kirkcaldy	Kirkcaldy	Dysart	1,757	3	0.8%

Area	Town	Town/Settlement	Number of Dwellings	Number of Households to Survey	Percentage of total responses
Kirkcaldy	Kirkcaldy	Kirkcaldy Bennochy East	1,651	3	0.7%
Kirkcaldy	Kirkcaldy	Kirkcaldy Bennochy West	1,327	2	0.6%
Kirkcaldy	Kirkcaldy	Kirkcaldy Central	1,678	3	0.7%
Kirkcaldy	Kirkcaldy	Kirkcaldy Chapel	1,950	3	0.8%
Kirkcaldy	Kirkcaldy	Kirkcaldy Dunnikier	1,398	2	0.6%
Kirkcaldy	Kirkcaldy	Kirkcaldy Gallatown and Sinclairtown	2,033	4	0.9%
Kirkcaldy	Kirkcaldy	Kirkcaldy Hayfield and Smeaton	1,597	3	0.7%
Kirkcaldy	Kirkcaldy	Kirkcaldy Linktown and Seafield	2,041	4	0.9%
Kirkcaldy	Kirkcaldy	Kirkcaldy Newliston and Redcraigs	1,430	2	0.6%
Kirkcaldy	Kirkcaldy	Kirkcaldy Pathead	1,606	3	0.7%
Kirkcaldy	Kirkcaldy	Kirkcaldy Raith	1,100	2	0.5%
Kirkcaldy	Kirkcaldy	Kirkcaldy Templehall East	2,181	4	0.9%
Kirkcaldy	Kirkcaldy	Kirkcaldy Templehall West	1,409	2	0.6%
Cupar	Cupar	Cupar	4,070	20	5.0%

Respondent characteristics

This section provides details of the respondent characteristics for the resident household survey.
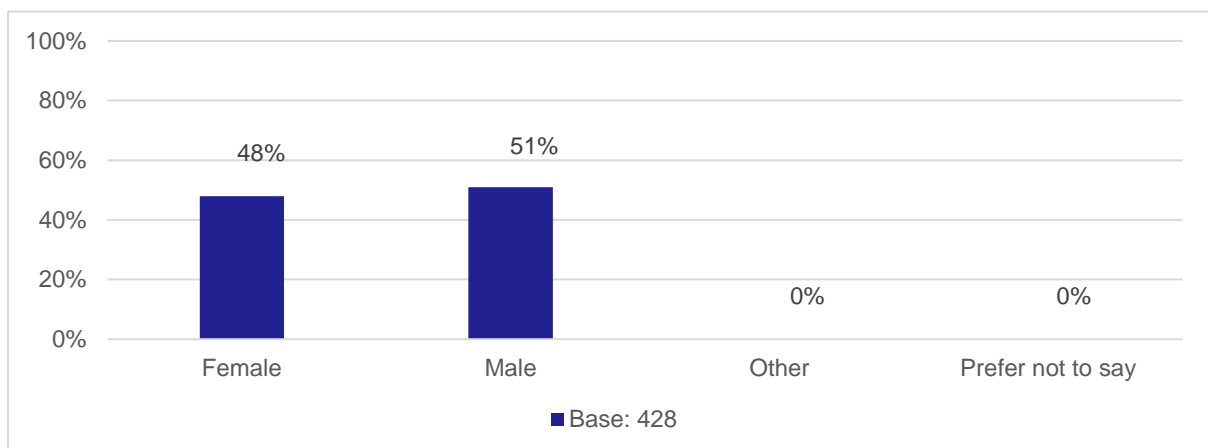
As shown in Chart B-1, the profile of respondents by age shows a wide range of age groups represented.

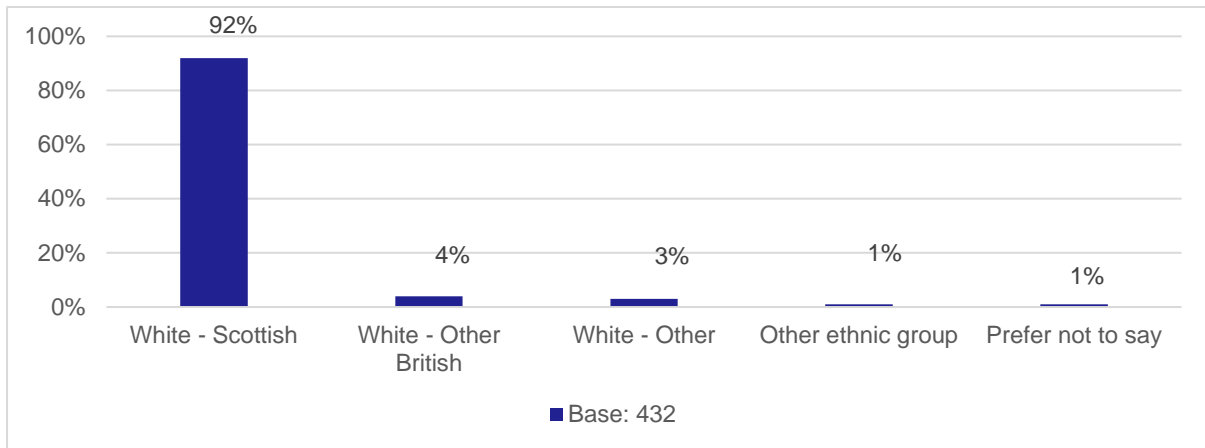Chart B-1 Resident Survey - Respondent Profile - Age
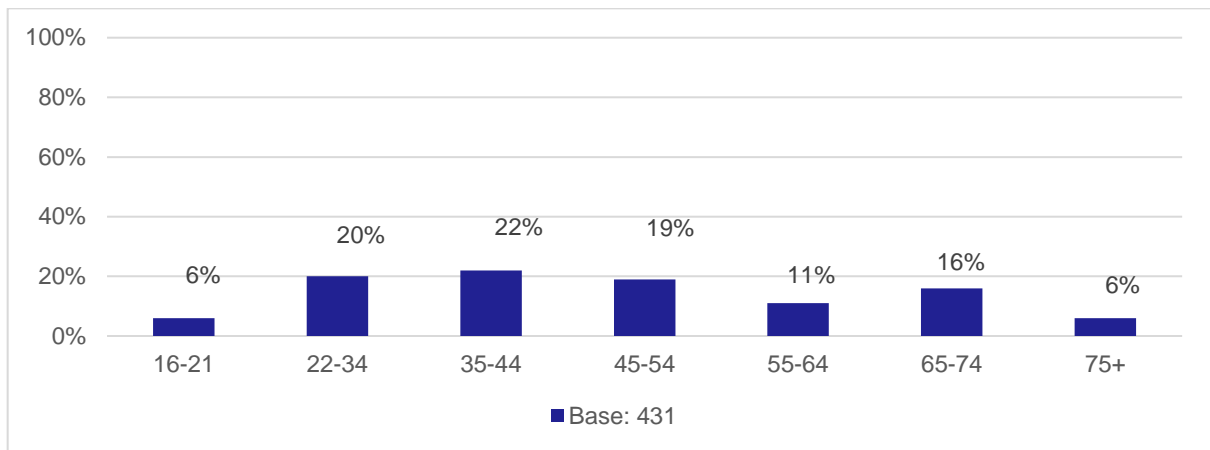
As shown in Chart B-2, there were slightly more male respondents (51%) than female respondents (48%).

Chart B-2 Resident Survey - Respondent Profile - Gender

As shown in Chart B-3, 92% of respondents described their ethnic group as "White Scottish".

Chart B-3 Resident Survey - Respondent Profile - Ethnic group

As shown in Chart B-4, the majority of respondents were homeowners (74%), while a further 20% rented their home, and 4% indicated they live rent-free.

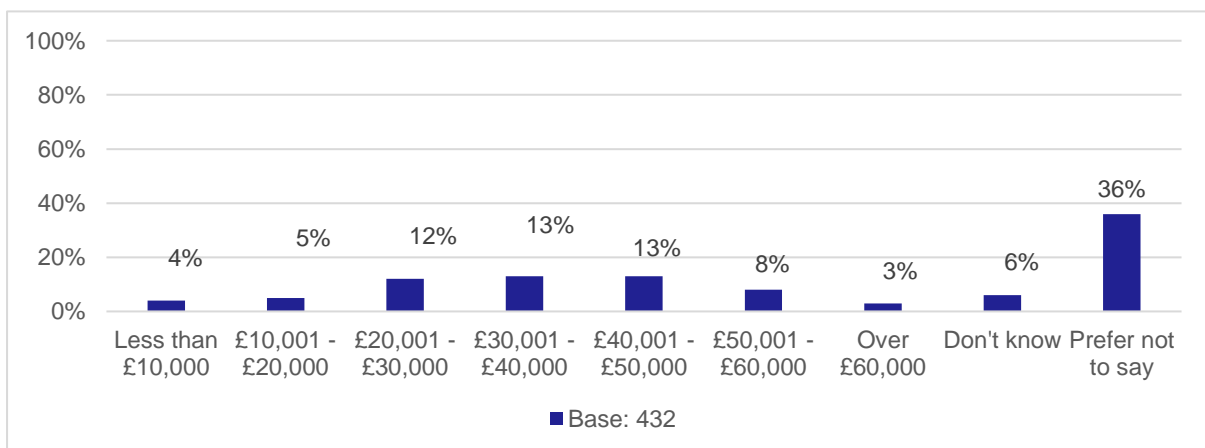Chart B-4 Resident Survey - Respondent Profile - Tenure
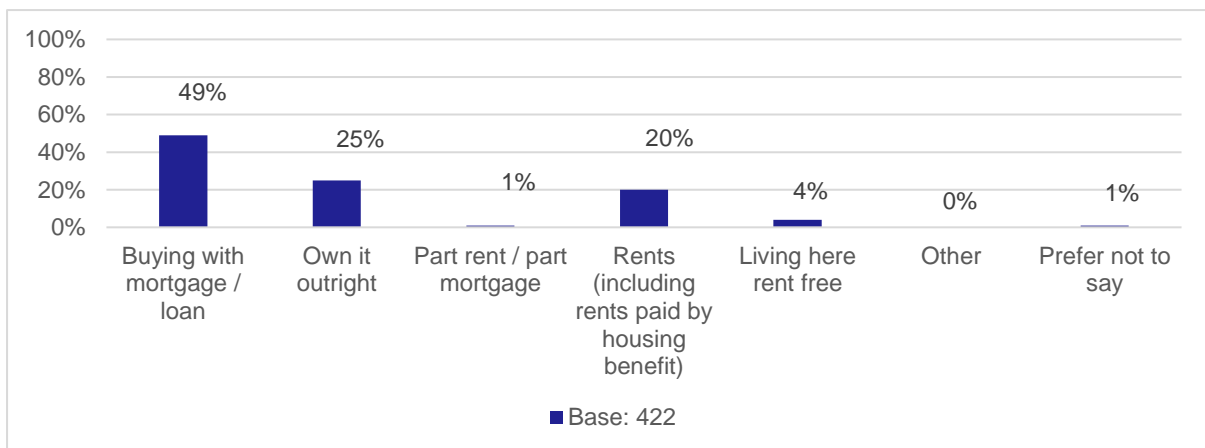
Fifteen per cent of respondents indicated that they had a physical or mental health condition or illness lasting or expected to last 12 months or more. Amongst this group, all respondents said that their condition affects their ability to carry out day-to-day activities, either a lot (32%) or a little (68%).

Chart B-5 Resident Survey - Respondent Profile - Effect of health condition on ability to carry out day-to-day activities
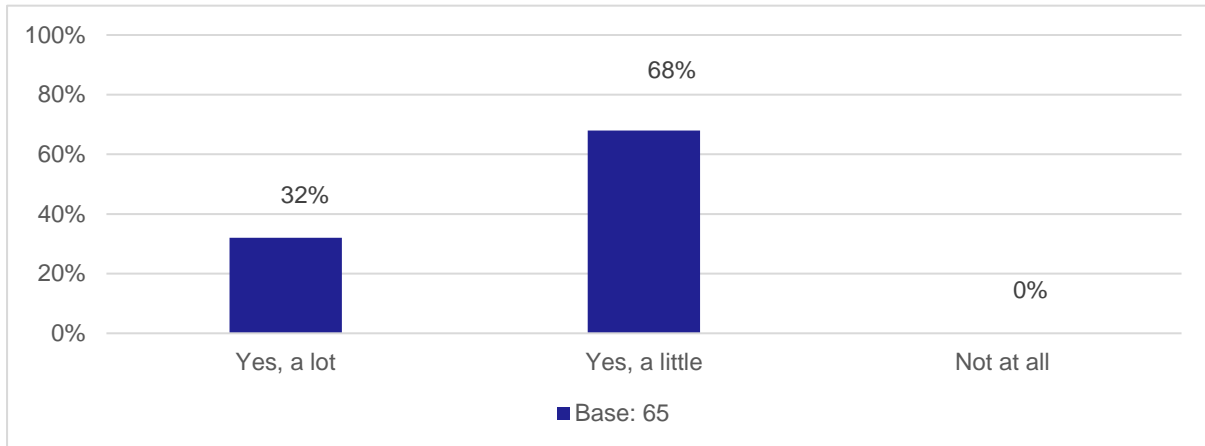

Taking the mid-point values from the income bands as shown in Chart B-6 below, the average gross annual income amongst respondents (before tax and other deductions and including all income from employment, benefits, pensions and savings) is calculated to be £35,295 (assuming "Less than £10,000" as £5,000 and "Over £60,000" as £60,000). This is based only on those that provided an answer to this question and "over £60,000" responses are assumed at £60,000, which likely means that this figure is a slight underestimate.

Chart B-6 Resident Survey - Respondent Profile - Gross annual income

As shown in Chart B-7, the majority of respondents had lived at their current address for five years or more (76%).

Chart B-7 Resident Survey - Respondent Profile - Length of time at address
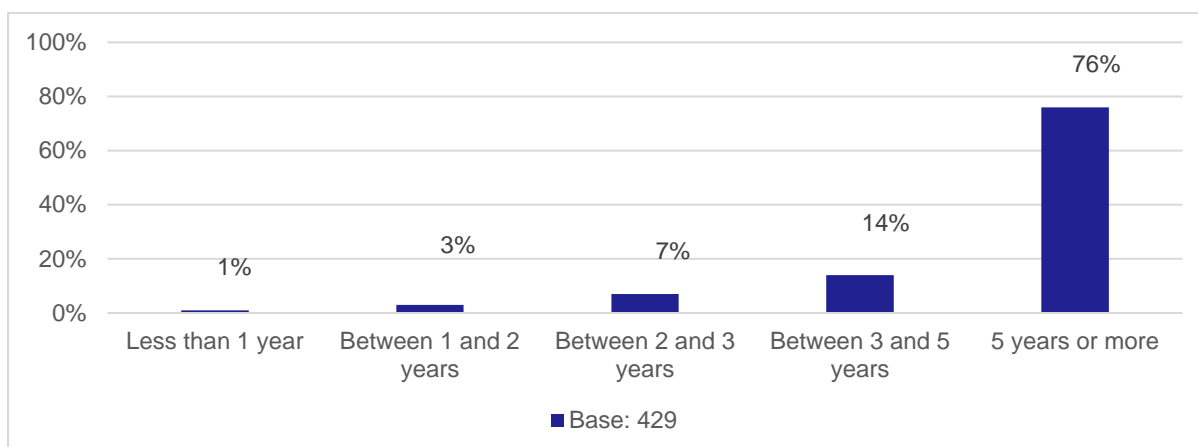
From home postcodes provided, the following profile of respondents has been derived. Most commonly, respondents were from Leven (18%), followed by Methil (16%), Glenrothes, Markinch and Thornton (16%) and other Levenmouth areas (13%). As noted in the previous section, this profile broadly reflects the target quotas that were set for the interviewing process.

The profile of residents by employment status is detailed in Table B-3 and shows that the majority of respondents were employed or self-employed (66%) while almost a quarter were retired (23%).

Table B-3 Resident Survey - Respondent Profile - Employment status

Employment Status	Percentage
Employed full-time	51%
Employed part-time (fewer than 30 hours per week)	11%
Self employed	4%
Not in employment - looking for work	4%
Not in employment - not looking for work	5%
Retired	23%
Student	1%
Other	1%
Base	**431**

Appendix C: Access to essential services and trip generators data tables and maps

This Appendix provides data tables and maps for accessibility catchment maps for selected destinations.

Methodology

To determine the baseline metrics for access to essential services and attractors, multimodal accessibility modelling (using TRACC software) has been undertaken. The model calculates the journey time by public transport from census data zone centroids (population weighted) to all the destinations – those included were cities, localities (*which represents populated settlements*), healthcare, education and rail stations.

A summary of the model parameters are as follows:

- Timetables represent 2024 Q1 (2nd week of January)
- Tuesday AM 0730-0930
- Allowance of 400 metre walk to 'first' bus stop (increased to 800m for access to cities)

Results

Table C- 1 Access to Leven Bus Station by Walk, Cycle and Public Transport (minutes) (Source: TRACC)

Leven Bus Line	10	15	20	30	45	60
Walk	5%	13%	28%	51%	68%	87%
Cycle	52%	71%	90%	100%	100%	100%
Public Transport	38%	71%	90%	91%	91%	91%

Table C-2.1 Access to Localities within Levenmouth (Levenmouth) by Public Transport in minutes (Source: TRACC)

Levenmouth	15	30	60	90	120
Buckhaven	41%	75%	91%	91%	91%
Coaltown of Balgonie	0%	10%	74%	89%	95%
Coaltown of Wemyss	20%	64%	93%	95%	95%
Crossgates	0%	0%	11%	70%	79%
East Wemyss	39%	72%	94%	94%	94%
Kennoway	28%	79%	91%	91%	91%
Leven	66%	91%	91%	91%	91%
Lower Largo, Lundin Links and Upper Largo	12%	42%	88%	91%	91%
Methil	37%	86%	91%	91%	91%
Windygates	38%	80%	88%	94%	94%

Table C-2.2 Access to Localities within Levenmouth (East Neuk) by Public Transport in minutes (Source: TRACC)

East Neuk	15	30	60	90	120
Anstruther	0%	3%	25%	83%	86%
Elie and Earlsferry	3%	12%	80%	91%	91%
Pittenweem	0%	3%	44%	83%	86%
St Monans	0%	12%	34%	83%	86%

Table C-2.3 Access to Localities within Levenmouth (Fife Circle) by Public Transport in minutes (Source: TRACC)

Fife Circle	15	30	60	90	120
Burntisland	0%	0%	5%	77%	86%
Cardenden and Auchterderran	0%	0%	5%	81%	83%
Cowdenbeath and Lumphinnans	0%	0%	29%	82%	91%
Dalgety Bay and Hillend	0%	0%	12%	87%	95%
Dunfermline	0%	0%	0%	9%	37%
Glenrothes	2%	37%	86%	95%	95%
Inverkeithing	0%	0%	3%	81%	95%

Fife Circle	15	30	60	90	120
Kirkcaldy and Dysart	0%	21%	95%	95%	95%
Lochgelly	0%	0%	5%	70%	86%
Markinch	5%	28%	92%	95%	95%
North Queensferry	0%	0%	0%	37%	69%
Springfield	0%	0%	9%	30%	39%
Thornton	0%	0%	67%	87%	87%

Table C-2.4 Access to Localities within Levenmouth (North Fife) by Public Transport in minutes (Source: TRACC)

North Fife	15	30	60	90	120
Cupar	0%	2%	28%	76%	82%
Ladybank	0%	0%	28%	85%	85%
Leuchars	0%	0%	16%	34%	34%
Newburgh (Fife)	0%	0%	0%	39%	73%
Newport-on-Tay and Wormit	0%	0%	0%	26%	26%
St Andrews	0%	3%	36%	87%	87%
Tayport	0%	0%	3%	34%	34%

Table C-2.5 Access to Localities within Levenmouth (West Fife) by Public Transport in minutes (Source: TRACC)

West Fife	15	30	60	90	120
Kincardine	0%	0%	0%	0%	0%

Table C- 3 Access to Healthcare by Public Transport (Source: TRACC)

Percentage of Levenmouth population able to access Healthcare sites by public transport journey time (minutes)						
Hospital	Services	15	30	60	90	120
Victoria Hospital	A&E	0%	17%	83%	95%	95%
Ninewells Hospital	A&E	0%	0%	0%	13%	31%
Perth Royal Infirmary	A&E	0%	0%	0%	0%	0%
Adamson Hospital	MIU	0%	0%	2%	28%	28%
Queen Margaret Hospital	MIU	0%	0%	0%	7%	37%
St Andrews Community Hospital	MIU, Community	0%	3%	34%	86%	86%

Percentage of Levenmouth population able to access Healthcare sites by public transport journey time (minutes)						
Cameron Hospital	Community	19%	47%	88%	94%	94%
Lynebank Hospital	Community	0%	0%	0%	10%	37%
Glenrothes Hospital	Community	0%	0%	54%	73%	78%
Randolph Wemyss Memorial Hospital	Community	44%	77%	91%	91%	91%
Stratheden Hospital	Community	0%	0%	10%	67%	82%
Whyteman's Brae Hospital	Community	0%	13%	77%	95%	95%
Edinburgh Royal Infirmary	A&E	0%	0%	0%	0%	0%
Western General Hospital	MIU	0%	0%	0%	0%	0%

Table C- 4 Access to Education by Public Transport (Source: TRACC)

Percentage of Levenmouth population able to access Education by public transport journey time (minutes)					
Education Facility	**15**	**30**	**60**	**90**	**120**
Levenmouth Academy	50%	85%	94%	94%	94%
Fife College, Dunfermline Campus	0%	0%	0%	43%	73%
Fife College, Glenrothes Campus	0%	11%	78%	83%	83%
Fife College, Kirkcaldy Campus	0%	11%	88%	95%	95%
Fife College, Levenmouth Campus	56%	85%	94%	94%	94%
Fife College, Rosyth Campus	0%	0%	0%	0%	0%
SRUC (Scotland's Rural College), Elmwood Campus	0%	0%	28%	50%	85%
Abertay University, Abertay University	0%	0%	0%	25%	31%
Heriot-Watt University, Edinburgh Campus	0%	0%	0%	0%	0%
University of Dundee, Dundee City Campus	0%	0%	0%	31%	34%
University of Edinburgh, Central Area	0%	0%	0%	0%	0%
University of St Andrews, Town Campus	0%	0%	17%	85%	86%

Public transport journey time accessibility mapping

Mapping is provided on the following pages showing public transport journey time access, from Fife Data Zones, to:

- Leven (Bus Station);
- Edinburgh (Princes Street);
- Victoria Hospital (A&E), Kirkcaldy;
- Fife College, Levenmouth Campus; and
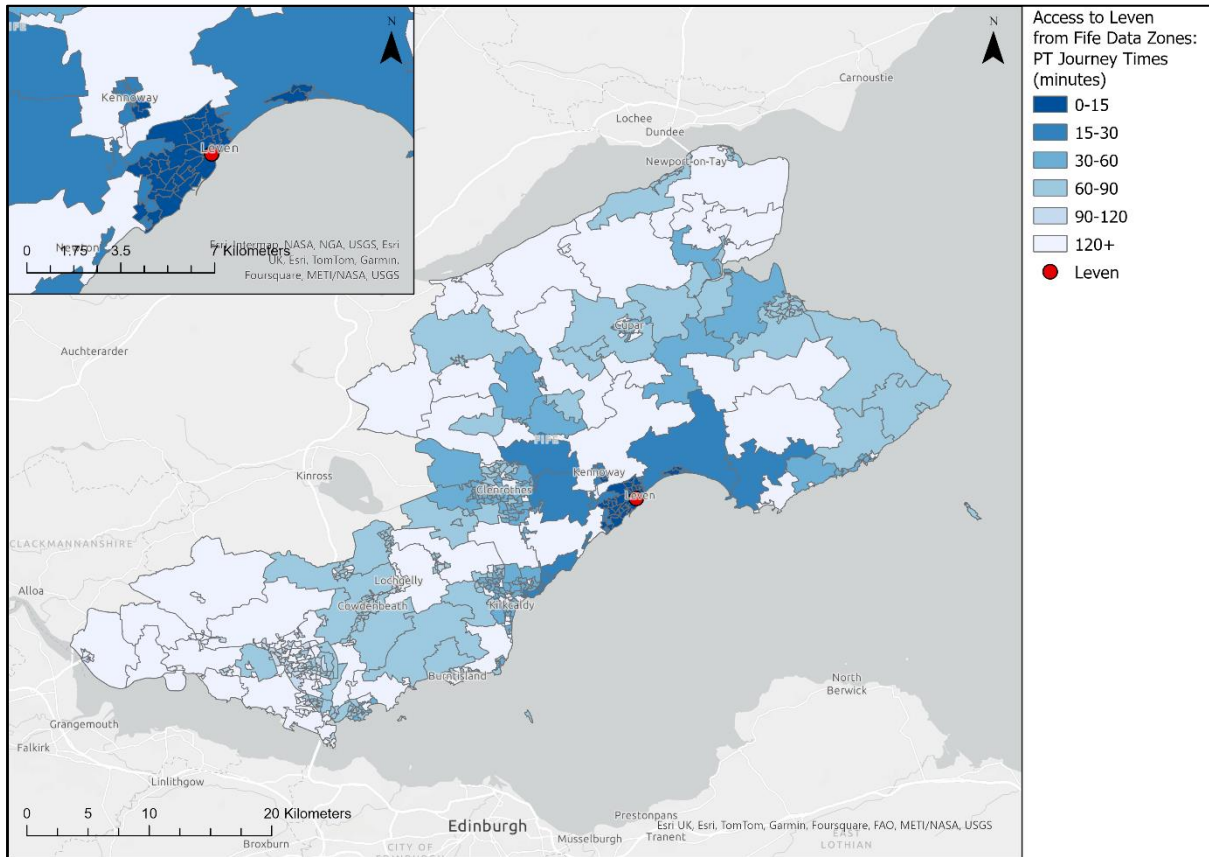- The closest rail station (located within Fife).

Figure C-1: Public transport journey time access, from Fife Data Zones, to Leven (Bus Station)
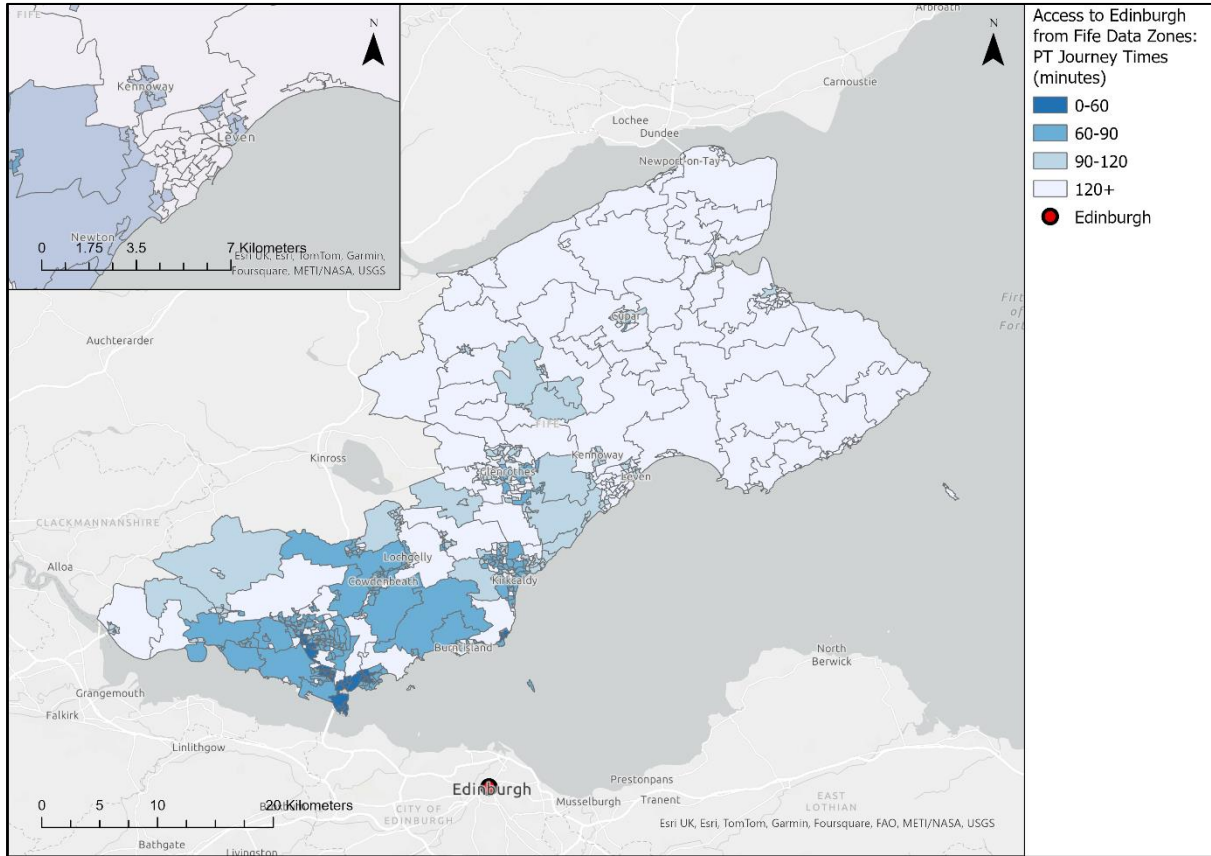
Figure C-2: Public transport journey access, from Fife Data Zones, to Edinburgh (Princes Street)
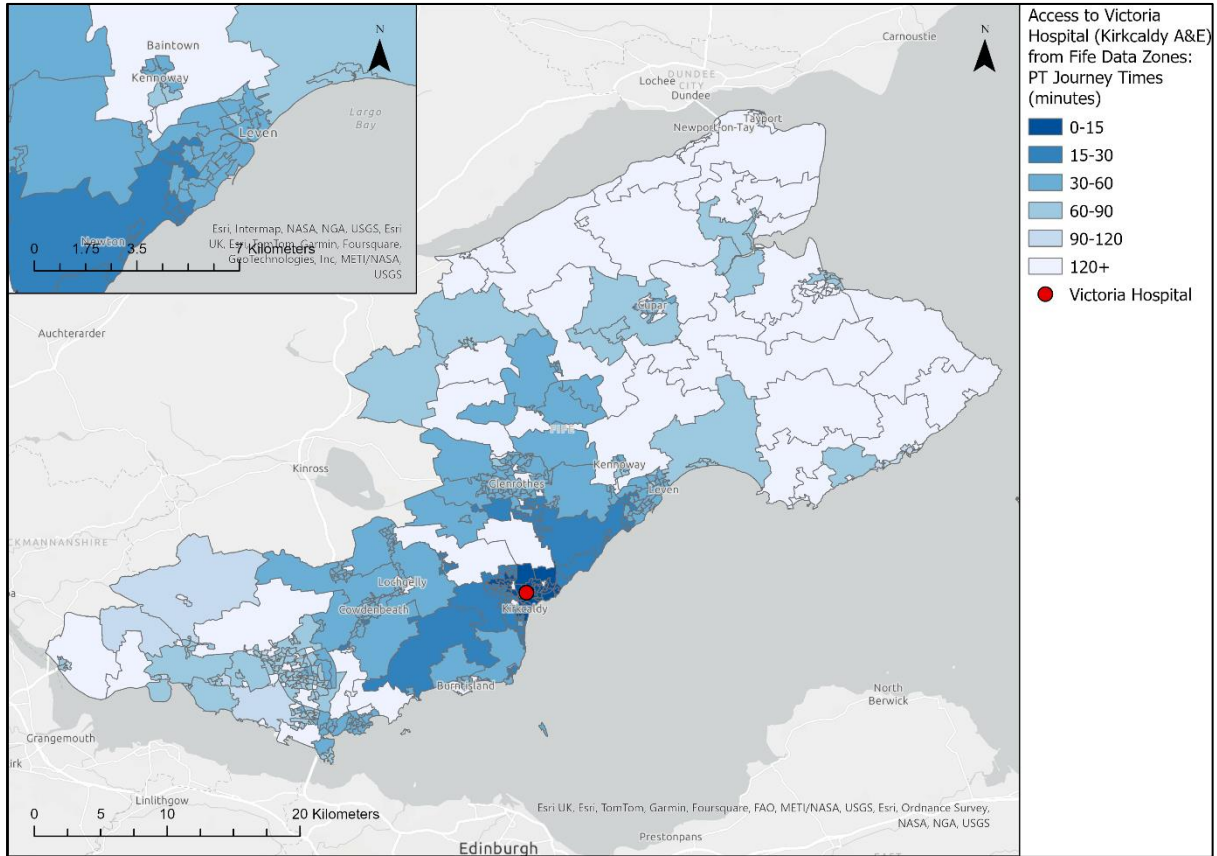
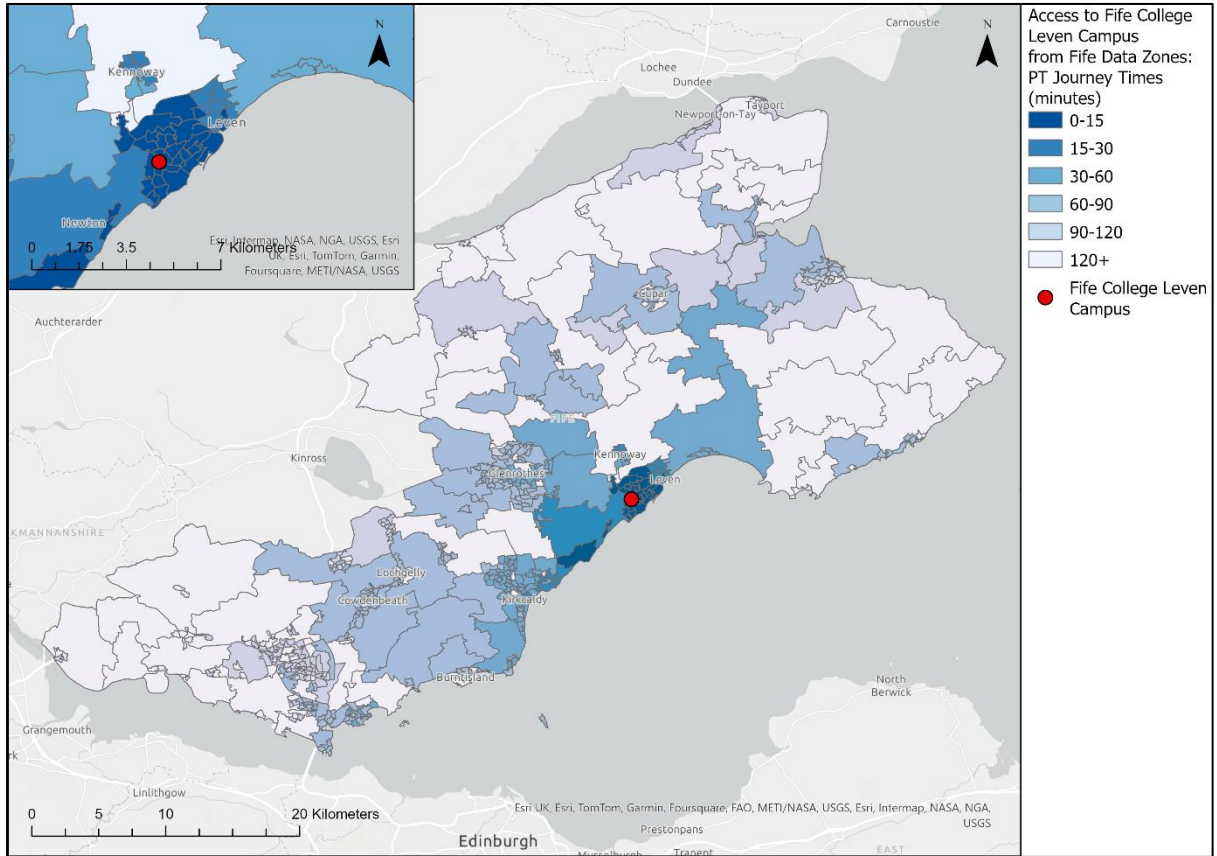Figure C-3: Public transport journey times, from Fife Data Zones, to Victoria Hospital (A&E), Kirkcaldy

Figure C-4: Public transport journey time access, from Fife Data Zones, to Fife College Leven Campus
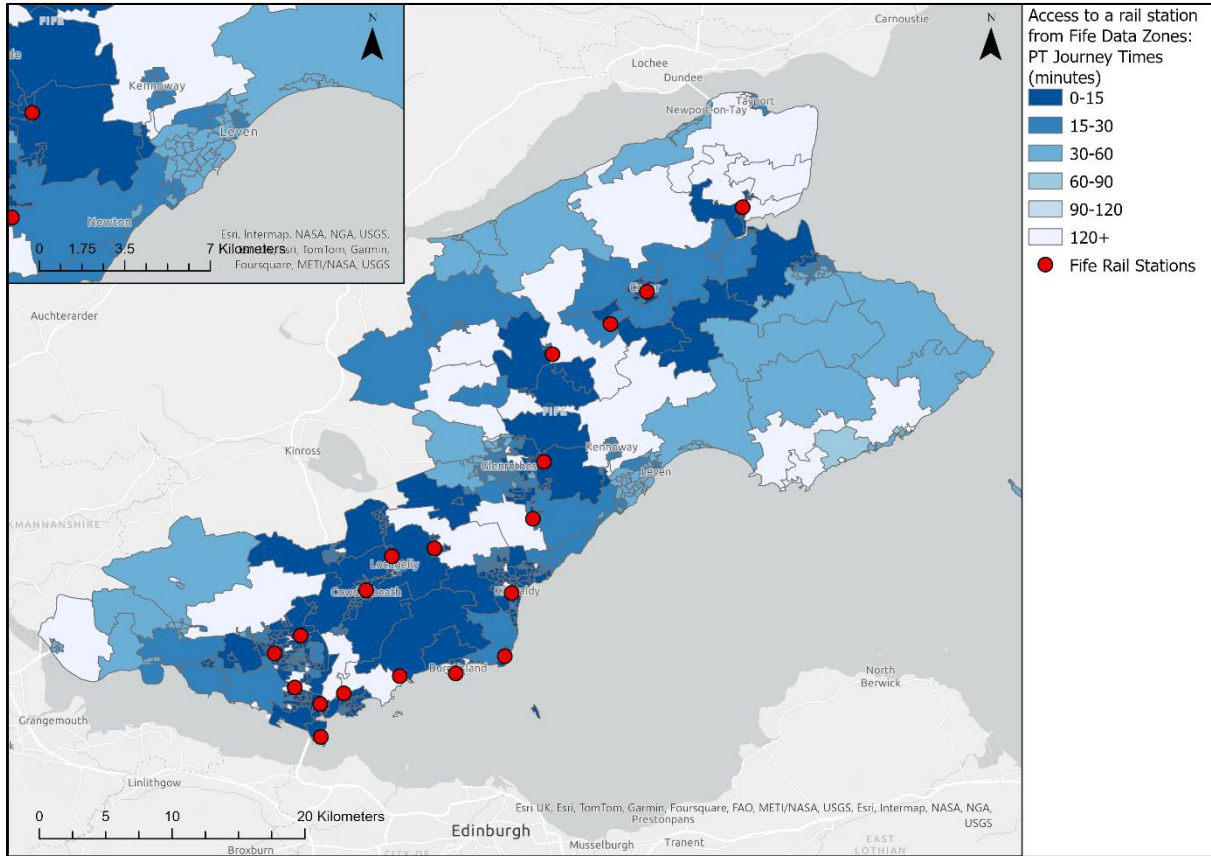
Figure C-5: Public transport journey times, from Fife Data Zones, to the nearest rail station (within Fife)

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