Cloddach Bridge – Business Case, Elgin

Traffic & Economics Assessment

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1 Introduction

1.1 Scope of Assessment

1.1.1 This assessment report outlines the traffic and economic assessment inputs for the Cloddach Bridge – Strategic Business Case and has been prepared in accordance with Department for Transport (DfT) Transport Assessment Guidance (TAG).

1.1.2 Cloddach Bridge is a three-span structure carrying a single carriageway road over the River Lossie. The bridge is located on an unnamed road (C2E) to the west of the B9010, south of Elgin. The bridge's location is shown in Figure 1-1.

Figure 1-1: Location Plan

1.1.3 As described in the DfT's document 'TAG Unit A1.1 Cost-Benefit Analysis' dated May 2023, a cost benefit analysis should include the following:

- the impacts of a scheme should be based on the difference between forecasts of the Without-Scheme and With-Scheme cases;
- impacts should be assessed over a defined appraisal period, capturing the planned period of scheme development and implementation and typically ending 60 years after scheme opening;
- the magnitude of impacts should be interpolated and extrapolated over the appraisal period drawing on forecasts for at least two future years;

- values placed on impacts should be in the perceived costs, factor costs and market prices unit of account, converted as appropriate from factor costs using the indirect tax correction factor;
- values should be in real prices, in the Department's base year, accounting for the effects of inflation;
- streams of costs and benefits should be in present values, discounted to the Department's base year;
- results should be presented in the appropriate cost-benefit analysis metrics, normally a Benefit-Cost Ratio (BCR); and
- Sensitivity testing should be undertaken to reflect uncertainty.

2 Existing Conditions

2.1 Introduction

2.1.1 This section summarises the existing traffic conditions in relation to the existing highway network in and around Elgin.

2.2 Background

2.2.1 The bridge provided access to the B9010 north and southbound for residents in rural communities including Birnie, Thomshill, Glenlatterach and Bardonside. Since 1996 Cloddach Bridge has been subject to a weight restriction. Initially 7.5 tonnes, this was subsequently lowered to 3.0 tonnes in 2019. A further inspection in 2022 reported that the structure was in a poor condition. Due to safety concerns, Moray Council (MC) authorised the closure of the bridge to all vehicular traffic on the 4th February 2022. Cloddach Bridge remains open to active travel users.

2.2.2 The bridge closure to traffic includes a signed alternative route for vehicles travelling to the A941 to enter Elgin from the south and then taking the A96 west back to the B9010. This diversion has a length of approximately 6 miles and anecdotal evidence suggests journey times are extended by up to 15 minutes during peak times. The diversion route is shown in news article contained in **Appendix A**.

2.3 Traffic Conditions

Traffic Flows

2.3.1 MC have a comprehensive collection of permanent Automatic Traffic Counter (ATC) sites in Elgin, as shown in drawing 158148/sk1202 contained in **Appendix B**. The information provided highlights average daily flows per month, generally from 2014 to 2023. Additional information is available from 'one-off' ATC surveys. Junction turning count (JTC) traffic surveys were undertaken on behalf of MC in 2018 in support of an update to the strategic Elgin Town Centre Model.

2.3.2 The extent of the affected area for motor vehicles due to the bridge restrictions (closure) within Elgin is shown in drawing 158148/SK1204 contained in **Appendix C**. Key routes have been considered.

2.3.3 The existing annual average weekday traffic flows on the following roads within the study are shown in Table 2-1.

Table 2-1: Existing Traffic Flows (ATC Sites)

Site Reference	Locations	Date Range	Average Annual Weekday Traffic Volume
00000007 (Site 7)	A941 near Birkenhill House	Jan 2014 – Apr 2023	7, 602 vehicles (May 2018)
00000010 (Site 10)	A941 near Hay Place	Jan 2014 – Apr 2023	7,619 vehicles (May 2018)
00000017 (Site 17)	Linkwood Road east of A941	Jan 2014 – Jan 2021	10,485 vehicles (May 2018)
00000018 (Site 18)	U171e – Maisondieu Road	Jan 2014 – May 2023	9, 203 vehicles (May 2018)
00000027 (Site 27)	Glen Moray Drive south of Mossend Place	Jan 2014 – Oct 2022	5,929 vehicles (May 2018)
00000028 (Site 28)	Thornhill Road east of A941	Jan 2014 - Mar 2023	8, 393 vehicles (May 2018)
24112001	C2E Cloddach Bridge	30 Nov – 6 Dec 2020	764 vehicles

2.3.4 Specific Junction Turning Counts (JTC) were undertaken at the junctions shown in Table 2-2.

Table 2-2: Existing Traffic Flows (JTC Surveys)

Junction	Date	12-hour Traffic Volume
Birnie Road / Sandy Road / C2E	Wed 30 May 2018	4913 vehicles (Birnie Road)
Glenlossie Road / C2E	Tue 28 Nov 2023	1014 vehicles (C2E North)
A941 / Rashcrook Road	Tue 28 Nov 2023	370 vehicles (Rashcrook Road)

2.3.5 A further set of ATC surveys (located on the C2E to the north of the Golf Club driving range) show the traffic flows contained in Table 2-3.

Table 2-3: Additional Automatic Traffic Count Data Details

Site Reference	Location	Date Range	5-Day Average 12-Hour Flows
21021704	C2E south of the Golf Range	20-26 Feb 2017	1335
20170220	C2E near Royal Troon Drive	22-27 Feb 2017	1087
20072105	C2E near Royal Troon Drive	21-27 July 2021	1160
20072101	C2E south of Golf Club access	21-27 July 2021	1958

Bus Services

2.3.6 The bus services within Elgin, which are considered to be influenced by the opening / closure of Cloddach Bridge, primarily follow the route along the A96 and A941 from the north to south. These services also route via New Elgin, with the largest land use being residential and therefore generates the largest demand for public transport services.

2.3.7 The most frequent buses that route through Elgin town centre, which travel primarily along the A96 corridor, are Stagecoach Bluebird services 10 / 10A / 10B, 34 and 35. These services provide a combined frequency of up to 3 services per hour via the A96. These bus services offer travel to local and regional towns such as Forres, Nairn, Keith, Huntly and Fochabers, whilst also offering travel further afield to Aberdeen and Inverness.

2.3.8 Stagecoach Bluebird services 33A / 33C and 36 each offer hourly bus services which route via the main residential settlements within Elgin. Bus service group 33 routes between Elgin and Lossiemouth via the main road corridors within New Elgin, offering a regular service for local residents to / from Elgin town centre and Lossiemouth. Bus service 36 similarly routes via New Elgin, whilst travelling to the south of the town to Dufftown and Aberlour.

2.3.9 The local bus service summary is shown in Table 2-4. The Elgin City Bus Map is contained in **Appendix D**.

Table 2-4: Bus Services

Bus Service	Bus Stops	Weekday Frequency
10	A96 Corridor	Approx. every hour
10A	A96 Corridor	Up to 4 daily services
10B	A96 Corridor	Up to 5 daily services
32	A96 Town Centre	1 daily service
33A	A96, A941, Edgar Road, Springfield Road, Thornhill Road	Approx. every hour
33C	A96, A941, Edgar Road, Springfield Road, Thornhill Road	Approx. every hour
34	A96 Town Centre	Approx. every hour
35	A96 Corridor	Approx. every hour
36	A941, Maisondieu Road, Linkwood Road, Thornhill Road	Approx. every hour
M96	A96 Corridor	Approx. every 2 hours
M98	A96 Corridor	2 daily services
X35	A96 Corridor	2 daily services

Non-Motorised Users

2.3.10 The Elgin Core Path Plan indicates that there is a recognised 'existing path' providing a connection between Elgin and the Cloddach Bridge via the C2E. The 'existing path' extends towards the B9010 via the C2E and routes north on the B9010 and towards Mosstowie via the Birchpark property access road. The Elgin Core Path Plan is contained in **Appendix E**.

2.3.11 The Elgin Active Travel Map indicates that the road corridor between Elgin and the B9010 via Cloddach Bridge is a waymarked cycle route on a minor road. The Elgin Active Travel Map is contained in **Appendix F**.

2.3.12 There is no available data for non-motorised users via Cloddach Bridge.

Road Collisions

2.3.13 Information was requested from MC that includes road traffic collision incidents for 2013-2022 inclusive. Full details of the road collision data are contained in **Appendix G**. A road traffic collision is an incident involving one or more vehicles, occurring on the public

highway, resulting in personal injury that is recorded by the Police. The area of interest contains a section of the A96 within Elgin Town Centre, the A941, which is a one of the primary links to Elgin from the south and the B9010 Pluscarden Road, which provides access to Elgin Town Centre from the west.

2.3.14 The information contains a unique reference, the number of vehicles involved, date, time and location for each incident. In the ten-year period, there were a total of 64 incidents, Fairhurst undertook a screening exercise and identified two further incidents, taking the total to 66. Of these collisions, 29 resulted in damage only (43.9%) to 50 vehicles. No causation has been stated, nor description of circumstances leading to the collisions, therefore no road user behaviour conclusions can be ascertained. There are no details to be able to consider any effects relating to vehicle condition. The weather, road surface conditions and light conditions are also not stated, however, could also be a causation factor. There is no distinction of which mode of travel the injured people were using, therefore no consideration of vulnerable users can be extracted.

2.3.15 MC data highlights that there were 37 collisions (56.1%), between 2013 and 2022, involving 66 vehicles that led to an injury of 56 persons. Of those injured, there were two fatalities (3.6%), twenty-one were seriously injured (37.5%) and thirty-three slightly injured (58.9%).

2.3.16 It is common to compare road collision statistics with national figures. A comprehensive review of road safety is contained in the Moray Road Safety Plan to 2030 report. This study uses high-level statistics that does not distinguish between rural and urban roads, as the available data does not include road classification and the study area is split between both rural and urban areas.

2.3.17 In terms of general national statistics, The Scottish Government published information indicating nationally that a total of 1659 fatalities (with 204 occurring in 2014) and 24133 seriously injured (2949 occurring in both 2013 and 2014) were recorded during the period between 2013 and 2022. In terms of the Moray Council area, The Scottish Government data shows that a total of 43 fatalities and 389 seriously injured during the same period of time.

2.3.18 Population statistics show that Scotland's population increased by circa 152,000 to 5,413,900 in 2021 and the average population between 2013 and 2021 (no data available for 2022) was 5,413,900. During the same time period the Moray Council area increased to 96,410 from 94,360, averaging at 95,550 persons. The study area (Elgin South) had a population of 12204 (2021), averaging 12,813 persons.

2.3.19 Comparing the killed and seriously injured (KSI) local road statistics for the entire ten-year period, the national figures indicate a fatality rate of 1 per 3,263 persons, the council figure calculates at 1 per 2,222 persons and the study area 1 per 6,091 persons. For the seriously injured, the national figures indicate an injury rate of 1 per 224 persons, the council area rate calculates as 1 per 246 persons and the study area 1 per 388 persons.

2.3.20 It is considered that the council area has less persons seriously injured in traffic collisions than the national average, however, the persons killed statistic per head of population is worse. This could be due to the council area consisting of mostly rural roads and these generally involve faster vehicle speeds and increased levels of injuries. Nevertheless, the roads in the south of Elgin have less persons injured (KSI) than both the national and council averages.

2.3.21 It is possible to provide a high-level review of the road environment based on the location and in relation to current width, alignment, layout, surroundings, signing and road markings. An online review highlights that the road environment appears to be suitable and is less likely to be contributing to traffic collisions.

3 Description of Options

3.1 Introduction

3.1.1 This section presents the options that have been considered as part of the project.

3.2 Description of Options

3.2.1 In the Pre-Feasibility Study, the following options were discussed:

- Option 1 Baseline Do Minimum - included for comparison purposes. This option does not permit the bridge to reopen to vehicular traffic.
- Option 2 Repairs to the existing bridge
- Option 3a New Overbridge including demolition of existing bridge (non-integral)
- Option 3b New Overbridge including retention of existing bridge (non-integral)
- Option 4a New integral bridge structure two lanes – full demolition of existing bridge
- Option 4b New integral bridge structure single lane – full demolition of existing bridge

3.2.2 Options 1 and 2 do not allow for the reopening of the bridge to vehicular traffic and are therefore considered to be the Without-Scheme options. Option 4b was identified as the preferred option during the pre-feasibility study and therefore forms the basis of the With-Scheme assessment. The proposed layout is contained in **Appendix H**.

3.3 Cost Estimates

3.3.1 A detailed explanation of the cost estimates is included in the Financial Case section of this Business Case report. The capital cost is based on the outline design for a minimum width bridge (Option 4b) provided by MC's term contractor, which is shown in Table 3-1.

Table 3-1: Option Cost Estimate Summary

Item	With-Scheme
Construction	£2,654,345
Land & Property	£30,000
Preparation & Administration	£30,000
Traffic related maintenance	£278,317
TOTAL	£3,014,735

3.3.2 The total cost above includes for inflation.

3.3.3 The cost estimate for the Without-Scheme scenario ranges between £769,578 and £2,804,566. The lower range includes the option of demolition within 10 years and the upper range includes the repair of the existing structure and the continued use as a footway / cycleway. It should be noted that none of the Without-Scheme options include the reopening of the bridge to vehicles. The Without-Scheme costs do not include optimism bias.

3.3.4 Optimism bias is the demonstrated systematic tendency for appraisers to be overly optimistic about key parameters. Theories on cost overruns suggest there are several means by which optimism bias could be caused, including the psychological tendency for humans and organisations to favour optimism, the economic rationale of advancing projects in which organisations have interests in, and the strategic behaviour of stakeholders involved in the planning and decision-making processes.

3.3.5 Optimism bias has been considered with the justification presented within the Financial Case section of the Business Case. This includes a review of the capital cost estimate in accordance with the HM Treasury Green Book and the draft report suggests a value of 42% that would accompany a capital cost based on the outline design for a minimum width bridge (Option 4b) provided by MC's term contractor.

3.3.6 This value provides a greater account to cost estimate uncertainty when compared with the TAG Unit document 'Scheme Costs' (A1.2) of 32% (TAG Unit A1.2 Table 8) assuming fixed link (bridge) project (TAG Unit A1.2 Table 6) and Stage 2 (outline) progress (TAG Unit A1.2 Table 7).

4 Traffic Modelling

4.1 Introduction

4.1.1 Fairhurst developed a traffic model using available 2018 Junction Turning Count (JTC) information, which is detailed in the Local Model Validation Report (LMVR) and contained in **Appendix I**. Overall, the model provides a mixed performance in terms of validation and further discussion determined that the failure of the traffic model stems from a lack of relevant historical traffic data in the study area. The approving authorities agreed to determine the economic case using an alternative method developed by the DfT.

4.1.2 The DfT's small scheme appraisal toolkit provides a proportionate method to monetise the impacts of small highway and bus improvement schemes. The impact of the scheme is monetised by inputs to the toolkit based on demand, journey times and travel distance, evidenced from modelled or observed data.

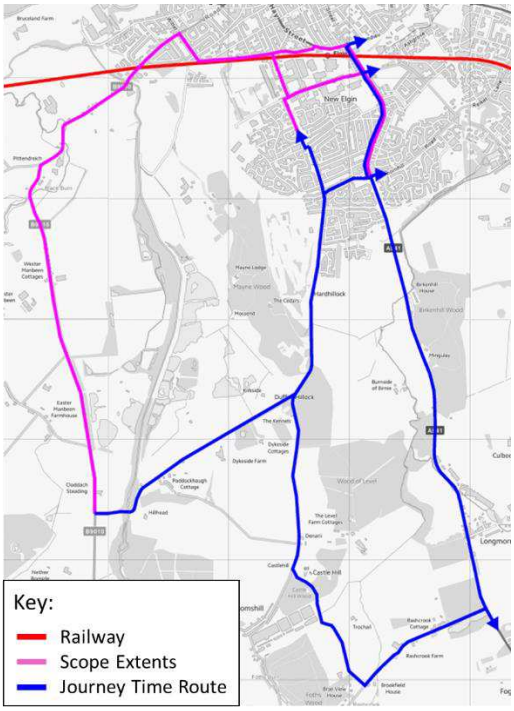
4.1.3 The funding sought for this type of assessment should not exceed £20m.

4.1.4 It has been agreed between DfT and MC that Fairhurst can use this toolkit to generate the present value of costs and resultant benefits to cost ratio in light of the difficulties encountered when completing the Paramics traffic model. This will be achieved using version 4.00 2022 edition of the toolkit.

4.2 Journey Times

4.2.1 On-line journey planner resources have been used to determine the extent of the road network that offers journey time savings should the bridge be reopened. The screening process included start and finish points on either side of Cloddach bridge and inspection of routes and estimated times, which generally suggest that the railway is the natural boundary. This has resulted in a proposed scope area that encompasses the south area of Elgin. The alternative route inspection outputs are contained in **Appendix J**, which detail an assessment of drivetimes during each time period. The routes are also shown in Figure 4-1.

Figure 4-1: Typical Journey Routes (Without and With-Scheme)



4.2.2 Journeys to / from Maisondieu Road have a similar duration using the A941 Station Road via B9010, Wittet Drive and Wards Road to those trips via the bridge, it is therefore proposed to assume in this study that trips to this area are less likely to use the bridge. It is also noted that trips to The Wards industrial area are also similar. Furthermore, there are potential journey time savings for trips to/from the A96 East Road / Ashgrove Road junction, however, as the majority of this saving is likely to be in the journey to/from Linkwood Road and the volume of trips observed using the bridge reaching this point of the road network will be small, any extension to the study scope in this area would be of little value.

4.2.3 It should be noted that a distance of circa 310m is 'missing' from the journey planner durations due to the software recognising that vehicles cannot use the bridge at the present time. However, this represents less than 40s journey time at 30mph or less than 20s at the national speed limit, which is considered to have little effect on driver route choice. Detailed inspection of journey times follows.

4.2.4 Global Positioning System (GPS) information was obtained to inform an update of the Elgin Town Model by Jacobs and provides a variety of statistics (link distance, travel time, travel speeds and statistical indicators) of Tom Tom navigation unit users, collected between Sept 2017 and June 2018, when the bridge was still open to traffic. The data has been provided by MC, for use in the study, and is presented in separate time periods that are

considered suitable for matching with the proposed input time periods to the toolkit, as shown in the Table 4-1.

Table 4-1: Time Period Comparison

GPS data	Traffic data time period
0000-0500	Night
0800-0900	AM Peak
0900-1000	
1000-1300	Inter-peak
1300-1600	
1630-1730	PM Peak
1730-1830	
1900-2400	Night

4.2.5 The average link travel time has been used to determine route travel time duration for each time period and for the Without-Scheme and the With-Scheme scenarios. The assumption is that traffic volumes in the town and road infrastructure have not substantially changed, therefore there should be sufficient confidence in the GPS data for use against the normalised bridge traffic data at opening year (2025).

4.2.6 The project timescales preclude the extension of the GPS data. However, infilling data gaps has used the observed link speeds at the current termination of data, to represent journeys as follows:

- A941 between Birkenhill Wood and Rashcrook Road (Link ID 322 toward Elgin and Link ID 325 leaving Elgin);
- C2E 'Glenlossie Road' / U119E Birkenbaud Road / C2E Rashcrook Road between the Elgin Golf Club driving range and A941 / B9010 (Link ID 241 toward Elgin and Link ID 243 leaving Elgin); and,
- The B9010 between the C2E and the Birchpark property access road (Link ID 295 toward Elgin and Link ID 294 leaving Elgin).

4.2.7 Table 4-2 displays details of the gap filling journeys associated with each route.

Table 4-2: Gap Filling Journey Times

Route	Journey time			
	AM	Inter	PM	Night
B9010/C2E to Birchpark access road	67	63	60	59
Birchpark access road to B9010/C2E	66	65	65	55
B9010/C2E to Driving Range	140	138	129	133
Driving Range to B9010/C2E	147	141	131	138
B9010/C2E to A941 via Rashcrook Road	314	304	282	296
A941 to B9010/C2E to via Rashcrook Road	309	301	281	293
A941 at Rashcrook Road to Birkenhill Wood	111	110	107	100
A941 at Birkenhill Wood to Rashcrook Road	109	107	103	103

4.2.8 The GPS data was inspected to validate the on-line journey planner assumptions. It confirmed that journey times to/from the Wards Road / The Wards junction were shorter via the B9010. However, it also confirmed that journeys to the Laichmoray Roundabout were slightly shorter via the bridge. Accordingly, this route has been added to the potential journey time saving routes.

4.2.9 Following the above finding, additional checks were undertaken to ensure that alternative routes to Linkwood via Edgar Road were not shorter than those via the A941, and it was confirmed that, based on the GPS data, the A941 was the more likely route to be used to reach Linkwood Road via the B9010.

4.2.10 The resultant journey times including gap filling are shown in Table 4-3.

Table 4-3: Route Journey Times

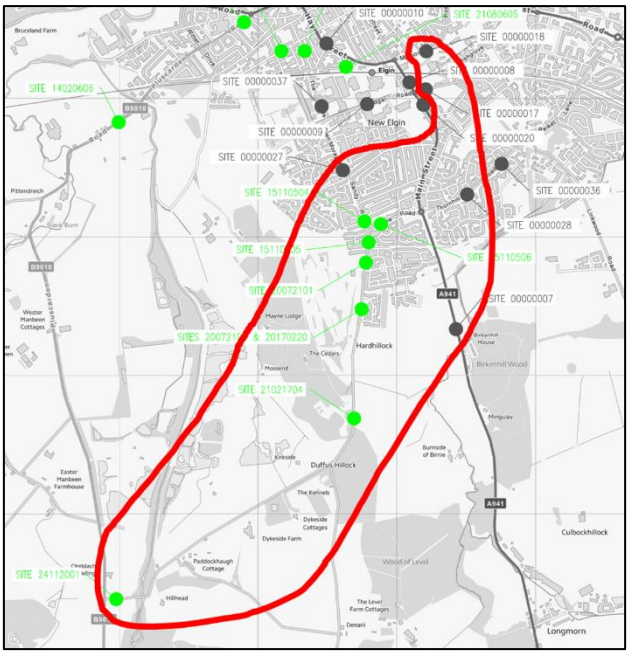
From	To	AM		Inter		PM		Night	
		Via B9010	Via C2E	Via B9010	Via C2E	Via B9010	Via C2E	Via B9010	Via C2E
Cloddach Bridge	A941 / Maisondieu Road	483	425	494	406	459	380	411	352
A941 / Maisondieu Road	Cloddach Bridge	442	399	447	397	436	380	395	354
Cloddach Bridge	Linkwood Road	520	390	536	372	500	346	443	326
Linkwood Road	Cloddach Bridge	489	368	493	362	480	345	430	328
Cloddach Bridge	Glen Moray Drive	496	275	521	269	476	254	425	252
Glen Moray Drive	Cloddach Bridge	483	286	`492	274	473	260	419	258
Cloddach Bridge	Thornhill Road	618	267	639	259	600	247	527	244
Thornhill Road	Cloddach Bridge	612	270	605	258	580	245	513	243

4.2.11 To account for Saturday and Sunday journey time inputs to the toolkit, it is assumed that 90% of traffic would be subject to interpeak and 10% night-time journey times, based on the ATC daily vehicle profiles.

4.3 Traffic Data

4.3.1 MC have provided Automatic Traffic Count (ATC) data in the study area, as shown in drawing 158148/SK1202. An extract showing the proposed screenline is shown in Figure 4-2:

Figure 4-2: Study Scope



4.3.2 The permanent sites contain data for each month and the summary outputs are contained in **Appendix K**, resulting in the ability to match the data with the specific site (Dec 2020). These sites represent anticipated destinations that would benefit from the bridge opening to motorised traffic, coinciding with destinations that would be common using either route. Generally, Birkenhill House represents trips to/from the south (A941), Maisondieu Road / Linkwood Road / Thornhill Road trips to/from the east and Glen Moray trips in the Edgar Road area.

4.3.3 A neutral month for a typical year has been used in later calculations, represented by May 2018. These show that the following proportions are as follows:

- A941 near Birkenhill House – 18.0%
- Thornhill Road east of A941 – 19.9%
- Linkwood Road east of A941 – 24.8%
- U171e – Maisondieu Road – 23.2%
- Glen Moray Drive south of Mossend Place – 14.1%

4.3.4 A Junction Traffic Count (JTC) survey was undertaken at the junction of Glenlossie Road / C2E on Tuesday 28th November 2023 between 7am and 7pm, this has been used to validate journey routing assumptions. This shows the existing use, with the bridge closed,

confirming route choice for users of the C2E east of the bridge, which is assumed to be complimentary to those potential users west of the bridge. The figures indicate that a daily split of 88% to/from the north, compared with 12% to/from the south.

4.3.5 The proportions are shown in gravity model contained in **Appendix L**.

4.3.6 It is noted that the C2E Cloddach West of Cloddach Bridge ATC (24112001) site represents data gathered over one week. Typical December traffic volumes reduce ahead of the Christmas break, resulting in the average flow being one of the lowest months for traffic movements during each year, this trend is displayed in the permanent site data. Focussing on the Thornhill Road site (Site 28), which is considered to be less susceptible to e.g. retail activities on Edgar Road, the increase in traffic from December 2020 traffic volume to the typical year / neutral month is circa 15.6%. However, taking the timing of the survey into account, it is likely that some shopping activity peaking would be present in the count (particularly the weekend), accordingly it has been concluded that no adjustment to the bridge traffic flows to represent a neutral month would be required.

4.3.7 It is noted that trips to/from the south represent a production/attraction of 18%, whilst the C2E JTC survey indicates 12%. In discussion with MC, it is understood that some trips south do not use the Birkenbaud Road due to its geometry. Therefore, the difference (6%) has been routed north initially via Birnie Road before heading south, adjusting the journey time savings accordingly.

4.3.8 A review of historic traffic trends using a further set of ATC surveys (located on the C2E to the north of the Golf Club driving range), as shown in Table 2-3, has also been undertaken.

4.3.9 This review comments on data consistency and, if required, determine whether a factor would be required to ‘normalise’ the 2020 ATC volumes for the ATC site west of Cloddach Bridge (24112001).

4.3.10 The JTC survey results for the junction of Glenlossie Road / C2E produced two-way traffic counts of 1014 vehicles and 875 vehicles to the north and south of the junction, respectively.

4.3.11 Based on the comparison with the two-way traffic flows in Table 4-5, no direct correlation can be made between the recent JTC survey figures and the two-way ATC flows. The survey results may have been impacted by continued construction activity or other unknown events. Given that the flows are inconsistent, they have been excluded from the study.

4.3.12 Traffic data requires to be input to the toolkit for the opening year (2025). Discussions with MC have determined that National Road Traffic Forecasts (NRTF) central traffic growth in the area would only be experienced in areas where there is major house building. In that regard, a review of the Glassgreen area (LDP Site Ref R20), which is designated for 195 houses, has been undertaken. This highlights that Royal Troon Drive etc. (accessed via the C2E) was fully occupied at some point between February 2021 and May 2021. Fyvie Green etc. (vehicle access via Dunnotter Way) is nearing completion at the time of writing. It is considered that increases in traffic on the bridge would be likely, were it to be reopened, with local traffic taking advantage to route westward compared to the 2020 count volumes.

4.3.13 A new school (Glassgreen Primary LDP Site Ref CF4) is also included within the Site R20 boundary, adjacent to Fyvie Green. However, the approved Elgin South Masterplan update (2021) relocates this school into the future development area. There would be no impact on opening year (2025) traffic flows on the bridge for that land use, as a consequence.

4.3.14 Overall, it is considered that these developments represent ‘a near certain’ land use change between the bridge traffic survey and the opening year. Whilst the rate of house building would not be seen as ‘major’, it is concluded that the application of NRTF ‘low’ growth (1.032) on the bridge’s surveyed traffic is appropriate to predict flows in the opening year (2025).

4.3.15 There is also a ‘most likely’ scenario, during the lifetime of the bridge that planned areas for community expansion in the south of Elgin will come forward (e.g., LONG2) and employment (e.g., I16 and LONG3) that could also benefit from the bridge reopening. It is understood that the toolkit includes prediction of growth beyond the opening and that is considered to be sufficient to allow for these LDP areas.

5 Traffic & Economic Assessment

5.1 Introduction

5.1.1 This section describes the findings of the traffic and economic assessment for the Cloddach Bridge options. It includes a description of the modelling undertaken and the economic performance of option.

5.1.2 It is recognised that the Without-Scheme scenario also includes capital costs, e.g. to maintain the existing structure and to continue to provide footway / cycleway access only, or to demolish it. It is common practice to include these investment costs in the Without-Scheme and subtract these from the With-Scheme. However, the toolkit does not allow for the entry of costs associated with the Without-Scheme, any cost reallocation from the Without-Scheme to the With-Scheme budgets are not recognised in the following calculations and therefore represents a robust approach within this study.

5.1.3 Uncertainty and sensitivity testing is undertaken to consider uncertainty in local factors and national demand growth. It is recognised that the toolkit does not appear to allow for sensitivity testing. Section 4 of this report details how this study has used appropriate growth factors suitable for the level of development in the local area, and without inclusion of future LDP areas. In addition, the level of uncertainty associated with the traffic predictions has also concluded that whilst a non-neutral to neutral month factor would have been appropriate, further consideration of the timing of the bridge surveys would warrant retaining the observed volumes. Both of these should contribute toward improve the certainty of the input. It should be noted that any uncertainty to values applied to the impact are inherent in all schemes using the toolkit, therefore there are no issues with the resulting outputs.

5.1.4 Cost Benefit Analysis provides a comparison of a number of metrics, with the two most commonly used metrics are the ‘benefit-cost ratio’ (BCR) and the ‘net present value’ (NPV). The following are components:

- Present Value of Benefits – (PVB) Summing the stream of discounted benefits over the appraisal period results in the ‘present value of benefits’ (PVB), the value of a benefit in the base year equivalent to the stream of estimated benefits.

- Present Value of Costs – (PVC) A stream of scheme, future operating, maintenance and renewal costs should be estimated over the same appraisal period as the benefits and discounted in the same way as PVB.

- Net present value – NPV is simply calculated as the sum of future discounted benefits minus the sum of future discounted costs: PVB – PVC. A positive NPV means that discounted benefits outweigh discounted costs and, in a world with no budgetary constraints there would be a case for taking forward all projects with a positive NPV (providing the net monetised benefit outweighed any net negative non-monetised factors).

- Benefit-cost ratio - BCR is given by PVB / PVC and so indicates how much benefit is obtained for each unit of cost, with a BCR greater than 1 indicating that the benefits outweigh the costs.

5.2 Impact on Traffic Flows

5.2.1 The reopening of the bridge will return traffic to selected roads in the south of Elgin, whilst simultaneously relieving the B9010, Wittet Drive / Wards Road and the A941 (north of Rashcrook Road).

5.2.2 Based on the Average Annual Daily Traffic (AADT) statistics received from MC, the proportion of traffic where Cloddach Bridge traffic would be re-routed to (as opposed to via the B9010) has been estimated using the two-way flows at five ATC counters. The permanent locations are on Maisondieu Road, Linkwood Road, Thornhill Road, Glen Moray Drive and the A941 at Rashcrook Road.

5.2.3 The proportions of the diverted traffic via Cloddach Bridge are shown in Table 5-1.

Table 5-1: Proportions of Diverted Traffic from Cloddach Bridge

Origin / Destination	Existing Route (Bridge Closed)	Proposed Route (Bridge Open)	Proportion
Maisondieu Road	B9010, Wards Road, A941	C2E, Birnie Road, A941	23.2%
Linkwood Road	B9010, Wards Road, A941	C2E, Birnie Road, A941	24.8%
Thornhill Road	B9010, Wards Road, A941	C2E, Birnie Road	19.9%
Glen Moray Drive	B9010, Wards Road, The Wards, Edgar Road	C2E, Sandy Road	14.1%
A941 at Rashcrook Road	B9010, Wards Road, A941	C2E, Birnie Road, A941	6.0%
		C2E, Rashcrook Road	12.0%

5.2.4 As a result of bridge opening, all existing traffic travelling from the south on the B9010 and routing to within the study area (i.e., to the south of the railway and west of the A941) would be diverted via the Cloddach Bridge and the C2E. Notably, there would be a significant proportional reduction of traffic on the A941 between Maisondieu Road and Linkwood Road and a small proportional increase in traffic on the A941 between Linkwood Road and Thornhill Road due to the route diversion.

5.2.5 The route diversion also leads to a reduction of traffic on the B9010. Under the With-Scheme scenario there would also be less vehicles on the A941 between Rashcrook Road and Thornhill Road and also between Linkwood Road and Maisondieu Road. Elsewhere on the A941, there would an increase in traffic between Thornhill Road and Linkwood Road. Significant traffic increases will occur on the C2E, Rashcrook Road and Birnie Road due to the opening of Cloddach Bridge.

5.2.6 The vehicle volumes for the Without-Scheme and the With-Scheme scenarios are shown in Table 5-2.

Table 5-2: 24-Hour Two-Way Vehicle Volumes

Corridor	Without-Scheme	With-Scheme
B9010	788	0
Wards Road west of The Wards	788	0
Wards Road east of The Wards	678	0
C2E east of Cloddach Bridge	0	788
Birnie Road	0	583
Rashcrook Road	0	95
A941 north of Rashcrook Road	142	47
A941 between Thornhill Road and Linkwood Road	299	379
A941 between Linkwood Road and Maisondieu Road	495	183

5.3 Impact on Bus Routes

5.3.1 There are several bus services which will be affected by the anticipated change in traffic flows due to the opening of Cloddach Bridge. The shortest route between the B9010 to Maisondieu Road, Linkwood Road and Thornhill Road in the With-Scheme scenario results in an increase in vehicles on the C2E, Rashcrook Road and Birnie Road, which affects Stagecoach bus services 33A, 33C and 36. Bus 33A offers weekday services between 6am and midnight, whilst the 33C operates from approximately 7am until 6pm. Stagecoach bus service 36 routes through Elgin between 5.30am and 7pm on weekdays.

5.3.2 It is expected that up to a combined 3 bus services per hour would be affected by the increase in traffic volumes due to the opening of the Cloddach Bridge, on the A941 between Thornhill Road and Linkwood Road. It is anticipated that there would be an increase of approximately 72 vehicles would occur on this link between 7am and 7pm. It is expected that the increase would have an immaterial impact on the road network and thus existing bus services would not be affected.

5.4 Impact on Non-motorised Users

5.4.1 There is no available data for existing non-motorised users, therefore the impacts cannot be quantified. Clearly the increase in traffic will have an impact on any current walking and cycling trip between the B9010 and Birnie Road / A941. It is noted that there is a formal

cycle route but the traffic volumes do not exceed 1,000 vehicles (two-way) per day, which meets the Cycle by Design low service criteria for a mixed street. Walking trips are generally assumed to have a reduced level of service.

5.5 Impact on Road Safety

5.5.1 The distribution of traffic following the reopening of the bridge is anticipated to increase 12-hour traffic on the C2E Glenlossie Road, north of the route to the bridge 123% (using 2023 JTC survey information) and Birnie Road by 11% (using 2018 JTC survey information). These two roads have infrequent collisions and the junction of the A941 / Birnie Road / Thornhill Road has no collision recorded between 2013 and 2022. No road safety concerns are apparent from the location, road geometry or frequency highlighted by the data provided.

5.5.2 The amount of traffic on Rashcrook Road increases by 23% (using 2023 JTC survey information) due to the bridge reopening. The single collision (in 2014), whilst resulting in a fatality, is infrequent and therefore no road safety concerns are apparent from the location, road geometry or frequency highlighted by the data provided.

5.5.3 The bridge reopening will lead to a small reduction in traffic volumes on the A941 between Thornhill Road and Rashcrook Road where there have been one collision resulting in slight injury, eight collisions resulting in serious injury and one fatality. The reduction in traffic could represent a small benefit to existing users. It is noted that the rerouting of traffic onto Rashcrook Road traffic does require vehicles to join the A941 at the site at which there was a fatality. However, the collision record at this junction is infrequent and there are no road safety concerns apparent from the road geometry or frequency highlighted by the data provided.

5.5.4 An increase in traffic on the A941 between Linkwood Road and Thornhill Road is anticipated due to the reopening of the bridge. There are only slight injury collisions in this section with five recorded collisions, which is also considered to be infrequent.

5.5.5 The final section of the A941, between Linkwood Road and Wards Road will benefit from a reduction in traffic, which the data shows there were three collisions resulting in serious injuries and one collision resulting in a slight injury. The anticipated reduction in traffic could represent a benefit to existing users.

5.5.6 The B9010 has one collision, that resulted in a serious injury, this also represents an infrequent occurrence. Wards Road has no collisions recorded for the period between 2013 and 2022. Both roads will see a reduction in traffic, representing a benefit to the remaining users.

5.5.7 Overall, there are no road safety concerns regarding the reopening of the bridge to traffic.

5.6 Economic Performance of Options

Introduction

5.6.1 To assess the economic impact of changes in journey times and Vehicle Operating Costs (VOC), the DfT Small Scheme Application toolkit (version 4.00 2022) was used to process inputs based on demand, journey times and travel distance, evidenced by modelled or observed data.

5.6.2 The toolkit calculates the value of the expected costs and benefits for users, private operators and the Government, both Local and Central, over a given appraisal period. To allow consistency and comparison between different projects, these costs and benefits are discounted and presented in 2010 values and prices.

5.6.3 Where the lifetime of a bridge is expected to be 100 years, typical assessments for highway schemes are considered over 60 years. The toolkit considers an appraisal period of 60 years, which is considered appropriate for this study.

5.6.4 The following values are quoted in 2010 prices.

Economy

5.6.5 The monetised impacts reported relate to business users (those travelling for work purposes) with the net business impact £3,190,238, which represents benefits due to journey time savings and vehicle operating costs.

5.6.6 There is no private sector investment in this project.

Environment

5.6.7 Benefits to the environment, that have been monetised, include noise (£11,662), air quality (£30,000) and greenhouse gas emissions (£471,417) and total £513,079.

Social

5.6.8 This category includes the following items:

- Commuting and other users' benefits £5,243,322
- Accidents benefits from reduced journeys £144,266

5.6.9 Physical activity and journey quality have not been estimated.

Public Accounts

5.6.10 The public accounts impacts are a combination of local and central government funding and indirect taxes, which accrue to the Treasury.

5.6.11 The cost to broad transport budget is calculated as £2,284,400.

5.6.12 The toolkit highlights that the Transport Economic Efficiency (TEE) of the With-Scheme is positive with total benefits of £8,433,560. This is summarised in Table 5-3 and the output for each option is contained in the **Appendix M**.

Table 5-3: Summary of Economic Efficiency of the Transport System (TEE)

Benefits to Travel	Total
Non-business commuting	£1,730,708
Non-business other	£3,512,615
Business	£3,190,238
Private sector	£0
TOTAL	**£8,433,560**

5.6.13 The public accounts (PA) are summarised in Table 5-4. PA impacts that do not directly affect the transport budget, such as Indirect Tax Revenues which accrue to the Treasury, and impacts on transport users and providers that might commonly be referred to as costs, such as fuel costs or public transport operating costs, are included in the PVB. The scheme does not currently lead to changes in public sector revenues (for example tolling options).

Table 5-4: Summary of PA

Public Accounts Results	Total
Investment Costs	£1,679,142
Indirect tax revenues	£623,094

5.6.14 The analysis of monetised costs and benefits (AMCB) are summarised in Table 5-5. This combines information from the TEE and PA tables with monetised estimates of other impacts (such as accidents and greenhouse gases). It should be noted that as there are no significant road traffic collision risks assumed.

Table 5-5: Summary of Analysis of Monetised Costs and Benefits (AMCB)

AMCB Results	Total
Noise	£11,662
Local Air Quality	£30,000
Greenhouse Gases	£471,417
Journey Quality	-
Physical Activity	-
Accidents	£144,266
Economic Efficiency: Consumer Users (Commuting)	£1,730,708
Economic Efficiency: Consumer Users (Other)	£3,512,615
Economic Efficiency: Business Users and Providers	£3,190,238
Wider Public Finances (Indirect Taxation Revenues)	£623,094
PVB	£8,467,811
PVC	£2,284,400
NPV	£6,183,411
BCR	3.7

5.6.15 The overall economic analysis indicates that there would be a good benefit passed to vehicle users with the reopening of the bridge.

6 Traffic and Economic Assessment Summary

6.1 Scope

6.1.1 This assessment report outlines the traffic and economic assessment inputs for the Cloddach Bridge – Strategic Business Case and has been prepared in accordance with Department for Transport (DfT) Transport Assessment Guidance (TAG).

6.2 Existing Conditions

6.2.1 The bridge previously provided access to the B9010 north and southbound for residents in rural communities including Birnie, Thomshill, Glenlatterach and Bardonside. Due to safety concerns, Moray Council (MC) authorised the closure of the bridge to all vehicular traffic on the 4th February 2022.

6.2.2 The bridge closure to traffic includes a signed alternative route for vehicles travelling to the A941 to enter Elgin from the south and then taking the A96 west back to the B9010. This diversion has a length of approximately 6 miles and anecdotal evidence suggests journey times are extended by up to 15 minutes during peak times.

6.2.3 MC have a comprehensive collection of permanent Automatic Traffic Counter (ATC) sites in Elgin. The information provided highlights average daily flows per month, generally from 2014 to 2023. Additional information is available from 'one-off' ATC surveys undertaken in 2017 and 2021. Junction Turning Count (JTC) traffic surveys were undertaken on behalf of MC in 2018 in support of an update to the strategic Elgin Town Centre Model. Fairhurst also commissioned JTC surveys at selected junctions that were undertaken in 2023.

6.2.4 Traffic flows on the bridge averaged 764 vehicles two-way per day (2020) and the A941 supported circa 7,600 vehicles two-way per day (2018). Glenlossie Road / C2E had 1014 two-way vehicles (7am-7pm, 2023) and Rashcrook Road at the A941 had 370 vehicles (7am-7pm, 2023). The 2018 survey of Birnie Road showed it carried 4913 two-way vehicles (7am-7pm).

6.2.5 Twelve bus services were investigated with most providing an hourly frequency.

6.2.6 Non-motorised users have been able to continue to use the bridge, but there are no existing volumes known.

6.2.7 Road safety investigation identified there were 37 collisions on the roads to the south of Elgin Town Centre that resulted in injury to 56 persons. It is considered that the council area has less persons seriously injured in traffic collisions than the national average, however, the

persons killed statistic per head of population is worse. This could be due to the council area consisting of mostly rural roads and these generally involve faster vehicle speeds and increased levels of injuries. Nevertheless, the roads in the south of Elgin have less persons injured per head of population than the national average. An online review highlights that the road environment appears to be suitable and is less likely to be contributing to traffic collisions.

6.3 Scheme Options

6.3.1 This study considers the option that enables the Cloddach Bridge to reopen to vehicular traffic, also includes increasing the weight limit to 40 Tonnes, which includes a new integral bridge structure single lane and full demolition of existing bridge.

6.4 Cost Estimates

6.4.1 The capital cost is provided by MC's term contractor and based on the outline design for a minimum width bridge (Option 4b). For the purposes of transport economics, the total investment is £3,014,735, which includes for inflation. An additional 42% has been used to represent optimism bias.

6.5 Traffic Modelling

6.5.1 Fairhurst developed a traffic model using available 2018 JTC information, which is detailed in the Local Model Validation Report (LMVR). Overall, the model provides a mixed performance in terms of validation and further discussion determined that the failure of the traffic model stems from a lack of relevant historical traffic data in the study area. The approving authorities agreed to determine the economic case using an alternative method developed by the DfT.

6.5.2 The DfT's small scheme appraisal toolkit provides a proportionate method to monetise the impacts of small highway and bus improvement schemes. The impact of the scheme is monetised by inputs to the toolkit based on demand, journey times and travel distance, evidenced from modelled or observed data.

6.5.3 To provide the inputs, journey time information in the form of GPS surveys was used with additional roads to complete the data set. This identified journey times for likely destinations in the south of Elgin, comparing the journeys via the B9010 and the reopened bridge. In general, it has been found that both journey times and distances reduce by one third with the bridge being reopened.

6.5.4 Traffic data for the bridge was factored using NRTF to the opening year (2025) using low growth.

6.6 Traffic Assessment

6.6.1 As a result of bridge opening, all existing traffic travelling from the south on the B9010 and routing to within the study area (i.e., to the south of the railway and west of the A941) would be diverted via the Cloddach Bridge and the C2E. Notably, there would be a significant proportional reduction of traffic on the A941 between Maisondieu Road and Linkwood Road and a small proportional increase in traffic on the A941 between Linkwood Road and Thornhill Road due to the route diversion.

6.6.2 The route diversion also leads to a reduction of traffic on the B9010 in Elgin. Under the With-Scheme scenario there would also be less vehicles on the A941 between Rashcrook Road and Thornhill Road and also between Linkwood Road and Maisondieu Road. Elsewhere on the A941, there would an increase in traffic between Thornhill Road and Linkwood Road. Significant traffic increases will occur on the C2E, Rashcrook Road and Birnie Road due to the opening of Cloddach Bridge.

6.6.3 It is expected that up to a combined 3 bus services per hour would be affected by the increase in traffic volumes due to the opening of the Cloddach Bridge, on the A941 between Thornhill Road and Linkwood Road. However, it is expected that the increase would have an immaterial impact on the road network and thus existing bus services would not be affected.

6.6.4 The impact on existing walking trips and cycling trips cannot be quantified, however, as there is no traffic currently on the bridge, it can be concluded that these road users will experience a reduction in the level of service. It is noted that the bridge hosts a section of a signposted cycle route but the increase in traffic volumes due to bridge opening do not exceed 1,000 vehicles (two-way) per day, which meets the Cycle by Design low service criteria for a mixed street.

6.6.5 Overall, there are no road safety concerns regarding the reopening of the bridge to traffic.

6.7 Economic Assessment

6.7.1 The cost benefit analysis identifies that the present value of costs to be circa £2.3 million and the present value of benefits to be circa £8.5 million (over 60 years). The net present value is calculated to be circa £6.2 million and the benefits to cost ratio 3.7.

6.8 Overall Summary

6.8.1 This study considers the option that enables the Cloddach Bridge to reopen to vehicular traffic, also includes increasing the weight limit to 40 Tonnes, which includes a new integral bridge structure single lane and full demolition of existing bridge.

6.8.2 In general, it has been found that both journey times and distances reduce by one third with the bridge being reopened.

6.8.3 Whilst three roads in the south of Elgin do experience increases in traffic, the impact is considered manageable and the overall impact on traffic is generally to the benefit of most users.

6.8.4 Impacts on existing bus services is considered negligible.

6.8.5 There will be a reduction in the level of service to existing walking and cycling trips on the bridge.

6.8.6 There are no road safety concerns with the reopening of the bridge.

6.8.7 The transport economics cost for the scheme is circa £2.3 million (2010 prices), whilst the benefits are circa £8.5 million (over 60 years).

6.8.8 The resultant net present value is positive, circa £6.2 million (2010 prices), and the benefits to cost ratio 3.7, which is considered to be good.

Appendix A

Bridge Closure News Article

03 FEB 2022

Cloddach Bridge to close to vehicles tomorrow

MORAY Council will close the Cloddach Bridge, near Birnie, to all motorised vehicles with effect from tomorrow (4 Feb).

In 2019 the weight-bearing capacity of the structure was around 60% of the capacity of when it was built in around 1905. However there has been rapid deterioration as a result of weathering, wear and tear, and repeated overloading of vehicles despite mitigations such as height and weight restrictions being implemented. This has significantly reduced the weight-bearing capacity to 45%. As 32% of the original capacity is required to carry the bridge's own weight there is only 13% remaining strength for traffic loads, and as such it is unsafe for use by motorised vehicles.

A temporary closure is in place while an independent inspection is carried out. It's due to take place within the next few weeks and the findings will set out if a repair is possible and indicative costs.

Signage will be installed at the bridge to advise motorists of the diversion, and barriers in place to prevent vehicular access. It remains open for pedestrian and cycle use, however the barriers may cause access issues. The diversion route for vehicles is via Elgin, following the B9010 >> Pluscarden Road >> Wittet Drive >> Wards Road >> Station Road >> New Elgin Road >> Main Street >> Birnie Road.

Emergency services were consulted prior to the weight and height restrictions being implemented and raised no concerns, and they have also been notified in advance of the closure.

Moray Council's Head of Environmental and Commercial Services, Stephen Cooper, said: "Public safety is our paramount consideration and, given the rapidly-deteriorating condition of the structure the council faces no alternative option and must close the bridge.

"We know that a diversion is inconvenient for local residents – and others – and apologise for the disruption this will likely cause."

Contact Information

Moray Council Press Office

pr@moray.gov.uk

Cloddach Bridge

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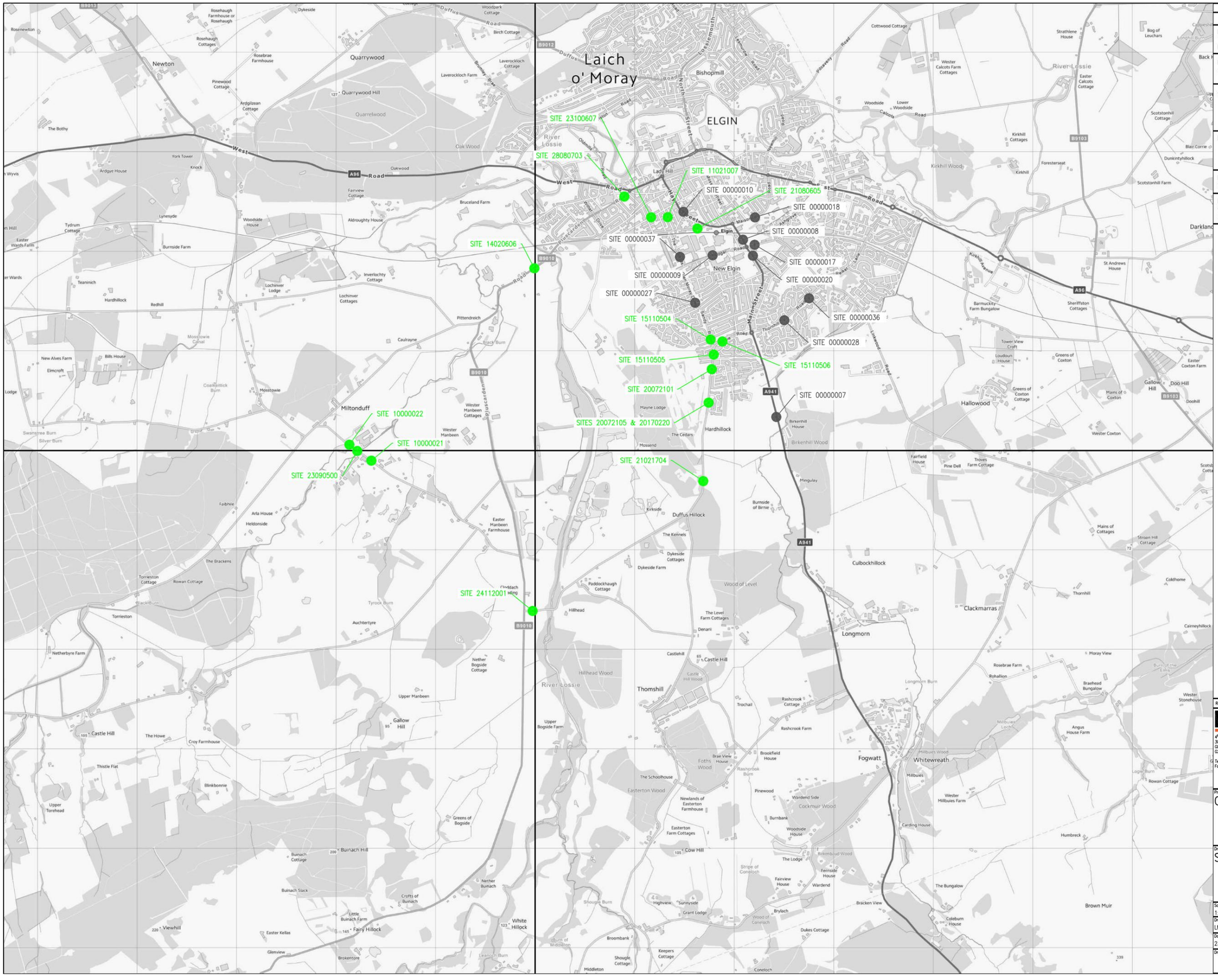
Appendix B

Fairhurst Drawing 158148/sk1202



Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

LEGEND

- ATC SURVEY LOCATION – PERMANENT
- ATC SURVEY LOCATION – SITE-SPECIFIC

Rev.	Date	Description	Drwn.	Chkd.	Appd.

FAIRHURST
4th Floor, Toy House,
100 Bath Street,
GLASGOW
G2 4GZ
Tel: 0141 204 8800
Fax: 0141 204 8801

Client:

Project Title:
CLODDACH BRIDGE

Drawing Title:
SURVEY LOCATION PLAN

Scale at A2:	Status:	
1:25000	For Information	
Drawn:	Checked:	Approved:
LM	JC	JC
Date:	Date:	Date:
23/02/2024	23/02/2024	23/02/2024

Drawing No.: 158148/sk1202 Revision: –

Appendix C

Fairhurst Drawing 158148/sk1204

LEGEND

RAILWAY

SCOPE EXTENTS

JOURNEY TIME ROUTE

Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

Rev.	Date	Description	Drawn	Checked	Approved
A	14/03/24	UPDATED ROUTE	LM	JC	JC

Project Title:
CLODDACH BRIDGE

Drawing Title:
JOURNEY TIME ROUTING

FAIRHURST
4th Floor, Tay House,
300 Bath Street, GLASGOW, G2 4JR
Tel: 0141 204 8800 Fax: 0141 204 8801

Scale at A3:	Status:	
1:25000	For Information	
Drawn: LM	Checked: JC	Approved: JC
Date: 22/02/2024	Date: 22/02/2024	Date: 22/02/2024

Drawing No.: 158148/sk1204

Revision: A

Appendix D

Elgin City Bus Map

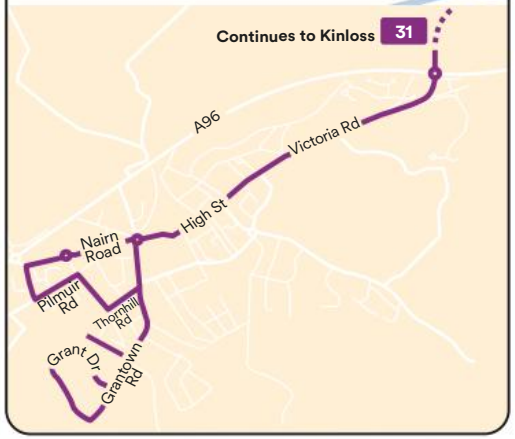
Elgin

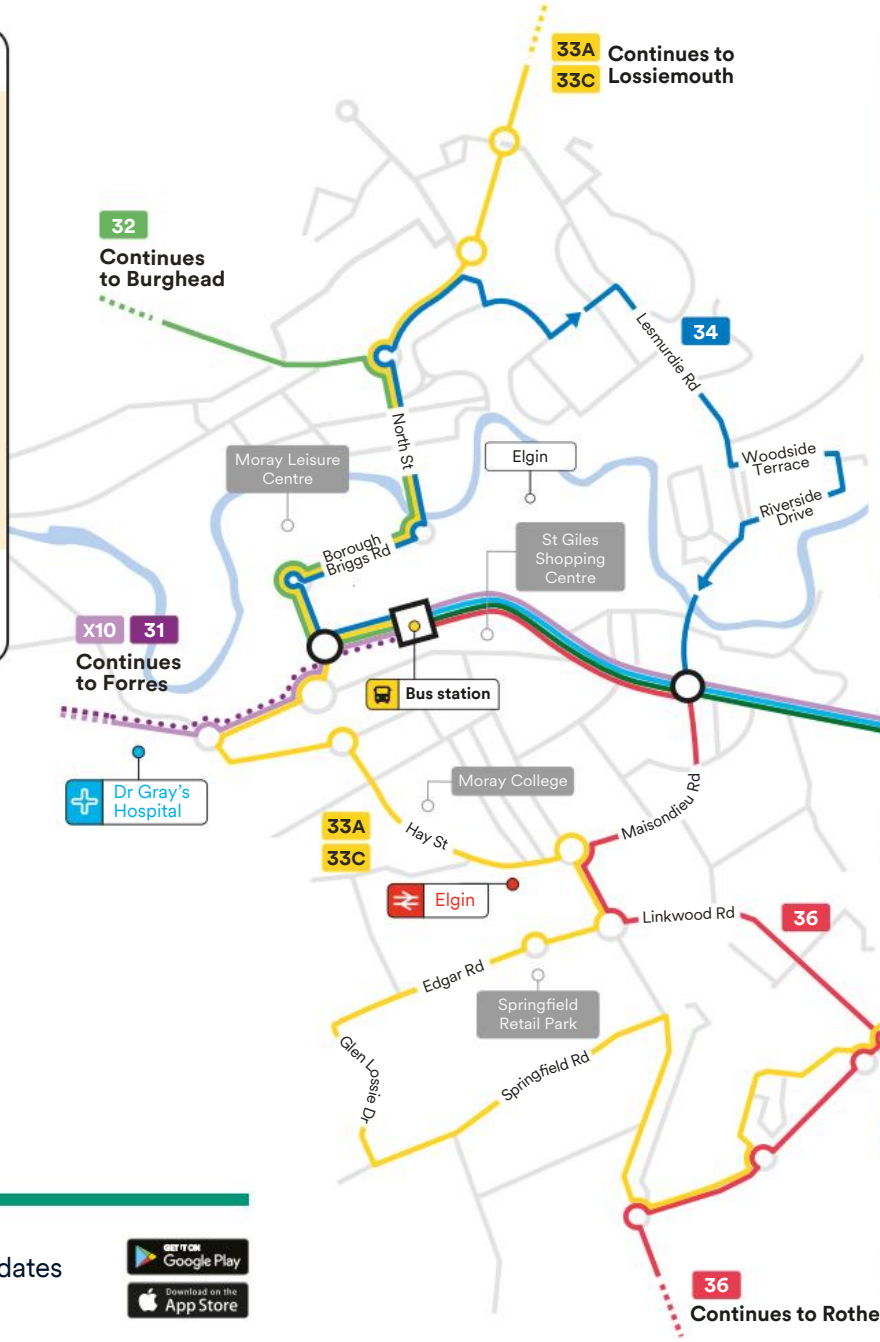
Stagecoach

Buckie

A Buckie Seafield Hospital
B East Church St McKays
C Craigbo Terrace
D Buckie Rathven
E Milton Drive
F Buckie Tesco
G Highfield Medical Centre
H Burns Square

Forres





Lossiemouth

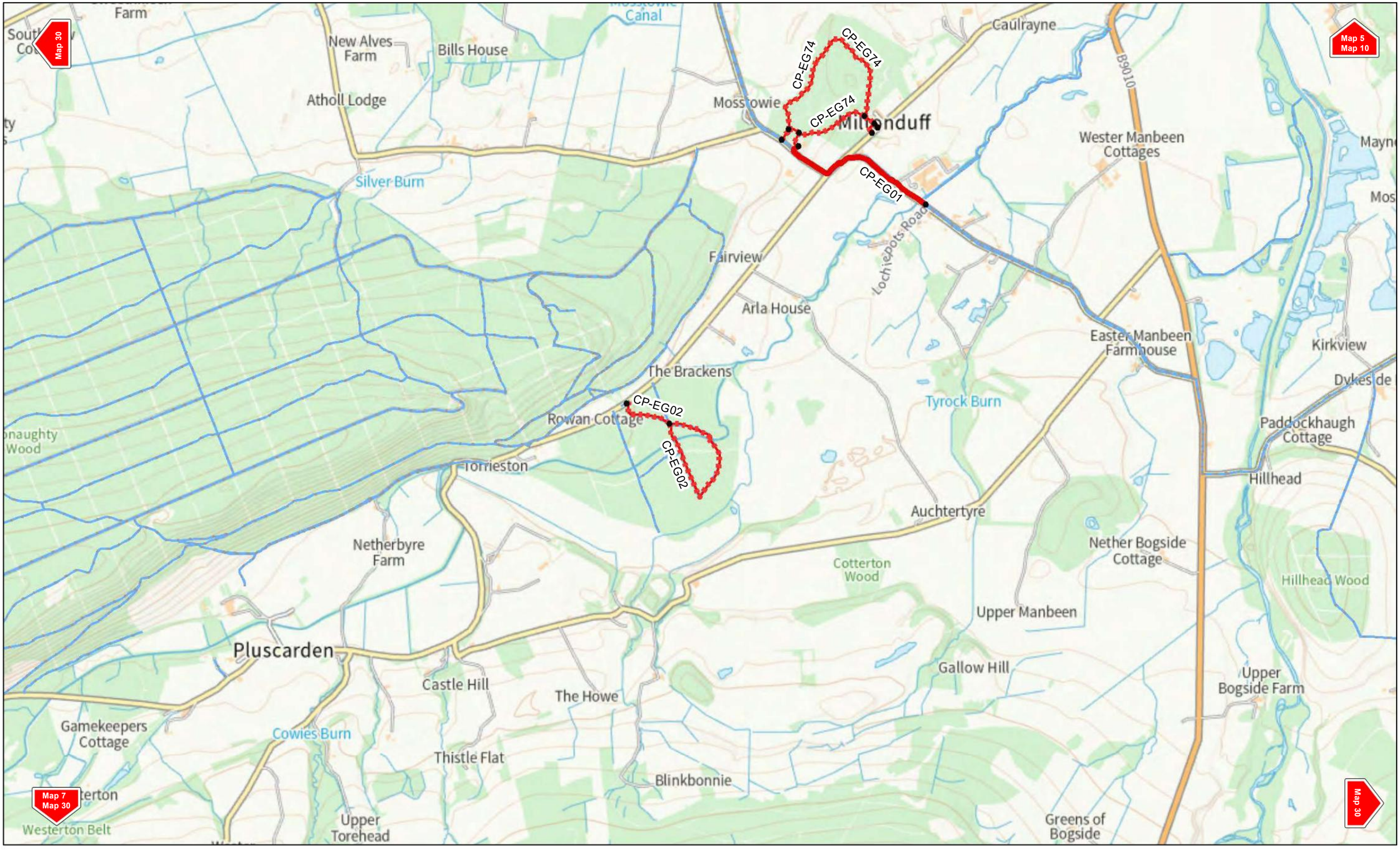
For more detailed journey planning and real-time updates **download the Stagecoach Bus App.**

GET IT ON Google Play
Download on the App Store

Correct at time of print; **6/04/2020**

Appendix E

Elgin Core Path Plan



Moray Core Path Plan
Pluscarden & Miltonduff Area

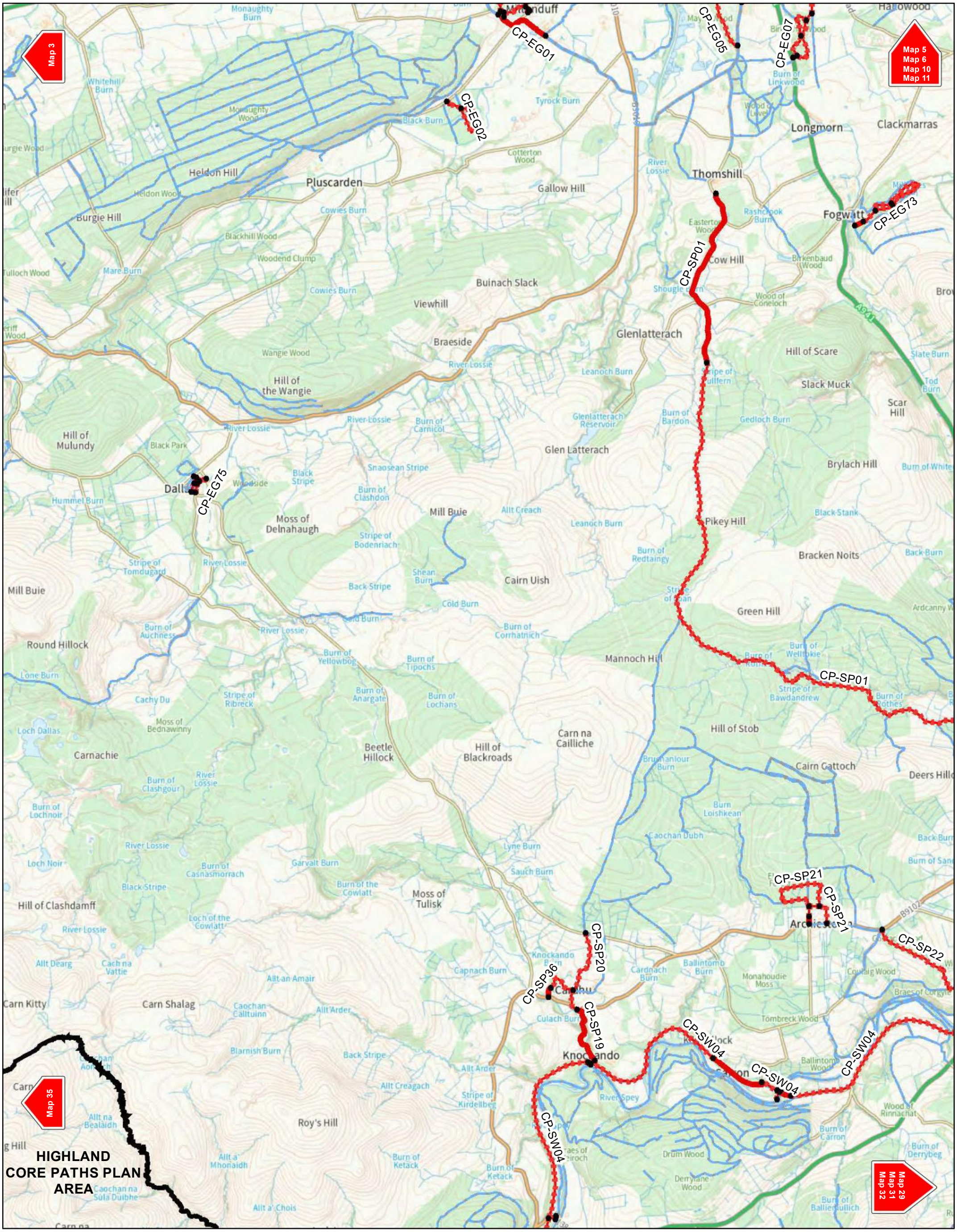
Scale: 1:20,000

Date: January 2024

Layers

- Core Paths- Off road
- Core Paths - Public roads/ Roadside paths
- Start Finish Points
- Existing Paths
- Core Paths outwith Moray
- National Park Boundary
- Moray Boundary

Map 6



Map 30

Layers

- Core Paths- Off road
- Core Paths - Public roads/ Roadside paths
- Start Finish Points
- Existing Paths
- Core Paths outwith Moray
- National Park Boundary
- Moray Boundary

Moray Core Path Plan
Mannoch Area

Scale: 1:60,000

Date: January 2024

N W E S

moray council

Appendix F

Elgin Active Travel Map

Smarter Travel Choices
HiTravel

Elgin Active Travel Map

Walking and cycling routes in and around Elgin

PUBLIC TRANSPORT

Traveline Scotland –
www.travelinescotland.com

ScotRail – www.scotrail.co.uk

Stagecoach – www.stagecoachbus.com

Citylink – www.citylink.co.uk

Moray Council -
www.moray.gov.uk/moray_standard/page_1679.html

OTHER USEFUL WEBSITES

Sustrans Scotland –
www.sustrans.org.uk/scotland

Cycling Scotland – www.cycling.scot

Paths for all – www.pathsforall.org.uk

Energy Saving Trust –
www.energysavingtrust.org.uk/scotland

Cycle Streets – Journey planning –
www.cyclestreets.net

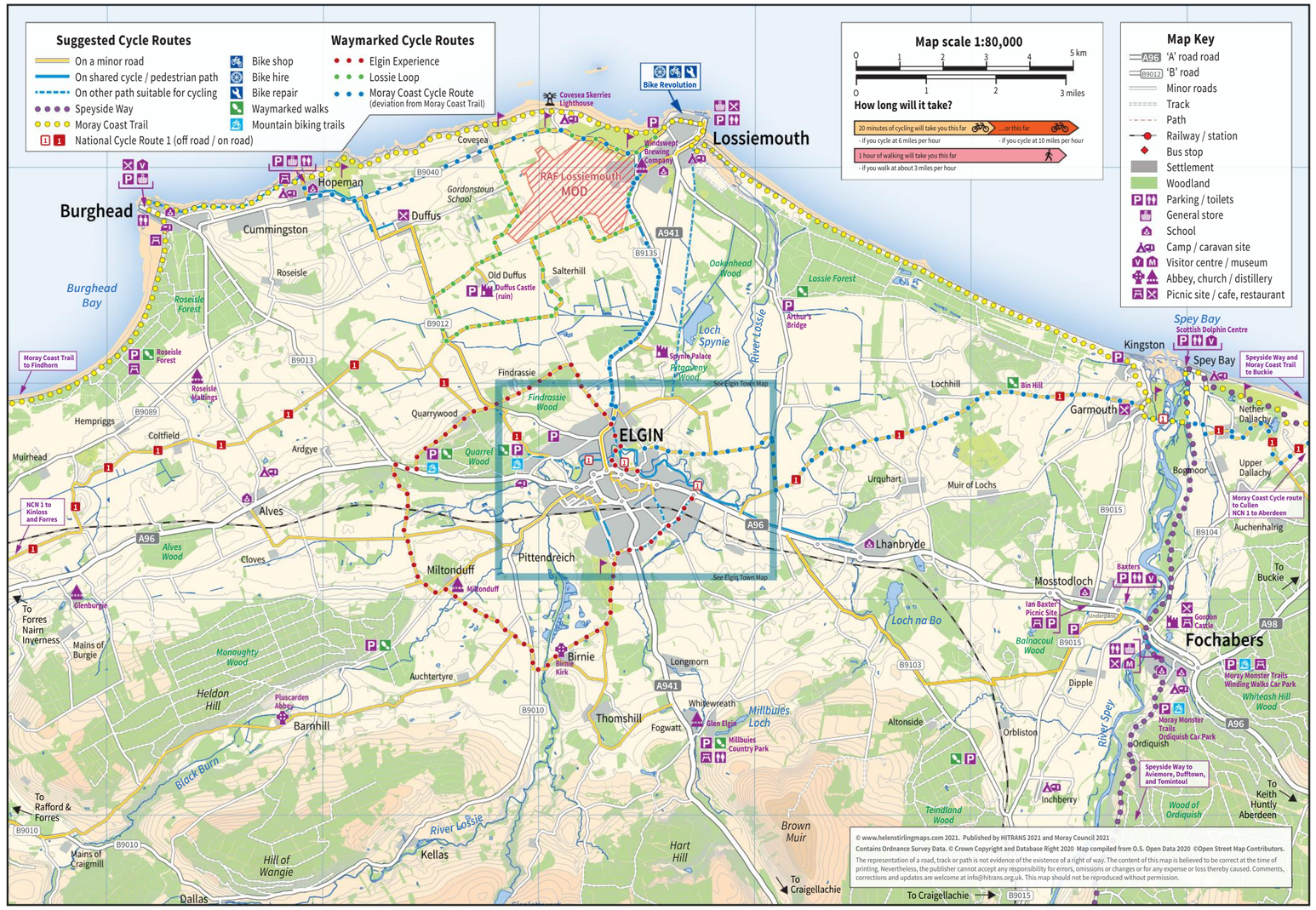
ELGIN BUS SERVICES

Elgin Bus Station
Alexandra Rd, Elgin IV30 1PW

Stagecoach:
web: www.stagecoachbus.com
tel: 01343 544222
email: bluebird.enquiries@stagecoachbus.com
Get the free app for journey planning, live times and etickets

Moray Council Bus Times Page:
www.moray.gov.uk/moray_standard/page_1679.html
tel: 0300 123 4565

All services are subject to change. Please check before you travel. Get live bus times on the app. Pay contactless on most services.



Why choose Active Travel? It's free!

Walking is the natural choice for short, everyday journeys, and you don't have to worry about parking! It is often quicker to travel around town by bike than by bus or car.

It helps you stay fit and healthy.
Incorporating exercise into your daily routine helps you to achieve the recommended 150 minutes of exercise a week which will help keep you mentally and physically healthy.

It benefits the environment.
Active travel contributes to quieter streets and cleaner air. Driving less could mean a mixture of walking, cycling, e-biking, car sharing and using public transport for some of your journeys.

SIGNS YOU WILL SEE

Shared use route
Walking and cycling traffic free.

No cycling

Recommended cycle route
Often marked with a dashed white line on the road.

Contraflow
Two-way cycling allowed on a one-way street.

Cycle route ahead
Warns drivers of riders on the road

National Cycle Network Route 1: Inverness to Aberdeen
See sustrans.org.uk/ncn/map

It's an offence to close-pass someone cycling and you could get three points on your license and be fined £100. Always give at least 1.5 metres space when passing – this will usually mean crossing into the other lane. Wait at a safe distance until you have space and visibility to pass safely.

SAFETY AND COURTESY

When you're cycling make sure you're easily visible to other road users – wear bright or reflective clothing and use front and rear lights when riding in the dark.

Check the Highway Code or information on walking, cycling and safe driving around cyclists. www.highwaycodeuk.co.uk

LOCAL BIKE SHOPS

Cycle Circle
7 High Street, Elgin, IV30 1EQ
t: 01343 549656 w: www.cycle-circle.co.uk

Halfords
Lossie Wynd, North Elgin, IV30 1GU
t: 01343 552030 w: www.halfords.com

Bike Revolution
Shore Street, Lossiemouth, IV31 6PB
t: 01343 549571 w: www.outfitmoray.com

Bike Repair Stand
Cooper Park

GOOD CYCLING ROUTES FROM ELGIN

Elgin - Hopeman **7.5 miles / 12 km**
Follow the NCN1 as far as the junction with B9012, then follow this to Hopeman and pick up coastal path.

Elgin - Lossiemouth **6 miles / 9.5 km**
Cycle path along A941 then B9135 into Lossiemouth.

Elgin - Spey Bay **11 miles / 7.5 km**
Follow NCN1

Lossiemouth Loop **14 miles / 22.4 km**
From the west beach, via the airfield, Duffus castle and back.

Elgin - Experience **13 miles /20.8 km**
A waymarked route through Moray's historic capital and its scenic surrounding countryside..

Elgin - Pluscarden Abbey **7 miles / 11 km**
Take the B9010 out of Elgin, then follow signs for the Abbey.

Elgin - Duffus Castle **5 miles / 8 km**
Follow B9012.

Elgin - Spynie Palace **2.5 miles / 4 km**
Cycle path towards Lossiemouth then minor road to the east.

Elgin - Fochabers **9 miles / 14.5 km**
NCN1 to B9013, then South East to Animal Country Hotel, then North to Mosstodloch and cycle path to Fochabers.

USING THIS MAP

This active travel map highlights suggested routes for cycling in and around Elgin. Where possible, it identifies traffic-free routes which are recommended for walking too. The map also shows quieter roads which people may prefer for cycling.

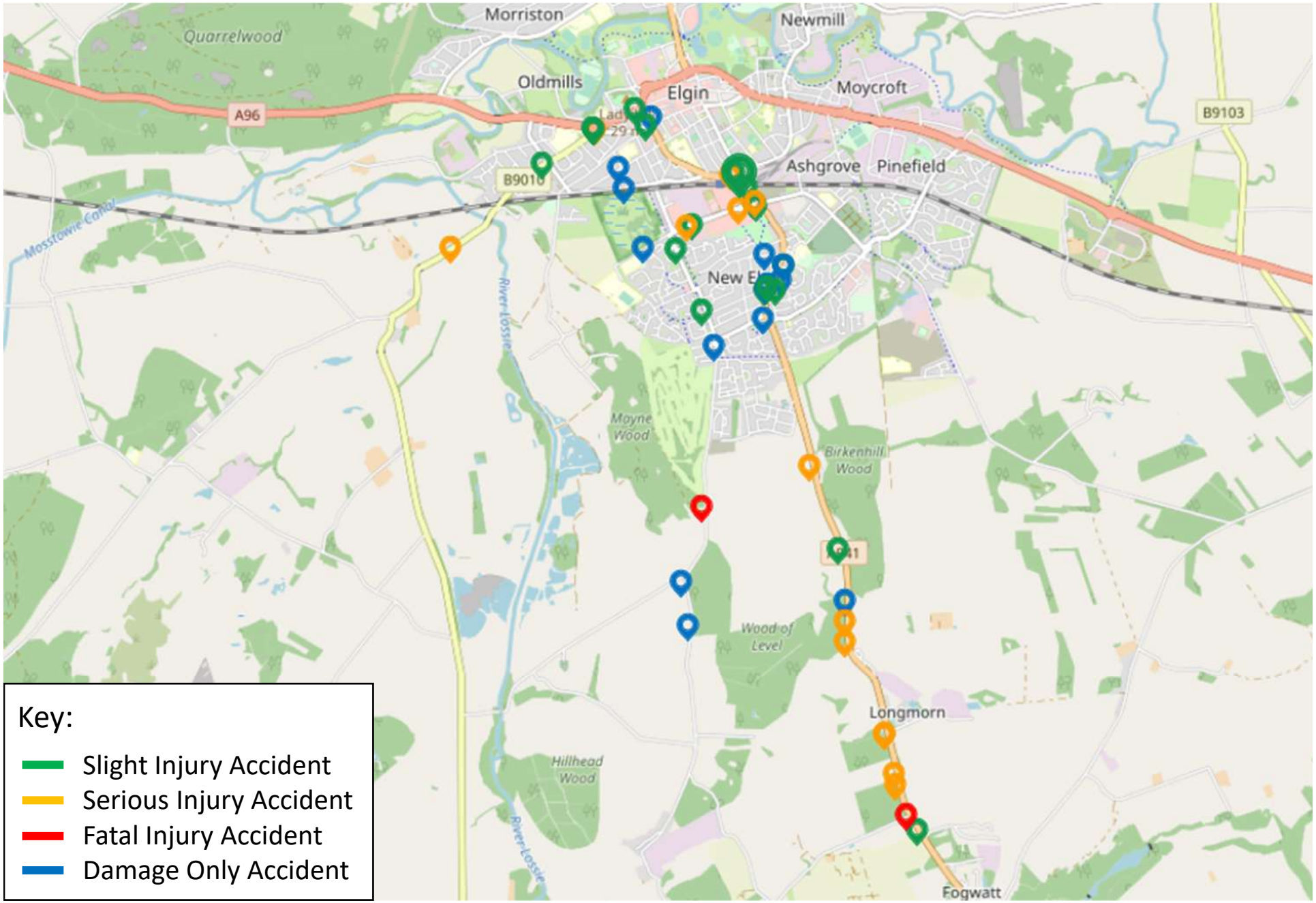
Elgin and the surrounding area is a great place to walk and cycle, where many people choose to make their journeys actively. This map shows how easily you can reach key destinations by bike or on foot.

This map was produced by:
HITRANS
(Highlands and Islands Regional Transport Partnership)
2nd Floor, 7 Ardross Terrace, Inverness, IV3 5NQ
www.hitrans.org.uk

Appendix G

Road Collision Data

Cloddach Bridge Accident Study 2013-2022



CRASH DETAILS

Crash Id	Accident Reference	Collision Severity	Number Of Vehicle Records	Number Of Casualty Records	Date	Time	Location - Easting	Location - Northing	1st Road Number	Accident Location
28	1301145	DamageOnly	1	0	17-Mar-2013	02:10	321533	859355		Unclassified Elgin to Birnie Road, Elgin
33	1301138	DamageOnly	2	0	15-Mar-2013	18:25	321802	861960		SC - Edgar Road, Elgin at its junction with the TA Centre
34	1301113	DamageOnly	2	0	15-Mar-2013	18:50	322260	861610	941	On the road outside No 31 Main Street
39	1300339	DamageOnly	2	0	25-Jan-2013	11:00	320923	862311		Mayne Road, Elgin, outside no 42.
45	1300264	DamageOnly	2	0	21-Jan-2013	17:00	321352	862619	941	South Street Elgin at it's roundabout junction with Hay Street, Elgin
47	1300208	DamageOnly	1	0	18-Jan-2013	00:02	321550	859377		The unclassified road from Elgin to Thomshill at its junction with the unclassified road to Cloddach quarry.
53	1300141	DamageOnly	2	0	13-Jan-2013	16:45	321085	862576		South Street, Elgin, Moray 30m West of its junction with Hawthorn Road
59	1300102	DamageOnly	2	0	01-Jan-2013	14:40	321984	862283		On the roundabout at the junction of Moss Street and Maisondieu Road, Elgin.
63	1301054	DamageOnly	1	0	13-Mar-2013	08:54	321675	859584		Unclassified road between Elgin and Thomshill near to Duffus Hillock Farm, Elgin, Moray
73	1600662	Slt	2	1	27-Jun-2016	15:20	320965	862606	96	Roundabout located betweenWest Street, A96, South Street and Pluscarden Road, Elgin

102	1300828	DamageOnly	3	0	25-Feb-2013	17:00	321656	861904		Edgar Road, Elgin outside S and D Harper
125	1301328	DamageOnly	2	0	28-Mar-2013	16:00	321413	862490	941	A941 Hay Street at its junction with Moray Street,Elgin
184	1301935	DamageOnly	1	0	24-May-2013	12:30	322108	862053		Edgar Road with the junction to New Elgin Road, Elgin, Moray
195	1301533	Slt	2	1	15-Apr-2013	17:10	320687	862239		Wittet Drive, Elgin at its junction with Petrie Crescent, Elgin
196	1301540	DamageOnly	2	0	16-Apr-2013	09:30	321943	861766		Councillors Walk, Elgin
198	1301597	Slt	2	2	16-Apr-2013	14:00	323205	857480	941	The locus is the located on the A941 carriageway, 40 metres north west of the junction with the unclassified road to Wester Whitewreath, near Fogwatt, Moray
218	1302231	DamageOnly	1	0	16-Jun-2013	04:00	321570	859000		Elgin to Thomshill Road, Elgin, Moray
247	1302054	DamageOnly	1	0	01-Jun-2013	21:25	322159	861208		Main Road, Elgin at its roundabout junction with Birnie Road.
248	1302154	DamageOnly	2	0	01-Jun-2013	16:45	321300	861740		Edgar Road, Elgin, at its junction with Glenmoray Drive, Elgin
270	1300133	DamageOnly	2	0	13-Jan-2013	12:30	322990	858191	941	The A941 Elgin to Rothes road at Longmorn is a single carriageway road governed by national speed limits. This incident took place at the mouth of the T-Junction leading to Lithe Lochan.
281	1302668	DamageOnly	1	0	18-Jul-2013	19:30	322179	861669		Convener Street at it's junction with Smith Street, New Elgin, Elgin, Moray.

289	1302420	DamageOnly	2	0	26-Jun-2013	15:05	321138	862322		Forteath Avenue at its junction with Young Street, Elgin
299	1302039	DamageOnly	2	0	25-May-2013	12:00	322294	861479		Outside No 39 New Elgin Road
350	1302790	DamageOnly	1	0	28-Jul-2013	14:00	321173	862177		Wards Road, Elgin heading in the direction of Hay Street from the railway arch
369	1303337	DamageOnly	1	0	06-Sep-2013	16:10	321799	861022		Birnie Road, Elgin at its roundabout junction with Sandy Road, Elgin, Moray
373	1303381	DamageOnly	2	0	10-Sep-2013	13:00	322194	861458	941	Main Street, New Elgin, outside the chinese carryout
418	1303494	DamageOnly	2	0	18-Sep-2013	11:00	321375	862685		Batchen Lane, Elgin
440	1303809	Ser	1	1	26-Aug-2013	15:20	321947	862263	941	A941 Station Road, Elgin, approximately 30 metres west of the junction with New Elgin Road.
497	1303851	Ser	1	1	11-Nov-2013	14:30	322480	860138	941	A941 Rothes to Elgin Road 15 metres south of the unclassidfied entrance to Birkenhill Elgin Moray
576	1401102	Slt	2	1	14-Aug-2014	18:00	321257	862750	96	High Street, Elgin at its roundabout junction with Alexandra Road, Elgin
592	1500908	Slt	2	1	15-Aug-2015	15:00	322182	861423	941	(A941) Main Street, New Elgin, near its junction with Land Street, Elgin, outside the Buccaneer Filling Station.
622	1401674	DamageOnly	3	0	05-Dec-2014	17:45	322711	859156	941	A941 near to Longmorn distillery.
626	1401508	Slt	2	2	21-Nov-2014	11:00	321717	861281		Sandy Road, Elgin, Moray approximately 35 metres north of its junction with Land Street, Elgin, Moray

660	1401432	Slt	2	1	07-Nov-2014	15:45	322173	861420		Land Street at its junction with Main Street, Elgin, Moray
686	1401613	Slt	1	1	16-Dec-2014	11:30	321656	861904		Edgar Road, Elgin
706	1500005	Ser	3	3	05-Dec-2014	19:02	322711	859002	941	A941 Elgin to Rothes road approximately 150 metres north of Viewbank, Longmorn, Elgin, Moray
717	1500619	DamageOnly	2	0	19-May-2015	17:49	322184	861423	941	Main Street, approximately 12 meters south of its junction with Croft Road, New Elgin
731	1500811	Slt	1	1	20-Jul-2015	01:15	322059	862166	941	New Elgin Road, Elgin near to junction with Maisondeu Road
768	1500850	Slt	2	1	26-Jun-2015	07:45	322125	862030	941	The A941 New Elgin Road, Elgin, at its roundabout junction with Edgar Road
773	1501252	Ser	2	1	10-Nov-2015	10:20	320967	862607	96	A96 High Street, Elgin, at its roundabout junction with South Street, Elgin, Moray.
820	1600485	Ser	1	1	01-May-2016	04:00	323043	857892	941	A941 Rothes to Elgin Road, approximately 300 metres south of its junction with Lithe Lochan, Longmorn
866	1600940	Ser	1	2	20-Oct-2016	19:10	322115	862059	941	A941 New Elgin Road at its roundabout junction with Edgar Road, Elgin
891	1600668	Slt	1	1	21-Jul-2016	10:25	322319	861589		Bezack Street, New Elgin, Elgin
893	1501147	DamageOnly	2	0	06-Oct-2015	12:30	322191	861449	941	Main Street, New Elgin
929	1700482	Ser	2	1	06-May-2017	11:30	322001	862010		Edgar Road, Elgin at it's junction with Asda , Elgin
965	1500252	Slt	1	1	02-Mar-2015	16:45	320953	862619	96	A96 at the roundabout at Dr Grays Hospital, Elgin

969	1700650	Slt	2	4	25-Jun-2017	00:35	321342	862624	941	A941 Northfield Terrace, at the mini roundabout with South Street, Elgin
989	1700207	Slt	2	1	16-Dec-2016	18:40	322253	861414		Junction with Bezack Street and Croft Road, New Elgin, Moray
991	1700549	DamageOnly	2	0	19-Jul-2017	10:40	322319	861589		Bezack Street, Elgin
1010	1400866	Ser	3	2	08-Jul-2014	15:14	322980	858183	941	A941 Rothes to Elgin road at junction with the Longmorn Distillery, Longmorn, Moray
1018	1800222	Slt	2	1	11-Feb-2018	14:40	322190	861438	941	Main Street at its staggered crossroads with Land Street and Croft Road, Elgin
1023	1800321	Ser	3	3	14-May-2018	15:40	322985	858179	941	A941, Rothes to Elgin Road at its junction to Longmorn Distillery, Elgin, Moray
1075	1700788	DamageOnly	1	0	20-Jun-2017	16:40	321530	859317		Unclassified road between Elgin and Thomshill, approximately 25 metres south of the Birnie Kirk junction
6428	954176	Ser	1	1	30-May-2020	16:30	322705	858854	941	A941
6650	1010181	Ser	1	1	26-Dec-2020	12:11	323058	857810	941	A941
6654	1053494	Fatal	2	1	08-Jun-2021	07:00	323129	857592	941	A941 AT JUNCTION WITH UNCLASSIFIED RASHCROOK ROAD
6655	1060087	Ser	2	1	27-Jun-2021	13:20	319906	861771	9010	PLUSCARDEN ROAD (B9010) NEAR JUNCTION WITH UNCLASSIFIED ROAD
6703	1900026	Ser	2	2	10-Jan-2019	15:50	321619	861891		Edgar Road, Elgin, Moray

45495	1121057	Slt	2	4	10-Dec-2021	13:30	322674	859530	941	A941 AT JUNCTION WITH UNCLASSIFIED ROAD LEADING TO BURNSIDE OF BIRNIE
45498	1100938	Slt	2	1	18-Oct-2021	19:27	320964	862606	96	A96 AT JUNCTION WITH SOUTH STREET
50370	1171190	Fatal	1	1	26-Apr-2022	09:58	321686	859859		THE UNCLASSIFIED THOMSHILL TO ELGIN ROAD ADJACENT TO ELGIN GOLF CLUB, ELGIN, MORAY
50395	1193180	Slt	2	2	28-Jun-2022	10:24	320581	862366	9010	PLUSCARDEN ROAD (B9010) NEAR JUNCTION WITH WITTET DRIVE
51759	1235258	Slt	2	1	26-Oct-2022	18:23	321538	861721		THE MEWS AT ITS JUNCTION WITH GLEN MORAY DRIVE, ELGIN, MORAY
51838	1258424	Slt	2	1	30-Dec-2022	14:10	321975	862275	941	A941 AT JUNCTION WITH STATION ROAD (A941)

VEHICLE DETAILS

Crash Id	Vehicle Reference Number	Type of Vehicle	Manoeuvres
28	1	Car4W	AhRhB
33	1	Car4W	AhOth
33	2	Car4W	WgTnR
34	1	Car4W	Parkd
34	2	Car4W	Rever
39	1		Parkd

39	2	Car4W	Rever
45	1	Car4W	AhOth
45	2	Car4W	TRght
47	1	Car4W	AhOth
53	1	Car4W	Parkd
53	2	Car4W	AhOth
59	1	Car4W	Start
59	2	Car4W	Start
63	1	Car4W	AhRhB
73	1	Car4W	AhOth
73	2	Car4W	AhOth
102	1	Car4W	AhOth
102	2	Car4W	WgAhd
102	3	Car4W	WgAhd
125	1	Car4W	Stop
125	2	Car4W	Stop
184	1	<3.5T	TLeft
195	1	Car4W	TRght
195	2	PedCy	AhOth
196	2		
196	1	Car4W	Parkd
198	2	Car4W	Stop

198	1	>7.5T	AhOth
218	1	Car4W	AhOth
247	1	Car4W	TRght
248	1	Car4W	TRght
248	2	Car4W	AhOth
270	1	Agric	Parkd
270	2	<3.5T	Parkd
281	1	Goods	Rever
289	2	Car4W	Parkd
289	1	Bus	Rever
299	1	Car4W	Parkd
299	2	Car4W	Rever
350	1	Car4W	AhOth
369	1	Agric	TRght
373	1	Car4W	AhOth
373	2	Car4W	AhOth
418	2	Car4W	Parkd
418	1		Start
440	1	PedCy	AhOth
497	1	MC+	AhOth
576	2	MC500	WgTnL
576	1	Car4W	WgTnL

592	1	Car4W	TRght
592	2	PedCy	TLeft
622	1	Car4W	OvMOs
622	2	Car4W	AhOth
622	3	<3.5T	AhOth
626	1	Car4W	OvMOs
626	2	Car4W	OvSOs
660	1	PedCy	AhOth
660	2	Car4W	TLeft
686	1	Car4W	Start
706	1	Car4W	AhOth
706	2	Car4W	AhOth
706	3	<3.5T	Parkd
717	1	Car4W	AhOth
717	2	Car4W	TRght
731	1	Car4W	AhOth
768	1	Car4W	WgAhd
768	2	Car4W	WgAhd
773	1	Car4W	AhOth
773	2	PedCy	TRght
820	1	Car4W	AhOth
866	1	<3.5T	AhOth

891	1	Car4W	AhOth
893	1	Car4W	Stop
893	2	Car4W	WgTnL
929	1	PedCy	Start
929	2	Car4W	TRght
965	1	<3.5T	Stop
969	1	Taxi	AhOth
969	2	Car4W	AhOth
989	2	Car4W	AhOth
989	1	Car4W	AhOth
991	2	Car4W	TRght
991	1	Car4W	OvNS
1010	1	>7.5T	AhOth
1010	2	Car4W	WgTnR
1010	3	<3.5T	WgAhd
1018	2	Car4W	TRght
1018	1	MC+	AhOth
1023	3	Car4W	AhOth
1023	2	Car4W	AhOth
1023	1	Car4W	AhOth
1075	1	MC+	AhLhB
6428	1	Car4W	AhRhB

6650	1	Car4W	AhOth
6654	1	Car4W	TRght
6654	2	MC+	AhOth
6655	1	Agric	WgTnR
6655	2	MC+	OvSOs
6703	1	Car4W	WgTnL
6703	2	PedCy	AhOth
45495	1	Bus	AhOth
45495	2	Car4W	WgTnR
45498	1		TRght
45498	2	Car4W	AhOth
50370	1	>7.5T	AhOth
50395	1	Car4W	Start
50395	2	PedCy	AhOth
51759	2	Car4W	AhOth
51759	1	PedCy	AhOth
51838	2	Car4W	Start
51838	1	PedCy	AhOth

CASUALTY DETAILS

Crash Id	Vehicle Reference Number	Casualty Reference Number	Casualty Class	Sex of Casualty	Age of Casualty
73	2	1	Passr	F	8

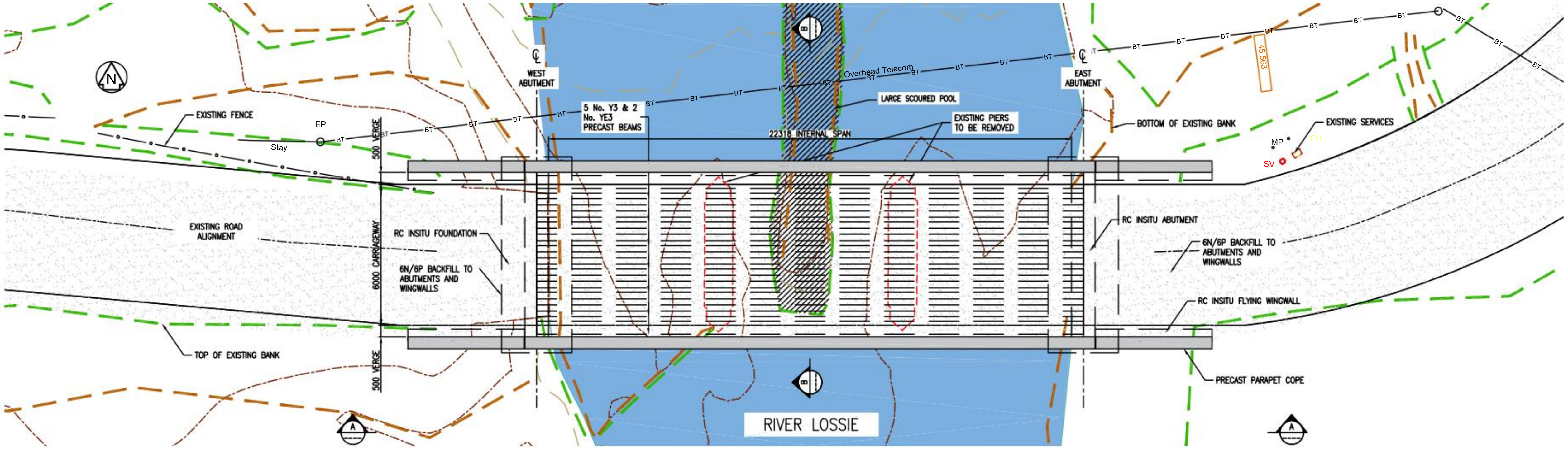
195	2	1	Drivr	F	40
198	2	1	Drivr	M	64
198	2	2	Passr	F	64
440	1	1	Drivr	F	46
497	1	1	Drivr	M	49
576	2	1	Drivr	M	19
592	2	1	Drivr	M	50
626	1	1	Drivr	F	56
626	1	2	Passr	F	68
660	1	1	Drivr	M	12
686	1	1	Pedsn	F	64
706	1	1	Drivr	M	80
706	2	2	Drivr	M	35
706	2	3	Passr	F	35
731	1	1	Pedsn	M	38
768	1	1	Passr	M	45
773	2	1	Drivr	M	63
820	1	1	Drivr	F	21
866	1	1	Pedsn	F	48
866	1	2	Pedsn	M	19
891	1	1	Pedsn	M	52
929	1	1	Drivr	M	70

965	1	1	Pedsn	F	16
969	1	1	Passr	M	34
969	1	2	Passr	F	40
969	1	3	Passr	F	29
969	2	4	Passr	F	26
989	2	1	Drivr	M	20
1010	3	1	Drivr	M	33
1010	3	2	Passr	M	19
1018	1	1	Drivr	M	24
1023	1	1	Drivr	M	49
1023	2	2	Drivr	M	53
1023	3	3	Drivr	F	50
6428	1	1	Passr	M	38
6650	1	1	Drivr	M	20
6654	2	1	Drivr	M	44
6655	2	1	Drivr	M	38
6703	2	1	Drivr	M	13
6703	2	2	Passr	M	13
45495	1	1	Drivr	M	65
45495	1	2	Passr	M	16
45495	2	1	Drivr	M	65
45495	2	2	Passr	M	16

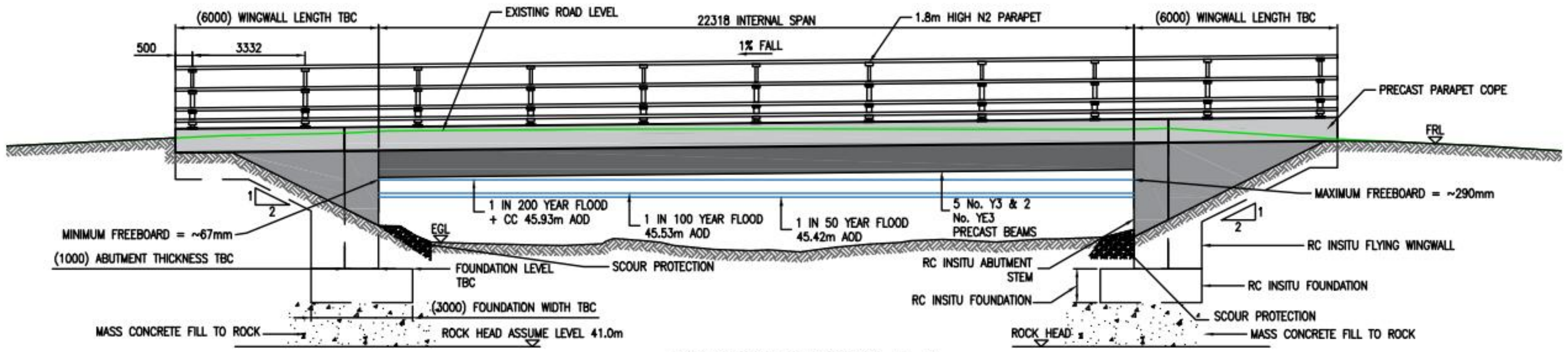
45498	2	1	Drivr	M	52
50370	1	1	Pedsn	M	42
50395	1	1	Pedsn	M	65
50395	2	1	Drivr	M	65
51759	1	1	Drivr	M	14
51838	1	1	Drivr	M	47

Appendix H

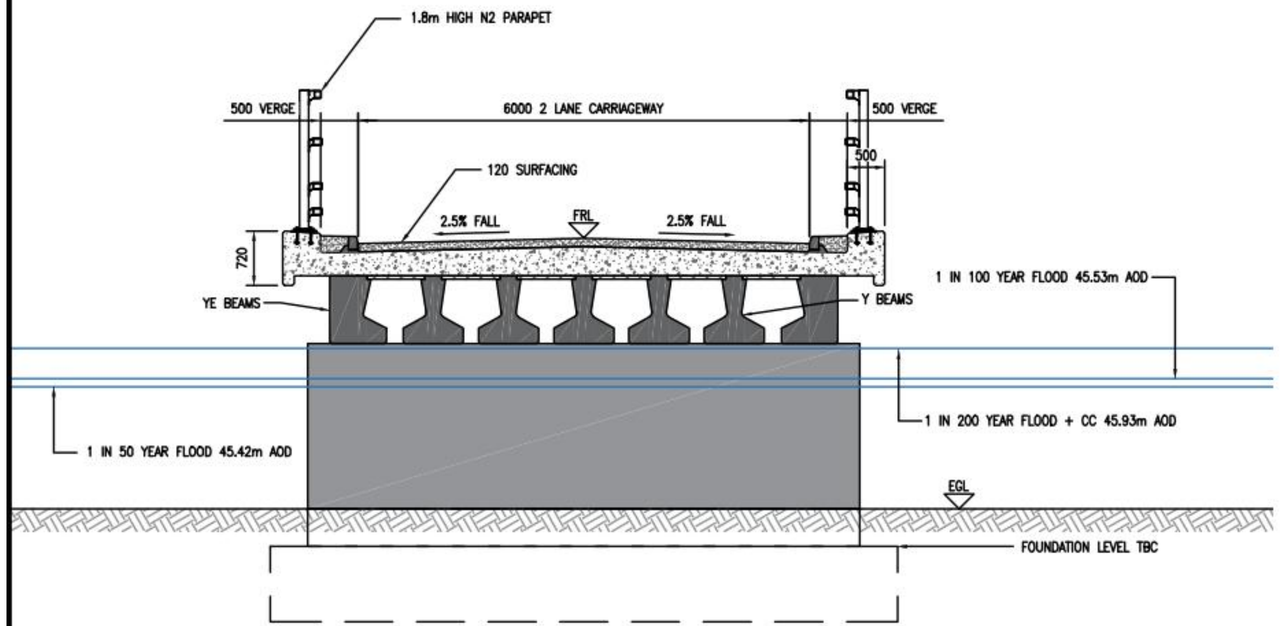
Proposed Layout



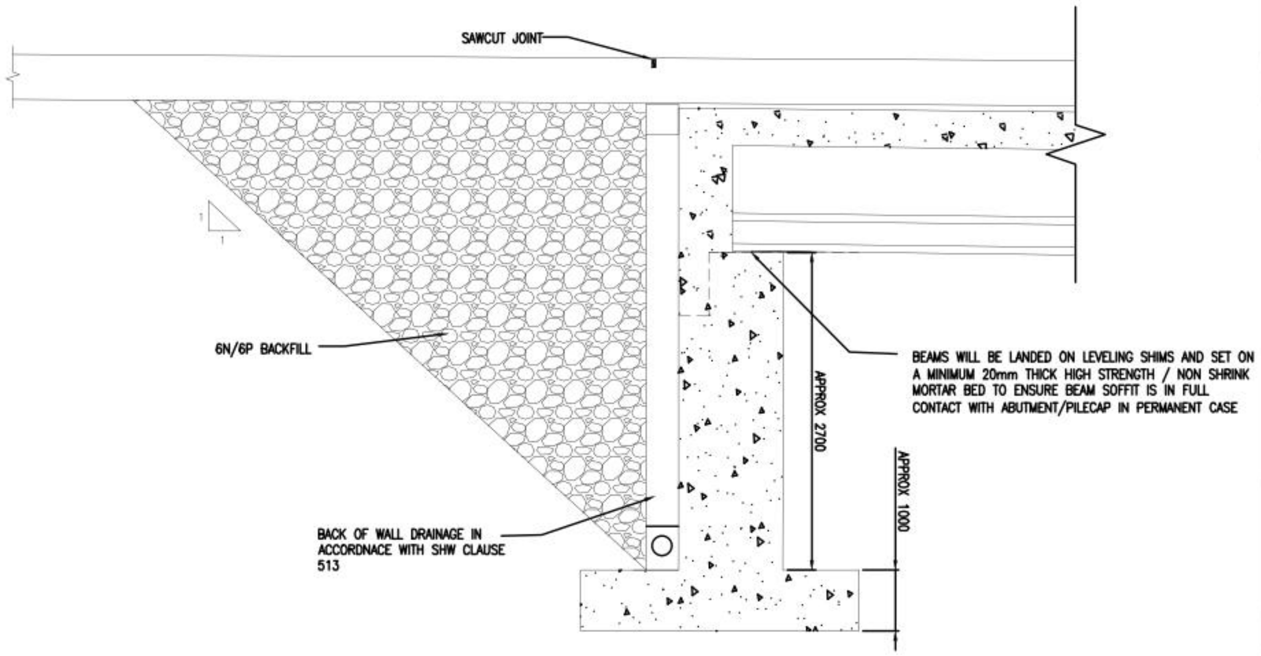
Plan on Bridge Deck
Scale 1 : 100



UPSTREAM ELEVATION A–A
Scale 1 : 100



SECTION B–B
Scale 1 : 50



TYPICAL ABUTMENT SECTION
NOT TO SCALE

Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO. 123640/ED/RA/01

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

1. THIS IS A PRELIMINARY DESIGN DRAWING – DETAILS ARE SUBJECT TO DESIGN DEVELOPMENT
2. ONLY WRITTEN DIMENSIONS TO BE USED
3. DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE
4. APPROXIMATE QUANTITIES;

   5No. Y3 BEAMS – 23.3m
   2No. YE3 BEAMS – 23.3m

   SUPERSTRUCTURE CONCRETE: $75m^3$
   ASSUMED REINFORCEMENT DENSITY $280kg/m^3$

   SUBSTRUCTURE CONCRETE: $90m^3$
   ASSUMED REINFORCEMENT DENSITY $150kg/m^3$

   4NO. FLYING WINGWALLS TOTAL: $26M^3$
   ASSUMED REINFORCEMENT DENSITY $200kg/m^3$

   ASSUME DEPTH OF MASS CONCRETE 1.3M BELOW FOUNDATION TO ROCK HEAD

Rev.	Date	Description	Drwn.	Chkd.	Appd.
1	[illegible]	GENERAL ARRANGEMENT	AS	EH	EH
0	[illegible]	GENERAL ARRANGEMENT	AS	EH	EH

FAIRHURST
43 George Street
EDINBURGH
EH2 2HT
Tel: 0131 225 6741
Fax: 0844 381 4412

Client: the moray council

Project Title:
CLODDACH BRIDGE REPLACEMENT

Drawing Title:
GENERAL ARRANGEMENT

Scale at A1:	Status:	
AS SHOWN	DRAFT	
Drawn: AS	Checked: EH	Approved: EH
Date: 15/01/24	Date: 15/01/24	Date: 15/01/24

Drawing No.: 158148-FAI-CLO-DR-1700-01
Revision: 1

Appendix I

Local Model Validation Report

158148 TN02: Cloddach Bridge Full Business Case – Local Model Validation Report - Technical Note

12th February 2024

Introduction

Fairhurst was commissioned to undertake a Full Business Case (FBC) assessment for the full replacement of Cloddach Bridge, Elgin. This was pre-dated by a pre-feasibility study undertaken in September 2023, following a petition by local residents to The Moray Council (TMC).

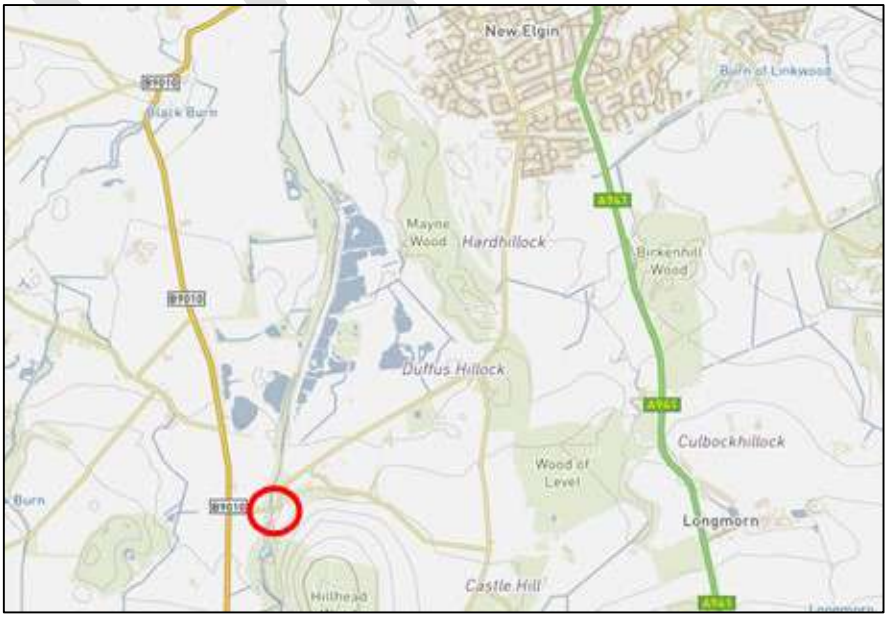
A Traffic and Economic Assessment will be prepared, in accordance with the Department for Transport (DfT) Transport Assessment Guidance (TAG), that will feed into the economic case of the FBC. To support this, it has been accepted that a micro-simulation model of the anticipated study area would be used to estimate vehicle journey times for two scenarios, i.e. bridge open (with-scheme) and bridge closed (without scheme). The scenarios would be tested for the anticipated re-opening of the bridge (2025) a future year of 2040 (15 year beyond opening) that would also take into consideration the potential developments listed in TMC's Local Development Plan (LDP) 2020 and in particular Policy PP2.

The purpose of this technical note is to detail the development, calibration and validation of the micro-simulation model. It was decided that S-Paramics would be used in this instance in consideration of the required timescales for presentation of the FBC. It has been prepared using Department for Transport (DfT) guidance and in particular TAG Unit M3.1 – Highway Assignment Modelling.

Background

Cloddach Bridge is a three-span structure carrying a single carriageway road over the River Lossie. The bridge is located on an unnamed road (C2E) to the west of the B9010, south of Elgin. The bridge location is shown in Figure 1.

Figure 1: Location Plan



The bridge provides access to the B9010 north and southbound for residents in rural communities including Birnie, Thomshill, Glenlatterach and Bardonside. The bridge is currently closed to traffic and the signed alternative route for these residents includes travelling to the A941 to enter Elgin from the south and then taking the A96 west back to the B9010. This diversion has a length of approximately 6 miles and anecdotal evidence suggests journey times are extended by up to 15 minutes during peak times.

When the bridge was open, traffic from the B9010 northbound could also use the existing bridge as an alternative access to the South and East of Elgin, avoiding the town centre. The same possibility exists for traffic wishing to travel between South or East Elgin and the B9010 south towards Kellas.

Modelled Area

The geographic coverage of highway assignment models generally needs to:

- allow for the strategic re-routeing impacts of interventions;
- ensure that areas outside the main area of interest, which are potential alternative destinations, are properly represented; and
- ensure that the full lengths of trips are represented for the purpose of deriving costs.

The Fairhurst Paramics Model extends to circa 12 square kilometres and is bound by t generally includes the following roads:

- B9010 to the south of the C2E, to its connection to the A96 at the West Road junction;
- The A96 between the B9010 and High Street junctions;
- The A941 between High Street and Rashcrook Road;
- C2E / 'Glenlossie Road' / Unnamed Road / Rashcrook Road between the B9010 and the A941.

Figure 2 shows the outline of the model coverage.

Figure 2: Fairhurst Paramics Model Coverage Area

This geographical coverage is considered sufficient to allow the various alternative routes with and without the scheme to be captured.

Zoning System

Generally, the zoning system has been designed around the availability of traffic surveys at the perimeter of the model. These are supplemented by a few zones located inside the perimeter but that also have survey data (refer to Surveys section later in this technical note). The remainder of the zones are located within either road, railway or natural boundaries and these are used to assist the matrix estimation process for junctions with survey data within the model perimeter.

The list of zones is as follows:

1. A96 (W) at West Road (surveyed);
2. A96 (E) at A941 (surveyed);
3. High Street east of A96/A941 (surveyed);
4. South Street east of Northfield Terrace (surveyed);
5. Moray Street east of Hay Street (surveyed);
6. Moray Street west of Hay Street (surveyed);
7. Moss Street north of Laichmoray Roundabout (surveyed);
8. Maisondieu Road east of Laichmoray Roundabout (surveyed);
9. Thornhill Road east of the A941 (surveyed);
10. Gleneagles Road east of Sandy Road (surveyed);
11. Dornoch Links east of C2E;
12. B9010 south of C2E
13. A941 south of Rashcrook Road;
14. U112E Miltonduff Road / Muir of Miltonduff (surveyed);
15. Unnamed Road to Miltonduff / C4E Cloves - Lochinver Road east of B9010;
16. Wittet Drive north of B9010 (surveyed);
17. Mayne Road east of Wittet Drive (surveyed);
18. Wiseman Road south of B9010;
19. Mayne Road south of Fleurs Road (surveyed);
20. Westpark Road north of South Street;
21. Hill Terrace north of A96;
22. UHI Moray;
23. Reidhaven Street north of A941;
24. Elgin Railway Station / Lidl south of A941;

25. Linkwood Road east of A941 (surveyed);
26. Asda north of Edgar Road (surveyed);
27. Retail Park (B&Q etc.) south of Edgar Road (surveyed);
28. B&M / Arnold Clark south of Edgar Road;
29. Territorial Army north of Edgar Road;
30. Walkers north of Edgar Road;
31. Walkers east of The Wards;
32. Industrial Estate west of The Wards;
33. Edgar Road west of The Wards and Springfield Road west of Glen Moray Drive (surveyed);
34. Birnie Crescent west of Sandy Road;
35. Land Street east of Sandy Road;
36. Land Street west of A941;
37. Bailies Drive north of Springfield Road;
38. The Mews east of Glen Moray Drive;
39. Mossend Place west of Glen Moray Drive;
40. Elgin Golf Course west of C2E;
41. Culzean Drive west of A941 (surveyed)
42. Birnie Drive south of Birnie Road;
43. Grant Street south of B9010;
44. Young Street north of Wards Road;
45. Elgin Health Centre north of A96.

Network Structure

The area of detailed modelling includes the following roads:

- B9010 to the south of the C2E, to its connection to the A96 at the West Road junction;
- The A96 between the B9010 and High Street junctions;
- The A941 between High Street and Rashcrook Road;
- South Street between West Road and Hay Street;
- Wittet Drive / Wards Road between the B9010 and A941;
- The Wards / Glen Moray Drive / Sandy Road / C2E between Wards Road and the B9010;
- Edgar Road between Glen Moray DriveDrive and Linkwood Road;
- Springfield Road / North Street / between Glen Moray DriveDrive and the A941;

- Birnie Road between Gleneagles Drive and Thornhill Road;
- C2E 'Glenlossie Road' / U119E Birkenbaud Road / C2E Rashcrook Road between Thomshill and the A941.

This detailed model area is not anticipated to change in the future, the LDP notes that improvements to vehicular access associated with a number of LDP allocated sites for housing and industrial land uses to the south east of Elgin, namely sites R17 (132 houses) and R20 (195 houses), as well as long term sites I16 (housing) and LONG3 (Industrial) would occur. However, these would contained within the current model structure, ultimately being represented with additional zones and junctions. The approach within this model build has been to be consistent with the available road network at the time of traffic data collection (2018), whilst allowing for junctions for contemporary developments (2023), which reduce the need to add numerous junctions to any future year assessment models. This is considered to be suitable to confirm the baseline model structure for validation.

The rest of the model includes numerous side streets e.g. the area bounded by South Street, A941, Wards Road / Wittet Drive and the B9010, also the area bound by A941, Birnie Road, Sandy Road and Springfield Road. Whilst these areas present opportunities for traffic to route between the surrounding roads, there is no survey data to quantify these effects and the proposed traffic zones have been introduced to take some cognisance in lieu of additional traffic movement targets.

The A96 West Road (west of the South Road roundabout) is the extent of the model, it is considered that minimal trips from this source will have cause to use the bridge. TMC have advised that common access to the A96 west from the southern side of Elgin occurs via other junctions outside the model, however, those trips are taken into internal to model via three zones (14, 15 and 16).

Time Periods

Traffic patterns, trip purpose and vehicle type proportions, traffic flows and congestion vary by time of day. Highway assignment models should therefore normally represent the morning and evening peaks and the inter-peak period separately as a minimum. Traffic surveys are detailed later in this technical note, but generally junction turning counts (JTC) contain a 12-hour period between 7am and 7pm. Automatic traffic counter (ATC) sites have at least 24-hour data.

For the traffic and economic assessment AM peak hour, PM peak hour and the Inter-peak hour are required. It is common practice to model each peak hour with a one-hour warm-up and cool-down each. In the inter-peak period, it is usually appropriate to model an average hour, although in cognisance of the project timescales the entire inter-peak period has been used. Therefore, the time periods used in the model are as follows:

- AM – 7am to 10am (3 hours);
- Inter-peak – 10am to 4pm (6 hours);
- PM – 4pm to 7pm (3 hours).

Other off-peak times (overnight) and weekends have not been modelled, as there is no data.

User Classes

Operating costs vary by vehicle type and values of time vary by the purpose of the trip being made. Values of time may also vary by income group. This means that different combinations of vehicle and user may have different distance coefficients (defined as the vehicle operating cost / value of time) and therefore be modelled as choosing different routes through the network.

A simple approach has been taken using the standard S-Paramics user classes, nineteen user classes are specified in the model. Each user class uses different routing assumptions based on travel distance and sensitivity to time, with further road restrictions also taken into accounts, including speed limits. To recognise certain road restrictions (height / weight) in place during 2018, and bus laybys the users have been grouped into two matrices in addition to scheduling of bus services. The fourteen user classes appearing in the model are shown in Table 1, which also highlights the proportions within each matrix.

Table 1: User Classes, Matrices and Vehicle Proportions

Matrix	User Class	Proportion
One	UC1: Car (Commuting)	63.0
	UC2: Car (Work to home)	2.4
	UC3: Car (Home to employers' business)	9.7
	UC4: Car (Employer's business to home)	0.2
	UC5: Car (Home to leisure short)	5.9
	UC6: Car (Leisure to home long)	1.8
	UC7: Car (Home to leisure long)	0.6
	UC8: Car (Leisure to home long)	0.2
	UC9: Car (Non-home-based employers' business)	5.1
	UC10: Car (Non-home-based leisure short)	2.7
	UC14: LGV	8.4
Two	UC15: OGV 1	44.4
	UC16: OGV 2	38.9
	UC17: Coach	16.7

Network Calibration

This section of the technical note considers the basic build of the network.

Nodes were placed at junctions, flaring sections, right turn facilities and each end of curves based on the ordnance survey (OS) drawing provided by TMC. At Cloddach Bridge to

simulate the narrow road width and shuttle working arrangement, nodes were placed at either end of the width restriction.

At junctions, kerbs were placed for aesthetic purposes but stoplines were placed to match lanes and control points and to avoid unusual vehicle behaviour.

Automatic hazard distances have not been adjusted.

Link categories used in the model are coded as single carriageway roads generally 3.7m width for the key roads (listed in Network Structure), with additional categorisation relating to the speed limit at each location, either 60mph or 30mph. Links to zones within housing areas have been coded as 20mph, with some width narrowed to 3m to suit the OS mapping. Junctions with widened approaches take cognisance of additional lanes.

Priorities at three arm priority-controlled junctions are generally medium for opposed left turns and minor for opposed right turns. The South Street/ Hay Street / Northfield Terrace (A941) priorities have been adjusted on the eastern approach for right turning traffic to medium, in cognisance of the operation of the junction. The traffic signal timings were taken from information supplied by TMC.

Vehicle release profiles have been derived using the supplied traffic survey data. There are 44 separate profiles included one each for the two matrices at the twenty-two external entry points to the model.

Vehicle dynamics have not been adjusted.

Matrix Development

Traffic surveys undertaken at 32No. junctions (Wednesday 30th May 2018) to support the updating of the Elgin Town Model (ETM) using VISUM by Jacobs have been supplied by TMC. Where the ETM and this study's model overlap those traffic counts (16No.) have been used in the calibration of the network. Fairhurst drawing SK1100 indicates the location of these junctions.

The traffic information has been supplemented by ATCs at C2E to the west of Cloddach Bridge and the south of the Elgin Golf Club's driving range, Muir of Miltonduff, and B9010 at Pittendriech Cottages to provide coverage outside the conurbation area (where the ETM were not required). A further JTC has been included that was undertaken by Fairhurst, Tuesday 28th November 2023, to ensure that the trips toward Fogwatt were accurately represented. The location of these surveys is shown on Fairhurst drawing SK1101.

These counts were used to define a survey file, which was used with a Pija file (obtained with perturbation switched off), the convergence criteria was set at 100.

Initially, an entropised matrix was used to generate a matrix through the matrix estimation (ME) part of the S-Paramics suite of programmes. An inspection of this matrix was undertaken to identify unrepresentative traffic movements between the non-surveyed zones. The ETM matrix was also inspected and used to create further constraints resulting in the developed matrices.

To consider the success of the ME process one of the following can be used:

- A GEH comparison of the modelled to observed flow;

- A percentage variance from the observed low;
- A value that constitutes the acceptable range in the number of vehicles that the modelled flow can vary from the observed.

For this project, the GEH indicator has been used, Table 2 details the results of the ME process.

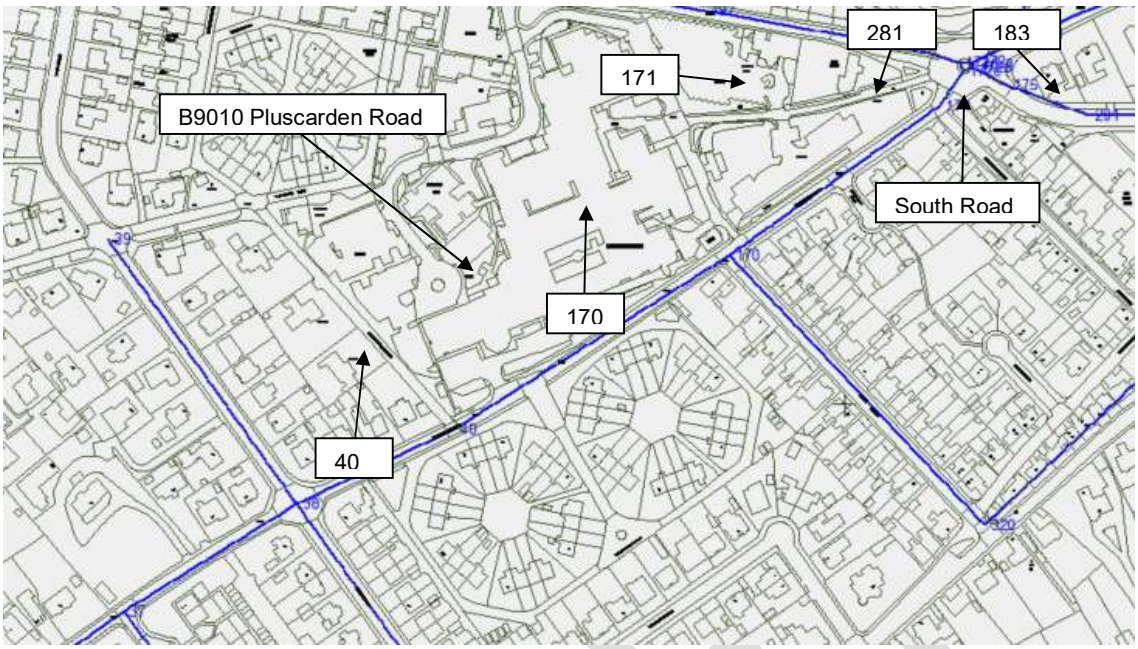
Table 2: GEH Criterion Check

Time Period / Matrix	GEH Turns	GEH Links	Check
AM Matrix 1	95.3%	98.1%	PASS
AM Matrix 2	98.6%	100.0%	PASS
Inter Matrix 1	80.9%	80.8%	Acceptable
Inter Matrix 2	98.1%	97.1%	PASS
PM Matrix 1	83.3%	100.0%	PASS
PM Matrix 2	100.0%	100.0%	PASS

Following acceptance of the ME process the demands were passed through the main S-Paramics programme and further observations of operation were made. It was decided that general cost factors would have to be increased for time (from 1.0 to 5.0) and for distance (from 0.0 to 5.0) to allow further calibration of the network and encourage use of the main road network. Cost factor values have been increased for specific links in this effort (refer to Figure 3), as follows:

- 40 to 170 – AM 2.8 and PM 5.7
- 170 to 40 – AM 1.8 and PM 2.9
- 170 to 171 – AM 2.8 and PM 5.7
- 171 to 170 – AM 1.8 and PM 2.9
- 201 to 183 – AM 1.8 and PM 2.9

Figure 3: Fairhurst Paramics Model Link Cost Change Locations



The model was then batch run to produce ten separate outputs using random seeds and feedback of 3 minutes.

Validation

Validation involves comparing modelled and independent observed data from that used in calibration.

For trip matrix validation, the measure which should be used is the percentage differences between modelled flows and counts. Comparisons at screenline level provide information on the quality of the trip matrices. Differences between modelled flows and counts should be less than 5% of the counts for all or nearly all screenlines. There are no roadside interviews.

It is normal practice to use screenlines of five links or more, however, as some of the ATCs were used for calibration the sites remaining from the information supplied by TMC within the model boundary there are 17No. sites remaining for validation checks. Fairhurst have grouped these into geographical areas representing sectors within the model. These are described as follows:

- A - Thornhill Road / A941 / C2E / Sandy Road / Birnie Road
- B – Glen Moray Drive / Edgar Road / The Wards
- C – Linkwood Road / A941 (N) / A941 (S)
- D – Wards Road / A941 Hay Street / B9010 Pluscarden Road

The GEH statistic, which is a form of the Chi-squared statistic that incorporates both relative and absolute errors is used in conjunction with the absolute and percentage differences between modelled flows and counts.

The results of the checks are shown in Table 3.

Table 3: Screenline Validation Checks

Screenline	Obs Veh AM	Obs Veh Inter	Obs Veh PM	Mod Veh AM	Mod Veh Inter	Mod Veh PM	GEH AM	GEH Inter	GEH PM	%Diff AM	%Diff Inter	%Diff PM
A - inbound	2785	5860	3109	3109	4590	4009	5.97	17.57	15.09	10.4%	-27.7%	22.4%
A - outbound	2589	5722	2857	2766	5166	3951	3.42	7.54	18.75	6.4%	-10.8%	27.7%
B - inbound	2525	6016	2260	1708	3558	2051	17.76	35.53	4.50	-47.8%	-69.1%	-10.2%
B - outbound	2469	6224	2351	1440	2991	2256	23.28	47.63	1.98	-71.5%	-108.1%	-4.2%
C - inbound	6252	13000	5527	3465	9683	4689	39.98	31.15	11.73	-80.4%	-34.3%	-17.9%
C - outbound	2839	8150	3945	3271	10302	4865	7.82	22.40	13.86	13.2%	20.9%	18.9%
D - inbound	1544	3449	1532	1845	5173	2282	7.31	26.25	17.18	16.3%	33.3%	32.9%
D - outbound	1114	3075	1410	1369	4640	2381	7.24	25.20	22.30	18.6%	33.7%	40.8%

The conclusion is that for the check against independent survey data, the model does not perform well against the independent ATC survey data. This could be partly due to the use of monthly average, although it is noted that there are still significant differences between the ATC and JTC survey data, e.g. A941 / Linkwood Road roundabout and Sandy Road.

For link flow and turning movement validation, there are two criteria, the first is volume differences between observed and modelled link flows. With the exception of the A941 between the Linkwood Road roundabout and the Laichmoray Roundabout, all roads within the model have less than 700 vehicles per hour and therefore, individual flows are suggested to be within 100 vehicles per hour for >85% of cases. For the A941 over the railway the first criteria is that modelled flows should be within 15% of the observed. The second criteria uses the GEH statistic and the acceptability guideline is >85% of cases. The results are shown in Table 4.

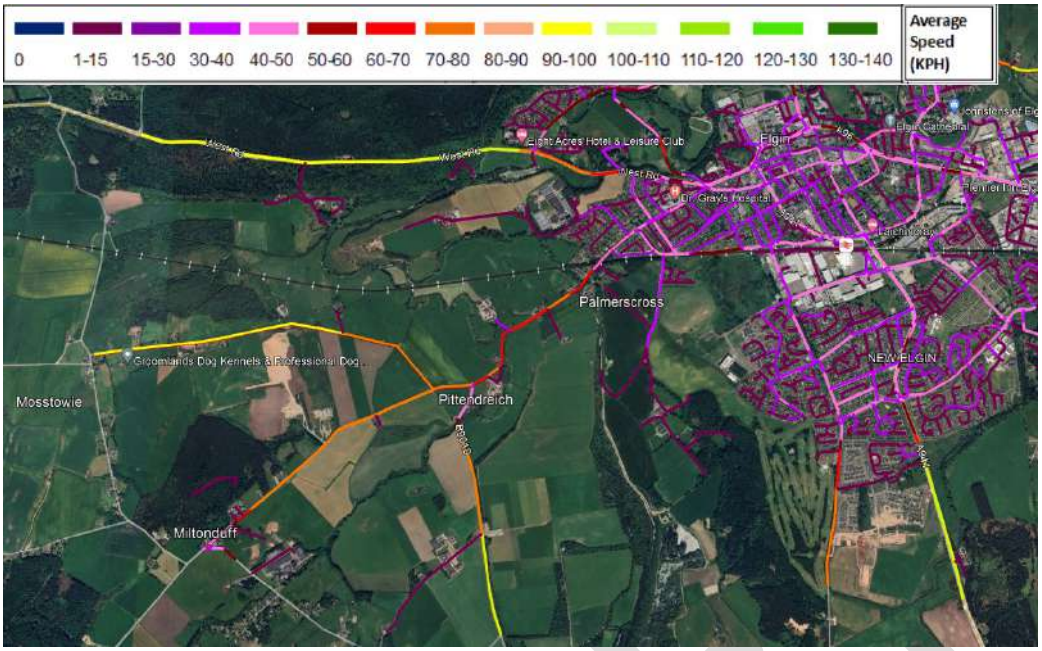
Table 4: Link and Turning Count Validation Checks (Total Vehicles)

Link Counts	Total	GEH < 5%	Difference less than 100 veh/hr	Criteria 1	Criteria 2
AM Period	8	6	0	100%	75.00%
Inter-peak Period	8	5	8	100%	62.50%
PM Peak	8	3	8	100%	62.50%
Turns	**Total**	**GEH < 5%**	**Difference less than 100 veh/hr**	**Criteria 1**	**Criteria 2**
AM Period	192	165	190	98.96%	85.94%
Inter-peak Period	199	129	190	95.48%	64.82%
PM Peak	189	143	185	96.32%	73.68%

For journey time validation, the measure which should be used is: the percentage difference between modelled and observed journey times, subject to an absolute maximum difference where modelled times along routes should be within 15% of surveyed times (or 1 minute, if higher than 15%) with an acceptability guideline of >85%.

Journey time information was supplied by TMC and takes the form of Tom Tom GPS data collected for the updating of the ETM, which details average and median travel time in distinct sections of the road network. This information was collated during the period that the bridge was open, but restricted to vehicles of less than 7.5T in weight. Figure 4 highlights the geographical area coverage.

Figure 4: Tom Tom Journey Time Coverage for Elgin (2018)



The results are shown in Tables 5, 6 and 7 for the AM, Inter and PM periods, respectively.

Table 5: AM Period Journey Time Validation Checks (Total Vehicles)

Path Route	Observed Travel Time (s)	Modelled Travel Time (s)	Percentage Difference	Absolute Difference	Acceptability
A96 W to A96 E	94.27	114.74	17.8%	20.47	fail
A96 E to A96 W	82.22	91.16	9.8%	8.94	PASS
B9010 South (Birchpark) to A96 W	309.88	200.63	54.5%	-109.25	fail
A96 W to B9010 South (Birchpark)	306.91	172.88	77.5%	-134.03	fail
A96 W to Birkenhill via The Wards	460.77	1065.50	56.8%	604.73	fail
Birkenhill to A96 W via The Wards	460.5	505.25	8.9%	44.75	PASS
Birkenhill to A96 E via A941	363.27	514.47	29.4%	151.20	fail
A96 E to Birkenhill via A941	353.15	346.04	2.1%	-7.11	PASS
Masondieu to Wittet	185.74	155.26	19.6%	-30.48	fail
Wittet to Masondieu	216.1	162.87	32.7%	-53.23	fail
Thornhill to Golf Range	123.65	271.78	54.5%	148.13	fail
Golf Range to Thornhill	130.9	290.05	54.9%	159.15	fail
Linkwood to Cedar Wood	163.62	107.35	52.4%	-56.27	fail
Cedar Wood to Linkwood	143.73	101.27	41.9%	-42.46	fail

Table 6: Inter-peak Period Journey Time Validation Checks (Total Vehicles)

Path Route	Observed Travel Time (s)	Modelled Travel Time (s)	Percentage Difference	Absolute Difference	Acceptability
A96 W to A96 E	104.53	127.08	17.7%	22.55	fail
A96 E to A96 W	87.32	84.95	2.8%	-2.37	PASS
B9010 South (Birchpark) to A96 W	307.07	184.99	66.0%	-122.08	fail
A96 W to B9010 South (Birchpark)	303.82	173.70	74.9%	-130.12	fail
A96 W to Birkenhill via The Wards	521.88	444.50	17.4%	-77.38	fail
Birkenhill to A96 W via The Wards	490.43	505.25	2.9%	14.82	PASS
Birkenhill to A96 E via A941	394.2	688.06	42.7%	293.86	fail
A96 E to Birkenhill via A941	381.96	380.90	0.3%	-1.06	PASS
Masondieu to Wittet	194.73	165.34	17.8%	-29.39	fail
Wittet to Masondieu	232.21	169.00	37.4%	-63.21	fail
Thornhill to Golf Range	124.89	269.73	53.7%	144.84	fail
Golf Range to Thornhill	125.99	278.87	54.8%	152.88	fail
Linkwood to Cedar Wood	177.11	173.00	2.4%	-4.11	PASS
Cedar Wood to Linkwood	160.85	144.22	11.5%	-16.63	PASS

Table 7: PM Period Journey Time Validation Checks (Total Vehicles)

Path Route	Observed Travel Time (s)	Modelled Travel Time (s)	Percentage Difference	Absolute Difference	Acceptability
A96 W to A96 E	94.03	125.70	25.2%	31.67	fail
A96 E to A96 W	84.66	99.61	15.0%	14.95	fail
B9010 South (Birchpark) to A96 W	300.02	209.78	43.0%	-90.24	fail
A96 W to B9010 South (Birchpark)	290.64	171.29	69.7%	-119.35	fail
A96 W to Birkenhill via The Wards	477.86	457.67	4.4%	-20.19	PASS

Path Route	Observed Travel Time (s)	Modelled Travel Time (s)	Percentage Difference	Absolute Difference	Acceptability
Birkenhill to A96 W via The Wards	471.81	683.50	31.0%	211.69	fail
Birkenhill to A96 E via A941	372.47	655.79	43.2%	283.32	fail
A96 E to Birkenhill via A941	379.77	376.40	0.9%	-3.37	PASS
Masondieu to Wittet	185.51	161.93	14.6%	-23.58	PASS
Wittet to Masondieu	216.39	Not estimated			
Thornhill to Golf Range	118.3	291.68	59.4%	173.38	fail
Golf Range to Thornhill	122.47	287.54	57.4%	165.07	fail
Linkwood to Cedar Wood	153.71	122.06	25.9%	-31.65	fail
Cedar Wood to Linkwood	142.18	107.15	32.7%	-35.03	fail

Conclusions

Screenline check is based on limited data and average of one calendar months. It is noted that there are several locations where JTC and ATC information are not complimentary e.g. A941 / Linkwood Road roundabout and Sandy Road.

Link and turning count validation checks show reasonable correlation to the hourly flows, however, the acceptability for turning flows is only reached for the AM period. This is a more robust check, but it is considered that the link-based check would not lead to a different conclusion.

With regard to journey times, the acceptability criteria is not reached with many journeys in the model having more than a minute difference to complete, compared to the observed. This could be due to trips routing contrary to the observed.

Overall, the model provides a mixed performance in terms of validation and further discussion is required with the approving authorities to determine whether it is still 'fit for purpose'.

John Craft MCIHT
Principal Traffic and Transportation Engineer – Traffic & Transportation (North)

Enclosures

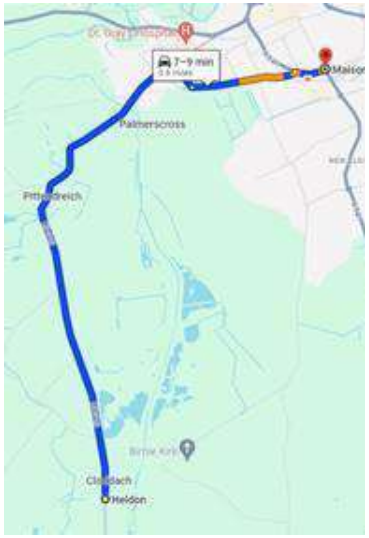
Junction Turning Count Location Drawing

Automatic Traffic Count Location Drawing

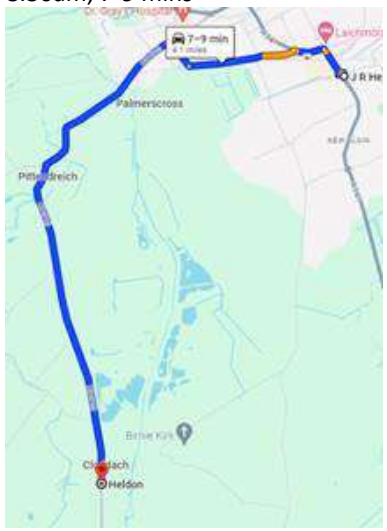
Appendix J

Alternative Route Inspection Outputs

Cloddach Bridge to Wards Drive / The Wards		Wards Drive / The Wards to Cloddach Bridge	
Via B9010	Via C2E	Via B9010	Via C2E
8.30am, 7 mins 	8.30am, 6-8 mins 	8.30am, 6 mins 	8.30am, 6-7 mins 
12.30pm, 7 mins 	12.30pm, 7 mins 	12.30pm, 7 mins 	12.30pm, 7 mins 

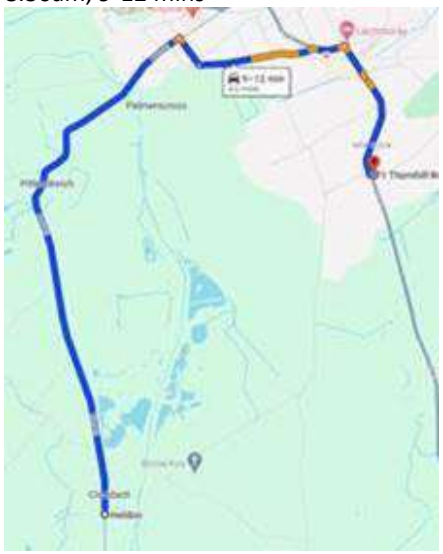
5pm, 7 mins 	5pm, 6-8 mins 	5pm, 6 mins 	5pm, 7 mins 
Cloddach Bridge to A941 / Maisondieu Road		A941 / Maisondieu Road to Cloddach Bridge	
8.30am, 7-9 mins 	8.30am, 7-10 mins 	8.30am, 8 mins 	8.30am, 6-8 mins 

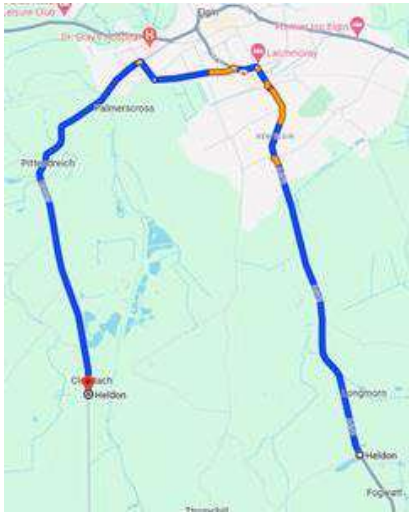
12.30pm, 8 mins 	12.30pm, 7-9 mins 	12.30pm, 8 mins 	12.30pm, 6-8 mins 
5pm, 7-9 mins 	5pm, 7-10 mins 	5pm, 8 mins 	5pm, 6-9 mins 

Cloddach Bridge to Linkwood Road		Linkwood Road to Cloddach Bridge	
8.30am, 8-10 mins	8.30am, 7-9 mins	8.30am, 7-9 mins	8.30am, 6-8 mins
			
12.30pm, 9 mins	12.30pm, 7 mins	12.30pm, 9 mins	12.30pm, 7 mins
			

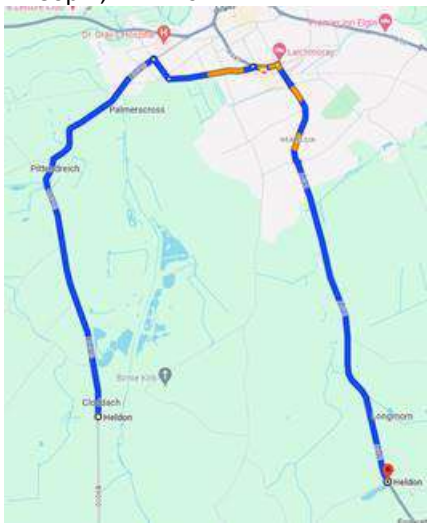
5pm, 8-12 mins 	5pm, 7-9 mins 	5pm, 7-9 mins 	5pm, 7 mins 
Cloddach Bridge to Glen Moray Drive		Glen Moray Drive to Cloddach Bridge	
8.30am, 7-9 mins 	8.30am, 6 mins 	8.30am, 7-9 mins 	8.30am, 6 mins 

12.30pm, 8 mins 	12.30pm, 5 mins 	12.30pm, 9 mins 	12.30pm, 5 mins 
5pm, 7-9 mins 	5pm, 5 mins 	5pm, 7-9 mins 	5pm, 5 mins 

Cloddach Bridge to Thornhill Road		Thornhill Road to Cloddach Bridge	
8.30am, 9-12 mins	8.30am, 6 mins	8.30am, 12 mins	8.30am, 5 mins
			
12.30pm, 10 mins	12.30pm, 5 mins	12.30pm, 12 mins	12.30pm, 5 mins
			

5pm, 10-14 mins 	5pm, 6 mins 	5pm, 9-14 mins 	5pm, 5 mins 
Cloddach Bridge to A941/ Rashcrook Road		A941 / Rashcrook Road to Cloddach Bridge	
8.30am, 12-16 mins 	8.30am, 8 mins 	8.30am, 12-16 mins 	8.30am, 8 mins 

12.30pm, 14 mins

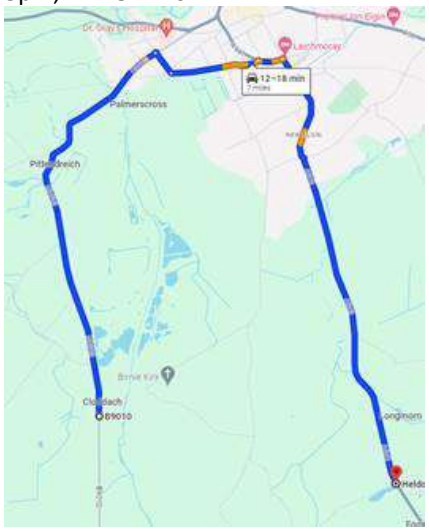


12.30pm, 8 mins

12.30pm, 12-16 mins

12.30pm, 7 mins

5pm, 12-18 mins



5pm, 8 mins

5pm, 12-16 mins

5pm, 7 mins

Appendix K

ATC Data

Site Number 00000007 **Site Refere** A941Elg-Fog **Lat/Lng.** 57.62623,-3.30038

A941 - Elgin - Fogwatt

Summary Info Report **Base Year 2014** **Channel:** Total Flow

Month	Statistics	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	AADT	5676	5787	6082	6173	6143	6191	6341	4498	5893	5835
	Growth factor from base	1.000	1.020	1.072	1.088	1.082	1.091	1.117	0.792	1.038	1.028
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	99.82	100.00	99.82	99.80	100.00	100.00
February	AADT	6138	6362	6667	6800	6711	6937	6811	3627	6355	6556
	Growth factor from base	1.000	1.036	1.086	1.108	1.093	1.130	1.110	0.591	1.035	1.068
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	99.79	100.00	99.79	99.79	99.58	99.79
March	AADT	6391	6639	6821	7031	6788	6450	5825	5483	4315	6476
	Growth factor from base	1.000	1.039	1.067	1.100	1.062	1.009	0.911	0.858	0.675	1.013
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.80	99.81	99.46	100.00	100.00
April	AADT	6501	6848	6888	7110	7303	6900	2923	6322	4890	6604
	Growth factor from base	1.000	1.053	1.060	1.094	1.123	1.061	0.450	0.972	0.752	1.016
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity
	Data Complete %	99.81	99.81	99.80	100.00	100.00	100.00	100.00	100.00	99.80	16.88
May	AADT	6691	6919	7173	7441	7602	7246	3803	6718	6182	
	Growth factor from base	1.000	1.034	1.072	1.112	1.136	1.083	0.568	1.004	0.924	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	99.82	100.00	99.80	100.00	100.00	
June	AADT	6765	6956	7094	7444	7608	7311	5114	6904	6998	
	Growth factor from base	1.000	1.028	1.049	1.100	1.125	1.081	0.756	1.021	1.034	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.58	100.00	100.00	100.00	
July	AADT	6754	6938	7168	7416	7382	7115	6383	7045	6731	
	Growth factor from base	1.000	1.027	1.061	1.098	1.093	1.053	0.945	1.043	0.997	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	99.60	100.00	100.00	100.00	100.00	99.81	100.00	
August	AADT	6780	7101	7400	7612	7616	7274	6825	7176	7107	
	Growth factor from base	1.000	1.047	1.091	1.123	1.123	1.073	1.007	1.058	1.048	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	31.15	100.00	100.00	
September	AADT	5231	7135	7271	7376	7401	7198		7050	6755	
	Growth factor from base	1.000	1.364	1.390	1.410	1.415	1.376		1.348	1.291	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity		-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00		100.00	100.00	
October	AADT	6352	6762	6898	7062	7118	4375	6756	6593	6674	
	Growth factor from base	1.000	1.065	1.086	1.112	1.121	0.689	1.064	1.038	1.051	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	97.54	100.00	100.00	
November	AADT	6573	6643	6847	7118	7399	6085	6641	6705	6604	
	Growth factor from base	1.000	1.011	1.042	1.083	1.126	0.926	1.010	1.020	1.005	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	99.79	99.80	99.81	99.62	99.62	99.60	99.60	99.81	100.00	
December	AADT	5849	6053	6459	6204	6444	6264	5742	6106	5782	
	Growth factor from base	1.000	1.035	1.104	1.061	1.102	1.071	0.982	1.044	0.989	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	99.80	99.81	100.00	100.00	100.00	
Year Value	AADT	6302	6677	6902	7071	7127	6599		6205	6188	
	Growth factor from base	1.000	1.060	1.095	1.122	1.131	1.047		0.985	0.982	
	Percentage HGV	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity	-Infinity		-Infinity	-Infinity	
	Data Complete %	99.97	99.97	99.94	99.97	99.90	99.90		99.89	99.95	

Site Number 00000010 **Site Refere** A941 Hay St **Lat/Lng.** 57.64437,-3.31683

A941 - Hay St, Elgin

Summary Info Report **Base Year 2014** **Channel:** Total Flow

Month	Statistics	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	AADT	12433	12672	12956	12983	8251	11395	11557	7428	11447	11067
	Growth factor from base	1.000	1.019	1.042	1.044	0.664	0.917	0.930	0.597	0.921	0.890
	Percentage HGV	1.94	2.37	2.09	1.84	1.17	2.04	1.89	3.55	-Infinity	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	14.95	99.95	100.00	100.00	100.00	100.00
February	AADT	13478	13935	14106	14099	12845	13024	12723	8342	12973	12242
	Growth factor from base	1.000	1.034	1.047	1.046	0.953	0.966	0.944	0.619	0.963	0.908
	Percentage HGV	2.22	2.57	2.21	2.08	2.01	2.17	2.11	3.34	-Infinity	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	21.72	100.00	99.95	99.95	100.00	99.79
March	AADT	13968	13794	14133	14384	12961	13648	10589	10283	14540	12520
	Growth factor from base	1.000	0.988	1.012	1.030	0.928	0.977	0.758	0.736	1.041	0.896
	Percentage HGV	2.42	2.63	2.12	2.04	2.19	2.19	2.43	3.21	-Infinity	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	99.91	100.00	100.00	100.00
April	AADT	13904	13852	14483	14393	11497	13514	5436	10821	14648	11853
	Growth factor from base	1.000	0.996	1.042	1.035	0.827	0.972	0.391	0.778	1.054	0.852
	Percentage HGV	2.19	2.36	2.34	1.91	2.70	1.99	3.35	2.91	-Infinity	-Infinity
	Data Complete %	99.95	99.95	99.95	100.00	99.95	100.00	100.00	100.00	99.90	8.44
May	AADT	14372	14247	12110	15093	7619	13967	6592	11695	14817	
	Growth factor from base	1.000	0.991	0.843	1.050	0.530	0.972	0.459	0.814	1.031	
	Percentage HGV	2.08	2.21	1.95	1.98	2.58	1.92	3.14	2.80	-Infinity	
	Data Complete %	100.00	100.00	25.43	100.00	100.00	100.00	100.00	100.00	100.00	
June	AADT	14449	14456	14622	14765	10472	13912	7923		13704	
	Growth factor from base	1.000	1.000	1.012	1.022	0.725	0.963	0.548		0.948	
	Percentage HGV	2.03	2.06	2.03	2.13	2.96	1.96	2.80		-Infinity	
	Data Complete %	100.00	100.00	70.88	100.00	100.00	99.95	100.00		100.00	
July	AADT	13672	13692	16017	13702	9965	12704	9833	12051	11172	
	Growth factor from base	1.000	1.001	1.172	1.002	0.729	0.929	0.719	0.881	0.817	
	Percentage HGV	2.15	2.13	2.94	2.15	2.97	2.04	2.85	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.91	30.16	100.00	
August	AADT	13946	14650	14788	15244	9999	13178	11113	12089	12304	
	Growth factor from base	1.000	1.050	1.060	1.093	0.717	0.945	0.797	0.867	0.882	
	Percentage HGV	2.14	2.11	2.26	2.01	2.82	1.93	2.65	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
September	AADT	14490	15187	14832	15543	10961	13110	11663	12313	12137	
	Growth factor from base	1.000	1.048	1.024	1.073	0.756	0.905	0.805	0.850	0.838	
	Percentage HGV	2.46	2.27	2.09	2.22	2.79	2.13	2.95	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
October	AADT	13659	13431	15000	15358	12323	12973	11196	12991	11867	
	Growth factor from base	1.000	0.983	1.098	1.124	0.902	0.950	0.820	0.951	0.869	
	Percentage HGV	2.28	2.40	2.64	2.24	2.42	2.28	2.85	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
November	AADT	14963	14631	14429	15137	12960	13129	11506	12864	12424	
	Growth factor from base	1.000	0.978	0.964	1.012	0.866	0.877	0.769	0.860	0.830	
	Percentage HGV	2.35	2.18	2.08	2.10	2.23	2.14	2.53	-Infinity	-Infinity	
	Data Complete %	99.95	99.95	99.95	99.76	11.65	99.75	99.75	99.81	100.00	
December	AADT	13586	14559	14339	14308	11333	12509	11235	12410	11911	
	Growth factor from base	1.000	1.072	1.055	1.053	0.834	0.921	0.827	0.913	0.877	
	Percentage HGV	2.00	1.72	1.59	1.66	1.59	1.95	1.99	-Infinity	-Infinity	
	Data Complete %	100.00	100.00	100.00	100.00	63.64	100.00	99.95	100.00	100.00	
Year Value	AADT	13894	14089	14315	14594	10894	13075	10107		12841	
	Growth factor from base	1.000	1.014	1.030	1.050	0.784	0.941	0.727		0.924	
	Percentage HGV	2.19	2.25	2.19	2.03	2.37	2.06	2.63		-Infinity	
	Data Complete %	99.99	99.99	91.25	99.98	76.13	99.97	99.96		99.99	

Site Number 00000017 **Site Refere** Linkwood Rd **Lat/Lng.** 57.64174,-3.30497

U171e - Linkwood Rd, Elgin

Summary Info Report **Base Year 2014** **Channel:** Other Flows

Month	Statistics	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	AADT	4147	8193	9178	8930	9120	9522	9737	4183		
	Growth factor from base	1.000	1.976	2.213	2.153	2.199	2.296	2.348	1.009		
	Percentage HGV	1.16	1.24	1.21	1.08	1.06	1.03	1.10	0.78		
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	11.61		
February	AADT	6075	9502	9988	9833	9799	10141	10620			
	Growth factor from base	1.000	1.564	1.644	1.619	1.613	1.669	1.748			
	Percentage HGV	1.45	1.12	1.24	1.08	1.18	1.08	1.30			
	Data Complete %	19.90	100.00	100.00	100.00	100.00	100.00	100.00			
March	AADT	9659	9732	10152	10180	9664	10461	8278			
	Growth factor from base	1.000	1.008	1.051	1.054	1.001	1.083	0.857			
	Percentage HGV	1.33	1.20	1.11	1.08	1.25	1.06	1.29			
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	99.95			
April	AADT	9514	9804	10441	10157	10255	10200	4184			
	Growth factor from base	1.000	1.030	1.097	1.068	1.078	1.072	0.440			
	Percentage HGV	1.15	1.14	1.53	1.11	1.21	1.21	1.07			
	Data Complete %	99.95	99.95	99.95	100.00	100.00	100.00	100.00			
May	AADT	9852	9828	10278	10413	10485	10615	5300			
	Growth factor from base	1.000	0.998	1.043	1.057	1.064	1.077	0.538			
	Percentage HGV	1.21	1.10	1.73	1.15	1.27	1.29	1.17			
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00			
June	AADT	9967	10049	9466	10403	10300	10556	6482			
	Growth factor from base	1.000	1.008	0.950	1.044	1.033	1.059	0.650			
	Percentage HGV	1.24	1.19	1.34	1.15	1.59	1.33	1.23			
	Data Complete %	51.79	100.00	100.00	100.00	100.00	99.95	100.00			
July	AADT	9415	9621	13344	9715	9347	9890	7532			
	Growth factor from base	1.000	1.022	1.417	1.032	0.993	1.050	0.800			
	Percentage HGV	1.23	1.22	2.35	1.28	1.57	1.45	1.50			
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.95			
August	AADT	8649	9998	10586	10297	10096	10529	3998			
	Growth factor from base	1.000	1.156	1.224	1.191	1.167	1.217	0.462			
	Percentage HGV	1.19	1.20	1.64	1.33	1.29	1.46	1.36			
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00			
September	AADT	9736	10202	10186	9688	10325	10148	8835			0
	Growth factor from base	1.000	1.048	1.046	0.995	1.060	1.042	0.907			
	Percentage HGV	1.30	1.38	1.17	1.40	1.20	1.33	1.48			-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00			54.96
October	AADT	9947	9827	10348	9913	9853	9835	8355			0
	Growth factor from base	1.000	0.988	1.040	0.997	0.991	0.989	0.840			
	Percentage HGV	1.15	1.28	1.37	1.20	1.22	1.21	1.34			-Infinity
	Data Complete %	55.98	100.00	100.00	100.00	100.00	100.00	100.00			61.17
November	AADT	9409	10345	9991	10755	10424	10668	9161			
	Growth factor from base	1.000	1.099	1.062	1.143	1.108	1.134	0.974			
	Percentage HGV	1.29	1.20	1.11	1.33	1.15	1.19	1.33			
	Data Complete %	100.00	99.95	99.95	99.76	99.76	99.80	99.75			
December	AADT	7084	9870	9589	9589	9920	9861	8634			
	Growth factor from base	1.000	1.393	1.354	1.354	1.400	1.392	1.219			
	Percentage HGV	1.01	1.04	0.86	0.99	0.90	1.01	1.09			
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.95			
Year Value	AADT	8610	9746	10289	9997	9961	10194	7598			
	Growth factor from base	1.000	1.132	1.195	1.161	1.157	1.184	0.882			
	Percentage HGV	1.22	1.19	1.38	1.18	1.24	1.22	1.27			
	Data Complete %	86.10	99.99	99.99	99.98	99.98	99.98	99.97			

Site Number 00000018 **Site Refere** Maisondue Rd **Lat/Lng.** 57.64439,-3.30455

U171e - Maisondieu Rd, Elgin

Summary Info Report **Base Year 2014** **Channel:** Other Flows

Month	Statistics	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	AADT	7805	7843	8134	8094	7903	7655	8121	5532	7315	3371
	Growth factor from base	1.000	1.005	1.042	1.037	1.013	0.981	1.040	0.709	0.937	0.432
	Percentage HGV	1.62	1.58	1.28	1.22	1.29	1.54	1.22	1.68	1.46	1.17
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
February	AADT	8361	8625	8817	8782	8595	8984	8676	6241	7722	6011
	Growth factor from base	1.000	1.032	1.055	1.050	1.028	1.075	1.038	0.746	0.924	0.719
	Percentage HGV	1.66	1.64	1.33	1.23	1.41	1.57	1.29	1.78	1.52	1.51
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
March	AADT	8658	8902	8495	9059	9404	9387	7229	7516	8152	8185
	Growth factor from base	1.000	1.028	0.981	1.046	1.086	1.084	0.835	0.868	0.942	0.945
	Percentage HGV	1.61	1.54	1.39	1.40	1.54	1.44	1.39	1.67	1.53	1.62
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	100.00	100.00	100.00	100.00
April	AADT	8619	8905	8799	6965	9385	9361	3688	7842	8065	7382
	Growth factor from base	1.000	1.033	1.021	0.808	1.089	1.086	0.428	0.910	0.936	0.856
	Percentage HGV	1.56	1.29	1.37	26.72	1.42	1.66	1.47	1.77	1.33	1.36
	Data Complete %	99.95	99.95	99.90	100.00	100.00	100.00	100.00	100.00	100.00	100.00
May	AADT	8799	9004	8983	8686	9788	9611	4789	8493	8428	5544
	Growth factor from base	1.000	1.023	1.021	0.987	1.112	1.092	0.544	0.965	0.958	0.630
	Percentage HGV	1.69	1.34	1.85	8.79	1.71	1.33	1.77	1.49	1.39	1.31
	Data Complete %	100.00	100.00	100.00	97.96	100.00	100.00	99.95	100.00	100.00	72.37
June	AADT	8720	9081	9377	9440	6010	9238	6062	8742	7932	
	Growth factor from base	1.000	1.041	1.075	1.083	0.689	1.059	0.695	1.003	0.910	
	Percentage HGV	1.66	1.35	1.40	1.47	1.60	1.27	2.03	1.43	1.57	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.95	100.00	100.00	
July	AADT	8515	8650	8200	8743	7679	8576	7448	8234	7305	
	Growth factor from base	1.000	1.016	0.963	1.027	0.902	1.007	0.875	0.967	0.858	
	Percentage HGV	1.62	1.43	1.61	1.39	1.50	1.36	2.36	1.27	1.56	
	Data Complete %	100.00	100.00	99.95	100.00	100.00	100.00	99.95	100.00	100.00	
August	AADT	8687	9144	8624	8815	8422	8746	8013	8748	8167	
	Growth factor from base	1.000	1.053	0.993	1.015	0.969	1.007	0.922	1.007	0.940	
	Percentage HGV	1.59	1.36	1.47	1.40	1.49	1.35	2.08	1.23	1.38	
	Data Complete %	100.00	100.00	100.00	100.00	99.91	100.00	100.00	100.00	100.00	
September	AADT	8906	9630	9034	8939	8487	9361	5487	8540	7957	5414
	Growth factor from base	1.000	1.081	1.014	1.004	0.953	1.051	0.616	0.959	0.893	0.608
	Percentage HGV	1.60	1.51	1.38	1.39	1.50	1.40	1.99	1.35	1.41	1.36
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	100.00	100.00	100.00	55.11
October	AADT	8807	8771	9474	8646	8390	8740	6995	7663	3359	4773
	Growth factor from base	1.000	0.996	1.076	0.982	0.953	0.992	0.794	0.870	0.381	0.542
	Percentage HGV	1.57	1.45	1.80	1.65	2.14	1.27	1.67	1.25	1.46	1.44
	Data Complete %	99.82	99.95	100.00	100.00	100.00	100.00	100.00	100.00	100.00	60.98
November	AADT	7764	9670	8902	8611	8091	8901	8187	8212	3756	
	Growth factor from base	1.000	1.245	1.147	1.109	1.042	1.146	1.054	1.058	0.484	
	Percentage HGV	1.62	1.39	1.46	1.53	1.75	1.33	1.49	1.26	1.28	
	Data Complete %	100.00	99.95	99.95	99.76	99.76	99.80	99.80	99.81	100.00	
December	AADT	8037	9134	8505	7786	7882	8240	7442	7493	3442	
	Growth factor from base	1.000	1.136	1.058	0.969	0.981	1.025	0.926	0.932	0.428	
	Percentage HGV	1.28	1.14	1.14	1.26	1.55	1.06	1.19	1.19	1.08	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Year Value	AADT	8474	8945	8779	8562	8344	8889	6838	7787	6808	
	Growth factor from base	1.000	1.056	1.036	1.010	0.985	1.049	0.807	0.919	0.803	
	Percentage HGV	1.59	1.42	1.46	4.00	1.58	1.38	1.66	1.44	1.41	
	Data Complete %	99.98	99.99	99.98	99.80	99.97	99.98	99.97	99.98	100.00	

Site Number 00000027 **Site Refere** Glenmoray Dr **Lat/Lng.** 57.63645,-3.31460

U171e - Glenmoray Drv, Elgin

Summary Info Report **Base Year 2014** **Channel:** Other Flows

Month	Statistics	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	AADT	4485	4635	4833	5002	3290	4955	5196	3651	4592	
	Growth factor from base	1.000	1.033	1.078	1.115	0.734	1.105	1.159	0.814	1.024	
	Percentage HGV	1.08	1.34	1.29	1.04	1.14	1.26	1.36	1.40	1.11	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.95	100.00	100.00	
February	AADT	4764	5018	5161	5311	4023	5302	5495	4207	4799	
	Growth factor from base	1.000	1.053	1.083	1.115	0.844	1.113	1.153	0.883	1.007	
	Percentage HGV	1.50	1.52	1.54	1.24	1.33	1.42	1.48	1.44	1.07	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	100.00	99.95	100.00	
March	AADT	4966	5209	5304	5562	5422	5505	4495	4246	4009	
	Growth factor from base	1.000	1.049	1.068	1.120	1.092	1.109	0.905	0.855	0.807	
	Percentage HGV	1.53	1.60	1.74	1.32	2.31	1.42	1.53	0.96	0.69	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.95	100.00	100.00	
April	AADT	4887	5184	5513	5337	5429	5444	2534	5145	3984	
	Growth factor from base	1.000	1.061	1.128	1.092	1.111	1.114	0.519	1.053	0.815	
	Percentage HGV	1.49	1.36	1.72	1.19	1.86	1.48	1.87	0.89	0.70	
	Data Complete %	99.95	99.95	99.90	100.00	100.00	100.00	100.00	100.00	99.90	
May	AADT	5077	5349	5931	5537	5929	5614	3151	5502	3974	
	Growth factor from base	1.000	1.054	1.168	1.091	1.168	1.106	0.621	1.084	0.783	
	Percentage HGV	1.34	1.57	1.69	1.22	2.10	1.50	1.44	0.93	0.60	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
June	AADT	5199	5497	5689	5697	6892	5707	4057	5686	5490	
	Growth factor from base	1.000	1.057	1.094	1.096	1.326	1.098	0.780	1.094	1.056	
	Percentage HGV	1.46	1.49	1.71	1.30	1.48	1.41	1.30	0.89	1.03	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
July	AADT	4649	4934	6504	5430	6007	5329	4763	5383	7630	
	Growth factor from base	1.000	1.061	1.399	1.168	1.292	1.146	1.025	1.158	1.641	
	Percentage HGV	1.39	1.64	1.63	1.09	1.42	1.61	1.31	0.85	1.33	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	99.95	100.00	100.00	
August	AADT	5343	5258	5862	5460	5999	5606	5143	5517	5527	
	Growth factor from base	1.000	0.984	1.097	1.022	1.123	1.049	0.963	1.033	1.034	
	Percentage HGV	1.21	1.03	1.09	0.98	1.25	1.30	1.10	0.86	1.02	
	Data Complete %	100.00	100.00	100.00	100.00	99.91	100.00	99.95	100.00	100.00	
September	AADT	5003	5364	5576	5247	5767	5620	5330	5687	5395	5979
	Growth factor from base	1.000	1.072	1.115	1.049	1.153	1.123	1.065	1.137	1.078	1.195
	Percentage HGV	1.30	1.46	1.28	1.21	1.35	1.49	1.33	1.32	1.39	1.07
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	54.17
October	AADT	4902	5005	5225	4633	5151	5257	5063	4859	5502	2389
	Growth factor from base	1.000	1.021	1.066	0.945	1.051	1.072	1.033	0.991	1.122	0.487
	Percentage HGV	1.48	1.50	1.36	1.09	1.41	1.52	1.38	1.10	1.52	0.91
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	45.83	61.17
November	AADT	4898	5300	5516	5713	5673	5823	5392	5254		
	Growth factor from base	1.000	1.082	1.126	1.166	1.158	1.189	1.101	1.073		
	Percentage HGV	1.35	1.46	1.29	1.27	1.36	1.63	1.48	1.13		
	Data Complete %	99.90	99.95	99.95	99.76	99.76	99.75	99.80	99.81		
December	AADT	4964	5234	5463	4990	5361	5526	5150	5470		
	Growth factor from base	1.000	1.054	1.101	1.005	1.080	1.113	1.037	1.102		
	Percentage HGV	1.10	1.14	0.94	1.08	1.00	1.17	1.03	1.05		
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
Year Value	AADT	4924	5165	5550	5330	5409	5469	4646	5060		
	Growth factor from base	1.000	1.049	1.127	1.082	1.098	1.111	0.944	1.028		
	Percentage HGV	1.35	1.43	1.44	1.17	1.50	1.43	1.38	1.06		
	Data Complete %	99.99	99.99	99.99	99.98	99.97	99.97	99.97	99.98		

Site Number 00000028 **Site Refere** Thornhill Rd **Lat/Lng.** 57.63496,-3.29982

U171e - Thornhill Rd, Elgin

Summary Info Report **Base Year 2014** **Channel:** Other Flows

Month	Statistics	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
January	AADT	6849	7438	7187	7237	7242	7486	7678	5490	7301	7391
	Growth factor from base	1.000	1.086	1.049	1.057	1.057	1.093	1.121	0.802	1.066	1.079
	Percentage HGV	3.09	3.39	3.28	2.85	3.04	3.36	2.90	3.80	2.67	2.78
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	99.91	100.00	100.00	100.00
February	AADT	7210	7590	7642	7877	7960	8075	8234	6072	7787	8014
	Growth factor from base	1.000	1.053	1.060	1.093	1.104	1.120	1.142	0.842	1.080	1.112
	Percentage HGV	3.02	3.42	3.48	3.03	4.13	3.52	3.09	4.46	3.10	2.68
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.95	100.00	99.79
March	AADT	7435	7788	7749	8135	8157	8345	6929	7026	7883	2306
	Growth factor from base	1.000	1.047	1.042	1.094	1.097	1.122	0.932	0.945	1.060	0.310
	Percentage HGV	3.04	3.45	3.50	3.20	3.18	3.05	3.42	3.50	3.17	2.65
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.95	99.95	100.00	100.00	100.00
April	AADT	7266	7628	7917	7862	8060	8071	3287	7714	7744	0
	Growth factor from base	1.000	1.050	1.090	1.082	1.109	1.111	0.452	1.062	1.066	
	Percentage HGV	2.91	3.43	3.40	3.06	3.78	3.11	4.08	3.28	3.06	-Infinity
	Data Complete %	99.91	99.95	99.95	100.00	100.00	100.00	100.00	100.00	99.90	100.00
May	AADT	7564	7845	8351	8321	8393	8478	4182	8210	7974	0
	Growth factor from base	1.000	1.037	1.104	1.100	1.110	1.121	0.553	1.085	1.054	
	Percentage HGV	3.04	3.31	3.42	2.97	3.51	3.12	3.42	3.05	2.95	-Infinity
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	67.71
June	AADT	7802	7936	8560	8469	9659	8461	5708	8543	8629	
	Growth factor from base	1.000	1.017	1.097	1.085	1.238	1.084	0.732	1.095	1.106	
	Percentage HGV	3.31	3.15	3.12	2.94	3.43	3.09	3.28	2.60	2.99	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.90	100.00	100.00	100.00	
July	AADT	7008	7148	538	7683	8029	7841	6725	7699	9123	
	Growth factor from base	1.000	1.020	0.077	1.096	1.146	1.119	0.960	1.099	1.302	
	Percentage HGV	3.24	3.44	2.62	2.74	3.88	3.16	2.94	2.68	2.71	
	Data Complete %	100.00	100.00	55.31	100.00	100.00	100.00	100.00	99.91	100.00	
August	AADT	7827	7625	8467	8196	8398	8314	7545	8074	8145	
	Growth factor from base	1.000	0.974	1.082	1.047	1.073	1.062	0.964	1.032	1.041	
	Percentage HGV	3.21	3.00	3.07	2.54	3.29	2.56	2.90	2.66	2.84	
	Data Complete %	100.00	100.00	97.37	100.00	99.91	100.00	99.95	100.00	100.00	
September	AADT	7697	7887	8125	8740	8395	3875	7819	8382	8172	
	Growth factor from base	1.000	1.025	1.056	1.136	1.091	0.503	1.016	1.089	1.062	
	Percentage HGV	3.54	3.33	3.20	2.74	3.22	2.68	3.40	2.77	2.69	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
October	AADT	8213	7390	7746	7741	7889	6149	7561	7733	7933	
	Growth factor from base	1.000	0.900	0.943	0.943	0.961	0.749	0.921	0.942	0.966	
	Percentage HGV	2.88	3.41	3.22	3.11	3.49	3.07	3.47	2.87	2.92	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
November	AADT	7897	7660	7953	8385	8494	8273	7931	8134	8077	
	Growth factor from base	1.000	0.970	1.007	1.062	1.076	1.048	1.004	1.030	1.023	
	Percentage HGV	3.14	3.22	2.91	3.21	3.91	3.21	3.33	2.90	3.11	
	Data Complete %	99.95	99.95	99.95	99.76	99.76	99.80	99.80	99.81	100.00	
December	AADT	8472	7265	7658	7367	7697	7637	7259	7746	7443	
	Growth factor from base	1.000	0.858	0.904	0.870	0.909	0.901	0.857	0.914	0.879	
	Percentage HGV	2.58	2.70	2.27	2.55	3.11	2.60	2.77	2.51	2.55	
	Data Complete %	100.00	100.00	100.00	100.00	100.00	99.91	100.00	100.00	100.00	
Year Value	AADT	7604	7596	7352	8006	8192	7580	6734	7584	8019	
	Growth factor from base	1.000	0.999	0.967	1.053	1.077	0.997	0.886	0.997	1.055	
	Percentage HGV	3.08	3.27	3.12	2.91	3.49	3.04	3.25	3.08	2.90	
	Data Complete %	99.99	99.99	96.16	99.98	99.97	99.96	99.97	99.97	99.99	

C2E Cloddach Bridge

to B9010 ***Speed***

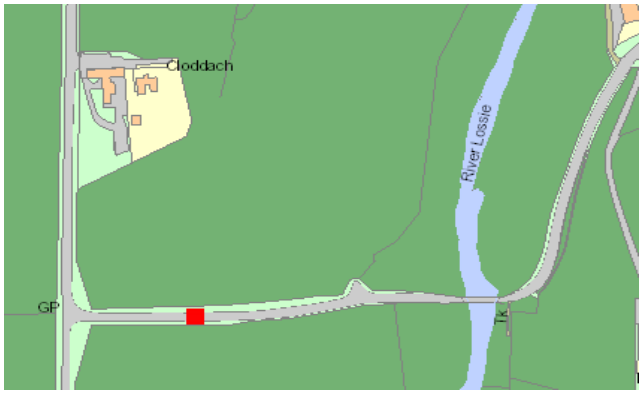
	Total Vol.	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <31Mph	Bin 2 31-<36	Bin 3 36-<41	Bin 4 41-<46	Bin 5 46-<51	Bin 6 51-<56	Bin 7 56-<61	Bin 8 61-<66	Bin 9 66-<71	Bin 10 71-<76	Bin 11 76-<81	Bin 12 81-<86	Bin 13 =>86
00:00	0		29.2		0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0		33.5		0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1		34.8		0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	2		32	6.9	0	1	0	0	0	0	0	0	0	0	0	0	0
06:00	7		35.7	6.1	2	2	3	1	0	0	0	0	0	0	0	0	0
07:00	18	40.1	35.9	5.7	2	6	7	3	0	0	0	0	0	0	0	0	0
08:00	36	41.5	35.1	6.8	7	14	10	6	0	0	0	0	0	0	0	0	0
09:00	27	40.5	34.1	7.6	7	6	6	3	0	0	0	0	0	0	0	0	0
10:00	25	40.4	34.2	7.4	8	8	7	1	0	0	0	0	0	0	0	0	0
11:00	25	40.8	34.4	7.2	6	9	7	4	0	0	0	0	0	0	0	0	0
12:00	29	41.1	35.9	7.3	5	10	10	3	2	0	0	0	0	0	0	0	0
13:00	24	40	34.3	6.4	5	8	8	3	0	0	0	0	0	0	0	0	0
14:00	32	40.6	34.2	7.2	8	10	9	3	1	0	0	0	0	0	0	0	0
15:00	37	40.5	34.3	7	10	10	11	4	0	0	0	0	0	0	0	0	0
16:00	49	40.7	34.9	6.4	9	18	15	6	0	0	0	0	0	0	0	0	0
17:00	29	43.2	37	6.5	3	7	11	6	0	0	0	0	0	0	0	0	0
18:00	16	44.4	37.4	8.5	2	4	6	2	1	0	0	0	0	0	0	0	0
19:00	10	38.9	34.2	5.8	2	4	4	0	0	0	0	0	0	0	0	0	0
20:00	6		35.9	5.7	0	2	3	0	0	0	0	0	0	0	0	0	0
21:00	7		33	7.7	1	2	0	0	0	0	0	0	0	0	0	0	0
22:00	2		34.8	7.6	0	0	1	0	0	0	0	0	0	0	0	0	0
23:00	1		36		0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	383	40.7	34.7	6.4	77	121	118	45	4	0	0	0	0	0	0	0	0

to bridge

	Total Vol.	85th %ile	Mean Ave.	Std. Dev.	Bin 1 <31Mph	Bin 2 31-<36	Bin 3 36-<41	Bin 4 41-<46	Bin 5 46-<51	Bin 6 51-<56	Bin 7 56-<61	Bin 8 61-<66	Bin 9 66-<71	Bin 10 71-<76	Bin 11 76-<81	Bin 12 81-<86	Bin 13 =>86
00:00	1		32.6		0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0				0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0		32.6		0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	3		31.4	9.7	2	0	1	0	0	0	0	0	0	0	0	0	0
06:00	5		32.8	6.1	2	2	1	0	0	0	0	0	0	0	0	0	0
07:00	34	38.8	33.2	5.9	9	15	9	2	0	0	0	0	0	0	0	0	0
08:00	40	35.8	31.2	5.8	14	20	6	0	0	0	0	0	0	0	0	0	0
09:00	30	38.8	32.7	6.5	9	12	6	2	0	0	0	0	0	0	0	0	0
10:00	25	37.5	32.5	5.8	7	13	5	0	0	0	0	0	0	0	0	0	0
11:00	27	37.3	31.6	6.2	10	12	4	1	0	0	0	0	0	0	0	0	0
12:00	27	38.7	33	6	7	11	8	1	0	0	0	0	0	0	0	0	0
13:00	29	37.8	32.3	5.8	9	13	7	0	0	0	0	0	0	0	0	0	0
14:00	27	38	31.5	6.6	10	9	5	1	0	0	0	0	0	0	0	0	0
15:00	39	37.7	31.5	6.5	15	15	7	2	0	0	0	0	0	0	0	0	0
16:00	37	39.5	33.6	6.6	8	16	9	3	0	0	0	0	0	0	0	0	0
17:00	21	40.5	35.4	6.2	3	7	7	3	0	0	0	0	0	0	0	0	0
18:00	12	39.4	33.6	7	4	5	2	1	0	0	0	0	0	0	0	0	0
19:00	7		33.8	6.4	2	3	0	0	0	0	0	0	0	0	0	0	0
20:00	4		33.2	7.2	1	3	0	1	0	0	0	0	0	0	0	0	0
21:00	6		30.9	7.2	3	1	0	0	0	0	0	0	0	0	0	0	0
22:00	3		32.4	6.9	1	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0		33.8		0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	377	38.5	32.3	6.1	116	157	77	17	0	0	0	0	0	0	0	0	0

Classification

	Total	Bin 1	Bin 2	Bin 3	Bin 4	Bin 5	Bin 6	Bin 7	Bin 8	Bin 9	Bin 10	Bin 11	Bin 12	Bin 13
	Vol.	1	2	3	4	5	6	7	8	9	10	11	12	13
Mon 30/11/2020	365	1	269	87	0	7	0	0	1	0	0	0	0	0
Tue 01/12/2020	385	4	291	86	0	4	0	0	0	0	0	0	0	0
Wed 02/12/2020	415	4	311	90	0	9	0	0	0	1	0	0	0	0
Thu 03/12/2020	380	2	284	90	0	4	0	0	0	0	0	0	0	0
Fri 04/12/2020	380	0	261	105	1	11	0	2	0	0	0	0	0	0
Sat 05/12/2020	256	3	196	52	0	4	0	0	1	0	0	0	0	0
Sun 06/12/2020	224	1	181	38	0	3	1	0	0	0	0	0	0	0
5 Day Ave.	385	2	283	92	0	7	0	0	0	0	0	0	0	0
7 Day Ave.	344	2	256	78	0	6	0	0	0	0	0	0	0	0

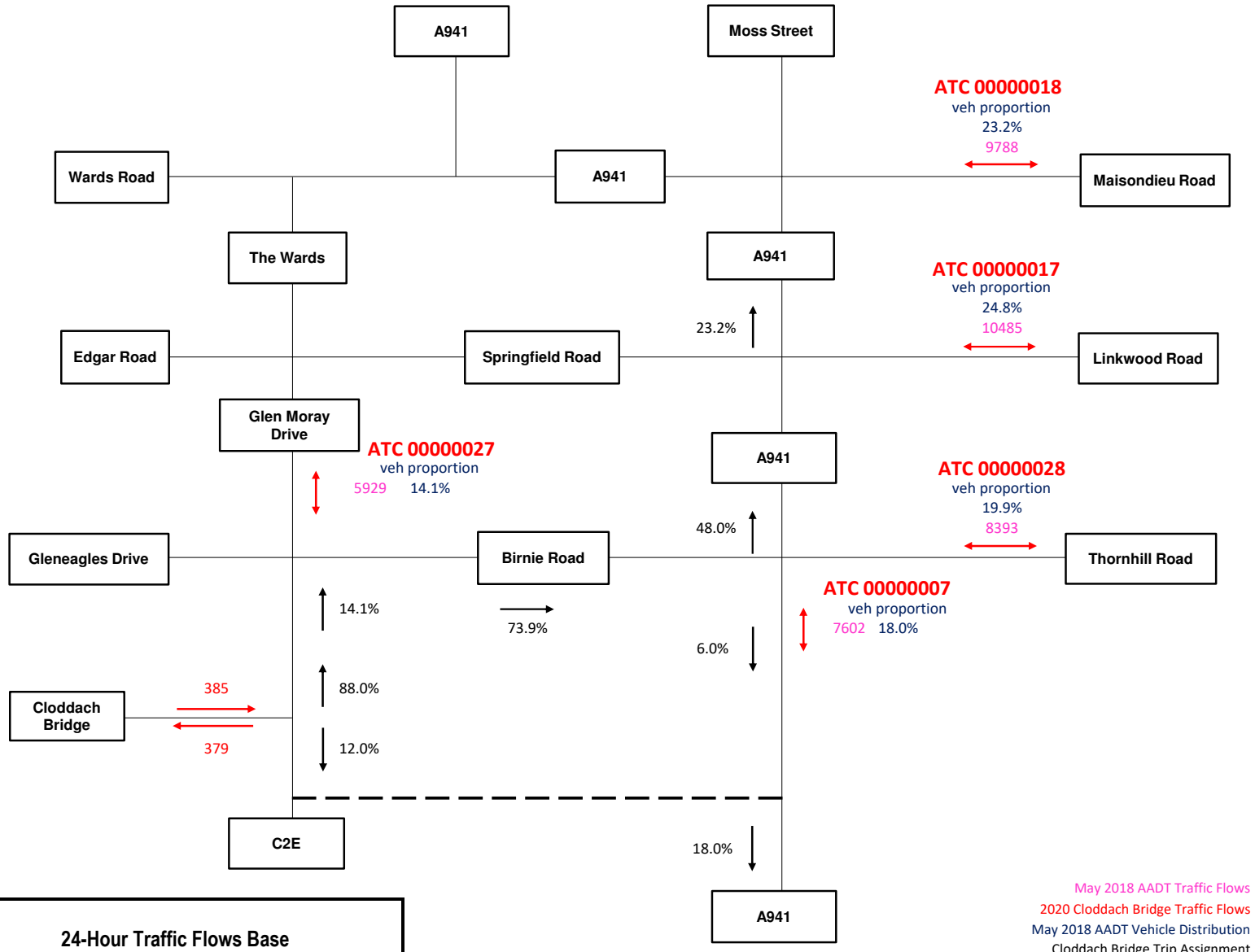


	Total	Bin 1	Bin 2	Bin 3	Bin 4	Bin 5	Bin 6	Bin 7	Bin 8	Bin 9	Bin 10	Bin 11	Bin 12	Bin 13
	Vol.	1	2	3	4	5	6	7	8	9	10	11	12	13
Mon 30/11/2020	381	1	271	98	0	11	0	0	0	0	0	0	0	0
Tue 01/12/2020	369	5	269	86	0	9	0	0	0	0	0	0	0	0
Wed 02/12/2020	385	7	282	85	0	11	0	0	0	0	0	0	0	0
Thu 03/12/2020	405	4	298	90	1	11	1	0	0	0	0	0	0	0
Fri 04/12/2020	355	0	255	85	0	12	0	2	0	1	0	0	0	0
Sat 05/12/2020	273	5	198	67	0	2	0	0	1	0	0	0	0	0
Sun 06/12/2020	243	1	194	44	0	4	0	0	0	0	0	0	0	0
5 Day Ave.	379	3	275	89	0	11	0	0	0	0	0	0	0	0
7 Day Ave.	344	3	252	79	0	9	0	0	0	0	0	0	0	0

Appendix L

Gravity Model

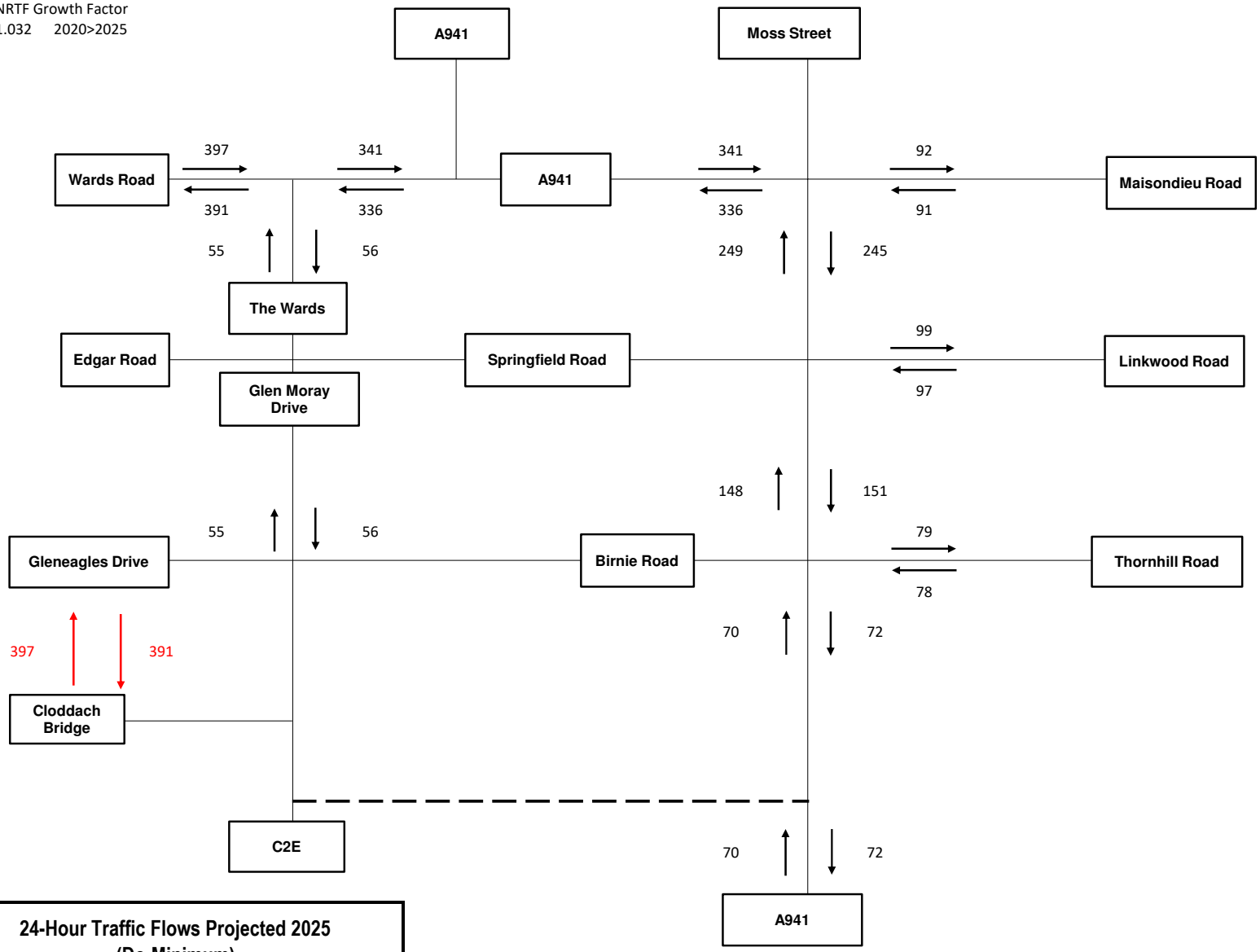
158148	Cloddach Bridge, Elgin	Diagram 1



24-Hour Traffic Flows Base

158148	Cloddach Bridge, Elgin	Diagram 2

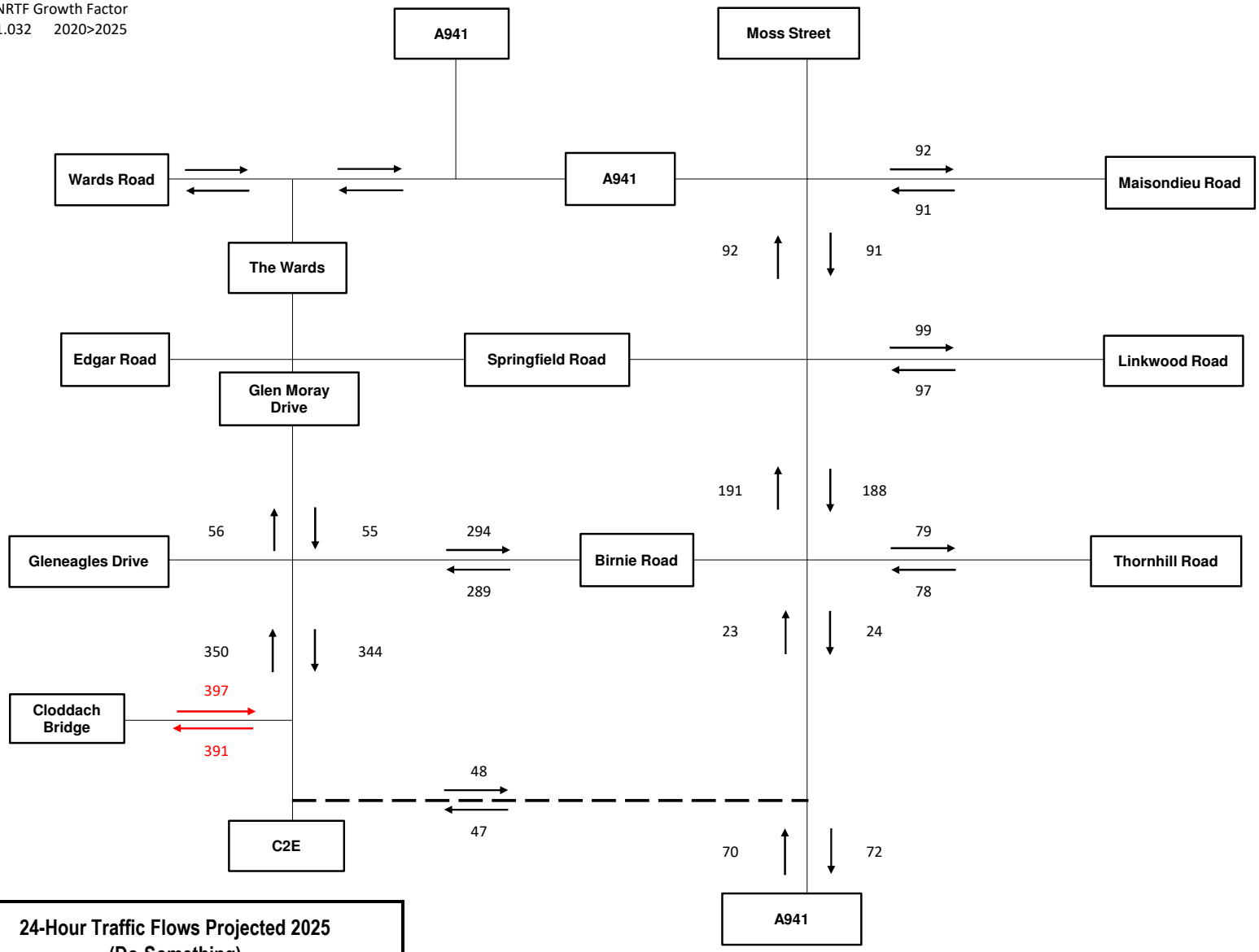
NRTF Growth Factor
1.032 2020>2025



24-Hour Traffic Flows Projected 2025 (Do-Minimum)

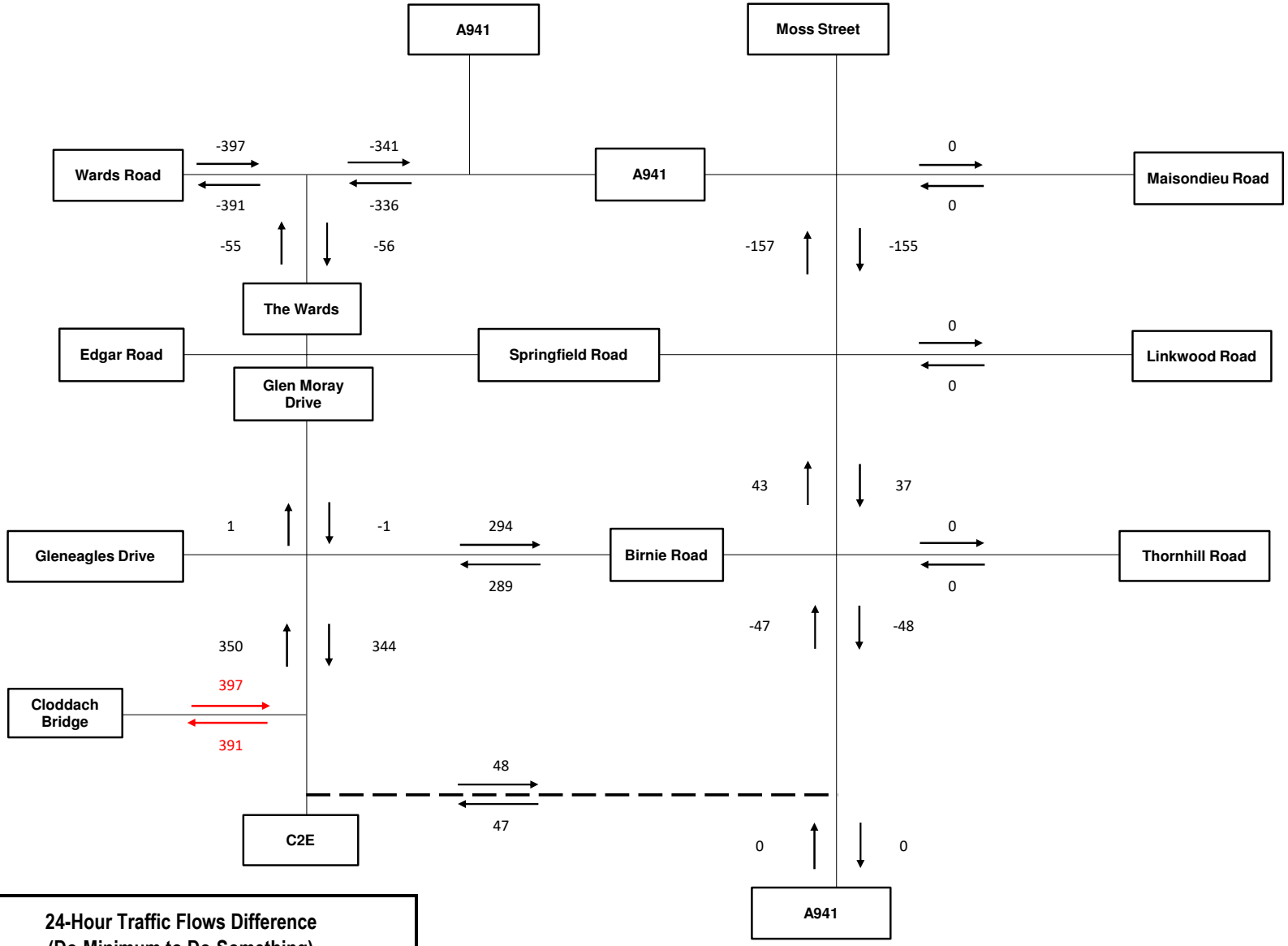
158148	Cloddach Bridge, Elgin	Diagram 3

NRTF Growth Factor
1.032 2020>2025



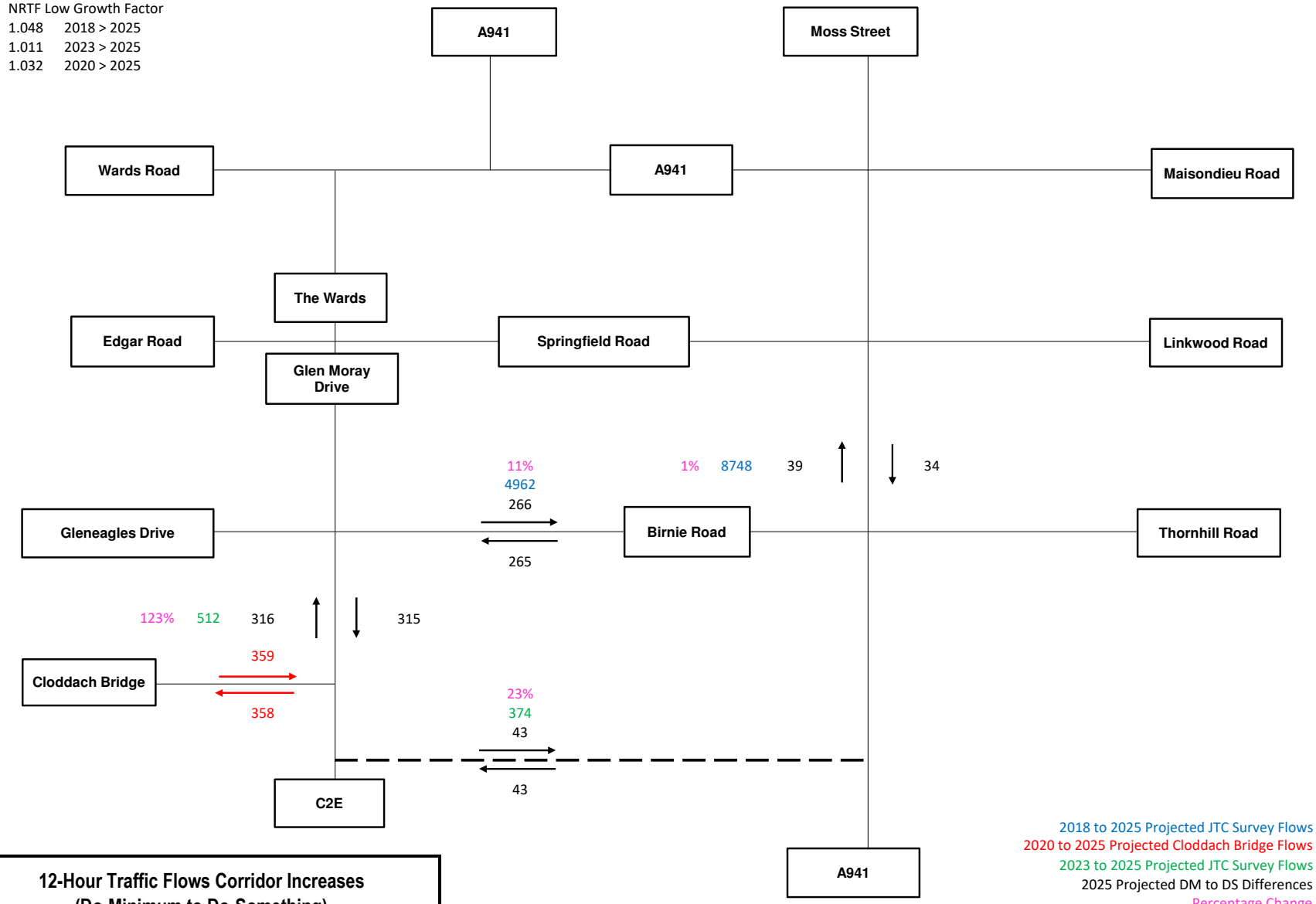
24-Hour Traffic Flows Projected 2025 (Do-Something)

158148	Cloddach Bridge, Elgin	Diagram 4



24-Hour Traffic Flows Difference
(Do-Minimum to Do-Something)

158148	Cloddach Bridge, Elgin	Diagram 5



12-Hour Traffic Flows Corridor Increases (Do-Minimum to Do-Something)

Appendix M

Small Scheme Application Toolkit

Inputs

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	I- Impacts Proforma
Description and Purpose of Sheet	*Users should complete all yellow input cells within this sheet, and select from the drop down in green cells. User instructions/notes are shown in green text.*
Version number	4.00

I- Impacts Proforma

Project Details

	Unit	Constant	Notes	Total
Scheme:	text	Cloddach Bridge, C2E, Elgin		
Scheme Promoter:	text	The Moray Council		
Scheme Type:	selection	Highway		
Scheme Opening Year:	yyyy	2025		
Model Base Year (if applicable):	yyyy	2020		
Modelled Year Used (if applicable):	yyyy	Please select		
Area Type:	selection	Rural	The area type can be found by look	

Scheme Impacts

The Do Minimum (DM) should reflect the without-scheme scenario. The inputs should consider those in the area of influence of the scheme.
The Do Something (DS) should reflect the with-scheme scenario. The inputs should consider those in the area of influence of the scheme.
Both DM and DS demand are inputs. For the majority of small schemes we would expect these to be the same - but in some cases there may be differences (e.g. where improvements to bus provision may lead to an uplift in patronage). Where the demand isn't the same between the DM and DS scenarios, the difference is
The requested information should be provided where possible, noting that for some schemes / modelling platforms it will not be possible to obtain all outputs.
Night, Saturday and Sunday inputs can be provided, however these should be left blank where there is not the information available.
Unless otherwise stated, inputs should be for the scheme opening year. Where there is not data for the scheme opening year, the closest possible year should be used or an alternative methodology justified.

Highway

					AM Peak Hour	PM Peak Hour	Inter-Peak Hour	Night	Saturday	Sunday	
		Time period		hhmm - hhmm	07:00-10:00	16:00-19:00	10:00-16:00	19:00-07:00	00:00-23:59	00:00-23:59	
		Peak period expansion factor		factor	1.00	1.00	1.00	1.00	1.00	1.00	This should reflect the factor that th
Scenario	**Mode**	**Input**	**Year**	**Units**							
DM	Highway	Demand: number of highway trips	Opening Year	number of trips	192	170	359	67	546	482	This input should reflect the numbe
DM	Highway	Time: select whether you are inputting the total vehicle travel time or delay time		selection	Total travel time	Total travel time	Total travel time	Total travel time	Total travel time	Total travel time	Please select whether the input is t
DM	Highway	Time: total travel time or delay time	Opening Year	vehicle hours	30	26	57	9	86	76	This input should reflect the total tr
DM	Highway	Distance: total vehicle travel distance	Opening Year	vehicle km	1,429	1,273	2,672	499	4,064	3,588	This input should reflect the total hi
DS	Highway	Demand: number of highway trips	Opening Year	number of trips	192	170	359	67	546	482	This input should reflect the numbe
DS	Highway	Time: select whether you are inputting the total vehicle travel time or delay time		selection	Total travel time	Total travel time	Total travel time	Total travel time	Total travel time	Total travel time	Please select whether the input is t
DS	Highway	Time: total travel time or delay time	Opening Year	vehicle hours	18	15	34	6	51	45	This input should reflect the total tr
DS	Highway	Distance: total vehicle travel distance	Opening Year	vehicle km	997	888	1,864	348	2,834	2,502	This input should reflect the total hi

Bus

					AM Peak Hour	PM Peak Hour	Inter-Peak Hour	Night	Saturday	Sunday	
DM	Bus	Time Period		hhmm - hhmm							
DM	Bus	Peak period expansion factor		factor							This should reflect the factor that th
Scenario	**Mode**	**Input**	**Year**	**Units**							
DM	Bus	Demand: number of bus trips	Opening Year	number of trips							This input should reflect the numbe
DM	Bus	Time: total current bus travel time	Opening Year	person hours							This input should reflect the total tr
DS	Bus	Demand: number of bus trips	Opening Year	number of trips							This input should reflect the numbe
DS	Bus	Time: total current bus travelled time	Opening Year	person hours							This input should reflect the total tr

Bus Quality Factors

As a result of your scheme, will any of the following measures be introduced? (see *TAG Unit M3-2 Public Transport Assignment* for further detail on bus quality factors)

				DM (daily)	DS (daily)	
Audio announcements	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			This input should be the daily dema
CCTV at bus stops	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
CCTV on buses	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
Climate control	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
New bus shelters	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
New bus with low floor	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
New interchange facilities	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
On-screen displays	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
RTPI (at bus stops)	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
Simplified ticketing	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			
Trained drivers	number	Please select	If yes, no. of daily passengers experiencing benefit in opening year			

Appraisal Period (for bus quality appraisal only)	years		In line with TAG Unit A1-1 Cost Be

Lists - do not delete or edit

END

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	I- Cost Proforma
Description and Purpose of Sheet	*Users should complete all yellow input cells within this sheet, and select from the drop down in green cells. User instructions/notes are shown in green text.*
Version number	4.00

I- Cost Proforma

	Unit	Constant	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Scheme Costs													

Note - only the costs associated with the transport scheme should be entered into this proforma. The costs should be reflective of the scheme for which the impacts on I- Impacts Proforma capture.
All costs entered into the proforma should be inclusive of inflation. Costs should not include risk adjustment or optimism bias.
Costs should be entered as positive numbers

Funding Sources

Funding sought from Levelling Up Fund in each year

Funding Source	Sector	Unit	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Levelling Up Fund	Public	£, with inflation	**870,000**				870,000						

Cost to other funding sources in each year

Funding Source	Sector	Unit	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Public	Public	£, with inflation	**2,144,735**				2,144,735						
		£, with inflation	-										
		£, with inflation	-										
		£, with inflation	-										
		£, with inflation	-										
		£, with inflation	-										
		£, with inflation	-										
		£, with inflation	-										
		£, with inflation	-										

	Unit	Total	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total costs incurred in each year	£, with inflation	**3,014,735**	-	-	-	3,014,735	-	-	-	-	-	-

Optimism Bias

	Unit	Constant	
Optimism Bias	%	42%	Please refer to TAG Unit A2-1 Scheme Costs to identify the appropriate optimism bias (or risk adjustment) percentage to be applied to scheme costs

END

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	I- Area Lookup
Description and Purpose of Sheet	*This sheet can be used to look-up the area type requested on I- Impacts Proforma*
Version number	4.00

Area Lookup

##

Area Lookup Table

For users to determine what area type their scheme is located, based on Middle Layer Super Output Areas (MSOAs), used for mode-shift calculations. Users may use a different area type if they have evidence that the mapping does not represent the area of the intervention.
The area type identified should be entered onto *I- Impacts Proforma*.

Search Bar - Enter MSOA Zone Code or Use Below Table to Filter

Zone Code	S99900136
Area Type	Rural

MSOA Zone Code	MSOA Zone Name	LAD Code	Control Area Name	MECs Area Type

Outputs

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	O- Summary
Description and Purpose of Sheet	*This sheet provides a summary of the benefits and costs of the scheme over the appraisal period*
Version number	4.00

O- Summary

	Unit	Constant	Source
Summary Results			
Highway Journey Time Impacts			
Car			
Business	£, 2010 PV	975,736	
Commuting	£, 2010 PV	1,150,419	
Other	£, 2010 PV	2,136,817	
LGV			
Business	£, 2010 PV	1,099,787	
Commuting	£, 2010 PV	34,558	
Other	£, 2010 PV	38,648	
HGV			
Business	£, 2010 PV	360,256	
Commuting	£, 2010 PV	-	
Other	£, 2010 PV	-	
Total	***£, 2010 PV***	***5,796,222***	
Highway VOCs Impacts			
Car			
Business	£, 2010 PV	251,254	
Commuting	£, 2010 PV	531,054	
Other	£, 2010 PV	1,301,189	
LGV			
Business	£, 2010 PV	371,337	
Commuting	£, 2010 PV	14,677	
Other	£, 2010 PV	35,960	
HGV			
Business	£, 2010 PV	131,867	
Commuting	£, 2010 PV	-	
Other	£, 2010 PV	-	
Total	***£, 2010 PV***	***2,637,339***	
Bus Journey Time Benefits			
Business	£, 2010 PV	-	
Commuting	£, 2010 PV	-	
Other	£, 2010 PV	-	
Total	***£, 2010 PV***	***-***	
Bus Quality Impacts			
Total	***£, 2010 PV***	***-***	
Marginal External Costs			
Congestion	£, 2010 PV	-	Note - different formula to cells below
Business		-	Note - different formula to cells below
Commuting		-	Note - different formula to cells below
Other		-	Note - different formula to cells below
Infrastructure	£, 2010 PV	75,876	
Accident	£, 2010 PV	144,266	
Local Air Quality	£, 2010 PV	30,000	
Noise	£, 2010 PV	11,662	
Greenhouse Gases	£, 2010 PV	471,417	
Indirect tax	£, 2010 PV	- 623,094	
Scheme Costs			
Levelling Up Fund Ask	£, 2010 PV	681,135	
Other Public Sector Costs	£, 2010 PV	1,679,142	
Private Sector Costs	£, 2010 PV	-	
Total	***£, 2010 PV***	***2,360,276***	
Initial BCR			
Highway Journey Times	£, 2010 PV	5,796,222	
Highway VOCs	£, 2010 PV	2,637,339	
Bus Journey Times	£, 2010 PV	-	
Bus Quality Impacts	£, 2010 PV	-	
Congestion	£, 2010 PV	-	
Infrastructure	£, 2010 PV	75,876	
Accident	£, 2010 PV	144,266	
Local Air Quality	£, 2010 PV	30,000	
Noise	£, 2010 PV	11,662	
Greenhouse Gases	£, 2010 PV	471,417	
Indirect tax	£, 2010 PV	- 623,094	
Levelling Up Fund Ask	£, 2010 PV	681,135	
Other Public Sector Costs	£, 2010 PV	1,679,142	
Private Sector Costs	£, 2010 PV	-	
PVB	**£, 2010 PV**	8,467,811	
PVC	**£, 2010 PV**	2,284,400	
NPV	**£, 2010 PV**	6,183,411	
BCR	**£, 2010 PV**	3.7	

END

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	O- TEE
Description and Purpose of Sheet	*This sheet populates the DfTs appraisal output table (TEE Table)*
Version number	4.00

O- TEE

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	1,184,977		1,184,977	-		
Vehicle operating costs	545,731		545,731			
User charges	-					
During Construction & Maintenance	-					
NET NON-BUSINESS BENEFITS: COMMUTING	1,730,708	*(1a)*	1,730,708	-	-	-

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	2,175,465		2,175,465	-		
Vehicle operating costs	1,337,150		1,337,150			
User charges	-					
During Construction & Maintenance	-					
OTHER	3,512,615	*(1b)*	3,512,615	-	-	-

Business			**Goods Vehicles**	**Business Cars & LGVs**				
User benefits					**Passengers**	**Freight**	**Passengers**	
Travel time	2,435,780		360,256	2,075,524	-			
Vehicle operating costs	754,458		131,867	622,591				
User charges	-							
During Construction & Maintenance	-							
Subtotal	3,190,238	*(2)*	492,123	2,698,115	-	-	-	-

Private sector provider impacts						**Freight**	**Passengers**	
Revenue								
Operating costs								
Investment costs	-							
Grant/subsidy								
Subtotal	-	*(3)*						
Other business impacts								
Developer contributions	-	*(4)*						
NET BUSINESS IMPACT	3,190,238	*(5) = (2) + (3) + (4)*						

TOTAL		
Efficiency Benefits (TEE)	8,433,560	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.

All entries are discounted present values, in 2010 prices and values

END

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	O- PA
Description and Purpose of Sheet	*This sheet populates the DfTs appraisal output table (PA Table)*
Version number	4

O- PA

Public Accounts (PA) Table

	ALL MODES TOTAL	
Local Government Funding		
Revenue		
Operating Costs	- 75,876	
Investment Costs	1,679,142	
Developer and Other Contributions		
Grant/Subsidy Payments		
NET IMPACT	1,603,265	*(7)*
Central Government Funding: Transport		
Revenue		
Operating costs		
Investment Costs	681,135	
Developer and Other Contributions		
Grant/Subsidy Payments		
NET IMPACT	681,135	*(8)*
Central Government Funding: Non-Transport		
Indirect Tax Revenues	623,094	*(9)*
TOTALS		
Broad Transport Budget	2,284,400	*(10) = (7) + (8)*
Wider Public Finances	623,094	*(11) = (9)*

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

END

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	O- AMCB
Description and Purpose of Sheet	*This sheet populates the DfTs appraisal output table (AMCB Table)*
Version number	4

O- AMCB

Analysis of Monetised Costs and Benefits

Noise	11,662	*(12)*	
Local Air Quality	30,000	*(13)*	
Greenhouse Gases	471,417	*(14)*	
Journey Quality	-	*(15)*	
Physical Activity	-	*(16)*	
Accidents	144,266	*(17)*	
Economic Efficiency: Consumer Users (Commuting)	1,730,708	*(1a)*	
Economic Efficiency: Consumer Users (Other)	3,512,615	*(1b)*	
Economic Efficiency: Business Users and Providers	3,190,238	*(5)*	
Wider Public Finances (Indirect Taxation Revenues)	- 623,094	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*	
Present Value of Benefits (see notes) (PVB)	8,467,811	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*	
Broad Transport Budget	2,284,400	*(10)*	
Present Value of Costs (see notes) (PVC)	2,284,400	*(PVC) = (10)*	
OVERALL IMPACTS			
Net Present Value (NPV)	6,183,411	NPV=PVB-PVC	
Benefit to Cost Ratio (BCR)	3.7	BCR=PVB/PVC	

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the

END

File Name	DfT_Small_Scheme_Appraisal_Toolkit_v4.00_2022 158148 Cloddach FBC 240320.xlsm
Sheet Name	O- Checks
Description and Purpose of Sheet	*This sheet shows the individual sheet checks within the model*
Version number	4.00

Summary of Model Checks

	Unit	Constant	Source
Sheet			
I- Impacts Proforma			
I- Cost Proforma			
I- Area Lookup			
I- Params			
I- TAG Values			
I- TAG Rates			
I- Capitalisation			
C- Time & Rates			
C- Annualisation			
C- MECs Rates			
C- Time Benefits (Hwy)			
C- VOCs			
C- Time Benefits (Bus)			
C- Bus Quality			
C- Hwy MECs			
C- Bus MECs			
C- Capex			
O- Summary			
O- Appraisal Output Tables			

END