



NORTH EAST UNIT 15/NE/0801/023

A92 Cadham to Balfarg Pedestrian Accessibility Assessment



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**TERM CONTRACT FOR THE MANAGEMENT AND MAINTENANCE OF
THE SCOTTISH TRUNK ROAD NETWORK - NORTH EAST UNIT
A92 CADHAM TO BALFARG - PEDESTRIAN ACCESSIBILITY ASSESSMENT**

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Executive Summary

Following the death of a nine year old pedestrian on the A92 between Cadham and Balfarg junction in February 2015, concern has been raised by local residents and representatives over pedestrian safety and the appropriateness of pedestrian crossing facilities in this area.

As a consequence of the fatality and the concerns raised by local residents, Transport Scotland agreed to undertake a study to evaluate various options for improving pedestrian accessibility in the area.

The extents of the A92 covered by this report are from the Balfarg junction with the local road 'Toftill' south for approximately 900 metres.

Currently there is one recognised pedestrian crossing point within the study area. This is an uncontrolled crossing facility at Balfarg junction. Pedestrian facilities are provided with a footpath located to the east of the A92 although this is incomplete.

At this time there are no known plans for further significant development of the local area.

A pedestrian survey was carried out over seven days on two separate occasions, from Monday 10th to Sunday 16th August 2015 and from Monday 31st August to Sunday 6th September 2015.

In the first week of study (10th to 16th August) a total of 277 pedestrians and 362 cyclists' movements were recorded in the study area, resulting in an average hourly pedestrian/cyclist A92 crossing flow of 3.8 per hour.

During week two of the study (31st August – 6th September) a total of 362 pedestrians and 205 cyclists were recorded crossing during the survey period. The average hourly pedestrian/cyclist crossing flow is calculated at 3.38 per hour.

Speed surveys were carried out over the same two weeks. The recorded mean speed and 85th percentile speeds show that the majority of users are traveling within the posted speed limits.

A number of options were investigated within the study to look at improvements which could be undertaken to improve pedestrian accessibility these were:

- Do nothing
- Speed limit reduction
- Fencing/Barrier
- Uncontrolled crossing including pedestrian activated warning signs
- Uncontrolled crossing with refuge island & pedestrian activated warning signs
- Uncontrolled crossing with refuge island with bus bay provision & pedestrian activated warning signs
- Signal controlled pedestrian crossing
- At grade separation
- A92 Footpath link



The options were evaluated in terms of pedestrian safety, active travel; social inclusion and accessibility, environmental impact, transport integration, projected timescales and cost.

The options detailed above were discussed with Mr Robert Brown, the grandfather of 9 year old Logan Carrie who died on the A92 at this location in February 2015, and Fife Councillor Billy Pollock. Mr Brown advised that he was supportive of the options to reduce the existing speed limit and provide the A92 footway link. He also informed that the provision of an uncontrolled crossing point with a central island is his preferred crossing option.

It was agreed that Mr Brown and Cllr Pollock would be kept updated on the progress of this report and any subsequent actions arising from this.

Based upon the considerations made, it is recommended that improvements to existing pedestrian facilities and trunk road layout should be made by means of the following:

- The promotion of a Traffic Regulation Order for the reduction of the 50mph Speed Limit to 40mph in this area.
- The extension of the footway, located to the east of A92, to Balfarg junction.
- Consultation with Fife Council to allow the cutting back of trees located outwith the trunk road boundary.

In addition further investigation into the feasibility of an uncontrolled pedestrian crossing with an associated central island at Zone 6B within the map below should be considered to ascertain its future viability.



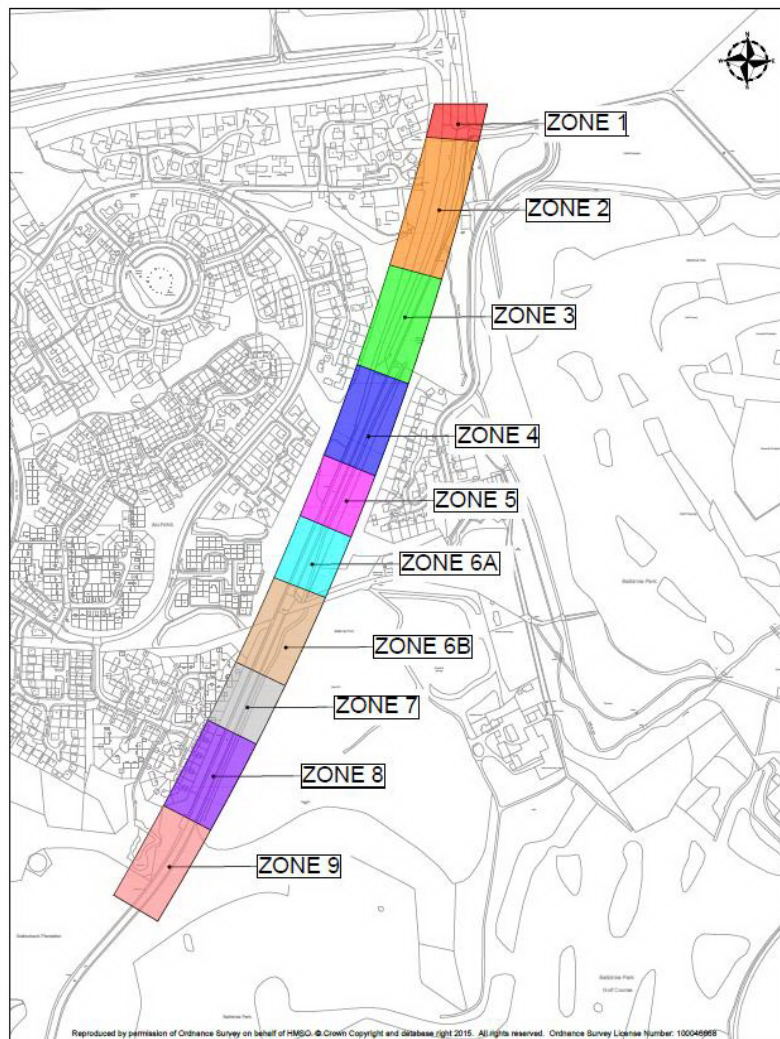


Figure 0/1 - Map showing extents of study zone areas

1.0 Introduction

- 1.1 Following death of a nine year old pedestrian on the A92 between Cadham and Balfarg junction in February 2015, concern has been raised by local residents and representatives over pedestrian safety and the appropriateness of pedestrian crossing facilities in this area.
- 1.2 As a consequence of the fatality and the concerns raised by local residents, Transport Scotland agreed to undertake a study to evaluate various options for improving pedestrian accessibility in the area.
- 1.3 This report has been prepared by BEAR Scotland in response to an instruction from Transport Scotland to undertake a study investigating current pedestrian activity by surveying movements, crossing points, conflicts and numbers and collating pedestrian collision statistics for the area. Using this information the study then evaluates various options available for improving pedestrian accessibility with regards to pedestrian safety, active travel; social inclusion, environmental impact, transport integration, projected timescales and value for money. It then provides a recommendation on the most appropriate course of action, taking these aspects into account. A copy of the assessment brief is contained in Appendix A.

2.0 Site Description

- 2.1 The A92 trunk road is a strategic traffic route from Halbeath Roundabout in Fife to Scott Fyffe Roundabout in Dundee covering a length of approximately 59 kilometres. The trunk road is made up of a combination of single and dual carriageway with widths typically varying from 6 metres to 8.5 metres. Traffic on the route is generally subject to national speed limits however a number of localised limits of 30, 40 and 50mph are also in operation.
- 2.2 The extents of the A92 covered by this report are from the Balfarg junction with the local road 'Tofthill' south for approximately 900 metres to an area in line with the southern extent of the local road Glenartney Court which runs adjacent with the trunk road. A 50mph speed limit is in force throughout the study section. A location plan showing the extents of the study area can be seen in Appendix B.
- 2.3 There are no properties directly accessed from the trunk road over the extents of study however developments are set back from the A92 on either side. To the west, a total of approximately 730 dwellings are present and approximately 190 to the east. The dwellings are made up of residential properties, farmhouses, sheltered homes, care homes and a hotel.
- 2.4 Fife Council has advised that there are no new developments (or extensions to existing developments) planned around the area at present with the exception of a 14 apartment building near the existing Balfarg Care Home on Kilmichael Road, with outline planning approval dating back to 2008.
- 2.5 Currently there is one recognised pedestrian crossing point within the study area. This is an uncontrolled crossing facility at Balfarg junction, the northern end of the site within the dual carriageway section. The staggered crossing incorporates build outs to minimise the length of crossing and increase visibility for pedestrians. To the west the crossing links to a local footpath which leads to Balfarg steadings and the main housing development. The east footway has recently been upgraded and leads to the core path network and the junction with Tofthills.
- 2.6 Pedestrian facilities are provided along the trunk road, with a footway located on the eastern side of the A92. However, this footway does not tie in with the crossing point at Balfarg junction, coming to an end approximately 230 metres south of this location.
- 2.7 Visibility for drivers throughout the study extents is generally good with straight lines of site and no obstruction with parked vehicles, signs or similar street furniture which can restrict views. Trees within the area do not block lines of sight however to the west of the A92, in land outwith the trunk road boundary, trees have grown considerably in recent years and create a closed environment within the area.

- 2.8 Environmental issues exist within the site extents. Directly to the east of the trunk road the boundary wall running parallel with the A92 forms part of Balbirnie Estate which is listed with Fife Council as being a Conservational Garden and Designed Landscape area which includes Tree Preservation Orders throughout, with listed buildings and structures and is noted as being a site of historic interest. To the west of the A92, an area of woodland located directly south of the dual carriageway section has Tree Preservation Orders in place.
- 2.9 There is no bus stop provision within the study extents however services to Glenrothes, Perth and Collydean, in addition to school services for Pitcoudie, Rimbeltion, St Pauls Primary School and Glenrothes High School are accessed via the residential estate to the west of the A92. East of the A92 on the local road, Tofthill Drive Road End, a bus service runs to Markinch and Kingskettle and school services run to Auchmuty High School and Markinch Primary School. A map and information showing the bus stops and services provided can be seen in Appendix D.
- 2.10 Street lighting is present throughout the study area. Within the single carriageway section this is accommodated on the western verge and within the dual section lighting is provided on both sides of the carriageway.
- 2.11 The traffic flows on this section of the A92 are recorded from the Scottish Roads Traffic Database. These are contained within Appendix E and show an annual average daily traffic flow (AADT) for August 2015 of 20,798.
- 2.12 Speed surveys were carried out over two weeks (10th to 16st August and 31st August to 6th September 2015) at two locations; adjacent to Balbirnie Park and near the north end of the site where the single carriageway meets the dual carriageway section. The recorded mean speed and 85th percentile speed (the speed at which 85% of traffic is travelling within) are shown in the table below. The figures show that the majority of users are traveling within the posted speed limits. Graphs detailing the results are contained in Appendix E.

	Balbirnie Park	Single/Dual
Wk 1 Mean Speed (mph)	45.4	44.1
Wk 1 85th Percentile (mph)	50.8	49.9
Wk 2 Mean Speed (mph)	44.9	46.1
Wk 2 85th Percentile (mph)	50.4	51

Table 2/1 - Recorded Mean & 85th Percentile Speeds

3.0 Collision History

- 3.1 Between 1 January 2010 and 30 September 2015 there were two injury collisions within the study extents. Table 1 provides a breakdown of these collisions by severity and year:

Year	Fatal	Serious	Slight	Total
2010	0	0	0	0
2011	0	0	0	0
2012	0	0	0	0
2013	0	0	0	0
2014	0	0	1	1
2015	1	0	0	1
Total	1	0	1	2

Table 3/1 - Collisions by Severity on the A92 within study extents

- 3.2 The first injury collision, recorded on 15th December 2014 at 07.10, involved a car exiting Tofthills onto the A92 and heading north within the dual section, the driver of which failed to look properly and collided with a motorcyclist travelling south to north. The injury type was recorded as slight, weather as fine, the road surface as wet and lighting conditions as dark with street lighting present and lit.
- 3.3 The second injury collision was recorded on 10th February 2015 at 17.35. The collision involved a nine year old pedestrian who was struck by a car traveling northbound on the A92 around the location of the historic Balbirnie Park entrance within the single carriageway section. This accident resulted in a fatality. The weather was recorded as fine, the road surface as wet and lighting conditions as dark with street lighting present and lit.
- 3.4 Over the wider 25 year period, one further pedestrian casualty has been recorded. This occurred on 19th December 1992 and involved a 37 year old male who was reported as walking in the carriageway with his back to the traffic at a location approximately 50 metres north of where the fatality recorded on 10th February 2015 occurred. The incident occurred at 01.15, the weather was fine, road surface as wet/damp and lighting conditions as dark with no street lighting present. A speed limit of 60 mph was in place at that time.
- 3.5 Details of the above collisions, shown as a plan detailing their locations, is contained in Appendix F.

4.0 Pedestrian Survey & Observations

- 4.1 A pedestrian survey was carried out over seven days on two separate occasions, from Monday 10th to Sunday 16th August 2015 and from Monday 31st August to Sunday 6th September 2015.
- 4.2 The survey was carried out over two different weeks in order to gain as accurate an interpretation of movements in the area as possible. As such the first survey was undertaken while schools were off for summer holidays and the second survey was undertaken after pupils had returned to school.
- 4.3 Using video technology the survey was carried out 24 hours a day and split the study area into 10 zones to allow a detailed investigation of the patterns of pedestrian and cyclists' movements crossing the A92.

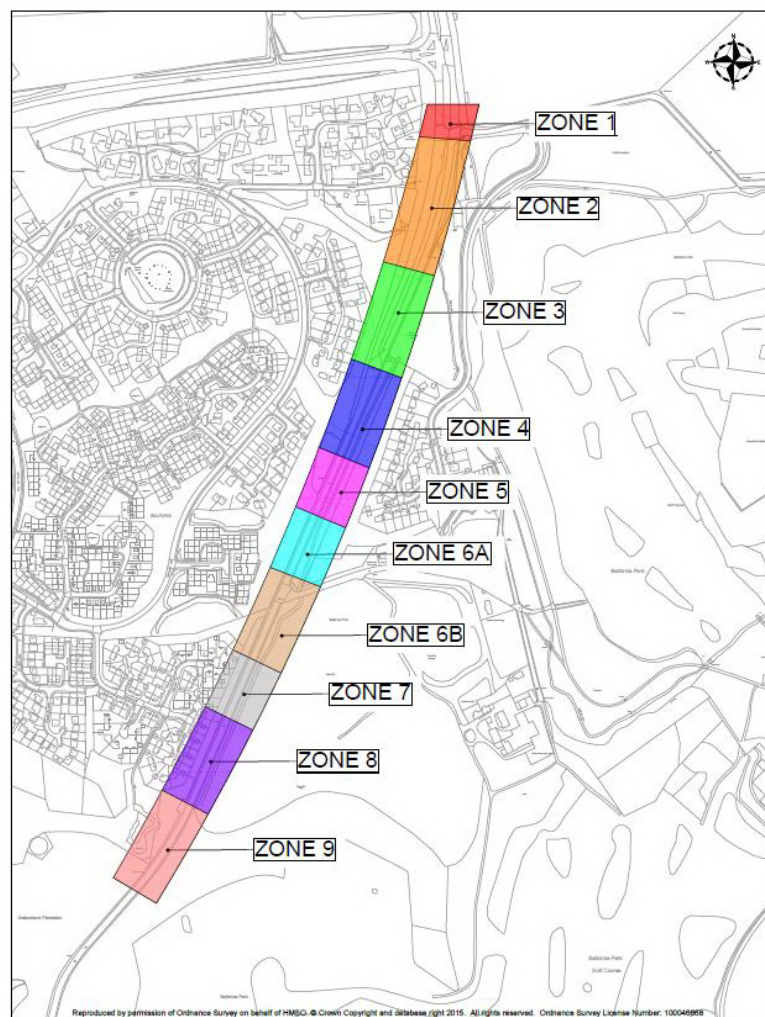


Figure 4/1 - Map showing extents of study zone areas

- 4.4 In the first week of study (10th to 16th August) a total of 277 pedestrians and 362 cyclists' movements were recorded in the study area, resulting in an average hourly pedestrian/cyclist crossing flow of 3.8 per hour.

Week 1 (Monday 10th August to Sunday 16th August 2015)				
	Total Pedestrian	Total Pedal Cycle	Total	% of Total
Zone 1	4	20	24	3.8
Zone 2	211	322	533	83.4
Zone 3	2	2	4	0.6
Zone 4	18	1	19	3.0
Zone 5	7	0	7	1.1
Zone 6A	1	0	1	0.2
Zone 6B	33	17	50	7.8
Zone 7	1	0	1	0.2
Zone 8	0	0	0	0.0
Zone 9	0	0	0	0.0
Total	277	362	639	100
% of Total				
Total	43.3	56.7		

Table 4/1 - Total pedestrian/cyclist movements A92 study area Week 1

- 4.5 The existing uncontrolled crossing within the dual section (Zone 2) saw the vast majority of movements with over 83% of all crossings occurring here within the study extents. The second most popular area for crossing was Zone 6B, the location near the former junction of Balbirnie Park, with just under 8% of crossings for the study area occurring here.
- 4.6 No children were observed crossing within the first week of study.
- 4.7 Slightly over 100 movements were recorded each day with the exception of Monday and Friday where only 58 and 38 movements were recorded respectively.
- 4.8 Cycling facilities, on road and off road, are present on either side of the A92 which would account for the high percentage of all crossings (56.7%) being that of cyclists. Facilities include local path networks link to Markinch and Glenrothes and the national cycle route 766 which can be reached via Tofthill.
- 4.9 Looking at the time of day that pedestrians/cyclists crossed the A92 during the survey period, three peak hourly flow periods were identified:
- 10:00-11:00 (10.3% of all movements (72) during this period with average hourly flow of 9.1)
 - 18:00-17:00 (9.4% of all movements (66) during this period with average hourly flow of 6.6)
 - 19:00-18:00 (8.0% of all movements (56) during this period with average hourly flow of 7.9).

- 4.10 10.00 – 11.00 on both Saturday and Sunday accounted for the busiest hour of crossing throughout the entire week with 22 movements recorded during this period on each day.
- 4.11 During week two of the study (31st August – 6th September) a total of 362 pedestrians and 205 cyclists were recorded crossing the A92 during the survey period. The average hourly pedestrian/cyclist crossing flow was 3.4 per hour.

Week 2 (Monday 31st August to Sunday 6th September 2015)					
	Total Pedal Cycle	Total Adult	Total Child	Total	% of Total
Zone 1	32	6	0	38	6.7
Zone 2	152	270	1	423	74.6
Zone 3	9	9	0	18	3.2
Zone 4	0	5	0	5	0.9
Zone 5	0	5	0	5	0.9
Zone 6A	0	4	0	4	0.7
Zone 6B	12	60	2	74	13.1
Zone 7	0	0	0	0	0.0
Zone 8	0	0	0	0	0.0
Zone 9	0	0	0	0	0.0
Total	205	359	3	567	100
% of Total					
Total	36.2	63.3	0.5		

Table 4/2 - Total pedestrian/cyclist movements A92 study area Week 2

- 4.12 As observed during the first week of the survey, Zone 2, where the existing uncontrolled crossing is in place within the dual section, saw the majority of movements with over 74% of all crossings occurring here, although this is not as high as the 83% recorded in week one. Zone 6B was once again the second most popular area to cross, with just over 13% of crossings occurring here, an increase of 5% from week one.
- 4.13 Three children were observed crossing during the entire survey period, all within week two.
- 4.14 Overall, with the exception on Sunday where 150 movements were recorded (the highest of any day of the two weeks), movements were reduced throughout week two with less than 50 crossings on Monday and Thursday and less than 100 on the remaining days.
- 4.15 In week one cycling movements were recorded as being higher than that of pedestrians at 56% however in week two this pattern was reversed with pedestrians being the main group to cross at just under 64%.

- 4.16 Looking at the time of day that pedestrians/cyclists crossed the A92 during week two of the survey period, three peak hourly flow periods were identified:
- 11:00-12:00 (8.0% of all movements (45) during this period with average hourly flow of 6.43)
 - 14:00-15:00 (6.9% of all movements (39) during this period with average hourly flow of 5.57)
 - 18:00-19:00 (3.4% of all movements (19) during this period with average hourly flow of 2.71).
- 4.17 The three peak hourly flow periods do not follow that of week one which shows that school holidays have an effect on the times and types of crossing. The times of day for crossings in week two appeared to be far more spread out with little pattern observed as to re-occurring times throughout the week in which people chose to cross.
- 4.18 The only pattern of time of crossing combined over the two weeks is shown to be on Saturday and Sunday between 10.00 and 11.00 accounting for 5.47% of all crossings for the two weeks. The highest observed hour of the two weeks was shown as being 25 movements on Sunday in week 2 between 15.00 and 16.00.
- 4.19 Appendix G shows the survey data for each zone.
- 4.20 Crossing and waiting times for each zone were also recorded to evaluate any delays or difficulty which occurred for pedestrians attempting to cross the A92. The average crossing and waiting times for Zones 2 and 6B over the two weeks are shown below.

	Zone 2					
	Number of:			Averages		
	PC*	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle
Monday 10th August	22	26	0	8	18	5
Tuesday 11th August	46	32	0	6	19	4
Wednesday 12th August	44	47	0	9	18	4
Thursday 13th August	61	27	0	18	19	4
Friday 14th August	7	19	0	6	16	8
Saturday 15th August	70	31	0	10	18	7
Sunday 16th August	72	29	0	10	17	7
Monday 31st August	11	19	0	11	20	6
Tuesday 1st September	10	45	0	5	15	5
Wednesday 2nd September	42	15	0	10	12	5
Thursday 3rd September	7	26	0	14	15	6
Friday 4th September	9	52	1	10	21	4
Saturday 5th September	22	41	0	6	22	4
Sunday 6th September	51	72	0	7	22	4
Total	474	481	1			
Average time for week				9.3	18.0	5.2

Table 4/3 - Crossing and Wait Time Zone 2 Daily Average

*Pedal cycle



	Zone 6B					
	Number of:			Averages		
	PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle
Monday 10th August	2	3	0	23	6	5
Tuesday 11th August	4	2	0	28	3	7
Wednesday 12th August	2	6	0	17	6	10
Thursday 13th August	2	7	0	16	6	6
Friday 14th August	3	5	0	19	6	3
Saturday 15th August	2	9	0	30	5	9
Sunday 16th August	0	3	0	63	6	11
Monday 31st August	1	6	0	9	5	6
Tuesday 1st September	2	2	0	16	5	8
Wednesday 2nd September	2	10	0	2	5	4
Thursday 3rd September	2	5	0	6	4	4
Friday 4th September	1	12	0	22	5	5
Saturday 5th September	2	11	0	14	5	7
Sunday 6th September	2	14	2	7	4	7
Total	27	95	2			
Average time for week				19.3	5.0	6.6

Table 4/4 - Crossing and Wait Time Zone 6B Daily Average

- 4.21 The average time to cross over the full two weeks at Zone 2 was observed at 9.3 seconds while the average time to cross was 18.0 seconds. At Zone 6B the average waiting time over the two weeks is 19.3 seconds while the average time to cross is 5.0 seconds.
- 4.22 Waiting times at Zone 2 were lower than at zone 6B due to the carriageway being split by a central island which allows pedestrians/cyclists to cross a single lane of traffic at a time. The actual time to cross at Zone 2 is greater than 6B owing to requiring two separate gaps in traffic, additionally the increased time of crossing is partially due to wider carriageway widths at this point.
- 4.23 The waiting times were further analysed to show the percentage of timescales affecting users, these were split into four time brackets, 0-15 seconds, 16-29 seconds, 30-59 seconds and 60+ seconds.

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Week 1				
Waiting Time	Zone 2	%	Zone 6B	%
0-15	419	78%	26	52%
16-29	65	13%	10	20%
30-59	34	6%	9	18%
60+	15	3%	5	10%
Total	533		50	
Week 2				
Waiting Time	Zone 2	%	Zone 6B	%
0-15	369	87%	59	80%
16-29	38	9%	9	12%
30-59	11	3%	5	7%
60+	5	1%	1	1%
Total	423		74	

Table 4/5 – Percentage of Timescales affecting users (Zone 2 & 6B)

- 4.24 It was observed at both locations that the vast majority of users (82.5% at Zone 2 and 66% at Zone 6B) experienced waiting times of 15 seconds and under, combined over the two weeks surveyed. It should be noted however that of some of the wait times experienced over 60 seconds are considerable with a time of 227 seconds observed at Zone 2 and 134 seconds at Zone 6B.
- 4.25 A scatterplot graph (shown below) was produced to show the degree of risk being taken, with wait times to cross measured against the time taken to the first passing car following the crossing movement.



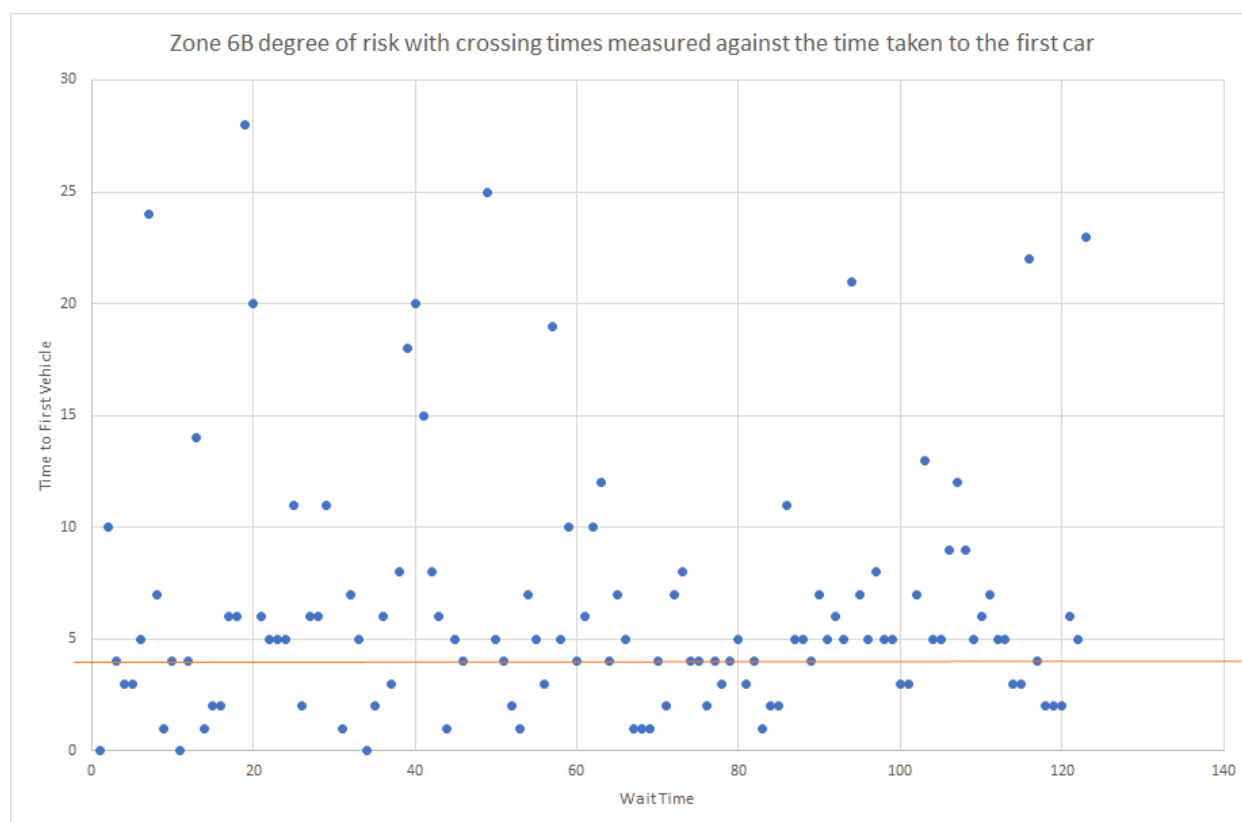


Figure 4/1 – Scatter Plot Graph of Degree of Risk with Crossing Times Against Time to First Car

- 4.26 Local Transport Note 1/95 The Assessment of Pedestrian Crossings advises:
'An acceptable gap in which to cross, from kerb to kerb (or refuge), varies from person to person. The majority of pedestrians will accept a gap of 4-6 seconds at normal urban vehicle speeds to cross two lanes of traffic and even shorter gaps at slow vehicle approach speeds. Other groups may require somewhat larger gaps, of around 10 to 12 seconds or even longer.'
- 4.27 The graph above shows that while the majority of users are crossing with gaps between 4-10 seconds (the red line is shown at 4 seconds) some users are accepting a shorter gap and increasing potential conflict. There does not however appear to be any greater degree of risk being taken by users who have to wait longer periods to cross with no significant reduction in the gap to the time of the first vehicle to pass.

5.0 Proposed Options

- 5.1 The following section provides a high level review of potential options assessed to improve crossing facilities for pedestrians and cyclists against the objectives specified within the Client Brief (safety, active travel, social inclusion, environmental impact, transport integration, projected installation timescales and cost). It should be noted that all cost estimates specified are preliminary in nature and therefore may change significantly, dependent upon the findings of any subsequent detailed design process.
- 5.2 Pedestrian safety is the principal consideration in evaluating the proposed options. The Design Manual for Roads and Bridges Volume 5, Section 2, Part 4, TA 91/05 Provision for non-motorised users is an advice note used to highlight the needs of non-motorised users on trunk roads and provides guidance on provision of both off-carriageway routes and on-carriageway facilities including junctions. Although the note is not directly applicable within Scotland it contains important guidance which has been followed in determining the most appropriate options to progress.
- 5.3 As part of the assessment the importance of active travel and social inclusion is recognised. The Scottish Government has a long term vision to increase the number of people choosing to travel actively (i.e. walking, cycling or via a personal mobility aid) as part of their everyday lives.
- 5.4 Achieving this vision will help to improve the quality of people's lives and make communities feel more connected. Consideration towards how improvements in infrastructure can facilitate walking and cycling is a key part of this vision as set out in "A Long Term Vision for Active Travel in Scotland 2030".

5.5 Do Nothing

- 5.5.1 A non-controlled pedestrian crossing area exists at the northern end of the site extents at Balfarg and is shown within the pedestrian survey to be far and away the most popular area for crossing movements within the extents of the study area. This was upgraded in June 2014 with a new footway link provided. The works included the lowering of kerbs, installation of tactile paving, signing, pedestrian barrier and surfaced footway. This option has been used as the benchmark against which the assessment of the improvement options summarised below have been assessed.

5.6 Speed Limit Review

- 5.6.1 Although not identified within the original assessment brief, a review of the current speed limit (50mph) in place through the survey area has been undertaken to evaluate the option of lowering it from 50mph to 40mph.
- 5.6.2 The relationship between speed and likelihood of collisions and severity of injury is complex, but there is a strong correlation. As a general rule for every 1 mph reduction in average speed, collision frequency reduces by around 5% (Taylor, Lynam and Baruya, 2000). For typical types of road traffic collisions the risk of death for drivers and pedestrians involved reduces with lower vehicle speeds. However, it is also important to ensure that speed limits are consistent with the road environment and surroundings within which they sit, to help ensure that they are easily understood by drivers and hence complied to. Speed limits that are inconsistent with the road environment are likely to result in high levels of non-compliance (speeding) and can be damaging to road users wider trust of speed limits.
- 5.6.3 In August 2006 the Scottish Government issued guidance titled 'Setting Local Speed Limits' which outlined the framework for road authorities to determine speeds on all A & B class roads so that they are consistent, understood by drivers and appropriate for the environment and circumstances of their use.
- 5.6.4 In 2012 the Speed Limit Review Report was published by Transport Scotland and concluded that whilst the general character of the A92 between Cadham to Balfarg would suggest an appropriate speed limit of 60mph, given the existing localised speed limits (50 & 40mph) within this section were introduced historically for safety reasons, that they should remain in place.
- 5.6.5 These speed limits continue to remain in place, however the further investigations undertaken through this report have found that there may be sufficient grounds to consider lowering the existing 50mph limit to 40mph.
- 5.6.6 The location is somewhat unique within the network in having an area of trunk road that has no frontage properties within the survey area, but has two large residential property developments running parallel with both sides of the road. These developments may not be apparent to motorists driving the route due to screening with trees and subsequently compliance with a lower limit may be of issue, however the risk of potential conflict with pedestrians is a major consideration.
- 5.6.7 Further to this the existing footway located to the east of the A92 lies adjacent to the carriageway with no separation. TA 90/05 The Geometric Design of Pedestrian, Cycle and Equestrian Routes paragraph 7.22 states that *'It is desirable to provide physical separation between Non-Motorised Users routes and carriageways. For pedestrians and cyclists the preferred separation between the NMU route and the carriageway is 1.5m, with an acceptable separation of 0.5m'*.
- 5.6.8 However due to constraints with the wall surrounding Balbirnie Park there is no way in which to provide an area of separation for the majority of the route outwith relocating the entire wall which carries environmental and conservational issues.

- 5.6.9 Another aspect in a proposed reduction of the 50mph speed limit to 40mph is that it may aid in reducing any ambiguity for motorists as to the speed at which they should be driving within this section in having only one formal speed limit instead of the current two over a relatively short distance (1.75km).
- 5.6.10 Following these considerations contact was made with Police Scotland to gain their views on reducing the existing 50mph speed limit over its full extent to 40mph. Police Scotland have indicated that they would be supportive of this reduction.
- 5.6.11 In terms of deliverability for a speed limit to change, a traffic regulation order, under the Road Traffic Regulation Act 1984, would need to be made. This follows a statutory process which includes advertising of the proposed order and opportunities for objections to be raised and resolved. If the order is proposed and no objections are forthcoming a change to the speed limit could be implemented in as little as six to twelve months. If objections are received, then this timescale could increase considerably. It should be noted that any change to the speed limit will require the publication and processing of a Traffic Regulation Order.
- 5.6.12 Given the above, the promotion of a reduction to the existing speed limit through a Traffic Regulation Order should be considered over and above the original improvement options.

5.7 Fencing/Barrier

- 5.7.1 This option would look at restricting pedestrian movements by blocking up areas of access along the west side of the A92 and channel the flow of movements towards the recognised crossing point in Zone 2.
- 5.7.2 In order to be effective the fencing/barrier would need to be of adequate height, strength and length in order to effectively prevent attempts to bypass the deterrent. It is estimated the cost of providing an adequate fence facility over 850 metres length would cost in the region of £170,000. Ground works and tree removal would be required in order to align the fence parallel with the carriageway. The control of the future maintenance of the fence would need confirmed as well as ongoing maintenance costs and longevity of the product.
- 5.7.3 This option would only return a minor improvement to safety due to the fact that the pedestrian collision record is very low historically and the small volume of crossing movements observed outwith the existing crossing point. This option would provide no improvement to active travel, nor transport integration. In addition, it would generate a slight negative impact on the environment visually as an area to the west of the A92 has a number of trees with tree preservation orders in place which could cause some issues with erecting a fence for the length of the extents. A slight improvement environmentally could be achieved with the use of acoustic fencing which could provide with a reduction in noise to the properties to the west of the A92.

5.8 Provision of additional uncontrolled single carriageway pedestrian crossing point

5.8.1 TA 91/05 Table 6/1 of the Design Manual for Roads and Bridges, reproduced below, shows the suitability of informal at-grade right of ways crossings.

Road type	AADT flow (two-way)		
	Normally Appropriate	Potentially Appropriate (see paragraph 6.8)	Not Normally Appropriate
Single carriageway	Below 8,000	8,000 to 12,000	Above 12,000
Dual carriageway	Below 16,000	16,000 to 25,000	Above 25,000
Wide single c'way	-	Below 10,000	Above 10,000

Table 6/1- Criteria for Suitability of Informal At-Grade Rights of Way Crossings

- 5.8.2 The table indicates that it would not normally be appropriate to provide any type of informal crossing measure within a single carriageway road type where the AADT flow is above 12,000. With the AADT for this location recorded as 20,798 it is likely that a Departure from Standard would be required in supplying any type of informal crossing facility within the survey area.
- 5.8.3 The pedestrian survey has indicated that only one area outwith the existing uncontrolled pedestrian crossing point has notable crossing movements. Zone 6B, near the historical entrance to Balbirnie Park, shows signs of some, albeit limited, desire to use this location as a point to cross the A92.
- 5.8.4 In order to provide an uncontrolled crossing at this location a small area of hard standing would be required to the west of the A92 with new footpath provision supplied by Fife Council to connect with the Balfarg Estate. To the east of the A92 it would be proposed to formally close off the historic entrance to Balbirnie Park and link the two sections of footpath with the new crossing area. A further small section of footpath linking to the Fife core path network would also be required.
- 5.8.5 The actual location of the crossing would require careful consideration to ensure that minimum visibility levels are achieved, there is potential for traffic to be masked approximately 200m south of Zone 6B due to carriageway gradients. Removal of branches/foliage would also be required to ensure clear lines of visibility for any crossing point to be located around this location.
- 5.8.6 The existing trees directly west of the trunk road in this section have grown considerably in recent years and now creates a very closed environment. In addition they are an ongoing maintenance burden. Part of this proposal would be to cut back the existing trees to the point where a more open environment is created and maintenance requirements are minimised. Further investigation would be required to confirm the extent of foliage to be removed, ensuring Fife Council were content with any such proposal, so that environmental impact is minimised and any removal/thinning would not result in increased noise pollution for residents.

- 5.8.7 Pedestrian activated signs would be installed to increase driver awareness of the potential for conflict with pedestrians crossing the carriageway at this location. These signs would work by flashing warning beacons which would be activated when a pedestrian movement is detected at the crossing point.
- 5.8.8 It is estimated the costs associated with providing the area of hardstanding would be around £15,000. This excludes any costs associated with the provision of required footpath links by Fife Council.
- 5.8.9 Further costs through for removal of a number of trees and branches which would improve visibility between drivers and pedestrians in advance of the crossing and additionally aid in opening up the overall area is estimated at around £18,000.
- 5.8.10 The estimated costs of the pedestrian activated signs is in the region £40,000. There would however be ongoing annual maintenance required including running costs and in addition the cost of supplying power to site would need to be taken into account.
- 5.8.11 Whilst this option introduces a pedestrian crossing facility where one does not currently exist, it may actually increase the risks associated with pedestrians crossing the A92. At present the recognised crossing point to the north allows pedestrians to deal with one directional flow of traffic at a time; the new crossing would expose pedestrians to both traffic flows simultaneously and therefore present a greater safety risk in comparison. As it is likely that there will be a degree of migration of pedestrians from the existing island refuge crossing (at Balfarg) to the proposed, for convenience sake, installation of this proposal would be likely to see an overall increase in the number of pedestrians undertaking the more risky crossing movement.
- 5.8.12 There would be minor improvements in social inclusion, in allowing an additional point which can be utilised by all users to cross the carriageway. There would be no improvement in transport integration and would generate a minor impact on the environment.
- 5.8.13 Community benefit may be provided in supplying an area of crossing that could potentially reduce distances travelled between the two estates however this could be in part negated by increased movements past some resident's properties. There is potential for a benefit in active travel by providing a more convenient recognised crossing area which could be utilised by both pedestrians and cyclists.
- 5.8.14 Fife Council has intimated they would be supportive of providing the necessary footpath links to a designated crossing facility at this location (subject to appropriate consultation). Depending upon approval of any required Departures from Standards, works could be completed within the 2016/17 financial year at a lower cost than a number of other options being considered within this report. Timescales and costs would require to be confirmed through further detailed consideration.

5.9 Provision of additional uncontrolled pedestrian crossing point with Central Island

- 5.9.1 This would be similar to the previous option but would incorporate a pedestrian refuge island within the center of the carriageway to allow a single lane of traffic to be crossed at a time.
- 5.9.2 Due to constraints with the width of the carriageway this could not be incorporated unless the overall width of the carriageway is increased to facilitate its inclusion. This would require additional carriageway construction on the approach to the refuge island to allow appropriate alignment in advance. Land take for this would involve areas of verge, existing footway and would require land uptake from areas out with the highway boundary which could cause delays, additional costs or other issues.
- 5.9.3 It has been identified that north of the site an area of land incorporates woodland with Tree Preservation Orders. To the east the existing stone wall forms part of the Balbirnie Estate and is identified as having historic significance which would require approval prior to any works to relocate the wall in constructing sufficient carriageway width. It is understood the wall would need rebuilt like for like and as such would involve significant costs and delays to timescales.
- 5.9.4 An alternative option would be to widen the carriageway completely on the western edge. This would not be without its own complications, particularly in regards road alignment however it may be preferable in avoidance of the environmental constraints of the eastern edge.
- 5.9.5 Further issues with construction for either option would involve the potential for relocating of services. It has been identified that a medium pressure gas main is located within the verge to the west of the A92. It is highly likely that this service would need to be relocated outwith the boundary of widened carriageway which would involve considerable costs. British Telecom have telegraph poles which would need relocated and underground plant which again would likely need either lowered or moved outwith the new carriageway boundary. Scottish Power cables have been identified within the footway to the east of the A92 and within the carriageway near the crossing area. In addition a number of lighting columns would need moved back to follow the line of the widening and checks made to ensure the illumination is still adequate from the new set back positions. It is estimated that the costs for service diversions and relocation of lighting columns may be well in excess of £150,000, however this would require to be confirmed through further detailed consideration.
- 5.9.6 The overall costs for either option for widening of the carriageway with associated earth works, removal of trees/thinning, drainage, illumination requirements within the island itself and rebuilding of wall are estimated at around £140,000, increasing to £180,000 with the inclusion of pedestrian activated warning signs. Coupled with the costs of diversion of services the provision of an uncontrolled crossing with traffic island is estimated to be in excess of £330,000. There is also an increased cost in terms of time for installation with a number of factors to be considered including land acquisition,

environmental assessments and the diversion of services. All costs and timescales would require to be confirmed through further detailed investigation.

- 5.9.7 This option would have a larger environmental impact by the requirement to increase the width of the carriageway to accommodate the island. Social Inclusion, Active Travel and Transport Integration would all be similar to that of the uncontrolled crossing.
- 5.9.8 The provision of the crossing with island could be considered to be safer for pedestrians to cross the carriageway by reducing the amount of lanes to cross to one at a time however it does carry an element of risk in leaving pedestrians exposed to two flows of traffic.
- 5.9.9 TA 91/05 paragraph 6.18 advises *'it should be noted that physical islands on high speed roads may constitute a hazard, and consideration should be given to speed reduction measures in these situations. Any island on a road with a speed limit greater than 40mph that is not part of a single lane dualling design requires 'Departure from Standards' approval.* As such a Departure from Standard would be required for this proposal should the existing speed limit remain.
- 5.9.10 It should be noted that significant further technical work and investigations would be required to even establish the feasibility of this option. This includes ground investigation works, detailed design and liaison with several groups including Fife Council, utility companies and land owners. All of which would affect time frame for delivery.

5.10 Additional uncontrolled pedestrian crossing point with Central Island and bus bay provision

- 5.10.1 In line with the previous option with the change in alignment of the carriageway it was considered that bus bay provision could be included should there be a desire shown from bus operators to include provision of services here.
- 5.10.2 Stagecoach, in correspondence to Fife Council, has indicated that they would happy to use any bus bay provision on the A92 at this location for their express services.
- 5.10.3 Considerable land uptake and construction work would be required to provide bus bays in line with standards at this location along with conservational issues previously identified. The cost for construction is estimated to be in excess of £250,000 (including pedestrian activated warning signs). The diversion of services/relocating of lighting columns with being over an extended area than the previous option is estimated at approximately £175,000 increasing the overall costs of this option to a figure projected around £425,000.
- 5.10.4 The overall benefit in safety would be similar to the previous option. There would be a benefit through social inclusion and to the community in general. There would also be benefit in transport integration not delivered through any of the previous options. However it would have a large environmental impact and as mentioned would be costly in terms of construction and timescales for delivery.

5.11 Provision of signal controlled single carriageway pedestrian crossing point

- 5.11.1 As per DMRB Volume 8, Section 5, Part 4, TA 91/05 the introduction of a standalone signalised crossing facility can only be introduced where the 85th percentile speed of traffic is below 50mph. This location as identified in paragraph 2.10 has speeds just slightly in excess of this.
- 5.11.2 The introduction of a signalised crossing will have an effect on traffic flows by the timings associated with crossing phases. With a basic Puffin crossing installation it is estimated that approximately 54 seconds would be required per phase of activation. The average peak flow crossing demand for pedestrians has been calculated at 7.86 per hour, this would mean an interruption to traffic flow of 8 movements per hour totalling 7 mins 12 seconds over the hour. With traffic flows averaged over the 7 day peak period of 1841 per hour this would result in a delay to 30 vehicles per phase (240 over the hour). Resultantly this could mean queuing traffic over a 180 metres length prior to the crossing per phase. This is of particular concern when considering northbound vehicles that emerge over the brow of a hill climbing from the Cadham Junction area. Drivers will not be expecting queuing traffic in what is seen as a relatively rural setting. Even with warning signs installed, such queuing may come as surprise to some drivers, introducing the likelihood of vehicular collisions in this area.
- 5.11.3 The installation of such a crossing in an area where low movements are recorded could also have a negative impact on the safety of crossing pedestrians. Local Transport Note 1/95 'The Assessment of Pedestrian Crossings' notes *'Caution should be exercised where pedestrian flows are generally light or light for long periods of the day. Drivers who become accustomed to not being stopped at the crossing may begin to ignore its existence, with dangerous consequences. The problems are accentuated as vehicle speeds increase.'*
- 5.11.4 The criteria for a controlled crossing can be tested by means of a PV^2 test, which is a recognised indicator for means of testing the need for a controlled crossing at a designated location. The methodology for the PV^2 test is set out in the DMRB Volume 8, Section 5, Part 1, TA 68/9. The PV^2 test analyses the degree of conflict between pedestrians and vehicles, where P is the two way hourly flow for pedestrians and V is the two way hourly flow for vehicles. If a value exceeding 10^8 is met then the guidance suggests a controlled crossing should be considered. Conversely, caution is advised when considering a controlled crossing at values less than 0.4×10^8 as mentioned in the previous paragraph (5.10.3)
- 5.11.5 Within the extents of the study even using the highest single hour of crossing movements throughout the entire study area for a single hour (25 between 15.00-16.00 Sun 16th) the calculation shows that the PV^2 does not meet that criteria at a value of only 0.19×10^8 .
- 5.11.6 Given the results of the PV^2 assessment, the potential for vehicular collisions and the risks identified within LTN 1/95, there is a likelihood that introduction of a signalised crossing would have significant detrimental effect on road safety in this area and therefore has not been considered any further.

5.12 Provision of a grade separated pedestrian crossing facility

- 5.12.1 The safest option for pedestrian crossings of live carriageway is for segregation. However bridges with steps or ramps represent the least suitable form of crossing for disabled people. Consequently, a proposed bridge would require ramps and stairs on either side of the carriageway to allow use by those with mobility impairments or others that may require to use these facilities, thereby complying with the Equality Act. The maximum gradient for the ramp is 1 in 12 and the estimated length of ramp would be around 90 metres long and 2 metres wide, the stairs would also need an area of at least 18 metres by 2 metres wide.
- 5.12.2 The bridge will also require to be protected by a high containment safety barrier moving the bridge further away from the A92 and increasing the area of land required to construct the bridge. Extra footpaths would also be required to connect the ramp and stairs to the existing footway network. It is estimated that the cost of the fully compliant footbridge would be in the region of £1.5m.
- 5.12.3 This option would improve the safety of pedestrians as there would be no need for anyone to cross the A92 at grade. The bridge would however have a major impact on the environment both visually and with the large footprint required for a fully compliant bridge. There would be no effect on transportation integration. There would be a positive effect on the community and active travel as the bridge may encourage more pedestrians/cyclist to cross the carriageway, although given the relatively low pedestrian/cyclist numbers at present, it is unlikely that any increase will be substantial.
- 5.12.4 The installation would require land acquisition on either side of the A92 which would take a longer time period to complete and would need to be purchased. In particular the conservational nature of the location would require further investigation to deem suitability/planning requirements. The cost of the bridge and its associated potential land take requirements is significant in relation the relatively low flow of pedestrians that would use the crossing.

5.13 Extension of the existing footway network

- 5.13.1 At present the footway to the east of the A92 is incomplete and serves little purpose other than to facilitate very occasional crossing movements that occur out with Zones 2 and 6b.
- 5.13.2 Three options exist for the section of footway, the first would be to remove it altogether and return the area to verge thus reducing the possibility of manoeuvres from one side to the other. The second proposal would be to tie the footway into the formal crossing point to the north of the site extents at Balfarg and complete the footway link with Glenrothes. The third option would be to do nothing.
- 5.13.3 Following consultation with Fife Council it is understood the preference would be to complete the footway link on the A92 to the existing formal crossing point at Balfarg junction.

- 5.13.4 The extension to the link would provide a slight improvement in pedestrian safety in providing a link to the crossing point at Balfarg from the footpath located on the east of the A92. Additionally this would complete the route from Glenrothes to the local road 'Tofthill' and may encourage more users to use this facility resulting in a potential positive effect on active travel and social inclusion.
- 5.13.5 There would be a minor impact on the environment with some removal and/or thinning of trees which will be required.
- 5.13.6 It is worth noting that the potential footway would pass a single property which faces the A92 as such consultation would be recommended with the householder to ensure they are content with the plans and if not what measures (such as screening) could be undertaken to prevent any visual intrusion into the property.
- 5.13.7 It is estimated that the footway could be delivered in a relatively short time period (summer 2016). The works described would cost in the region of £40,000, which includes the cost of relocating three lighting columns to the rear of the footway.

6.0 Option Assessment

- 6.1 The proposed options have been tabulated in an assessment matrix below. This compares each of the options against the objectives specified in the brief and details the benefit/impact/neutrality of each.

Option No	Option Description	(+ represents benefit, - represents cost or negative impact)						Environmental Impact*
		Pedestrian Safety	Social Inclusion	Active Travel	Transport Integration	Potential time taken to implement options*	Estimated costs*	
A92 Cadham to Balfarg Pedestrian Assessment								
1	Do nothing	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
2	Speed Limit Reduction	Minor +	Neutral	Neutral	Neutral	Minor -	Neutral	Neutral
3	Fencing/Barrier	Minor +	Minor -	Neutral	Neutral	Minor -	Medium -	Minor -
4	Uncontrolled Crossing including pedestrian activated warning signs	Minor -	Minor +	Minor +	Neutral	Minor -	Minor -	Minor -
5	Uncontrolled Crossing with refuge island & pedestrian activated warning signs	Medium +	Minor +	Minor +	Neutral	Medium -	Medium -	Minor -
6	Uncontrolled crossing with refuge island, including bus bay provision & pedestrian activated warning signs	Medium +	Minor +	Minor +	Minor +	Medium -	Medium -	Major -
7	Grade Separation	Major +	Minor+	Minor +	Neutral	Major -	Major -	Major -
8	A92 Footpath Link	Minor +	Minor +	Minor +	Minor +	Minor +	Minor -	Minor -
9	Cut back vegetation to create a more open environment							

Table 6/1– Assessment Matrix benefit/impact/neutrality

* These are based on assumptions that would require to be confirmed through detailed investigation and further consultation with stakeholders.

6.2 Taking into account the factors outlined in the table above the following next steps are proposed alongside the supporting rationale.

Option No	Option Description	Next Steps	Supporting rationale
1	Do nothing	Do not progress	The report has recognised concerns in relation to pedestrian safety. To do 'nothing' would not address these concerns.
2	Speed Limit Reduction	Proceed with promotion of a reduction to the existing speed limit to 40mph.	Potential conflict with pedestrians with large housing estates either side of A92. No separation of existing footway and carriageway. Correlation of reduction of speeds and severity of injury.
3	Fencing/Barrier	Do not progress	Limited improvement of pedestrian safety Negative effects on social inclusion, environment and costs.
4	Uncontrolled Crossing including pedestrian activated warning signs	Do not progress	Could increase risks with crossing A92 as would expose pedestrians to both traffic flows simultaneously in comparison to the existing arrangement at Zone 2.
5	Uncontrolled Crossing with refuge island & pedestrian activated warning signs	Further Investigation required	Refuge island would require carriageway widening. Due to constraints on site including boundary walls, residential properties and utility diversions further detailed investigations would be required to ascertain viability.
6	Uncontrolled crossing with refuge island, including bus bay provision & pedestrian activated warning signs	Do not progress	Due to large land uptake for bus bays along with environmental impact this is not seen as a viable option.
7	Grade Separation	Do not progress	Significant environmental impact along with high cost of installation for limited crossing movements
8	A92 Footpath Link	Progress	Completing the route from Glenrothes to the local road 'Toftthill' may encourage more users to use this footway resulting in a potential positive effect on active travel and social inclusion. Provides a link to the existing crossing area.

Table 6/2–Option Assessment Results and Supporting Rationale

6.3 In summary it is recommended that the following options demonstrate merit in being progressed:

- Speed limit reduction.
- A92 Footpath link.
- Investigation of the feasibility of a potential uncontrolled crossing with refuge island within Zone 6B including vehicle activated warning signs All crossing options include liaising with Fife Council to understand whether approval can be granted to cut back trees to open up the general area.

7.0 Options Liaison

- 7.1 The options detailed above were discussed with Mr Robert Brown, the grandfather of 9 year old Logan Carrie who died on the A92 at this location in February 2015, and Fife Councillor Billy Pollock. Mr Brown advised that he was supportive of the options to reduce the existing speed limit and provide the A92 footway link. He also informed that the provision of an uncontrolled crossing point with central island is his preferred crossing option.
- 7.2 It was agreed that Mr Brown and Cllr Pollock would be kept updated on the progress of this report and any subsequent actions arising from this.

8.0 Conclusions

- 8.1 Since January 2010 there have been two recorded injury collisions for all accident types within the study extents including one pedestrian collision. In total over the past 25 years there has been two injury collisions involving pedestrians both of which have been recorded as fatalities.
- 8.2 Despite the recent pedestrian fatality, there is not a statistically significant pattern of such collisions. Consequently, whilst the outcome of such a collision is likely to be severe the likelihood of this occurring is very low.
- 8.3 At present the uncontrolled formal crossing facility to the north of the extents (Zone 2) incorporates the vast majority of crossing movements within the area, 79% over the two week study. There is however shown to be some desire, albeit limited, to cross the carriageway near the historic entrance to Balbirnie Park (Zone 6B), with 10% of all crossing movements within the study extents.
- 8.4 The existing number of pedestrians and cyclists crossing the A92 within the study extents is relatively small at 81 per day, this is even lower at Zone 6B with 9 crossings on average per day.
- 8.5 The waiting times to cross the carriageway are not significant generally, however low numbers of waiting times in excess of one minute have been observed.
- 8.6 In light of the aforementioned pedestrian collision history, it is unlikely that the provision of pedestrian crossing improvements at Zone 6B would vastly improve these statistics. However, it would reduce the risks associated with crossing the carriageway in this area and provide improved links for servicing the community.
- 8.7 A number of improvement proposals have been assessed against various objectives including safety, active travel, social inclusion, implementation timescales and costs. This was used to inform the recommendations arrived at in this report.
- 8.8 Firstly it is recommended that pedestrian crossing safety would be improved by lowering vehicle speeds from the existing 50mph to 40mph and that this lowered speed limit

would be appropriate for the nature of this particular area. Consequently a reduction of the existing 50mph speed limit to 40mph should be sought.

- 8.9 Secondly the completion of the footpath link which would serve to provide a route to the recognised crossing area at Balfarg junction thereby improving safety, active travel, social inclusion and accessibility.
- 8.10 The assessment has recognised that there may be potential for the provision of an uncontrolled crossing with refuge island within Zone 6B to include vehicle activated warning signs. However, there are various factors that require further detailed investigation to determine the ultimate feasibility of this option. These considerations would take time to progress in relation to the environmental constraints and other factors which would require extensive consultation with stakeholders. Further detailed consideration would also need to include further cost benefit analysis to enable the viability of this option to be determined against other competing projects.

9.0 Recommendations

- 9.1 It is recommended that a reduction to the existing speed limit from 50mph to 40mph is promoted. The reduced speed limit would be of benefit to general safety in the area, reduce ambiguity of existing speed limits and is thought to be the most appropriate speed for the conditions within the area.
- 9.2 It is also recommended that improvements to existing pedestrian facilities by means of the completion of the existing footpath to the east of the A92 formalising the link from Tofthills Road end to Glenrothes is undertaken.
- 9.3 As identified in paragraph 5.8.6 a number of trees outwith the trunk road boundary lead to a closed environment and create an on-going maintenance burden. It is recommended that if approval is granted following consultation with Fife Council these should be cut back to open up the general area.
- 9.4 In addition to the delivery of these recommended improvement measures, it is also suggested that further detailed investigation is undertaken to determine the feasibility of carriageway widening and the provision of a refuge island at Zone 6B. Subsequent to these considerations and an evaluation of the impacts of the recommended improvement measures identified above (8.1 to 8.3), consideration towards the viability of this option, as required, could then be considered alongside other competing projects in the future.

APPENDIX A

Client Brief



1. TERMS OF REFERENCE

Following death of a 9 year old pedestrian on the A92 between Cadham and Balfarg junction in February 2015, concern has been raised by local residents and representatives over pedestrian safety and the appropriateness of pedestrian crossing facilities in this area.

At present this section of road has a 50mph speed limit in operation and is predominantly single carriageway with a short section of dual carriageway at the northern end of the site. An uncontrolled pedestrian crossing facilities exist on this section of dual carriageway, which is the only recognised pedestrian crossing point within the extent of the site, although it is understood from discussions with local residents and representatives and evident on site that there are other locations with the section where pedestrians cross regularly.

The proposed study should record current pedestrian activity, surveying movements, crossing points, conflicts and numbers and collate pedestrian collision statistics for the area. Using this information, it should then evaluate various options available for improving pedestrian accessibility against the following factors:

Pedestrian safety;
Active Travel;
Social Inclusion;
Environmental impact;
Transport integration;
Projected timescales; and
Value for money.

The options to be considered are:

1. Do nothing;
2. Fencing/barrier installation to restrict ad hoc crossing movement and channel pedestrians to the recognised crossing point;
3. Provision of additional uncontrolled single carriageway pedestrian crossing point at the historical access point to Balbirnie Estate;
4. Provision of additional uncontrolled pedestrian crossing point with central island at the historical access point to Balbirnie Estate;
5. Provision of additional signal controlled single carriageway pedestrian crossing point at the historical access point to Balbirnie Estate;
6. Provision of a grade separated pedestrian crossing facility at the historical access point to Balbirnie Estate
7. Improvements to existing trunk road footway links to the existing recognised crossing point.

As part of the evaluation process it will be necessary to consult with a number of different parties who can assist with providing appropriate information for the assessment, these are not limited to, but should include:

Fife Council – Roads, Planning and Transportation departments;
Public Transport Operators covering both local and trunk road services.

The study will take appropriate consideration of the needs of different users groups as necessary including disabled people (ref: Roads for all: Good Practice Guide for Roads) and cyclists (ref: Cycling by Design 2010)

2. TIMESCALES

A study draft is to be submitted to the Transport Scotland Strategic Road Safety Manager by 6th November 2015 and the report is to be finalised by 4th December 2015. However, it should be noted that these timescales may be affected by forthcoming discussions between Transport Scotland and Fife Council.

Timescales for design and construction will be agreed with Transport Scotland upon acceptance of Study

3. PROCUREMENT

N/A

4. FINANCIAL

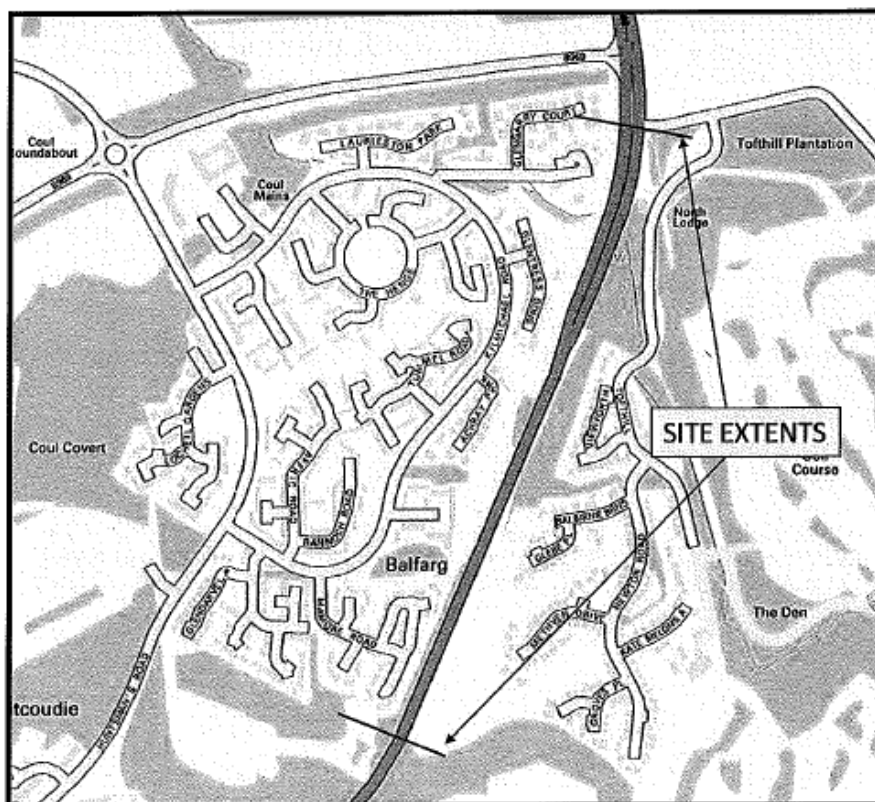
N/A

5. CONTACTS

Transport Scotland 1 st point of contact – Stephen Davies	(0141 272 7389)
Transport Scotland 2 nd point of contact – Stuart Wilson	(0141 272 7389)

BEAR Scotland Ltd – Roads Manager – Alasdair Allen	(01738-448634)
BEAR Scotland Ltd – MI&RS Manager - Alan Campbell	(01738-448644)
BEAR Scotland Ltd – Lead Investigator/Designer – Alan Farnington	(01738-448639)

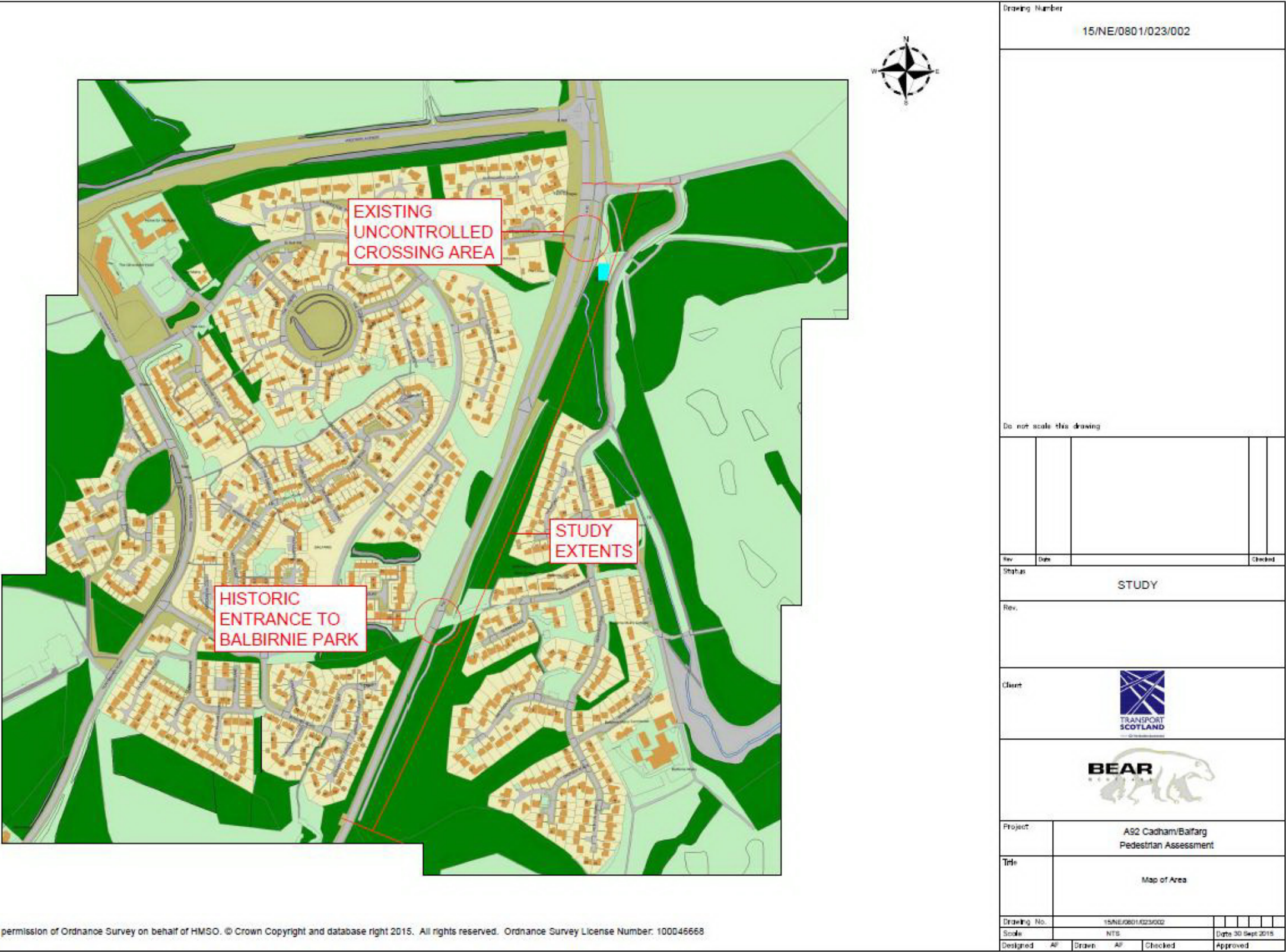
6. Location Extents



APPENDIX B

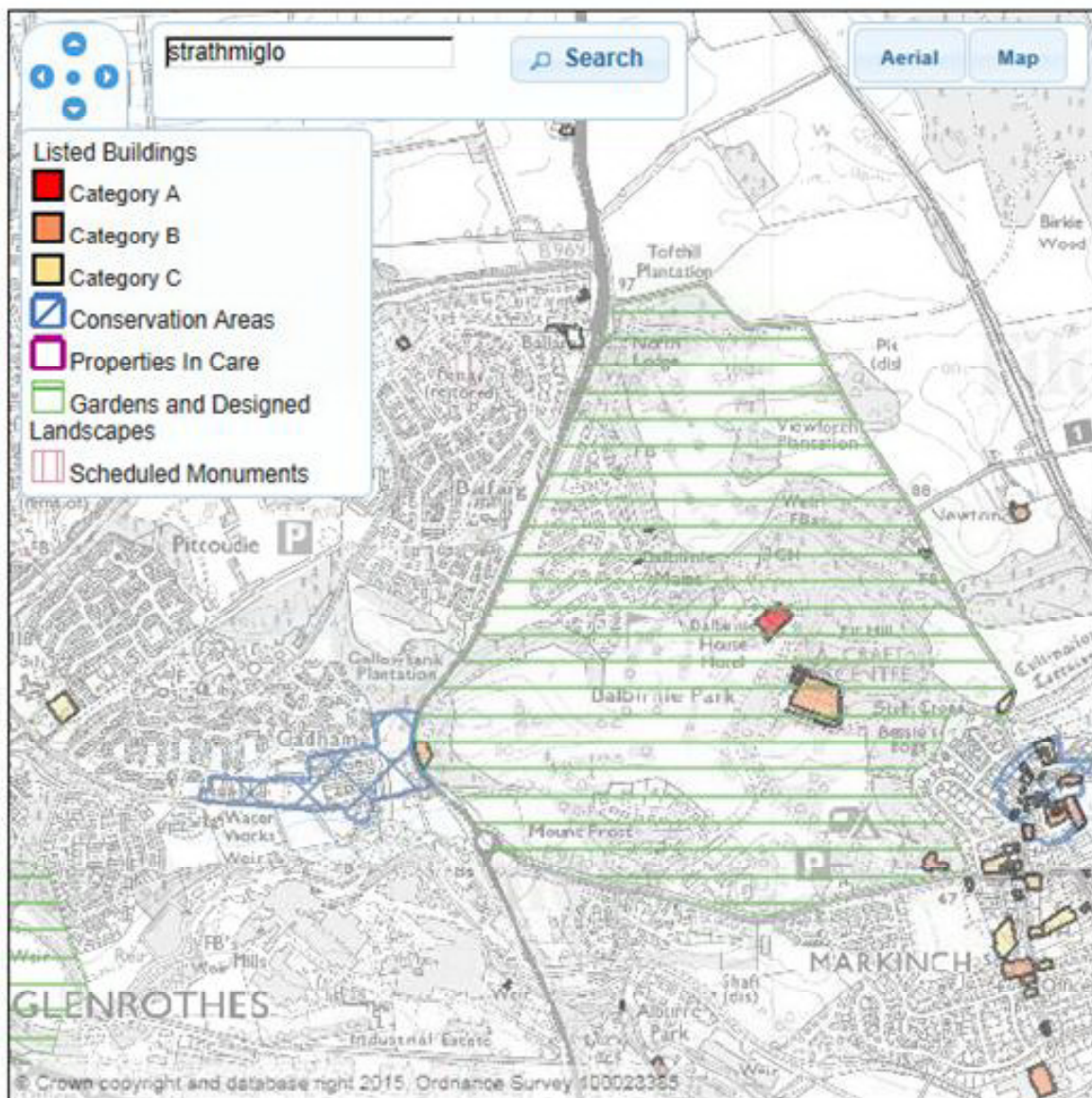
Location Plan



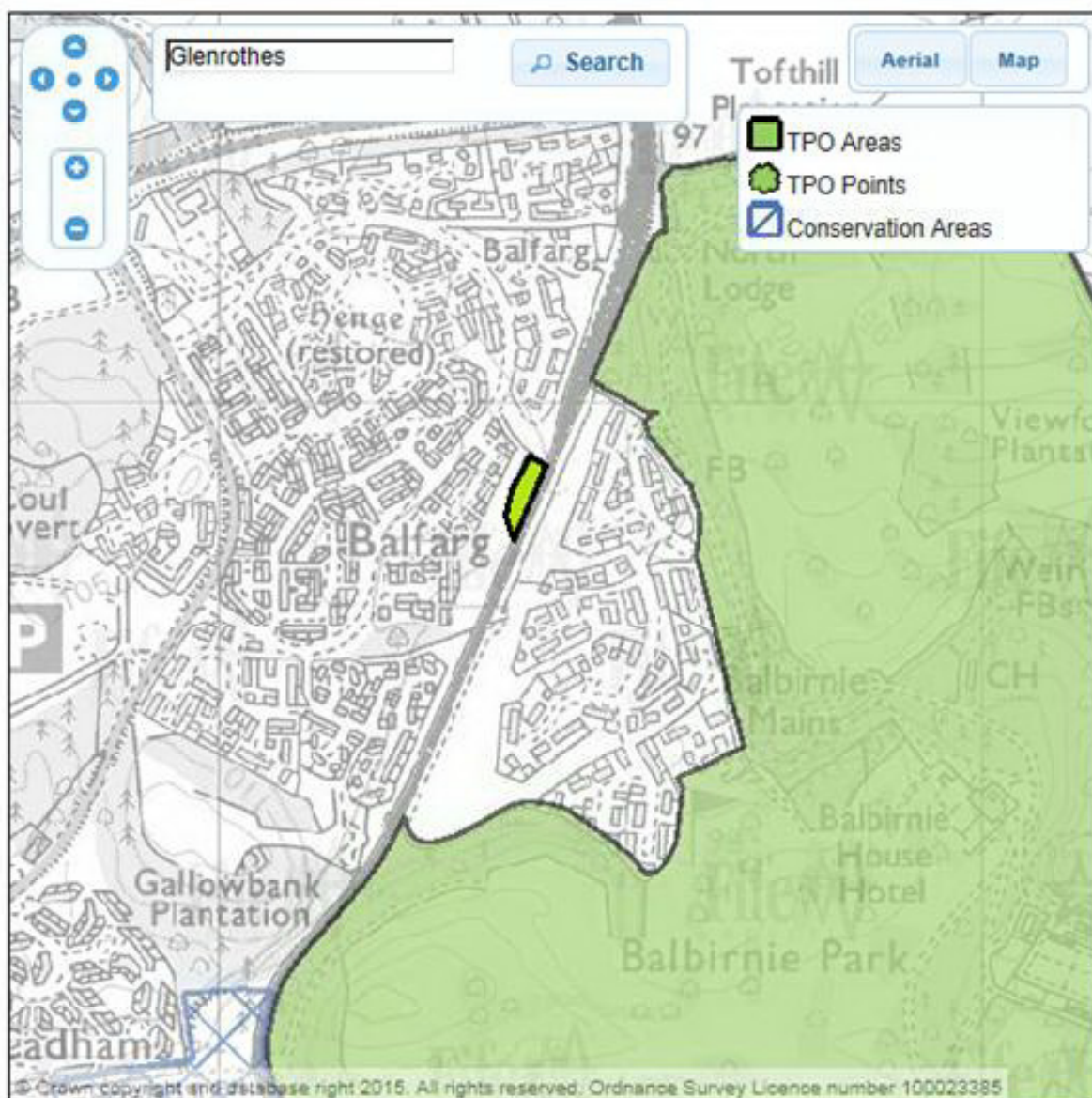


APPENDIX C

Conservational/Tree Preservation and Dwellings Maps



Conservational map of Balfarg showing Garden and landscape area of Balbirnie Park



Tree preservation map of Balfarg



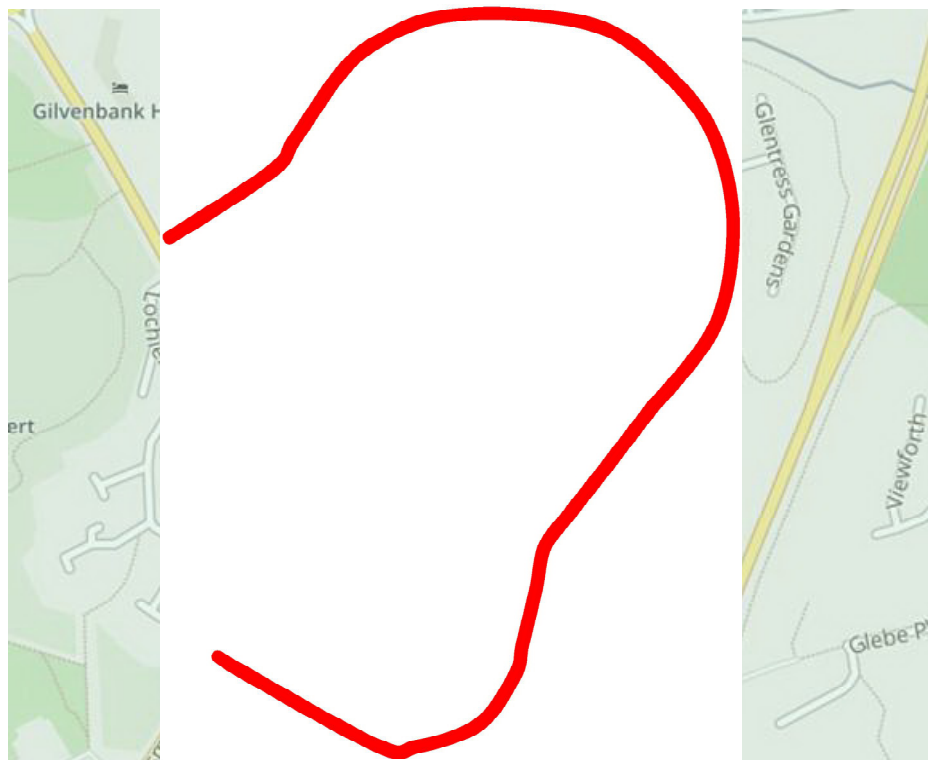
Map of property dwellings



APPENDIX D

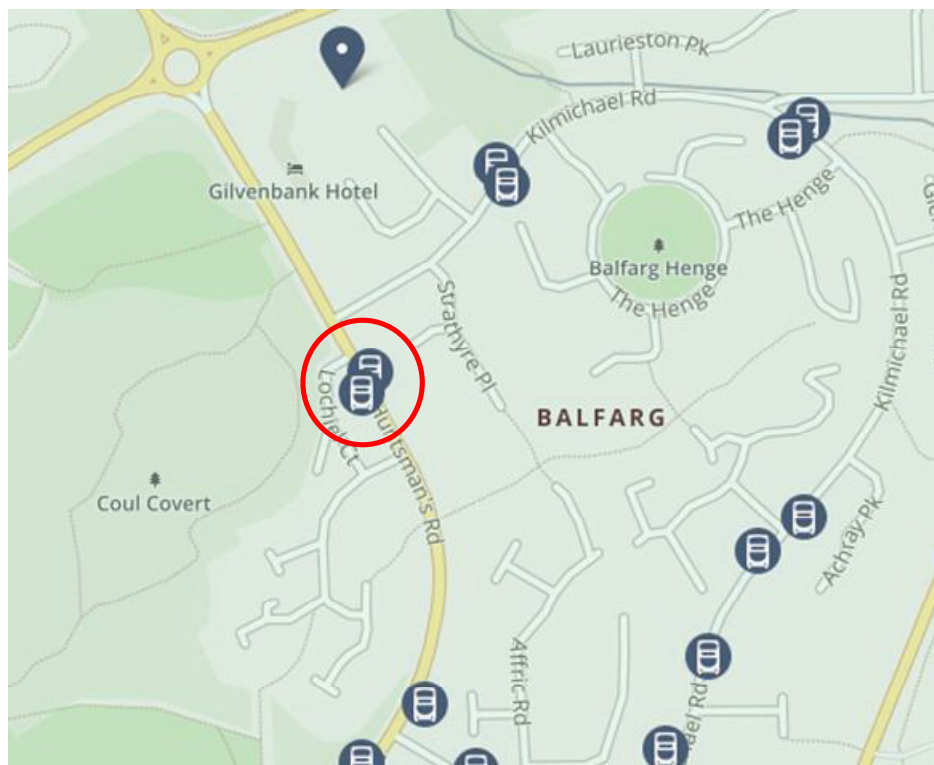
Bus Service Information

Bus Services: Kilmichael Road



Services through this Stop		
37 Glenrothes - Pitcairn circular <i>Stagecoach in Fife</i>	Download Timetable	
4 Glenrothes - Collydean <i>Moffat & Williamson</i>	Download Timetable	
GR1 Balfarg - Glenrothes High School <i>Stagecoach in Fife</i>	Download Timetable	
GR2 Balfarg - Glenrothes High School <i>Stagecoach in Fife</i>	Download Timetable	
PC1 Balfarg - Pitcoudie Primary School <i>Stagecoach in Fife</i>	Download Timetable	
SP5 Balfarg - Rimpleton St Pauls PS <i>Stagecoach in Fife</i>	Download Timetable	
X37 Kirkcaldy - Glenrothes <i>Stagecoach in Fife</i>	Download Timetable	

Bus Services: Huntsman's Road



Services through this Stop

36

Glenrothes - Perth

Stagecoach in Fife

 [Download Timetable](#) 

36A

Glenrothes - Perth

Stagecoach in Fife

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4

Glenrothes - Collydean

Moffat & Williamson

 [Download Timetable](#) 

GR1

Balfarg - Glenrothes High School

Stagecoach in Fife

 [Download Timetable](#) 

GR2

Balfarg - Glenrothes High School

Stagecoach in Fife

 [Download Timetable](#) 

SH9

Strathmiglo - Kirkcaldy St Andrews HS

Stagecoach in Fife

 [Download Timetable](#) 

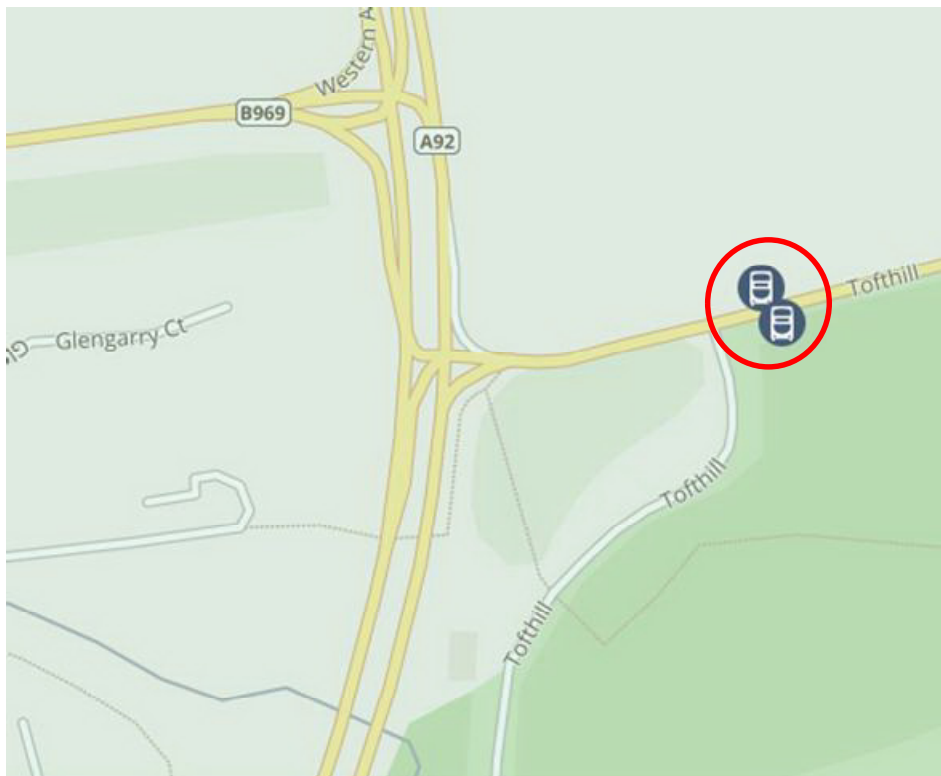
SP5

Balfarg - Rimbleton St Pauls PS

Stagecoach in Fife

 [Download Timetable](#) 

Bus Services: Tofthill Drive Road End



Services through this Stop

67B

Glenrothes - Markinch and Kingskettle

Stagecoach in Fife

 [Download Timetable](#) 

AH4

Markinch - Auchmuty High School

Moffat & Williamson

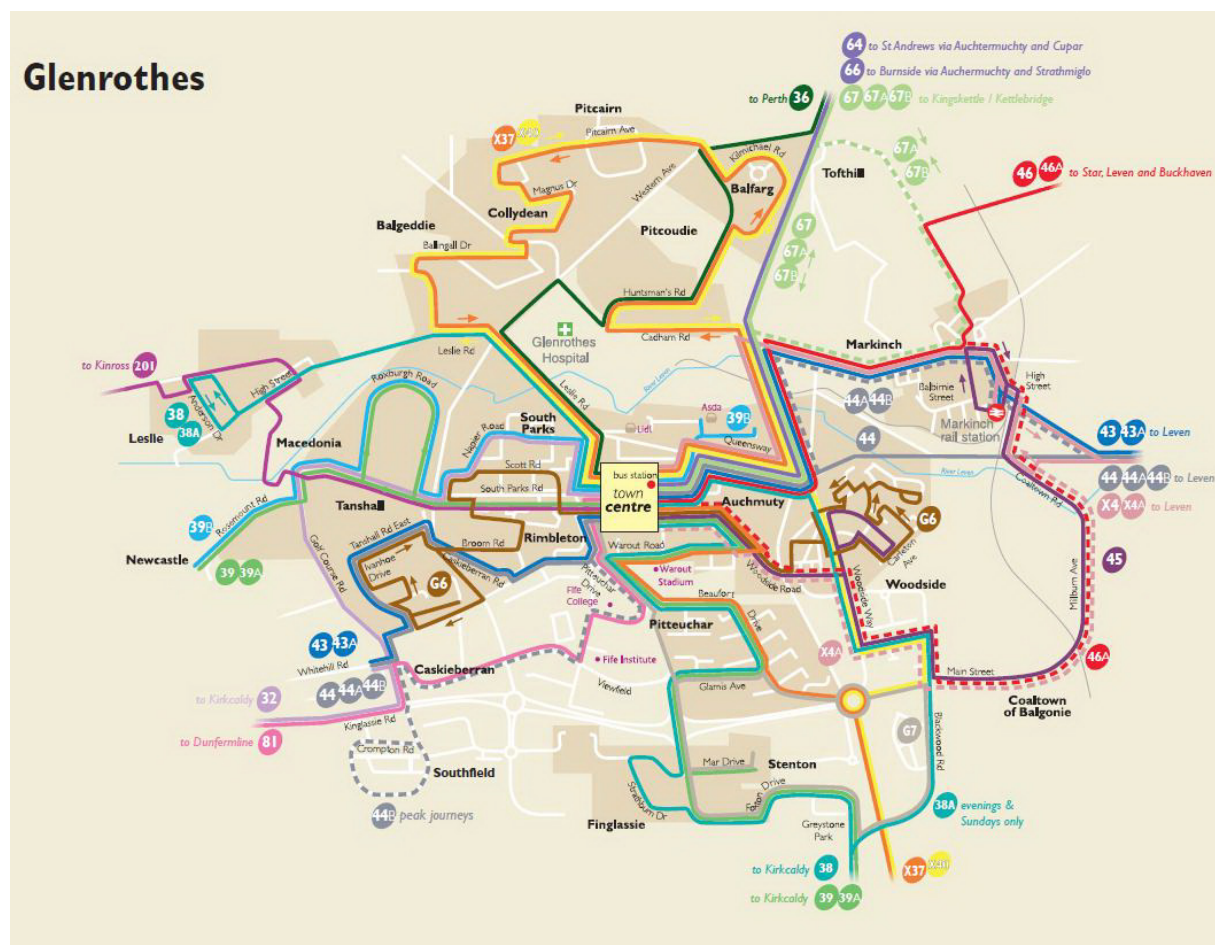
 [Download Timetable](#) 

MK

Balbirnie Mains - Markinch Primary School

Hamish Gordon

 [Download Timetable](#) 



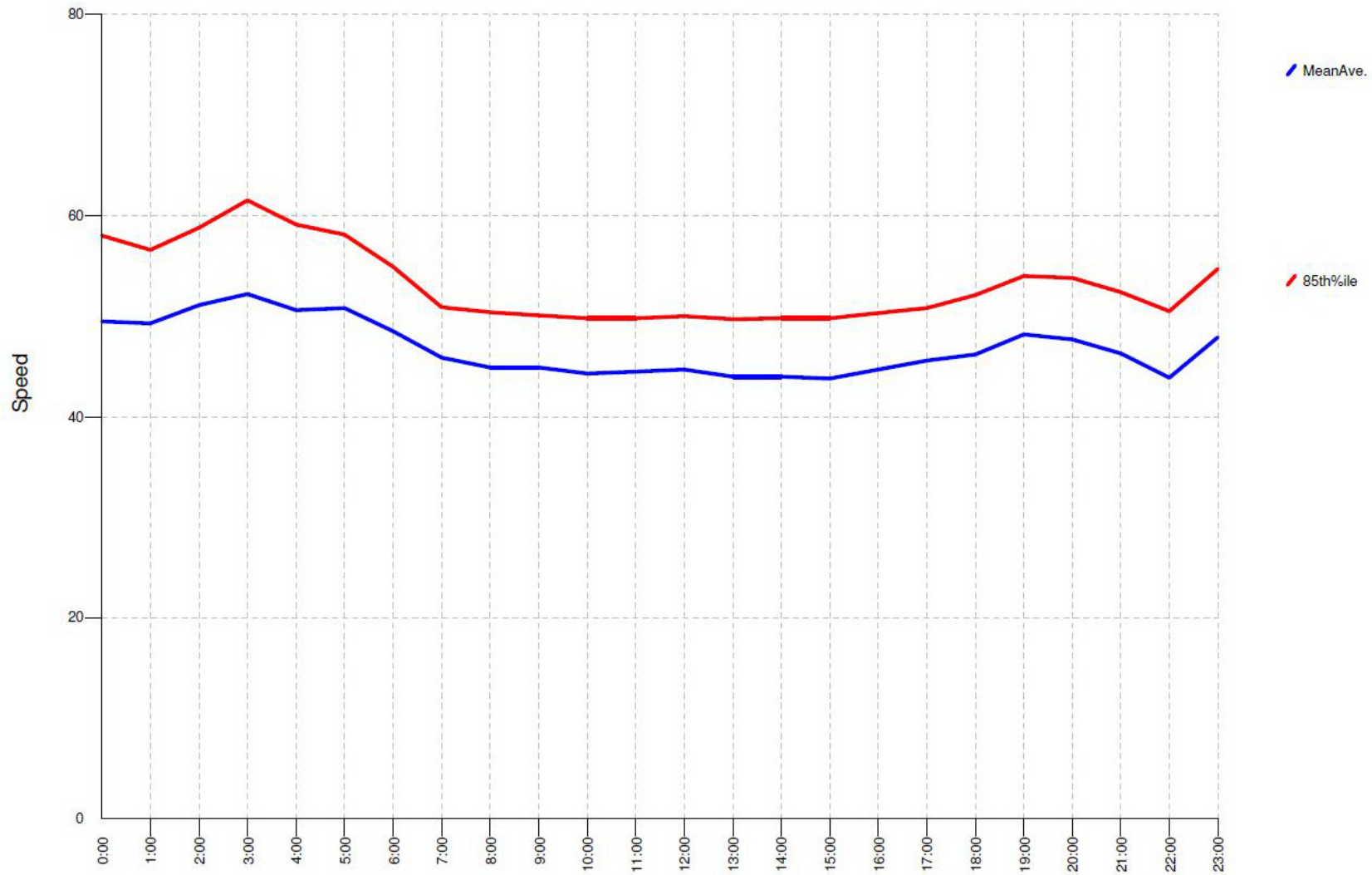
Stagecoach East map of services Glenrothes

APPENDIX E

Speed Surveys/AADT



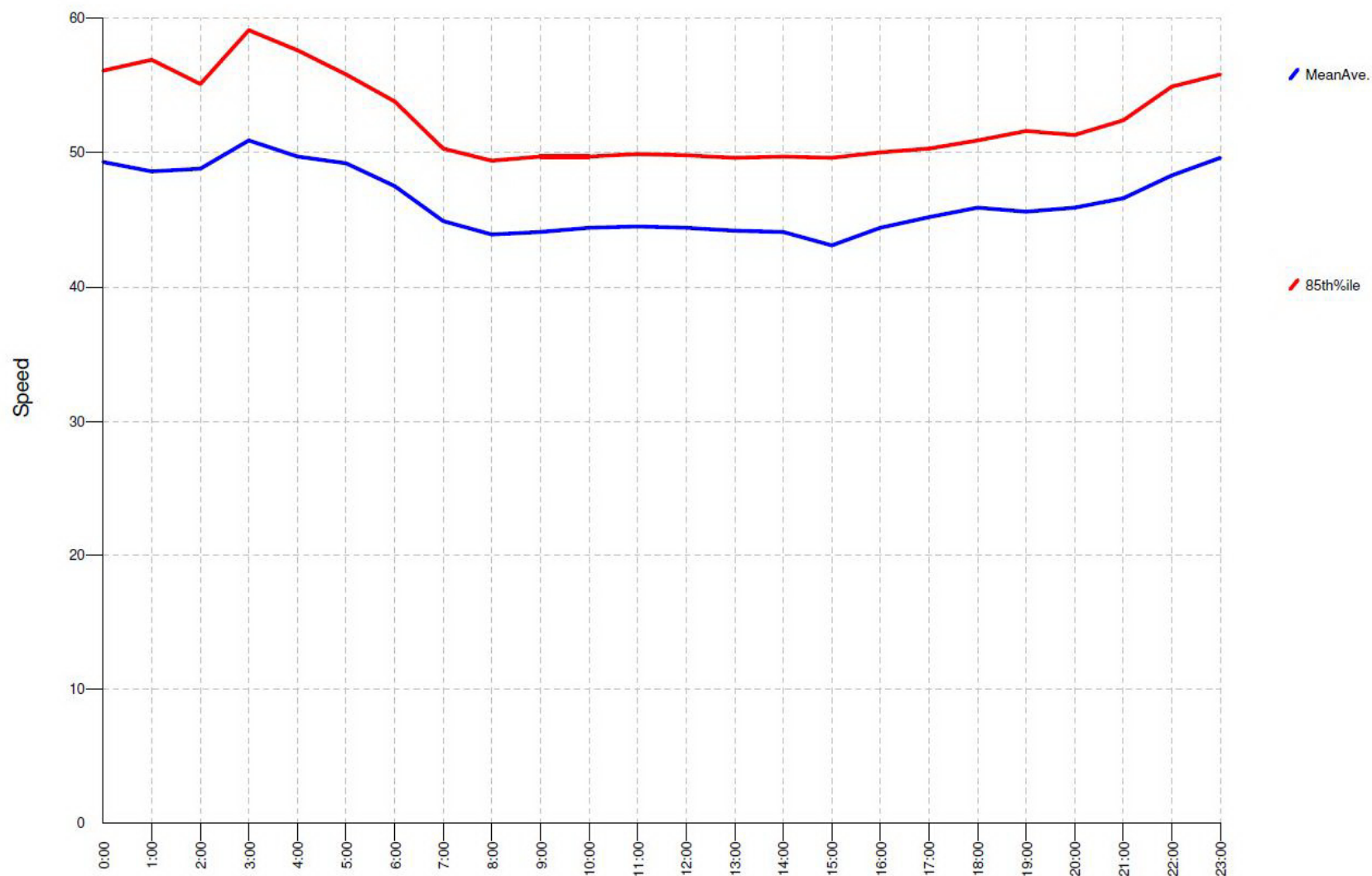
A92 - Adjacent to Balbirnie Park, Both Directions



7th August to 17th August 2015 Speed(Mph): Site No. 00000201



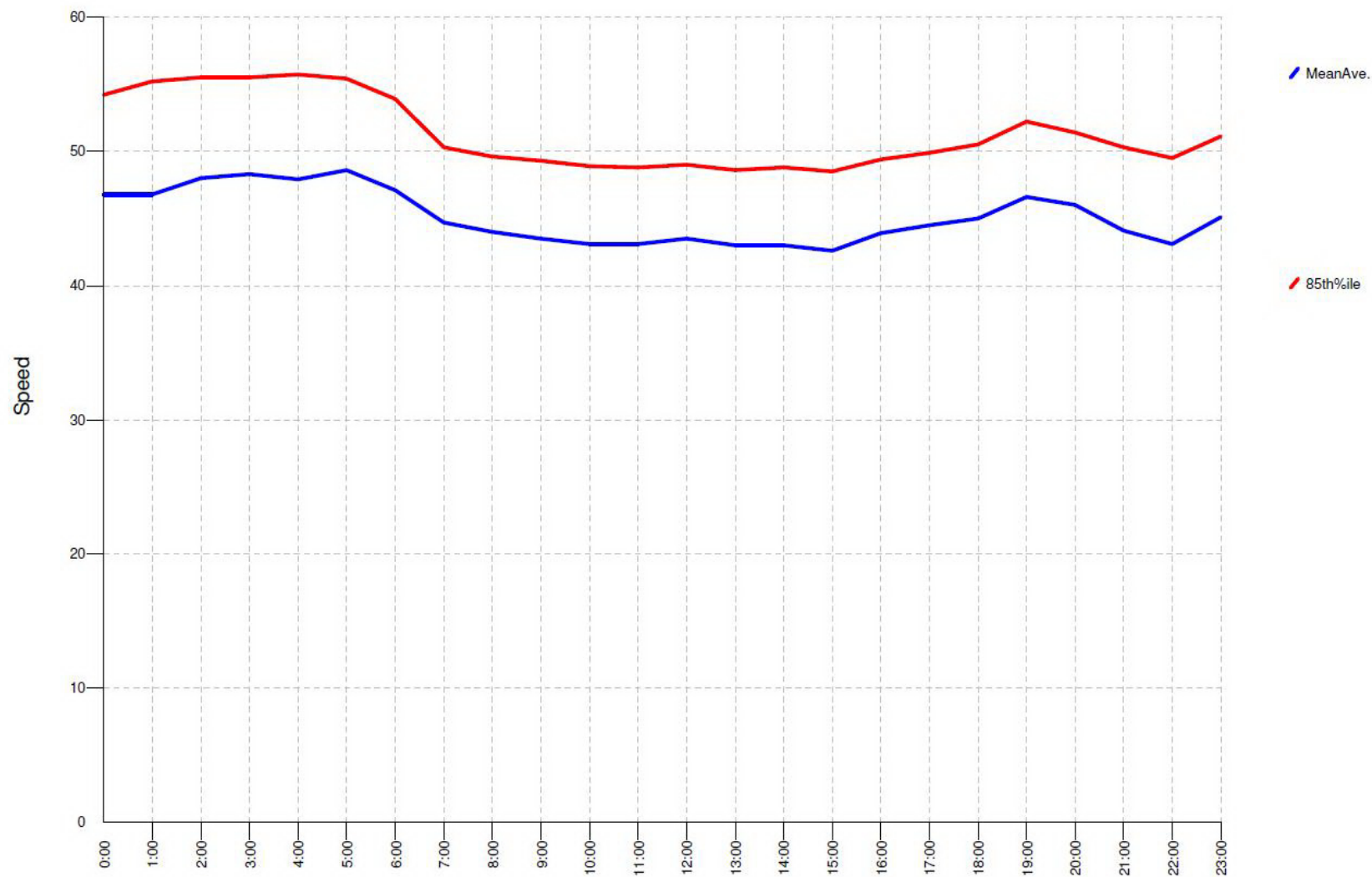
A92 - Adjacent to Balbirnie Park, Both Directions



28th August to 7th September 2015 Speed(Mph): Site No. 00000201



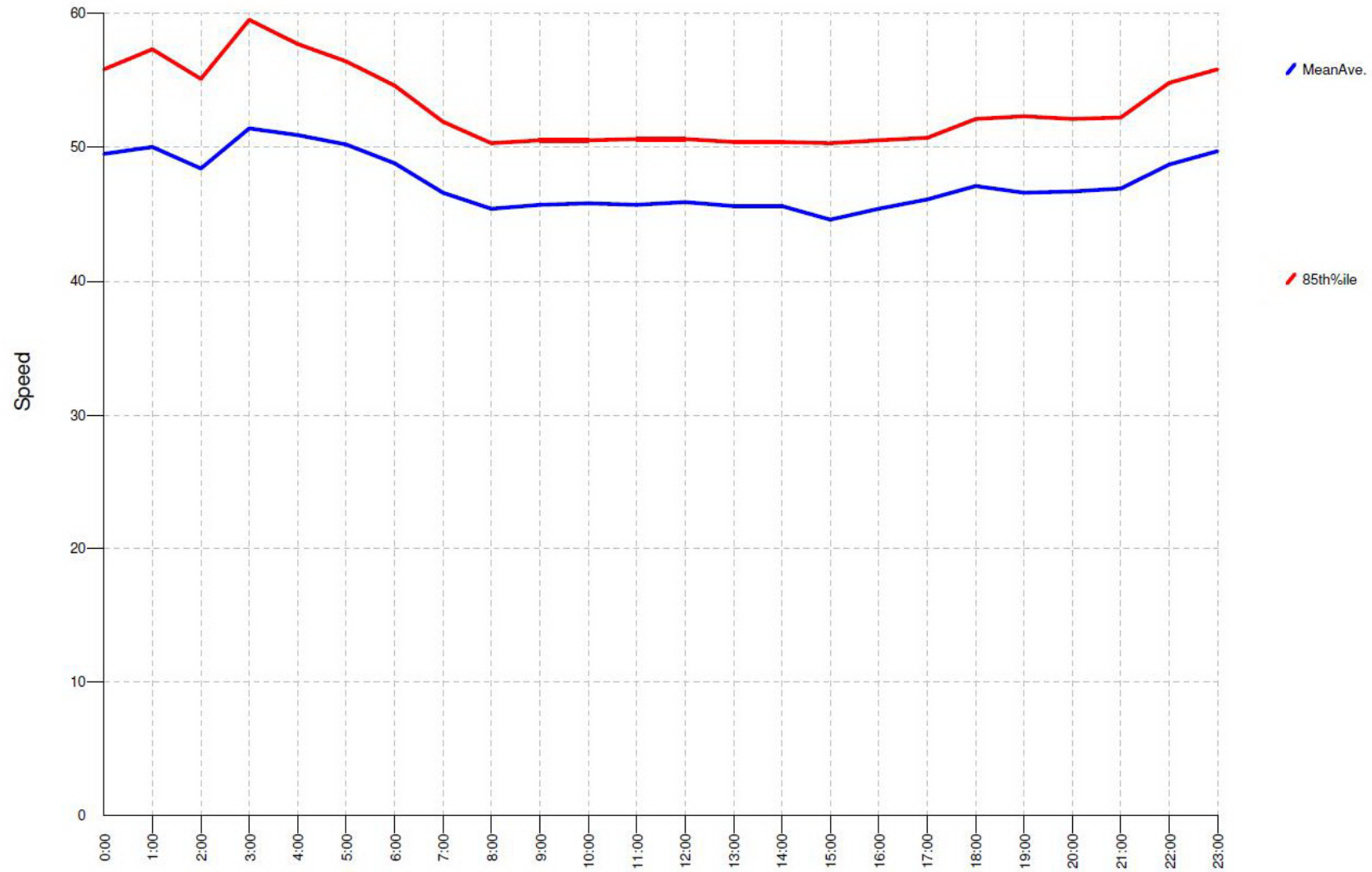
A92 - Single to Dual Balfarg, Both Directions



7th August to 14th August 2015 Speed(Mph): Site No. 00000202



A92 - Single to Dual Balfarg, Both Directions



28th August to 7th September 2015 Speed(Mph): Site No. 00000202



**TERM CONTRACT FOR THE MANAGEMENT AND MAINTENANCE OF
THE SCOTTISH TRUNK ROAD NETWORK - NORTH EAST UNIT
A92 CADHAM TO BALFARG - PEDESTRIAN ACCESSIBILITY ASSESSMENT**

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A92 recorded from the Scottish Roads Traffic Database for August 2015

JTC00304	A9	104322 NW	01AUG2015	24	26	10733	275	654	226	68	45	10076	212	631	236	64	23246
JTC00304	A9	104322 NW	02AUG2015	24	44	8388	176	466	240	31	24	10991	225	578	210	30	21403
JTC00304	A9	104322 NW	03AUG2015	24	35	8911	240	1089	687	53	41	7703	171	891	580	51	20452
JTC00304	A9	104322 NW	04AUG2015	24	20	7764	156	1055	690	49	10	7078	116	991	730	48	18707
JTC00304	A9	104322 NW	05AUG2015	24	9	8139	172	1032	726	55	14	7641	112	982	699	50	19631
JTC00304	A9	104322 NW	06AUG2015	24	40	8984	202	1123	678	60	36	8529	175	1100	676	56	21659
JTC00304	A9	104322 NW	07AUG2015	24	53	10706	219	1081	548	52	39	9993	204	1145	644	66	24750
JTC00304	A9	104322 NW	08AUG2015	24	42	10603	208	658	218	50	47	10975	258	687	247	64	24057
JTC00304	A9	104322 NW	09AUG2015	24	51	8520	150	502	246	43	65	10936	313	692	209	38	21765
JTC00304	A9	104322 NW	10AUG2015	24	26	9060	174	1036	731	60	29	8070	155	881	617	65	20904
JTC00304	A9	104322 NW	11AUG2015	24	33	8186	134	1017	674	48	30	7773	132	971	754	62	19814
JTC00304	A9	104322 NW	12AUG2015	24	32	8300	147	1027	708	68	28	7903	150	1002	770	52	20187
JTC00304	A9	104322 NW	13AUG2015	24	31	8399	133	1012	720	52	40	8655	174	1033	715	56	21020
JTC00304	A9	104322 NW	14AUG2015	24	37	9978	235	1055	560	50	33	9681	196	1134	621	71	23651
JTC00304	A9	104322 NW	15AUG2015	24	47	10385	149	642	229	78	39	10042	162	631	239	67	22710
JTC00304	A9	104322 NW	16AUG2015	24	40	8501	131	432	237	31	67	10025	235	557	197	41	20494
JTC00304	A9	104322 NW	17AUG2015	24	44	8561	139	1096	677	61	33	7654	155	848	616	66	19950
JTC00304	A9	104322 NW	18AUG2015	24	27	7073	120	998	743	53	24	6943	102	965	756	61	17865
JTC00304	A9	104322 NW	19AUG2015	24	18	7169	97	1032	752	61	23	7160	115	1020	780	52	18279
JTC00304	A9	104322 NW	20AUG2015	24	14	7492	103	1058	721	58	23	7649	108	1060	750	63	19099
JTC00304	A9	104322 NW	21AUG2015	24	46	9737	174	1009	590	61	23	8736	166	1096	649	79	22366
JTC00304	A9	104322 NW	22AUG2015	24	34	9213	142	602	237	57	26	9023	174	619	253	57	20437
JTC00304	A9	104322 NW	23AUG2015	24	47	8658	143	456	245	40	63	9956	190	582	186	41	20607
JTC00304	A9	104322 NW	24AUG2015	24	26	7977	150	1090	689	73	26	7122	114	894	672	67	18900
JTC00304	A9	104322 NW	25AUG2015	24	24	7316	107	977	744	58	14	6994	101	964	718	56	18073
JTC00304	A9	104322 NW	26AUG2015	24	23	7316	111	994	777	63	16	7477	119	1034	775	68	18773
JTC00304	A9	104322 NW	27AUG2015	24	104	7715	127	1015	737	52	27	8057	99	1070	759	55	19817
JTC00304	A9	104322 NW	28AUG2015	24	506	10265	207	1079	594	61	36	9344	146	1064	666	84	24052
JTC00304	A9	104322 NW	29AUG2015	24	158	9722	118	590	255	65	130	9535	129	615	267	60	21644
JTC00304	A9	104322 NW	30AUG2015	24	62	8445	85	401	243	38	353	10204	198	629	196	38	20892
JTC00304	A9	104322 NW	31AUG2015	24	32	7575	128	857	670	59	342	8183	192	821	614	63	19536

AADT Aug 15 **20798**

ADDT august 2015 (sourced from Transport Scotland)



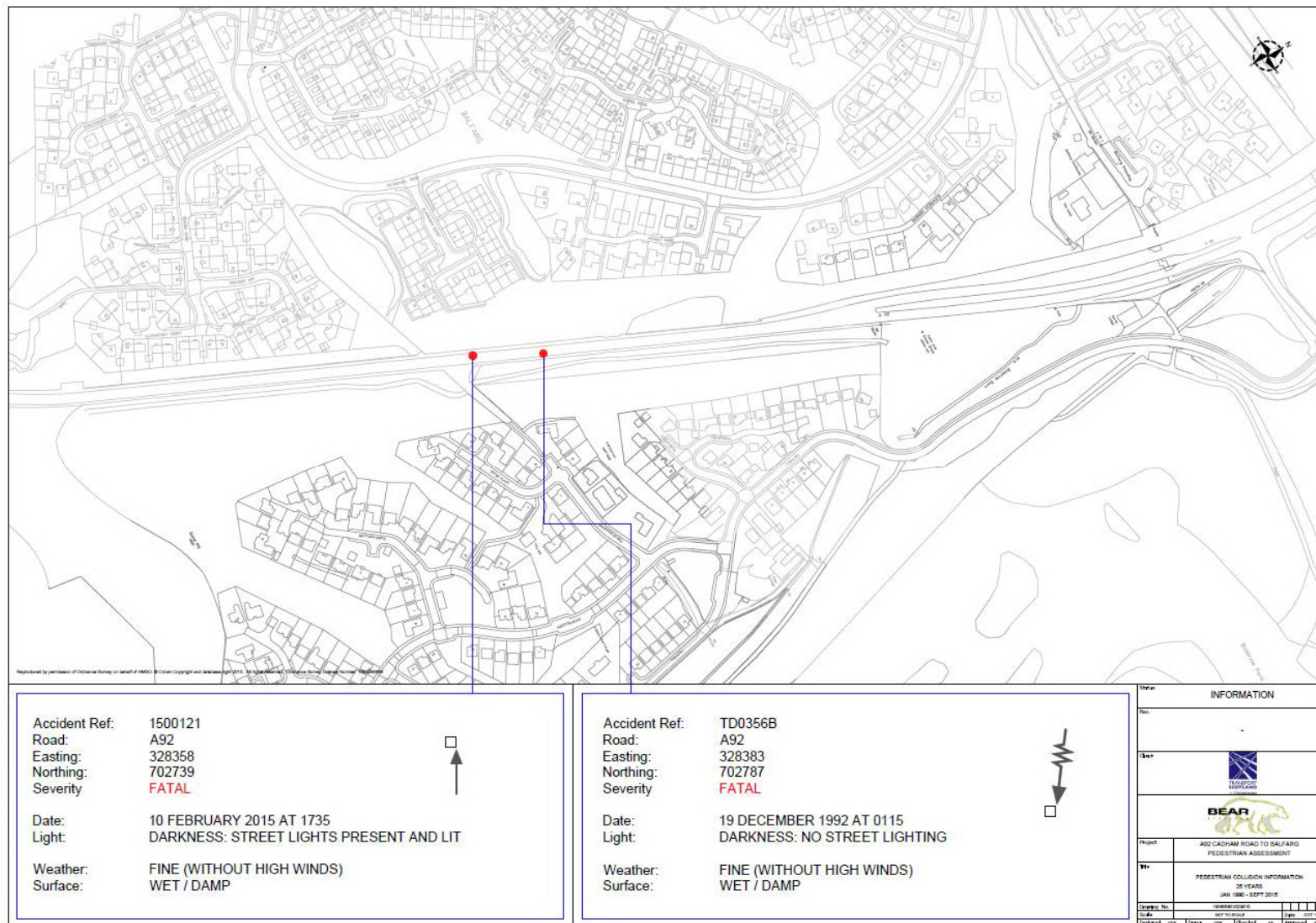
APPENDIX F

Collision History



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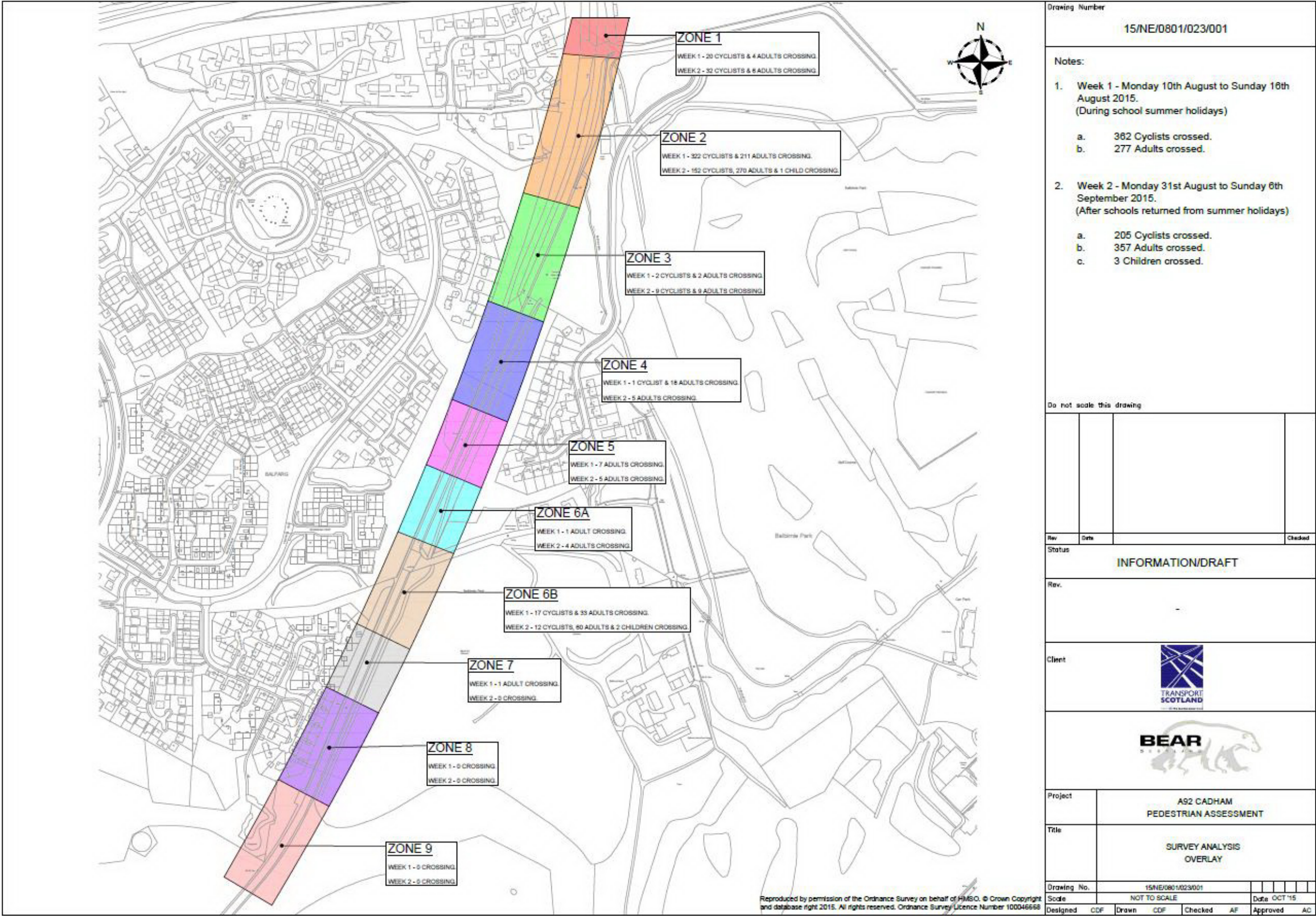
25 Year Collision information (Pedestrian Only) Jan 1990 – Sept 2015



APPENDIX G

Pedestrian Survey Data





Overall Plan of Zones including crossing movements



Week 1 (Monday 10th August to Sunday 16th August 2015)																			
	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday						
	Pedestrian	Pedal Cycle	Pedestrian	Pedal Cycle	Pedestrian	Pedal Cycle	Pedestrian	Pedal Cycle	Pedestrian	Pedal Cycle	Pedestrian	Pedal Cycle	Pedestrian	Pedal Cycle	Total Pedestrian	Total Pedal Cycle	Total	% of Total	
Zone 1	0	2	0	17	0	0	0	0	0	0	4	0	0	1	4	20	24	3.76	
Zone 2	26	22	32	46	47	44	27	61	19	7	31	70	29	72	211	322	533	83.41	
Zone 3	0	1	2	1	0	0	0	0	0	0	0	0	0	0	2	2	4	0.63	
Zone 4	1	0	2	1	10	0	1	0	4	0	0	0	0	0	18	1	19	2.97	
Zone 5	1	0	2	0	1	0	3	0	0	0	0	0	0	0	7	0	7	1.10	
Zone 6A	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0.16	
Zone 6B	3	2	2	4	6	2	7	2	3	5	9	2	3	0	33	17	50	7.82	
Zone 7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0.16	
Zone 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Zone 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	31	27	40	69	66	46	38	63	26	12	44	72	32	73	277	362	639	100	
															% of Total				
Total	58		109		112		101		38		116		105		43.35	56.65			

Week 1 Day by Day

Week 2 (Monday 31st August to Sunday 6th September 2015)																							
	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday				
	Pedal Cycle	Adult	Child	Pedal Cycle	Adult	Child	Pedal Cycle	Adult	Child	Pedal Cycle	Adult	Child	Pedal Cycle	Adult	Child	Pedal Cycle	Adult	Child	Pedal Cycle	Adult	Child	Total	% of Total
Zone 1	7	3	0	1	0	0	7	0	0	1	0	0	7	0	0	8	0	0	1	3	0	32	38
Zone 2	11	19	0	10	45	0	42	15	0	7	26	0	9	52	1	22	41	0	51	72	0	152	74.60
Zone 3	1	0	0	2	0	0	2	1	0	2	2	0	1	1	0	0	3	0	1	2	0	9	18
Zone 4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	5
Zone 5	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	5
Zone 6A	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	4
Zone 6B	1	6	0	2	2	0	2	10	0	2	5	0	1	12	0	2	11	0	2	14	2	12	74
Zone 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Zone 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zone 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	29	0	15	49	0	53	26	0	12	34	0	18	67	1	32	61	0	55	93	2	205	567
Total	49			64			79			46			86			93			150			36.16	63.32

Week 2 Day by Day



		Zone 1							Zone 2							Zone 3							Zone 4					
		Number of:			Averages				Number of:			Averages				Number of:			Averages				Number of:			Averages		
		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle
Monday 10th August		2	0	0	3	9	1		22	26	0	8	18	5		1	0	0	1	4	9		0	1	0	-	-	-
Monday 31st August		7	3	0	9	9	5		11	19	0	11	20	6		1	0	0	5	11	1		0	1	0	1	7	2
Tuesday 11th August		17	0	0	1	9	4		46	32	0	6	19	4		1	2	0	6	5	2		1	2	0	4	1	5
Tuesday 1st September		1	0	0	6	9	2		10	45	0	5	15	5		2	0	0	25	23	2		0	0	0	-	-	-
Wednesday 12th August		0	0	0	-	-	-		44	47	0	9	18	4		0	0	0	-	-	-		0	10	0	11	5	13
Wednesday 2nd September		7	0	0	5	18	9		42	15	0	10	12	5		2	1	0	5	26	6		0	0	0	-	-	-
Thursday 13th August		0	0	0	-	-	-		61	27	0	18	19	4		0	0	0	-	-	-		0	1	0	22	13	?
Thursday 3rd September		1	0	0	4	14	5		7	26	0	14	15	6		2	2	0	7	10	6		0	0	0	-	-	-
Friday 14th August		0	0	0	-	-	-		7	19	0	6	16	8		0	0	0	-	-	-		0	4	0	8	5	18
Friday 4th September		7	0	0	8	11	4		9	52	1	10	21	4		1	1	0	1	16	1		0	0	0	-	-	-
Saturday 15th August		0	4	0	-	-	-		70	31	0	10	18	7		0	0	0	-	-	-		0	0	0	-	-	-
Saturday 5th September		8	0	0	5	22	2		22	41	0	6	22	4		0	3	0	22	11	5		0	3	0	0	7	10
Sunday 16th August		1	0	0	-	-	-		72	29	0	10	17	7		0	0	0	-	-	-		0	0	0	-	-	-
Sunday 6th September		1	3	0	6	11	5		51	72	0	7	22	4		1	2	0	13	12	10		0	1	0	2	6	1
		Zone 5							Zone 6A							Zone 6B							Zone 7					
		Number of:			Averages				Number of:			Averages				Number of:			Averages				Number of:			Averages		
		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle
Monday 10th August		0	1	0	1	3	7		0	0	0	-	-	-		2	3	0	23	6	5		0	0	0	-	-	-
Monday 31st August		0	0	0	-	-	-		0	0	0	-	-	-		1	6	0	9	5	6		0	0	0	-	-	-
Tuesday 11th August		0	2	0	13	6	3		0	0	0	-	-	-		4	2	0	28	3	7		0	0	0	-	-	-
Tuesday 1st September		0	2	0	8	4	4		0	0	0	-	-	-		2	2	0	16	5	8		0	0	0	-	-	-
Wednesday 12th August		0	1	0	4	5	1		0	1	0	4	6	19		2	6	0	17	6	10		0	1	0	44	4	4
Wednesday 2nd September		0	0	0	-	-	-		0	0	0	-	-	-		2	10	0	2	5	4		0	0	0	-	-	-
Thursday 13th August		0	3	0	2	8	58		0	0	0	-	-	-		2	7	0	16	6	6		0	0	0	-	-	-
Thursday 3rd September		0	0	0	-	-	-		0	1	0	0	7	6		2	5	0	6	4	4		0	0	0	-	-	-
Friday 14th August		0	0	0	-	-	-		0	0	0	-	-	-		3	5	0	19	6	3		0	0	0	-	-	-
Friday 4th September		0	2	0	6	4	5		0	0	0	-	-	-		1	12	0	22	5	5		0	0	0	-	-	-
Saturday 15th August		0	0	0	-	-	-		0	0	0	-	-	-		2	9	0	30	5	9		0	0	0	-	-	-
Saturday 5th September		0	0	0	-	-	-		0	3	0	7	5	7		2	11	0	14	5	7		0	0	0	-	-	-
Sunday 16th August		0	0	0	-	-	-		0	0	0	-	-	-		0	3	0	63	6	11		0	0	0	-	-	-
Sunday 6th September		0	1	0	1	6	0		0	0	0	-	-	-		2	14	2	7	4	7		0	0	0	-	-	-
		Zone 8							Zone 9																			
		Number of:			Averages				Number of:			Averages																
		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle		PC	Adult	Child	Waiting Time	Time to Cross	Time to First Vehicle														
Monday 10th August		0	0	0	-	-	-		0	0	0	-	-	-														
Monday 31st August		0	0	0	-	-	-		0	0	0	-	-	-														
Tuesday 11th August		0	0	0	-	-	-		0	0	0	-	-	-														
Tuesday 1st September		0	0	0	-	-	-		0	0	0	-	-	-														
Wednesday 12th August		0	0	0	-	-	-		0	0	0	-	-	-														
Wednesday 2nd September		0	0	0	-	-	-		0	0	0	-	-	-														
Thursday 13th August		0	0	0	-	-	-		0	0	0	-	-	-														
Thursday 3rd September		0	0	0	-	-	-		0	0	0	-	-	-														
Friday 14th August		0	0	0	-	-	-		0	0	0	-	-	-														
Friday 4th September		0	0	0	-	-	-		0	0	0	-	-	-														
Saturday 15th August		0	0	0	-	-	-		0	0	0	-	-	-														
Saturday 5th September		0	0	0	-	-	-		0	0	0	-	-	-														
Sunday 16th August		0	0	0	-	-	-		0	0	0	-	-	-														

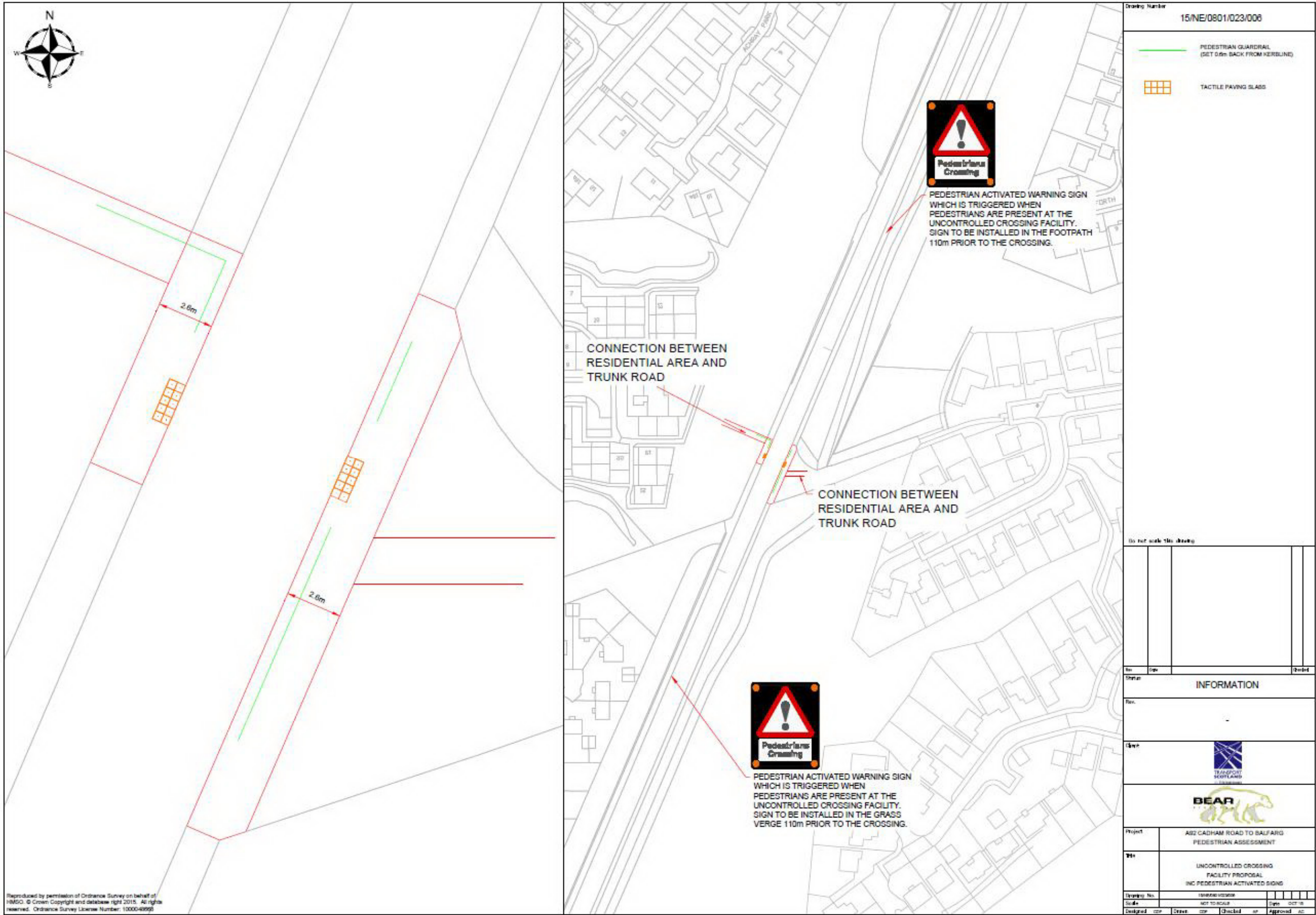
Waiting times for crossing



APPENDIX H

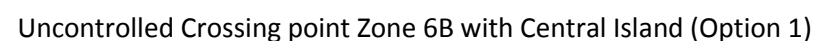
OPTION PROPOSALS

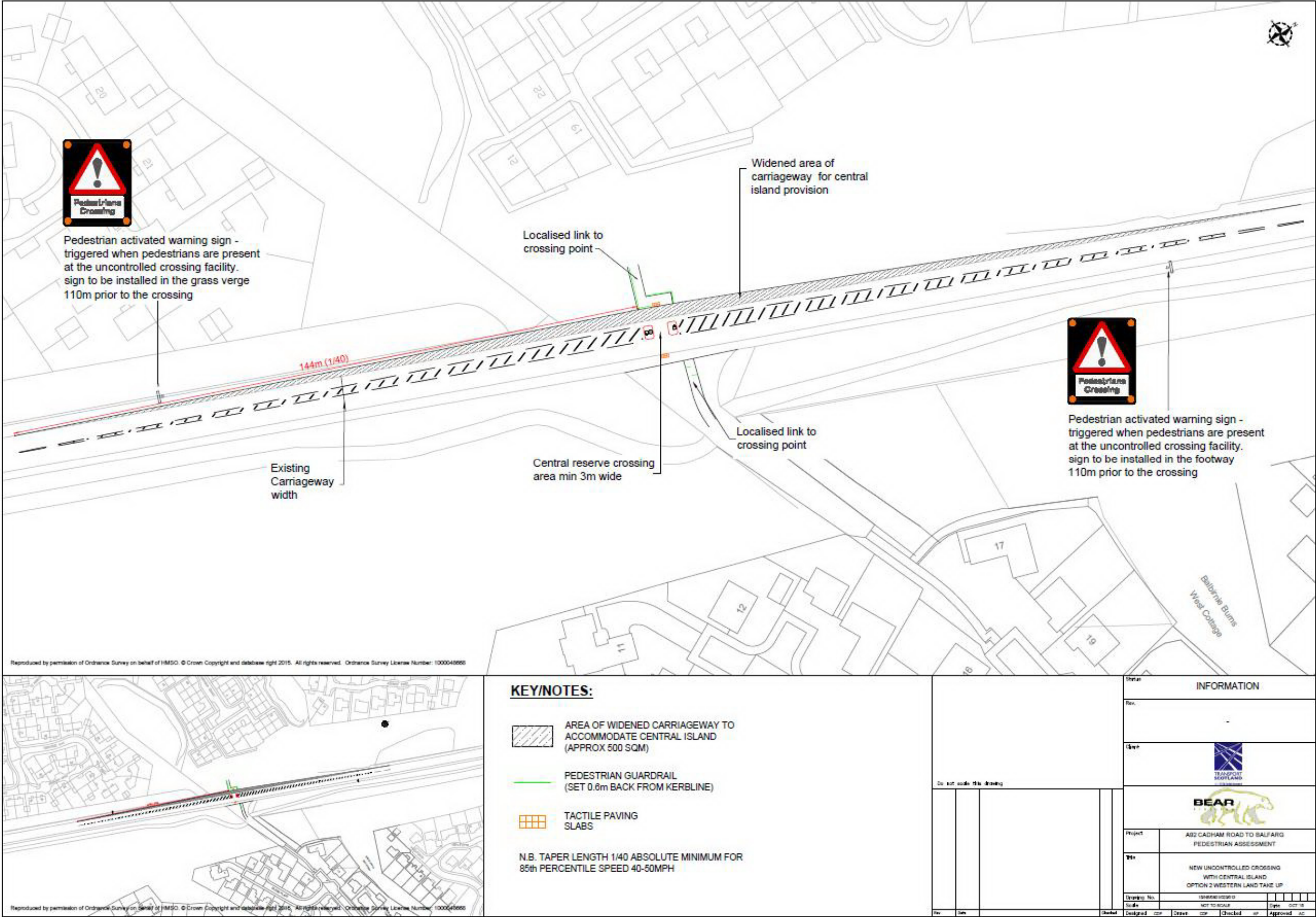




Uncontrolled Crossing point with Pedestrian Activated Signs at Zone 6B

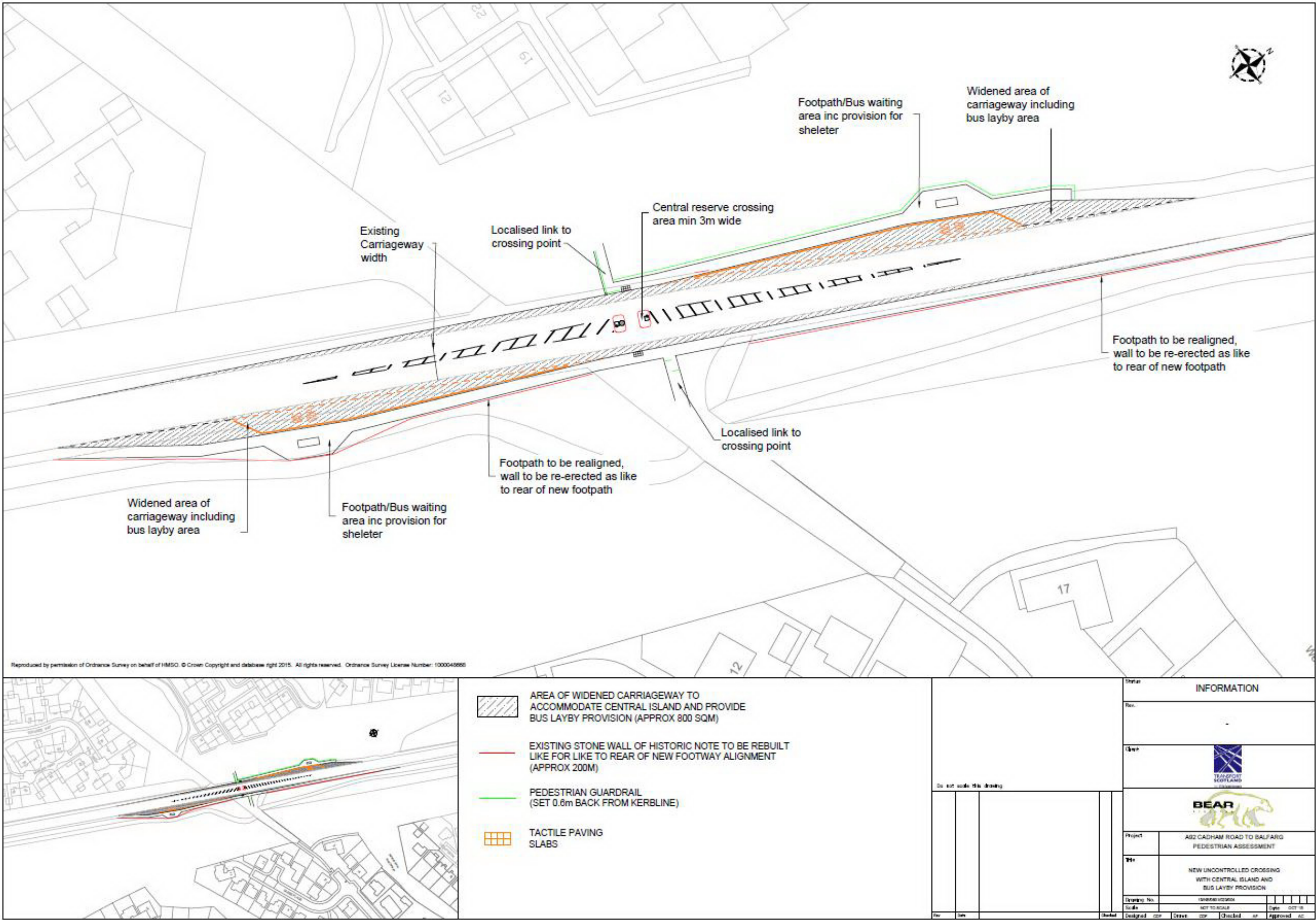






Uncontrolled Crossing point Zone 6B with Central Island (Option 2 western land uptake)





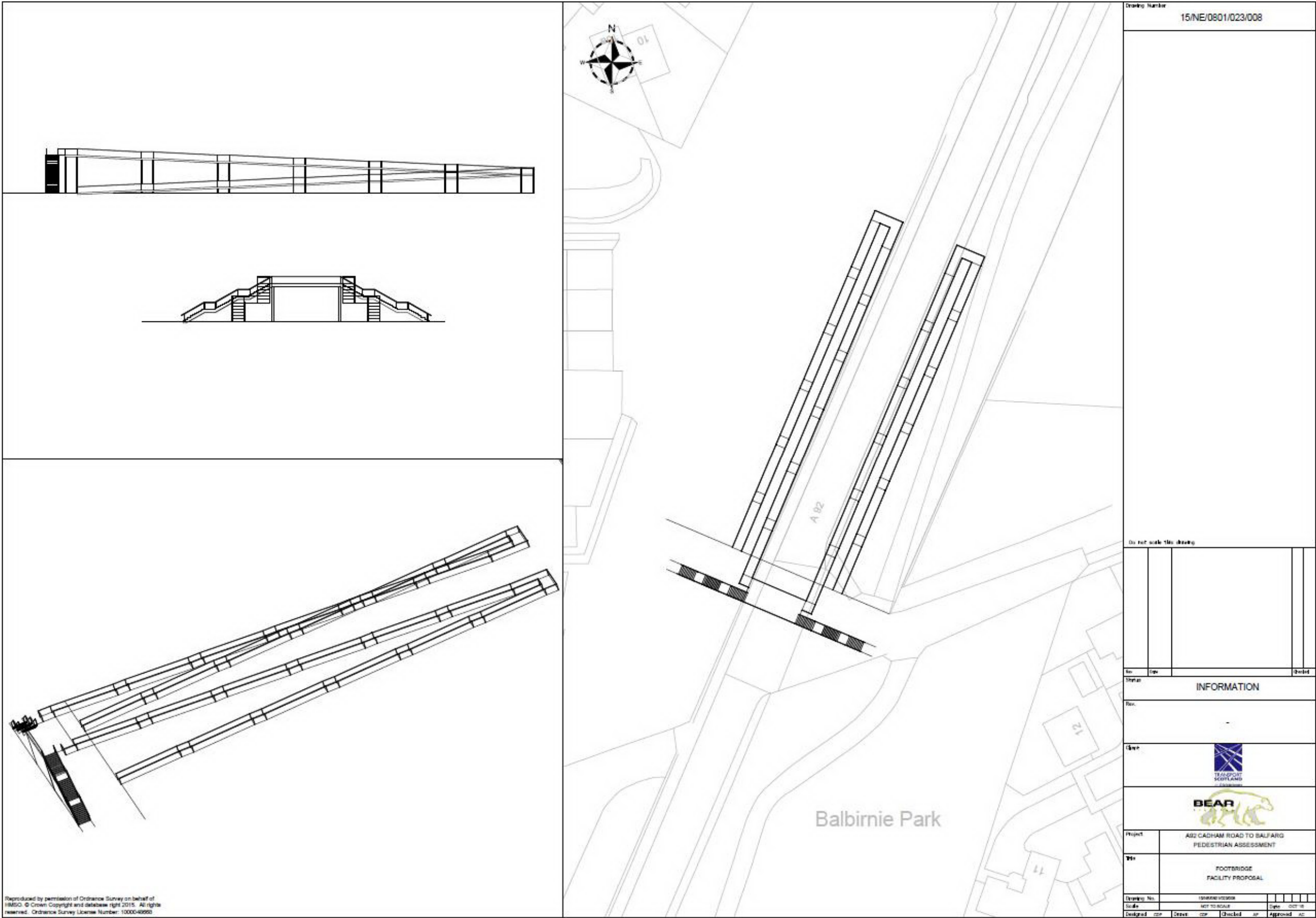
Uncontrolled Crossing point Zone 6B with Central Island and Bus Stop Layby Provision





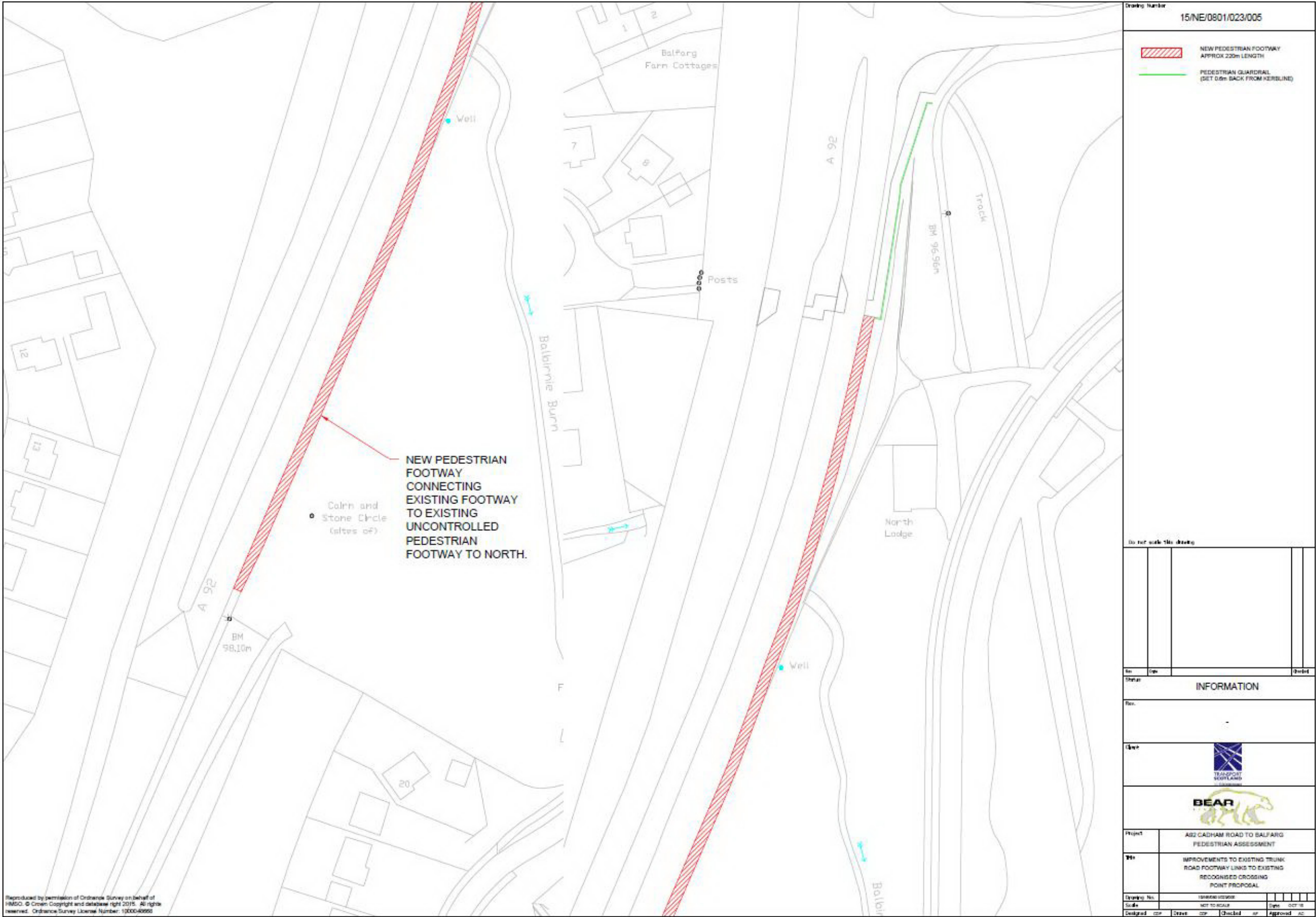
Plan to show extent of land required for Uncontrolled Crossing with Central Island and Bus Stop Layby Provision





At Grade Separation/Footbridge







Footway Link to existing crossing point





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Extent of proposed reduction to existing 50mph to 40mph



APPENDIX K

PHOTOGRAPHS



Existing crossing (Zone 2) looking towards east



Existing crossing looking towards east



Existing crossing looking South



Existing crossing (eastside) showing recent upgraded footpath provision



Looking southbound – area of verge with no footpath provision (shows property as per para 5.9.5)



Verge southbound



Verge southbound showing end of existing footpath



Zone 6B looking northbound



Zone 6B looking southbound