

	Driver Car/Van	Passenger Car/Van	Walking	Bicycle	Bus	Rail	Taxi/Minicab	Other <sup>26</sup>
Commuting	62	9	13	1	10	3	1	1
Escort	74	6	17	0	2	0	0	0
Business	78	7	4	0	3	1	0	6

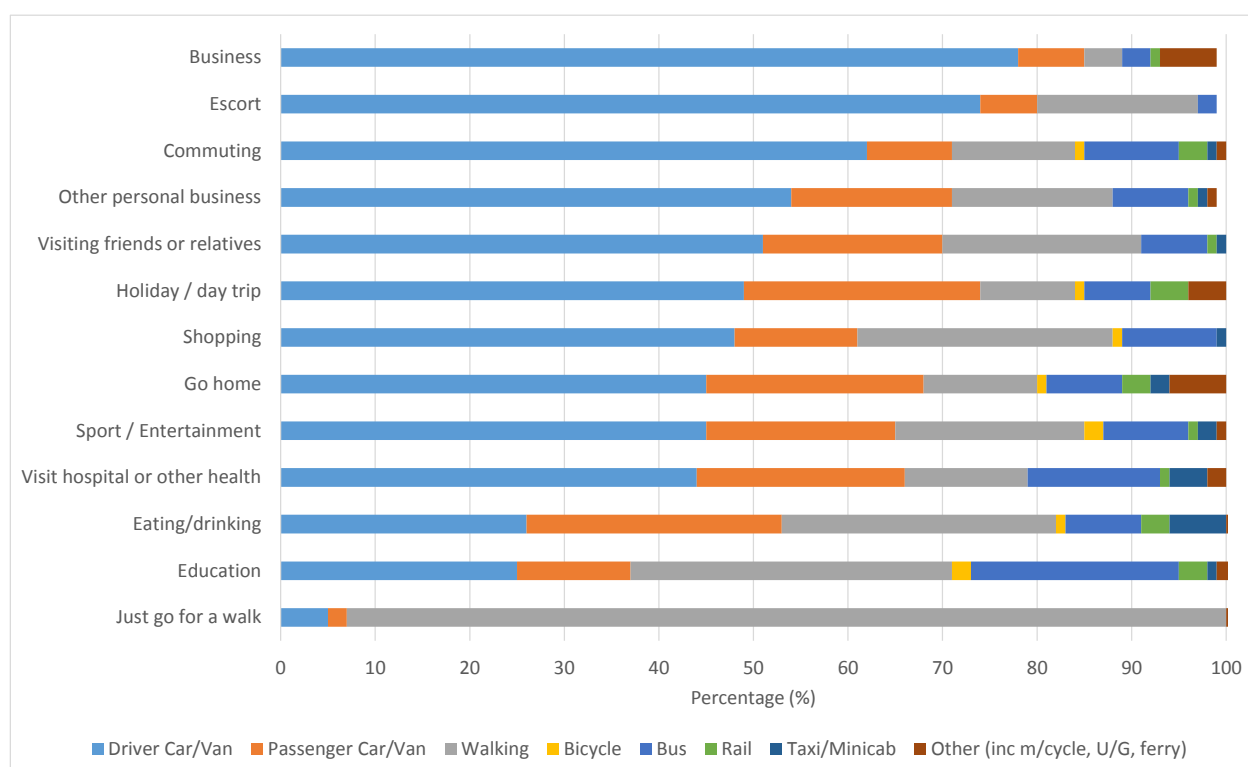


Chart 1: Main mode of travel by purpose, 2009/2010<sup>27</sup>

For the holiday/day trip purpose, it was recorded that 74% of trips involved people travelling by car/van.

Alternatively, data on the means of transport for various areas of Scotland; various ranges of visitors; various attraction categories; and various attraction locations, was obtained from The Moffat Centre. A summary of this data, potentially appropriate to the location and attraction type being considered in this study, is provided in Table 11 and Chart 2.

Table 11: Summary of The Moffat Centre Means of Transport Data

Area/ Range of Visitors/ Category/ Location	Sample	% Car	% Public Transport	% Walk/ Cycle	% Tour	% Other
Edinburgh and Lothian	23	46.8	15.5	32.1	5.4	0.2

<sup>27</sup> <http://www.transportscotland.gov.uk/statistics/scottish-household-survey-travel-diary-results-all-editions>

Area/ Range of Visitors/ Category/ Location	Sample	% Car	% Public Transport	% Walk/ Cycle	% Tour	% Other
Greater Glasgow	35	51.3	24.2	16.8	7.2	0.6
Kingdom of Fife	13	46.7	13.4	25.9	5.3	8.7
100,000+	39	52.8	11.8	20.5	14.4	0.6
Activity Attractions	5	87.2	5.8	2.2	4.8	0
Heritage Centres	13	58.8	8.5	11.6	20.9	0.2
Industrial/Workplaces	2	77.5	6.5	0.5	15.5	0
Transport Related Attractions	5	71.8	8	3.2	16	1
Accessible Small Towns	18	67.7	9.3	15.7	6.3	1
Accessible Rural	60	72.6	5.8	8.5	10.9	0.6
Coastal	86	61.8	9.9	15.1	10.1	0.8
Total	270	61.5	9.3	14.5	12.2	1.8

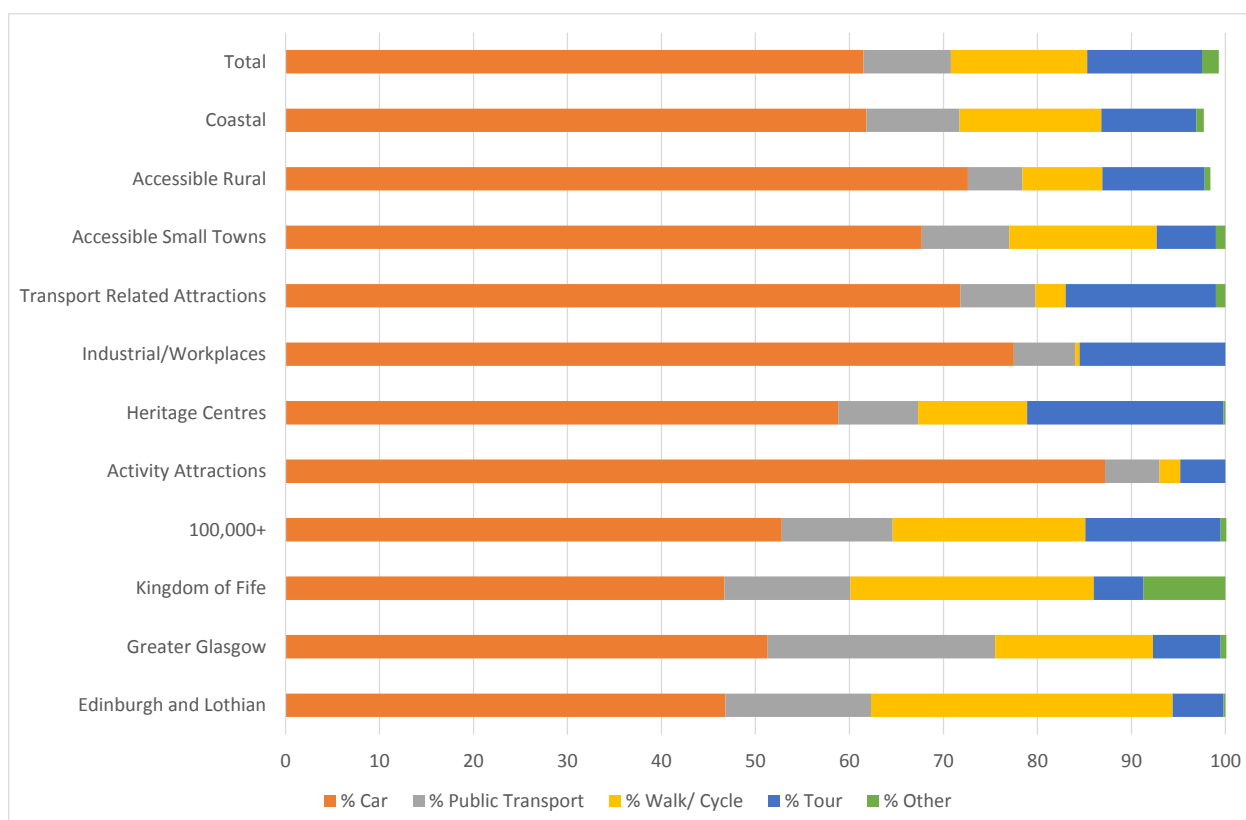


Chart 2: Summary of The Moffat Centre Means of Transport Data

The Moffat Centre data highlights a range of mode shares with the percentage of people travelling by car ranging from approximately 47% to approximately 87%. An average of the values extracted equals

approximately 63% while the 85<sup>th</sup> percentile value equals approximately 74%. Based on these figures and to provide a conservative estimate of private car trips, the mode share from Table 10 has been applied to estimate the car/van trips to the visitor attraction proposals. This is summarised in Table 12.

Table 12: Summary of Visitor Numbers by Car/Van

	Minimum Estimated Annual Visitor Numbers	Maximum Estimated Annual Visitor Numbers	Minimum Estimated Annual Visitor Numbers by Car/Van	Maximum Estimated Annual Visitor Numbers by Car/Van
WHS Status	0 - negligible	0 - negligible	0 - negligible	0 - negligible
CEC Visitor Centre	136,910	230,162	101,314	170,320
North Queensferry Visitor Centre	136,910	230,162	101,314	170,320
South Queensferry Bridge Walk	75,810	126,350	56,100	93,499
<b>Total</b>	<b>349,630</b>	<b>586,674</b>	<b>258,728</b>	<b>434,139</b>

### 5.2.5.2 Vehicle Occupancy

The Scottish Household Survey (SHS) data shows a car occupancy rate of 2.46 for holiday/day trips in 2009/2010, as shown in Chart 3 (summary of occupancy by trip purpose).

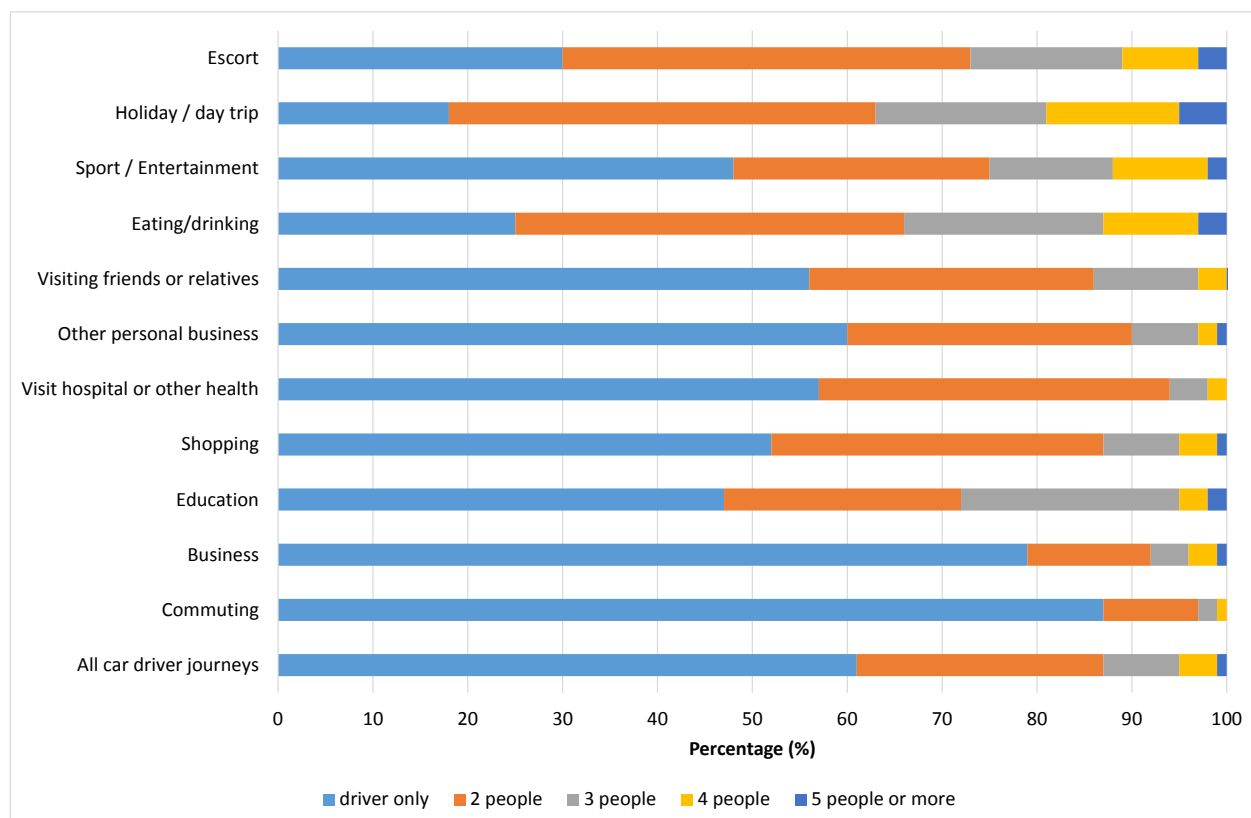


Chart 3: Car occupancy – by purpose of driver's journey 2009/10<sup>28</sup>

<sup>28</sup> <http://www.scotland.gov.uk/Topics/Statistics/Browse/Transport-Travel/TrendCarOccupancy>

This rate has been used to derive the visitor estimates. However, it should be noted that other studies suggest even higher occupancy rates, including one in 2006 by Britishparking.co.uk that gave a rate of 3.5 for tourist visits<sup>29</sup>. In contrast, the Department for Transport's National Travel Survey 2012<sup>30</sup> gave an average occupancy rate of 2.0 persons per vehicle for holidays/day trips.

Using the car/van trip numbers from Table 12, the 2.46 occupancy rate has been applied to estimate the number of car/van trips to the visitor attraction proposals and is summarised in Table 13.

Table 13: Summary of Annual Car/Van Trips

	Minimum Estimated Annual Visitor Numbers by Car/Van	Maximum Estimated Annual Visitor Numbers by Car/Van	Minimum Estimated Annual Car/Van Trips	Maximum Estimated Annual Car/Van Trips
WHS Status	0 - negligible	0 - negligible	0 - negligible	0 - negligible
CEC Visitor Centre	101,314	170,320	41,185	69,236
North Queensferry Visitor Centre	101,314	170,320	41,185	69,236
South Queensferry Bridge Walk	56,100	93,499	22,805	38,008
<b>Total</b>	<b>258,728</b>	<b>434,139</b>	<b>105,175</b>	<b>176,480</b>

### 5.2.6 Monthly/Weekly/Hourly Distribution of Annual Trips

In order to consider the seasonality of visitor attraction trips, reference has been made to information from The Moffat Centre website<sup>31</sup>. The 2009 Visitor Attraction Monitor provides a comparative analysis of visits to Scottish attractions in 2008/2009, including monthly distributions of visits overall and by admission.

<sup>29</sup> [https://www.atcm.org/policy\\_files/496-ParkingforTourismpositionpaper13](https://www.atcm.org/policy_files/496-ParkingforTourismpositionpaper13)

<sup>30</sup> <https://www.gov.uk/government/publications/national-travel-survey-2012>

<sup>31</sup> <http://www.moffatcentre.com/ourpublications/visitorattractionreports/>

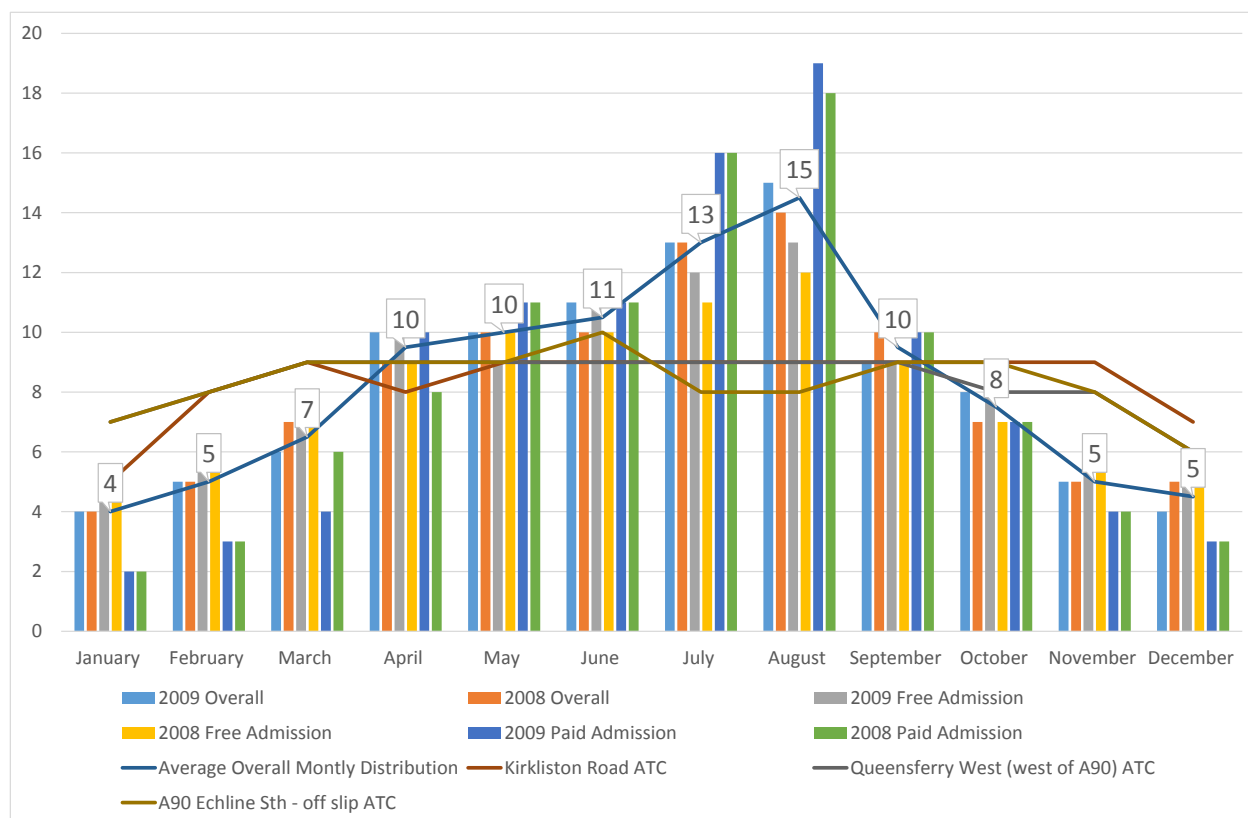


Chart 4: Monthly distribution of visits 2008/2009

The average of the 2008/2009 overall monthly distribution highlights the seasonal nature of visitors in Scotland with the summer months (June; July; and August) having approximately three times as many visitors as the winter months (December; January; and February). August is the peak month for visitors in Scotland with approximately 15% visiting in August alone, based on the 2008/2009 data. Applying this monthly distribution to the maximum and minimum estimated annual car/van trips from Table 13, the monthly distribution of these trips has been estimated, as summarised in Table 14.

Table 14: Monthly Distribution of Trips

Month	CEC Visitor Centre		North Queensferry Visitor Centre		South Queensferry Bridge Walk		Total	
	Min. Car/Van Trips	Max. Car/Van Trips	Min. Car/Van Trips	Max. Car/Van Trips	Min. Car/Van Trips	Max. Car/Van Trips	Min. Car/Van Trips	Max. Car/Van Trips
January	1,647	2,769	1,647	2,769	912	1,520	4,207	7,059
February	2,059	3,462	2,059	3,462	1,140	1,900	5,259	8,824
March	2,677	4,500	2,677	4,500	1,482	2,471	6,836	11,471
April	3,913	6,577	3,913	6,577	2,166	3,611	9,992	16,766
May	4,119	6,924	4,119	6,924	2,281	3,801	10,518	17,648
June	4,324	7,270	4,324	7,270	2,395	3,991	11,043	18,530
July	5,354	9,001	5,354	9,001	2,965	4,941	13,673	22,942

Month	CEC Visitor Centre		North Queensferry Visitor Centre		South Queensferry Bridge Walk		Total	
	Min. Car/Van Trips	Max. Car/Van Trips	Min. Car/Van Trips	Max. Car/Van Trips	Min. Car/Van Trips	Max. Car/Van Trips	Min. Car/Van Trips	Max. Car/Van Trips
August	5,972	10,039	5,972	10,039	3,307	5,511	15,250	25,590
September	3,913	6,577	3,913	6,577	2,166	3,611	9,992	16,766
October	3,089	5,193	3,089	5,193	1,710	2,851	7,888	13,236
November	2,059	3,462	2,059	3,462	1,140	1,900	5,259	8,824
December	1,853	3,116	1,853	3,116	1,026	1,710	4,733	7,942
<b>Total</b>	<b>41,185</b>	<b>69,236</b>	<b>41,185</b>	<b>69,236</b>	<b>22,805</b>	<b>38,008</b>	<b>105,175</b>	<b>176,480</b>
<b>Monthly 85<sup>th</sup> %ile</b>	<b>4,685</b>	<b>7,876</b>	<b>4,685</b>	<b>7,876</b>	<b>2,595</b>	<b>4,324</b>	<b>11,964</b>	<b>20,074</b>

To convert monthly trips into hourly trips, professional judgement and local traffic count data has been used:

- Weekly trips have been calculated by dividing the monthly trips by 4 (assuming 28 days in a month);
- Daily trips have been derived by applying local traffic data (recorded in August 2014 at the entrance to Deep Sea World<sup>32</sup>), summarised in Chart 5; and
- Hourly trips have been calculated by applying local traffic data (recorded in August 2014 at the entrance to Deep Sea World), summarised in Chart 6 and Chart 7, and assuming visitor centre opening hours of 10.00 – 18.00.

<sup>32</sup> Selected as this is most likely to represent the distribution profile of visitor traffic.

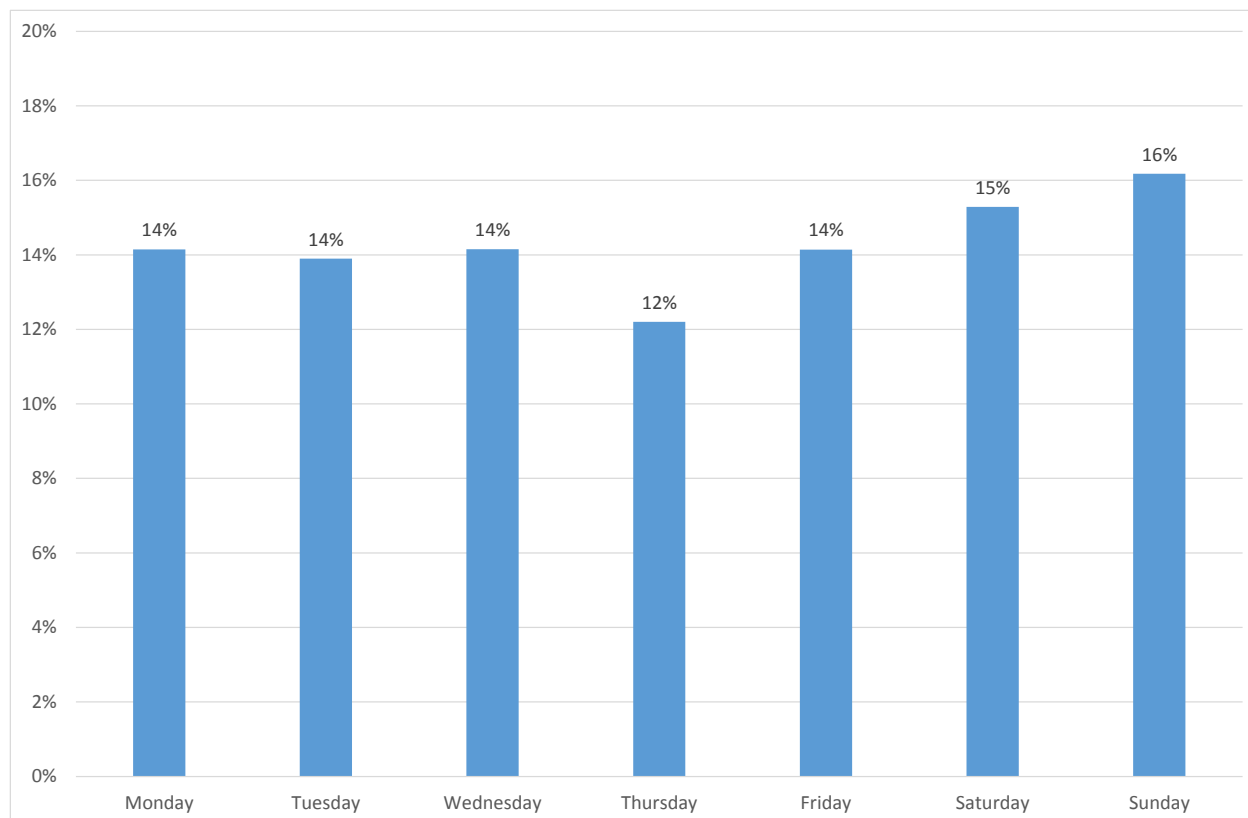


Chart 5: Access to Deep Sea World distribution of visits – August 2014 Data

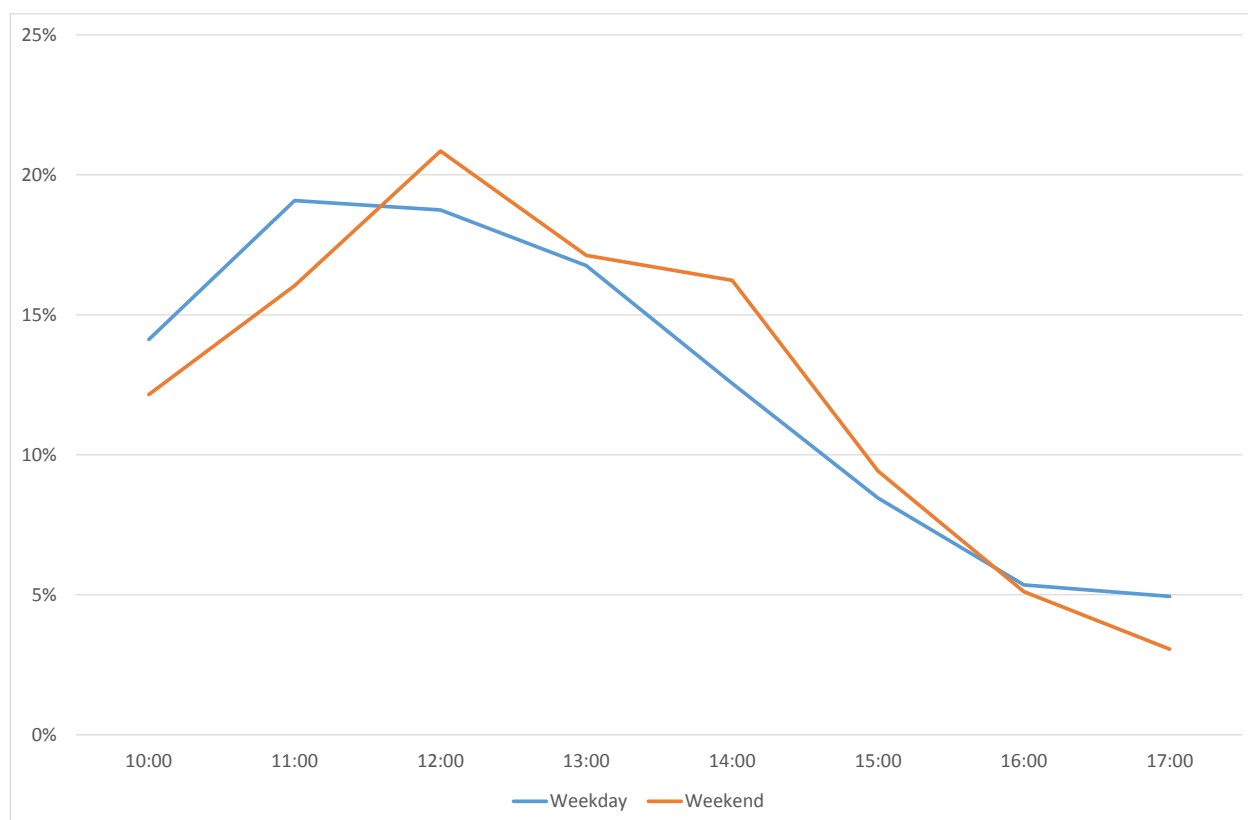


Chart 6: Access to Deep Sea World hourly distribution of arrivals – August 2014 Data

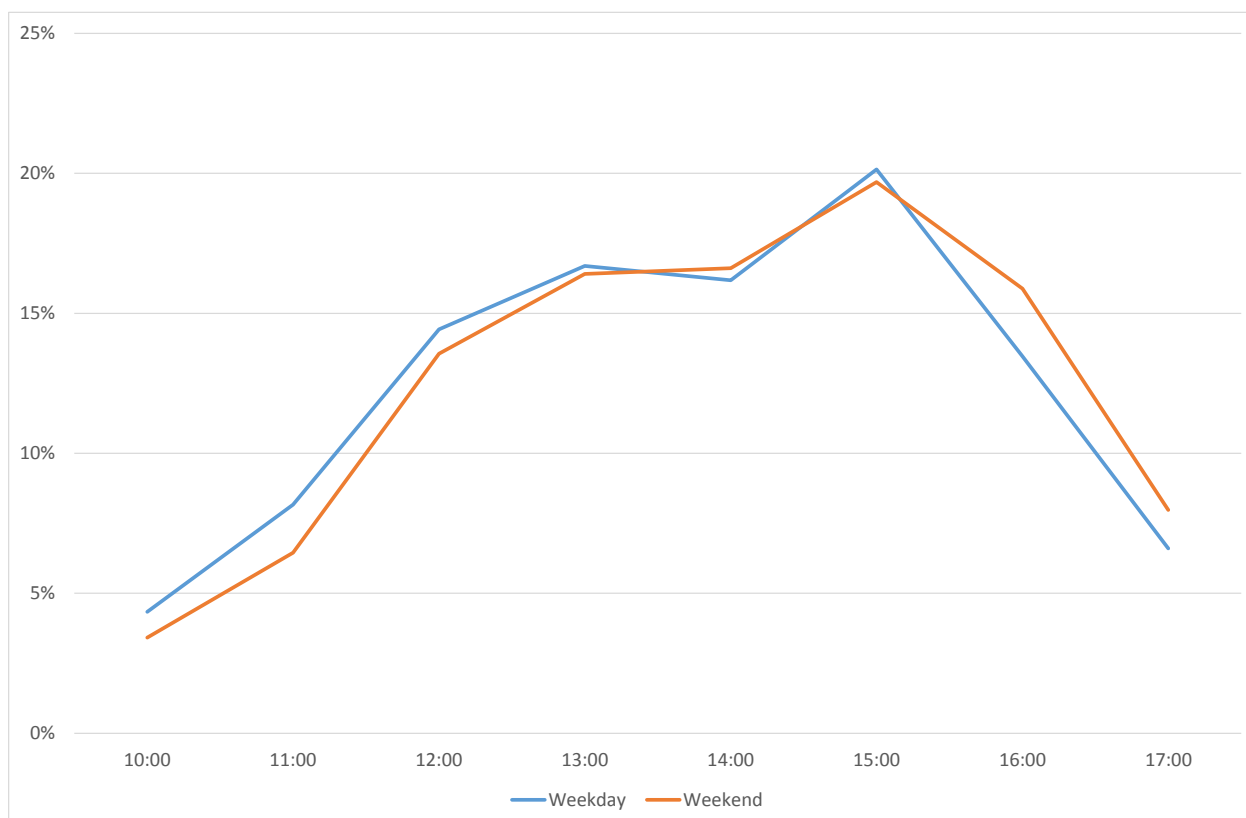


Chart 7: Access to Deep Sea World hourly distribution of departures – August 2014 Data

The summary of the daily trip breakdown to the prospective Visitor Centre at the existing Contact & Education Centre is provided in Table 15 i.e. by applying the factors to the peak month (August) and to the 85<sup>th</sup> percentile values from Table 14.

Table 15: CEC Visitor Centre – Estimated Daily Trips

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
August	211	207	211	182	211	228	242	355	349	355	306	355	384	406
85 <sup>th</sup> %ile	166	163	166	143	166	179	189	279	274	279	240	278	301	319

The summary of the hourly trip breakdown to the prospective Visitor Centre at the existing Contact & Education Centre is provided in Table 16 and Table 17 for August trips, and Table 18 and Table 19 for 85<sup>th</sup> percentile trips i.e. by applying the factors to the peak month (August) and to the 85<sup>th</sup> percentile values from Table 14.

Table 16: CEC Visitor Centre – Estimated Hourly Arrival Trips, August

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
10.00	30	29	30	26	30	28	29	50	49	50	43	50	47	49
11.00	40	40	40	35	40	37	39	68	67	68	58	68	62	65
12.00	40	39	40	34	40	48	50	67	65	67	57	67	80	85



	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
13.00	35	35	35	31	35	39	41	59	58	59	51	59	66	70
14.00	26	26	27	23	26	37	39	45	44	45	38	45	62	66
15.00	18	18	18	15	18	22	23	30	30	30	26	30	36	38
16.00	11	11	11	10	11	12	12	19	19	19	16	19	20	21
17.00	10	10	10	9	10	7	7	18	17	18	15	18	12	12
Total	211	207	211	182	211	228	242	355	349	355	306	355	384	406

Table 17: CEC Visitor Centre – Estimated Hourly Departure Trips, August

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
10.00	9	9	9	8	9	8	8	15	15	15	13	15	13	14
11.00	17	17	17	15	17	15	16	29	28	29	25	29	25	26
12.00	30	30	30	26	30	31	33	51	50	51	44	51	52	55
13.00	35	35	35	30	35	37	40	59	58	59	51	59	63	67
14.00	34	34	34	29	34	38	40	57	56	57	50	57	64	67
15.00	43	42	43	37	43	45	48	71	70	72	62	71	76	80
16.00	28	28	28	25	28	36	38	48	47	48	41	48	61	64
17.00	14	14	14	12	14	18	19	23	23	23	20	23	31	32
Total	211	207	211	182	211	228	242	355	349	355	306	355	384	406

Table 18: CEC Visitor Centre – Estimated Hourly Arrival Trips, 85<sup>th</sup> Percentile

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
10.00	23	23	23	20	23	22	23	39	39	39	34	39	37	39
11.00	32	31	32	27	32	29	30	53	52	53	46	53	48	51
12.00	31	31	31	27	31	37	40	52	51	52	45	52	63	66
13.00	28	27	28	24	28	31	32	47	46	47	40	47	52	55

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
14.00	21	20	21	18	21	29	31	35	34	35	30	35	49	52
15.00	14	14	14	12	14	17	18	24	23	24	20	24	28	30
16.00	9	9	9	8	9	9	10	15	15	15	13	15	15	16
17.00	8	8	8	7	8	5	6	14	14	14	12	14	9	10
Total	166	163	166	143	166	179	189	279	274	279	240	278	301	319

Table 19: CEC Visitor Centre – Estimated Hourly Departure Trips, 85<sup>th</sup> Percentile

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
10.00	7	7	7	6	7	6	6	12	12	12	10	12	10	11
11.00	14	13	14	12	14	12	12	23	22	23	20	23	19	21
12.00	24	23	24	21	24	24	26	40	39	40	35	40	41	43
13.00	28	27	28	24	28	29	31	46	46	47	40	46	49	52
14.00	27	26	27	23	27	30	31	45	44	45	39	45	50	53
15.00	33	33	33	29	33	35	37	56	55	56	48	56	59	63
16.00	22	22	22	19	22	28	30	37	37	38	32	37	48	51
17.00	11	11	11	9	11	14	15	18	18	18	16	18	24	25
Total	166	163	166	143	166	179	189	279	274	279	240	278	301	319

## 5.3 Network Rail Study Summary of Trip Generation

### 5.3.1 North Queensferry

To forecast demand, the Network Rail study used the visitor numbers from their market research data. A comparison of the market research data focus groups mode share data was made with established mode share data from the Scottish Visitor Attraction monitor<sup>33</sup>. The modal split adopted was:

- Car = 72%
- Train = 10%
- Bus = 2%
- Coach Tour = 11%
- Bicycle = 3%
- Walk = 2%

<sup>33</sup> For attractions in Edinburgh, Fife and Scotland.

Applying the adopted mode share data to the visitor forecast, estimated that approximately 30,000 visitors will travel to the North Queensferry attraction by car in the peak month of August. Subsequently, applying a vehicle occupancy rate of 2.5, it was determined that there could be approximately 390 new vehicle trips on an average day in August, not including coach; staff; delivery; and servicing vehicle trips.

### **5.3.2 South Queensferry**

To forecast traffic demand to the South Queensferry element of the Forth Bridge Visitor Experience, the same source of the visitor numbers and adopted modal split was applied.

Applying the adopted mode share data to the visitor forecast, estimated that approximately 16,000 visitors will travel to the South Queensferry attraction by car in the peak month of August. Subsequently, applying a vehicle occupancy rate of 2.5, it was determined that there could be approximately 210 new vehicle trips on an average day in August, not including coach; staff; delivery; and servicing vehicle trips.

# Trip Distribution and Assignment

## 6.1 Introduction

This chapter details the methodology used to distribute and assign the vehicle trips generated by the prospective Visitor Centre at the existing Contact & Education Centre onto the surrounding road network.

## 6.2 Trip Distribution

The derived vehicle trips associated with the prospective Visitor Centre have initially been split between different visitor types. These visitor types proportions are based on data sourced from the Moffat Centre, details of which are presented in Table 20. The visitor type splits have also been linked to different geographical areas as part of the distribution methodology.

Table 20: Visitor Type Splits

Visitor Type	Local	Scotland	Other UK	Overseas
Visitor Type Split	33.1%	27.2%	17.2%	22.6%
Geographical Area	Clackmannanshire, Edinburgh, Falkirk, Fife, West Lothian	Rest of Scotland	England, Wales and Northern Ireland	Local Visitor Types

For overseas visitors, it has been assumed that these visitors would stay and travel to the site from the local area. Therefore, the 22.6% of overseas visitors has been added to the local visitor type distribution which now totals 55.6%.

2001 and 2011 census population data has been incorporated to develop a representative gravity model. Population data for each Council region within Scotland was sourced alongside total population data for the rest of the UK. To add a further level of detail, the 2001 population data for each ward within the Edinburgh and West Lothian Councils was also collated (chosen as the wards used pre-2007 allowed a more straightforward judgment on trip assignment).

The driving distance and journey time to/from the site from each Scottish ward/region and the rest of the UK was determined through online routing software.

A deterrence factor<sup>34</sup> was then applied to the journey time travelled between potential origin and the site. This deterrence factor was applied in order to make more distant origins less inclined to travel to the site compared to closer origins. Population data was then incorporated to provide a weighted distribution which considers both journey time and population. An example of this process is presented within Table 21 for the Local Visitor Type origins and demonstrates how closer and higher populated areas have a higher distribution weighting than if just population were considered.

<sup>34</sup> As detailed in Technical Appendix 6 within the Guidance on Accessibility Planning in Local Transport Plans (DfT, 2006), the deterrent effect of travel time is modelled by means of a negative exponential function of the form  $e^{-\lambda t}$  which is hypothesised to describe the relationship between travel duration and the likelihood of travel. In this case, a deterrence value of 0.041 was applied which is representative of travel to Leisure Destinations located in a Metropolitan area.

Table 21: Trip Distribution Derivation Process Example for 'Local' Origins<sup>35</sup>

Local Origins	2011 Population	2011 Population Distribution <sup>36</sup>	Journey Time	Opportunity	Visitor Centre Draw	Visitor Centre Distribution	Population – Visitor Centre Distribution
Clackmannanshire	51,300	4%	35	24%	12,215	3%	-1%
Edinburgh	487,500	39%	21	42%	206,085	45%	+6%
Falkirk	157,100	13%	25	36%	56,367	12%	0%
Fife	366,900	30%	32	27%	98,799	22%	-8%
West Lothian	176,100	14%	18	48%	84,188	18%	+4%

## 6.3 Trip Assignment

Based on the local highway network and considering the junctions located in the vicinity of the prospective Visitor Centre, each origin was assigned to one of six assignment zones: the A90 North; the A90 South; the A904; the B800; the B924, Bo'ness Road; and the B907, Kirkliston Road. In turn, the route to/from these assignment zones and the site was identified.

The distributed trips and subsequent allocation to the six assignment zones provided the number of trips to be assigned to each route. These trip numbers are presented within Table 22, for the August scenario, and Table 23, for the 85<sup>th</sup> percentile scenario.

Table 22: CEC Visitor Centre – Estimated Daily Trips (one-way), August

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
A90 (N)	29	29	29	25	29	31	33	49	48	49	42	49	53	56
A90 (S)	150	147	150	129	150	162	171	252	248	252	217	252	272	288
A904	26	26	26	23	26	29	30	44	44	44	38	44	48	51
B800	4	4	4	3	4	4	4	6	6	6	6	6	7	7
B924	1	1	1	1	1	1	1	2	2	2	2	2	2	2
B907	1	1	1	1	1	1	1	2	2	2	2	2	2	2

<sup>35</sup> Note that the output distributions for Edinburgh and West Lothian were further disaggregated by ward to provide a greater degree of detail in the distribution of development trips for areas located closest to the proposed/prospective development.

<sup>36</sup> The 2001 Population Distribution is equivalent to the 2011 Population Distribution i.e. Clackmannanshire – 48,077 = 4%; Edinburgh – 448,624 = 39%; Falkirk – 145,191 = 13%; Fife – 349,429 = 30%; West Lothian – 158,714 = 14%.

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
Total	211	208	211	182	211	228	242	355	349	355	306	355	384	406

Table 23: CEC Visitor Centre – Estimated Daily Trips (one-way), 85<sup>th</sup> Percentile

	Minimum Car/Van Trips							Maximum Car/Van Trips						
	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su
A90 (N)	23	22	23	20	23	25	26	38	38	38	33	38	41	44
A90 (S)	118	116	118	101	118	127	134	198	194	198	170	198	214	226
A904	21	20	21	18	21	22	24	35	34	35	30	35	38	40
B800	3	3	3	3	3	3	3	5	5	5	4	5	5	6
B924	1	1	1	1	1	1	1	1	1	1	1	1	1	2
B907	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Total	166	163	166	143	166	179	189	278	273	278	241	278	301	318

The resulting assignment of the worst-case hourly weekday trips and hourly weekend trips through the immediate road network has been derived and are presented in Figure 1 and Figure 2.

## 6.4 Network Rail Study Summary of Trip Distribution and Assignment

Data from the market research undertaken by Network Rail also forecast the anticipated origin of trips. This estimated that the majority of trips would come from Edinburgh, as this is where the majority of the local population are based and is also the busiest city for tourism in Scotland. The assessment highlighted that the key vehicle routes to the Network Rail developments are:

- Fife and the North – from the A90 via the M90 and A92.
- Glasgow and the West – from the A90 via the M8, for Glasgow, and the M9, for Falkirk/Stirling etc.
- Edinburgh and the South East – from the A90 via the M8/A902/City of Edinburgh Bypass/A1/A68.



The diagram illustrates the proposed road layout for the Site, showing the intersection of A90 North and A90 South, and the intersection of A904 and B800. The diagram includes various traffic flow indicators and vehicle counts.

**Key Features:**

- A90 North/South:** A vertical road running through the center of the site, labeled "A90 North" and "A90 South".
- A904:** A horizontal road on the left side, labeled "A904".
- B800:** A horizontal road on the right side, labeled "B800".
- Site:** A green rectangular area labeled "Site" located between A904 and B800.
- Intersections:**
  - Aroundabout intersection between A90 North/South and A904.
  - Roundabout intersection between A90 North/South and B800.
- Traffic Flow Indicators:** Arrows indicate the direction of traffic flow at each intersection.
- Vehicle Counts:** Numbers in green boxes indicate vehicle counts for specific lanes or directions.

**Vehicle Counts and Flow Details:**

- A904 Intersection:**
  - Approaching from the left: 7 vehicles (green box).
  - Approaching from the right: 0 vehicles (green box).
  - Departing to the left: 0 vehicles (green box).
  - Departing to the right: 8 vehicles (green box).
- A90 North/South Intersection:**
  - Approaching from the north: 8 vehicles (green box).
  - Approaching from the south: 42 vehicles (green box).
  - Departing to the north: 8 vehicles (green box).
  - Departing to the south: 8 vehicles (green box).
- Site Intersection:**
  - Approaching from the left: 58 vehicles (green box).
  - Approaching from the right: 1 vehicle (green box).
  - Departing to the left: 58 vehicles (green box).
  - Departing to the right: 1 vehicle (green box).
- B800 Intersection:**
  - Approaching from the left: 0 vehicles (green box).
  - Approaching from the right: 1 vehicle (green box).
  - Departing to the left: 0 vehicles (green box).
  - Departing to the right: 1 vehicle (green box).

The diagram illustrates a road network with the following components and traffic flows:

- Vertical Road:** Labeled "A90 North" at the top and "A90 South" at the bottom. It features a central roundabout.
- Horizontal Road:** Labeled "A904" on the left and "B800" on the right. It features a roundabout further east.
- Site:** A green rectangular area labeled "Site" located on the horizontal road between the two roundabouts.
- Traffic Flows and Counts:**
  - From A904 to A90 North:** A box with "11" in a green section and an empty white section, with arrows pointing up and right.
  - From A904 to A90 South:** A box with "11" in a green section and an empty white section, with arrows pointing down and right.
  - From A90 North to A904:** A box with "12" in a green section and an empty white section, with arrows pointing left, down, and right.
  - From A90 South to A904:** A box with "60" in a green section and two empty white sections, with arrows pointing left, up, and right.
  - From Site to A904:** A box with "54" in a green section and "1" in a white section, with arrows pointing left, down, and right.
  - From A904 to Site:** A box with "83" in a green section and an empty white section, with arrows pointing up and right.
  - From A904 to B800:** A box with "0" in a green section and "1" in a white section, with arrows pointing right, up, and down.
  - From B800 to A904:** A box with "2" in a green section and an empty white section, with arrows pointing left, up, and down.
  - From A904 to the East Roundabout:** A box with "0" in a green section and "1" in a white section, with arrows pointing right, up, and down.
  - From the East Roundabout to A904:** A box with "2" in a green section and an empty white section, with arrows pointing left, up, and down.
  - From A904 to the Central Roundabout:** A box with "0" in a green section and "7" in a white section, with arrows pointing right, up, and down.
  - From the Central Roundabout to A904:** A box with "8" in a green section, "7" in a white section, and "39" in a green section, with arrows pointing left, up, and down.

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# Framework Travel Plan

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## 7.1 Introduction

This chapter presents a framework Travel Plan for the prospective Visitor Centre that could be located at the existing Contact & Education Centre, providing an assessment of the measures that could be incorporated. This framework could also be easily applied to the Network Rail proposals. A Travel Plan is a package of measures aimed at promoting sustainable travel, with an emphasis on reducing the reliance on single occupancy car travel, car parking and car use in general.

In order to ensure the overall aims of a Travel Plan and the modal shift targets are achieved and sustained, it is important to ensure that the Travel Plan is a combination of 'carrots and sticks' and incorporates all travel modes. It should be implemented over the short, medium and long term. As a guideline, clear objectives should be set for year 1, year 5 and year 10, with delivery facilitated by a clear action plan for each of these periods.

Travel Plans can result in a number of benefits including time and cost savings, health advantages, and environmental benefits.

## 7.2 Aims and Targets

### 7.2.1 Introduction

In order for a Travel Plan to succeed it is important to be clear about the strategy it is trying to achieve by setting clear aims and targets. These should be: Specific; Measurable; Attainable; Realistic; and Timed (SMART), thus ensuring that, wherever possible, targets for modal shift can be achieved.

In considering the role of the Travel Plan and what it wishes to achieve the following aims have been developed:

- To help reduce potential congestion;
- To encourage and enable greater use of sustainable transport modes i.e. on bike and foot; and
- To raise awareness amongst visitors of the consequences of their travel choices.

The use of sustainable modes of transport promotes healthier lifestyles and can have a positive impact on air quality within the area of the development.

### 7.2.2 Modal Share Targets

The aims and objectives introduced form the basis for a successful Travel Plan. It is recommended that a travel survey is undertaken on a regular basis as recommended in Section 7.5.3. Using the travel survey data and considering the sustainable transport options available, mode share targets can be determined, say, at regular five year intervals.

It is important to note that it is not possible to develop entirely realistic mode share targets without carrying out comprehensive up-to-date travel surveys and these targets should be developed in consultation with the local authority.

## 7.3 Travel Plan Administration

In order to maximise the chances of a Travel Plan being successful it is important to have a clear implementation strategy, identify responsibilities and to maintain momentum.

### 7.3.1 Travel Plan Coordinator

The role of a Travel Plan Coordinator is fundamental to the success of any Travel Plan. The main tasks for the Coordinator are to act as the main point of contact for the Travel Plan; to organise and chair regular meetings of a Travel Plan Steering Group; to implement new measures; and to ensure that monitoring takes place and the Travel Plan is reviewed as appropriate.

### 7.3.2 Travel Plan Steering Group

A Travel Plan Steering Group for the site will be established in order to assist the Travel Plan Coordinator(s). The purpose of the steering group is to enable users to become involved in the development of the Travel Plan. It will be used as a forum to generate new ideas, to put forward suggestions for new measures, to provide feedback on existing measures and, perhaps most importantly, to raise awareness and ensure that all users are fully aware of the Travel Plan and the different travel options that are available to them. Another key aspect of the steering group is to maintain the momentum of the Travel Plan.

## 7.4 Package of Measures

### 7.4.1 Introduction

Existing infrastructure, as outlined in Chapter 3, already encourage sustainable travel to the existing site, such as:

- The walking and cycling links surrounding the site e.g. NCN 1; cycle lanes incorporated into the existing car park layout; and footways contiguous to the road network; and
- The provision of cycle parking close to the entrance of the existing Contact & Education Centre.

Below are a number of example measures associated with encouraging the use of sustainable modes of transport that could enhance existing/future facilities and help to achieve the aims and the modal shift targets. The Travel Plan Coordinator will be responsible for monitoring the use of these measures and reviewing them if necessary.

### 7.4.2 Information Provision

Information provision is likely to take the form of communicating to staff and visitors the various travel options available, raising awareness of sustainable travel modes and the benefits of these.

The provision of information is especially important to leisure or tourist attractions because those visiting may be new to the site and are therefore more likely to search for travel information. Information about how to travel to the site sustainably could be included on:

- A website;
- Leaflets;
- Internal staff web pages; and
- In newsletters.

Providing incentives to visitors who travel sustainably may encourage those who could travel sustainably to give it a go, and could include: providing a discount in any associated restaurant/café; providing a discount on entrance fares; or providing free parking for those who car share.

### 7.4.3 Walking and Cycling

The following measures could be put in place to further encourage walking and cycling as practical modes of transport. This range of 'soft' measures, i.e. non-physical measures, include:

- Interest free loans to assist staff in the purchase of bicycles and associated safety equipment – these loans should also be made available to staff who walk to work to buy waterproof clothing etc.;
- Provide staff and visitors with information on recommended walking and cycling routes to the proposed development from the surrounding areas;
- Providing maps of walking and cycling routes;
- Providing lockers for staff for keeping a change of clothes; and
- Providing staff showers and changing rooms.

### 7.4.4 Public Transport

A range of 'soft' measures, i.e. non-physical measures could also be introduced to further promote access by public transport, including:

- Introduce interest free loans for the purchase of season tickets (for staff); and
- Provide local public transport timetables and route information within the workplace, at receptions and via links on the attractions website.

### 7.4.5 Discouraging Single Occupancy Car Use

The availability of car parking is extremely important in determining how people travel. Parking for the mobility impaired (Blue/Orange badge holders) however, should be as close to the main entrance/attraction as possible.

Consideration should also be given to providing dedicated car sharing spaces in the car park as a further incentive to staff, and potentially visitors, and should also be as close to the main entrance as possible. A car sharing database scheme for the site could be developed in order to increase the number of staff car sharing to and from the site. This is a particularly effective method of creating a more sustainable commute for staff with poor public transport links between their home and the development.

## 7.5 Monitoring

### 7.5.1 Requirement for Monitoring

A Travel Plan is not a one-off document. It is a continuing and ongoing process and therefore needs to be reviewed on a regular basis. Monitoring is a crucial part of any Travel Plan and is undertaken to show that targets are being met (or not met, at which point the measures being used should be reviewed).

### 7.5.2 Types of Monitoring

Following a full travel survey, the data will be used as the benchmark against which the success of the Travel Plan can be monitored. The survey not only identifies how people are currently travelling, it will also allow users to declare their views on transport arrangements to and from the development and to indicate what would encourage them to use sustainable modes of transport and also what discourages them.

Undertaking a regular full travel survey is important for new users to have a chance to declare their views and for others whose circumstances may have changed to answer in relation to their new travel situation. Undertaking the full travel survey however can be very resource intensive and therefore carrying out a snapshot survey can be a beneficial tool in order to monitor the progress of the Travel Plan on a regular basis. The snapshot survey can simply consist of asking users how they travelled that particular day and undertaking occupancy counts of car parks and the number of bicycles parked in the areas provided.

### 7.5.3 Monitoring Framework

An indicative survey timetable for monitoring is illustrated below in Table 24.

Table 24: Monitoring Framework

Type of Monitoring	Timescales	Person Responsible
Full Travel Survey	Annually	Travel Plan Co-ordinator
Snapshot Survey	Annually	Travel Plan Co-ordinator

When carrying out surveys and all other monitoring, 'non-typical' travel days will be avoided as best as possible. Surveys will be carried out at the same time each year to ensure similar weather conditions. Weather conditions for the day will be recorded as part of the survey and if there are unexpected extreme conditions on the day surveys will be carried out again as soon as possible.

### 7.5.4 Indicators

The following indicators should be used to determine the success of the Travel Plan:

- Modal split;

- Number of vehicles in car parks;
- Number of cycles parked in designated cycle areas; and
- Car occupancy levels.

### **7.5.5 Reviewing**

As stated above, the purpose of monitoring is to ensure that the Travel Plan is effective and that progress is being made towards achieving the targets and objectives. It will also help to identify priority areas and initiatives for the next year. After each annual 'full' survey has been carried out it is the responsibility of the Travel Plan Coordinator to review the current Travel Plan and ensure that the measures in place are appropriate and effective. The Travel Plan Steering Group should also be involved in this process and should collectively approve the reviewed document.

### **7.5.6 Feedback**

To maintain momentum and ensure that users remain motivated and committed to the Travel Plan it is essential that they are kept informed. Results of the surveys will be publicised along with details of progress made so that users know what has been achieved. The continued involvement and support of all users is crucial.

## **7.6 Summary and Next Steps**

### **7.6.1 Summary and Next Steps**

The Travel Plan, whilst being proactive in raising awareness of the sustainable travel modes to encourage greater use of services already available, will also be aimed at developing opportunities for more sustainable travel by all modes.

In addition to the indicative measures contained within this Framework, the owners/occupiers would seek to investigate and engage best practice in the field of travel planning from other organisations, as well as making use of appropriate guidance documentation (e.g. 'The Travel Plan Resource Pack for Employers'). A Visitor Centre would also seek support from the local authority and Transport Scotland for the development of innovative measures.

# Traffic Impact Assessment

## 8.1 Introduction

This chapter presents a percentage impact assessment that has been undertaken to help determine the potential traffic impacts on the surrounding road network.

Note that typical thresholds for including junctions in a Transport Assessment include:

- Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway; and
- Traffic to and from the development exceeds 5% of the existing two-way traffic flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations.

Although no junction assessment models are being undertaken as part of this study, the above thresholds have been considered and the 5% threshold has been used to highlight links that appear to be impacted most (highlighted orange in subsequent tables).

### 8.1.1 Vehicular Access

Vehicular access to the prospective CEC Visitor Centre is likely to be via the existing road network, or a very close imitation of it depending on any realignments/changes as a result of the Queensferry Crossing.

## 8.2 Assessment

The two-way vehicle traffic flows summarised in Table 25 and Table 26 have been extracted from the data collected during the August/September 2014 surveys and convey the average weekday and average weekend hourly flows during the first week of collection i.e. prior to the Forth Bridges Festival.

Table 25: Average weekday hourly flows – from August/September 2014 surveys

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	735	742	805	855	929	1044	1316	1360
Ferrymuir Gait	51	50	53	66	42	45	62	62
B800, west of F Gait	775	843	925	1026	993	1074	1199	1373
B800, east of F Gait	775	843	925	1026	993	1074	1199	1373
B907, Kirkliston Road	591	630	688	705	720	815	869	981
Station Road	137	155	179	180	173	230	299	458
B924, Hopetoun Road	251	283	301	306	320	362	419	541
B907, The Loan	382	420	453	462	475	400	555	467
B924, Edinburgh Road	186	225	258	269	266	259	256	305

Table 26: Average weekend hourly flows – from August/September 2014 surveys

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	721	887	1035	1054	985	939	1005	918
Ferrymuir Gait	31	59	56	59	70	50	50	45
B800, west of F Gait	829	1012	1187	1237	1235	1174	1259	1216
B800, east of F Gait	829	1012	1187	1237	1235	1174	1259	1216
B907, Kirkliston Road	599	782	856	854	874	857	909	869
Station Road	146	210	192	224	216	199	209	192
B924, Hopetoun Road	308	355	385	356	379	393	361	404
B907, The Loan	424	529	607	624	391	507	593	615
B924, Edinburgh Road	214	280	405	418	464	435	425	404

The predicted vehicle trips have been distributed and assigned to the local road network based on census population data to develop a representative gravity model, as outlined in Chapter 4. In order to assess the potential impacts of the proposed/prospective developments it is deemed appropriate to use the Wednesday and Sunday hourly trips i.e. the highest weekday and highest weekend daily trips to assess three scenarios:

- Scenario 2a – WHS status being granted plus a Visitor Centre and Attractions developed at Contact & Education Centre building, assuming all trips only access the Visitor Centre before making their return trips (pre-opening of Queensferry Crossing).
- Scenario 2b – WHS status being granted plus a Visitor Centre and Attractions developed at Contact & Education Centre building, assuming all trips only access the Visitor Centre before making their return trips, and assumes that the Queensferry Crossing is open.
- Scenario 2c – WHS status being granted plus a Visitor Centre and Attractions developed at Contact & Education Centre building, with one-third of vehicle trips deciding to make a linked trip to South Queensferry town centre i.e. assumed to be Hawes Brae, and making the return trip via the B924, Hopetoun Road/Bo'ness Road, and assumes that the Queensferry Crossing is open.

It should be noted that it is very unlikely that a Visitor Centre and Attractions developed at the Contact & Education Centre building would be commissioned and opened prior to the Queensferry Crossing opening and the new road layout brought into operation. Nevertheless, the assessment of scenario 2a has been undertaken for comparative purposes and to provide a reference to the current situation.

## 8.2.1 Off-site Considerations for Scenario 2b and Scenario 2c

### 8.2.1.1 Queensferry Crossing - DMRB Stage 3

The Queensferry Crossing is currently under construction with an anticipated completion in 2016, and comprises the construction of a new crossing of the Forth together with new approach roads linking to the connecting road network on both sides of the Firth of Forth. The bridge deck will carry two general lanes of traffic in each direction with wide hard shoulders to ensure that breakdowns, incidents and any maintenance works do not cause severe congestion. The hard shoulders also provide the flexibility to carry buses displaced from the FRB during periods of high wind and other forms of public transport should it be required in the future.

To the south of the bridge, a new motorway standard road links the crossing to the A90 and M9, making use of the M9 Spur (now renamed M90). To the north, a new motorway will connect the bridge to the A90/M90, incorporating junction enhancements at Admiralty and Ferrytoll and road widening between them.

The 'Strategic Transport Projects Review Intervention 14: Forth Replacement Crossing Public Transport Strategy' published in January 2010, illustrated not only the proposed improvements for crossing the Firth of Forth i.e. by providing a dedicated public transport corridor using the existing Forth Road Bridge, but more local improvements including the provision of a northbound bus lane on the B800, Ferry Muir Road, with bus priority through the signalised Ferrymuir Roundabout.

The conceptual design drawings submitted by the winning tenderer, FCBC have been reviewed and the arrangements on these drawings do not vary significantly from the layouts described above.

### **Scheme Impacts**

The DMRB Stage 3 report highlights the improvements to be made to the road network as a result of the construction of the Queensferry Crossing, including the construction of Queensferry Junction, to be sited south of the line of the existing A904, and changes to the local road connections.

The Queensferry Junction will take the form of a signalised grade separated gyratory providing access in all directions between the Main Crossing and the strategic and local road networks. The relevant alterations/improvements e.g. new and improved road connections; and public transport links, comprise the following:

- Realignment of the B924, Bo'ness Road to a new signalised junction with the A904, east of Queensferry Junction. In addition, a maintenance track will connect to a new junction with the B924 and will run parallel to the mainline carriageway through Echline Field.
- The B800, Ferrymuir Road will be reconfigured to accommodate a northbound public transport lane from Ferrymuir Roundabout to Echline Junction. To further enhance public transport access to the Forth Road Bridge, Ferrymuir Junction will be redesigned becoming a signalised crossroads with public transport priority. General traffic will continue to be accommodated on the B800 through this section with the provision of a single lane in each direction. The existing 30mph speed limit will be maintained. Southbound public transport will depart the Forth Road Bridge through Echline Junction with onward travel to the north of Edinburgh facilitated by the use of the existing southbound merge slip road associated with the current junction arrangement.

Pedestrian and cyclist facilities will be provided to maintain and improve existing routes, where feasible, with pedestrian and cycle access to/from the Forth Road Bridge maintained via existing routes. The existing footway located to the north of the A904 will be realigned over the northern extents of the gyratory with the provision of a 3-metre wide segregated footway/cycleway. To the east and west of the gyratory, this facility will be connected to new 2-metre wide footways, which will in turn connect to the footways associated with the existing A904. A new 3-metre wide segregated footway/cycleway will be provided over the southern extents of the gyratory, linking the A904 to the east of the junction with the realigned Builteon Road to the west.

### **Traffic Forecasting**

The traffic modelling and forecasting assessment has been undertaken using the Transport Model for Scotland (TMfS), a strategic multi modal forecasting model, and a local area PARAMICS model, developed for detailed operational testing of the proposed scheme.

### **Improved Local Access**

From the DMRB Stage 3 report, it is highlighted that local improvements will include: improved operation and greater capacity e.g. through signal control at the new Queensferry Junction, when compared with the existing Echline Junction; and a reduction on the levels of congestion experienced with significantly reduced, or removed, delays expected for traffic joining the A90.



Summary tables were also included that indicate traffic flow volume changes in the AM and PM peak periods on several approaches to the A90 corridor from the local Dunfermline Rosyth, Inverkeithing and South Queensferry areas. These routes have been chosen as they are commonly thought to contain 'rat running' traffic which may be better accommodated by routing more directly to the mainline. Locations that are likely to experience a significant reduction in traffic flows under the Managed Crossing Scheme were highlighted in bold and included: the A904, west of the Echline Junction; and Ferry Muir Road, east of the Echline Junction. These are summarised in Table 27**Error! Reference source not found..**

Table 27: Extract of comparison of Do-minimum and Do-something forecast traffic volumes from Queensferry Crossing DMRB Stage 3 Report

	AM Peak (06.00 – 10.00)				PM Peak (15.00 – 19.00)			
	Do-min	Scheme	Change	% Change	Do-min	Scheme	Change	% Change
A904, west of Echline	5390	2860	-2530	46.9%	5230	3080	-2150	41.1%
Ferry Muir Road, east of Echline	3870	2880	-990	25.6%	3690	3160	-530	14.4%

## Summary

The summary in Table 27**Error! Reference source not found.** highlights that the local road network in the vicinity of the prospective CEC Visitor Centre is likely to improve significantly following the construction of the Queensferry Crossing and associated road infrastructure (a 40%-50% decrease in traffic on the A904, west of the Echline Junction and a 15%-25% decrease in traffic on Ferry Muir Road, east of the Echline Junction, during the AM and PM peak periods). With the exception of scenario 2a, these anticipated impacts have been considered in the subsequent assessment scenarios.

### 8.2.2 Scenario 2a

Scenario 2a assumes that all traffic associated with the prospective CEC Visitor Centre are new trips on the road network and only access the site before making their return trips using the existing road network. Table 28 and Table 29 summarise the highest weekday and highest weekend two-way daily trips.

Table 28: Prospective CEC Visitor Centre Weekday hourly flows – Wednesday from Chapter 4 assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	9	13	15	15	13	13	8	5
Ferrymuir Gait	65	97	118	118	102	102	67	41
B800, west of F Gait	64	95	115	116	100	99	66	40
B800, east of F Gait	1	3	3	2	2	2	1	0
B907, Kirkliston Road	0	0	0	0	0	0	0	0
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	0	0	0	0	0	0	0
B907, The Loan	0	0	0	0	0	0	0	0

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
B924, Edinburgh Road	0	0	0	0	0	0	0	0

Table 29: Prospective CEC Visitor Centre Weekend hourly flows – Sunday from Chapter 4 assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	8	11	18	17	17	15	11	6
Ferrymuir Gait	63	93	140	137	134	118	85	45
B800, west of F Gait	62	90	137	133	130	115	83	44
B800, east of F Gait	1	2	3	3	3	2	1	1
B907, Kirkliston Road	0	0	0	0	0	0	0	0
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	0	0	0	0	0	0	0
B907, The Loan	0	0	0	0	0	0	0	0
B924, Edinburgh Road	0	0	0	0	0	0	0	0

Table 30 and Table 31 summarise the worst-case percentage impact assessment on the road links in the vicinity.

Table 30: Average weekday hourly flows – percentage impact assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	1.2%	1.8%	1.9%	1.8%	1.4%	1.2%	0.6%	0.4%
Ferrymuir Gait	127.5%	194.0%	222.6%	178.8%	242.9%	226.7%	108.1%	66.1%
B800, west of F Gait	8.3%	11.3%	12.4%	11.3%	10.1%	9.2%	5.5%	2.9%
B800, east of F Gait	0.1%	0.4%	0.3%	0.2%	0.2%	0.2%	0.1%	0.0%
B907, Kirkliston Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Station Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Hopetoun Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B907, The Loan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Edinburgh Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 31: Average Weekend hourly flows – percentage impact assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	1.1%	1.2%	1.7%	1.6%	1.7%	1.6%	1.1%	0.7%
Ferrymuir Gait	203.2%	157.6%	250.0%	232.2%	191.4%	236.0%	170.0%	100.0%
B800, west of F Gait	7.5%	8.9%	11.5%	10.8%	10.5%	9.8%	6.6%	3.6%
B800, east of F Gait	0.1%	0.2%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%
B907, Kirkliston Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Station Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Hopetoun Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B907, The Loan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Edinburgh Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

The results of this scenario assessment highlight that the impacts of the traffic may only materially affect traffic levels on Ferrymuir Gait and the B800, west of its junction with Ferrymuir Gait.

### 8.2.3 Scenario 2b

Scenario 2b assumes that all traffic associated with the prospective CEC Visitor Centre only access the site before making their return trips and assumes that the Queensferry Crossing is open i.e. using the future road network. Table 32 and Table 33 summarise the highest weekday and highest weekend two-way daily trips.

Table 32: Prospective CEC Visitor Centre Weekday hourly flows – Wednesday from Chapter 4 assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	64	95	115	116	100	99	66	40
Ferrymuir Gait	65	97	118	118	102	102	67	41
B800, west of F Gait	64	95	115	116	100	99	66	40
B800, east of F Gait	1	3	3	2	2	2	1	0
B907, Kirkliston Road	0	0	0	0	0	0	0	0
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	0	0	0	0	0	0	0
B907, The Loan	0	0	0	0	0	0	0	0
B924, Edinburgh Road	0	0	0	0	0	0	0	0

Table 33: Prospective CEC Visitor Centre Weekend hourly flows – Sunday from Chapter 4 assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	62	90	137	133	130	115	83	44
Ferrymuir Gait	63	93	140	137	134	118	85	45
B800, west of F Gait	62	90	137	133	130	115	83	44
B800, east of F Gait	1	2	3	3	3	2	1	1
B907, Kirkliston Road	0	0	0	0	0	0	0	0
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	0	0	0	0	0	0	0
B907, The Loan	0	0	0	0	0	0	0	0
B924, Edinburgh Road	0	0	0	0	0	0	0	0

Table 34 and Table 35 summarise the worst-case percentage impact assessment on the road links in the vicinity.

Table 34: Average weekday hourly flows – percentage impact assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	8.7%	12.8%	14.3%	13.6%	10.8%	9.5%	5.0%	2.9%
Ferrymuir Gait	127.5%	194.0%	222.6%	178.8%	242.9%	226.7%	108.1%	66.1%
B800, west of F Gait	8.3%	11.3%	12.4%	11.3%	10.1%	9.2%	5.5%	2.9%
B800, east of F Gait	0.1%	0.4%	0.3%	0.2%	0.2%	0.2%	0.1%	0.0%
B907, Kirkliston Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Station Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Hopetoun Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B907, The Loan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Edinburgh Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 35: Average Weekend hourly flows – percentage impact assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	8.6%	10.1%	13.2%	12.6%	13.2%	12.2%	8.3%	4.8%
Ferrymuir Gait	203.2%	157.6%	250.0%	232.2%	191.4%	236.0%	170.0%	100.0%

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
B800, west of F Gait	7.5%	8.9%	11.5%	10.8%	10.5%	9.8%	6.6%	3.6%
B800, east of F Gait	0.1%	0.2%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%
B907, Kirkliston Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Station Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Hopetoun Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B907, The Loan	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Edinburgh Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

The results of this scenario assessment highlight that the impacts of the traffic may only materially affect traffic levels on Ferrymuir Gait; the B800, west of its junction with Ferrymuir Gait; and the A904, Builyleon Road.

However, this above assessment does not consider the anticipated impacts on traffic levels following the opening of the Queensferry Crossing. As summarised in Section 8.2.1, it is predicted that traffic levels on the A904, west of the Echline Junction and on Ferry Muir Road, east of the Echline Junction will reduce during the AM and PM peak periods. Taking these reductions (summarised in Table 27) into consideration a revised assessment has been undertaken for the 15.00; 16.00; and 17.00 assessment periods, on the A904, Builyleon Road and B800, Ferrymuir Road links. This highlights (Table 36) an increased impact on these links as a result of the prospective CEC Visitor Centre.

*Table 36: Average weekday hourly flows – percentage impact assessment considering effects on traffic levels of Queensferry Crossing works*

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	-	-	-	-	-	16.1%	8.5%	5.0%
Ferrymuir Gait	-	-	-	-	-	-	-	-
B800, west of F Gait	-	-	-	-	-	10.8%	6.4%	3.4%
B800, east of F Gait	-	-	-	-	-	0.2%	0.1%	0.0%
B907, Kirkliston Road	-	-	-	-	-	-	-	-
Station Road	-	-	-	-	-	-	-	-
B924, Hopetoun Road	-	-	-	-	-	-	-	-
B907, The Loan	-	-	-	-	-	-	-	-
B924, Edinburgh Road	-	-	-	-	-	-	-	-

## 8.2.4 Scenario 2c

Scenario 2c assumes that all traffic associated with the prospective CEC Visitor Centre are new trips on the road network with one-third deciding to make a linked trip (using car) to South Queensferry town centre i.e. assumed to be Hawes Brae, and making the return trip via the B924, Hopetoun Road/Bo'ness

Road (assuming Queensferry Crossing open i.e. using the future road network). Table 37 and Table 38 summarise the highest weekday and highest weekend two-way daily trips.

*Table 37: Prospective CEC Visitor Centre Weekday hourly flows – Wednesday from Chapter 4 assessment*

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	59	85	98	96	81	75	50	32
Ferrymuir Gait	65	97	118	118	102	102	67	41
B800, west of F Gait	59	85	98	96	81	75	50	32
B800, east of F Gait	6	13	20	22	21	26	17	8
B907, Kirkliston Road	5	10	17	20	19	24	16	8
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	5	10	17	20	19	24	16
B907, The Loan	5	10	17	20	19	24	16	8
B924, Edinburgh Road	5	15	27	37	39	43	40	24

*Table 38: Prospective CEC Visitor Centre Weekend hourly flows – Sunday from Chapter 4 assessment*

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	58	82	124	118	115	96	71	38
Ferrymuir Gait	63	93	140	137	134	118	85	45
B800, west of F Gait	58	82	124	118	115	96	71	38
B800, east of F Gait	5	10	16	18	18	21	13	7
B907, Kirkliston Road	4	8	13	15	15	19	12	6
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	4	8	13	15	15	19	12
B907, The Loan	4	8	13	15	15	19	12	6
B924, Edinburgh Road	4	12	21	29	31	34	31	19

Table 39 and Table 40 summarise the worst-case percentage impact assessment on the road links in the vicinity.

*Table 39: Average weekday hourly flows – percentage impact assessment*

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	8.0%	11.5%	12.2%	11.3%	8.7%	7.2%	3.8%	2.4%

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
Ferrymuir Gait	127.5%	194.0%	222.6%	178.8%	242.9%	226.7%	108.1%	66.1%
B800, west of F Gait	7.6%	10.1%	10.6%	9.4%	8.1%	7.0%	4.2%	2.3%
B800, east of F Gait	0.8%	1.5%	2.2%	2.1%	2.1%	2.4%	1.4%	0.6%
B907, Kirkliston Road	0.9%	1.5%	2.5%	2.8%	2.7%	2.9%	1.8%	0.8%
Station Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Hopetoun Road	0.0%	1.8%	3.2%	5.6%	6.2%	5.3%	5.7%	2.9%
B907, The Loan	1.3%	2.3%	3.8%	4.3%	4.0%	6.0%	2.9%	1.7%
B924, Edinburgh Road	2.8%	6.6%	10.4%	13.7%	14.6%	16.6%	15.5%	7.8%

Table 40: Average Weekend hourly flows – percentage impact assessment

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	8.0%	9.3%	11.9%	11.1%	11.7%	10.3%	7.0%	4.1%
Ferrymuir Gait	203.2%	157.6%	250.0%	232.2%	191.4%	236.0%	170.0%	100.0%
B800, west of F Gait	7.0%	8.1%	10.4%	9.5%	9.3%	8.2%	5.6%	3.1%
B800, east of F Gait	0.6%	0.9%	1.4%	1.5%	1.5%	1.8%	1.1%	0.6%
B907, Kirkliston Road	0.7%	1.0%	1.6%	1.8%	1.7%	2.2%	1.4%	0.7%
Station Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B924, Hopetoun Road	0.0%	1.1%	2.0%	3.8%	4.1%	3.8%	5.2%	3.1%
B907, The Loan	0.9%	1.4%	2.2%	2.5%	3.8%	3.7%	2.1%	1.0%
B924, Edinburgh Road	1.9%	4.1%	5.2%	6.9%	6.6%	7.8%	7.3%	4.6%

In addition to the impacts on Ferrymuir Gait; the B800, west of its junction with Ferrymuir Gait; and the A904, Builyeon Road, the results of this scenario assessment highlight that the impacts of the traffic may also have a material effect on traffic levels on the B924, Hopetoun Road; the B907, The Loan; and the B924, Edinburgh Road (and consequently High Street).

However, this above assessment does not consider the anticipated impacts on traffic levels following the opening of the Queensferry Crossing. As summarised in Section 8.2.1, it is predicted that traffic levels on the A904, west of the Echline Junction and on Ferry Muir Road, east of the Echline Junction will reduce during the AM and PM peak periods. Taking these reductions (summarised in Table 27) into consideration a revised assessment has been undertaken for the 15.00; 16.00; and 17.00 assessment periods, on the A904, Builyeon Road and B800, Ferrymuir Road links. This highlights (Table 41) an increased impact on these links as a result of the prospective CEC Visitor Centre.

Table 41: Average weekday hourly flows – percentage impact assessment considering effects on traffic levels of Queensferry Crossing works

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	-	-	-	-	-	12.2%	6.5%	4.0%
Ferrymuir Gait	-	-	-	-	-	-	-	-
B800, west of F Gait	-	-	-	-	-	8.2%	4.9%	2.7%
B800, east of F Gait	-	-	-	-	-	2.8%	1.6%	0.7%
B907, Kirkliston Road	-	-	-	-	-	-	-	-
Station Road	-	-	-	-	-	-	-	-
B924, Hopetoun Road	-	-	-	-	-	-	-	-
B907, The Loan	-	-	-	-	-	-	-	-
B924, Edinburgh Road	-	-	-	-	-	-	-	-

## 8.2.5 Summary

The results of the percentage impact assessment scenarios highlight that the impact of additional traffic associated with the prospective CEC Visitor Centre can be anticipated along:

- The B800/A904 corridor west of the junction with Ferrymuir Gait (to Ferrymuir Roundabout currently, and beyond Ferrymuir Roundabout following the opening of Queensferry Crossing), assuming that the trips are solely to/from the prospective development.
- The B800/A904 corridor west of the junction with Ferrymuir Gait and the B907 and B924, assuming that the Queensferry Crossing is open.

However it should be noted that a number of factors should be considered when interpreting the above results, particularly the theoretical capacity of the adjacent road network and the impact on the network from the opening of the Queensferry Crossing.

## 8.2.6 Theoretical Capacity

In order to determine the theoretical capacity of adjacent road links an assessment has been made based on The Design Manual for Roads and Bridges Volume 15, which summarises theoretical link capacities for various road types.

### 8.2.6.1 Scenario 2a

The theoretical link capacities are summarised in Table 42 and Table 43, as well as an assessment of the percentage of capacity reached by combining the existing and prospective CEC Visitor Centre traffic.

Table 42: Theoretical link capacities (vehicles per hour – two-way) and weekday assessment

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	1600	47%	47%	51%	54%	59%	66%	83%	85%
Ferrymuir Gait	1600	7%	9%	11%	12%	9%	9%	8%	6%



Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
B800, west	2400	35%	39%	43%	48%	46%	49%	53%	59%
B800, east	2400	32%	35%	39%	43%	41%	45%	50%	57%
B907, Kirkliston Road	1600	37%	39%	43%	44%	45%	51%	54%	61%
Station Road	1600	9%	10%	11%	11%	11%	14%	19%	29%
B924, Hopetoun Road	1600	16%	18%	19%	19%	20%	23%	26%	34%
B907, The Loan	1600	24%	26%	28%	29%	30%	25%	35%	29%
B924, Edinburgh Road	800	23%	28%	32%	34%	33%	32%	32%	38%

Table 43: Theoretical link capacities (vehicles per hour – two-way) and weekend assessment

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	1600	46%	56%	66%	67%	63%	60%	64%	58%
Ferrymuir Gait	1600	6%	10%	12%	12%	13%	11%	8%	6%
B800, west	2400	37%	46%	55%	57%	57%	54%	56%	53%
B800, east	2400	35%	42%	50%	52%	52%	49%	53%	51%
B907, Kirkliston Road	1600	37%	49%	54%	53%	55%	54%	57%	54%
Station Road	1600	9%	13%	12%	14%	14%	12%	13%	12%
B924, Hopetoun Road	1600	19%	22%	24%	22%	24%	25%	23%	25%
B907, The Loan	1600	27%	33%	38%	39%	24%	32%	37%	38%
B924, Edinburgh Road	800	27%	35%	51%	52%	58%	54%	53%	51%

This assessment highlights that the surrounding network has significant available road capacity, although this does not include any impacts at junctions.

#### 8.2.6.2 Scenario 2b

The theoretical link capacities are summarised in Table 44 and Table 45, as well as an assessment of the percentage of capacity reached by adding the existing and prospective CEC Visitor Centre traffic.

Table 44: Theoretical link capacities (vehicles per hour – two-way) and weekday assessment

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	1600	50%	52%	58%	61%	64%	71%	86%	88%
Ferrymuir Gait	1600	7%	9%	11%	12%	9%	9%	8%	6%

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
B800, west	2400	35%	39%	43%	48%	46%	49%	53%	59%
B800, east	2400	32%	35%	39%	43%	41%	45%	50%	57%
B907, Kirkliston Road	1600	37%	39%	43%	44%	45%	51%	54%	61%
Station Road	1600	9%	10%	11%	11%	11%	14%	19%	29%
B924, Hopetoun Road	1600	16%	18%	19%	19%	20%	23%	26%	34%
B907, The Loan	1600	24%	26%	28%	29%	30%	25%	35%	29%
B924, Edinburgh Road	800	23%	28%	32%	34%	33%	32%	32%	38%

Table 45: Theoretical link capacities (vehicles per hour – two-way) and weekend assessment

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	1600	49%	61%	73%	74%	70%	66%	68%	60%
Ferry Muir Gait	1600	6%	10%	12%	12%	13%	11%	8%	6%
B800, west	2400	37%	46%	55%	57%	57%	54%	56%	53%
B800, east	2400	35%	42%	50%	52%	52%	49%	53%	51%
B907, Kirkliston Road	1600	37%	49%	54%	53%	55%	54%	57%	54%
Station Road	1600	9%	13%	12%	14%	14%	12%	13%	12%
B924, Hopetoun Road	1600	19%	22%	24%	22%	24%	25%	23%	25%
B907, The Loan	1600	27%	33%	38%	39%	24%	32%	37%	38%
B924, Edinburgh Road	800	27%	35%	51%	52%	58%	54%	53%	51%

This assessment highlights that the surrounding network has significant available road capacity, although this does not include any impacts at junctions.

Also, the above assessment does not consider the anticipated impacts on traffic levels following the opening of the Queensferry Crossing. As summarised in Section 8.2.1, it is predicted that traffic levels on the A904, west of the Echline Junction and on Ferry Muir Road, east of the Echline Junction will reduce during the AM and PM peak periods. Taking these reductions (summarised in Table 27) into consideration a revised assessment has been undertaken (Table 46), for the 15.00; 16.00; and 17.00 assessment periods, on the A904, Builyleon Road and B800, Ferry Muir Road links.

*Table 46: Theoretical link capacities (vehicles per hour – two-way) and weekday assessment considering effects on traffic levels of Queensferry Crossing works*

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	-	-	-	-	-	45%	53%	53%
Ferrymuir Gait	-	-	-	-	-	-	-	-
B800, west of F Gait	-	-	-	-	-	42%	46%	51%
B800, east of F Gait	-	-	-	-	-	38%	43%	49%
B907, Kirkliston Road	-	-	-	-	-	-	-	-
Station Road	-	-	-	-	-	-	-	-
B924, Hopetoun Road	-	-	-	-	-	-	-	-
B907, The Loan	-	-	-	-	-	-	-	-
B924, Edinburgh Road	-	-	-	-	-	-	-	-

### 8.2.6.3 Scenario 2c

The theoretical link capacities are summarised in Table 47 and Table 48, as well as an assessment of the percentage of capacity reached by adding the existing and prospective CEC Visitor Centre traffic.

*Table 47: Theoretical link capacities (vehicles per hour – two-way) and weekday assessment*

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyleon Road	1600	50%	52%	56%	59%	63%	70%	85%	87%
Ferrymuir Gait	1600	7%	9%	11%	12%	9%	9%	8%	6%
B800, west	2400	35%	39%	43%	47%	45%	48%	52%	59%
B800, east	2400	33%	36%	39%	44%	42%	46%	51%	58%
B907, Kirkliston Road	1600	37%	40%	44%	45%	46%	52%	55%	62%
Station Road	1600	9%	10%	11%	11%	11%	14%	19%	29%
B924, Hopetoun Road	1600	16%	18%	19%	20%	21%	24%	28%	35%
B907, The Loan	1600	24%	27%	29%	30%	31%	26%	36%	30%
B924, Edinburgh Road	800	24%	30%	36%	38%	38%	38%	37%	41%

Table 48: Theoretical link capacities (vehicles per hour – two-way) and weekend assessment

Link	Capacity	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	1600	49%	61%	72%	73%	69%	65%	67%	60%
Ferrymuir Gait	1600	6%	10%	12%	12%	13%	11%	8%	6%
B800, west	2400	37%	46%	55%	56%	56%	53%	55%	52%
B800, east	2400	35%	43%	50%	52%	52%	50%	53%	51%
B907, Kirkliston Road	1600	38%	49%	54%	54%	56%	55%	58%	55%
Station Road	1600	9%	13%	12%	14%	14%	12%	13%	12%
B924, Hopetoun Road	1600	19%	22%	25%	23%	25%	26%	24%	26%
B907, The Loan	1600	27%	34%	39%	40%	25%	33%	38%	39%
B924, Edinburgh Road	800	27%	36%	53%	56%	62%	59%	57%	53%

Also, the above assessment does not consider the anticipated impacts on traffic levels following the opening of the Queensferry Crossing. As summarised in Section 8.2.1, it is predicted that traffic levels on the A904, west of the Echline Junction and on Ferry Muir Road, east of the Echline Junction will reduce during the AM and PM peak periods. Taking these reductions (summarised in Table 27) into consideration a revised assessment has been undertaken (Table 49) for the 15.00; 16.00; and 17.00 assessment periods, on the A904, Builyeon Road and B800, Ferrymuir Road links.

Table 49: Theoretical link capacities (vehicles per hour – two-way) and weekday assessment considering effects on traffic levels of Queensferry Crossing works

Link	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
A904, Builyeon Road	-	-	-	-	-	43%	52%	52%
Ferrymuir Gait	-	-	-	-	-	-	-	-
B800, west of F Gait	-	-	-	-	-	41%	45%	50%
B800, east of F Gait	-	-	-	-	-	39%	43%	49%
B907, Kirkliston Road	-	-	-	-	-	-	-	-
Station Road	-	-	-	-	-	-	-	-
B924, Hopetoun Road	-	-	-	-	-	-	-	-
B907, The Loan	-	-	-	-	-	-	-	-
B924, Edinburgh Road	-	-	-	-	-	-	-	-

#### 8.2.6.4 Summary

This assessment highlights that the surrounding network has significant available road capacity, particularly when the effects of the estimated decrease in traffic following the opening of the Queensferry Crossing is taken into consideration. However this does not include any impacts at individual junctions. For example, there is likely to be an impact on traffic exiting at the Ferry Muir Road/Ferry Muir Gait priority junction, including traffic exiting the existing Petrol Filling Station, with increased delays and increased queues. This might be mitigated by the improvements to the local network, and subsequent estimated reduction in traffic on Ferry Muir Road, following the construction/opening of the Queensferry Crossing. If the prospect of a Visitor Centre at the existing Contact & Education Centre are developed further it will be necessary to consider junction impacts, particularly at the main access junctions, to determine their suitability.

### 8.3 Committed/Potential Developments

In order to consider the impacts from other developments in the area the following information was extracted from available data.

#### 8.3.1 Ferrymuir Gait Residential Development (pending decision)

The adjacent Ferrymuir Gait residential development is a proposed development of 125 residential units with vehicular access to be taken from Hugh Russell Place and Henry Ross Place, which has been agreed in principle with The City of Edinburgh Council. Access from Ferrymuir Gait is to be a pedestrian only access. The application's associated Transport Statement Addendum Note estimates that the development will generate 49 two-way vehicle trips during the AM peak and 66 two-way vehicle trips during the PM peak. The impact of this additional traffic was assessed at the B907, Kirkliston Road/Viewforth Place priority junction, and it was concluded that this would have no material impact on the operation of the junction with no queuing expected to occur.

Based on the access strategy and minimal impacts of the proposed residential development it has been determined that there will be negligible impacts from this development on the prospective Visitor Centre developments being considered in this assessment.

#### 8.3.2 Agile Development, Scotstoun Avenue Residential Development (application granted)

The nearby residential development to be located adjacent to Scotstoun Avenue and Dalmeny Railway Station proposes to build up to 450 residential dwellings with 15,000ft<sup>2</sup> of commercial/retail space. The application's associated Transport Assessment estimates that the development will generate 509 two-way person trips during the AM peak and 466 two-way person trips during the PM peak, which equates to an estimated generation of 205 two-way car based trips during the AM peak (186 associated with residential element and 19 associated with the commercial element) and 187 two-way car based trips during the PM peak (178 associated with residential element and 9 associated with the commercial element). The impact of the development traffic was assessed at a number of junctions in South Queensferry including: Station Road/Ashburnham Loan; Station Road/Bankhead Road; Bankhead Road/Hawes Brae; Station Road/The Loan; B907/B800 Roundabout (Ferrymuir Roundabout); Kirkliston Road/Scotstoun Avenue; and The Loan/High Street. The capacity assessments, undertaken for the AM and PM peak hours, concluded that all junctions operated well within their theoretical capacity.

#### 8.3.3 Residential Development, Ferrymuir, South Queensferry (pending consideration)

A developer has applied for planning permission for a residential development at Ferrymuir (adjacent to Ferrymuir Retail Park). The proposals comprise 152 units (85 houses and 67 flatted units) of which 25% would be allocated as affordable housing.

The application's associated Transport Statement estimates that the development will generate 129 two-way person trips during the AM peak and 106 two-way person trips during the PM peak, which equates to an estimated generation of 69 two-way car based trips during the AM peak and 56 two-way car based trips during the PM peak. The impact of the development traffic was assessed at three

junctions including: the internal site roundabout; B907/B800 Roundabout (Ferry Muir Roundabout); and Kirkliston Crossroads. The capacity assessments, undertaken for the AM and PM peak hours, concluded that all junctions operated well within their theoretical capacity.

### 8.3.4 Local Development Plan Housing Sites

The City of Edinburgh Council's Local Development Plan highlights prospective sites for future development, summarised in Table 50. The Local Development Plan includes the Agilent site described in Section 8.3.2.

Table 50: Local Development Plan Housing Sites Summary

Reference	Site Name	Estimated Total Capacity	Comments
HSG1	Springfield, Queensferry	150	The site lies on the western edge of the town between existing housing at Springfield and the line of the replacement Forth Crossing.
HSG2	Agilent, South Queensferry	450	Planning permission granted for a housing-led mixed use development on the site of former Agilent plant.
HSG32	Builyeon Road, Queensferry	700 – 980	Proposal for housing-led development on land to the south of Builyeon Road.
HSG33	South Scotstoun, Queensferry	365 – 510	Proposal for housing development on land to the north of the A90.
HSG34	Dalmeny	12 – 18	Proposal for small housing development on land to the west of Bankhead Road.

### 8.3.5 Conclusions

When taking each site into account individually it would appear that the surrounding road network can accommodate the estimated associated vehicular trips, particularly considering that the Agilent site is a redevelopment of a former employment site.

However, consideration has to be given to the combined impacts, especially bearing in mind the prospective developments outlined in the City of Edinburgh Council's Local Development Plan (the Dalmeny site has been discounted due to its size). Therefore an additional assessment has been undertaken. This has been based on the weekday AM and PM peak hour vehicle trip data available from Transport Assessments and Transport Statements provided online. The Housing sites are illustrated on Drawing 9005. Thereafter the trip rates from the Agilent site have been used to provide an estimate of vehicle trips associated with the sites included in the Local Development Plan, that are not developed to the extent that a Transport Assessment has been undertaken. For the sites that have an estimated total capacity range, the median has been used. This therefore generates an estimate that an additional 2,155 units could be built in South Queensferry. Table 51 and Table 52 provide a summary of the vehicle trips associated with the proposed/potential housing sites.

Table 51: AM Peak Hour Summary – Housing Sites

Link	Agilent	Ferrymuir Gait	Ferrymuir	Springfield	Builyeon Road	South Scotstoun
AM Peak Arrivals	41	16	17	14	77	40
AM Peak Departures	145	33	52	48	271	142
<b>Total</b>	<b>186</b>	<b>49</b>	<b>69</b>	<b>62</b>	<b>348</b>	<b>182</b>

Table 52: PM Peak Hour Summary – Housing Sites

Link	Agilent	Ferrymuir Gait	Ferrymuir	Springfield	Builyeon	South Scotstoun
PM Peak Arrivals	109	43	42	36	203	107
PM Peak Departures	69	23	14	23	129	67
<b>Total</b>	<b>178</b>	<b>66</b>	<b>56</b>	<b>59</b>	<b>332</b>	<b>174</b>

It has also been deemed suitable to distribute the trips based on the distribution developed for the Agilent site i.e.:

- Internal – 5.00%
- Local – 10.81%
- A90 North – 6.21%
- Bo'ness – 1.87%
- East – 59.66%
- West – 16.43%

The assessment that has been carried out assumes that the Queensferry Crossing is open. Trips to/from the development sites have been assigned to roads as summarised in Table 53 e.g. Agilent A90 (N) trips; Bo'ness trips; West trips; and 50% of Local trips, route via the B907, Kirkliston Road.

Table 53: Assignment Summary

Assignment Links	Agilent	Ferrymuir Gait	Ferrymuir	Springfield	Builyeon	South Scotstoun
A904, Builyeon Road	A90 (N); Bo'ness and West	A90 (N); Bo'ness; East; and West	A90 (N); Bo'ness; East; and West	50% Local	A90 (N); Bo'ness; East; West; and Local	A90 (N); Bo'ness; East; and West
Ferrymuir Gait	-	-	-	-	-	-
B800, west of F Gait	A90 (N); Bo'ness and West	A90 (N); Bo'ness; East; and West	A90 (N); Bo'ness; East; and West	50% Local	50% Local	A90 (N); Bo'ness; East; and West

Assignment Links	Agilent	Ferrymuir Gait	Ferrymuir	Springfield	Builyeon	South Scotstoun
B800, east of F Gait	A90 (N); Bo'ness; and West	A90 (N); Bo'ness; East; and West	A90 (N); Bo'ness; East; and West	50% Local	50% Local	A90 (N); Bo'ness; East; and West
B907, Kirkliston Road	A90 (N); Bo'ness; West; and 50% Local	A90 (N); Bo'ness; East; and West	Local	50% Local	50% Local	Local
Station Road	East; and 50% Local	50% Local	50% Local	50% Local	50% Local	50% Local
B924, Hopetoun Road	-	-	-	A90 (N); Bo'ness; East; and West	50% Local	-
B907, The Loan	50% Local	50% Local	50% Local	50% Local	50% Local	50% Local
B924, Edinburgh Road	50% Local	50% Local	50% Local	50% Local	50% Local	50% Local

This equates to estimated AM and PM peak flows on the link roads from all the prospective housing sites as summarised in Table 54 and Table 55.

Table 54: Housing Sites AM Peak Summary

Assignment Links	Agilent	Ferrymuir Gait	Ferrymuir	Springfield	Builyeon	South Scotstoun	Total
A904, Builyeon Road	46	41	58	3	330	153	<b>631</b>
Ferrymuir Gait	0	0	0	0	0	0	<b>0</b>
B800, west of F Gait	46	41	58	3	19	153	<b>320</b>
B800, east of F Gait	46	41	58	3	19	153	<b>320</b>
B907, Kirkliston Road	56	41	7	3	19	20	<b>146</b>
Station Road	121	3	4	3	19	10	<b>159</b>
B924, Hopetoun Road	0	0	0	52	19	0	<b>71</b>
B907, The Loan	10	3	4	3	19	10	<b>48</b>
B924, Edinburgh Road	10	3	4	3	19	10	<b>48</b>



Table 55: Housing Sites PM Peak Summary

Assignment Links	Agilent	Ferrymuir Gait	Ferrymuir	Springfield	Buileyon	South Scotstoun	Total
A904, Buileyon Road	44	56	47	3	332	146	<b>628</b>
Ferrymuir Gait	0	0	0	0	0	0	<b>0</b>
B800, west of F Gait	44	56	47	3	18	146	<b>314</b>
B800, east of F Gait	44	56	47	3	18	146	<b>314</b>
B907, Kirkliston Road	53	56	6	3	18	19	<b>155</b>
Station Road	116	4	3	3	18	9	<b>153</b>
B924, Hopetoun Road	0	0	0	50	18	0	<b>68</b>
B907, The Loan	10	4	3	3	18	9	<b>47</b>
B924, Edinburgh Road	10	4	3	3	18	9	<b>47</b>

Applying the same methodology as used in Section 8.2, the two-way vehicle traffic flows have been extracted from the data collected during the August/September 2014 surveys to convey the average weekday hourly flows during the first week of collection i.e. prior to the Forth Bridges Festival. These are summarised in Table 56. However, the anticipated effects of the reduction in traffic as a result of the Queensferry Crossing works should be considered and these are summarised in Table 57.

Table 56: Average weekday hourly flows – from August/September 2014 surveys

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Buileyon Road	596	1382	1263	831	1044	1316	1360	1042
Ferrymuir Gait	32	73	53	47	45	62	62	48
B800, west of F Gait	457	998	1124	816	1074	1199	1373	1140
B800, east of F Gait	457	998	1124	816	1074	1199	1373	1140
B907, Kirkliston Road	193	490	796	575	815	869	981	858
Station Road	56	216	388	150	230	299	458	335
B924, Hopetoun Road	77	268	386	263	362	419	541	469
B907, The Loan	90	259	436	362	400	555	467	375
B924, Edinburgh Road	50	133	165	150	259	256	305	281

Table 57: Average weekday hourly flows – from August/September 2014 surveys

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Builyeon Road	316	734	671	441	615	775	801	614
Ferrymuir Gait	32	73	53	47	45	62	62	48
B800, west of F Gait	340	743	836	607	919	1026	1175	976
B800, east of F Gait	340	743	836	607	919	1026	1175	976
B907, Kirkliston Road	193	490	796	575	815	869	981	858
Station Road	56	216	388	150	230	299	458	335
B924, Hopetoun Road	77	268	386	263	362	419	541	469
B907, The Loan	90	259	436	362	400	555	467	375
B924, Edinburgh Road	50	133	165	150	259	256	305	281

The prospective CEC Visitor Centre weekday two-way trips from Scenario 2b (which assumes that all trips are new trips on the road network and only access the prospective Visitor Centre before making their return trips) have been extracted and are summarised in Table 58.

Table 58: Prospective CEC Visitor Centre Weekday hourly flows – Wednesday

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Builyeon Road	0	0	0	0	99	66	40	0
Ferrymuir Gait	0	0	0	0	102	67	41	0
B800, west of F Gait	0	0	0	0	99	66	40	0
B800, east of F Gait	0	0	0	0	2	1	0	0
B907, Kirkliston Road	0	0	0	0	0	0	0	0
Station Road	0	0	0	0	0	0	0	0
B924, Hopetoun Road	0	0	0	0	0	0	0	0
B907, The Loan	0	0	0	0	0	0	0	0
B924, Edinburgh Road	0	0	0	0	0	0	0	0

To undertake an overall percentage impact assessment on the road links in the vicinity it is also necessary to consider the cumulative impact of the housing developments and the prospective Visitor Centre trips. To do this, the peak hour traffic totals from Table 54 and Table 55 have been applied over 4 AM and 4 PM hour periods as summarised in Table 59. The peak hour flows have been applied to 08.00 and 17.00, and preceding and subsequent hours based on profiles established from the counts undertaken on the links being considered in the assessment (illustrated on Chart 8 and Chart 9).

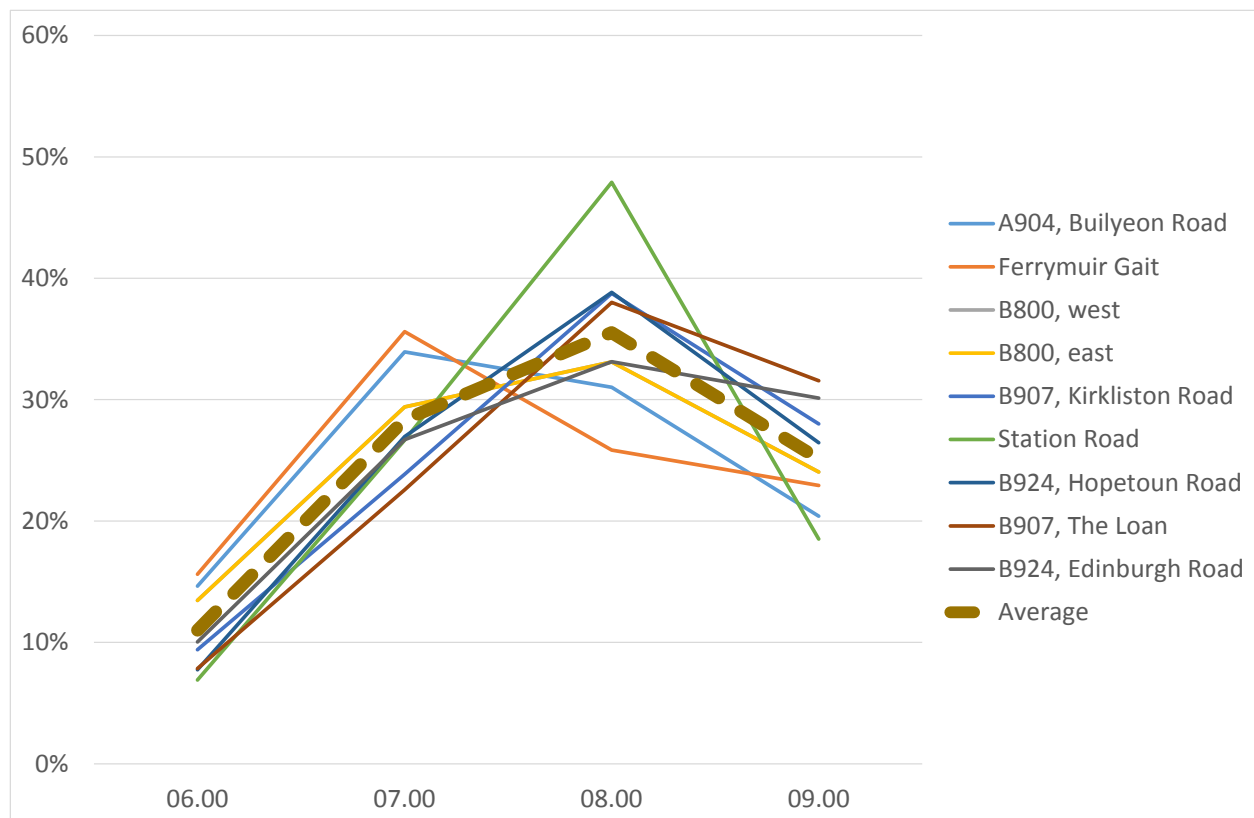


Chart 8: AM Peak Profiles

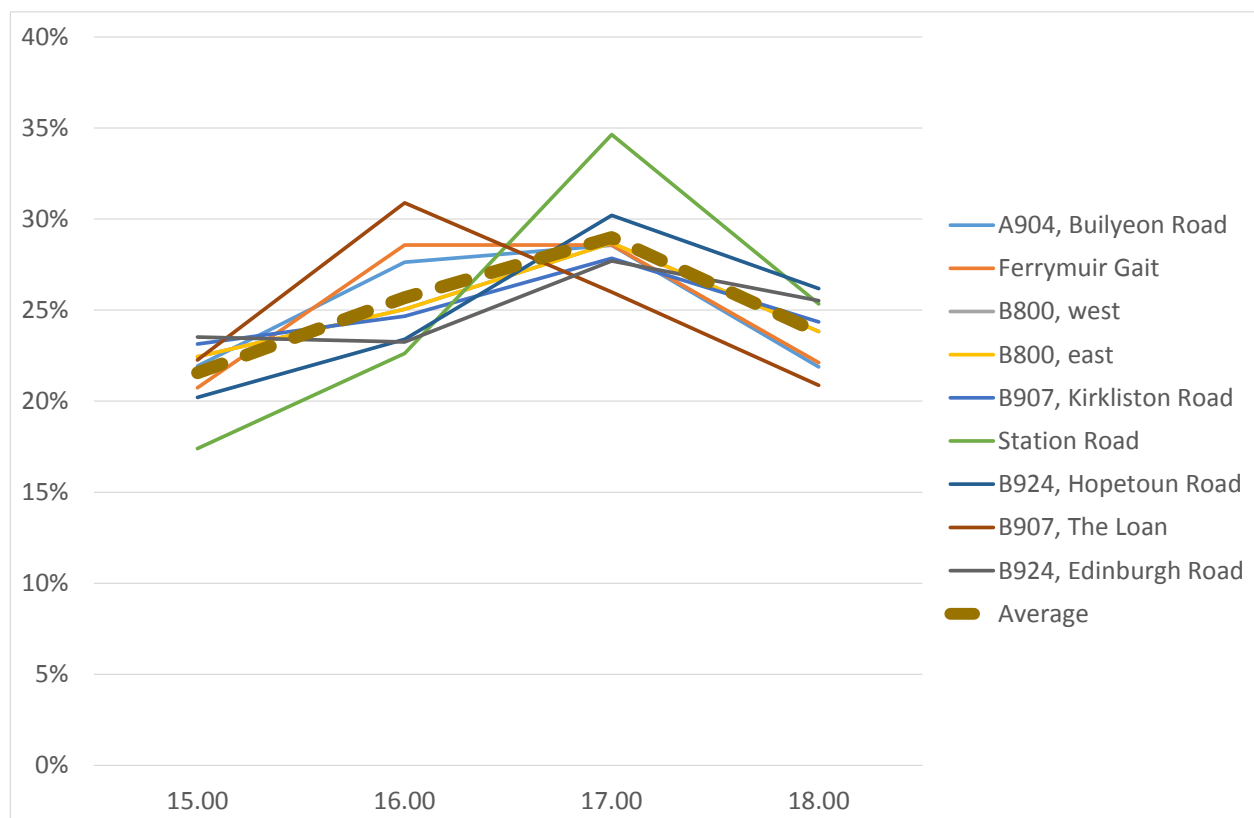


Chart 9: PM Peak Profiles

Table 59: Weekday Peak Hour Flows – Housing Developments

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Builyeon Road	196	504	631	446	467	557	628	515
Ferrymuir Gait	0	0	0	0	0	0	0	0
B800, west of F Gait	99	255	320	226	234	278	314	257
B800, east of F Gait	99	255	320	226	234	278	314	257
B907, Kirkliston Road	45	117	146	103	115	137	155	127
Station Road	49	127	159	113	114	136	153	125
B924, Hopetoun Road	22	57	71	50	51	60	68	56
B907, The Loan	15	39	48	34	35	41	47	38
B924, Edinburgh Road	15	39	48	34	35	41	47	38

The estimated cumulative vehicle trips are summarised in Table 60.

Table 60: Cumulative Flows – All Prospective Developments including the Prospective CEC Visitor Centre

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Builyeon Road	196	504	631	446	566	623	668	515
Ferrymuir Gait	0	0	0	0	102	67	41	0
B800, west of F Gait	99	255	320	226	333	344	354	257
B800, east of F Gait	99	255	320	226	236	279	314	257
B907, Kirkliston Road	45	117	146	103	115	137	155	127
Station Road	49	127	159	113	114	136	153	125
B924, Hopetoun Road	22	57	71	50	51	60	68	56
B907, The Loan	15	39	48	34	35	41	47	38
B924, Edinburgh Road	15	39	48	34	35	41	47	38

Table 61 summarises the worst-case percentage impact assessment on the road links in the vicinity of the prospective development.

Table 61: Cumulative Flows – percentage impact assessment

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Builyeon Road	61.8%	68.6%	94.1%	101.1%	92.1%	80.3%	83.4%	83.9%
Ferrymuir Gait	0.0%	0.0%	0.0%	0.0%	226.7%	108.1%	66.1%	0.0%

Link	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
B800, west of F Gait	29.2%	34.4%	38.3%	37.3%	36.2%	33.5%	30.1%	26.4%
B800, east of F Gait	29.2%	34.4%	38.3%	37.3%	25.6%	27.2%	26.7%	26.4%
B907, Kirkliston Road	23.5%	23.8%	18.4%	18.0%	14.1%	15.8%	15.8%	14.8%
Station Road	88.2%	58.9%	41.1%	75.1%	49.5%	45.3%	33.4%	37.4%
B924, Hopetoun Road	28.6%	21.1%	18.4%	19.1%	14.0%	14.4%	12.6%	11.9%
B907, The Loan	16.7%	14.9%	11.1%	9.4%	8.7%	7.5%	10.0%	10.2%
B924, Edinburgh Road	30.0%	29.0%	29.3%	22.8%	13.4%	16.2%	15.3%	13.7%

The theoretical link capacities are summarised in Table 62, as well as an assessment of the percentage of capacity reached by combining prospective development traffic.

*Table 62: Theoretical link capacities (vehicles per hour – two-way) and cumulative weekday assessment*

Link	Capacity	06.00	07.00	08.00	09.00	15.00	16.00	17.00	18.00
A904, Builyeon Road	1600	32%	77%	81%	55%	74%	87%	92%	71%
Ferrymuir Gait	1600	2%	5%	3%	3%	9%	8%	6%	3%
B800, west	2400	18%	42%	48%	35%	52%	57%	64%	51%
B800, east	2400	18%	42%	48%	35%	48%	54%	62%	51%
B907, Kirkliston Road	1600	15%	38%	59%	42%	58%	63%	71%	62%
Station Road	1600	7%	21%	34%	16%	21%	27%	38%	29%
B924, Hopetoun Road	1600	6%	20%	29%	20%	26%	30%	38%	33%
B907, The Loan	1600	7%	19%	30%	25%	27%	37%	32%	26%
B924, Edinburgh Road	800	8%	21%	27%	23%	37%	37%	44%	40%

This assessment highlights that, generally, the surrounding network has significant available road capacity, although only when the effects of the anticipated reductions in traffic as a result of the Queensferry Crossing works are taken into consideration. The A904, Builyeon Road and the future Queensferry Junction can be anticipated to have to accommodate a significant amount of the estimated vehicular trips associated with the proposed housing developments during the weekday AM and PM peak periods. Although the assessment undertaken above is likely a worst-case scenario in terms of estimated trips, the assessment does not include traffic growth. Also, the isolated assessment of the link capacities will not take into account any downstream impacts of any resulting congestion. Although this is not a detailed assessment of the potential impacts of the committed and potential future developments, it does provide an indication of the potential magnitude and road links affected of the potential increase in traffic movements. It will be incumbent on individual developers to consider the impacts of any future development in more detail.

## 8.4 Parking Impacts

### 8.4.1 On-site

Extracting the peak arrival and departures from Table 16 and Table 17 (that summarise the prospective CEC Visitor Centre estimated hourly arrival and departure trips) i.e. Sunday, an assessment has been undertaken on the likely peak parking accumulation at the site. A summary is provided in Table 63.

Table 63: CEC Visitor Centre – Estimated Parking Accumulation, August

	Arrivals	Departures	Accumulation
	Sunday	Sunday	Sunday
10.00	49	14	35
11.00	65	26	74
12.00	85	55	104
13.00	70	67	107
14.00	66	67	106
15.00	38	80	64
16.00	21	64	21
17.00	12	32	1

This assessment highlights that the peak car parking accumulation is estimated to be 107 car parking spaces. This is based on the assessment undertaken in Chapter 5, including the application of the hourly arrival and departure trips recorded in August 2014 at the entrance to Deep Sea World.

From the parking analysis undertaken as part of the Network Rail study, it was concluded that:

- For an average duration of stay of 3 hours, up to 210 car parking spaces would be required.
- For an average duration of stay of 2 hours, up to 150 car parking spaces would be required.

On this basis, it can be assumed that the prospective CEC Visitor Centre also requires up to 150 car parking spaces (to also take account of staff trips etc.), which ties into the current availability at the Contact & Education Centre. However, there is the existing demand from the other uses at the site that needs to be accommodated. Therefore, there is the potential that the parking provision will have to be expanded, and this will require a more detailed assessment if the site is to be developed. Options that could be exploited are the conceivable expansion into the compound area to the east of the existing car park, or developing other Transport Scotland owned land in the vicinity including for example the “Echline Triangle”, an area of land immediately to the west of Echline roundabout.

Parking demand would also increase if the Contact & Education Centre site was to be used as a ‘hub’ for all trips associated with the attractions being promoted in both North and South Queensferry. A second car park distinctly associated with the North Queensferry proposals would mitigate this, whether at the development site or remote from it.

### 8.4.2 Off-site

Halcrow Group Limited were commissioned by The City of Edinburgh Council to undertake a traffic management and parking study in South Queensferry, which was published in November 2013. This involved the collection of parking data to determine the parking demand and the potential for providing additional off-street car park facilities within South Queensferry.

The parking surveys highlighted that vehicles parked during the survey period were within the available practical capacity throughout the surveyed period with the maximum parking utilisation on Saturday 30 March 2013 of 285 vehicles (92% of capacity) at 14.00. The maximum parking utilisation on Wednesday 10 April 2013 was 198 vehicles (64% of capacity), at 13.00. It was noted that a number of vehicles were recorded parked on double yellow lines; on single yellow lines; on white lines; and on zig-zag lines. Therefore, even though practical capacity was generally available, some drivers were recorded parking on restricted sections. From the duration of stay data recorded, it was determined that 79% and 80% of vehicles recorded on Saturday 30 March 2013 and Wednesday 10 April 2013, respectively, were determined to stay in the area for up to 4 hours i.e. present during 3 parking beats. However, the results of the seasonality assessment does highlight that the potential number of vehicles parked in the survey area may exceed the available practical capacity of 311 by a few vehicles during the busiest hours of the busiest day of the week in the busiest month of the year, although this does not take into account vehicles that cannot park easily and, therefore, do not stay. This conclusion is reinforced by the parking surveys undertaken in the Network Rail study.

However, any potential increase in car traffic into South Queensferry is likely to have an impact on the parking situation within the town centre. As referenced above, the parking surveys undertaken highlight that the practical parking capacity is reached during the busier periods of the year. If no additional parking is available then this might encourage additional movements on the network as drivers search for a space, or discourage those from using the town centre at all. On that basis, there may be some use in considering the potential off-street car park options appraised within the Traffic Management and Parking Study i.e. redevelopment of the Binks site option (which scored highest as a result of its location and current conditions) or development of Parkland Site 5. It should be noted that the Traffic Management and Parking Study did stress that all potential off-street parking options would require significant access improvements to allow pedestrians to reach their likely destinations (town centre/Hawes Brae).

However, the provision of additional off-street parking may have a detrimental impact on the local road network by encouraging more car trips. Therefore, the alternative would be to apply the concept that the Contact & Education Centre site is promoted as a 'hub', from which more sustainable forms of transport are used to make trips to/from the town centre.

## 8.5 Network Rail Study Summary of Impact Assessment

### 8.5.1 North Queensferry

Based on the estimated additional traffic demand over the site's opening time of 10 hours adds an average of approximately 39 trips to the network every hour, equivalent to 78 two-way trips. This estimates a substantial percentage increase in traffic movements, if traffic travels along Main Road to reach the development. The Network Rail study concludes that this could result in the village becoming congested as it already operates near capacity in the summer months due to the impact of Deep Sea World. However, considering the theoretical capacity of Main Road and the existing volume of traffic using it, then it would appear that sufficient capacity exists and is able to accommodate the potential increased traffic associated with the proposed Network Rail proposals. The impact of on-street parking on Main Street (the continuation of Main Road forming part of the potential access to the development site), which is likely to create congestion issues at this location with vehicles having to give-way to oncoming vehicles, and the perceived impact by the local community has led Fife Council to recommend solutions that encourage car based trips to be directed to facilities on the periphery of the village.

A parking assessment within the Network Rail Transport Assessment estimates that, for an average duration of stay of 3 hours, up to 210 car parking spaces would be required. Alternatively, assuming an average duration of stay of 2 hours, up to 150 car parking spaces would be required. Ongoing work is considering how this can be accommodated within and close to North Queensferry. It should be noted that the provision of car parking associated with the development outside the village might require additional parking enforcement within the village, as existing free on-street and off-street parking could be seen by some visitors as a more attractive option.

## 8.5.2 South Queensferry

Based on the estimated additional demand traffic over the site's opening time of 10 hours adds an average of approximately 21 trips to the network every hour, equivalent to 42 two-way trips. This is a low number and when added to the peak hour traffic recorded on Hawes Brae on 24 August 2014 (approximately 370 two-way movements) there would be a circa 11% increase in traffic. Considering the theoretical capacity of Hawes Brae, it would appear that sufficient capacity exists, able to accommodate the potential increased traffic associated with the proposed Network Rail proposals.

No consideration has been given to the potential impact of the additional traffic on the surrounding road network beyond Hawes Brae. With the exception of the traffic that will be attracted to the development from the east, traffic from the west and north is likely to approach the development via the B800/Kirkliston Road/Station Road/Bankhead Road/Hawes Brae or via the B924/Hopetoun Road/Edinburgh Road/Hawes Brae i.e. via the local roads in South Queensferry. However, considering the analysis included in this section which concludes that the road links in South Queensferry have capacity, it is unlikely that the traffic volumes attracted to the South Queensferry rail bridge attraction will have impacts that need to be mitigated.

A parking assessment estimated that approximately 95 car parking spaces would be required and it is intended that this would be accommodated on-site.

## 8.6 Signing Strategy

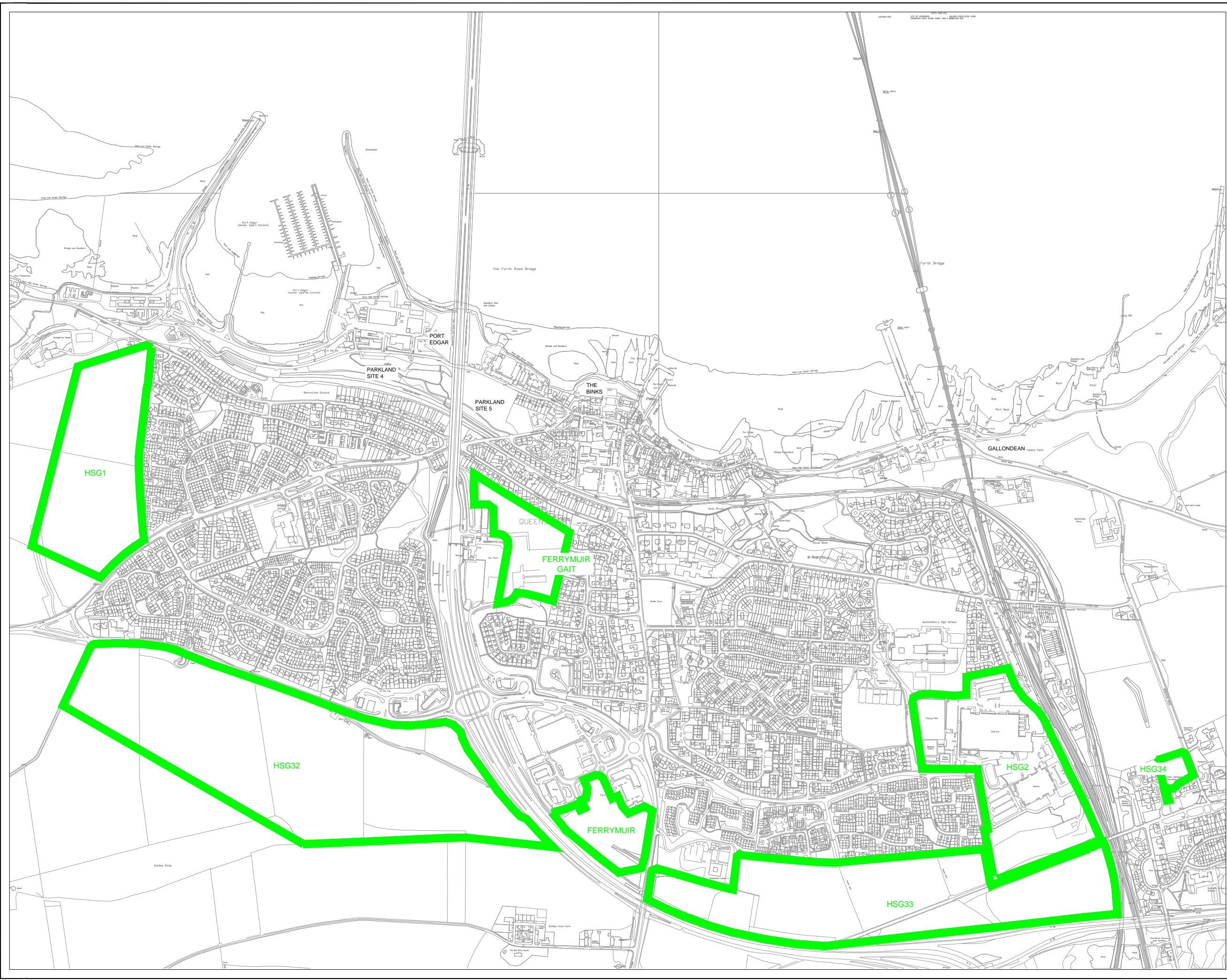
In order for Visitor Centres/attractions to function appropriately, especially as a 'hub', a signing strategy will need to be developed directing visitors to the relevant location(s), reinforcing the traffic management and parking solutions.

On-road, this would build on the already well developed strategic signing that directs people to the Forth Road Bridge (which will change to accommodate the opening of the Queensferry Crossing and its associated redevelopment of the surrounding road network). Informatory signs would provide road users with information, the detail and design of which will have to be developed and given serious consideration at the relevant time.

With regard to walking and cycling routes, there will be a greater need to develop a coherent signing strategy that directs users to/from the walking and cycling network and the potential development sites and existing attractions. A signing strategy to help visitors would incorporate the provision of 'wayfinding' signs to help pedestrians and cyclists form a better picture of the surrounding area linking the key landmarks/attractions/amenities. To develop an effective system, detailed consideration would have to be given to the needs of the community through auditing and consultation (local groups) examining existing links, places of interest and any physical infrastructure issues that pedestrians and cyclists in the area face. An effective and coherent signage system would include: distinctive and consistent signs; predictable and coherent placement; and appealing and accessible design. Detailed consideration would need to be given to placement, materials and information, in order that the signs are distinguishable to all users including those with limited mobility and visibility.







Key Plan:  
 Local Development Plan Boundary

Notes:

Rev	By	Chkd	Apprd	Date	Description

Client:  

TRANSPORT SCOTLAND

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**CH2MHILL.**

Project:  

FORTH BRIDGES  
TRAFFIC IMPACT ASSESSMENT

Drawing:  

Local Development  
Plan Sites

Drawn by: -  
Checked by: -  
Approved by: -  
Drawing No.

Date: -  
Date: -  
Date: -  
Revision

9005  
-

Drawing Scale: NTS

Drawing file path & name : C:\Users\kernall\AppData\Local\Temp\KCP\Plan\_5494\_0001.dwg  
User: kernall  
Date: 13/03/15 10:15 am



# Summary and Conclusions

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## 9.1 Summary

CH2M HILL was commissioned to undertake a traffic impact assessment to investigate the traffic impacts of promoting the Forth Bridges as a visitor attraction.

The existing transport conditions have been considered, including pedestrian facilities, cycle facilities, public transport facilities and the local road network both before and after opening of the Queensferry Crossing.

A Framework Travel Plan has also been prepared and provides an assessment of the measures that could be incorporated within a Visitor Centre if developed. This takes into account all aspects of travel in order to reduce dependency on single occupancy private car use. Details of monitoring, reviewing and reporting procedures are also included.

A summary of the prospective Visitor Centre at the existing Contact & Education Centre has also been provided highlighting the elements that could be incorporated into the design and the surrounding infrastructure to encourage sustainable travel.

A methodology to determine the number and distribution of vehicular trips to and from the site has been developed based on: Scottish Household Survey mode share and vehicle occupancy data; Moffat Centre Visitor Attraction Monitor monthly distributions of visits to Scottish attractions; weekly and daily traffic flow distribution from existing local traffic flows; and distribution and assignment of predicted vehicle trips based on census population data to develop a representative gravity model. A methodology has then been applied to assess the percentage impact of the estimated additional vehicular traffic trips on the local road network.

## 9.2 Conclusions

### 9.2.1 Contact & Education Centre Site

Considering the current pedestrian, cyclist, public transport and vehicle access provision, improvements are likely to focus on the promotion of providing safe, lit and convenient routes to and from the development using the adjacent footway/footpath and cycle network.

It is considered that the prospective Visitor Centre is feasible in accessibility terms with the broad assessment undertaken confirming that the surrounding road network should be able to operate within capacity with no need for physical mitigation beyond that already committed as part of the Queensferry Crossing works. Considering the level of traffic estimated to be associated with the prospective development; the theoretical capacity of the surrounding road network; the conclusions from the capacity assessments included in the committed development applications (summarised in Section 8.3); and the impacts of the construction/opening of the Queensferry Crossing, it can be determined that it is not anticipated to materially impact on the capacity of the surrounding road network, although further consideration of junction impacts and required parking is required if a Visitor Centre is to be developed. The assessment would suggest that the number of vehicles at peak times would exceed the capacity of the existing car park at the CEC when other users are considered however potential sites for additional car parking have been identified. It should also be noted that the assessment provided does consistently use what is considered to be a worst-case scenario.

However, any potential increase in traffic into South Queensferry is likely to have an impact on the available parking within the town centre. As concluded in the Traffic Management and Parking Study, produced for The City of Edinburgh Council and published in November 2013, the results of a seasonality assessment did highlight that the potential number of vehicles parked in the surveyed area may exceed the available maximum practical capacity during the busiest period of the year (based on existing numbers).

Therefore, based on the appraisal of potential off-street car park options also undertaken in the Traffic Management and Parking Study, it is likely that consideration needs to be given to the highest scoring options (see Appendix A for location plans) i.e. redevelopment of the Binks site option, which scored highest mainly as a result of its location and current conditions; and Parkland Site 5 (perhaps as a joint development of car parking in Parkland Site 5 in combination with the development of the existing cycling and walking amenities in Parkland Site 4). The Traffic Management and Parking Study did stress that all potential off-street parking options would require significant access improvements to allow pedestrians to reach their likely destinations (town centre/Hawes Brae).

### 9.2.2 Network Rail Developments

Based on the estimated additional traffic demand, a substantial percentage increase in traffic movements can be anticipated within North Queensferry, assuming traffic travels along Main Road to reach the development. Considering the theoretical capacity of Main Road and the existing volume of traffic using it, it appears that sufficient capacity exists able to accommodate the potential increased traffic associated with the Network Rail proposals. However, the impact of on-street parking on Main Street has the potential to generate congestion at this location with vehicles having to give-way to oncoming vehicles. A parking assessment estimated that up to 210 car parking spaces would be required and ongoing work is considering how this can be accommodated within and close to North Queensferry. It is conceivable that the impact on the roads in North Queensferry could be mitigated by accommodating parking remote from the prospective visitor centre/attraction.

For the South Queensferry development site, the Network Rail assessment concluded that the traffic impact of the proposals, based on the estimated additional demand traffic, is low. It is noted that no consideration has been given to the potential impact of the additional traffic on the surrounding road network beyond Hawes Brae, however, taking account of the more extensive assessment undertaken to assess the prospective Visitor Centre in South Queensferry, it is unlikely that the traffic volumes attracted to the South Queensferry rail bridge attraction will have significant impacts that need to be mitigated. The associated parking assessment estimated that approximately 95 car parking spaces would be required and it is intended that this would be accommodated on-site.

### 9.2.3 Hub Concept

The concept of a hub combining attractions into a 'Forth Bridges Visitor Destination' were raised in a report produced by The Glamis Consultancy, published in March 2014. The study presented a range of transport options in order to enable the movement of visitors between the various activities/attractions around the Bridges, with the proposed South Queensferry Visitor Centre functioning as the transport 'hub'. The benefit of the South Queensferry Visitor Centre 'hub' is that there is access to the trunk road network, which would minimise the traffic impacts on the adjacent towns (North Queensferry and South Queensferry), assuming that the connecting transport options are commercially viable and attractive to the consumer.

However, considering the parking analysis undertaken and the existing/future uses at this site there is the potential that the parking provision will have to be expanded. This will require a more detailed assessment if the proposals are developed, although options that could be developed further include the potential expansion into the compound area to the east of the existing car park, or developing other Transport Scotland owned land in the vicinity. This leads to the potential issues of creating a 'hub' at the South Queensferry site, which may have to be reconsidered with a second alternative car park located north of the Firth of Forth close to North Queensferry.

### 9.2.4 Other Committed/Potential Developments

Beyond the potential increase in traffic associated with visitors, there are plans that involve the expansion of South Queensferry. These plans focus on the provision of additional housing in the region of 2,155 units at various sites. An assessment has been undertaken and has been based on the weekday AM and PM peak hour vehicle trip data available from Transport Assessments and Transport Statements provided online. The Agilent site trip rates have then been extrapolated to determine estimated trips associated with the sites included in the Local Authority's Local Development Plan. The distribution of trips from the Agilent Transport Assessment has also been used for all sites and subsequently the trips

have been assigned to the local network based on professional judgment and using online routing software.

Combining the potential development options and applying these to the base traffic data recorded in 2014, the assessment highlights that, generally, the surrounding network has significant available road capacity, although this is provided for information only and more detailed assessment work will be required if further residential development is progressed. The A904, Builyeon Road and the future Queensferry Junction can be anticipated to have to accommodate a significant amount of the estimated vehicular trips associated with the proposed housing developments. Also, it should be noted that the isolated assessment of the link capacities does not take into account any downstream impacts of any congestion.

## 9.3 Next Steps

While this study aims to provide an impact assessment of the various proposed and prospective visitor attractions and future housing proposals, it is acknowledged that more detailed assessments will be required to elicit more refined conclusions and recommendations.

It is important that while this impact assessment and the assessment undertaken on behalf of Network Rail should be used as a basis for more detailed investigation as proposals are developed, it is also recommended that recognition should be given to other valuable studies undertaken in the area, some of which have been referenced in the preceding chapters. These include:

- Shaping the Future of Queensferry, A Vision for Queensferry's West End Feedback Report, published in April 2014
- The Glamis Consultancy prepared a Market Appraisal and Development report, published in March 2014
- The Forth Bridge Nomination for Inclusion in the World Heritage List Nomination Document, published in January 2014
- The Forth Bridge Nomination for Inclusion in the World Heritage List Management Plan 2014 – 2019
- Queensferry Traffic Management and Parking Study, published November 2013



## Appendix A

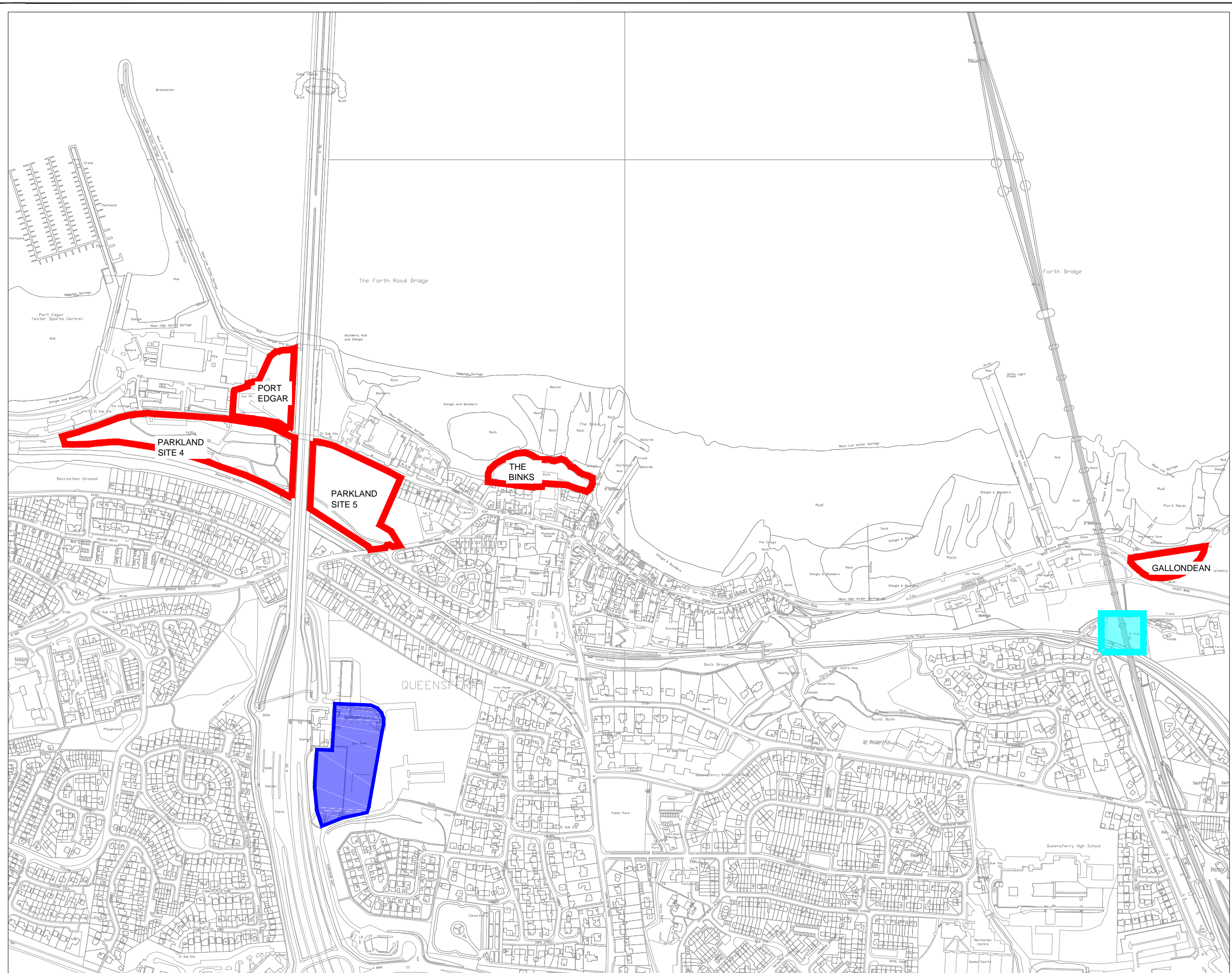
### Off-street Parking Options<sup>37</sup>

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<sup>37</sup> Extracted from the Traffic Management and Parking Study, produced for The City of Edinburgh Council and published in November 2013.





### Key Plan:

-  Transport Scotland  
Visitor Centre
-  Network Rail Guided  
Bridge Walk Experience
-  Car Park Option Outline

### Notes:

-	-	-	-	-	-
Rev	By	Chkd	Apprvd	Date	Description

Client

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# FORTH BRIDGES TRAFFIC IMPACT ASSESSMENT

Drawing

## Off-Street Parking Options from Traffic Management and Parking Study - 2013

Drawn by: -	Date: -
Checked by: -	Date: -
Approved by: -	Date: -

Drawing Scale: NTS

Drawing file path & name : C:\Users\kerrall\AppData\Local\Temp\AcPublish\_6484\Queensterny - Location Plan\_Rer.dwg  
 Reference file path : C:\Users\kerrall\AppData\Local\Temp\AcPublish\_6484\Queensterny - Location Plan\_Rer.dwg  
 User and Plot Date : KerrAL : 31/3/2015 - 10:3 am