UNIVERSITY OF LEEDS
Institute for Transport Studies

UNIVERSITY OF GLASGOW
Adam Smith Business School

Forth Road Bridge Closure Survey: Analysis of Commuter Behaviour

Final Findings Report

16th September 2016

Authors: J. Shires, G. Marsden, I. Docherty and J. Anable

Executive Summary

This document presents the findings of surveys conducted on both commuter & non-commuting travel behaviour during the Forth Road Bridge (FRB) closure. The survey captured 923 commuters (842 full time and 81 part time workers) and 441 non-commuters giving a total sample of 1,364 respondents. We anticipate that the survey will most likely have been filled out by those experiencing significant adverse impacts and, as such, the findings should be interpreted as an upper bound of impacts amongst those affected.

Commuting, Working from Home and Flexible Working

There was a headline reduction in the number of days people travelled to work of 0.4 days per person per week. Three-quarters of this was offset by home working. The remainder may be explained by greater use of flexible working arrangements such as flexi-time although 11% of respondents reported cancelling at least one commute trip during the closure. Overall, the workforce and employers exhibited significant flexibility to reduce the inconvenience of the travel delays.

- There was a 12% reduction in the number of days people travelled to work overall. This reduction was slightly higher for car users but was seen in users of all modes (reductions by mode of access used prior to closure - 13% car, 12% bus/coach, 9% rail & 9% other modes)
- The largest reduction was in people travelling to work five days a week which decreased from 63% to 51% of commuters. This was also seen across all modes with people who commuted by rail prior to the bridge closure showing the largest reduction (16% compared with a 13% reduction for car users)
- There was a corresponding 46% increase in the number of days working from home. This was largest for car users (58%) and lowest for bus/coach (8%), with rail and other similar at 28% and 27% respectively.
- Overall, this equates to a reduction of days travelled to work per week of 0.4 and an increase in days spent working at home per week of 0.3. This was the same for those who used car and rail prior to the closure. Whilst this may imply a loss of days working, there was also substantial evidence of flexible work times being used and it may also represent an intensification of work per commute trip (see below).
- 84% of respondents reported home working being possible. Of these, 38% of employers were supportive of home working (a great deal or quite a bit) whilst 42% were not supportive of home working.
- 90% of respondents reported flexible working being possible. 57% of employers were supportive of flexible working (a great deal or quite a bit). Only 18% were not supportive of flexible working.

Commuting Mode Shift and Journey Times

As anticipated, rail users were least affected by the closure of the road bridge. Journey time increases were much greater for car and bus/coach, although delays

were also seen on the rail network due to increased use. The overwhelming response to the increases in journey times and out of pocket costs was negative. It was difficult to provide sufficient capacity not just on the rail network but at the interchanges and access points to this network. This was less problematic for the bus based Park and Ride as it was not as attractive to users due to the extended journey times.

- The main mode shift during the closure was to rail. 42% of car users shifted to rail, 46% of bus/coach users and 43% of other. 96% of rail users continued with their journeys by rail.
- Those who commuted by car before the closure reported a 64% increase in journey time during the closure (from 44 to 72 minutes). Those commuting by bus reported increases of up to 64% (from 66 to 108 minutes) whilst those travelling by rail reported much smaller increases (37% from 60 to 82 minutes). This seems likely to be due to additional queuing at stations and additional congestion on the rail network.
- 84% of respondents reported paying more per day for their journeys during the closure, with 7% reporting paying less. On average the reported increase in costs was £11.25 per day, although it is not clear whether this was only out of pocket costs (i.e. ignoring fuel saved).
- 10% of people who drove across the Bridge before it closed reported their journeys as being cheaper and 13% of bus users. 17% of rail users reported cheaper journeys, perhaps reflecting fewer trips overall or more off-peak trips.
- Impacts on user experience were overwhelmingly negative and match to the journey time increases/inconvenience for each mode.
    - 45% of car users reported very negative impacts on them and 83% negative overall
    - 50% of bus users reported very negative impacts on them and 90% negative overall
    - 17% of rail users reported very negative impacts on them and 73% negative overall
    - 14% of users reported no impact and 5% either positive or very positive
- Modal transfer points were challenging for travellers. Of those reporting using the modal transfer points:
    - 67% of car users before the closure reported that parking provision at train stations was poor or very poor and 75% of bus users reported the same. 83% of rail users also reported this which is perhaps unsurprising as regular rail users had a benchmark with lower daily use as a reference point.
    - Far fewer people used the bus based park and ride but satisfaction levels were much higher with parking (53% of car drivers who shifted to bus P&R reported good or very good parking compared with 30% who shifted from car to rail).

Commuting & Information Sources

Most people consulted a range of information sources to find out travel information. On average, between 4 and 5 information sources were used. Traditional sources of information are accessed by most people but are not necessarily the most highly valued. The importance of up to date information came through strongly in questions about the use and helpfulness of information sources. There was a strong utilisation of social media as well as local radio.

The three sources with the highest scores of helpfulness (all respondents) were:

- Radio news 18%; Official twitter 16% and Facebook 15%

Overall helpfulness ratings from those that used each source showed the following to have the highest helpfulness (very helpful or helpful) which is indicative of the ability of users of social media to filter out or seek targeted and relevant information:

- Official twitter (75%); Facebook (73%); Radio News (71%); Unofficial twitter (66%) and Train Company Website (66%)

There is a greater prevalence of social media use in the under 40s, with Facebook and Twitter being more popular here. Twitter was less used by over 40s and Facebook use decreased for those over 40 and was used very little by over 60s.

Most accessed information sources by age group (Forth Road Bridge Closure)

16-29	*30-39*	*40-49*	*50-59*	*60-69*
TV	TV	TV	TV	TV
Train Website	Train Website	Radio	Radio	Radio
Radio	Radio	Train Website	Train Website	Train Website
Facebook	Facebook	Government Website	Government Website	Newspaper
Government Website	Government Website	Facebook	Newspaper	Government Website
Official Twitter Feeds	Official Twitter Feeds	Newspaper	Facebook	Stagecoach Website

Commuting and Longer-term impacts

Most people will return to their previous travel patterns once the bridge re-opened. However, 5% of people reported the closure of the bridge having a positive impact on their journeys and a small proportion of users reported being likely to maintain at least some of their behavioural shift. For example, compressing work from five days into four or working remotely more often may have been unexpectedly beneficial. This is important as it is indicative of a lower bound in the potential for behaviour change (given that the alternatives for travelling were all more crowded or took longer than is typically the case).

- 8% of travellers reported being not at all or very unlikely to return to their previous frequency of travel
- 7% reported being not at all or very unlikely to return to the previous timing of travel
- 6% reported being not at all or very unlikely to return to the previous mode of travel.

There is the potential to capitalise on this latent behaviour change potential during 'life events' – for example job and house moves or through more deliberate and targeted behavioural shift strategies which could be considered as part of the National Transport Strategy.

Non-commute and Impact on Activities

Whilst a key focus in times of disruption is the journey to work, there is a range of social impacts of infrastructure failure. Overall, reductions in the frequency and changes in the location of non-work trips were the most common responses. This reflects the ability of consumers to change their retail and leisure destinations and spend on any one trip but clearly has potentially significant distributional impacts (both negative and positive). One explanation for the reduction in trip frequency may be the additional journey times endured for the commute which reduces free time for travel outside of work hours. The reduction in visiting friends and relatives and socialising is likely a result of both the physical segregation from the bridge closure but also the more limited free time resulting from extended commute durations.

- 18% of those with childcare responsibilities reported making a change of some sort;
- 4% of those with a healthcare appointment reported cancelling it;
- 27% of people who do food shopping reported making a change with 24% reducing the frequency with which they shopped and 35% shifting where they shopped
- 60% of people conducting non-food shopping activities reported them being affected. 29% reduced the frequency of shopping, 27% shopped elsewhere and 22% cancelled at least once.
- There were significant impacts on social interaction. Of those reporting these as activities they do 34% reduced the frequency of visiting friends and family, 22% reduced the frequency of leisure trips and 3% reduced the frequency of sports trips
- Rerouting was not as important a response for non-work journeys as for work. As a comparison, 37% of commuters reported re-routing and the highest non-work response was 14% for visiting friends and family.

.

Table of Contents

1. Introduction

This research has been funded by the EPSRC and ESRC Impact Acceleration Account schemes and focuses upon the impacts upon residents either side of the Forth following the closure of the Forth Road Bridge (FRB) between 4th and 22nd December as a result of serious structural faults.

Around 24 million vehicles (Carnegie UK Trust 2016) cross the bridge each year. As such the closure of the bridge had major implications for the Lothian and Fife regions and in particular for those who normally use the bridge for their daily commute.

Road traffic was redirected via the Kincardine and Clackmannshire bridges, adding around 30 minutes and 40 minutes respectively to the normal 40 minutes exemplar journey between Dunfermline and Edinburgh by car. This compares with a journey of around 35 minutes by rail and 100 minutes by bus/coach (Table 1.1)

Table 1.1 Changes in Journey Times Following the Closure of the FRB

Mode	Forth Road/Rail Bridge	Kincardine Bridge	Clackmannshire Bridge
Car	40 minutes	70 minutes	80 minutes
Rail	35 minutes	n.a.	n.a.
Bus/coach	60 minutes	100 minutes	110 minutes

In addition a set of major initiatives was put in place by Transport Scotland in conjunction with local authorities and operators to ameliorate the effects of the closure. Commuters were asked to consider changing modes with a large number of additional trains introduced between Edinburgh and Fife by ScotRail (increasing passenger capacity by 40%[1]), along with additional park and ride coach services operating between Halbeath and Edinburgh (an extra 33 buses[1]). Employers were encouraged to facilitate 'working from home' and flexible working practises and employees to take them up. Freight hauliers were advised to consider alternative routes and/or times to travel. There was also a large information dissemination exercise to keep travellers and businesses up to date and informed about travel conditions and alternative services.

The closure of the FRB had serious implications for residents and travellers. Whilst this is a one-off event in this context, there are risks to road and rail infrastructure from climate change which are growing and infrastructure failures will happen elsewhere in the world. It is therefore essential to learn from such events to ensure that travellers, businesses and communities can be supported in the best way possible if further disruptions occur and to ensure that interventions funded by the taxpayer have the maximum impact. Six months on from completing a large Engineering and Physical Sciences Research Council grant on Disruption (EP/J00460X/1)), the Universities of Leeds and Glasgow where able to deploy the

[1] https://www.forthroadbridge.org/news/forth-road-bridge-closure/

methods developed there to study the FRB closure with the assistance of funding from Impact Acceleration Accounts (Leeds – EPSRC & Glasgow - ESRC) and in discussion with Transport Scotland.

2. Survey

Previous experience from the EPSRC Disruption project clarified the importance of surveying those caught up in a major disruption *during* rather than post disruption. Doing so ensures more accurate responses in terms of what people did and did not do. It also captures the actual thought processes of people at the time as well as encouraging higher response rates. It was therefore essential that a series of quick response surveys could be put into the field in a short time frame.

News of the FRB closure broke on Friday 4 December. Work began on adapting a previous Disruption project survey on Monday 7 December, with a finalised version in place by Wednesday 9 December.

Operationalising the Surveys

Initial discussions to operationalise the survey had centred on using an online panel survey. This would have the advantages of targeting people directly and quickly, however after speaking to panel companies it became clear that they would struggle to guarantee sufficient sample sizes and that the associated costs of doing so would be prohibitive.

Instead a mixed mode survey strategy was implemented (Table 2.1) which utilised: (1) An online survey promoted via Twitter; (2) A postal survey mailed directly to 9,500 households in areas affected by the disruption; and (3) The distribution of self-complete paper surveys to passengers boarding train services operating across the Forth Rail bridge and to passengers boarding direct coach services at Halbeath park and ride site travelling to Edinburgh via the Kincardine Bridge.

Table 2.1 Survey Strategy

Survey Type	**Target Audience**	**Distributed**	**Returns**
Online – Twitter	Travellers – all modes Non-travellers	750,000+[2]	98
Train/Coach – Postal	Travellers – existing users & those shifting mode	3,112	607
Household Direct Mail	Travellers – all modes Non-travellers	9,500	659

The online Twitter survey was seen as a method to quickly deliver (or at least draw attention to) an online survey (hosted by BristolOnlineSurveys). A number of transport companies, local government offices, newspapers, radio stations etc. were contacted to see if they would tweet out a link to the survey. The survey ran from 10 December until the 5 January with some notable retweets including Scotrail (110,000 followers) and the Sunday Times (349,000 followers).

[2] Difficult to estimate how many people read the tweet or how relevant the tweet was however some notable retweets included Scotrail (110,000 followers) and the Sunday Times (349,000 followers).

Despite this, the number of respondents undertaking the survey amounted to just over 98 reflecting the limitations of using twitter and other social media for undertaking survey work. These mediums appear to be mainly used to impart and exchange bite size chunks of news and views; not to direct people to surveys that would be difficult to complete on a mobile device or take up time.

A further weakness of using social media to promote surveys is that it is impossible to target specific users in terms of geographical location, transport modes or socio-demographic groups. To overcome this, two different types of paper based postal surveys were developed.

The paper based surveys encompassed a direct mail shot to households within Fife (an historic county, just to the north of Edinburgh, with a population of around 370,000) and surveys of rail and coach passengers making journeys across the Forth. The former had the intention of targeting affected travellers (of all modes) and non-affected travellers who none the less might have been impacted (e.g. having to pick friends' children up from school).

Given the size of Fife a decision was made to target selected postal codes that would have had a greater likelihood of being affected by the disruption. To this end the following codes were targeted, with the distribution of households receiving the questionnaire (total of 9,500) within each postal code weighted by their relative populations (Table 2.2).

The processes involved with delivering such a large direct mail survey were longer than the other two surveys (e.g. approving proofs, sourcing mail addresses) and were exacerbated by the time of year (the run into Christmas). This combination of factors meant that the surveys were not sent out until 18th December, however this still ensured that households received the survey before the FRB reopened on 23rd December. A total of 659 completed surveys were received back, giving a 7% response rate. This is a relatively high response rate for a direct mail survey, especially considering that households received it just a few days before Christmas, and proves how important an issue the closure of the FRB was for many households.

Table 2.2 Distribution of Direct Mail Survey

Postcode	Populations	Questionnaires Distributed[3]
KY1	92,620	4,420
KY2	14,126	674
KY3	5,471	261
KY4	10,222	488
KY5	9,493	453
KY6	8,779	419
KY7	12,619	602
KY11	27,026	1,209
KY12	18,731	894
Total	199,087	9,500

[3] Note the distribution within each postcode was randomised.

In contrast, the survey of train and coach services had the specific aims of intercepting car users who had switched to these modes and to see what the impact (e.g. overcrowding & services not running to time) was on those who normally travelled by these modes. To this end, rail passengers boarding and disembarking to/from affected services at both Waverley and Haymarket railway stations were given self-complete paper surveys and asked to mail them back in a pre-paid freepost envelope. A similar survey was carried out at Halbeath park and ride in Fife for passengers boarding direct coach services to Edinburgh.

Permissions to survey passengers were sort and granted from both Scotrail and Stagecoach East Scotland. This resulted in the survey team being in place by 14 December, finishing the survey on 17 December. All passengers were in scope to take part in the survey provided they were crossing the Forth[4]. In total 3,112 surveys forms were distributed (3,000 to rail passengers & 112 to coach passengers) during this period and 607 completed forms returned (568 rail and 39 coach). Overall the response rate for this survey was 20% which is particularly high for a mail back survey and again reflects the importance of the disruption to travellers.

Description of the Survey Data

This section outlines some of the key broad descriptors of the returned survey data in order to characterise the population that responded. The next chapter present much more detailed analysis, centred on a commuter vs non-commuter split. Whilst the questionnaires differed slightly across all three surveys (to reflect the target audiences), the direct mail questionnaire can be found in Appendix One and contains all the key questions asked across all the surveys.

Very light touch cleaning was applied to the survey data returns, which maximised the returns included in the data set. Only those who failed to provide anything of value (e.g. could not be sensibly included in any analysis) were excluded. In the event the completion rate was exceptionally high with only 36 questionnaires being discarded.

Table 2.3 outlines some key descriptors which indicate how representative the data is and whether there are any inbuilt biases that should be considered in the ensuing detailed analyses. Where possible, comparative measures, as taken from the Scottish Census (Scottish Census, 2011) for the Fife region, have been reported (inside brackets) alongside the survey data.

From a gender perspective the survey sample contains slightly more males than females (2% more) and is not quite reflective of the Fife population as a whole (4% more females). This may reflect a bias towards commuters within the survey which are likely to have higher numbers of males.

The age profile of the survey sample is over representative towards the older age categories (40+ years) and underweighted towards the youngest age categories,

[4] Only local train services were surveyed, e.g. Fife to/from Edinburgh.

especially 16-19. This pattern is a familiar one and highlights higher response rates amongst older segments of society vs lower response rates amongst younger segments. The contrast was particularly marked for the youngest cohort (16-19 years) and reflects the likelihood that this age group was not reached particularly well by the train/coach surveys or household survey. In the case of the latter it is likely that a parent will have completed the survey, whilst for the former the flows will have been dominated by older groups making commuting/business/leisure trips as opposed to educational trips.

Table 2.3 Descriptive Data Statistics by Survey & Census

Descriptor	*Male*	*Female*					*Obs*
Gender[5]	51% (48%)	49% (52%)					1,309
	16-29 yrs[6]	*30-39 yrs*	*40-49 yrs*	*50-59 yrs*	*60-69 yrs*	*70+ yrs*	
Age Group[7]	7% (21%)	14% (15%)	20% (18%)	23% (16%)	24% (15%)	12% (15%)	1,316
	Employed	*Not Employed*					
Employment[8]	70% (72%)	30% (28%)					1,313
	Yes	*No*					
Driving license[9]	91% (68%)	9% (32%					1,317
	Yes	*No*					
Car Availability[10]	86% (70%)	14% (30%)					1,221
	Children <6 yrs - Yes	*Children <6 yrs - No*	*Children 6-16 yrs – Yes*	*Chidren 6-16 yrs – No*			
Household Composition	*14%*	*86%*	22%	78%			*1,157* 1,220
	Edinburgh	*Non-Edinburgh*					
Home Location	12%	*88%*					1,364

From an employment perspective the survey sample is replicative of the census statistics. This does not appear to be the case with regards driving license and car availability, with the survey sample reporting much higher incidences of both (23% and 16% respectively). This suggests that those responding are more likely to have

[5] http://www.scotlandscensus.gov.uk/ods-analyser/jsf/tableView/tableView.xhtml
[6] Note that the response for 16-19 was 1% and 20-29 was 7%. The comparative census figures for these two groups is 6% and 15%
[7] http://www.scotlandscensus.gov.uk/ods-analyser/jsf/tableView/tableView.xhtml
[8] http://www.scotlandscensus.gov.uk/ods-analyser/jsf/tableView/tableView.xhtml
[9] http://www.gov.scot/Publications/2015/08/3720/7
[10] http://www.gov.scot/Publications/2015/08/3720/7

been directly affected by the FRB closure, namely car drivers or car passengers. It also reflects that our sample is skewed towards commuters (68%). Care is therefore required when carrying out the analysis of this data to ensure that the views of non-car users are also represented.

3. Analysis

3.1 Commuters

In this chapter analysis is presented related to the impact of the FRB closure on commuters. Commuters have been defined as those respondents who work, either full or part time, as such the analysis is based on 923 commuters (842 full time workers and 81 part time workers). As noted in chapter 2, we anticipate that the survey will most likely have been filled out by those experiencing the most significant adverse impacts and, as such, the findings should be interpreted as an upper bound of impacts amongst those most affected.

Commuting, Working from Home and Flexible Working

The change in travel patterns for commuters is outlined in Tables 3.1 and 3.2 presenting the frequency of journeys across the Forth disaggregated by mode for both the pre and post closure of the FRB. Tables 3.3 and 3.4 present the same analysis for working from home. The information from these four tables has been combined and analysed in Tables 3.5 and 3.6 belowFrom Table 3.5 it can be seen that since the closure of the FRB there has been a 12% reduction in the number of days people travelled to work overall. This reduction was slightly higher for car users but was seen in users of all modes (with reductions by mode of access prior to closure in the order of 13% car, 12% bus/coach, 9% rail and 9% other modes).

The largest reduction in travelling to work was in people travelling to work five days a week which decreased from 63% to 51% of commuters (Tables 3.1 and 3.2). This was also seen across all modes with rail commuters prior to the bridge closure showing the largest reduction (16% compared with a 13% reduction for car users) which may reflect increased crowding on rail services.

There was a corresponding 46% increase in the number of days working from home. This was largest for car users (58%) and lowest for bus/coach (8%) with rail and 'other' similar at 28% and 27% respectively (Tables 3.3 and 3.4).Overall, this equates to a reduction of days travelled to work per week of 0.4 and an increase in days spent working at home per week of 0.3 (Table 3.5). This was the same for those who used car and rail prior to the closure. Whilst this may imply a loss of days working, there was also substantial evidence of flexible work times being used and it may also represent an intensification of work per commute trip for those who could work flexi-time but not work from home (see below).

Working from home assumes that the employee is able to work from home and that the employer is happy for them to work at home. Table 3.6 outlines both of these, noting that 84% of respondents reported home working being possible. Of these, 38% of employers were supportive of home working (a great deal or quite a bit), with 42% not supportive of home working. A total of 90% of respondents reported flexible working being possible, with 57% of employers being supportive of flexible working (a great deal or quite a bit) and 18% not supportive of flexible working.

Table 3.1 Travel to and From Work – Before Closure (Commuters, n=909)

	ALL			Car			Bus/coach			Rail			Other		
Days per Week	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days
0	40	4%	0	16	3%	0	0	0%	0	2	1%	0	15	27%	0
1	10	1%	10	6	1%	6	1	1%	1	0	0%	0	3	5%	3
2	35	4%	70	22	4%	44	5	5%	10	6	4%	12	1	2%	2
3	81	9%	243	49	9%	147	10	11%	30	19	13%	57	1	2%	3
4	112	12%	448	72	13%	288	7	7%	28	22	15%	88	6	11%	24
5	577	63%	2885	362	64%	1810	67	71%	335	102	68%	510	25	45%	125
6	37	4%	222	30	5%	180	2	2%	12	0	0%	0	4	7%	24
7	17	2%	119	12	2%	84	2	2%	14	0	0%	0	1	2%	7
Total	909	100%	3997	569	100%	2559	94	100%	430	151	100%	667	56	100%	188

Table 3.2 Travel to and From Work – Since Closure (Commuters, n=873)

	ALL			Car			Bus/coach			Rail			Other		
Days per Week	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days	Frequency	Percent	Total travelling days
0	45	5%	0	21	4%	0	3	3%	0	4	3%	0	12	23%	0
1	25	3%	25	19	3%	19	3	3%	3	1	1%	1	2	4%	2
2	70	8%	140	44	8%	88	7	8%	14	13	9%	26	3	6%	6
3	113	13%	339	67	12%	201	10	11%	30	26	17%	78	6	12%	18
4	130	15%	520	82	15%	328	13	14%	52	26	17%	104	6	12%	24
5	445	51%	2225	276	51%	1380	52	57%	260	78	52%	390	19	37%	95
6	29	3%	174	25	5%	150	1	1%	6	1	1%	6	2	4%	12
7	16	2%	112	10	2%	70	2	2%	14	0	0%	0	2	4%	14
Total	873	100%	3535	544	100%	2236	91	100%	379	149	100%	605	52	100%	171

Table 3.3 Working from home – Before Closure (commuters, n=899)

	ALL			Car			Bus/coach			Rail			Other		
Days per Week	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days
0	721	80%	0	463	82%	0	76	84%	0	115	76%	0	36	65%	0
1	76	8%	76	41	7%	41	4	4%	4	21	14%	21	8	15%	8
2	33	4%	66	21	4%	42	2	2%	4	9	6%	18	0	0%	0
3	16	2%	48	10	2%	30	3	3%	9	2	1%	6	0	0%	0
4	11	1%	44	7	1%	28	0	0%	0	1	1%	4	2	4%	8
5	31	3%	155	19	3%	95	4	4%	20	3	2%	15	4	7%	20
6	0	0%	0	0	0%	0	0	0%	0	0	0%	0	0	0%	0
7	11	1%	77	3	1%	21	2	2%	14	0	0%	0	5	9%	35
Total	899	100%	466	564	100%	257	91	100%	51	151	100%	64	55	100%	71

Table 3.4 Working from home – After Closure (commuters, n=878)

	ALL			Car			Bus/coach			Rail			Other		
Days per Week	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days	Frequency	Percent	Total non travelling days
0	610	69%	0	382	70%	0	72	79%	0	99	66%	0	29	57%	0
1	94	11%	94	61	11%	61	6	7%	6	20	13%	20	4	8%	4
2	67	8%	134	42	8%	84	2	2%	4	17	11%	34	3	6%	6
3	47	5%	141	30	5%	90	5	5%	15	8	5%	24	2	4%	6
4	14	2%	56	9	2%	36	2	2%	8	2	1%	8	1	2%	4
5	32	4%	160	18	3%	90	3	3%	15	3	2%	15	7	14%	35
6	3	0%	18	3	1%	18	0	0%	0	0	0%	0	0	0%	0
7	11	1%	77	4	1%	28	1	1%	7	0	0%	0	5	10%	35
Total	878	100%	680	549	100%	407	91	100%	55	149	100%	101	51	100%	90

Table 3.5 Comparison between Work Travel and Working from Home (commuters – based on Tables 3.1 to 3.4 above)

	ALL		Car			Bus/coach			Rail			Other		
No. of Trips/Days at home	To work pw	Days at home	No. of Trips	To work pw	Days at home	No. of Trips	To work pw	Days at home	No. of Trips	To work pw	Days at home	No. of Trips	To work pw	Days at home
Before	3997	466	Before	2559	257	Before	430	51	Before	667	64	Before	188	71
After	3535	680	After	2236	407	After	379	55	After	605	101	After	171	90
After – before	-462	214	After - before	-323	150	After - before	-51	4	After – before	-62	37	After - before	-17	19

Mean Trips/Days at home	To work pw	Days at home	Mean trips	To work pw	Days at home	Mean trips	To work pw	Days at home	Mean trips	To work pw	Days at home	Mean trips	To work pw	Days at home
Before	4.4	0.5	Before	4.5	0.5	Before	4.6	0.6	Before	4.4	0.4	Before	3.4	1.3
After	4.0	0.8	After	4.1	0.7	After	4.2	0.6	After	4.1	0.7	After	3.3	1.8
After - before	-0.3	0.3	After - before	-0.4	0.3	After - before	-0.4	0.0	After - before	-0.4	0.3	After - before	-0.1	0.5

pw - per week

Table 3.6 How Accommodating have Employers' been?

Ratings	Working from Home	Working Flexible Hours	In General
A great deal	24%	35%	31%
Quite a bit	14%	22%	25%
Somewhat	13%	18%	22%
Very little	6%	7%	9%
Not at all	42%	18%	13%
Total	633	692	735
Not an option	104	80	58

Mode Shift and Journey Times

As anticipated, rail users were least affected by the closure of the road bridge. Journey time increases were much greater for car and bus/coach although delays were also seen on the rail network due to increased use. The overwhelming response to the increases in journey times and out of pocket costs was negative. It was difficult to provide sufficient additional capacity not just on the rail network but at the interchanges and access points to this network. This was less problematic for the bus based Park and Ride as it was not as attractive to users.

The main mode shift (Table 3.7) during the closure was to rail with 42% of car users shifting to rail, 46% of bus/coach users and 43% of other. Of existing rail users, 96% continued with their journeys by rail and 4% ceased. The latter may have made their decision based upon increased crowding, longer journey times and general disruption to rail services during this time.

Table 3.7 Modal Shift in Main Modes Used for Journey to Work during the Closure (commuters, n=752)

	Mode After								
	Car		Bus/coach		Rail		Other		
Before	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Totals
Car	264	54%	14	3%	204	42%	3	1%	485
Bus	2	3%	42	52%	37	46%	0	0%	82
Rail	3	2%	1	0%	138	96%	2	1%	144
Other	3	7%	2	4%	17	43%	19	46%	41

From Table 3.8 it can be seen that those who commuted by car before the closure and continued to do so during the closures reported a 64% increase in journey time (from 44 to 72 minutes). Similar figures for bus and rail report increases of 64% (from 66 to 108 minutes) and 37% (from 60 to 82 minutes). Clearly the impact of the closure had less impact on rail vis-à-vis car and road. This is especially the case for those who travelled by rail before the disruption (and presumably continued to do so during the disruption) with an increase of only 17%. It is unclear at this stage what the cause(s) of the increase were but it is likely to be as a result of a more congested rail network and additional queuing at rail stations.

Table 3.8 Change in Travel Time – Based on Original Mode of Travel & Mode of Travel during Disruption

	Travelling to Work (minutes)			
	All Modes	Car Users	Bus Users	Rail Users
Pre Closure – Typical Journey Time	50	44	66	60
During Closure (original modes) – Typical Journey Time	82	83	95	70
During Closure (actual modes) – Typical Journey Time	n.a.	72	108	82
N	730/ 796	459/495/233	80/86/60	129/143/368

Given the high levels of modal transfer, especially from car, it is not surprising that 84% of commuters reported paying more per day for their journeys during the closure with 7% reporting paying less (Table 3.9). On average the reported increase in costs was £11.25 per day, although it is not clear whether this was only out of pocket costs (i.e. ignoring fuel saved); however this figure does appear to tally with the associated cost of a peak rail return ticket between Fife and Edinburgh (Dunfermline - £10, Cowdenbeath - £11.70 and Kirkcaldy - £14).

Table 3.9 Financial Impact on Cost of Travel

Categories	Cheaper per Day	More Expensive per Day
£2 or less	8	14
£2.01 to £5	15	88
£5.01 to £10	5	172
£10.01 to £20	5	100
£20.01+	3	79
Total	36	453
I pay the same	52	

Breaking down Table 3.9 by previous mode reveals that 86% of car users who travelled across the Bridge before it closed reported their journeys as being more expensive (Table 3.10). For previous bus users a similar figure of 79% reported paying more for their travel during the closure. This is to be expected, given that bus travel between Fife and Edinburgh is cheaper than rail (£6.20 return from Halbeath Park and Ride - http://www.halbeath.org/htmlpages/fares.html) and that car users often underestimate the costs of car travel.

For rail, 17% of users reported cheaper journeys, whilst 40% reported more expensive journeys. The former may reflect people travelling less often and either working longer days when in the workplace or working more from home. The latter

may reflect existing rail users travelling to a different (preceding) train station in order to guarantee a seat.

Table 3.10 Financial Impact on Cost of Travel

	Car		Bus		Rail	
Categories	Cheaper per Day	More Expensive per Day	Cheaper per Day	More Expensive per Day	Cheaper per Day	More Expensive per Day
£2 or less	6	8	1	1	1	2
£2.01 to £5	7	67	4	10	1	5
£5.01 to £10	3	128	1	21	1	2
£10.01 to £20	3	80	0	10	1	4
£20.01+	19	55	2	6	4	6
Total	38	338	8	48	8	19
I pay the same	19		5		20	

In terms of Impacts on user experience, it can be seen from Table 3.11 that these were overwhelmingly negative and match to the journey time increases/inconvenience for each mode. A total of 45% of car users reported very negative impacts on them and 83% negative overall. For bus users the figures were 50% reporting very negative impacts on them and 90% negative overall. A total of 17% of rail users reported very negative impacts on them and 73% negative overall

Given the promotion of public transport by the authorities during the FRB closure it is worth noting that modal transfer points were challenging for travellers (Table 3.12). Of those reporting using the modal transfer points, around 67% of car users before the closure reported that parking provision at train stations was poor or very poor and 75% of bus users reported the same. In addition, 83% of rail users also reported this. This is perhaps unsurprising as regular rail users had a benchmark with lower daily use as a reference point

Table 3.11 Impact of the Closure on People (commuters, N's as reported in table)

Ratings	Impact on You	Impact on Work Colleagues	Impact on Anyone you Live With
All Users			
Very negative	40%	37%	29%
Negative	42%	39%	31%
No impact	14%	22%	37%
Positive	3%	2%	1%
Very positive	2%	1%	1%
Total	901	849	813
Car Users before Closure			
Very negative	45%	42%	32%
Negative	38%	37%	31%
No impact	12%	19%	35%
Positive	3%	1%	1%
Very positive	2%	1%	1%
Total	561	532	505
Bus Users before Closure			
Very negative	50%	44%	35%
Negative	40%	30%	31%
No impact	7%	21%	30%
Positive	2%	4%	4%
Very positive	1%	1%	1%
Total	92	84	81
Rail Users before Closure			
Very negative	17%	14%	16%
Negative	56%	53%	33%
No impact	24%	31%	49%
Positive	3%	1%	1%
Very positive	1%	0%	0%
Total	148	143	138

Table 3.12 Rating Alternative Means & Different Aspect of Travel since the Closure of the Bridge (commuters, N's as reported in table)

Ratings	Availability of Car Parking at Train Stations	Availability of Car Parking at PnRide	Access to/from train stations using bus/coach
Car Users before Closure			
Very Good	3%	7%	2%
Good	10%	11%	11%
Neutral	10%	9%	13%
Poor	19%	3%	9%
Very Poor	26%	4%	9%
Not Applicable	33%	66%	56%
Total	545	533	538
Bus Users before Closure			
Very Good	1%	20%	8%
Good	3%	10%	9%
Neutral	9%	6%	14%
Poor	10%	2%	11%
Very Poor	32%	6%	13%
Not Applicable	44%	55%	45%
Total	87	83	87
Rail Users before Closure			
Very Good	1%	3%	1%
Good	4%	2%	7%
Neutral	6%	5%	5%
Poor	19%	2%	6%
Very Poor	36%	6%	7%
Not Applicable	34%	81%	74%
Total	140	134	137
Other Users before Closure			
Very Good	2%	6%	0%
Good	8%	4%	10%
Neutral	2%	8%	2%
Poor	13%	0%	15%
Very Poor	17%	0%	6%
Not Applicable	58%	82%	67%
Total	52	51	52

Far fewer people used the bus based park and ride but satisfaction levels were much higher with parking (53% of car drivers who shifted to bus P&R reported good or very good parking compared with 30% who shifted from car to rail).

Impact on Activities

Analysis of commuters has been focused upon the impact on work related activities during the FRB closures (Table 3.13), with the impact on non-work trips illustrated for completeness.

For commuting trips there are key changes to choice of route (37%), time (35%) and mode of travel (26%), along with large changes to frequency of travel (17%), cancelation (13%) and where they worked from (12%). This clearly reflects that commuters adopted a number of strategies to cope with the FRB closure, clustered around changing both travel habits and working practises.

Business travel was less affected, which probably reflects that not all commuters make such trips. Non-work trips for shopping, sport, leisure and visiting family and friends were strongly affected, with reduced frequency, cancellation and, for non-food shopping, change of location the key behavioural response. These tally with the non-commuter behaviour in the next chapter.

Table 3.13 Impacts on Activities during Closure (commuters, n=923)

Activity	**Reduced the frequency I do this**	**Asked someone else to do this for me**	**Cancelled at least once**	**Carried on with new route**	**Carried on but at new time**	**Carried on with new mode**	**Changed where I do this**	**N/A**
Work	14%	2%	11%	31%	29%	22%	10%	16%
Biz travel	8%	1%	7%	9%	6%	5%	2%	47%
School/child care	2%	4%	1%	1%	1%	1%	0%	62%
Health care	2%	1%	4%	2%	1%	1%	0%	62%
Food shopping	7%	2%	3%	2%	2%	1%	6%	56%
Non-food shopping	15%	1%	10%	4%	2%	3%	13%	39%
Sport	10%	0%	7%	2%	2%	1%	3%	53%
Leisure	21%	0%	16%	7%	3%	4%	8%	34%
Visiting Family & Friends	27%	0%	21%	10%	5%	4%	4%	29%

Information Sources

During the closure of the FRB there was a strong emphasis placed upon providing the general public with information about alternative routes and modes, Most people consulted a range of information sources to find out travel information (Table 3.14).

Table 3.14 Sources of Information Consulted and Age Profile (n=906)

Info Sources	16-29	30-39	40-49	50-59	60-69	70+	Total
TV news	66	129	195	210	88	4	692
Radio news	59	116	170	184	78	3	610
Newspaper	33	82	105	125	56	3	404
Govt/LA websites	50	103	134	154	46	0	487
Train company website	63	136	169	182	61	1	612
Stagecoach website	28	57	75	83	35	2	280
Scottish Citylink website	15	33	35	41	16	0	140
Facebook	56	109	121	93	22	0	401
Official twitter	45	93	100	68	16	0	322
Unofficial twitter	30	71	63	54	11	0	229
N	90	177	250	267	116	6	

On average, between 4 and 5 information sources were used.(Table 3.15), possibly reflecting an upper limit that people have for processing information and the time they are willing to spend doing so (time budget). Traditional sources of information are accessed by most people but are not necessarily the most highly valued (Table 3.16). The importance of up to date information came through strongly in questions about the use and helpfulness of information sources. There was a strong utilisation of social media as well as local radio.

Table 3.15 During Closure How Many Sources of Information did People Use

No. of Sources Consulted	Respondents	%
0	31	3.4
1	57	6.2
2	123	13.3
3	143	15.5
4	142	15.4
5	136	14.7
6	91	9.9
7	69	7.5
8	35	3.8
9	16	1.7
10	80	8.7
Total	923	100

Table 3.16 How Did People Rate the Following Sources of Information

Info Sources	Very helpful	Helpful	Neutral	Unhelpful	Very unhelpful	Not used	N
TV news	11%	37%	25%	7%	3%	17%	841
Radio news	18%	37%	16%	4%	2%	23%	797
Newspaper	4%	18%	21%	7%	3%	47%	770
Govt/LA websites	7%	29%	17%	6%	5%	35%	760
Train company website	14%	37%	17%	8%	2%	23%	805
Stagecoach website	6%	13%	10%	5%	4%	62%	747
Scottish Citylink website	1%	4%	9%	4%	2%	80%	716
Facebook	15%	24%	10%	3%	1%	47%	772
Official twitter	16%	17%	7%	1%	1%	56%	748
Unofficial twitter	9%	12%	8%	2%	1%	68%	727

The three sources with the highest scores of helpfulness (all respondents) were, radio news 18%, official twitter 16% and Facebook 15%.

Overall helpfulness ratings from those that used each source showed the following to have the highest helpfulness (very helpful or helpful) which is indicative of the ability of users of social media to filter out or seek targeted and relevant information: (1) Official twitter (75%); (2) Facebook (73%); (3) Radio News (71%); (4) Unofficial twitter (66%); and (5)Train Company Website (66%)

There is a greater prevalence of social media use in the under 40s (Table 3.17) with Facebook and Twitter being more popular here. Twitter was less used by over 40s and Facebook decreasingly by over 50s.

Table 3.17 Most accessed information sources by age group (Forth Road Bridge)

16-29	30-39	40-49	50-59	60-69
TV	TV	TV	TV	TV
Train Website	Train Website	Radio	Radio	Radio
Radio	Radio	Train Website	Train Website	Train Website
Facebook	Facebook	Government Website	Government Website	Newspaper
Government Website	Government Website	Facebook	Newspaper	Government Website
Official Twitter Feeds	Official Twitter Feeds	Newspaper	Facebook	Stagecoach Website

Longer-term Impacts

One of the key premises of the EPRSC Disruption project was that disruptions would be a point at which people are forced to change how they travel and that this will lead to some experimentation and innovation. There is a possibility that some of their changes in behaviour may become permanent if they view it as beneficial, e.g. not needing to be in the office every day, setting off earlier once a week being beneficial, realising that a journey can be made by bicycle or that a bus route does connect. This is of course tempered by the issues which occur during a disruption where many people may make such changes and the transport supply may be insufficient to cope with it, thus reinforcing reluctance to change some behaviours.

Table 3.18 reports how likely commuters are to return to their previous travel behaviours and illustrates that whilst most people will return to their previous travel patterns once the bridge re-opened, around 3-4% of people will definitely not. In addition another 3-4% of people reported being likely to maintain at least some of their behavioural shift.

This is important as it is indicative of a lower bound in the potential for behaviour change (given that the alternatives for travelling were all more crowded or took longer than is typically the case) with:

- 8% of travellers reported being not at all or very unlikely to return to their previous frequency of travel
- 7% reported being not at all or very unlikely to return to the previous timing of travel
- 6% reported being not at all or very unlikely to return to the previous mode of travel.

Table 3.18 Likelihood of Returning to Previous Travel Behaviours

Likelihood of Returning to Previous Behaviours	Transport Mode	When to Travel	Frequency of Travel
Definitely yes	78%	75%	75%
Probably yes	12%	14%	12%
Not sure	5%	4%	4%
Probably not	3%	4%	4%
Definitely not	3%	3%	4%
Total	837	811	806

The magnitude of these changes are sizeable and as such provide some evidence that certain types of disruption can achieve long term changes in travel behaviour. Supporting alternative travel patterns during such events will be useful for at least some travellers and of longer-term value. Furthermore, there is the potential to capitalise on this latent behaviour change potential during 'life events' – for example job and house moves or through more deliberate and targeted behavioural shift strategies which could be considered as part of the National Transport Strategy.

3.2 Non-Commuters

Analysis of non-commuters has been focused upon the impact on non-work related activities during the FRB closures (Table 3.19). Overall, reductions in the *frequency* and *changes* of the location on non-work trips were the most common responses. This reflects the ability of consumers to change their retail and leisure destinations and the amount they spend on any one trip but clearly has potentially significant distributional impacts (both negative and positive).

One explanation for the reduction in trip frequency may be the additional journey times endured for the commute which reduces free time for travel outside of work hours. The reduction in visiting friends and relatives and socialising is likely a

combination of the reduced free time and some effects of the physical segregation from the bridge closure. Notable changes included[11]:

- 18% of those with childcare responsibilities reported making a change of some sort;
- 4% of those with a healthcare appointment reported cancelling it;
- 27% of people who do food shopping reported making a change with 24% reducing the frequency with which they shopped and 35% shifting where they shopped
- 60% of people conducting non-food shopping activities reported them being affected. Of these 29% reduced the frequency of shopping, 27% shopped elsewhere and 20% cancelled at least once.
- There were significant impacts on social interaction. Of those reporting these as activities they do 34% reduced the frequency of visiting friends and family, 22% reduced the frequency of leisure trips and 3% reduced the frequency of sports trips
- Rerouting was not as important a response for non-work journeys as for work. As a comparison, 37% of commuters reported re-routing and the highest non-work response was 14% for visiting friends and family.

Table 3.19 Impacts on Activities during Closure (non-commuters, n=390)

Activity	Reduced the frequency I do this	Asked someone else to do this for me	Cancelled at least once	Carried on with new route	Carried on but at new time	Carried on with new mode	Changed where I do this	N/A
School/child care	2%	1%	4%	2%	0%	1%	0%	43%
Health care	2%	0%	2%	2%	0%	2%	4%	44%
Food shopping	4%	0%	4%	2%	0%	1%	6%	38%
Non-food shopping	13%	0%	9%	5%	2%	4%	12%	26%
Sport	2%	0%	2%	2%	1%	1%	1%	42%
Leisure	16%	0%	11%	7%	2%	6%	7%	26%
Visiting Family & Friends	26%	1%	15%	11%	2%	9%	3%	23%

[11] Percentages refer to those for whom this category of activity was marked as applicable

It is worth noting that non-commute trips should not be seen to be less important as part of a response to disruptive events. Elsewhere, our work has identified single parent families being particularly vulnerable to delays around childcare and one-off events such as funerals and reunions holding special value. Healthcare is another challenging issues with many people performing caring roles for others in the community and feeling this to be difficult to change. We received comment from someone forced to divert by road to receive radiotherapy, with the additional journey time adding to an already difficult and tiring process. Inevitably, organised interests can attract attention and demand response during such events but that should not overshadow the very real wider social impacts which are felt.

4. Conclusions

The Forth Road Bridge Closure provided an opportunity to learn from behavioural responses observed during the event. Our work confirmed that the overwhelming majority of travellers in the area were negatively affected by the closure. To cope with this, a variety of responses were adopted which will be a necessary part of responses to other kinds of disruption elsewhere on the road and rail network.

Whilst there is an understandable and necessary emphasis on what can be done to improve the conditions on the transport networks that remain open (such as with additional rail services in this case) there is a very significant social response required to keep cities functioning. These responses need to be understood and planned for. For example, it should be possible to identify which health care trips will be affected and to offer rescheduled or relocated appointments. It is possible to enact more supportive policies on flexi-time and working from home which will allow more people to adopt this and to reduce flows on the network and cut wasted time. These responses will be quite context and area specific. Some businesses, for example, will be negatively affected as they become less easy to reach but others may gain as people switch destinations. Analysis of the resilience of society rather than just the transport network should be considered to improve our planning around these events.

That said, there is still more that can be done within the transport sector to manage such events. In particular it appears that better and more targeted information is important to users. Currently multiple sources are accessed but with varying degrees of trust and usefulness. Better information on the capacity on different services at different times of day would also clearly be helpful given the funnelling of more passengers into fewer modes. Communication about where will be affected is important in businesses planning for staff and customer impacts. It is also important in not discouraging people from going to places that are actually unaffected.

The key behavioural findings from this report are set out in the Executive Summary. The next phase of this work will be to develop a practical guide drawing on experiences of managing disruptions in several different areas

References:

Carnegie UK Trust (2016) Breaking the Link

Disruption Project (2015) http://www.disruptionproject.net/

Scottish Census (Scottish Census, 2011) http://www.scotlandscensus.gov.uk/ods-web/home.html

Appendix One Paper Questionnaire

Travel Survey – Impact of Forth Road Bridge Closure

Dear Householder,

This survey is being undertaken by the Universities of Glasgow and Leeds to understand the impact on you caused by the closure of the Forth Road Bridge. The information you provide will be treated as confidential.

Please return your completed questionnaire in the FREEPOST envelope provided or complete it online at: https://leeds.onlinesurveys.ac.uk/frb

Part 1 – Some general questions about your use of the Forth Road Bridge

Q1 **Before the Forth Road Bridge was closed, how many days a week (if any) would you typically use it?** *(please circle a response for each row)*

a)	*To get to/from work*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
b)	*For business travel*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
c)	*For other reasons*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*

Q2 **SINCE the Forth Road Bridge was closed, how many days a week (if any) have you typically crossed or travelled around the Forth using car, motorcycle, bus or coach?** *(please circle a response for each row)*

a)	*To get to/from work*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
b)	*For business travel*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
c)	*For other reasons*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*

Q3 **Before the Forth Road Bridge was closed, how many days a week (if any) would you typically cross the Forth Rail Bridge?** *(please circle a response for each row)*

a)	*To get to/from work*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
b)	*For business travel*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
c)	*For other reasons*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*

Q4 **SINCE the Forth Road Bridge was closed, how many days a week have you typically crossed the Forth Rail Bridge?** *(please circle a response for each row)*

a)	*To get to/from work*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
b)	*For business travel*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*
c)	*For other reasons*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Days per week*

Q5 **Are you employed?**

○ *Yes – Full Time/Part time* (please go to Q6) ○ No (please go to Q17)

○ *Yes – Self-employed* (please go to Q6)

Q6 **Where is your main office/place of work?**

Post code _____ *OR* *Town*_____ *& Street* _____

or ○ I have no fixed place of work

Q7 **What is typically the <u>main</u> mode of transport for your journey to work?** *(please circle a response)*

○ Car as driver ○ Bus/coach ○ Cyclist

○ Car as passenger ○ Rail ○ Other _____

Q8 **Before the closure of the bridge, how many days a week did you typically travel to work?** *(please circle a response)*

To/from work *0 1 2 3 4 5 6 7* *Days per week*

Q9 **Before the closure of the bridge, how many days a week did you typically work from home?** *(please circle a response)*

Days working from home *0 1 2 3 4 5 6 7* *Days per week*

Q10 **Before the bridge closed, what time did you <u>typically</u> set off for work?** ___*am/pm*

a) **If you set off at this time how long did the journey normally take?** ___ *mins*

b) **What would be the <u>earliest</u> time you set off to go to work?** ___ *am/pm*

& how long would the journey normally take at that time of day? ___ *mins*

c) **What would be the <u>latest</u> time you would set off to go to work?** ___ *am/pm*

& how long would the journey normally take at that time of day? ___ *mins*

Q11 **Before the bridge closed, what time did you <u>typically</u> return home from work?**__*am/pm*

a) **If you set off at this time how long did the journey normally take?** ___ *mins*

b) **What would be the <u>earliest</u> time you would return home from work?** __ *am/pm*

& how long would the journey normally take at that time of day __ *mins*

c) **What would be the <u>latest</u> time you would return home from work** __ *am/pm*

& how would the journey normally take at that time of day __ *mins*

Q12 **SINCE the closure of the bridge, how many days a week have you been traveling to work?** *(please circle a response)*

To/from work *0 1 2 3 4 5 6 7* *Days per week*

Q13 **SINCE the closure of the bridge, how many days a week have you typically worked from home?** *(please circle a response)*

Days working from home *0 1 2 3 4 5 6 7* *Days per week*

Q14 **SINCE the closure of the bridge, what is the <u>earliest</u> you have set off for work?** _____*am/pm*

a) **How long did it take to get to work setting off at that time?** _____ *mins*

b) **What was the <u>main</u> mode of transport for that journey to work?** *(please circle a response)*

○ Car as driver	○ Bus/coach	○ Rail	○ Cyclist
○ Car as passenger	○ Bus/coach from P&Ride	○ Motorcycle	○ Other

Q15 SINCE the closure of the bridge, what is the <u>latest</u> time you have set off for work?
_____*am/pm*

a) How long did it take to get to work setting off at that time? _____ *mins*

b) What was the <u>main</u> mode of transport for that journey to work? *(please circle a response)*

○ Car as driver	○ Bus/coach	○ Rail	○ Cyclist
○ Car as passenger	○ Bus/coach from P&Ride	○ Motorcycle	○ Other

Q16 SINCE the closure of the bridge, what is the <u>longest</u> time it has taken to get to work?
_____ *mins*

What was the <u>main</u> mode of transport for that journey to work? *(please circle a response)*

○ Car as driver	○ Bus/coach	○ Rail	○ Cyclist
○ Car as passenger	○ Bus/coach from P&Ride	○ Motorcycle	○ Other

Q17 SINCE the closure of the bridge have you:

a) Offered a lift to other people you know in your car? Yes ○ No ○

b) Offered a lift to people through a formal lift-sharing website? Yes ○ No ○

c) Taken a lift from someone through a formal lift-sharing website? Yes ○ No ○

Q18 SINCE the closure of the bridge which of the following sources of information have you looked at & how helpful have you found them?

Sources of Information	Very Helpful	Helpful	Neutral	Unhelpful	Very Unhelpful	"Not used"
TV news	○	○	○	○	○	○
Radio news	○	○	○	○	○	○
Newspaper	○	○	○	○	○	○
Government/Council Websites	○	○	○	○	○	○
Train Company Websites	○	○	○	○	○	○
Stagecoach East Scotland Website	○	○	○	○	○	○
Scottish Citylink Website	○	○	○	○	○	○
Facebook	○	○	○	○	○	○
Official Twitter Feeds	○	○	○	○	○	○
Other Twitter Feeds	○	○	○	○	○	○
Other	○	○	○	○	○	○

Q19 Please indicate which of your activities have been affected by the closure of the bridge and how they have been impacted. In each case, leave blank if not applicable. (*Please note you can tick more than one impact for each activity, e.g. you may have carried on with both a new route and a new time)*

Activity	Reduced the frequency I do this	Asked someone else to do this for me	Cancelled at least once	Carried on with new route	Carried on but at new time	Carried on with new mode	Changed where I do this	N/A
Work	○	○	○	○	○	○	○	○
Business Travel	○	○	○	○	○	○	○	○
School or child care	○	○	○	○	○	○	○	○
Health care	○	○	○	○	○	○	○	○
Food Shopping	○	○	○	○	○	○	○	○
Non-food shopping	○	○	○	○	○	○	○	○
Sport	○	○	○	○	○	○	○	○
Leisure	○	○	○	○	○	○	○	○
Visiting Friends and Family	○	○	○	○	○	○	○	○

Q20 How would you rate the alternative means & different aspects of travel SINCE the closure of the bridge?

Activity	Very Good	Good	Neutral	Poor	Very Poor	N/A
Availability of car parking at train stations	○	○	○	○	○	○
Availability of car parking at Park and Ride sites	○	○	○	○	○	○
Access to and from train stations using bus/coach services	○	○	○	○	○	○

Q21 What impact has the closure of the Forth Road Bridge had on:

		Very Negative	*Negative*	*No Impact*	*Positive*	*Very Positive*
a)	*You?*	○	○	○	○	○
b)	*Your work colleagues?*	○	○	○	○	○
c)	*Anyone you live with?*	○	○	○	○	○

Q22 Since the bridge closure please indicate how much the amount you pay daily for travel has changed?

£_____ Cheaper/More Expensive (please delete as appropriate)

Q23 Have you incurred any other costs or loss of earnings, as a result of the bridge closure?

If yes, please specify_____

Q24 If applicable, how accommodating have your employers been during the disruption in terms of the following:

		A great deal	Quite a bit	Somewhat	Very little	Not at all
a)	*Working from home?*	○	○	○	○	○
b)	*Working flexible hours?*	○	○	○	○	○
c)	*In general?*	○	○	○	○	○

Q25 When the bridge is re-opened, how likely are you to go back to your previous way of travelling, when: *(please tick one response per row))*

	Definitely Yes	Probably Yes	Not Sure	Probably Not	Definitely Not
Deciding which modes of transport to use?					
Deciding when to travel?					
Deciding how often to travel?					

(a) If you circled 'Not Sure', 'Probably Not' or 'Definitely Not', can you please tell us why that is?

(b) If applicable, is the lack of car parking spaces preventing you from using public transport? Yes ○ No ○

Q26 What is your home address

Post code _____ OR Town_____ & Street _____

Q27 Are you? *(please tick one of the following options)*

Male…..○ Female….○

Q28 Which age group do you belong to? *(please tick one of the following options)*

16-19..○ 20-29..○ 30-39..○ 40-49..○

50-59..○ 60-69..○ 70+..○

Q29 What is your <u>main</u> occupation? *(please tick one of the following options)*

Employed full time……..…○ Full time education……. ○ Part time education……..,,.○
Employed part time…….○ Carer……..○ Self-employed…….. …○
Retired……○ Unemployed…… ○ Other……..…○

Q30 What is your total annual <u>household</u> income before tax?

(please tick one of the following options)

<£5,000……..…..○ £15,001-£20,000….○ £30,001-£40,000…○ £75,001-£100,000…○
£5,001-£10,000….○ £20,001-£25,000….○ £40,001-£50,000…○ £100,001+……..○
£10,001-£15,000…○ £25,001-£30,000….○ £50,001-£75,000…○ Prefer to not say….○

Q31 Do you have: (please tick one of the following options for each part of the question)

a) A full driving license?	Yes…..○	No….○
b) A car available to you most of the time?	*Yes…..○*	*No….○*

Q32 Do you have in your household:

a) Children aged 5 or under?	*Yes…..○*	*No….○*
b) Children aged 6-16?	*Yes…..○*	*No….○*

Q33 What three actions could be taken which would improve your situation whilst the bridge is closed?

If you have any comments regarding this questionnaire please contact Jeremy Shires at j.d.shires@its.leeds.ac.uk. Thank you for your time, it is greatly appreciated. HSEHold