

Tab. 13 C31 Littleport Station Traffic Data Collection

Project:	Anglia Level Crossing Grip 2 to 4		
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1 Introduction

This note has been prepared as part of The Anglia Level Crossing Reduction Strategy project and summarises the data collection exercise that was undertaken in 2016 to inform the assessment of potential impacts resulting from changes proposed at Littleport Station, Cambridgeshire.

To inform the assessment of the closure of Littleport Barrow Level Crossing, traffic and pedestrian census data was collected from Station Road and the adjacent underpass.

The project proposals include the closure of the existing underpass adjacent to Station Road to vehicular traffic. This would require all vehicular traffic to use the existing Station Road level crossing. As part of these proposals pedestrians and cyclists would use the underpass instead of the barrow crossing currently in place at Littleport Station.

This note considers the potential impact of diverting traffic from the underpass to Station Road and any associated mitigation that may be required to alleviate adverse impacts.

2 June 2016 Data Collection

Mott MacDonald and Network Rail discussed the form of the data required at this location and established that additional level crossing usage census data was required to support the ALCRM assumptions previously provided by Network Rail.

The need for new data was identified at Littleport Station and two Automatic Traffic Count (ATC) surveys with pedestrian census usage were subsequently commissioned to take place at the underpass adjacent to Station Road and near the level crossing on Station Road. These surveys were undertaken for a period of nine-days between 18th to 26th June 2016.

A typical 7 day 'virtual' week has therefore been derived for the purposes of assessment, calculated using the data for the 5 surveyed weekdays and the average of the two weekends. Weekend traffic characteristics can vary from weekdays and hence the 'virtual' week presents typical data in relation to traffic flow and composition that is appropriate for assessment purposes.

Figures 1 and 2 provide an overview of the location of the surveys.

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Figure 1: Location of survey at level crossing on Station Road, Littleport

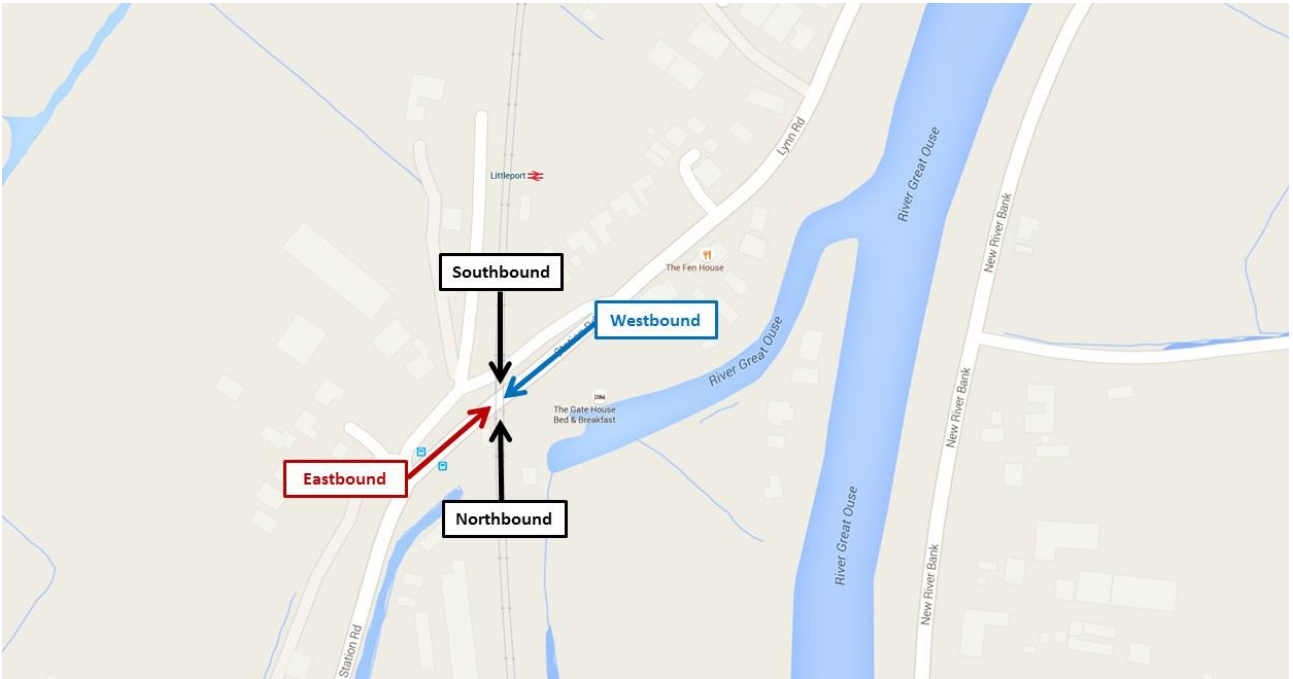


Figure 2: Location of survey at underpass adjacent to Station Road, Littleport



Table 1 to Table 4 below provide a summary of data collected from these sites.

Table 1: Combined direction ATC – Station Road at Level Crossing

Survey Dates	Survey Day	Total Vehicles	Motor-cycles	Cars or car-based LGV	LGVs	Buses	2 axle, six tyre, rigid	3 axle rigid	4+ axle rigid	4- axle artic	5 axle artic	6+ axle artic	5- axle multi-trailer artic	6 axle multi-trailer artic	7+ axle artic
Saturday 18th - Sunday 26th June 2016	Monday	1621	28	1372	172	7	12	11	0	12	2	4	0	0	1
	Tuesday	1689	39	1413	169	9	4	18	0	14	16	4	2	0	1
	Wednesday	1729	42	1394	190	11	9	16	0	34	25	6	2	0	0
	Thursday	1807	31	1478	205	8	16	9	0	29	21	6	4	0	0
	Friday	1685	30	1437	171	7	10	6	1	11	4	5	2	0	1
	Saturday**	1519	31	1349	108	6	4	7	0	9	6	1	1	0	1
	Sunday**	1427	52	1292	72	2	2	4	0	5	0	2	1	0	0
	TOTAL 'VIRTUAL WEEK'	11477	253	9735	1087	50	57	71	1	114	74	28	12	0	4

** Average of two weekends surveyed

Source: Tracsis Traffic Survey 18th-26th June 2016

Table 2: Combined direction ATC – Underpass adjacent to Station Road

Survey Dates	Survey Day	Total Vehicles	Motor-cycles	Cars or car-based LGV	LGVs	Buses	2 axle, six tyre, rigid	3 axle rigid	4+ axle rigid	4- axle artic	5 axle artic	6+ axle artic	5- axle multi-trailer artic	6 axle multi-trailer artic	7+ axle artic
Saturday 18th - Sunday 26th June 2016	Monday	508	2	478	26	0	0	2	0	0	0	0	0	0	0
	Tuesday	552	4	509	34	0	0	5	0	0	0	0	0	0	0
	Wednesday	478	10	441	25	0	0	2	0	0	0	0	0	0	0
	Thursday	529	2	496	31	0	0	0	0	0	0	0	0	0	0
	Friday	577	4	540	32	0	0	1	0	0	0	0	0	0	0
	Saturday**	354	9	332	12	0	0	2	0	1	0	0	0	0	0
	Sunday**	295	6	274	15	0	0	1	0	0	0	0	0	0	0
	TOTAL 'VIRTUAL WEEK'	3293	37	3070	175	0	0	13	0	1	0	0	0	0	0

** Average of two weekends surveyed

Source: Tracsis Traffic Survey 18th-26th June 2016

Table 3: Combined direction pedestrian census results – Station Road Level Crossing

Survey Date	Survey Day	Equestrians/Cyclists				Pedestrians									
		Horse Riders	Wheeling Bicycle	Pushing Bicycle	Total	Adult	Accompanied Child	Unaccompanied Child	Elderly	Impaired	Wheelchair	Pushchair/ Pram	Scooter	Railway Personnel	Total
18/06/2016	Saturday	2	22	0	22	69	10	0	0	0	0	4	0	0	83
19/06/2016	Sunday	0	12	0	12	62	1	0	0	0	0	0	0	63	
20/06/2016	Monday	0	6	0	6	25	3	0	0	0	0	2	0	30	
21/06/2016	Tuesday	0	30	2	32	41	2	0	0	0	0	0	1	44	
22/06/2016	Wednesday	0	26	2	28	19	3	0	0	0	0	0	1	23	
23/06/2016	Thursday	0	10	0	10	19	3	0	0	0	0	0	0	22	
24/06/2016	Friday	0	21	0	21	24	4	0	0	0	0	0	0	28	
25/06/2016	Saturday	0	9	0	9	44	1	1	0	0	0	0	0	46	
26/06/2016	Sunday	0	31	0	31	39	2	0	1	0	0	1	0	43	
	TOTAL	2	167	4	171	342	29	1	1	0	0	7	2	382	

** Average of two weekends surveyed

Source: Tracsis Traffic Survey 18th-26th June 2016

Table 4: Combined direction pedestrian census results – Underpass adjacent to Station Road

Survey Date	Survey Day	Equestrians/Cyclists				Pedestrians										
		Horse Riders	Wheeling Bicycle	Pushing Bicycle	Total	Adult	Accompanied Child	Unaccompanied Child	Elderly	Impaired	Wheelchair	Pushchair/ Pram	Scooter	Railway Personnel	Total	
18/06/2016	Saturday	0	5	0	5	52	3	0	0	0	0	0	0	0	0	55
19/06/2016	Sunday	0	1	0	1	45	5	0	0	0	0	5	2	0	0	57
20/06/2016	Monday	0	2	0	2	61	1	0	0	0	0	0	0	0	0	62
21/06/2016	Tuesday	0	10	0	10	78	0	0	0	0	0	0	2	0	0	80
22/06/2016	Wednesday	0	11	0	11	77	0	0	0	0	0	0	0	0	0	77
23/06/2016	Thursday	0	9	0	9	92	0	0	0	0	0	2	0	0	0	94
24/06/2016	Friday	0	10	0	10	71	0	0	0	0	0	0	0	0	1	72
25/06/2016	Saturday	0	5	0	5	29	1	0	0	0	0	0	0	0	0	30
26/06/2016	Sunday	0	17	0	17	29	0	0	0	0	0	0	0	0	0	29
	TOTAL	0	70	0	70	534	10	0	0	0	0	7	4	0	1	556

** Average of two weekends surveyed

Source: Tracsis Traffic Survey 18th-26th June 2016

3 October/November 2016 Data Collection

The requirement for two additional video surveys south of Littleport Station arose through discussions at the Option Validation Workshop for Cambridgeshire and NR discussions with their colleagues in Infrastructure Projects. The intention of the additional data capture was to provide a more in depth understanding of existing movements around this crossing.

A network of video cameras was set up around the following locations:

- Station Road level crossing
- Underpass adjacent to Station Road
- Entry/exit junction to Littleport Station car park

Data was collated for a period of nine days between 29th October to 6th November 2016.

The surveys undertaken at the Station Road level crossing recorded the following data:

- Vehicle usage
- Pedestrian usage
- Barrier open/close time
- Train passing times
- Blocking back (vehicle queuing)

The survey at the adjacent underpass recorded both the vehicle and pedestrian usage, as well as recording when the level crossing barrier was closed in order to establish when the underpass was being used.

A Manual Classified Turning Count was also undertaken at the entry/exit junction to Littleport Station car park which sought to establish whether vehicles accessing the car park travelled via the underpass. This data could then be correlated with instances of when the barrier on the adjacent crossing was open or closed.

Table 5 to 6 provide a summary of vehicle usage data captured during the survey period for both Station Road and the adjacent underpass.

Table 5: Combined direction vehicle flow – underpass adjacent to Station Road

	Day	Date	Total vehicles over 24 hour period
Day 1	Saturday	29/10/2016	340
Day 2	Sunday	30/10/2016	111
Day 3	Monday	31/10/2016	587
Day 4	Tuesday	01/11/2016	591
Day 5	Wednesday	02/11/2016	558
Day 6	Thursday	03/11/2016	606
Day 7	Friday	04/11/2016	669
Day 8	Saturday	05/11/2016	359
Day 9	Sunday	06/11/2016	65

Source: Tracsis Traffic Survey 29/10/16 – 06/11/16

Table 6: Combined direction vehicle flow – Station Road

	Day	Date	Total vehicles over 24 hour period
Day 1	Saturday	29/10/2016	1442
Day 2	Sunday	30/10/2016	1889
Day 3	Monday	31/10/2016	1455
Day 4	Tuesday	01/11/2016	1514
Day 5	Wednesday	02/11/2016	1549
Day 6	Thursday	03/11/2016	1492
Day 7	Friday	04/11/2016	1647
Day 8	Saturday	05/11/2016	1327
Day 9	Sunday	06/11/2016	1689

Source: Tracsis Traffic Survey 29/10/16 – 06/11/16

Assuming all vehicular traffic currently using the underpass transferred to Station Road, the volume of traffic on Station Road would increase as shown in Table 7 below.

Table 7: Combined direction vehicle flow – Station Road following closure of Station Road underpass

	Day	Combined total
Day 1	Saturday	1782
Day 2	Sunday	2000
Day 3	Monday	2042
Day 4	Tuesday	2105
Day 5	Wednesday	2107
Day 6	Thursday	2098
Day 7	Friday	2316
Day 8	Saturday	1686
Day 9	Sunday	1754

Table 8 provides a summary of the recorded down times of the level crossing barrier on Station Road during the survey period.

Table 8: Station Road barrier closure

Day	Date	Minimum Time Road Closed	Maximum Time Road Closed	Average Time Road Closed	Number of times barrier closed during the 24 hour period	Total time barrier closed in 24 hour period
Saturday	29/10/2016	00:04:10	00:11:49	00:05:47	36	3:28:00
Sunday	30/10/2016	00:02:50	00:16:38	00:07:43	5	0:38:35
Monday	31/10/2016	00:04:00	00:14:33	00:06:13	46	4:46:07
Tuesday	01/11/2016	00:03:25	00:16:04	00:06:27	44	4:43:36
Wednesday	02/11/2016	00:03:23	00:17:08	00:05:51	47	4:35:05
Thursday	03/11/2016	00:03:31	00:17:30	00:05:53	51	5:00:08
Friday	04/11/2016	00:03:50	00:17:48	00:05:53	52	5:05:44
Saturday	05/11/2016	00:04:15	00:17:02	00:06:32	39	4:14:47
Sunday	06/11/2016	00:04:44	00:04:44	00:04:44	1	00:04:44
Average Day (weekday and weekend)		00:02:50	00:17:48	00:06:06	36	03:37:25

Source: Tracsis Traffic Survey 29/10/16 – 06/11/16

The average recorded closure times of the level crossing barriers during the survey period was approximately 6 minutes.

The maximum number of closures in a single hour during the survey period was 4 closures. The average number of closures over a 24 hour period was 48 times on weekdays, 38 times on Saturdays and 3 on Sundays.

Over a 24 hour period the barrier was closed for an average total of 04:50:08 on weekdays, 03:51:24 on Saturdays and 00:21:40 on Sundays.

The surveys also recorded the number of times and corresponding classification for occurrences of blocking back from the level crossing. The classification of blocking back occurrences is based on Network Rail Signalling Design Group Guidance Reference Document GRD007.

Table 9: Blocking back classifications

Classification	Details
Amber 1	A queuing event where the rear of the queue extends to between 11m and 50m downstream of the crossing barrier.
Amber 2	A queuing event where the rear of the queue extends from the barrier to 11m downstream of the crossing barrier.
Red 1	A queuing event where vehicles start to queue at the downstream barrier and foul the crossing but do not foul within 1.25m of the running line.
Red 2	A queuing event where vehicles foul the running lines (or within 1.25m either side of running line) and are stationary for 3 or more seconds (any part of vehicle, anywhere in fouling zone).
Red 3	A queuing event similar to Red 2, but where no escape route is available (either forward or backward) to vehicle(s) in the fouling zone (running lines plus 1.25m either side).

Source: Network Rail, GRD007

Table 10 provides a combined direction summary of the occurrences of blocking back recorded during the survey period.

Table 10: Combined direction – blocking back

			Blocking Back Classification					
			Amber 1	Amber 2	Red 1	Red 2	Red 3	Total
Day 1	Saturday	29/10/2016	0	0	0	0	0	0
Day 2	Sunday	30/10/2016	0	3	0	0	0	3
Day 3	Monday	31/10/2016	0	0	0	0	0	0
Day 4	Tuesday	01/11/2016	0	0	0	0	0	0
Day 5	Wednesday	02/11/2016	1	0	0	0	0	1
Day 6	Thursday	03/11/2016	1	0	0	0	0	1
Day 7	Friday	04/11/2016	0	1	0	0	0	1
Day 8	Saturday	05/11/2016	0	0	0	0	0	0
Day 9	Sunday	06/11/2016	0	0	0	0	0	0
Total			2	4	0	0	0	6

Source: Tracsis Survey 29/10/16 – 06/11/16

Occurrences of traffic blocking back were only noted within the Amber 1 and Amber 2 classifications which confirms that occurrences of fouling the running line were not recorded. The most common form of blocking back recorded queues of less than 11m from the barrier which equates to between 1 and 3 vehicles queuing at any one given period.

More detailed analysis of the data shows that during any given closure of the Station Road level crossing that the maximum number of vehicles using the underpass in any single direction was 19 vehicles. This was recorded on Monday 31st October during the level crossing closure which occurred between 17:55 and 18:05. The weekday average maximum single direction usage of the underpass during the closure of the level crossing was 16 vehicles, with an average weekday usage of 4 vehicles in each direction during each closure of the barriers.

Whilst the primary vehicle use of the underpass was during times when the level crossing barriers were down, the surveys also noted that the underpass is used by vehicles when the barriers are open as an alternative route to access the station car park access junction.

The maximum two-way number of vehicles using the underpass when the barriers were open over the course of a single weekday was recorded on Thursday 3rd November with a total of 89 vehicles. The weekday two-way total average usage of the underpass when the level crossing was open was 78 vehicles per day.

4 Additional data from external sources

Information about the estimated usage of Littleport Station has been extracted from data provided by the Office of Rail and Road and is summarised in Table 11 below.

Table 11: Estimated entries and exits at Littleport Station

Year	Estimated entries and exits
2015/2016	229,628
2014/2015	238,062

Source: Office of Rail and Road, 2017 <http://orr.gov.uk/statistics/published-stats/station-usage-estimates>

5 Alternative Highway Routes

The closure of the underpass to vehicular traffic will lead to additional delay for a small proportion of vehicles using Station Road. As a result, consideration has been given to alternative highway routes which could be used by vehicles traveling between Littleport and the A10.

Average journey time data extracted from Google Maps confirms the existing journey time between Littleport (the junction with Main Street / Church Lane) and the junction of the A10/A1101 via Station Road is 4 minutes (1.1 miles) if the level crossing remains open.

Alternative routes and the corresponding journey time between Littleport and the roundabout junction of the A10/A1101 include the following:

- Via Grange Lane and A10 – 3.9 miles – 7 minutes;
- Via Wisbech Road and A10 - 2.7 miles – 6 minutes;
- Via Camel Road and A10 – 1.9 miles – 5 minutes;
- Via Victoria Street and New River Bank – 1.5 miles – 5 minutes

All of the above detailed routes require vehicles to pass through either the level crossing on the A10 to the west of the roundabout junction of the A10/A1101 or the level crossing on Victoria Street to the west of New River Bank. The journey times noted above do not take into account potential delays which may be encountered should either of these level crossings be closed.

6 Impact Assessment

The closure of the underpass adjacent to Littleport Level Crossing will cause vehicles which currently use it to primarily transfer on to Station Road. This transfer of vehicles is unlikely to increase the traffic flow on Station Road over the level crossing to such levels that it would have a significant impact on the capacity of this road. Drivers who currently use the underpass may however encounter an increase in delay as a result of having to wait at the barrier and this would increase the journey time for these drivers. The barrier currently closes for an average of 6 minutes during each closure on weekdays and weekends, with up to a maximum of four closures an hour on weekdays.

Both surveys conducted in June and October/November confirmed that during these neutral periods the average two-way weekday flow over a 24 hour period was between 1530 and 1706 vehicles per day. The flow on this road is therefore considered to be relatively low, with any forecast changes in traffic flow resulting from the proposals also considered to have a negligible impact on the capacity of this road.

Analysis of the surveys confirms that barrier down times across the 24 hour period were relatively comparable each day. This would allow local residents to forecast the arrival of a train and therefore retime their journeys to avoid level crossing closure times.

If all traffic currently using the underpass during level crossing closure times were to transfer to use Station Road over the level crossing it is forecast that the weekday average maximum single direction queue during the closure of the level crossing would be 16 vehicles, with an average weekday queue of 4 vehicles in each direction. As identified in Section 5 there are alternative routes between the A10 and Littleport, As the underpass currently offers the only viable opportunity from the north to access Littleport without using a level crossing, it is anticipated that some of the existing underpass traffic during barrier down time occurrences would transfer to these alternative routes. This would mean that forecasts regarding additional traffic flows on Station Road, and additional queuing at the level crossing, would be reduced and distributed between these alternate routes.

Pedestrians will benefit from the removal of vehicles, and any associated severance, from the underpass and will not see a reduction in amenity as a result of the proposals due to access to the local bus stops, train station and footpaths being retained. The increase in traffic flows on Station Road is also considered unlikely to have a significant impact on pedestrian delay or experience of fear and intimidation when attempting to cross the road.

7 Mitigation

The primary impact of the closure will be an increase in queue lengths as outlined above. Mitigation in the form of signage on the approach to the level crossing could be introduced to warn drivers of the new arrangements and the potential for queuing traffic.

8 Conclusion

This note has considered the impact of the proposed closure of the underpass adjacent to the Station Road level crossing to vehicular traffic. To inform the assessment data has been collected during June and October / November 2016. This indicates that the underpass is currently used by between 111 and 611 vehicles per day. The recorded two-way vehicle flows over the adjacent Station Road level crossing ranged from 1,427 to 1,889 vehicles per day. Flows using both of these routes are low in comparison to a number of other routes in this area.

The underpass currently offers the only viable route from the North into Littleport without using a level crossing and therefore, at times when trains are expected, it will currently offer a quicker journey time than alternative highway routes. Following the closure of the underpass and increase in the journey time uncertainty on Station Road it is anticipated that some underpass users may transfer to alternative highway routes and therefore the flow increase stated above reflects a worst-case and conservative scenario.

Given that the forecast average two-way flow on Station Road following the closure will be around 2,000 vehicles per day, it is not expected that the highway changes will generate any significant capacity issues. Due to the consistency of barrier down times it is anticipated that regular users will time their journeys to avoid barrier down times. On average, the barrier is down for six minutes and it is forecast that the average queue in each direction will be 4 vehicles per barrier down time during weekdays. To mitigate this impact, it is recommended that additional signage be provided on the approaches to the level crossing to acknowledge the revised highway arrangements and to warn drivers of the potential of queuing vehicles ahead.

In summary, the underpass is currently used by a relatively low number of vehicles and its closure is expected to have minimal impact on the operation of the external highway network.