

Wisbech Area Transport Study

Data Collection Report

April 2009

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Glossary of Abbreviations Used in the Report

Annual Average Daily Traffic	AADT
Annual Average Weekday Traffic	AAWT
Average Daily Traffic	ADT
Automatic Traffic Count	ATC
Average Weekday Traffic	AWT
Cambridgeshire County Council	CCC
Design Manual for Roads and Bridges	DMRB
East of England Regional Model	EERM
Fenland District Council	FDC
Highways Agency	HA
Heavy Goods Vehicle	HGV
Journey to Work	JTW
Lights Goods Vehicle	LGV
Motorcycle	MC
Manual Classified Count	MCC
Manual Classified Turning Count	MCTC
Medium Goods Vehicles	OGV1
Heavy Goods Vehicles	OGV2
Ordnance Survey	OS
Ordnance Survey Grid Reference	OSGR
Public Service Vehicle	PSV
Roadside Interview	RSI
Wisbech Area Transport Study	WATS

1. Introduction

Background

- 1.1 Atkins Transport Planning was commissioned by Fenland District Council (FDC) in February 2008 to undertake a transport study of the market town of Wisbech and its surrounding villages.
- 1.2 The Wisbech Area Transport Study (WATS) will set out to review existing problems and issues, and examine a range of proposed measures and policies to improve the current transport system, as well as meet the demand expected from future urban growth in the study area.
- 1.3 Traffic and travel data has been collected to establish the existing patterns of demand for travel in and around Wisbech.
- 1.4 The study has identified several existing sources of data, which have been made available by the relevant highway authorities for use in this study, including Cambridgeshire County Council (CCC) and the Highways Agency (HA).
- 1.5 In addition to the available existing traffic data, a series of other surveys were undertaken to enhance the study.

The Study Area

- 1.6 The proposed study area comprises the town of Wisbech, the principal roads of the A17, A1101 and A47/A141. The study area extends to West Walton in the North, Emneth in the East, Guyhirn to the South and Gorefield to the West.
- 1.7 The extent of the study area is highlighted in Figure 1.1.

Scope and Structure of this Report

- 1.8 This report describes the scope of the existing traffic data and the additional data obtained from surveys completed as part of the study.
- 1.9 Data from CCC's annual monitoring programme gives details of traffic flows within Wisbech, and HA TRADS ATC data gives volumetric information at several points along the A47. Traffic surveys within the study area that were undertaken in the past five years (2003-2008) have been identified including:
 - CCC's annual traffic monitoring programmes for the local road network;
 - Automatic Traffic Count (ATC) data as held by the HA for sites on the A47 held in the TRADS database;
 - CCC Traffic Signals Data;
 - 2001 National Census Journey to Work (JTW) data;
 - CCC's Education Trips Data;
 - Bus Route Data; and
 - The East of England Regional Model (EERM).
- 1.10 To complement the available datasets, additional data was collected by undertaking the following surveys:
 - Highway network inventory surveys;
 - Roadside Interview Surveys (RSI) including Manual Classified Counts (MCCs) and ATCs;
 - Manual Classified Turning Count (MCTC) surveys;

- Car park surveys;
- Bus surveys;
- Taxi rank surveys;
- Pedestrian and cycling surveys; and
- Journey time surveys.

1.11 All data collected for the purpose of this study, as outlined above, has been collected with the following vehicle classifications:

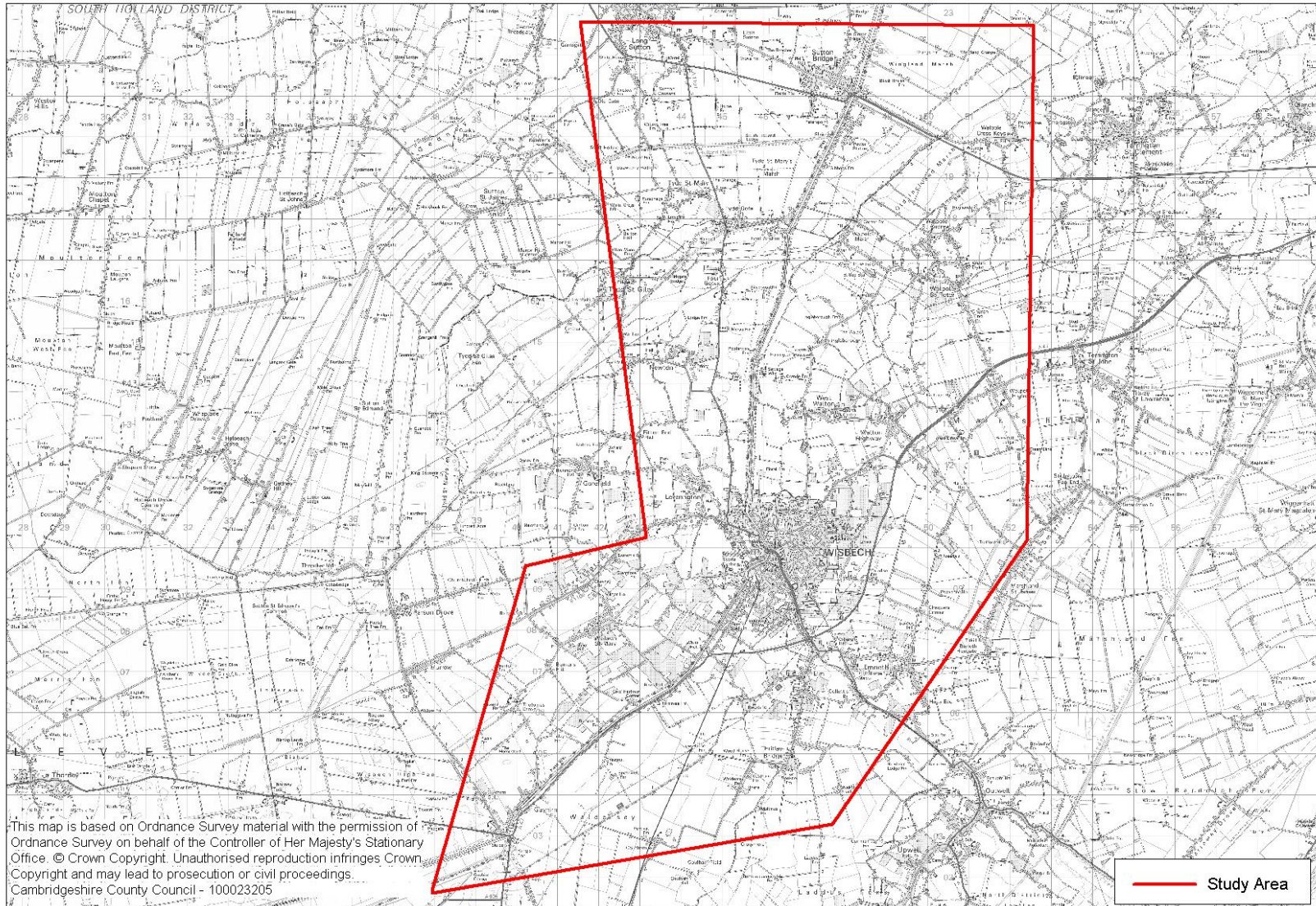
- **Cars** including taxis, estate cars, 'people carriers' and other passenger vehicles (for example, minibuses and camper vans) with a gross vehicle weight of less than 3.5 tonnes, normally ones which can accommodate not more than 15 seats. Cars towing caravans or trailers are counted as one vehicle;
- **Light Goods Vehicles (LGV)** – includes all goods vehicles up to 3.5 tonnes gross vehicle weight, including those towing a trailer or caravan. This includes all car derived vans and those of the next larger carrying capacity such as transit vans. Included here are small pickup vans, three-wheeled goods vehicles, milk floats and pedestrian controlled motor vehicles. Most of this group are delivery vans of one type or another;
- **Other Goods Vehicles 1 (OGV1)** – includes all rigid vehicles over 3.5 tonnes gross vehicle weight with two or three axles. Includes larger ambulances, tractors (without trailers), road rollers for tarmac pressing, box vans and similar large vans. A two or three axle motor tractive unit without a trailer is also included;
- **Other Goods Vehicles 2 (OGV2)** – includes all rigid vehicles with four or more axles and all articulated vehicles. Also included in this class are OGV1 goods vehicles towing a caravan or trailer;
- **Buses and Coaches (PSV)** – includes all public service vehicles and works buses with a gross vehicle weight of 3.5 tonnes or more, usually vehicles with more than 16 seats; and
- **Motor Cycles (MC)** – two wheeled mechanically propelled vehicles.

1.12 The use of the term Heavy Goods Vehicle (HGV) has been applied to define both OGV1 and OGV2 classifications as one.

1.13 The remainder of this report is broken down into four main sections:

- Chapter 2 provides a summary of the existing datasets that were available to the study;
- Chapters 3 to 10 describe the additional datasets that have been collected as part of this study;
- Chapter 11 draws conclusions from these findings.

Figure 1.1 – The Study Area



2. Existing Traffic Data

2.1 This study aims to make the best use of the existing transport related data, where possible, throughout the study. Traffic surveys within the study area that were undertaken in the past five years (2003-2008) have been identified. A number of key data sources have been considered, including:

- CCC's annual traffic monitoring programmes for the local road network;
- ATC TRADS data as held by the HA for sites on the A47;
- CCC Traffic Signals Data;
- 2001 National Census Journey to Work (JTW) data;
- CCC's Education Trips Data;
- Bus Route Data; and
- The EERM Model.

2.2 This chapter provides a summary of the above traffic datasets which are available.

Cambridgeshire County Council Annual Traffic Monitoring Data

2.3 For the purpose of calibrating and validating the highway model, traffic counts were used from CCC for all intersections and key junctions in the study. Annual Town Monitoring MCC link counts were undertaken in November 2007 and 12 hour counts provided (07:00-19:00).

2.4 The list of CCC Annual Town Monitoring link counts for Wisbech is shown in Table 2.1 and the location of the counts shown in Figure 2.1 and also in Figure 2.2 in further detail. Figure 2.2 provides a summary of the data.

Table 2.1 – CCC Annual Monitoring MCC Locations

Map Ref	Location	Easting	Northing
1	Lynn Road (1)	548233	311825
2	Broad End Road	548213	309215
3	Elm High Road (Churchill Road)	547057	307930
4	Cromwell Road	545135	308099
5	North Brink	545583	309504
6	Leverington Road	545274	310530
7	Walton Road (South of West Walton)	547057	311546
8	Lynn Road (2)	546315	309994
9	Whitby Street	546407	309809
10	William Road	546530	309578
11	Marsh Walk	546559	309543
12	Norwich Road	546564	309486
13	Ramnoth Road	546878	308669

Figure 2.1 – CCC Annual Monitoring Link Counts (MCC)

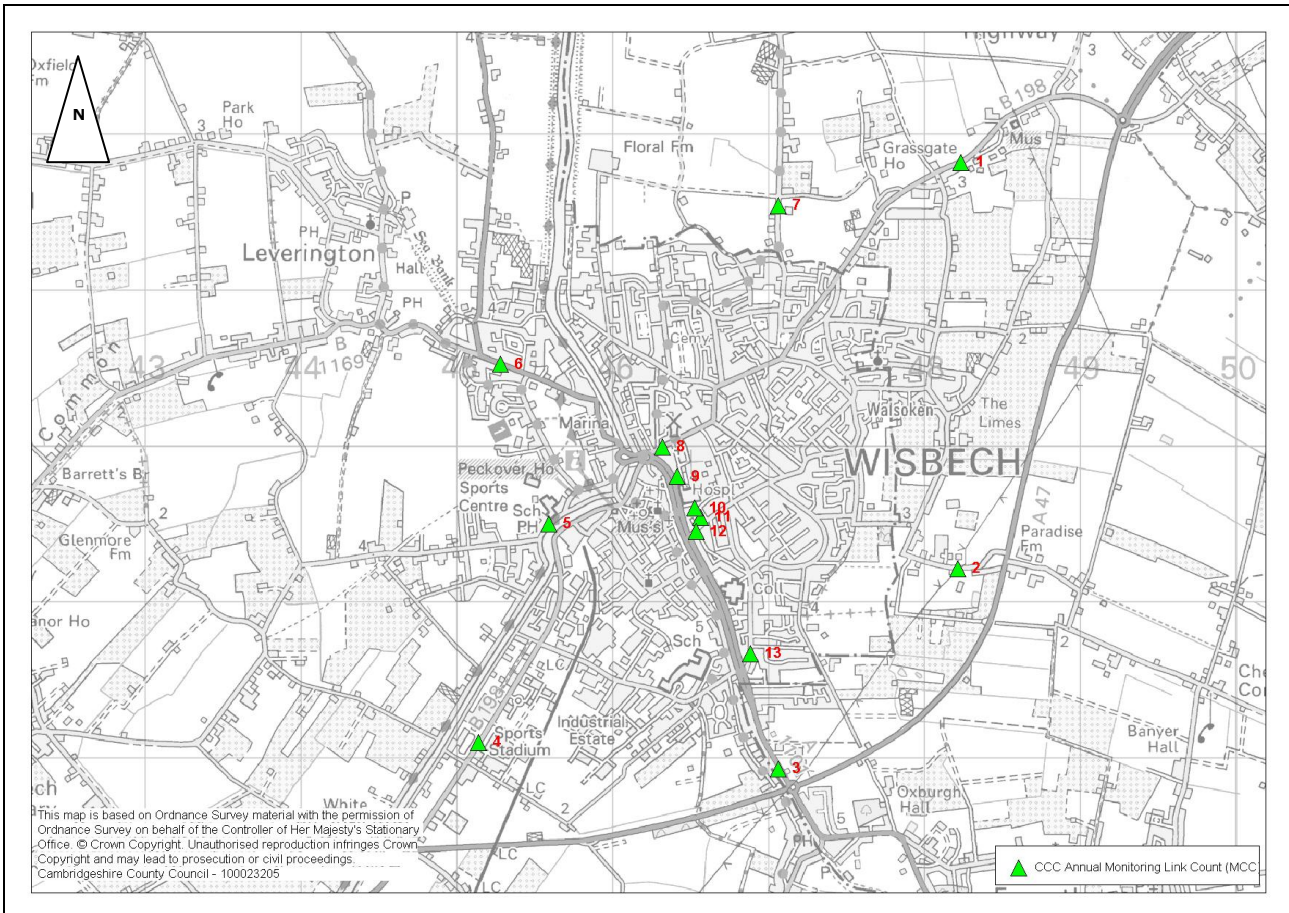


Table 2.2 – CCC Annual Monitoring Link Counts

Map Ref	Location	Date	12 hour Flow		
			All	HGV	%HGV
1	Lynn Road (1)	22/11/2007	8,291	423	5.1
2	Broad End Road	22/11/2007	2,012	146	7.3
3	Elm High Road (Churchill Road)	22/11/2007	15,922	1,111	7.0
4	Cromwell Road	22/11/2007	12,855	1,017	7.9
5	North Brink	22/11/2007	4,840	131	2.7
6	Leverington Road	22/11/2007	16,230	1,160	7.1
7	Walton Road (South of West Walton)	22/11/2007	1,651	52	3.1
8	Lynn Road (2)	22/11/2007	18,186	622	3.4
9	Whitby Street	22/11/2007	2,023	176	8.7
12	Norwich Road	22/11/2007	7,121	31	0.4
13	Ramnoth Road	22/11/2007	4,784	85	1.8

Note: Sites 10 and 11 have no data available.

- 2.5 Table 2.2 indicates that the busiest link is Lynn Road (Site 8) in the south with over 18,000 vehicles passing through this site in the 12 hour survey period.
- 2.6 The site with the highest percentage of HGVs is Cromwell Road (Site 4), accounting for 8% of the traffic in the 12 hour survey period. The highest numbers of HGVs however travel through Site 3 at the southern end of Churchill Road. Because Cromwell Road and Churchill road are the main routes linking traffic travelling from the A47 with Wisbech Port, Town Centre and the Industrial Estate, it would be expected that HGV traffic would be high at these sites. Both Sites 3 and 4 are in the top four locations with the highest 12 hour flows for this survey.

Highways Agency TRADS Data

- 2.7 The HA maintains a network of ATC Sites across the country, of which several have been identified within the study area. ATC data is available for four sites along the A47, which are:
- A47 St Johns Highway;
 - A47 South of Wisbech;
 - A47 between B198 near Wisbech (west) and A141; and
 - A47 between A1101 and B198 near Wisbech (east).
- 2.8 The locations, including Ordnance Survey Grid Reference (OSGR), of the survey sites and the available traffic data are summarised in Table 2.3 and the locations can be found in Figure 2.2.

Table 2.3 – Survey Sites

HA ATC Reference	Location	Direction	X	Y
6/2014	A47 St Johns Highway	EB	551258	314085
6/2015	A47 St Johns Highway	WB	551267	314076
6/9263	A47 South of Wisbech	EB	545090	307435
6/9264	A47 South of Wisbech	WB	545089	307436
6/30013461	A47 eastbound between A141 and B198 near Wisbech (west)	EB	543580	306443
6/30013462	A47 westbound between B198 near Wisbech (west) and A141	WB	543583	306439
6/30013471	A47 between A1101 and B198 near Wisbech (east)	EB	548931	310737
6/30013472	A47 between B198 near Wisbech (east) and A1101	WB	548935	310734

- 2.9 Table 2.4 and Table 2.5 summarise the most recent two-way ATC data obtained from the HA.
- 2.10 Table 2.4 provides a summary of traffic flow data for the year 2007 and Table 2.5 provides the traffic flow data for the year 2008. The data was collected in the form of Annual Average Daily Traffic (AADT) and Annual Average Weekday Traffic (AAWT) data. Table 2.6 highlights the percentage difference in flows at each site between 2007 and 2008.

Table 2.4 – Summary of HA ATC Data (2007)

HA ATC Reference	Data Availability for 2007	24hr flow		12hr	12hr Wkday to 24hr Daily	24hr Wkday to 24hr Daily	12hr Wkday to 24hr Wkday
		AADT	AAWT	AAWT			
6/2014 & 6/2015	Daily, Jan to Dec	18,041	18,635	15,340	1.18	0.97	1.21
6/9263 & 6/9264	Partial Data (No Aug-Oct)	16,317	16,943	13,893	1.17	0.96	1.22
6/30013461 & 6/30013462	Daily, Jan to Dec	22,456	23,459	18,947	1.19	0.96	1.24
6/30013471 & 6/30013472	Daily, Jan to Dec	15,717	16,162	13,294	1.18	0.97	1.22
Average		18,133	18,800	15,368	1.18	0.96	1.22

Table 2.5 – Summary of HA ATC Data (2008)

HA ATC Reference	Data Availability for 2008	24hr flow		12hr	12hr Wkday to 24hr Daily	24hr Wkday to 24hr Daily	12hr Wkday to 24hr Wkday
		AADT	AAWT	AAWT			
6/2014 & 6/2015	Daily, Jan to Sept	18,151	18,957	15,611	1.16	0.96	1.21
6/9263 & 6/9264	Daily, Jan to Sept	16,846	17,507	14,343	1.17	0.96	1.22
6/30013461 & 6/30013462	Daily, Jan to Aug	22,514	24,457	19,170	1.17	0.92	1.28
6/30013471 & 6/30013472	Daily, Jan to Aug	15,842	16,418	13,508	1.17	0.96	1.22
Average		18,338	19,335	15,658	1.17	0.95	1.23

Table 2.6 – Percentage Difference in Flows between 2007 and 2008

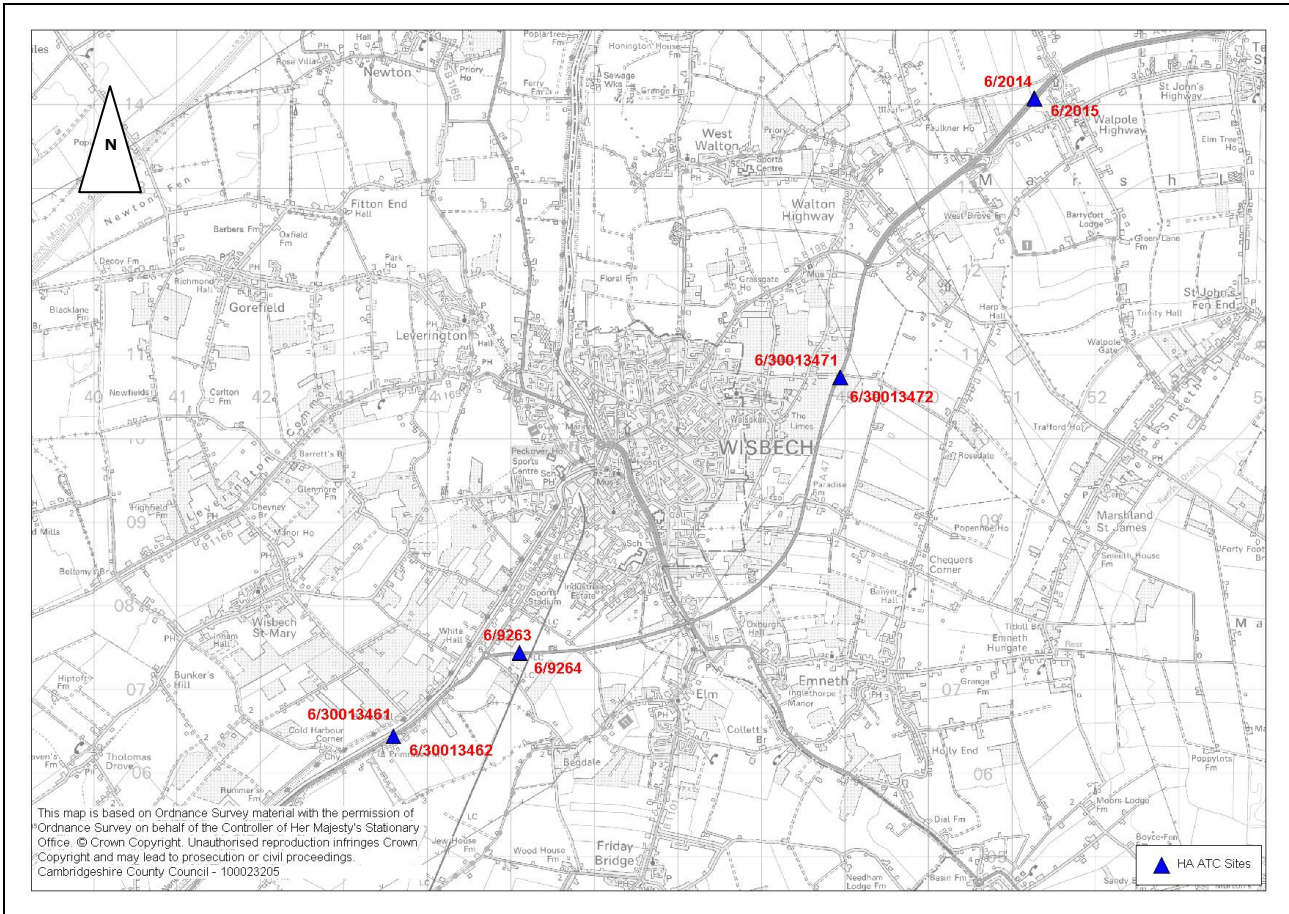
HA ATC Reference	24hr Flow % Difference Between 2007 & 2008		12hr Flow % Difference Between 2007 & 2008
	Daily	Weekday	Weekday
6/2014 & 6/2015	0.61	1.70	1.74
6/9263 & 6/9264	3.14	3.22	3.14
6/30013461 & 6/30013462	0.26	4.08	1.16
6/30013471 & 6/30013472	0.79	1.56	1.58
Average	1.20	2.64	1.91

- 2.11 Table 2.4 and Table 2.5 show that the A47 between B198 near Wisbech (west) and A141 is the busiest stretch of the A47 in the study area, with a 24 two way AAWT of over 23,000 vehicles. This route has experienced the greatest percentage increase in weekday traffic flow from 2007 to 2008 of over 4%.
- 2.12 All routes have experienced an increase in traffic flow from 2007 to 2008, with the A47 just south of Wisbech experiencing the second greatest increase in traffic flow at around 3%.
- 2.13 TRADS data available was used for factoring CCC Annual Monitoring data from November 2007 to June 2008 and from June 2008 to the average year. The factor was obtained by dividing the June 2008 value by the average value of the 12 month period from September 2007 to August 2008. Table 2.7 provides the 12 hour Average Daily Traffic (ADT) and Average Weekday Traffic (AWT) TRADS data for each month (Sep 07 to Aug 08) and the calculated average and factor which were used on the CCC Annual Monitoring Data.

Table 2.7 – TRADS Factor from Nov 2007 to June 2008

Year	Month	12hr	
		ADT	AWT
2007	Sep	48899	49559
	Oct	47696	49478
	Nov	58059	61314
	Dec	53442	55578
2008	Jan	52583	55803
	Feb	57280	60369
	Mar	57178	60886
	Apr	61497	64555
	May	62680	64643
	Jun	59921	61982
	Jul	63266	65016
	Aug	65061	66785
Calculations	Average (Sept 07 to Aug 08)	57296.83	59664
	Factor(June 2008 Value/Average)	1.0458	1.038851

Figure 2.2 – HA ATC Sites



Traffic Signals Data

2.14 Traffic Signals data within Wisbech was obtained from CCC. Further surveys were undertaken by Atkins to confirm signal timings. Table 2.8 provides the details of the junctions with signals and Figure 2.3 highlights the location of the traffic signals.

Table 2.8 – Traffic Signals

Map Ref	Junction Detail	X	Y
1	Dowgate Road / Leverington Road / Sutton Road	545145	310592
2	A1101 North End / Supermarket Entrance	546050	309991
3	Nene Quay / Bridge Street / Alexandra Road / South Brink / Town Bridge	546046	309634
4	A1101 Churchill Road / Norwich Road	546478	309416
5	Lynn Road / Mount Pleasant	546651	310378
6	Lynn Road / Walton Road	547181	310746
7	Churchill Road / Weasenham Lane / Ramnoth Road	546824	308558

Figure 2.3 – Wisbech Traffic Signal Locations



2001 National Census Journey to Work Data

- 2.15 The 2001 National Census recorded, amongst other things, the areas of residence and employment of everyone living in the UK. This data can be used to give an idea of journey to work movements (by different modes) in and out of each area of the country. For the purpose of this study, data relating to journeys to and from all counties in the UK were used.
- 2.16 The 2001 JTW Census Data will be used to assist the infilling of the traffic movements that are not captured by the RSI surveys, for example, internal movements within Wisbech.

Education Trips Data

- 2.17 Data has been obtained from CCC, giving journey-to-school data for state funded primary and secondary schools in Wisbech. The data shown in Table 2.9 comprises the total number of pupils travelling to each school, and their mode of transport to school. Table 2.10 provides a percentage analysis of this data and Figure 2.4 highlights the location of the schools within Wisbech.
- 2.18 This data is utilised in providing internal-internal movements for Wisbech for input into the matrix.

Table 2.9 – CCC State Schools Education Trips Data

Site Ref	School	Journey						Total
		Walk	Cycle	Car	School Bus	Public Transport	Other	
1	Thomas Clarkson CC	265	45	323	106	18	23	780
2	Leverington Primary	32	9	139	0	0	0	180
3	Orchards Primary	277	19	81	0	0	0	377
4	Peckover Primary	99	22	151	0	0	1	273
5	Clarkson Infants	116	7	51	0	0	0	174
6	St. Peter's Junior	133	19	80	0	0	2	234
7	The Nene Infants (data incomplete)	36	0	17	0	0	0	53
8	Ramnoth Junior	107	17	109	0	0	2	235
9	Elm Road Primary	60	0	42	0	2	0	104

Table 2.10 – Percentage Analysis of Education Trips Data

Site Ref	School	Journey % of Total Trips						Total %
		Walk	Cycle	Car	School Bus	Public Transport	Other	
1	Thomas Clarkson CC	34	6	41	14	2	3	100
2	Leverington Primary	18	5	77	0	0	0	100
3	Orchards Primary	73	5	21	0	0	0	100
4	Peckover Primary	36	8	55	0	0	0	100
5	Clarkson Infants	67	4	29	0	0	0	100
6	St. Peter's Junior	57	8	34	0	0	1	100
7	The Nene Infants (data incomplete)	68	0	32	0	0	0	100
8	Ramnoth Junior	46	7	46	0	0	1	100
9	Elm Road Primary	58	0	40	0	2	0	100

Figures in red indicate the highest % of total trips for that mode of travel.

Figure 2.4 – Location of Schools

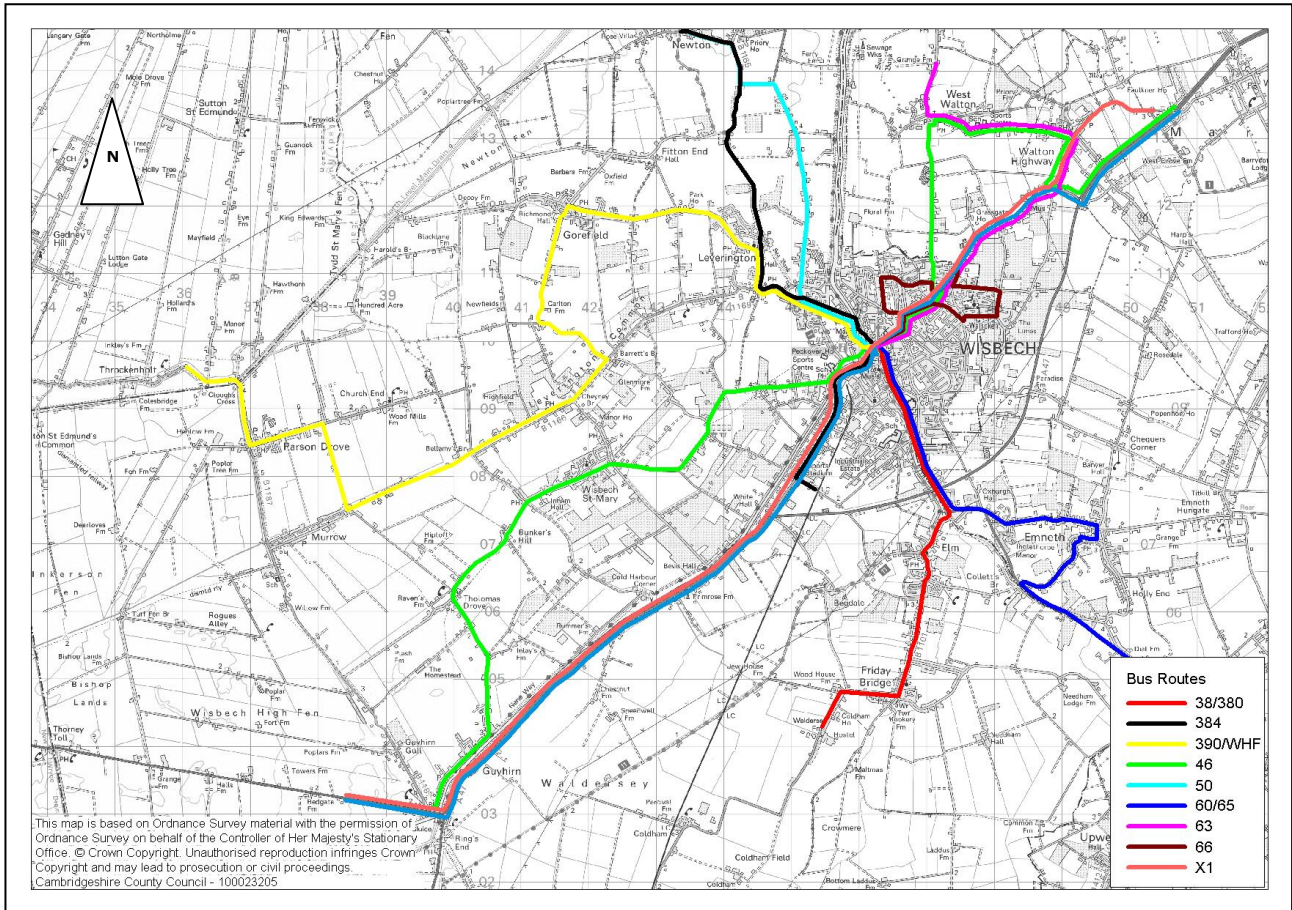


- 2.19 The largest state school in the area is the Thomas Clarkson Community College (secondary education 11-18). This school has the highest percentage of pupils travelling by school bus.
- 2.20 Orchards Primary School has the highest percentage of pupils walking to school at just over 70%. The school with the greatest use of a car to travel is Leverington Primary with almost 80% of pupils travelling by this means.
- 2.21 The data obtained indicates that overall walking or travelling to school by car is the most popular means of travel at all schools in Wisbech.

Bus Routes

2.22 Figure 2.5 highlights the bus routes in Wisbech and the surrounding area. Bus route information was obtained from the relevant bus operators and has subsequently been added to the Wisbech model.

Figure 2.5 – Wisbech Bus Routes



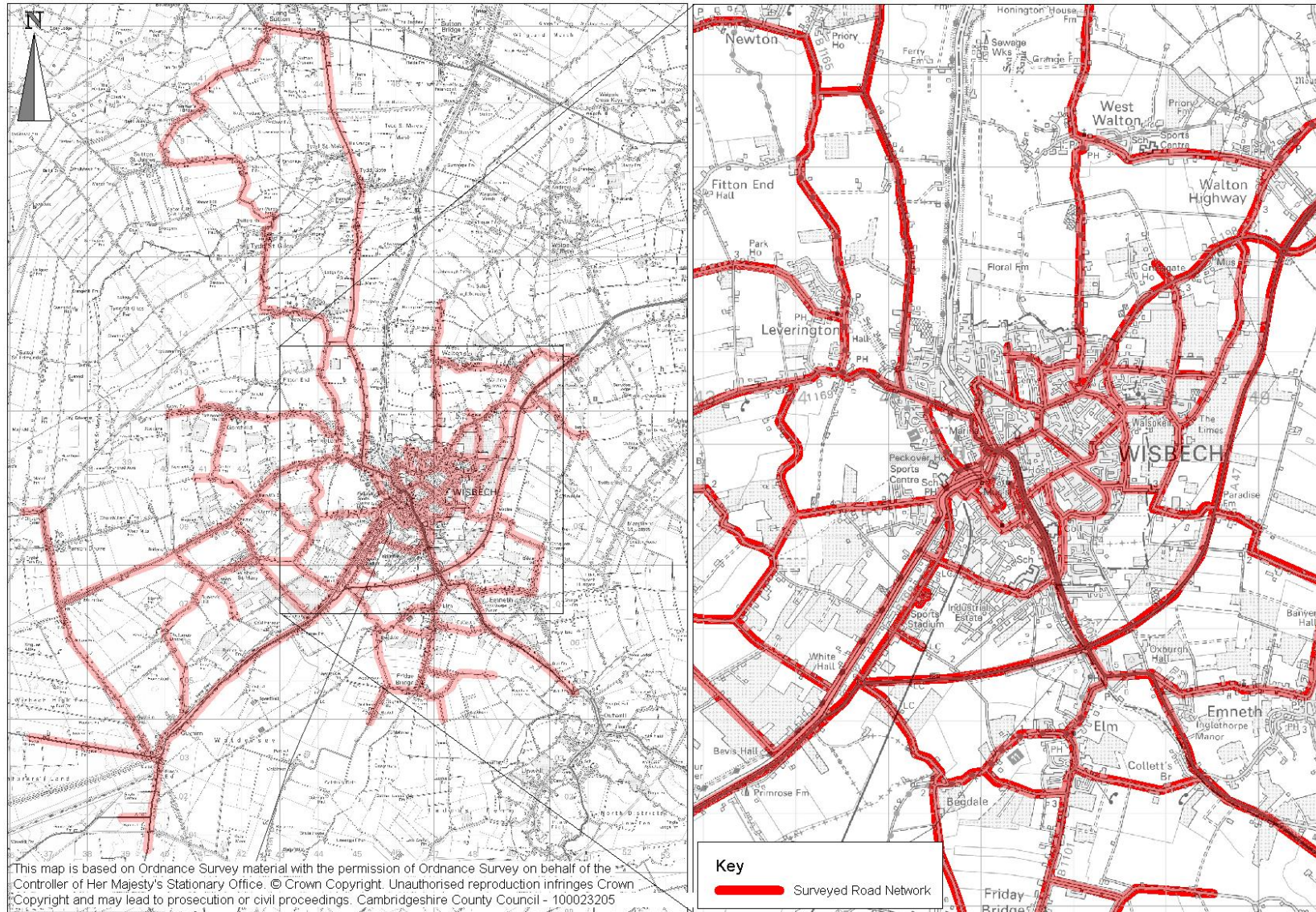
The East of England Regional Model

2.23 Select link matrices from the EERM were provided for HGV movements along the A17 at RSI site 7. These were processed to give OGV2 through trips along the A17 in both Eastbound and Westbound directions to account for the lack of OGV2 interviews at RSI Site 7.

3. Highway Network Inventory Surveys

- 3.1 The local highway network model has been developed using Ordnance Survey (OS) mapping as a basis. This was used to find the co-ordinates of junctions, to build up the basic structure of the network.
- 3.2 Online aerial photography was used to ascertain the majority of junction layouts (which arms have priority, number of lanes for each turn, etc.) and any additional information was obtained through site visits as required.
- 3.3 Extensive site visits were undertaken to enable the modellers to understand the operation and speed limit of each road, visibility at junctions, operation of traffic signals, and any other issues that may be apparent, as well as checking the details of the junction layouts. Many photographs were taken, and their locations documented, to enable junctions to be reviewed again at a later date.
- 3.4 Figure 3.1 highlights the road network which within Wisbech and the surrounding area which was surveyed.

Figure 3.1 – Surveyed Network



4. Roadside Interview Surveys

4.1 Seven RSI surveys were undertaken in June 2008 at strategic points within the study area. These locations were:

- Site 1 – A47 south of A47/B198 Roundabout;
- Site 2 – A47 south of A47/B198 Cromwell Road Roundabout;
- Site 3 – A1101 west of Harecroft Road;
- Site 4 – B198 Lynn Road between Wheatley Bank and Burrett Road;
- Site 5 – North Brink west of B198/A1101 Junction;
- Site 6 – Elm High Road south of A47/A1101 Junction; and
- Site 7 – A17 west of Long Sutton.

4.2 The surveys were undertaken to provide an up-to-date, accurate and detailed picture of current demand along each route. The sites were chosen in order to obtain a clear picture of the variation in the pattern of origins and destinations in and around Wisbech

4.3 The exact locations of the sites were based on considerations such as the availability of lay-bys, carriageway standard and safety.

4.4 All RSIs were carried out over a 12-hour period, from 07:00 to 19:00. Table 4.1 provides details of the survey sites and Figure 4.1 is a location plan of the sites in Wisbech.

Table 4.1 – Location and Date of RSI Surveys

Map Ref	Location	Date of Survey	Direction of Survey	X	Y
1	A47, south of B198 Roundabout	11/06/2008	Southbound	549190	311823
2	A47, south of B198 Cromwell Rd Roundabout	10/06/2008	Northbound	544066	306793
3	A1101, west of Harecroft Rd	11/06/2008	Eastbound	545274	310530
4	B198 Lynn Rd, between Wheatley Bank & Burrett Rd	12/06/2008	Westbound	548455	312025
5	North Brink, between Barton Rd and Chapel Rd	12/06/2008	Eastbound	545578	309492
6	A1101 Elm High Rd, south of A47 Junction	10/06/2008	Northbound	547226	307618
7	A17, west of Long Sutton	11/06/2008	Southbound	541811	323095

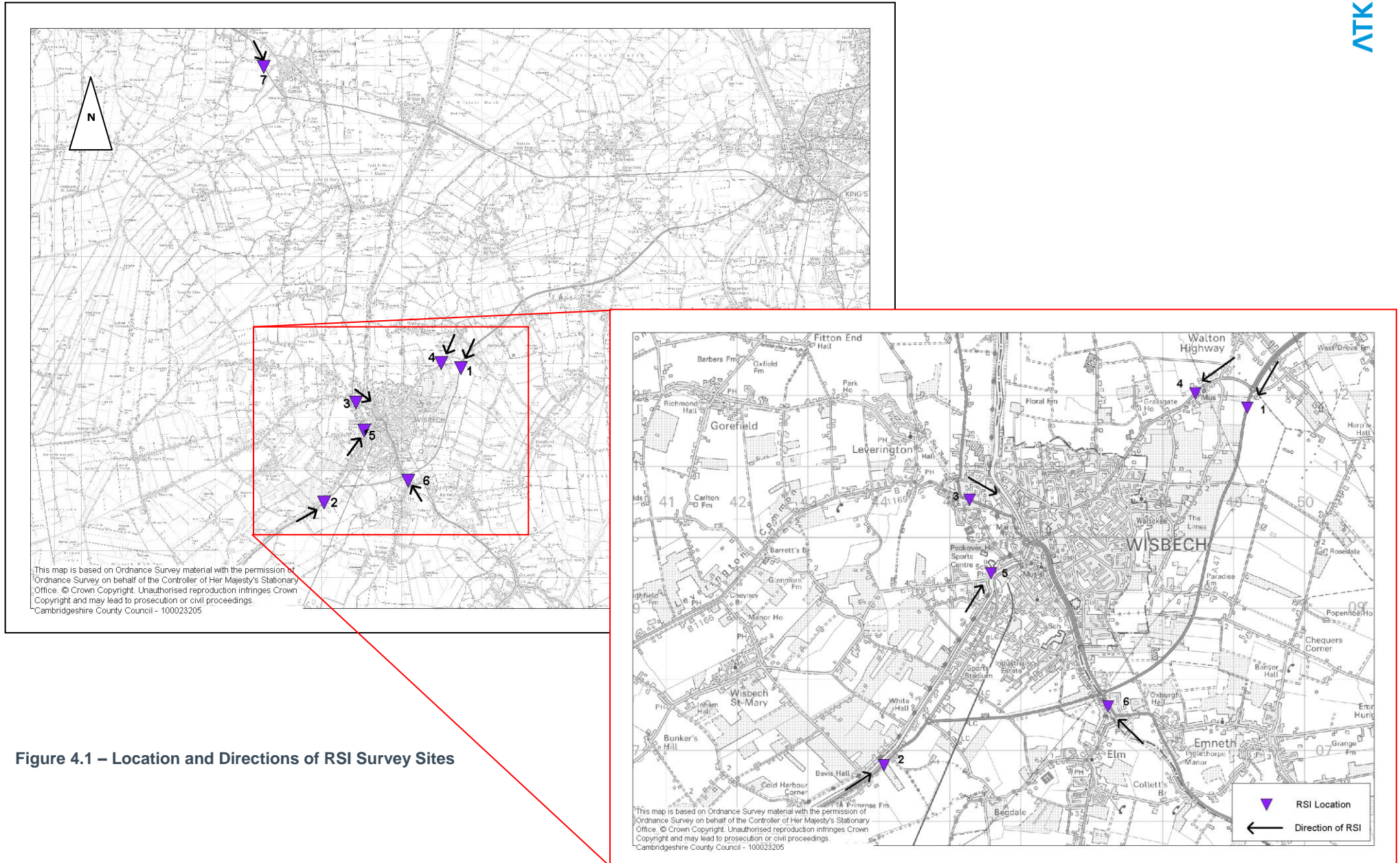


Figure 4.1 – Location and Directions of RSI Survey Sites

- 4.5 A sample of motorists were interviewed in a single direction during a typical weekday and they were asked to provide origin and destination information for their trips, their trip purpose and give details of where they intended to park in the City if applicable.
- 4.6 In addition to the 12-hour RSIs, 16-hour MCCs were carried out at these seven locations in both directions. These MCCs were repeated on a different (non-interview) day so as to detect any possible changes in traffic flow by vehicle class as a result of the RSIs.
- 4.7 Table 4.2 summarises both traffic surveys and the number of interviews undertaken

Table 4.2 – Summary of RSI Site Traffic Counts (MCCs) and Interviews

RSI Site Ref	Total Traffic Flow		No. Of Interviews	Sample Factor
	16 hr Count	12hr Count		
1	7278	6257	1012	16%
2	10472	9268	1009	11%
3	7497	6241	1398	22%
4	3448	3001	771	26%
5	2589	2306	948	41%
6	9084	7615	1027	13%
7	6999	6444	956	15%

Table 4.3 – RSI Sample Rates by Period and Vehicle Type (Funnelled)

RSI Site Ref	AM			IP			PM		
	Overall Sample Rate	Light Vehicles	HGVs	Overall Sample Rate	Light Vehicles	HGVs	Overall Sample Rate	Light Vehicles	HGVs
1	42%	41%	45%	92%	91%	103%	41%	41%	49%
2	22%	19%	54%	76%	68%	115%	29%	27%	49%
3	57%	61%	22%	100%	108%	11%	59%	60%	18%
4	40%	41%	7%	174%	181%	67%	80%	82%	11%
5	85%	84%	125%	243%	240%	375%	114%	114%	100%
6	37%	38%	25%	77%	79%	57%	32%	33%	12%
7	42%	51%	3%	87%	113%	3%	44%	50%	0%
Avg	46%	48%	40%	121%	126%	104%	57%	58%	34%

Note: Light Vehicles = Cars, LGV's & Motorcycles. HGVs = OGV1 & OGV2

Figures in red indicate low sample rates.

Figures shown in this table have been funnelled. Therefore when funneling takes place it takes into account the interviews over the whole period (6 hours for the IP and 3 hours each for the AM & PM) and concentrates it to the count of the peak 1 hour period being modelled.

- 4.8 As shown in Table 4.2 the interview sample factors ranged between 11% and 41%, which overall compares fairly well against a general target of 15%. The data is therefore considered acceptable. As expected, overall higher sample factors were achieved where traffic flows were lower.

- 4.9 Table 4.3 provides sample rate analysis by period and vehicle type. Sample rates were highest overall in the Inter Peak period. The PM Peak had the lowest sample rate of HGVs and the AM peak had the lowest overall sample rate of all periods. It must be noted that these figures have been produced from funnelled data. Funneling takes into account the interviews over the whole period (6 hours for the Inter Peak and 3 hours each for the AM Peak and PM Peak) and concentrates it to the count of the peak 1 hour period being modelled.
- 4.10 No HGVs were interviewed at Site 7. However EERM data was used to fill in the gap here for HGV numbers. Further information on this can be found in section 2.21.
- 4.11 As well as the RSIs and MCCs, ATCs were undertaken at the same locations over a two week period to detect any variations in the traffic volumes and to ensure the RSI survey day is of a typical weekday and is representative. This volumetric data was provided at 1-hr intervals. Table 4.4 summarises the results of the ATC data.

Table 4.4 – Summary of ATC Data

Site Ref	Direction	Average		Survey Day		24hr %Diff	12hr %Diff
		24hr Weekday ¹	12hr Weekday ¹	24hr Flow	12hr Flow		
1	Northbound	8195	6755	7819	6428	4.6	4.8
	Southbound	7950	6470	7889	6337	0.8	2.1
2	Northbound	13891	11252	12868	10471	7.4	6.9
	Southbound	11335	9022	11452	9106	-1.0	-0.9
3	Eastbound	10010	8189	8134	6279	18.7	23.3
	Westbound	9880	8040	8922	7080	9.7	11.9
4	Eastbound	5090	4138	3766	2828	26.0	31.7
	Westbound	5210	4187	5214	4195	-0.1	-0.2
5	Eastbound	2871	2416	2427	1928	15.5	20.2
	Westbound	3091	2586	2788	2215	9.8	14.3
6	Northbound	10838	8946	10089	8509	6.9	4.9
	Southbound	6542	5291	6686	5580	-2.2	-5.5
7	Northbound	8692	7056	9030	7347	-3.9	-4.1
	Southbound	8429	6738	8661	6887	-2.8	-2.2

1: The 24hr and 12hr weekday flows are an average taken from the week (Mon-Fri) prior to the week in which the RSI survey was undertaken.

Figures in bold = Interview Direction

- 4.12 The ATC data at Sites 1, 2 and 6 was found to be inaccurate because of the number of HGVs at these sites.
- 4.13 The ATC data shows some change in traffic flow from the counts undertaken on the day of the RSI. This was partly a result of inaccuracies with the number of HGVs at the ATC data at Sites 1, 2 and 6. However, in the majority of cases at the other sites the changes are fairly reasonable indicating little traffic diversion as a result of the RSI survey itself. The MCC data suggests that sites 3 and 5 did experience diversion effects, probably because the locations of these sites enabled last minute diversions to be made easily, when the queues from the RSI surveys became visible.

Table 4.5 – RSI to MCC Factors

Site	AM			IP			PM		
	MCC	ATC Avg	Factor	MCC	ATC Avg	Factor	MCC	ATC Avg	Factor
1 NB	522	548	1.049	522	538	1.030	522	744	1.425
1 SB	648	691	1.066	648	544	0.839	648	597	0.921
2 NB	926	1090	1.177	926	900	0.972	926	1139	1.230
2 SB	842	874	1.038	842	729	0.865	842	874	1.038
3 EB	554	978	1.765	554	655	1.182	554	579	1.044
3 WB	548	518	0.946	548	683	1.245	548	970	1.771
4 NB	342	453	1.324	342	325	0.950	342	437	1.278
4 SB	335	369	1.100	335	364	1.085	335	486	1.450
5 EB	295	292	0.988	295	196	0.664	295	204	0.692
5 WB	174	194	1.117	174	213	1.224	174	320	1.836
6 NB	742	835	1.126	742	726	0.978	742	810	1.092
6 SB	592	430	0.726	592	480	0.811	592	594	1.003
7 NB	552	554	1.004	552	602	1.091	552	703	1.274
7 SB	638	620	0.972	638	602	0.943	638	611	0.958

MCC = Link count for that site in the peak period indicated

ATC Avg = Average weekday Count

5. Manual Classified Turning Counts

5.1 For the purpose of calibrating and validating the highway model, traffic counts were carried out for all intersections and key junctions in the study area. Table 5.1 lists the traffic count survey sites including the type of the surveys. The locations of MCTCs are shown in Figure 5.1.

Table 5.1 – Locations of Traffic Counts

Map Ref	Location	Easting	Northing
1	A1101/A47 Roundabout,	547160	307791
2	B198/A47 Roundabout North	549251	312115
3	B198/A47 Roundabout South	544698	307426
4	Freedom Bridge Roundabout	546175	309971
5	Town Bridge	546017	309674
6	Mount Pleasant Road/B198	546652	310378
7	Leverington Road/Harecroft Road	545453	310484
8	B1169/A1101	545128	310610
9	Weasenham Lane/A1101 Ramnoth Road	546798	308559
10	A47/A141	539867	302988
11	Cowpers Gate/A17	542664	321979
12	Wisbech Road/A17	544118	321730
13	Sutton Road/Little Ramper	544726	313800



Figure 5.1 – Location of Turning Counts

5.2 The surveys were undertaken over a 12-hour period (0700-1900) on a neutral weekday (Tuesday, Wednesday or Thursday). The counts were collected in 15 minute intervals and were fully classified as outlined in paragraph 1.11

5.3 Turning count summary data can be found below in Table 5.2.

Table 5.2 – Turning Count Summary

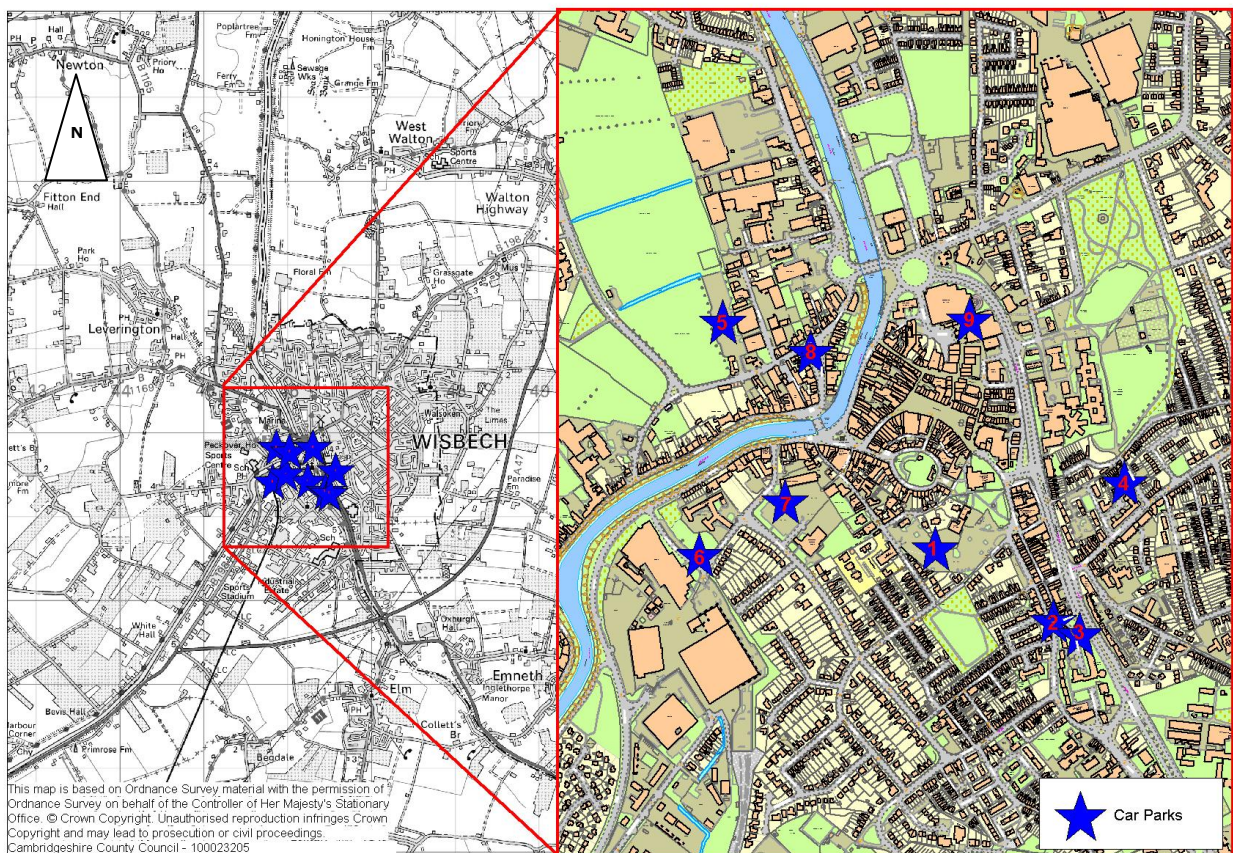
Map Ref	Movement	Description	AM Peak 0800 - 0900	PM Peak 1700 - 1800	12 Hour Total
1	A	A1101 Elm High Road (N)	544	861	8189
	B	A47 (E)	721	663	6712
	C	A1101 Elm High Road (S)	855	778	8632
	D	A47 (W)	545	821	6894
2	A	B198 Lynn Road	419	432	3809
	B	A47 (N)	810	815	7836
	C	Light Lane	161	156	1446
	D	A47 (S)	577	721	6435
3	A	B198 Cromwell Road	389	925	6416
	B	A47	684	606	6951
	C	Redmoor Lane	262	118	1395
4	A	A1101 North End	1183	1076	11978
	B	Bedford Street	0	0	0
	C	B198 Lynn Road	876	837	8830
	D	A1101 Churchill Road	675	870	8713
	E	Horsefair	105	256	3496
	F	B198 Nene Quay	329	491	5564
5	A	Exchange Square	11	8	65
	B	Old Market	497	354	4367
	C	Nene Quay	380	326	3850
	D	Bridge Street	82	135	1652
	E	Alexandra Road	105	269	1469
	F	B198 South Brink	464	609	5858
	G	North Brink	7	13	77
6	A	B198 Lynn Road (N)	748	663	7004
	B	B198 Lynn Road (S)	585	941	8178
	C	Mount Pleasant Road	227	293	2712
7	A	The Chase	30	22	227

Map Ref	Movement	Description	AM Peak 0800 - 0900	PM Peak 1700 - 1800	12 Hour Total
	B	A1101 Leverington Road (E)	449	712	6462
	C	Harecroft Road	168	331	2451
	D	A1101 Leverington Road (W)	1010	634	8457
8	A	Sutton Road	563	405	4676
	B	A1101 Leverington Road	510	974	7965
	C	B1169 Dowgate Road	470	293	3993
9	A	Churchill Road	449	564	6334
	B	Ramnoth Road	301	193	2537
	C	A1101 Elm High Road	843	664	8147
	D	Weasenham Lane	439	591	4948
10	A	A47 South Brink	892	966	9359
	B	A141 March Road	722	832	7088
	C	A47 Fen Road	916	880	8941
11	A	B1390 Cowpers Gate	110	108	1280
	B	A17 (E)	538	734	6648
	C	B1390 St James Road	116	115	997
	D	A17 (W)	651	633	6372
12	A	B1359 Wisbech Road (N)	216	221	2096
	B	A17 (E)	519	559	5702
	C	B1359 Wisbech Road (S)	299	372	3389
	D	A17 (W)	638	681	6966
13	A	A1101 Sutton Road (N)	428	352	3706
	B	A1101 Sutton Road (S)	344	580	4267
	C	Little Ramper	103	62	741

6. Car Park Surveys

- 6.1 Car park surveys and interviews were carried out to determine car park capacity and to obtain information regarding purpose of use, length of stay and distance travelled.
- 6.2 Car park counts and interviews were undertaken on two days, Wednesday 18th June and Thursday 19th June between the hours of 07:00 and 19:00. All the vehicles entering and leaving the car parks were counted at 15 minute intervals.
- 6.3 Additional car park data was collected at Chapel Road Car Park on Wednesday 15th and Thursday 16th October 2008 during the same time period and using the same methodology. Figure 6.1 highlights the location of these car parks.

Figure 6.1 – Location of Car Parks



- 6.4 Table 6.1 and Table 6.2 show a full summary for the Car Park Counts undertaken in June in the AM and PM peak hours and over 12 hours for each day. Additional recounting for Chapel Road has been included at the end of each table.
- 6.5 The data below highlights that Church Terrace Car Park (Site 1) has the greatest vehicle count inbound and outbound from the car park within the AM and PM peak hour periods. It also has the greatest total use over the 12 hour survey period with almost 2000 vehicles entering the car park on both survey days.
- 6.6 Horsefair Car Park (Site 9) has the second greatest use over the 12 hour survey period, with an average of 1500 vehicles entering and exiting the car park on both survey days.

Table 6.1 – Car Park Vehicle Count Summary, Peak Hours

Map Ref	Car Park Location	Wednesday 18 th June 2008				Thursday 19 th June 2008				No. Spaces
		AM Total		PM Total		AM Total		PM Total		
		In	Out	In	Out	In	Out	In	Out	
1	Church Terrace	264	61	115	238	280	95	115	229	401
2	West Street	5	4	9	16	3	0	2	6	16
3	Onyx Court	18	1	5	12	18	3	10	17	22
4	Park Street	1	1	2	4	9	3	6	6	23
5	Chapel Road	129	14	11	49	93	10	8	68	196
6	Coal Wharf	2	0	0	0	5	3	9	10	38
7	Somers Road	195	8	29	148	178	7	15	127	272
8	Old Market/North St	28	12	21	21	13	3	10	16	40
9	Horsefair	57	16	57	109	91	26	43	96	365
Recount		Wednesday 15th October 2008				Thursday 16th October 2008				
5	Chapel Road	102	10	13	49	79	13	24	48	196

Table 6.2 – Total Use of each Car Park over 12 hours

Map Ref	Car Park Location	Wednesday 18th June 2008		Thursday 19th June 2008	
		12hr Total		12hr Total	
		In	Out	In	Out
1	Church Terrace	1710	1666	1915	1841
2	West Street	56	59	45	46
3	Onyx Court	85	86	106	98
4	Park Street	45	45	39	35
5	Chapel Road	669	659	479	467
6	Coal Wharf	16	17	41	40
7	Somers Road	816	787	870	855
8	Old Market/North St	312	310	152	151
9	Horsefair	1448	1418	1683	1683
Recount		Wednesday 15th October 2008		Thursday 16th October 2008	
5	Chapel Road	567	546	535	497

6.7 Table 6.3 shows the total number of interviews obtained at each car park over the 12 hour survey periods on both days, the average inbound count, and the corresponding sample rates.

Table 6.3 – Car Park Interview Sample Rates

Map Ref	Car Park Location	Total No. of Interviews	Average 12-hr In Count	Combined 12-hr Sample Rate
1	Church Terrace	280	1812.5	15.4%
2	West Street	27	50.5	53.5%
3	Onyx Court	87	95.5	91.1%
4	Park Street	31	42	73.8%
5	Chapel Road	194	574	33.8%
6	Coal Wharf	22	28.5	77.2%
7	Somers Road	219	843	26.0%
8	Old Market/North St	45	232	19.4%
9	Horsefair	290	1565.5	18.5%

Table 6.4 – Car Park Sample Rates by Peak Hour (Funnelled)

Car Park Ref	AM	IP	PM
1	43%	24%	125%
2	200%	400%	273%
3	117%	385%	520%
4	160%	160%	500%
5	109%	11%	600%
6	314%	0%	222%
7	54%	45%	436%
8	107%	43%	174%
9	86%	25%	322%

Figures in red indicate low sample rates.

Figures shown in this table have been funnelled. Therefore when funneling takes place it takes into account the interviews over the whole period (6 hours for the Inter Peak and 3 hours each for the AM Peak & PM Peak) and concentrates it to the count of the peak 1 hour period being modelled.

6.8 The interview sample factors ranged between 15.4% and 91.1%, which compares well against a general target of 15%. The data is therefore considered acceptable. As expected, overall higher sample factors were achieved where the car parking turnover was lower.

7. Bus Surveys

7.1 Bus occupancy surveys were undertaken at Wisbech Bus Station on Wednesday 11th June and Thursday 19th June 2008 and additionally on Wednesday 9th October and Thursday 10th October between the hours of 07:00 and 19:00. The surveys were carried out to observe the number of passengers boarding and alighting buses at the bus station.

7.2 All buses entering and leaving the bus station were surveyed, including the following services:

- X1 – Kings Lynn-Wisbech-Peterborough
- 46 – Kings Lynn-Wisbech-March
- 63 – Kings Lynn-Walpole-Wisbech
- 66 – Wisbech-Walsoken circular
- 380 – Wisbech-Friday Bridge-March

7.3 Figure 7.1 and Figure 7.2 highlight the number of passengers boarding and alighting each bus service in 30 minute intervals between 07:00 and 17:00 hours in June 2008. The figures were produced from an average of the two day survey data.

Figure 7.1 – Wisbech Bus Services, Passengers Boarding June 2008

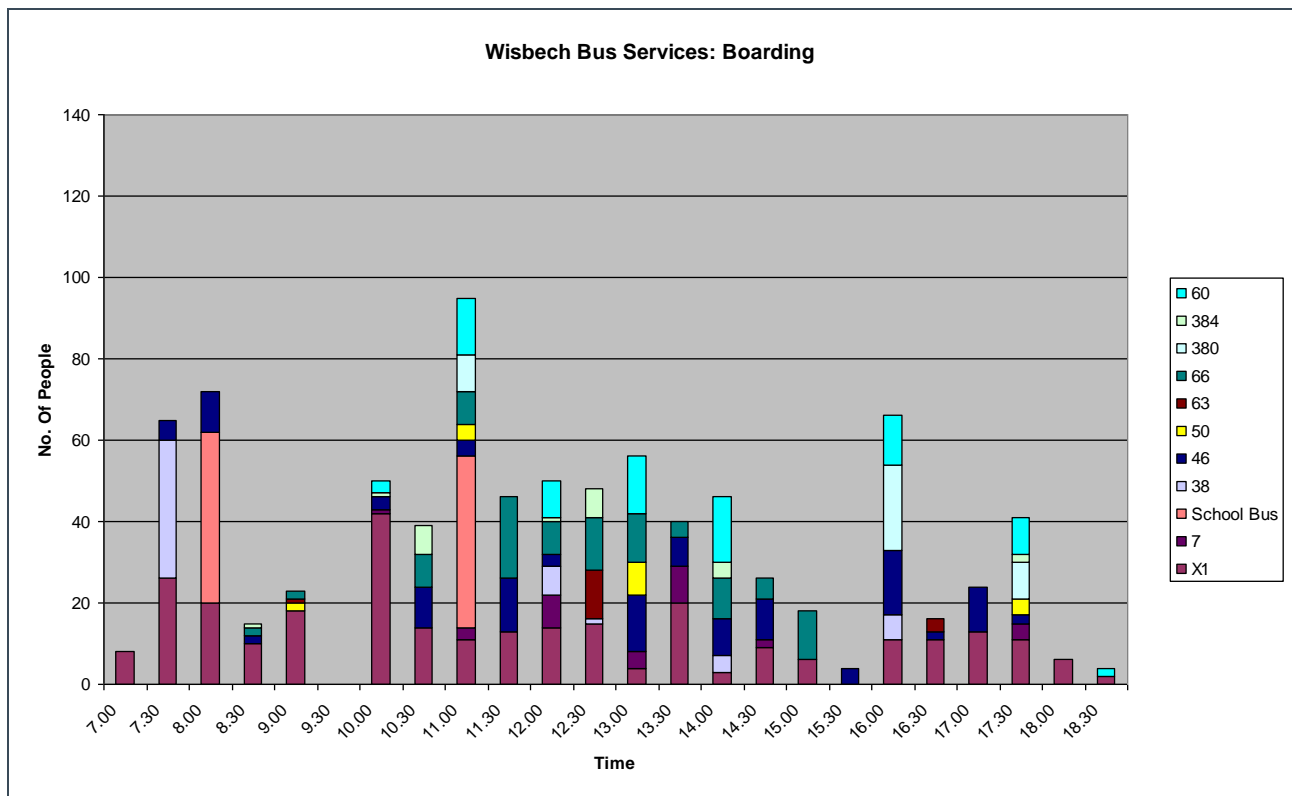
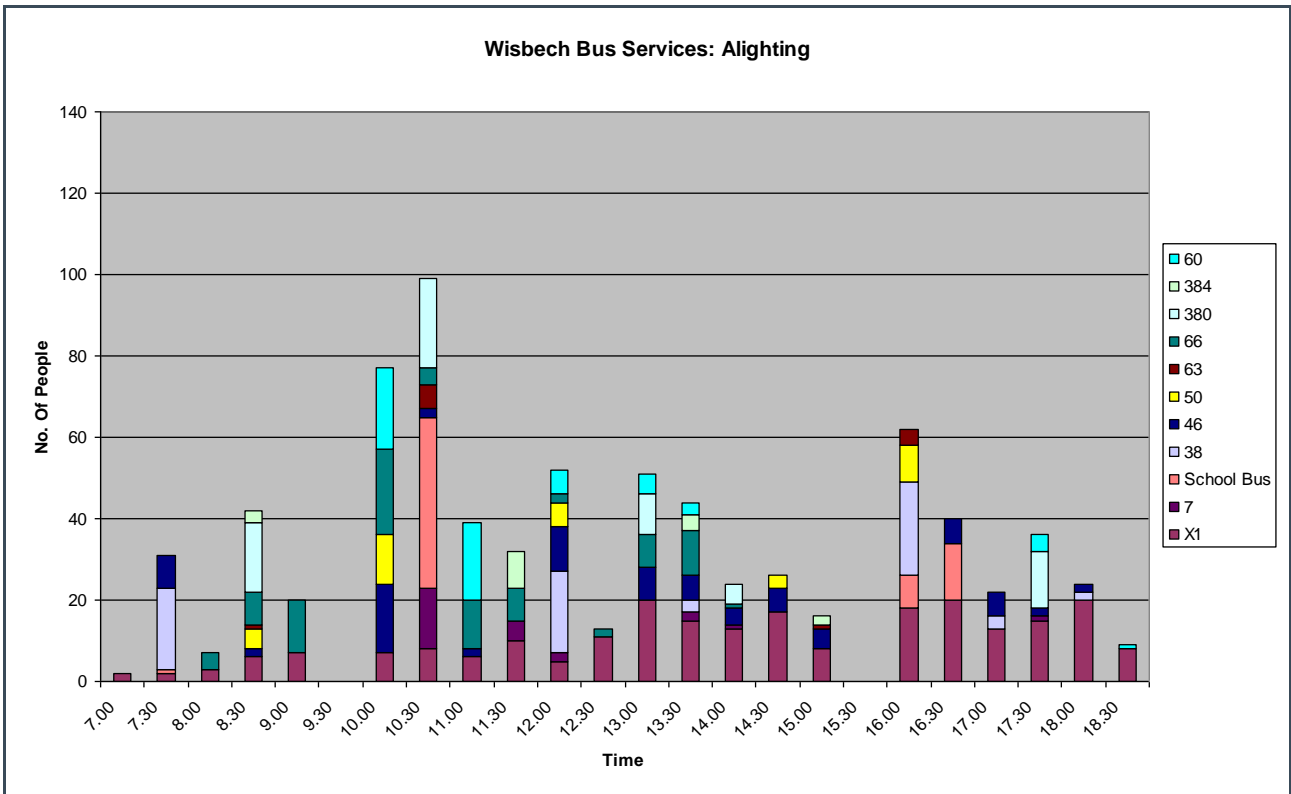


Figure 7.2 – Wisbech Bus Surveys, Passengers Alighting June 2008



7.4 Further surveys were undertaken in Oct 2008 between the hours of 07:00 and 09:30 hours. Figure 7.3 and Figure 7.4 highlight the number of passengers boarding and alighting each bus service in 30 minute intervals. The figures were produced from an average of the two day survey data.

Figure 7.3 – Wisbech Bus Surveys, Passengers Boarding October 2008

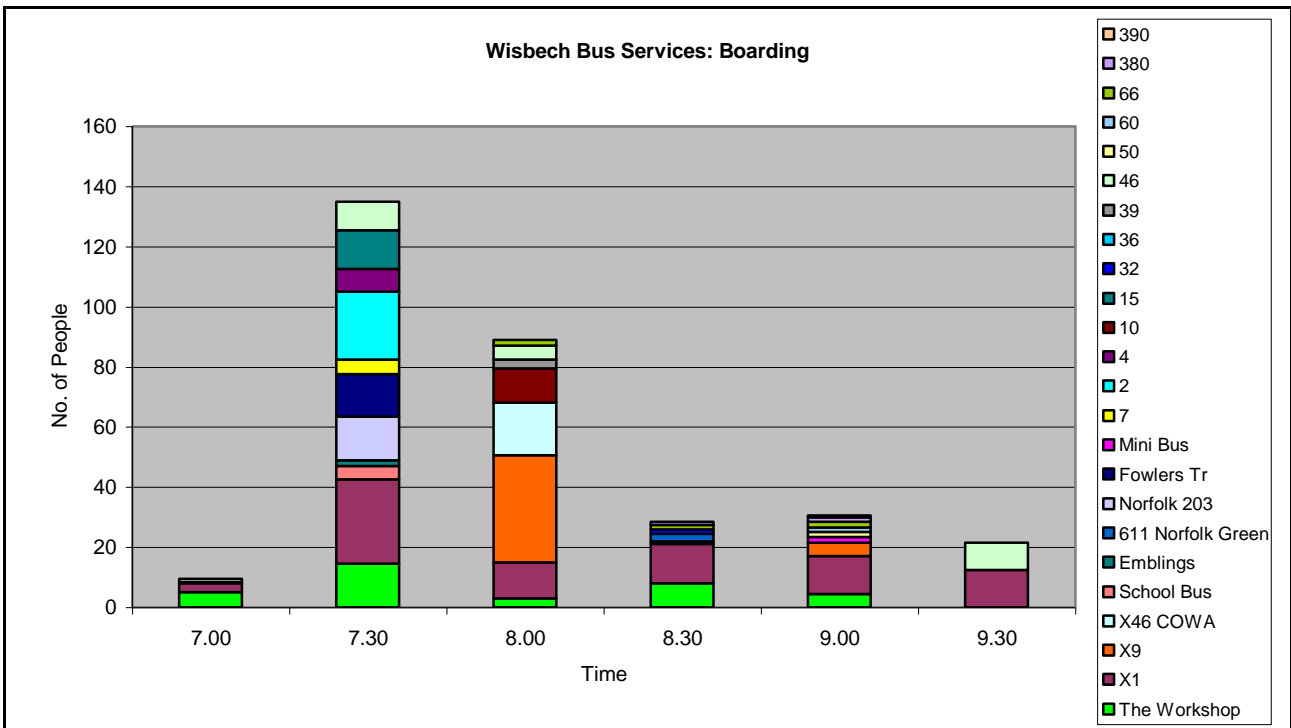
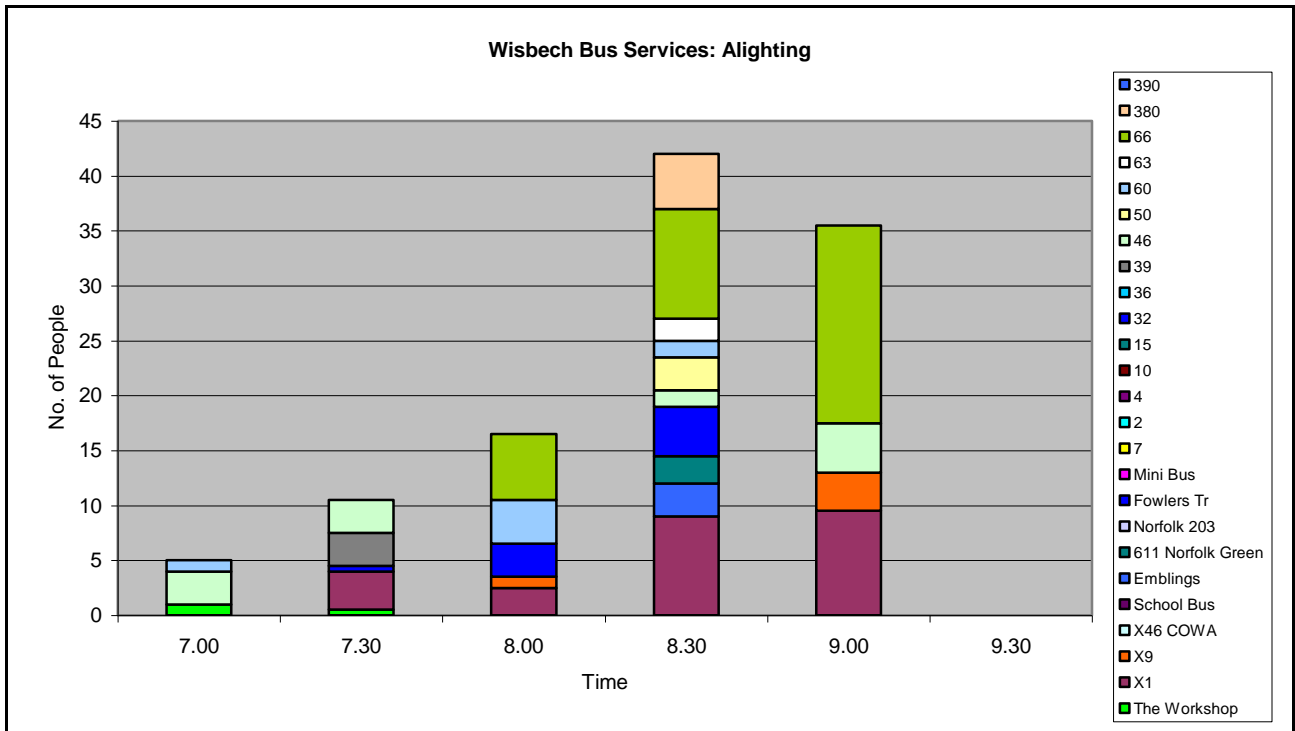


Figure 7.4 – Wisbech Bus Surveys, Passengers Alighting October 2008



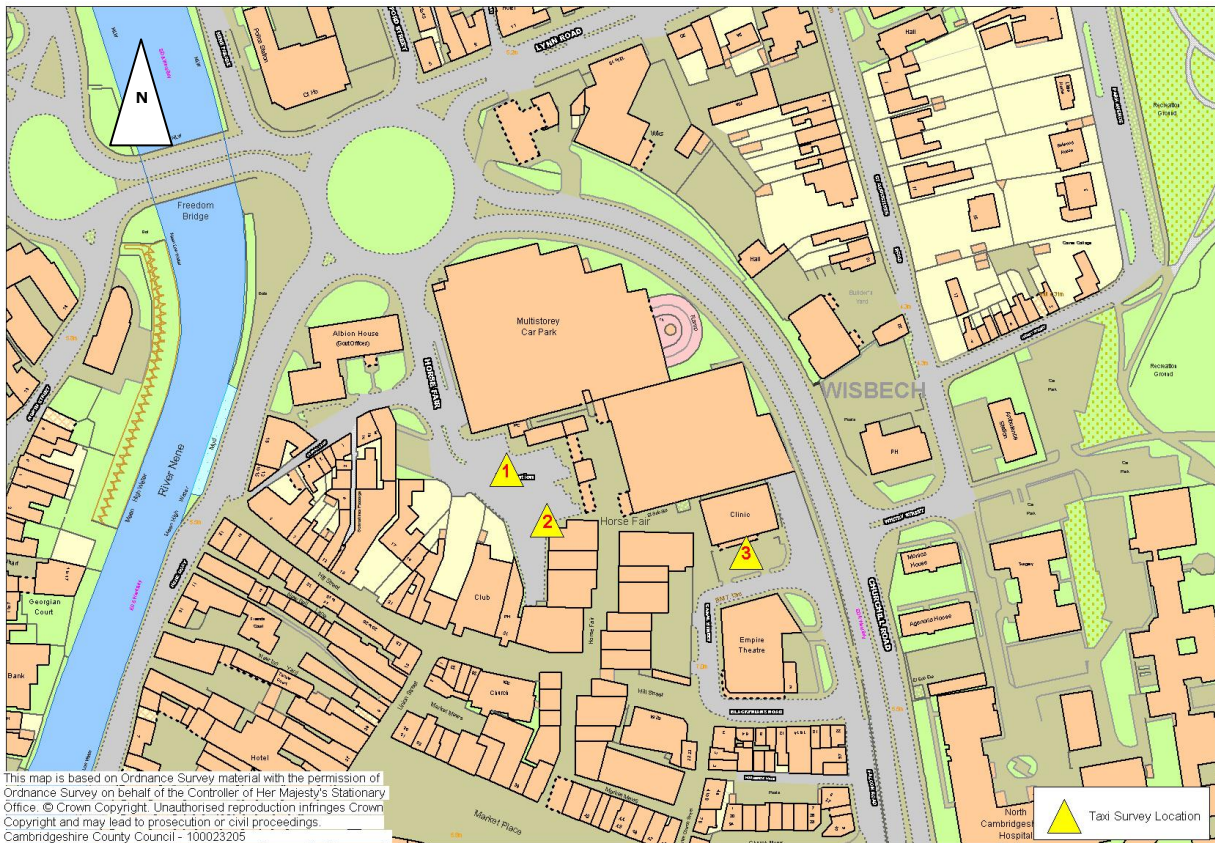
8. Taxi Rank Surveys

8.1 Surveys and Interviews were undertaken at three taxi ranks within Wisbech town centre on Wednesday 18th June. Details of the locations are shown in Table 8.1 and Figure 8.1. Interviews at Taxi ranks were undertaken to determine origin and destination information and were carried out between 11:00 and 22:00.

Table 8.1 – Taxi Surveys

Map Ref	Location	Easting	Northing
1	Bus Station	546236	309813
2	Horsefair	546251	309794
3	Blackfriars Road	546328	309781

Figure 8.1 – Location of Taxi Rank Surveys



- 8.2 Although there were three Taxi Rank survey locations identified only sites 2 and 3 had surveys undertaken.
- 8.3 At Site 2 over 95% of respondents were using a Taxi to travel within Wisbech. 70% of all respondents stated that they used a Taxi nearly every day of the week, with over 50% highlighting 'convenience' as the reason for using Taxis. 76% of respondents were female.
- 8.4 At Site 3 all respondents were using a Taxi to travel within Wisbech. Almost 70% of respondents indicated that they make use of Taxis only once a week, with over 55% indicating 'no access to a car' as the reason. Almost 90% of respondents were female.

9. Pedestrian and Cycling Surveys

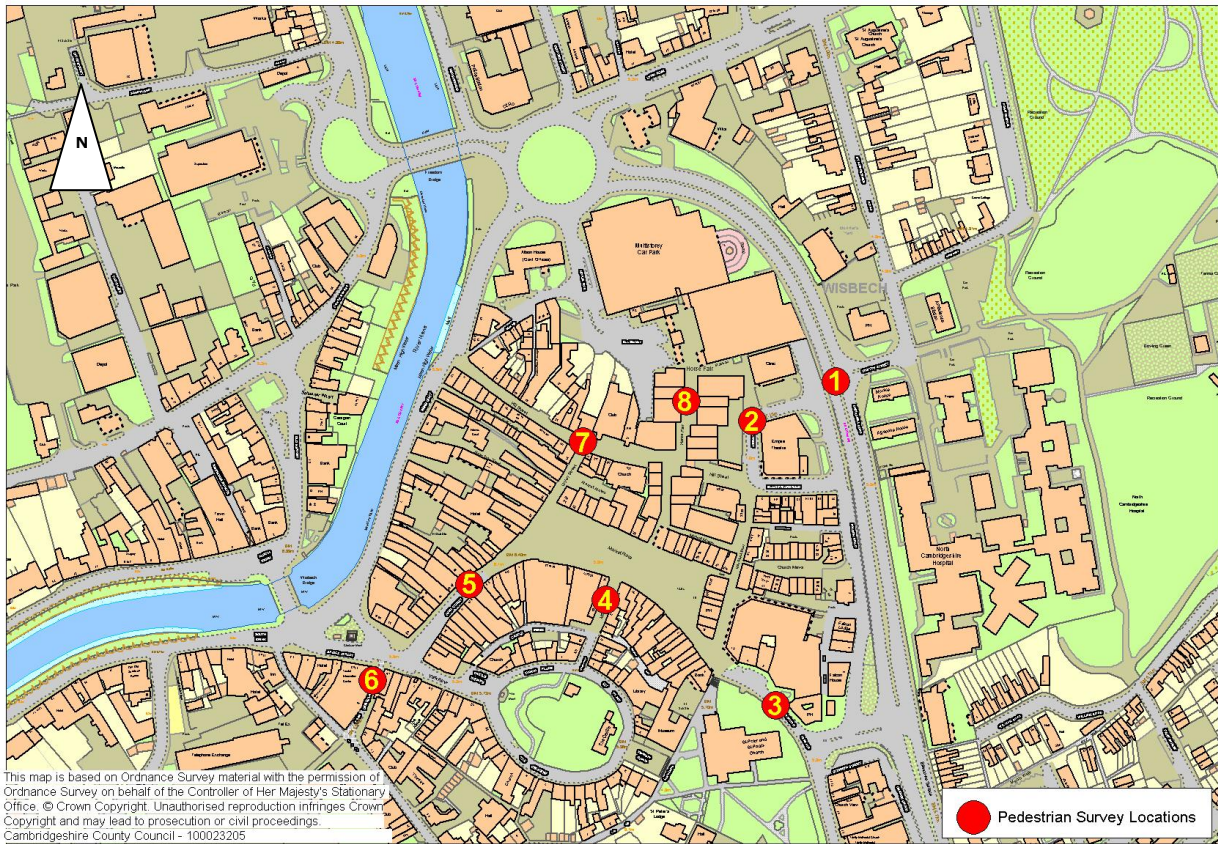
Pedestrian Surveys

- 9.1 Observations of pedestrian movements were undertaken on Tuesday 17th June 2008 in 30 minute intervals between 0800 and 1800 in Wisbech Town Centre. Interviews were also undertaken at selected sites to establish the mode of travel for a complete journey. The details of the surveys are shown in Table 9.1 and the locations are shown in Figure 9.1. A summary of the count data can be found in Table 9.3.

Table 9.1 – Pedestrian Surveys

Map Ref	Location	Count/Interview undertaken	Easting	Northing
1	A1101 Blackfriars Road crossing	Count	546365	309786
2	Canal St/Hill St	Count & Interview	546312	309761
3	Church Terrace (by Help the Aged)	Count & Interview	546327	309584
4	Market Street	Count	546221	309649
5	High Street	Count & Interview	546136	309659
6	Post office Lane (by corner with Bridge St)	Count	546076	309599
7	Union St/Hill St Junction	Count	546207	309748
8	Horsefair/Bus Station, opposite Peacocks Shop	Count & Interview	546271	309773

Figure 9.1 – Pedestrian Survey Locations



Cycle Surveys

- 9.2 Cycle surveys were carried out to determine the numbers of cyclists crossing a count line. With a distinction made between those being ridden or pushed on either the pavement or road
- 9.3 Cycling surveys were undertaken at all sites in Wisbech Town Centre on Tuesday 10th June and Thursday 12th June 2008. The details of the surveys are shown in Table 9.2 and the locations are shown in Figure 9.2. A summary of the count data can be found in Table 9.3.

Table 9.2 – Cycle Survey Locations

Map Reference	Location	Easting	Northing
1	B198 Lynn Road	546321	310004
2	A1101 Churchill Road	546365	309789
3	Horsefair	546273	309792
4	High Street	546140	309662
5	Church Terrace	546333	309579

Figure 9.2 – Cycle Survey Locations

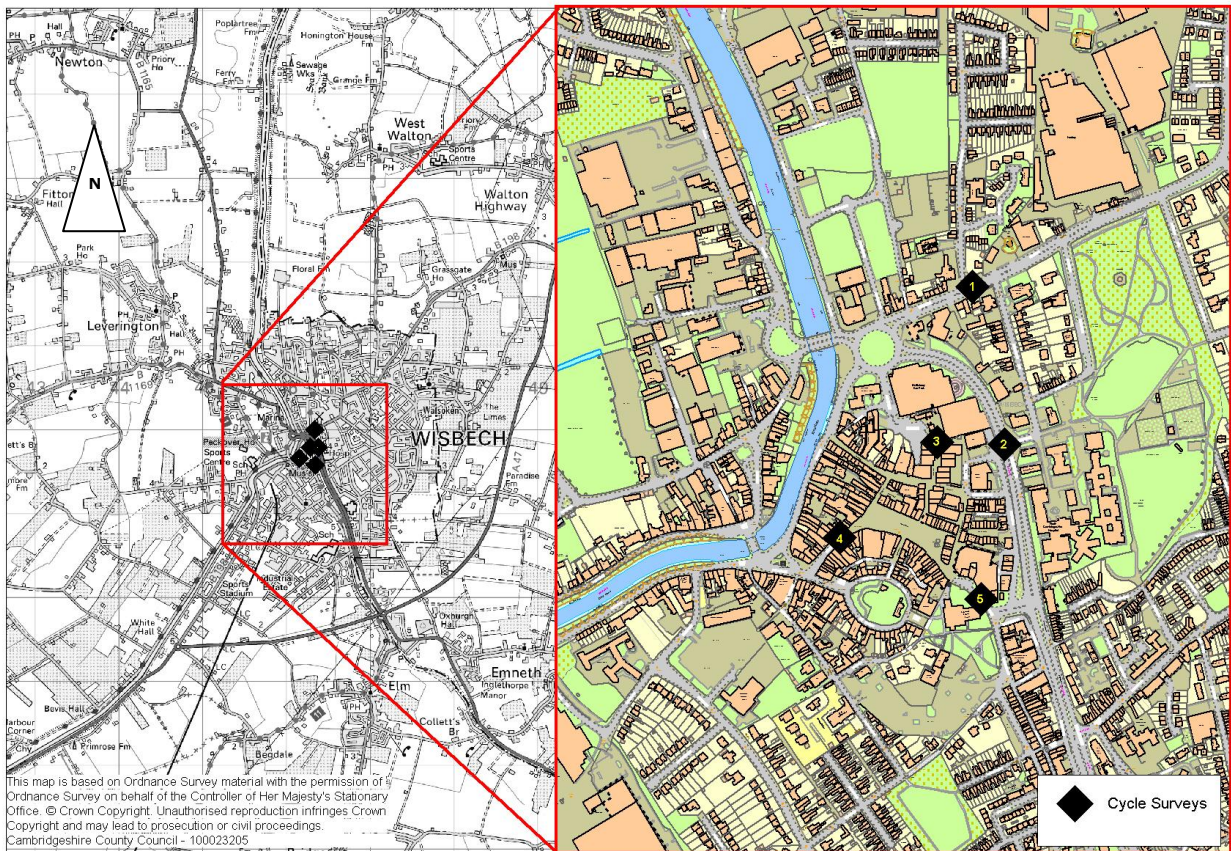


Table 9.3 – Pedestrian and Cycle Surveys Summary

Site	Pedestrians	Pushed Cycles		Ridden Cycles		Total Cycles
		On Road	On Path	On Road	On Path	
B198 Lynn Road	2,012	0	24	139	192	355
A1101 Churchill Road	209	0	2	15	51	68
Horsefair	11,093	0	44	0	101	145
High Street	6,610	38	18	190	23	268
Church Terrace	4,343	13	19	289	32	353

9.4 The greatest numbers of pedestrians were observed at Horsefair. The highest number of cyclists riding on the road was observed at Church Terrace, with the highest number of cycles riding on pavement occurring at Lynn Road. Both of these locations overall had the highest number of cycles (ridden or pushed) observed during the survey period.

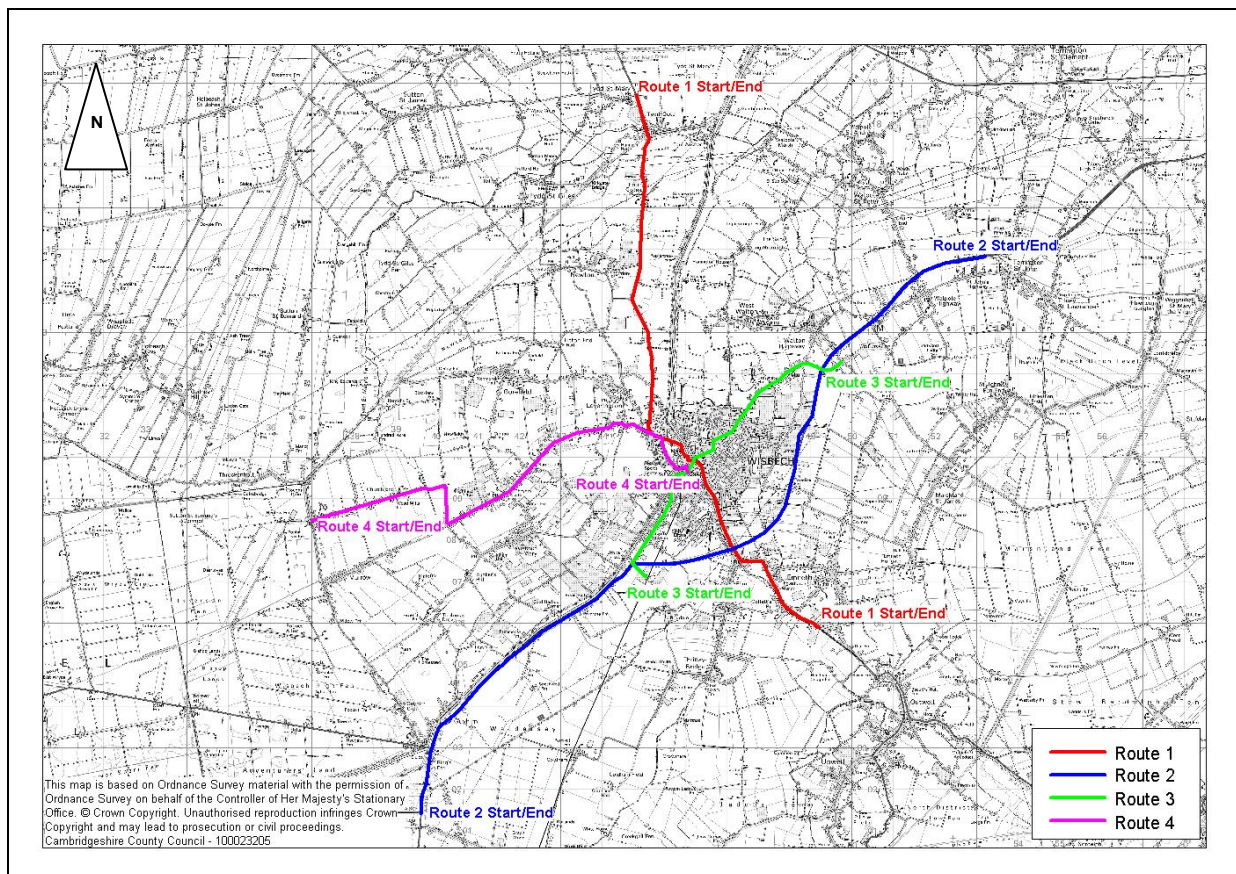
10. Journey Time Surveys

10.1 A number of journey time surveys were carried out across the study area, passing through Wisbech. The detailed journey time data is key to understanding present conditions and is integral to the development and validation of the local highway traffic model. Four journey time survey routes have been identified as shown in Table 10.1, and illustrated in Figure 10.1

Table 10.1 – Journey Time Routes

Route	From	To
1	A1101/Station Road	Outwell Road Roundabout
2	A605 Wisbech Road/A141 March Road	A47/Church Road
3	B198 Cromwell Road/A47	B198 Lynn Road/A47
4	B1166 The Bank/B1166 Main Road	Chapel Road/North Street

Figure 10.1 – Map of Journey Time Survey Routes



10.2 The journey time surveys were undertaken using the “moving observer” method as set out in the Design Manual for Roads and Bridges (DMRB) Volume 13. This requires two enumerators: a driver and a time recorder. The survey car is driven at the average speed of the general traffic along the predefined routes. The drivers are instructed that in free flow conditions, where possible, the number of overtaken vehicles should approximately equal the number of overtaking vehicles (without compromising safety). The time recorder is asked to note down the time to the nearest second at which the survey car passes through the predefined timing points. There are

several timing points per route and these timings points are usually major junctions or an easily recognised landmark such as bridges.

- 10.3 The target survey sample was a minimum of six timings for each route in each direction during each period (AM Peak period (0700-1000), Inter Peak period (1000-1300) and PM Peak period (1600-1800)). No accidents or incidents were recorded during the journey time surveys. Table 10.2 shows the average journey times along each route in the peak hour periods and a brief summary of the findings from each route is presented further below.

Table 10.2 – Journey Time Data Summary

Route	Period	Direction	Runs	Distance (km)	Journey Time (min)		Average Speed (kph)
					Average	St Dev	
1: A1101/Station Road to Outwell Road Roundabout	AM	Northbound	6	15.2	00:20:57	02:12	44.3
	IP		6		00:19:24	01:36	47.4
	PM		6		00:19:23	02:53	47.4
	AM	Southbound	2		00:20:19	03:21	45.2
	IP		7		00:19:58	02:33	46.6
	PM		5		00:19:20	01:35	47.5
2: A605 Wisbech Road/A141 March Road to A47/Church Road	AM	Northbound	5	20.8	00:19:07	05:10	65.4
	IP		8		00:16:33	01:02	76.4
	PM		5		00:17:49	01:28	71.4
	AM	Southbound	4		00:18:33	02:05	68.1
	IP		7		00:19:41	06:47	64.3
	PM		6		00:16:57	01:35	75.3
3: B198 Cromwell Road/A47 to B198 Lynn Road/A47	AM	Northbound	8	8.2	00:10:11	03:11	48.7
	IP		10		00:10:52	01:13	46.8
	PM		7		00:09:40	00:25	52.3
	AM	Southbound	9		00:09:29	00:43	53.0
	IP		10		00:11:11	01:34	44.3
	PM		7		00:10:41	02:59	47.3
4: B1166 The Bank/B1166 Main Road to Chapel Road/North Road	AM	Eastbound	6	11.6	00:13:06	01:20	53.3
	IP		8		00:16:05	01:03	43.4
	PM		6		00:13:25	00:42	52.5
	AM	Westbound	6		00:12:36	00:50	56.3
	IP		8		00:14:32	01:04	48.6
	PM		7		00:13:44	01:06	51.8

Please note: The average journey time given is the average over the 3 hours for the AM = 07:00-10:00 and PM= 16:00-19:00, and average over the 6 hours for the IP = 10:00-16:00

Route 1

- 10.4 Route 1 shows little variance in average journey times, except in the southbound direction during the AM and PM Peak where journey times are slightly lower than in the northbound direction. In the Inter-Peak period journey times are higher in the southbound direction compared to the PM peak.

Route 2

- 10.5 Route 2 shows a variance in average journey times between the three time periods in the northbound direction, with the AM peak period having a greater journey time than in the IP. In the southbound direction journey times were highest and speeds lowest in the Inter Peak period.

Route 3

- 10.6 Cromwell Road in the northbound direction has a lower average journey time in the PM Peak period than in the Inter Peak and AM Peak periods, although overall there is little difference between journey times. Southbound average journey times show little variance although the Inter-Peak period has the highest average journey time and AM Peak the lowest. Unusually, the travel speeds observed on Route 3 were slower (in both directions) during the Inter-Peak than during the Peak periods. This is unlikely to imply Inter Peak congestion, but probably lower speeds due to unfamiliarity with the road.

Route 4

- 10.7 Journey times for this route both eastbound and westbound were highest in the Inter Peak period. Journey times were lowest in the AM peak for both directions. Subsequently although somewhat unusually, the travel speeds observed on Route 4 were slower (in both directions) during the Inter Peak than during the AM Peak and PM Peak periods. This is unlikely to imply Inter Peak congestion, but probably lower speeds due to unfamiliarity with the road.

11. Conclusions

- 11.1 The main findings from an initial examination of the survey data show that the data is robust and can be used with confidence to establish the existing patterns of demand for travel in the Wisbech study area.
- 11.2 As part of this exercise, several existing sources of traffic and travel data were identified and the data has been made available by the relevant highway authorities for use in this study.
- 11.3 All of the additional traffic and travel surveys programmed for 2008, to supplement the existing data, have been completed, thereby capturing all the traffic movements in the Wisbech study area that are considered significant and relevant to this study. These surveys provide information on travel patterns, traffic levels and journey time reliability in the study area.
- 11.4 An extensive range of inventory surveys were carried out on the highway network, which ensures a good understanding of the situation being modelled.
- 11.5 The funnelled sample rates of vehicles interviewed at the RSI surveys carried out in June 2008 were in the range 22% to 246% of the peak hour traffic, indicating that the sample size is sufficient to provide reliable information on the existing travel patterns.
- 11.6 Some unusual patterns were identified in the journey time results with regards to the average journey times for routes 2, 3 and 4. Further analyses will be undertaken on all routes to identify and remove any anomalous runs that would cause the average of the observations to be inaccurate.