

## **HEREFORDSHIRE COUNCIL**

### **Hereford City Centre Transport Package (HCCTP) Interim Traffic Flow Evaluation Report**

**November 2020**

#### **Contents Amendment Record**

**This report has been issued and amended as follows:**

<b>Issue</b>	<b>Revision</b>	<b>Description</b>	<b>Date</b>	<b>Signed</b>
1	0.1	HCCTP TFER	11.11.19	JC
2	0.2	HCCTP TFER	18.11.19	JC
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4	1.1	HCCTP TFER	23.01.20	JC
5	1.2	HCCTP TFER	03.11.20	JC

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## 1.0 Introduction

This report provides an evaluation of traffic flow changes following the opening of the Hereford City Link Road (CLR) in 2017. The analysis compares data from 2014 (before the CLR was operational) with data from 2018 (one year after the CLR opening).

The CLR forms one element of an overarching package of measures forming the Hereford City Centre Transport Package (HCCTP). The HCCTP aims to support economic growth, improve accessibility and encourage active travel in Hereford, in line with the adopted policies of Herefordshire Council, the Marches Local Enterprise Partnership (LEP) and central government. The CLR component of the HCCTP will address a number of transport related problems set out in both the business case<sup>1</sup> and transport assessment report<sup>2</sup>. These are provided in Table 1 below and will be drawn upon in this report.

**Table 1-** The HCCTP transport related problems and resolutions from the HCCTP business case

Problem	CLR contribution to resolution
Car dominated environment limiting use of active travel modes	The CLR will provide an alternative route for traffic travelling east-west across the north of the city centre with consequent rerouting of journeys to this new route from Newmarket St, Blueschool St and Commercial Rd. The package of measures will encourage greater use of non-car modes for journeys to/from/within the city centre contributing towards a reduction in car dependency.
Severance	The CLR as well as public realm improvements along Newmarket St, Blueschool St and Commercial Rd will help to manage traffic volumes and reduce speeds thereby reducing severance and creating a safe and more pleasant environment for pedestrians and cyclists.
Deteriorating public transport performance	The HCCTP and CLR will contribute towards improving bus and passenger access to and from bus stops along the inner ring road and Commercial Rd and in turn improve performance
Accessibility including public transport, cycling and pedestrians	The CLR will provide access to and across the ESG regeneration area opening up land which is currently inaccessible and underutilised, as well as improve access to the railway station and associated transport hub
Safety	The HCCTP will better manage traffic flows and speeds along Commercial Rd, Blueschool St and Newmarket St.
Sub-optimal interchange provisions	The CLR will provide improved vehicular access to the station from the north and west. The HCCTP as a whole will provide enhanced quality facilities for interchange.
Impact on health and physical activity	The new infrastructure and improved environment for pedestrians and cyclists will encourage more active travel, reduce short distance journeys by car, increase physical activity and lead to health benefits.

The CLR specific objectives established to address these problems include:

- *Objective L2-01 – Unlock inaccessible and underutilised land for development within the ESG area through provision of:*
  - *A new (0.8km) single carriageway road (the CLR) from Edgar Street to Commercial Road; and*

<sup>1</sup> Hereford City Centre Transport Package Business Case (WSP, November 2015)

<sup>2</sup> Edgar Street to Commercial Road Link Road and Cycleway: Transport Assessment Vol. 1 Main Report (Crowd Dynamics, October 2009)

- A new 0.8km off-road cycle way along the CLR.
- Objective L2-02 – Improve multi-modal access to the railway station, including through provision of :
  - A new single carriageway road between Edgar Street (A49) the railway station and the A465; and
  - A new 0.8km off-road cycle way between Edgar Street and the railway station.
- Objective L2-03 – Provide additional highway capacity on the network to enable delivery of HCCTP improvements to existing city centre transport infrastructure and public realm.

## 2.0 Specification from the HCCTP MEP

The specification for the evaluation of the CLR contained in this report is set out in the ‘HCCTP Monitoring and Evaluation Report (MEP) October 2014’.

Table 2 provides a summary of the data requirements for the HCCTP as set out in the MEP. The first year full evaluation report will be published one year after completion of the HCCTP and the five year full evaluation report will be published five years after completion of the HCCTP.

**Table 2- MEP data requirements and reporting timeframe**

Survey metric	Data requirement	Interim traffic flow evaluation report	First year full evaluation report	Five year full evaluation report
Road traffic flows	Automatic Traffic Count surveys	√	√	√
	Manual junction count surveys	√	√	√
Walking and cycling	Pedestrian surveys		√	√
	Cycle turning count surveys		√	√
Bus usage	Bus patronage surveys		√	√
Rail usage	Mode share rail passenger surveys		√	√
Journey time and reliability	Journey time data from Highway Analyst		√	√
	Queue length surveys		√	√
Economic impacts	Additional employment floor space		√	√
	No of jobs created		√	√
	Total amount of completed city centre uses		√	√
	Performance of city centres through retail assessment		√	√
Carbon	Transport User Benefit analysis		√	√
Air Quality	NOx diffusion tube data		√	√

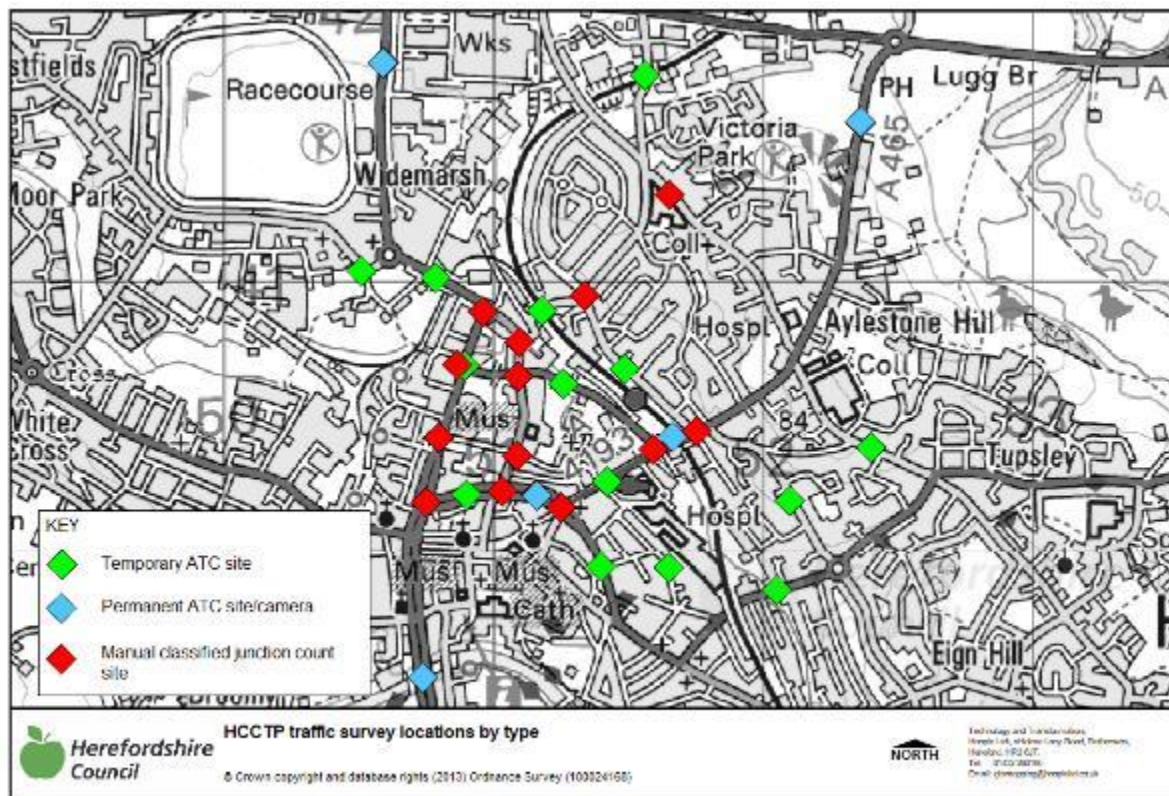
### 3.0 Surveys

Table 3 provides information on the traffic data used for this analysis, the survey timescales and their methodology. Figure 1 shows the locations of the various traffic surveys undertaken for the HCCTP and the survey type.

**Table 3- Data source, survey timescales and data methodology**

Survey type/Data source	Survey dates	Methodology
Permanent Automatic Traffic Counters (ATCs)	6 <sup>th</sup> -25 <sup>th</sup> October 2014 18 <sup>th</sup> February 2019-17 <sup>th</sup> March 2019	ATC using induction loops in carriageway
Temporary ATCs	6 <sup>th</sup> -25 <sup>th</sup> October 2014 18 <sup>th</sup> February 2019-17 <sup>th</sup> March 2019	ATC using temporary tubes secured on carriageway
Manual Classified Junction Counts	22 <sup>nd</sup> October 2014 16 <sup>th</sup> October 2018 24 <sup>th</sup> October 2019 (two additional surveys undertaken)	Multi-modal video cameras

**Figure 1- Traffic survey locations and type**



## 4.0 Variability, growth assumptions and other scheme effects on traffic flows

### 4.1 Accounting for monthly variability in traffic flows

To ensure that the HCCTP 'before' and 'after' survey data is representative of annual average traffic conditions in each year, with any variations due to monthly variation removed, the count data was factored using locally obtained data . This comprised:

- For the 'before' data - factoring October 2014 12 hour and peak hour count data to establish 2014 annual average 12 hour and peak hour flows and
- For the 'after' data- factoring February/March 2019 12 hour and peak hour count data to establish 2018 annual average 12 hour and peak hour flows.

### 4.2 Growth assumptions

To ensure the CLR evaluation allowed for any local growth in traffic that could have occurred whether the city link road was in place or not, national, regional and local traffic data was analysed to establish the change in traffic flows between 2014 and 2018. Locally, on Greyfriars Bridge, traffic flows declined by 2% between 2014 and 2018, whilst regional and national traffic levels increased by 4% and 5% respectively. For the purposes of this analysis, it has therefore been assumed that traffic levels have remained static between 2014 and 2018.

Traffic flows on A49 Greyfriars Bridge were used to establish monthly variation and growth factors for this evaluation because:

- The flow profiles on the bridge are considered to be representative of those present in the area affected by the CLR;
- Traffic flows on the bridge are considered to be unaffected by the changes brought about by the CLR; and
- Traffic data obtained from the counter on the A49 Greyfriars Bridge is considered to be statistically robust.

### 4.3 Other schemes having effects on traffic flows

There were a number of other changes which took place in Hereford that are likely to have effected traffic flows between 2014 and 2018. These include:

- A ban on right turning movements from Barrs Court Road onto the A465 Aylestone Hill;
- The opening of the Old Market retail area and its associated car parks (e.g. Merton Meadow access changes and the introduction of the Old Market car park);
- Implementation of new residents parking schemes in the north west of Hereford;
- The introduction of on-street parking charges in the city centre; and
- New development in the HCCTP area.

These changes will have influenced vehicle movements in the city centre and therefore will be present in the 2018 data.

## 5.0 Results

Table 4 and Figure 2 provides daily, morning peak (0800-0900) and evening peak (1700-1800) annual average traffic flows and percentage change in flows from 2014 to 2018 on all of the main links in the HCCTP study area. The turning count for each year can be found in **Appendix A**.

Following a series of checks to establish validity it was concluded that the ATC data analysed for this report lacked consistency when compared with the manual classified junction count survey data which, due to the more rigorous recording process, was considered to be more reliable than the ATC data. Consequently, a significant proportion of ATC data was rejected and has therefore not been included in this analysis.

The results of the traffic flow analysis show the following main changes between 2014 and 2018:

- **Morning peak hour**
  - Traffic flows have decreased on Newmarket St (-19%), Blueschool St (-20%), Barrs Court Rd (-6%), Commercial Rd (-25% to -37%) and Aylestone Hill (-24%) and have increased on Edgar St (21% to 25%), Burcott Rd (+16%), Venns Lane (+14%) and College Rd (+42%); and
  - The following vehicles have transferred to the CLR in the morning peak:
    - 294 vehicles on the section west near the A49;
    - 290 vehicles on the section west of Widemarsh Street;
    - 590 on the section east of Widemarsh Street; and
    - 576 on the section west of Station Approach.
- **Evening peak hour**
  - Traffic flows have decreased on Newmarket St (-9%), Blueschool St (-6%), Aylestone Hill (-4%), Barrs Court Rd (-16%), and Commercial Rd (-13% to -26%) and have increased on Edgar St (32% to 68%), Burcott Rd (+5%), Venns Lane (+8%) and College Rd (+15%); and
  - The following vehicles have transferred to the CLR in the evening peak:
    - 285 vehicles on the section west near the A49;
    - 379 vehicles on the section west of Widemarsh Street;
    - 671 on the section east of Widemarsh Street; and
    - 556 on the section west of Station Approach.
- **Daily traffic flows**
  - Daily traffic flows have decreased on Newmarket St (-10%), Blueschool St (-13%), Barrs Court Rd (-50%) and Commercial Rd (-17% to -24%) and have increased on Edgar St (17% to 19%), Venns Lane (+16%) and College Rd (+6%); and
  - The following vehicles have transferred to the CLR:
    - 3,849 vehicles on the western section near the A49;
    - 4,288 vehicles on the section west of Widemarsh Street;
    - 8,308 on the section east of Widemarsh Street; and
    - 8,272 on the section west of Station Approach.



**Table 4- 24hr, AM and PM peak annual average link flows and % difference in flows in 2014 and 2018**

Link	Road name	Annual average link flow by year and time period								
		2014			2018			% difference		
		AM peak	PM peak	Daily	AM peak	PM peak	Daily	AM peak	PM peak	Daily
1	Newtown Rd West	1935	1747	25834	1743	1678	26325	-10%	-4%	2%
2	Newtown Rd East	826	673	9162	770	787	9654	-7%	17%	5%
3	Edgar St North of CLR	1162	1124	14334	1090	1281	14600	-6%	14%	2%
4	Edgar St North of Black friars	1408	858	18413	1756	1444	21857	25%	68%	19%
5	Edgar St South of Blackfriars	1597	1355	21997	1928	1790	25793	21%	32%	17%
6	Newmarket St	2093	1746	27362	1687	1596	24598	-19%	-9%	-10%
7	Blueschool St	2420	1883	27794	1946	1764	24206	-20%	-6%	-13%
8	Commercial Rd Clr-Barrs Crt	1464	1613	20032	1103	1395	16716	-25%	-13%	-17%
9	Commercial Rd S of Monkmoor St	1289	1137	16584	807	929	12589	-37%	-18%	-24%
10	Commercial Rd N of Monkmoor St	1390	1383	18026	895	1027	14057	-36%	-26%	-22%
11	Widemarsh St (Newtown rd- CLR)	904	930	10939	948	1228	11132	5%	32%	2%
12	Widemarsh St (Black junc to CLR)	725	915	10018	689	842	10875	-5%	-8%	9%
13	Widemarsh Street (A438-Blackfr junc)	472.5	612	6563	500	566	7574	6%	-8%	15%
14	Aylestone Hill	1838	1729	21407	1396	1657	18824	-24%	-4%	-12%
15	Blackfriars St West	264	576	5136	233	503	6140	-12%	-13%	20%
16	Blackfriars East	236	478	4831	234	395	5226	-1%	-17%	8%
17	Coningsby St	277	252	3235	164	131	2174	-41%	-48%	-33%
18	Barrs Court Rd	696	779	8537	657	655	5091	-6%	-16%	-40%
19	Farriers Way	659	710	8221	612	573	6702	-7%	-19%	-18%
20	Bath St	1473	1238	16553	1435	1343	17433	-3%	8%	5%
21	Burcott Road	676	873	9279	785	917	8981	16%	5%	-3%
22	College Road	735	811	8506	1041	929	9033	42%	15%	6%
23	Venns Lane	554	566	6087	647	615	7284	14%	8%	16%
24	CLR (west at j/w Edgar St)				294	285	3849			
25	CLR (west of Widemarsh St)				290	379	4288			
26	CLR (East of Widemarsh St)				590	671	8308			
27	CLR (W of Station Approach)				576	556	8272			

	Increase in flows
	Decrease in flows



**Figure 2- 24hr, AM and PM peak differences in 2 way traffic flows and percentage difference in 2 way traffic flows from 2014 to 2018**

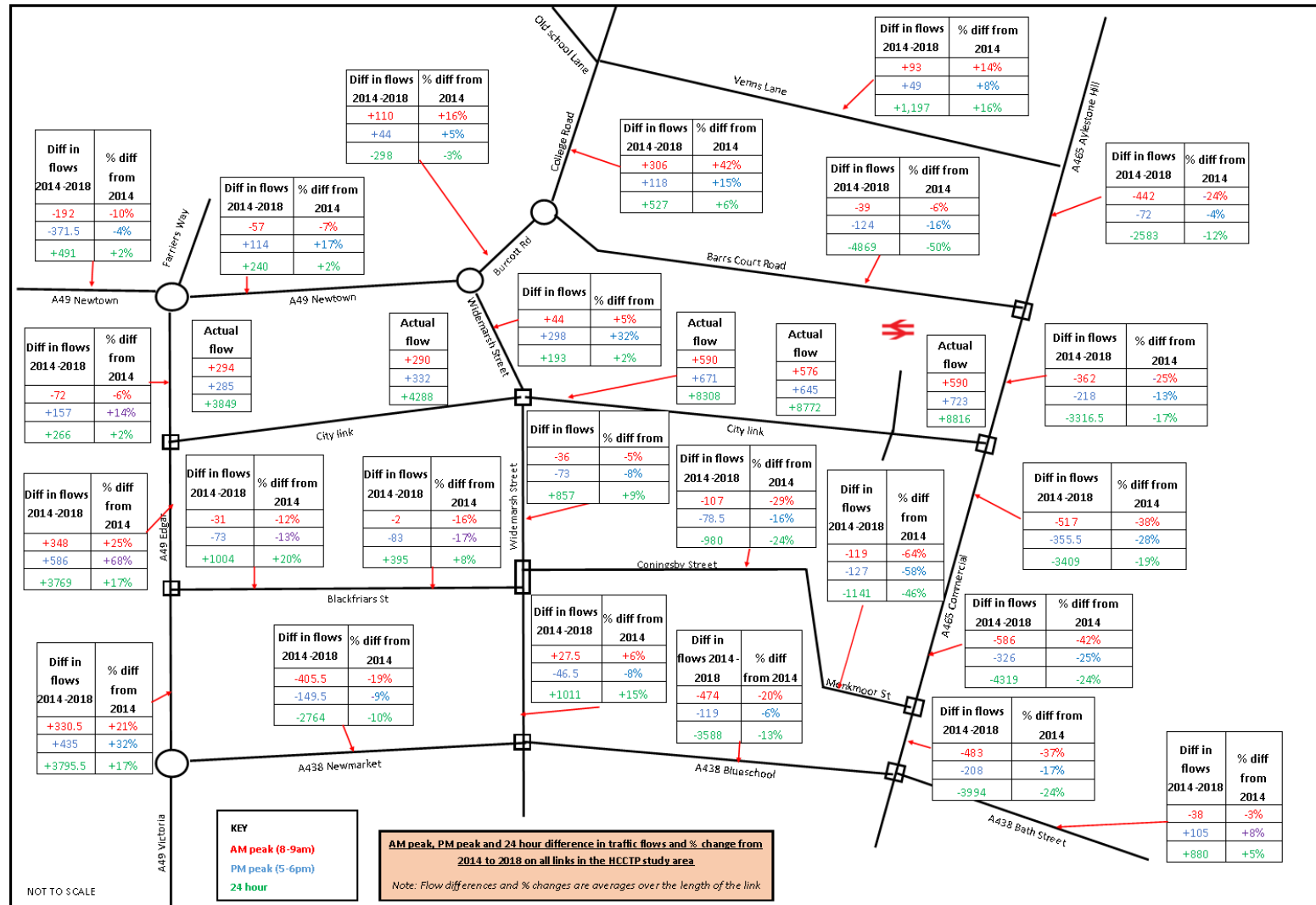


Table 5 provides a comparison of change in 'actual' traffic flows on key routes (i.e. from 2014 and 2018 survey data), with the change in the 2014 traffic flows forecast by the traffic model from the Traffic Assessment report with and without the link road.

The majority (79%) of 'actual' link flows in the PM peak showed a similar result to that which was forecast. There were two routes which recorded a decrease when the model forecasted an increase. These comprise:

- **Newtown Road West;** and
- **Coningsby Street**

There was one route which recorded an increase when the model forecasted a decrease:

- **Venns Lane**

Forecasts in the AM peak were less reliable with 50% of routes (7 of 14) showing the opposite result to that which was originally forecast. There were five routes which recorded a decrease, when the model forecasted an increase. These comprise:

- **Coningsby Street;**
- **Newtown Road West;**
- **Newtown Road East;**
- **Edgar Street North of CLR;** and
- **Widemarsh St South.**

There were two routes which recorded an increase when the model forecasted a decrease. These comprise:

- **Venns Lane;** and
- **College Road.**

**Table 5- Comparison of percentage change in traffic flows from 2014/2018 data and 2014 model forecasts**

Road name	% change in 2014 and 2018 survey data		% change in original model forecasts with and without the link road	
	AM peak	PM peak	AM peak	PM peak
Newtown Rd West	-10%	-4%	5%	5%
Newtown Rd East	-7%	17%	18%	51%
Edgar St North of CLR	-6%	14%	7%	8%
Edgar St South of Blackfriars	21%	32%	2%	10%
Newmarket St	-19%	-9%	-1%	-31%
Blueschool St	-20%	-6%	-18%	-28%
Commercial Rd S of Canal Rd	-37%	-18%	-44%	-63%
Widemarsh St South	-5%	-8%	15%	-17%
Aylestone Hill	-24%	-4%	-26%	-12%
Blackfriars St W	-12%	-13%	-14%	-24%
Coningsby St	-41%	-48%	45%	78%
Barrs Court Rd	-6%	-16%	-91%	-87%
College Road	42%	15%	-18%	2%
Venns Lane	14%	8%	-8%	-6%

	A reduction in flows
	An increase in flows

Table 6 sets out the transport problems in the HCCTP area against the outcomes to be delivered by the CLR in the business case.

**Table 6- The extent to which the CLR has mitigated the problems set out in the HCCTP business case**

Problem	CLR contribution to resolution	Extent to which the CLR has mitigated the problem
Car dominated environment limiting use of active travel modes	The CLR will provide an alternative route for traffic travelling east-west across the north of the city centre with consequent rerouting of journeys to this new route from Newmarket St, Blueschool St and Commercial Rd. The package of measures will encourage greater use of non-car modes for journeys to/from/within the city centre contributing towards a reduction in car dependency.	The CLR has provided an alternative route for traffic travelling east west across the north of the city. It has successfully removed traffic off Newmarket St, Blueschool St and Commercial Rd in the AM, PM and 24 hour periods and hence has contributed to providing a less car dominated environment. The delivery of the public realm improvements will further enhance these routes for pedestrians and cyclists.
Severance	The CLR as well as public realm improvements along Newmarket St, Blueschool St and Commercial Rd will help to manage traffic volumes and reduce speeds thereby reducing severance and creating a safe and more pleasant environment for pedestrians and cyclists.	The CLR has removed traffic on Newmarket St, Blueschool St and Commercial Rd across the AM, PM and 24hr periods and contributed to reduced severance. This outcome will be further improved with the delivery of public realm improvements.

Deteriorating public transport performance	The HCCTP and CLR will contribute towards improving bus and passenger access to and from bus stops along the inner ring road and Commercial Rd and in turn improve performance	Public transport performance will be evaluated in the 'First Year Evaluation report'.
Accessibility including public transport, cycling and pedestrians	The CLR will provide access to and across the ESG regeneration area opening up land which is currently inaccessible and underutilised, as well as improve access to the railway station and associated transport hub	The CLR has provided access to and from the ESG regeneration area and improved access to the railway station by motorised and non-motorised modes. The CLR has also opened up land for development with a super GP surgery already in development north of the CLR, with a number of others to follow.
Safety	The HCCTP will better manage traffic flows and speeds along Commercial Rd, Blueschool St and Newmarket St.	Safety will be evaluated in the 'First Year Evaluation Report' produced when the public realm measures have been delivered.
Sub-optimal interchange provisions	The CLR will provide improved vehicular access to the station from the north and west. The HCCTP as a whole will provide enhanced quality facilities for interchange.	The CLR has improved vehicular access to the railway station from the north and west through improved junction layouts at Station Approach. These will be further enhanced with the delivery of the transport hub.
Impact on health and physical activity	The new infrastructure and improved environment for pedestrians and cyclists will encourage more active travel, reduce short distance journeys by car, increase physical activity and lead to health benefits.	The impacts on health and physical activity will be evaluated in the 'First Year Evaluation Report'.

## 6.0 Conclusions

This report has analysed traffic data from 2014 and 2018 in the area likely to be affected by the opening of the CLR. It has identified some significant changes to traffic flows on the road network which are most likely attributable to the effect of the CLR introducing both additional traffic capacity, and routes which offer lower journey times and improved journey time reliability into the road network.

Whilst the traffic flows forming the basis of this evaluation are likely to contain the effects of other changes to the operation of the road network, it is not considered that these changes are likely to have compromised the aims of this evaluation.

Delivery of the CLR has realised objectives L2-01, L2 02 and L2 03 and related problems contained in the HCCTP business case. Furthermore, by providing an alternative route for traffic travelling east west across the north side of the city centre, traffic has re-routed between the new road and Edgar Street from Newmarket Street, Blueschool Street, Barrs Court Road, Aylestone Hill and Commercial Road. The distribution of this re-routing is broadly compatible with the traffic forecasts for the CLR shown in Table 5 although the scale of the change is less than that forecast for the full package. This initial reduction in traffic flows is likely to increase following delivery of the public realm components of the HCCTP.

The routes which have shown changes in traffic flows that differ significantly to those originally forecast include:

- A 41% and 48% **decrease** in traffic flows on Coningsby street and Monkmoor Street in the peak periods when a 45% and 78% **increase** in flows were originally forecast; and
- A 42% **increase** in traffic flows on College road in the morning peak when an 18% **decrease** was originally forecast. This is likely to be a result of extensive queuing on Aylestone Hill resulting in the use of College Road as an alternative route.

## 7.0 Next steps

Investigations are on-going as to the reasons behind the increase in traffic on College Road and how they can be mitigated. This issue will be a consideration in the design of measures for Commercial Road as part of the next phase of the HCCTP.

As noted in Table 2 the first year evaluation report will be published one year after the HCCTP is completed. The first year evaluation report will include the following:

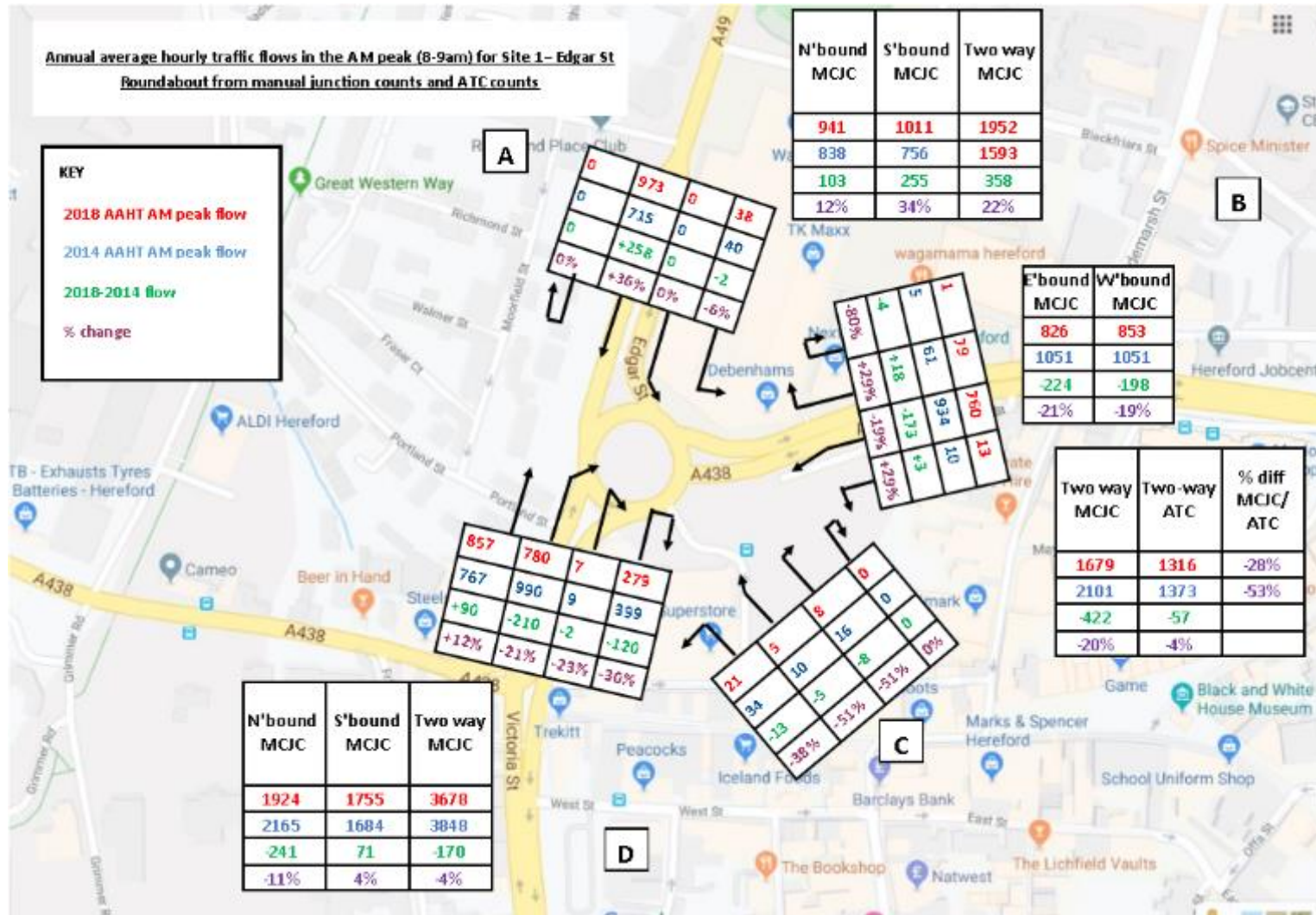
- Travel demand (public transport patronage, rail use, pedestrian and cycle counts);
- Travel times and reliability of travel times (journey times, queue length);
- Impacts on the economy (travel times/accessibility changes to businesses, employment levels, and rental values); and
- Environmental impacts (carbon, air quality).

A five year full evaluation report will also be produced five years after the full HCCTP has been delivered, repeating the analysis covered in the First Year Full Evaluation report.

# APPENDIX A- Manual classified turning count diagrams

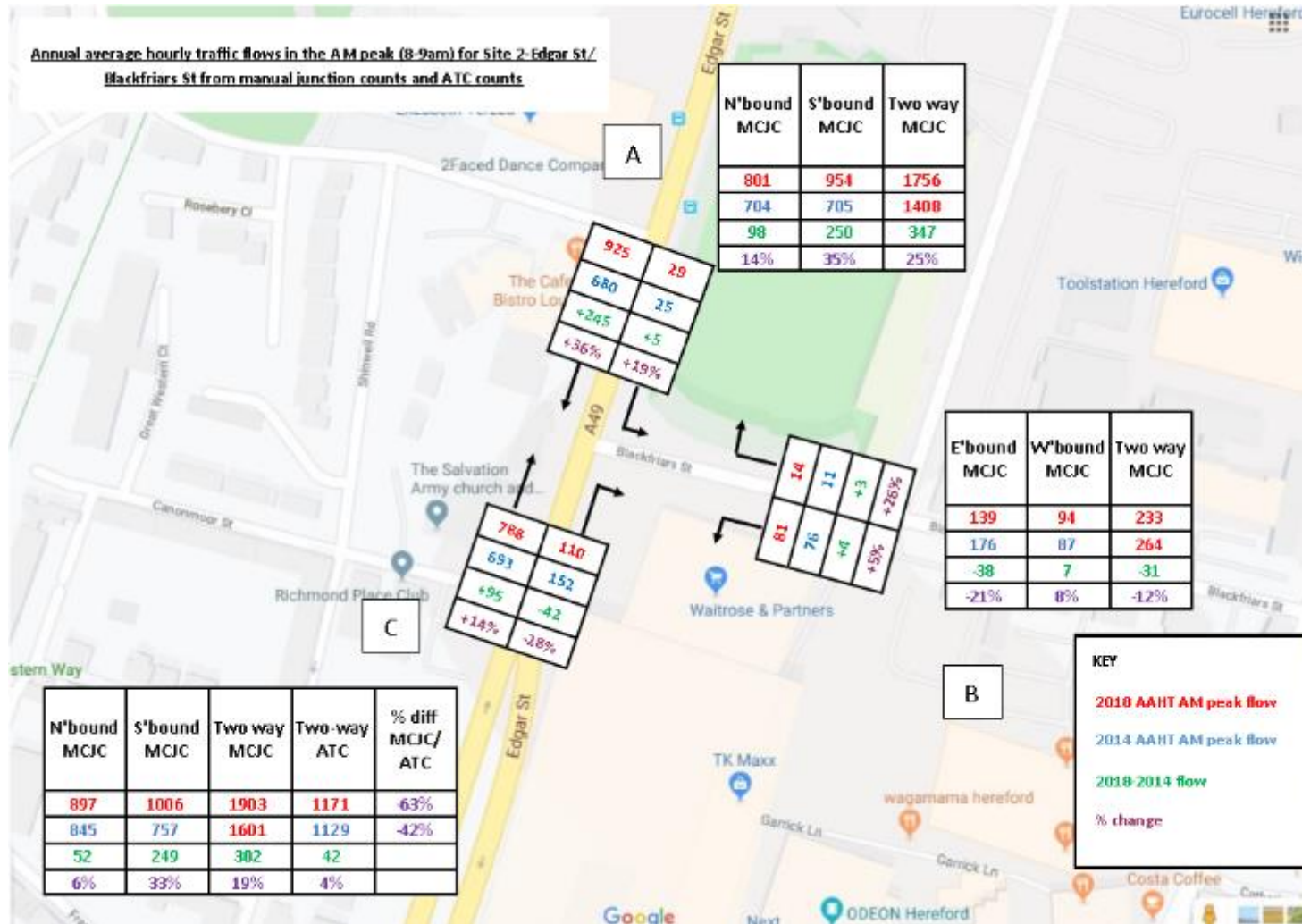
AM Peak (8-9am)

Site 1

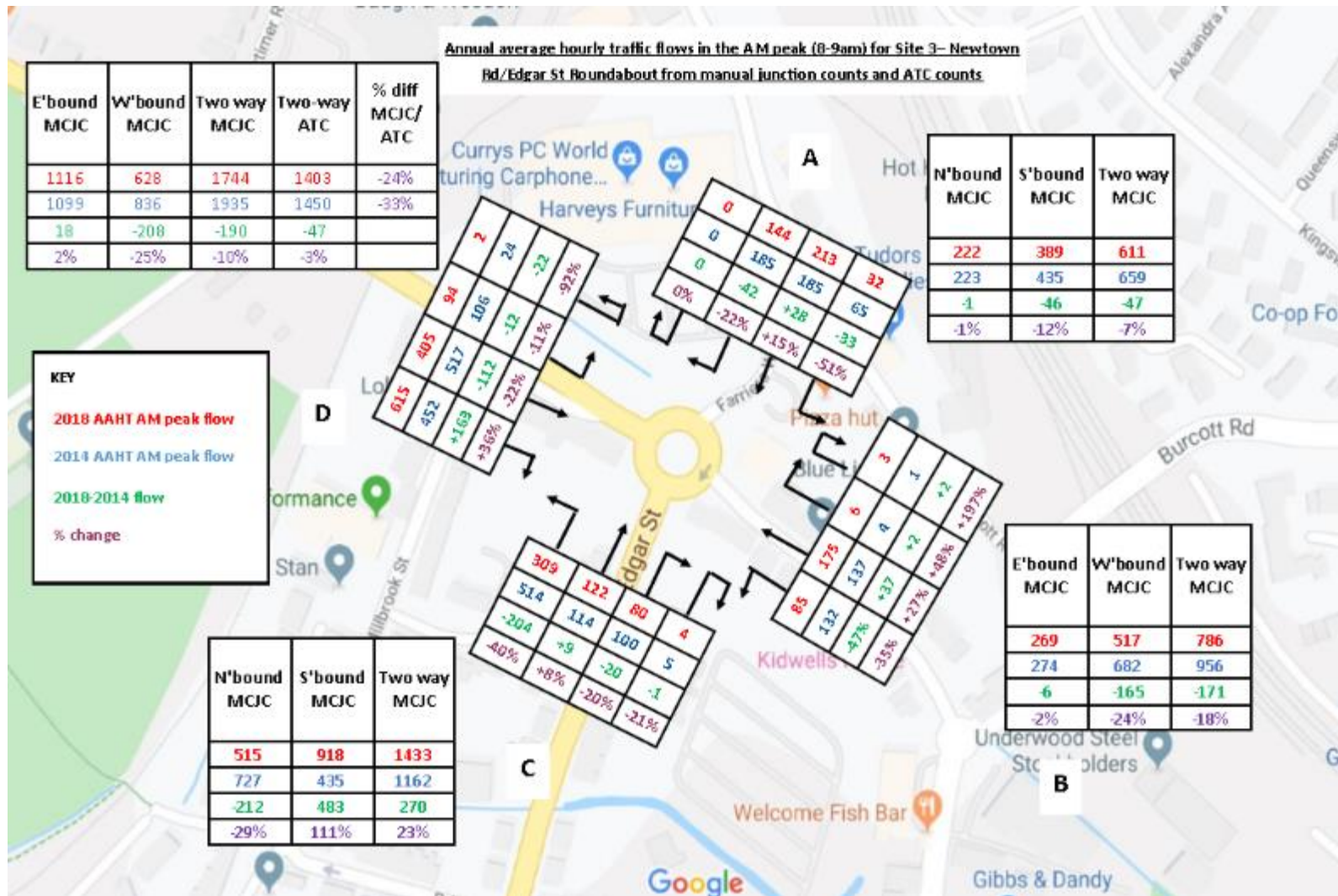




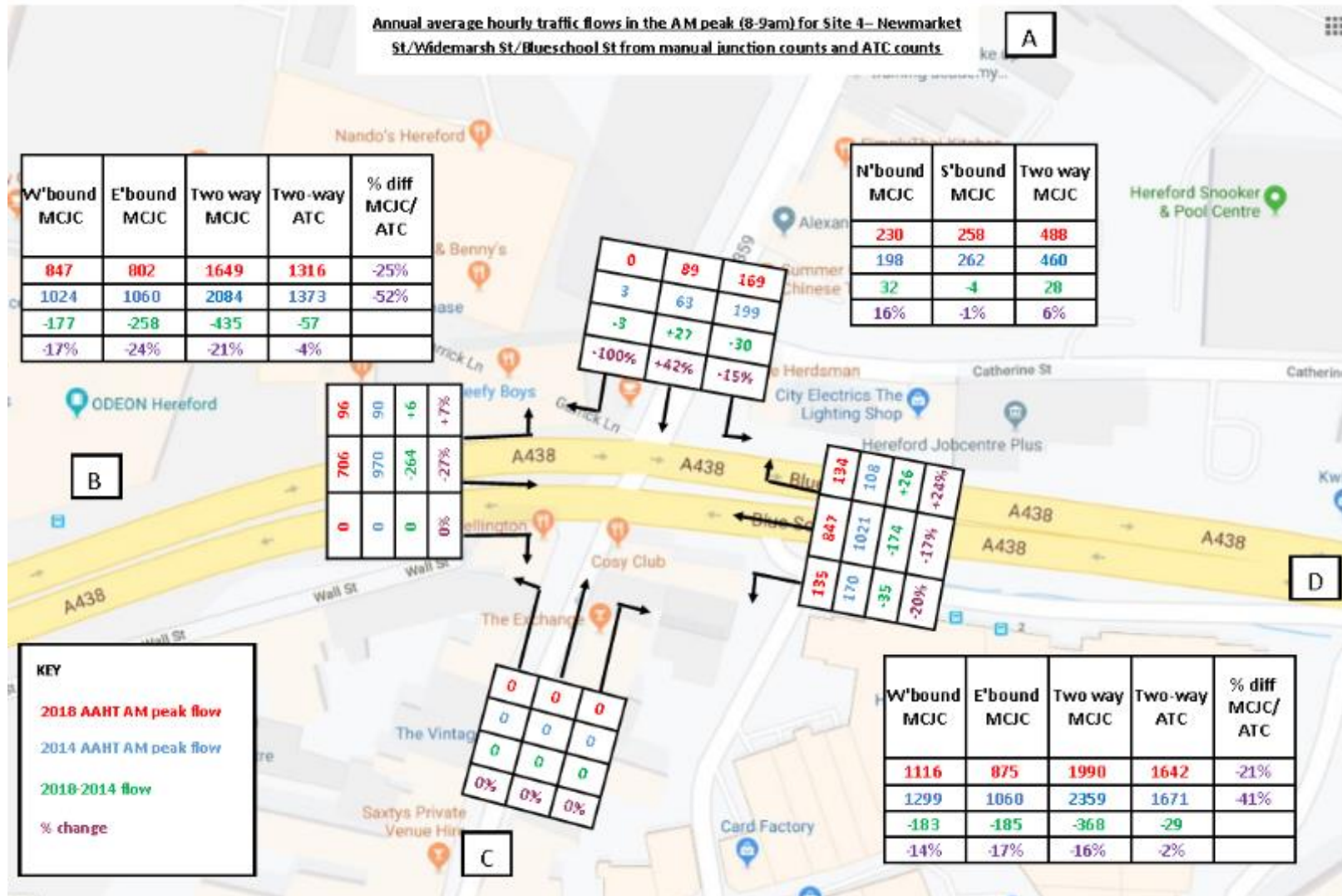
Site 2



Site 3

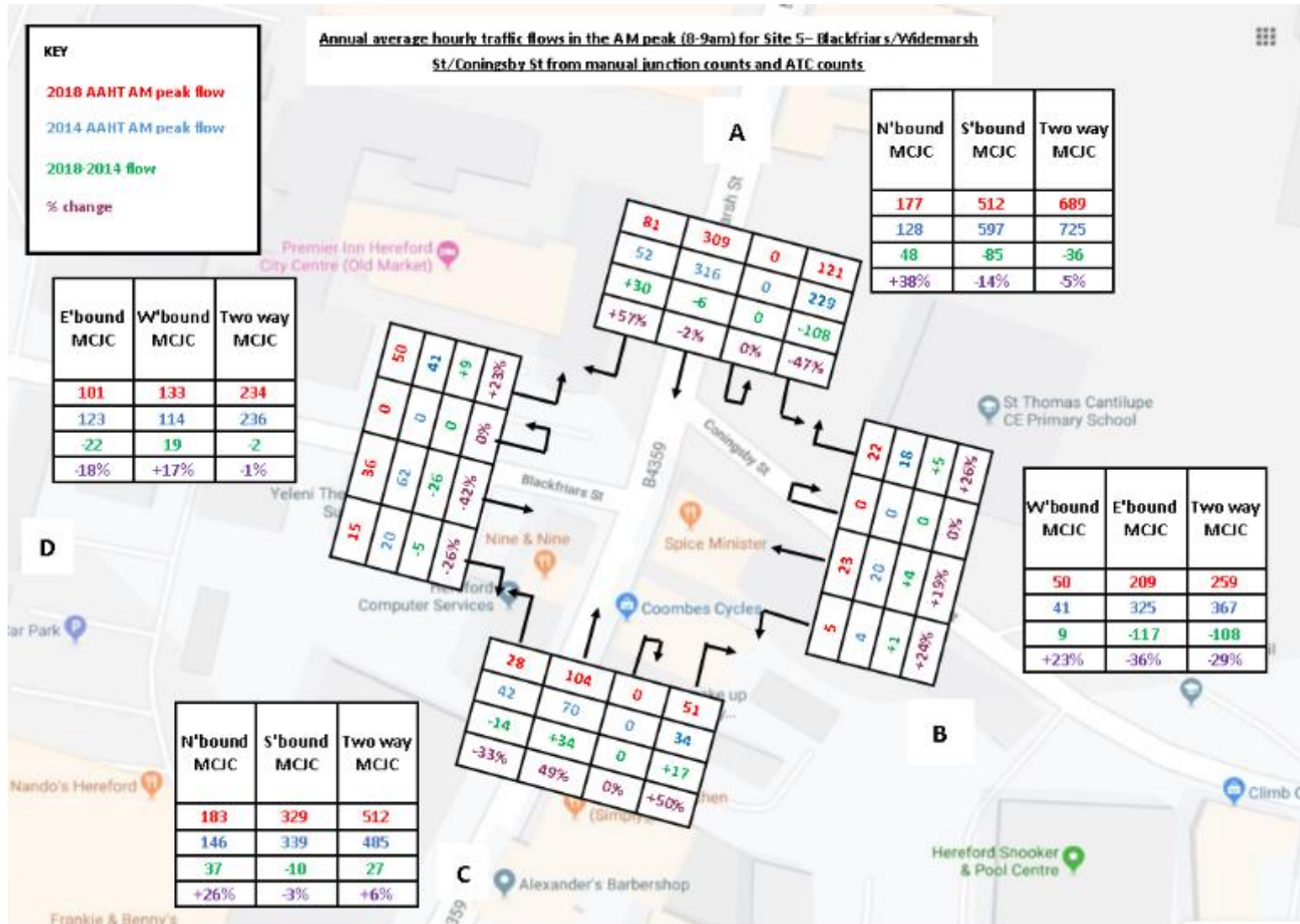


Site 4

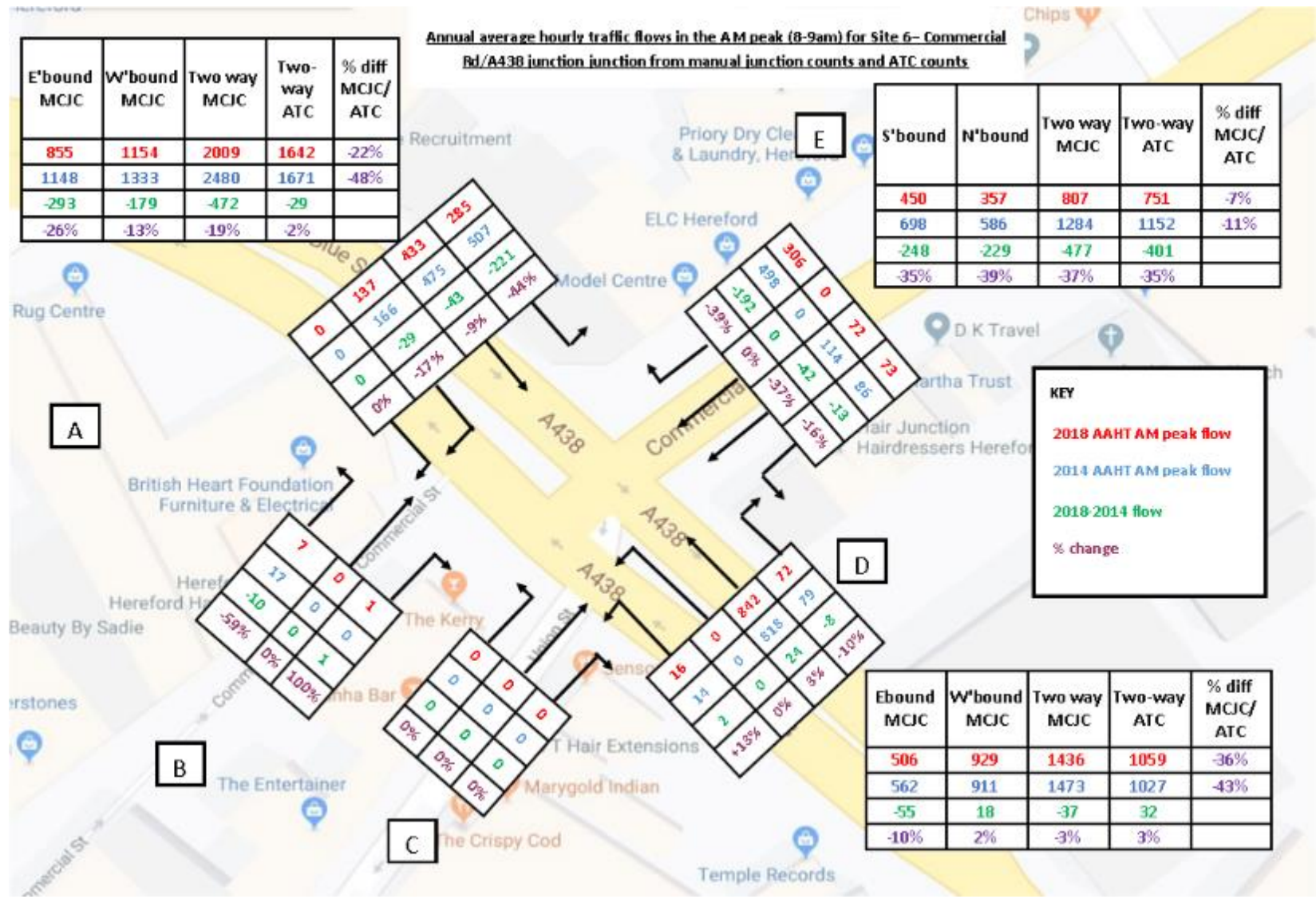


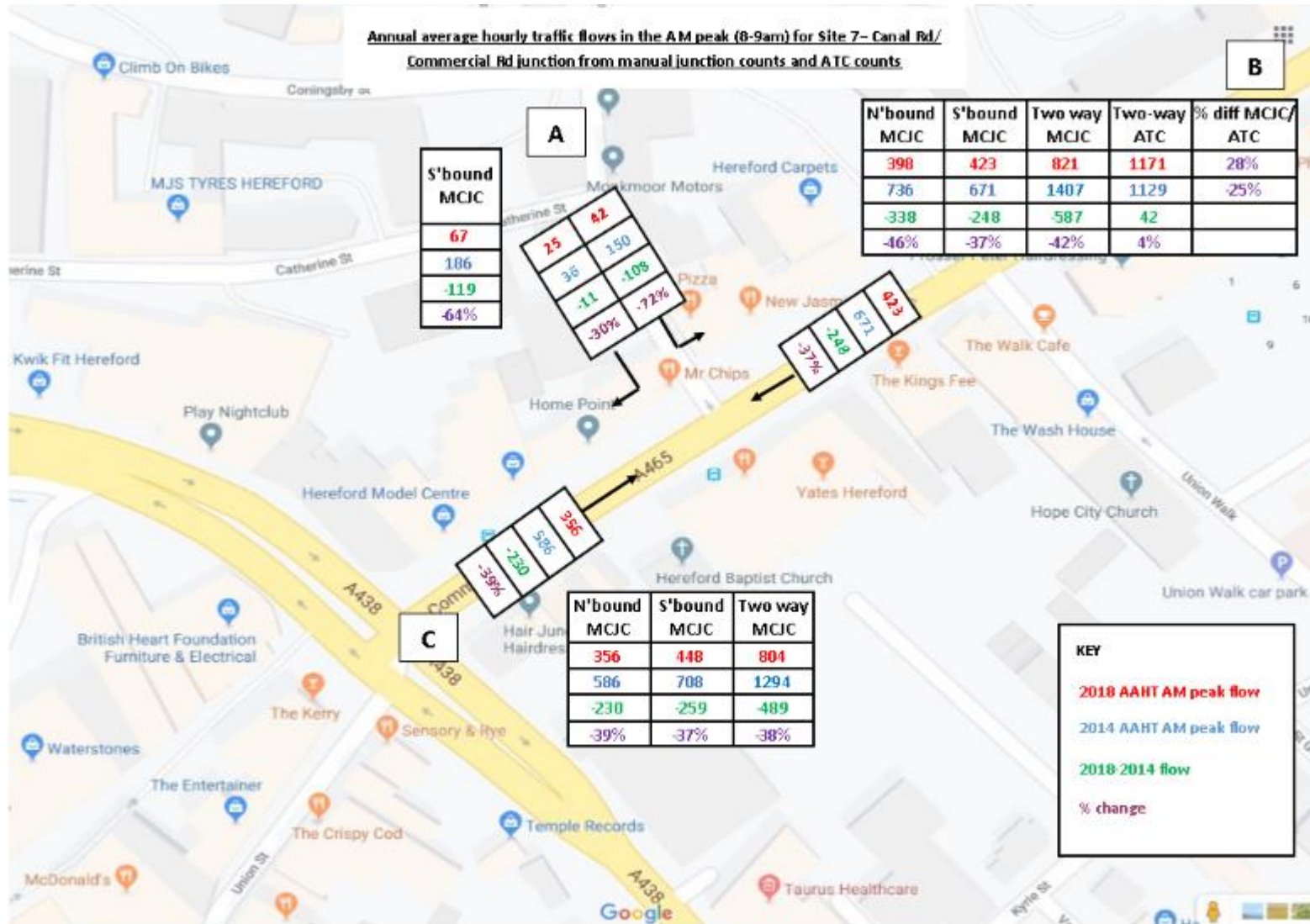


Site 5



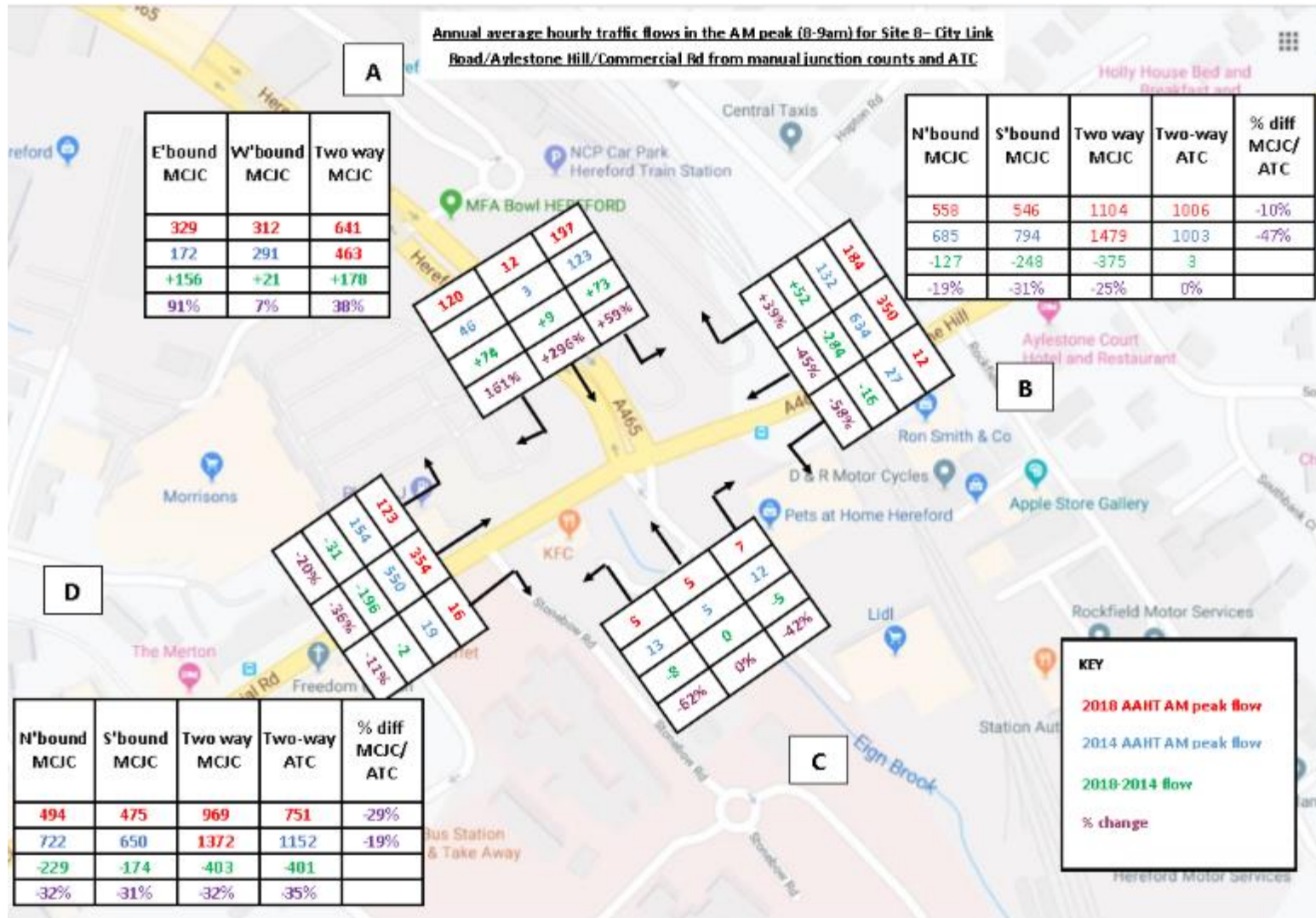
Site 6



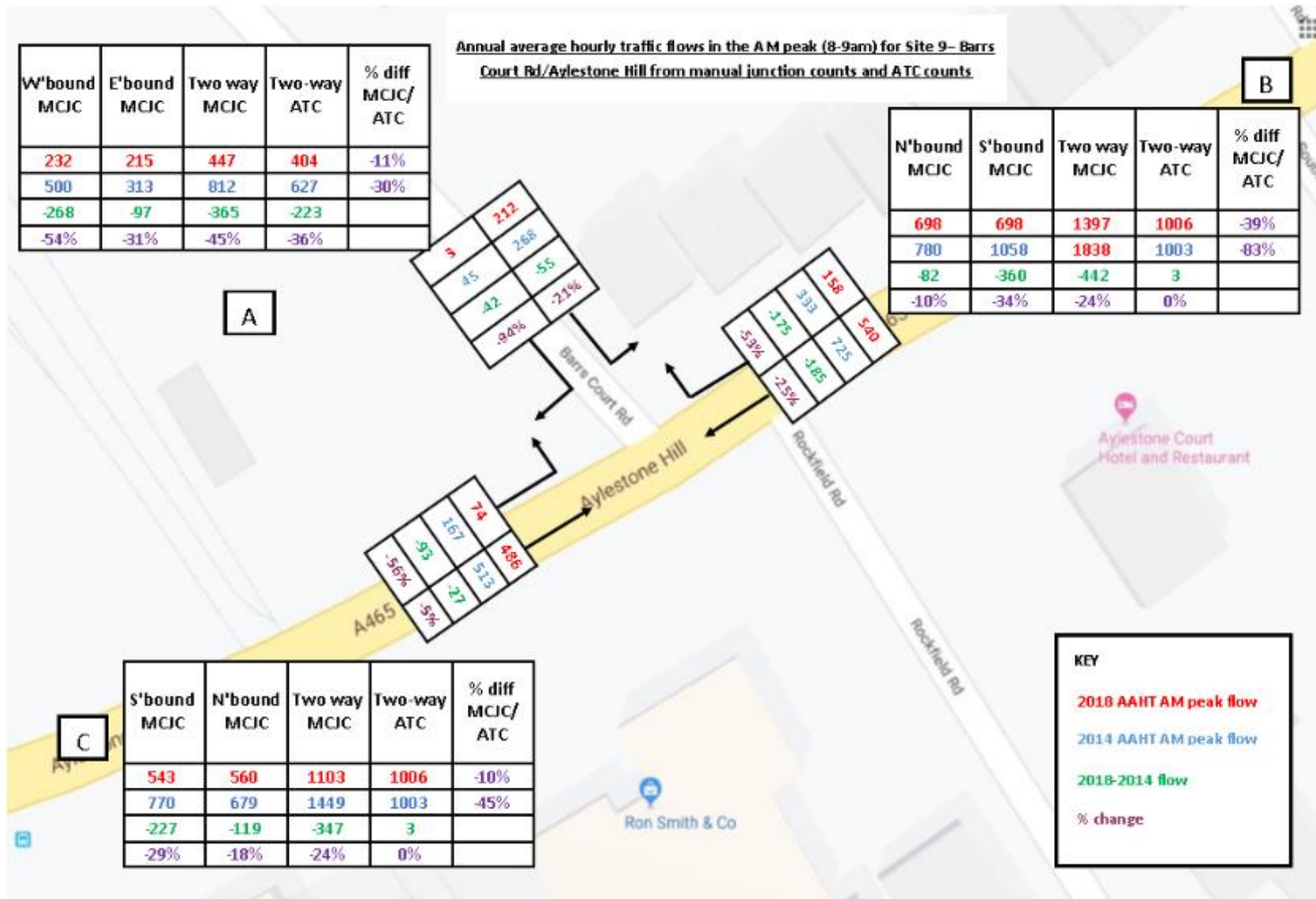


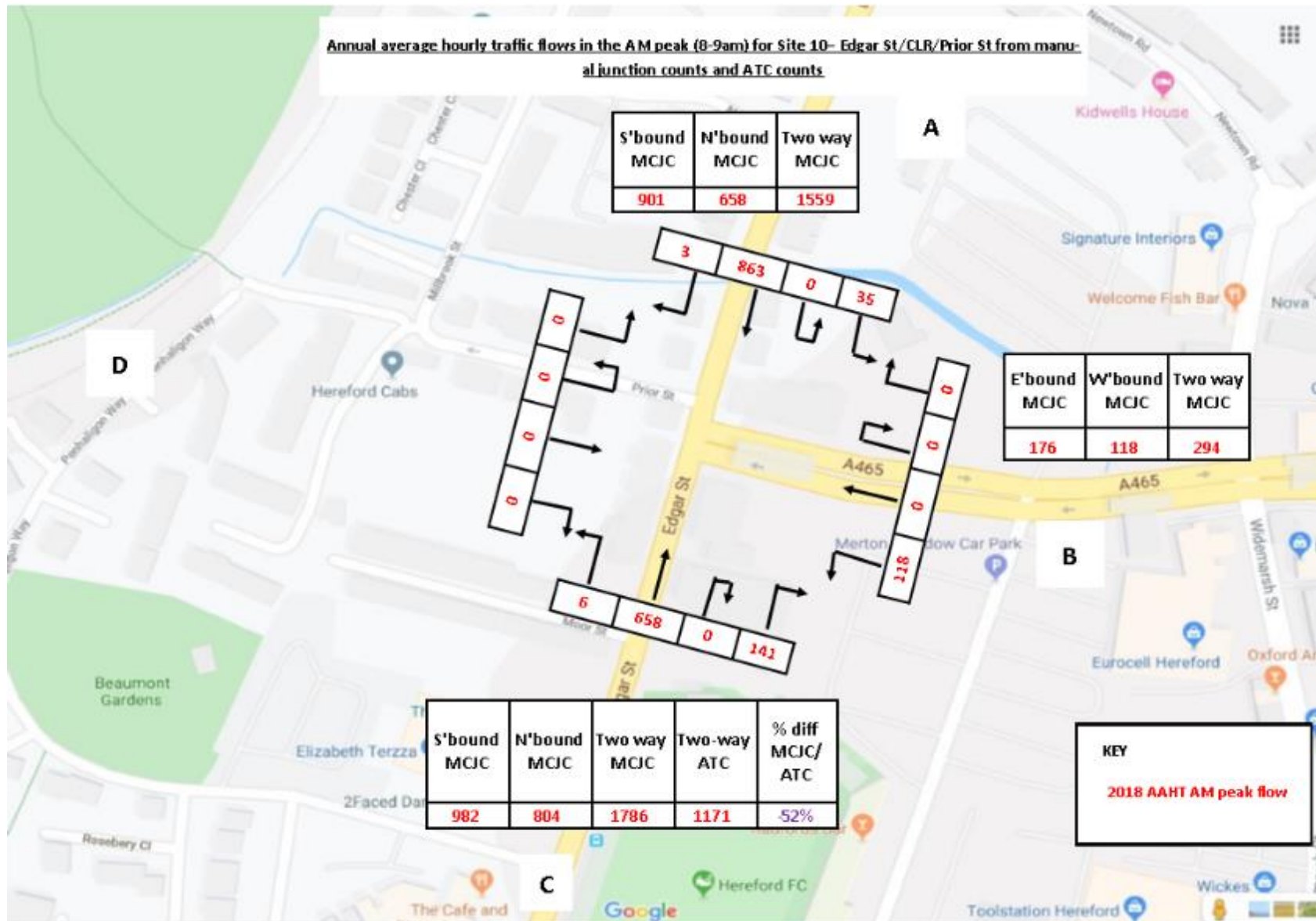


Site 8

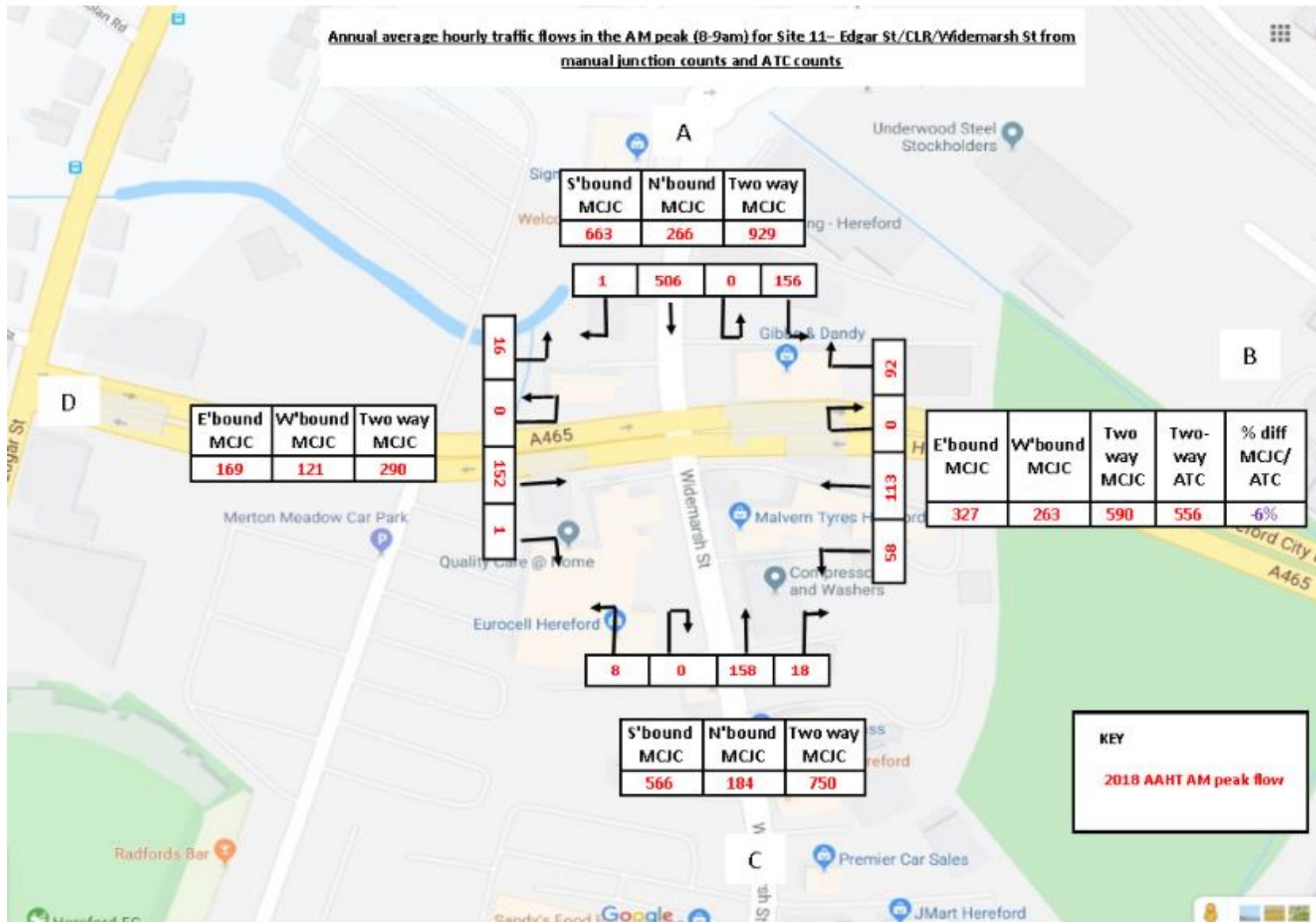






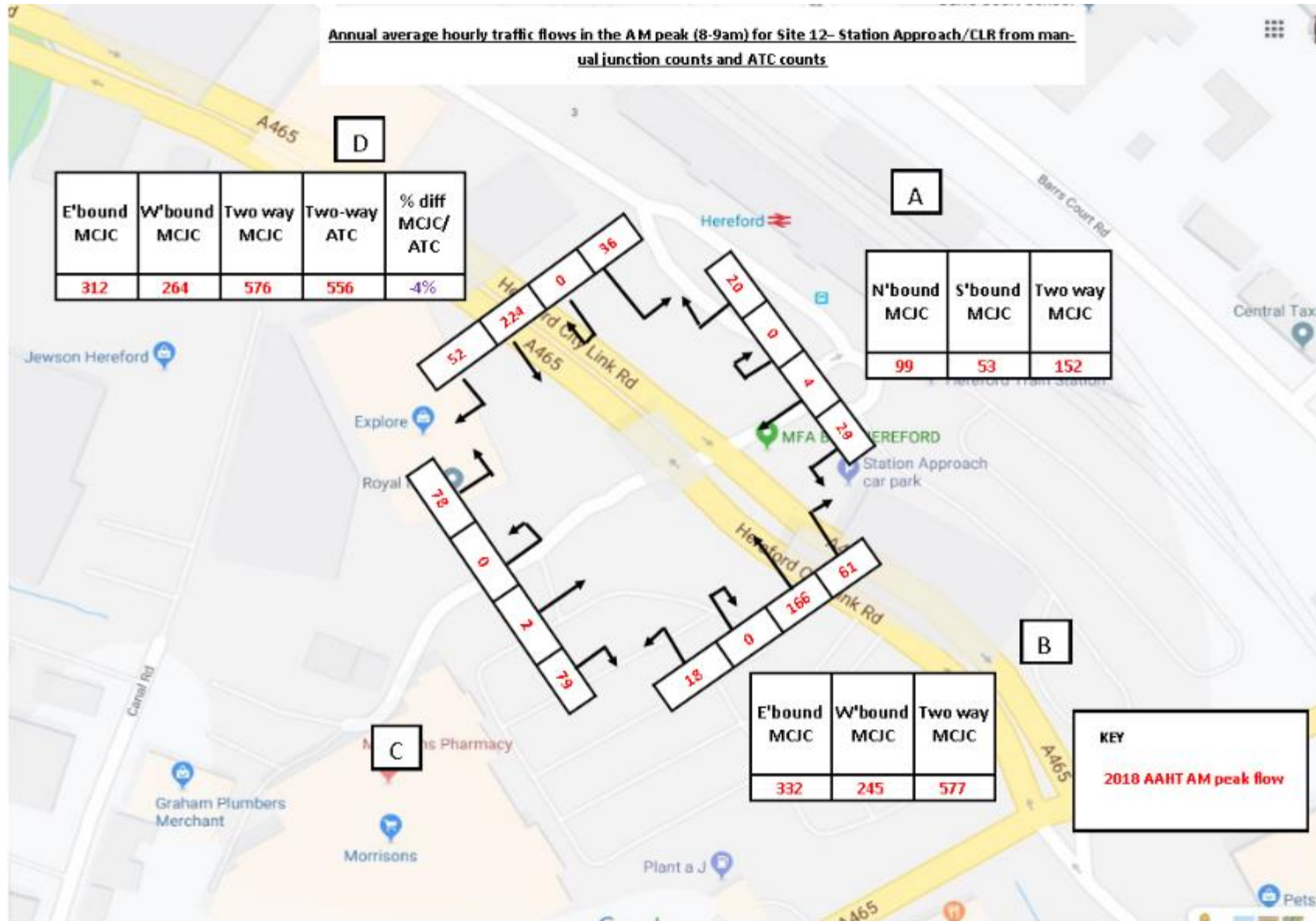


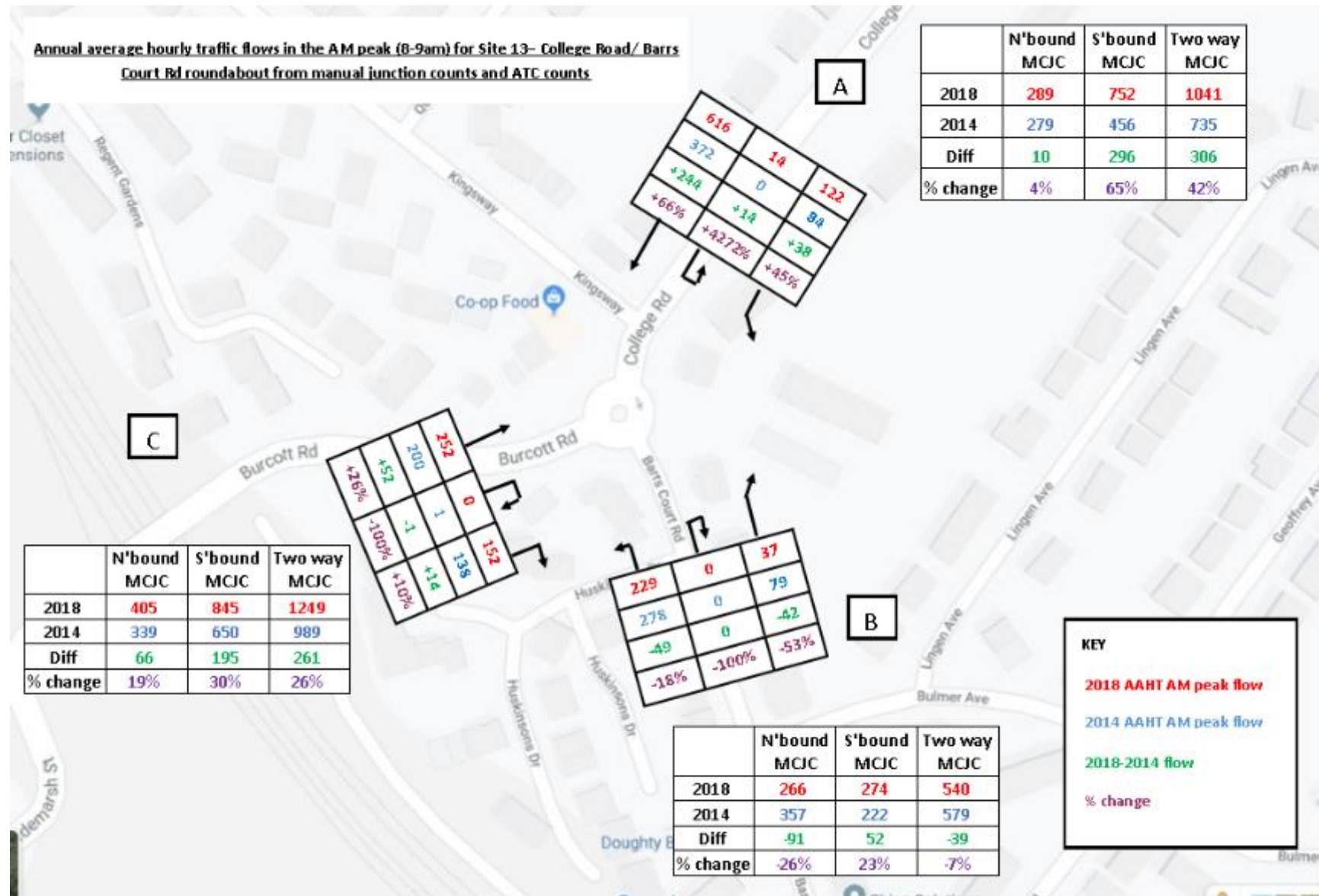
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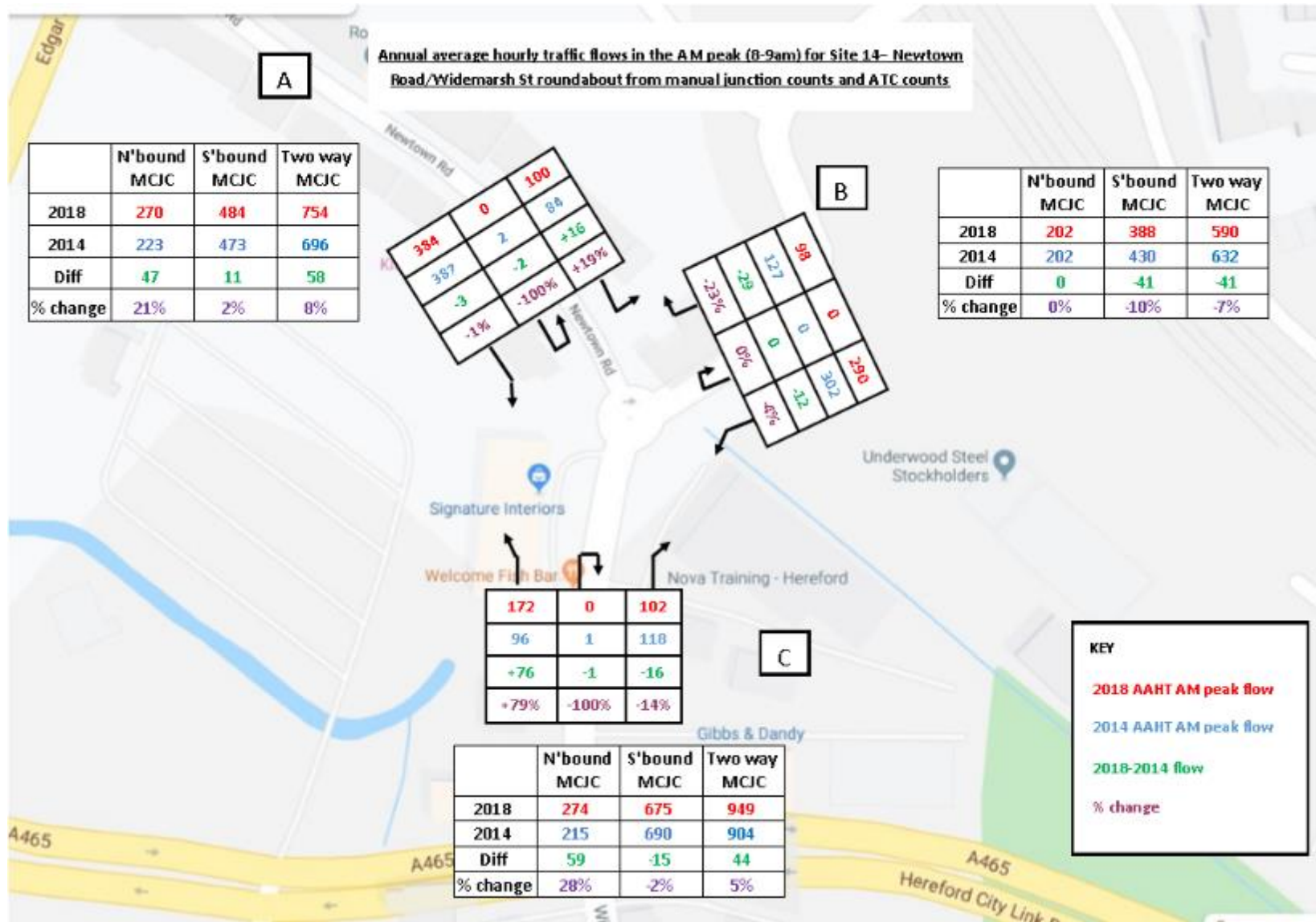




Site 12



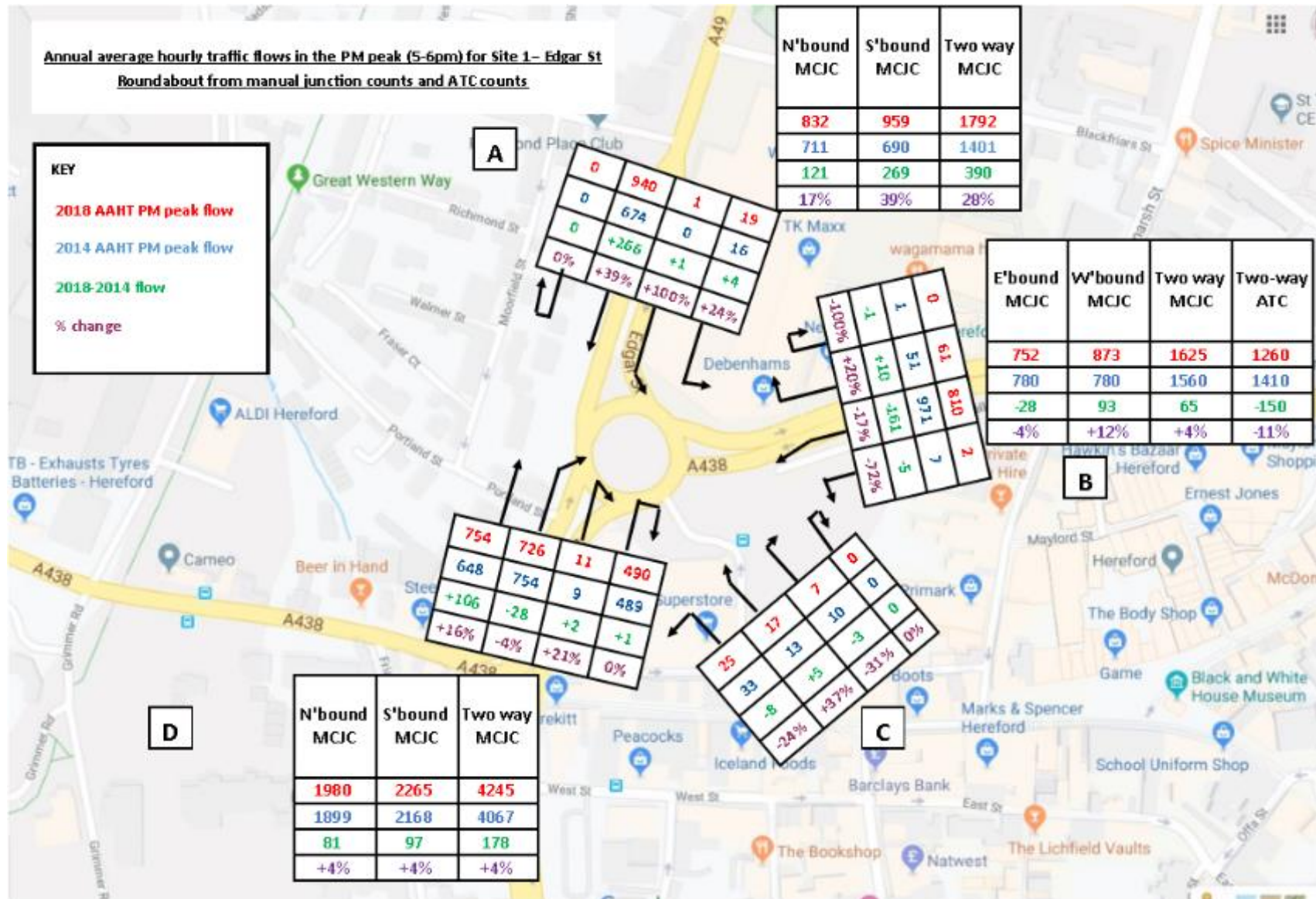






PM peak (5-6pm)

Site 1

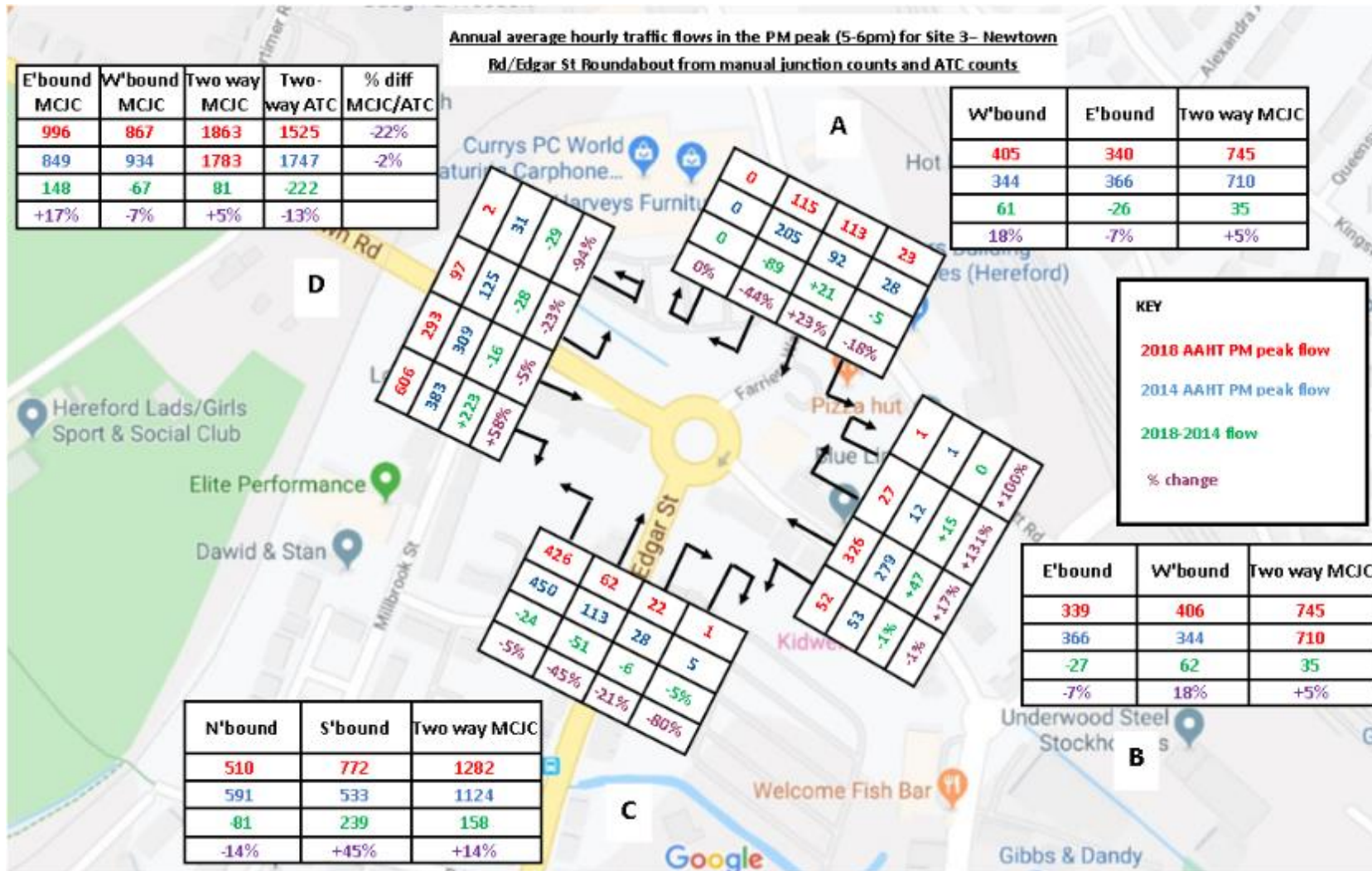




Site 2

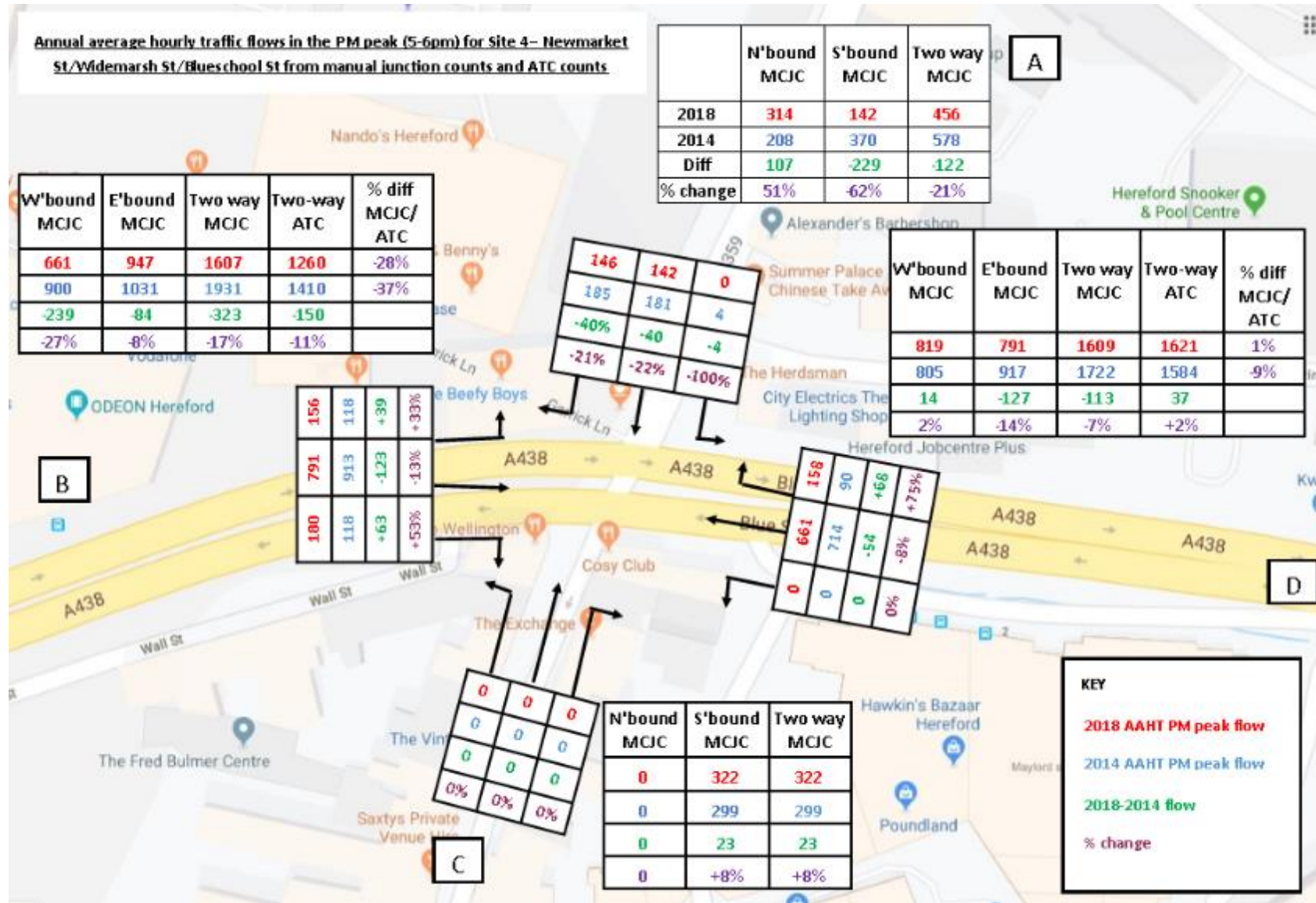


Site 3

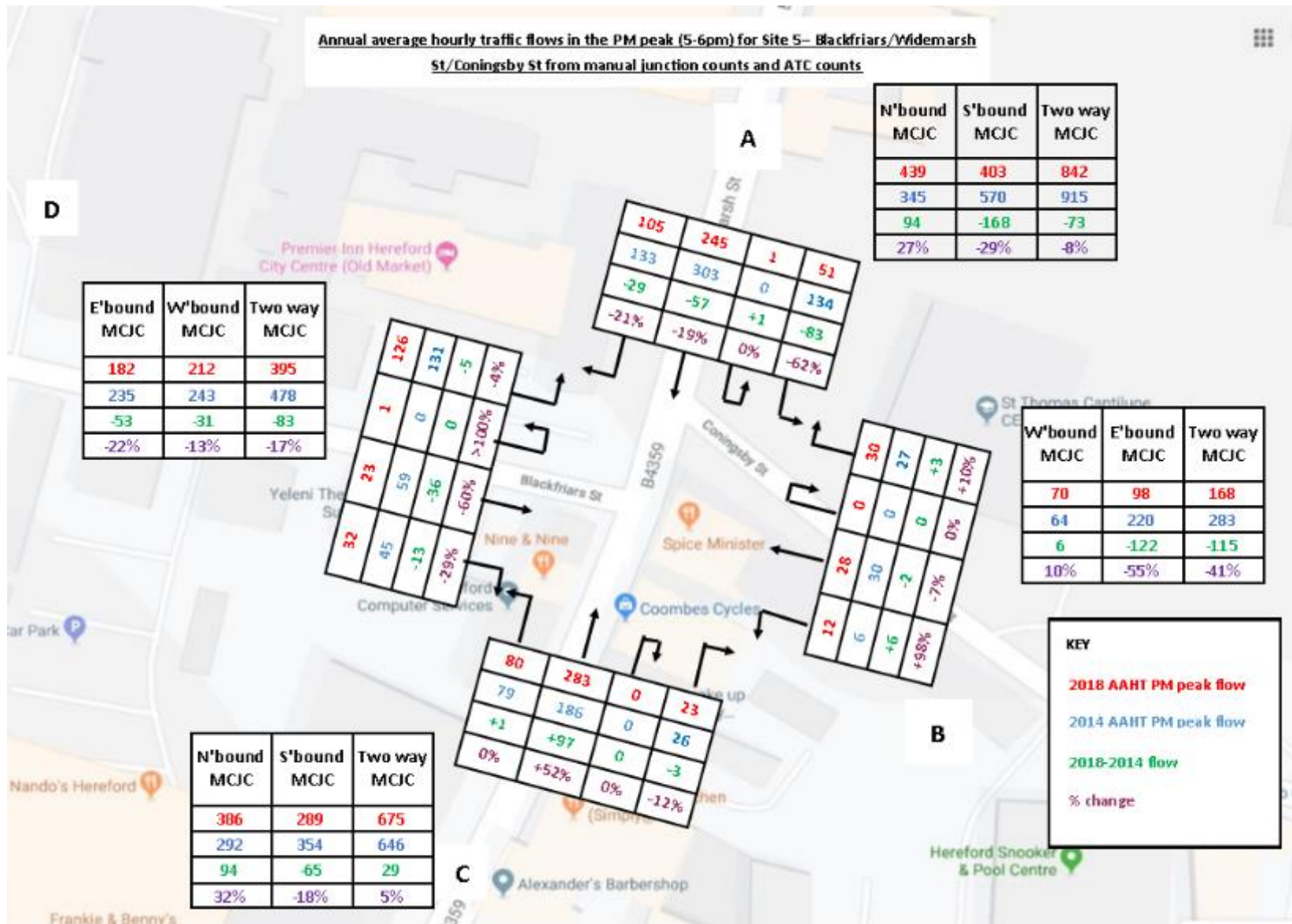




Site 4

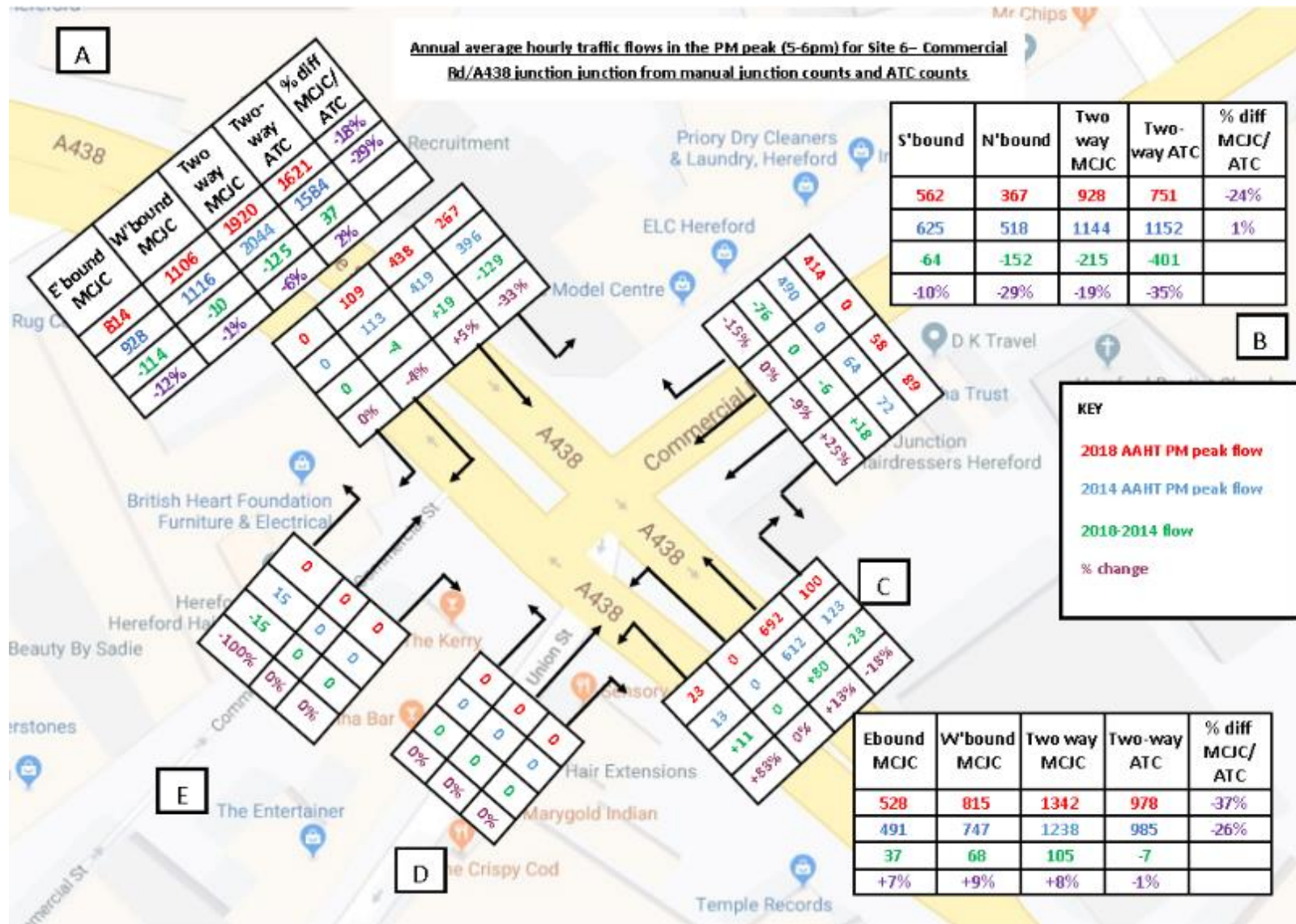


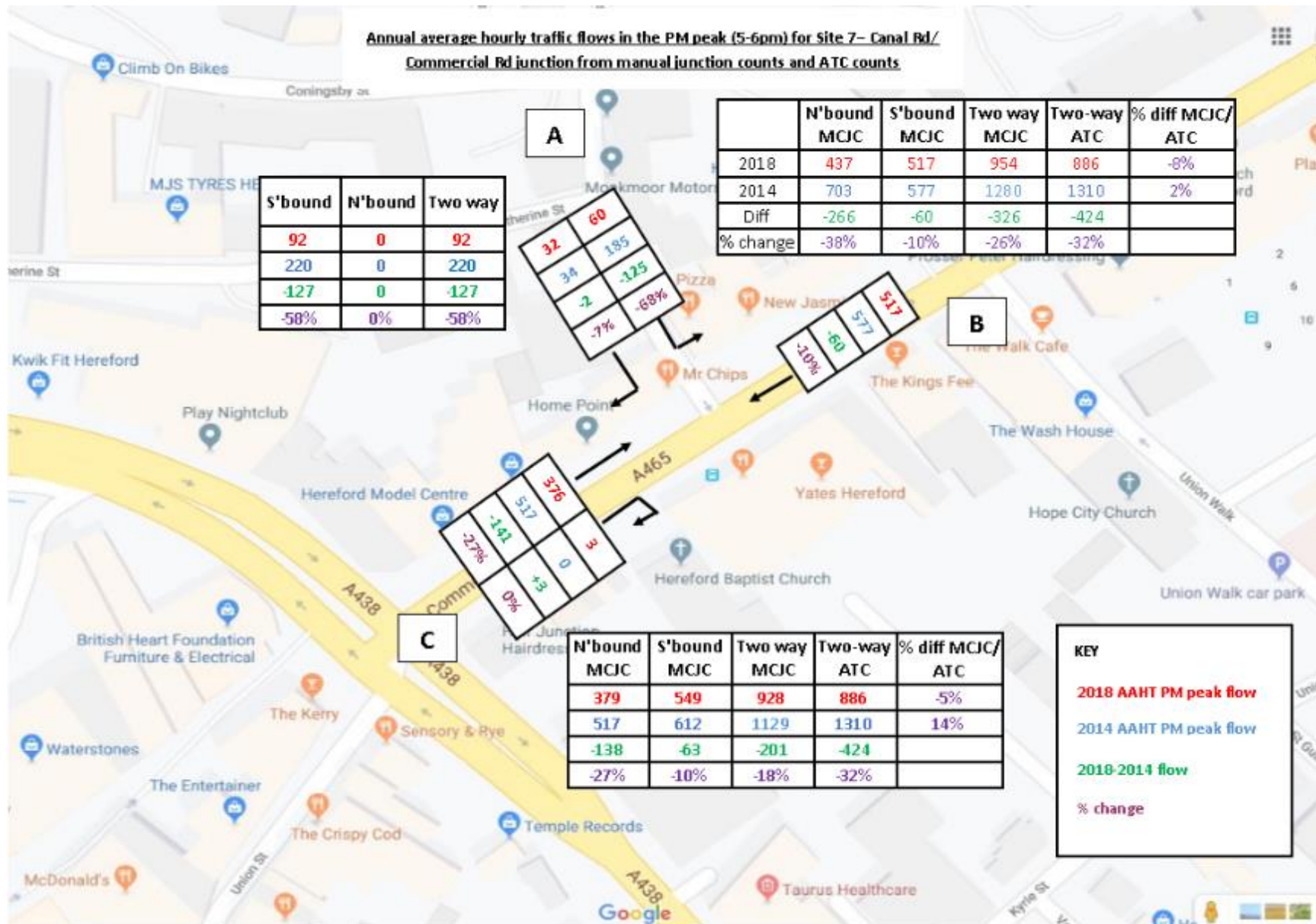
Site 5



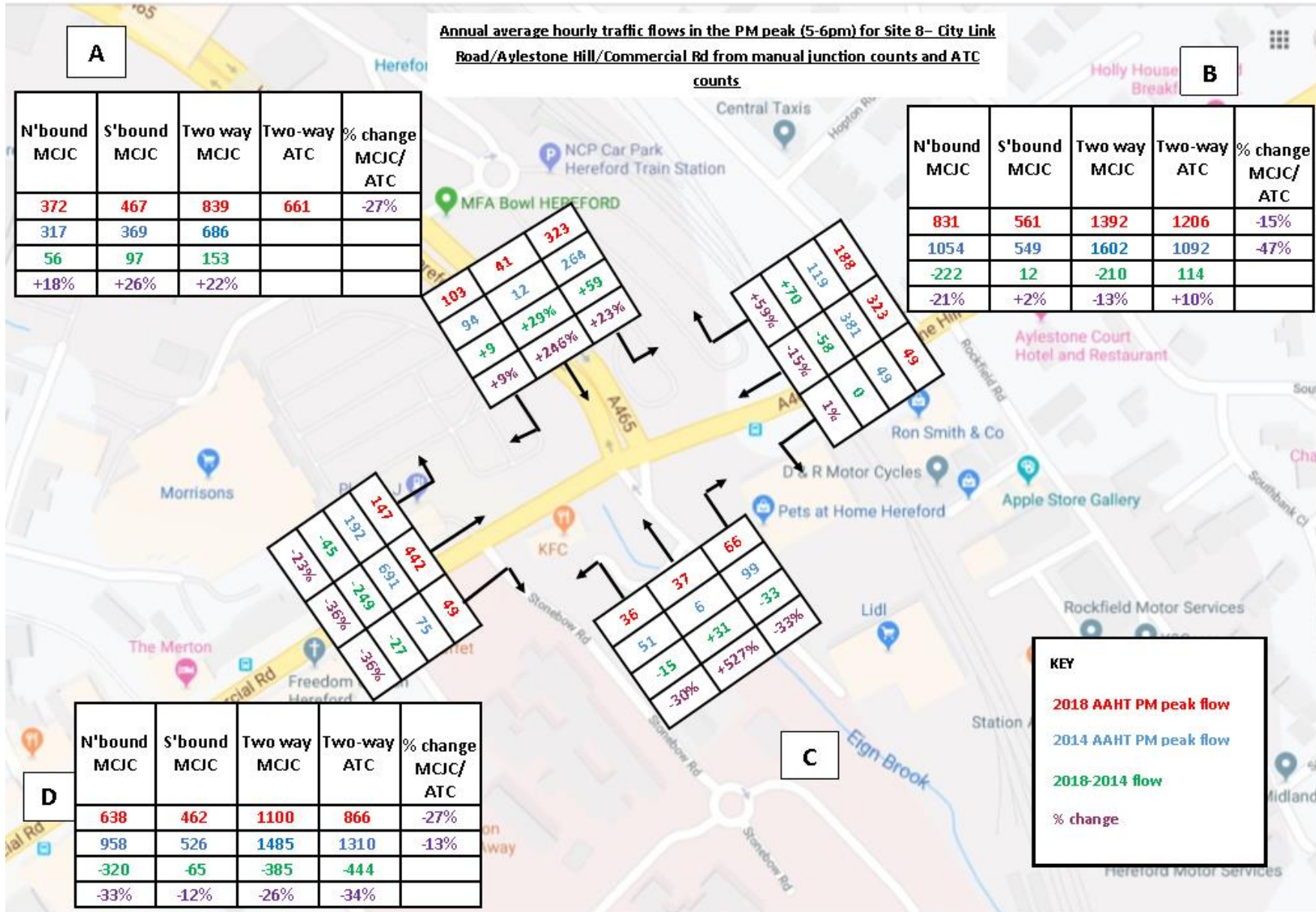


Site 6



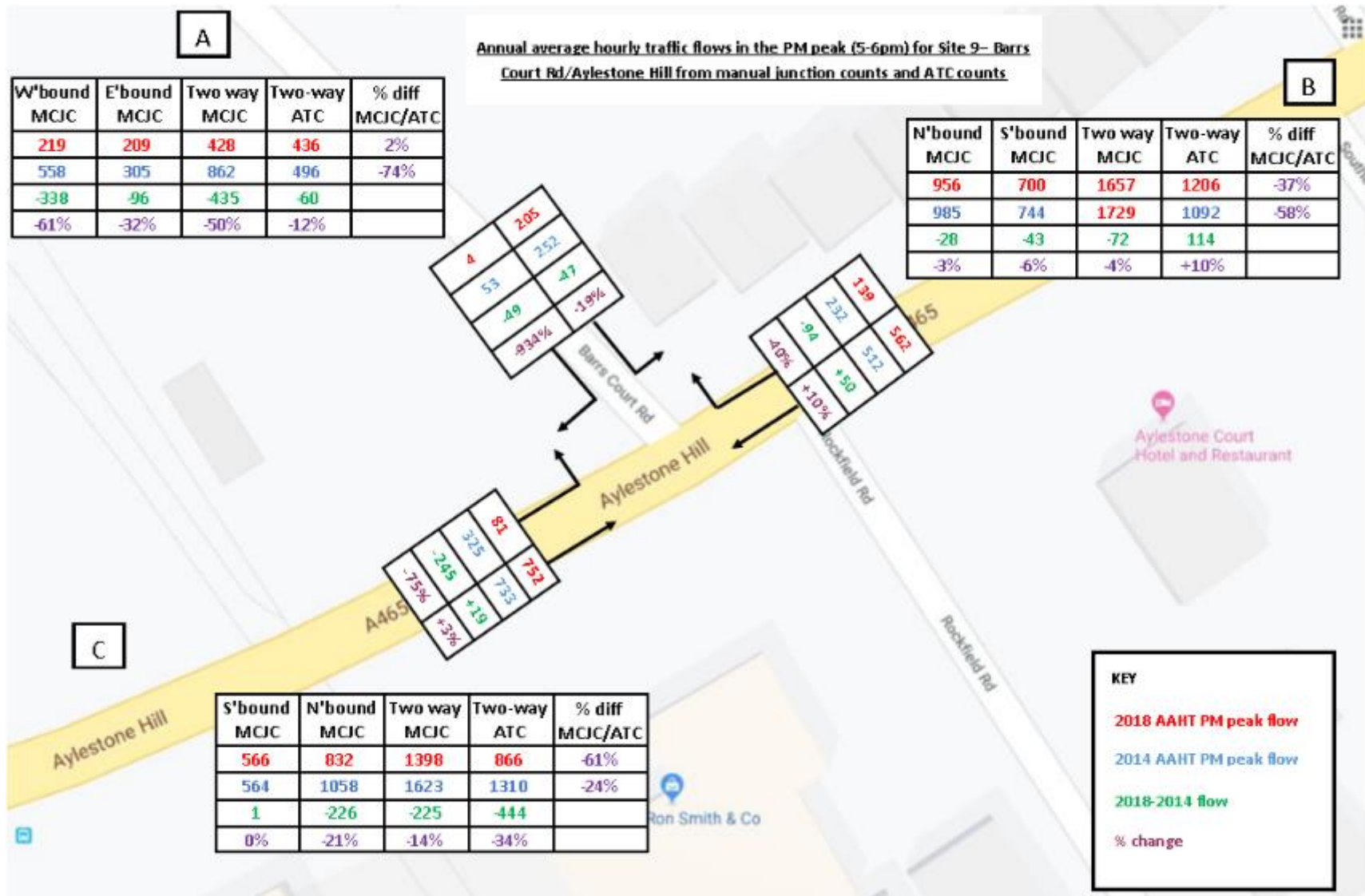






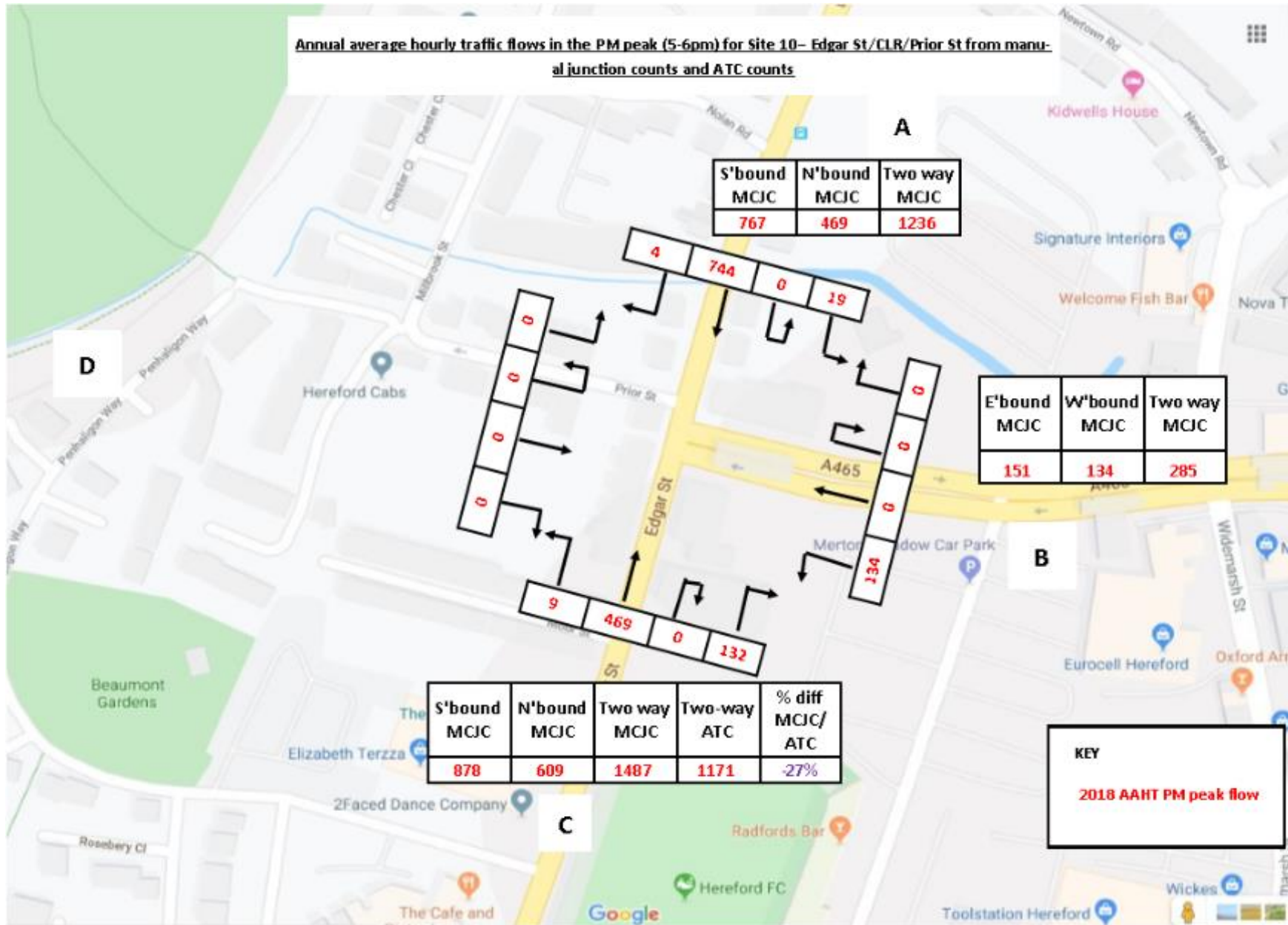


Site 9

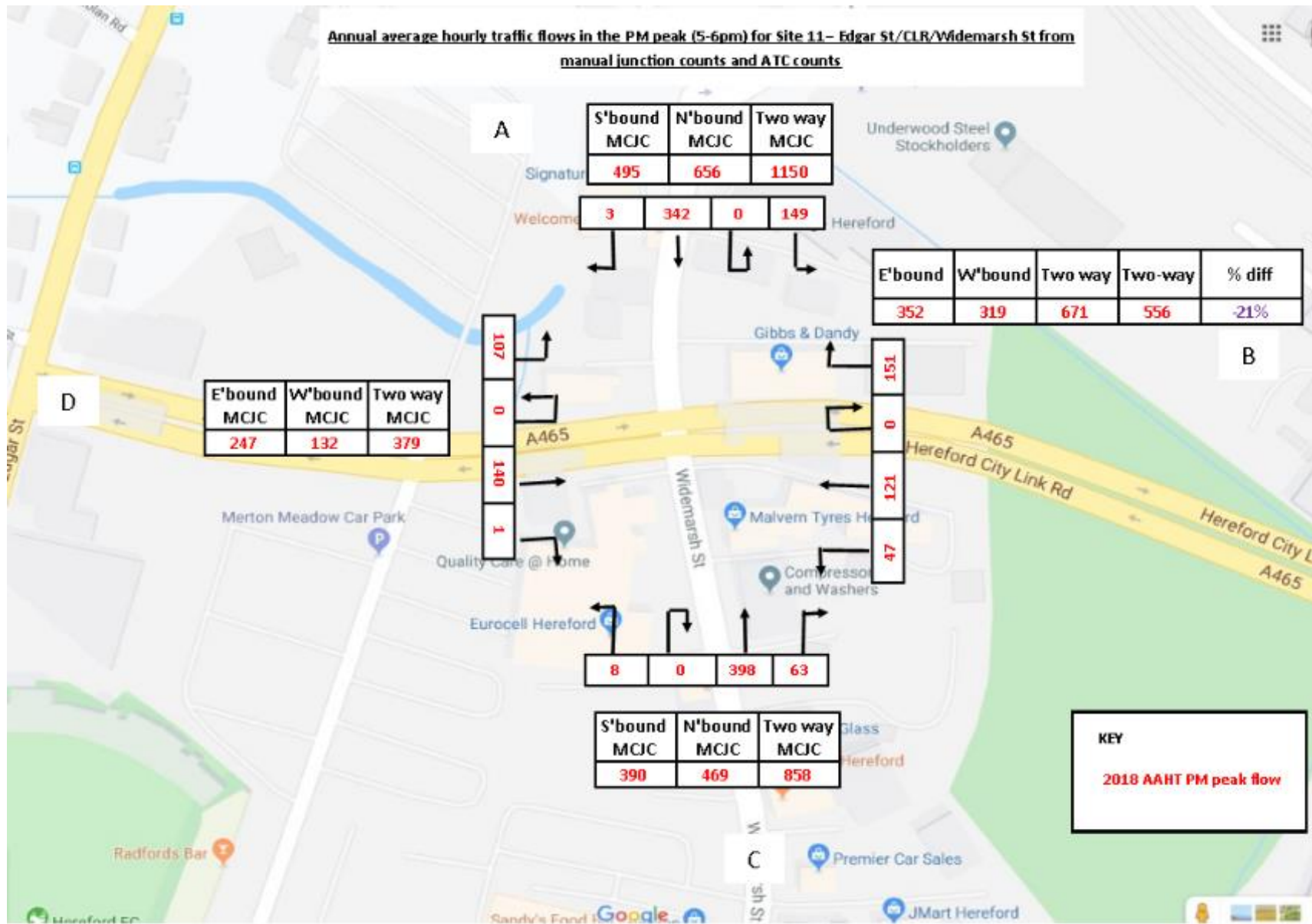


Site 10

**Annual average hourly traffic flows in the PM peak (5-6pm) for Site 10– Edgar St/CLR/Prior St from manual junction counts and ATC counts**

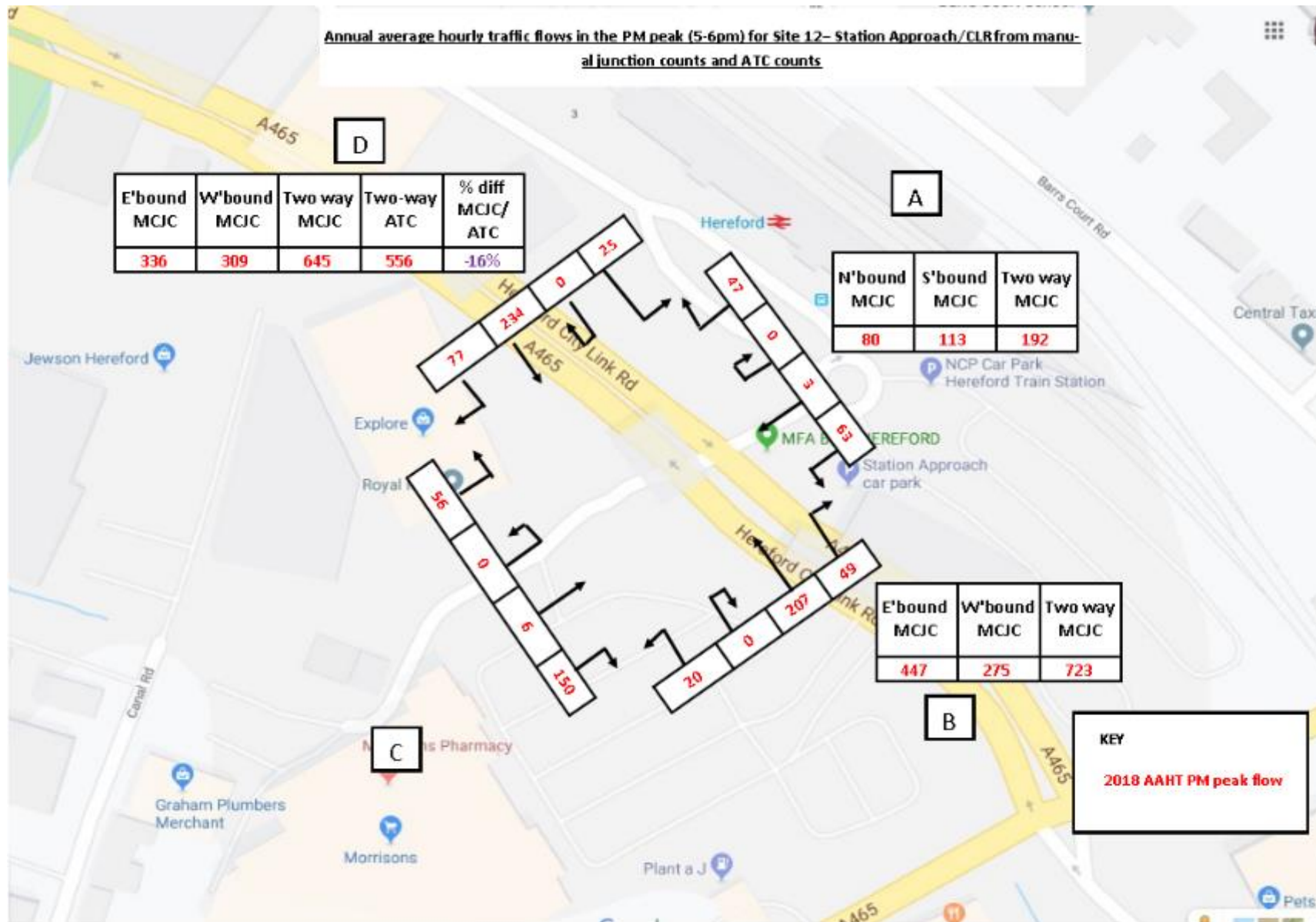


Site 11

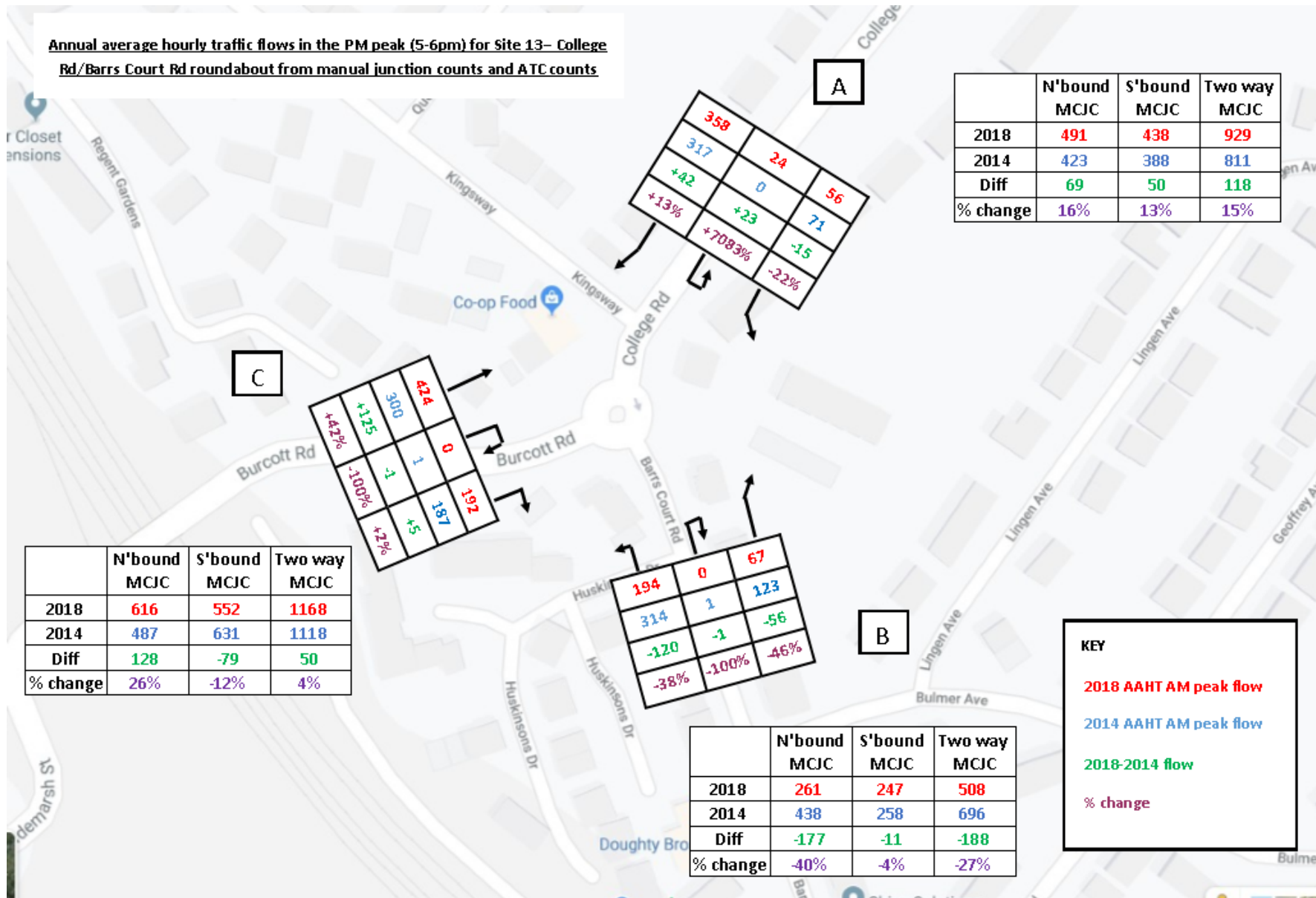




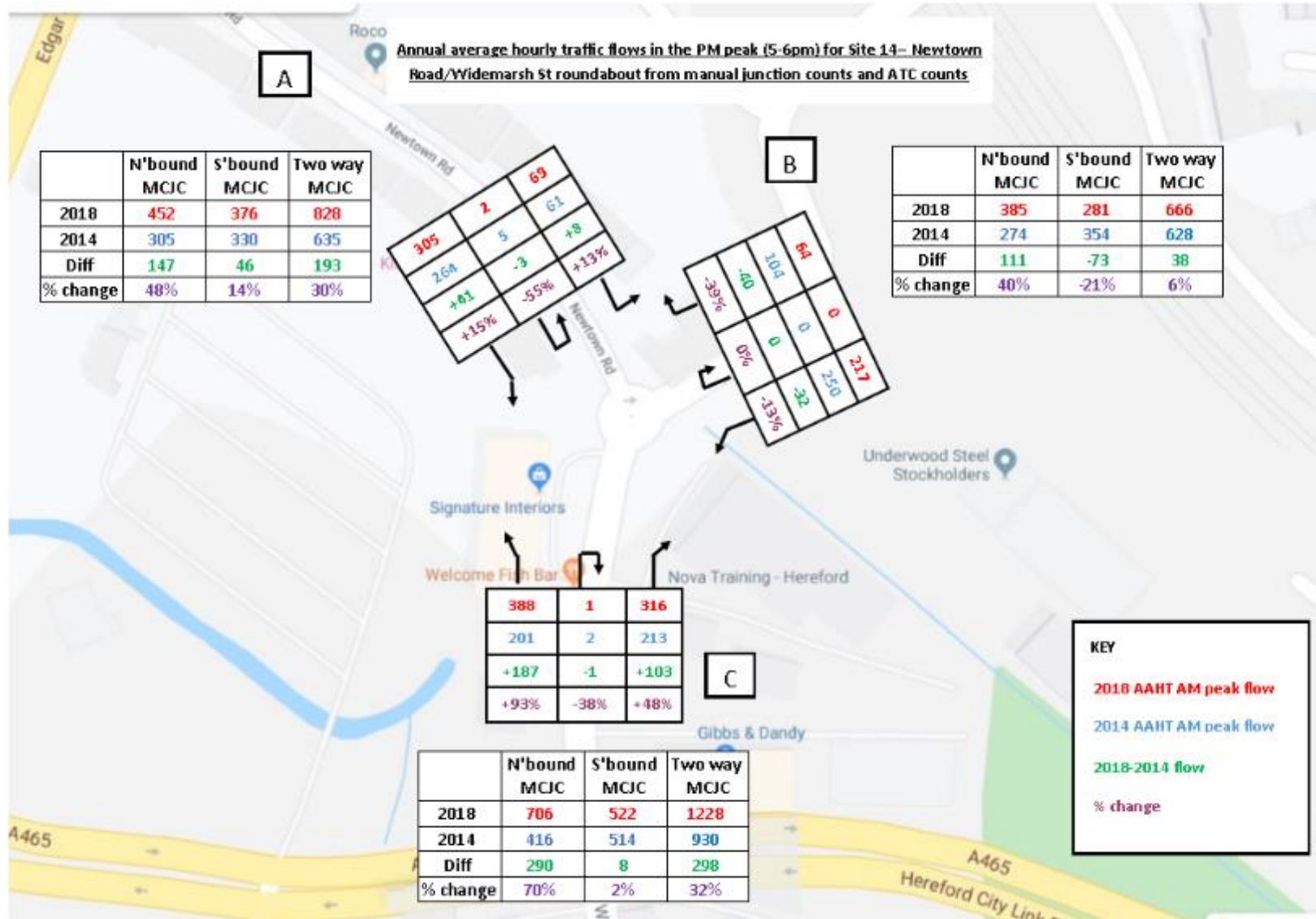
Site 12



Annual average hourly traffic flows in the PM peak (5-6pm) for Site 13- College Rd/Barrs Court Rd roundabout from manual junction counts and ATC counts



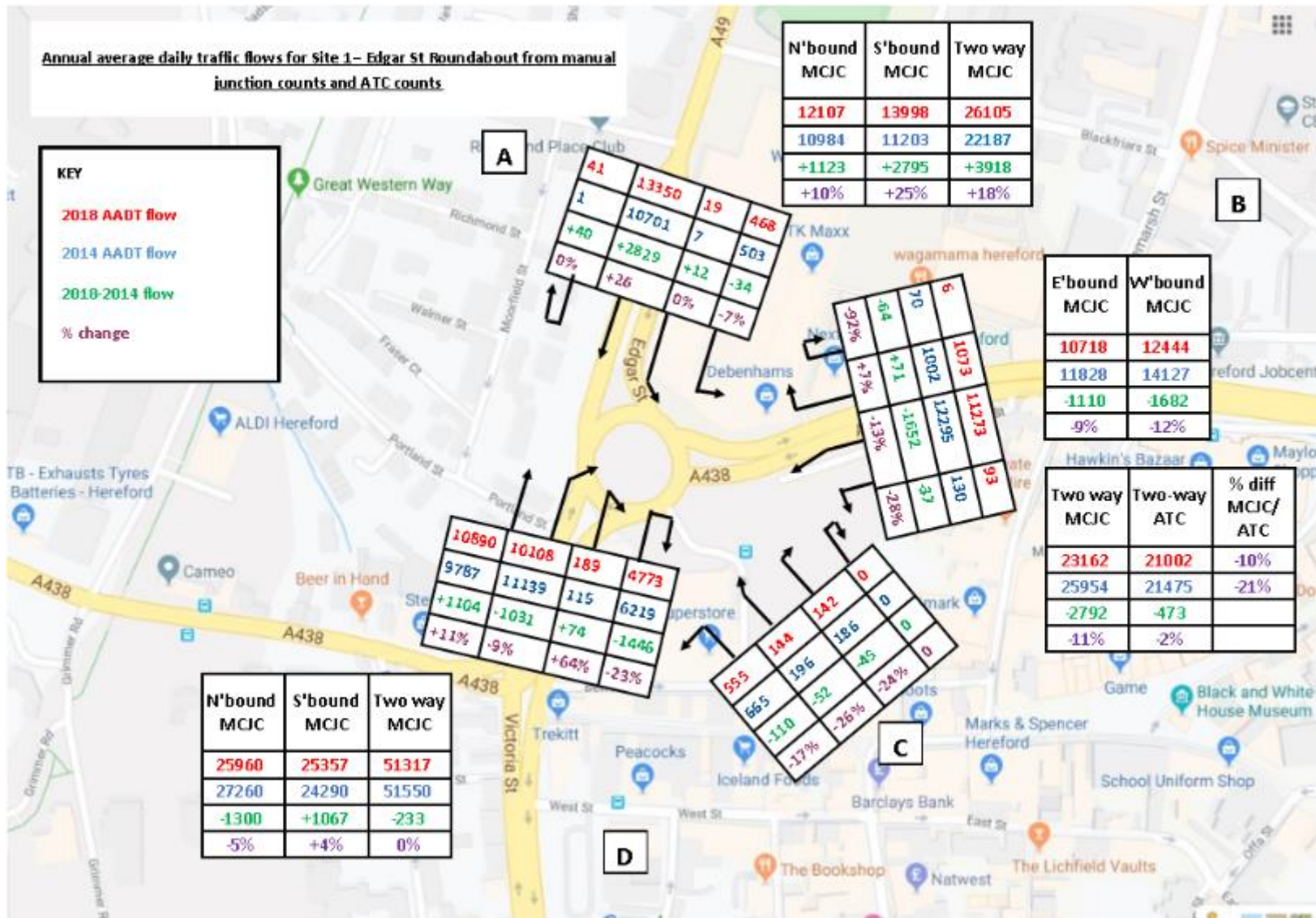
Site 14





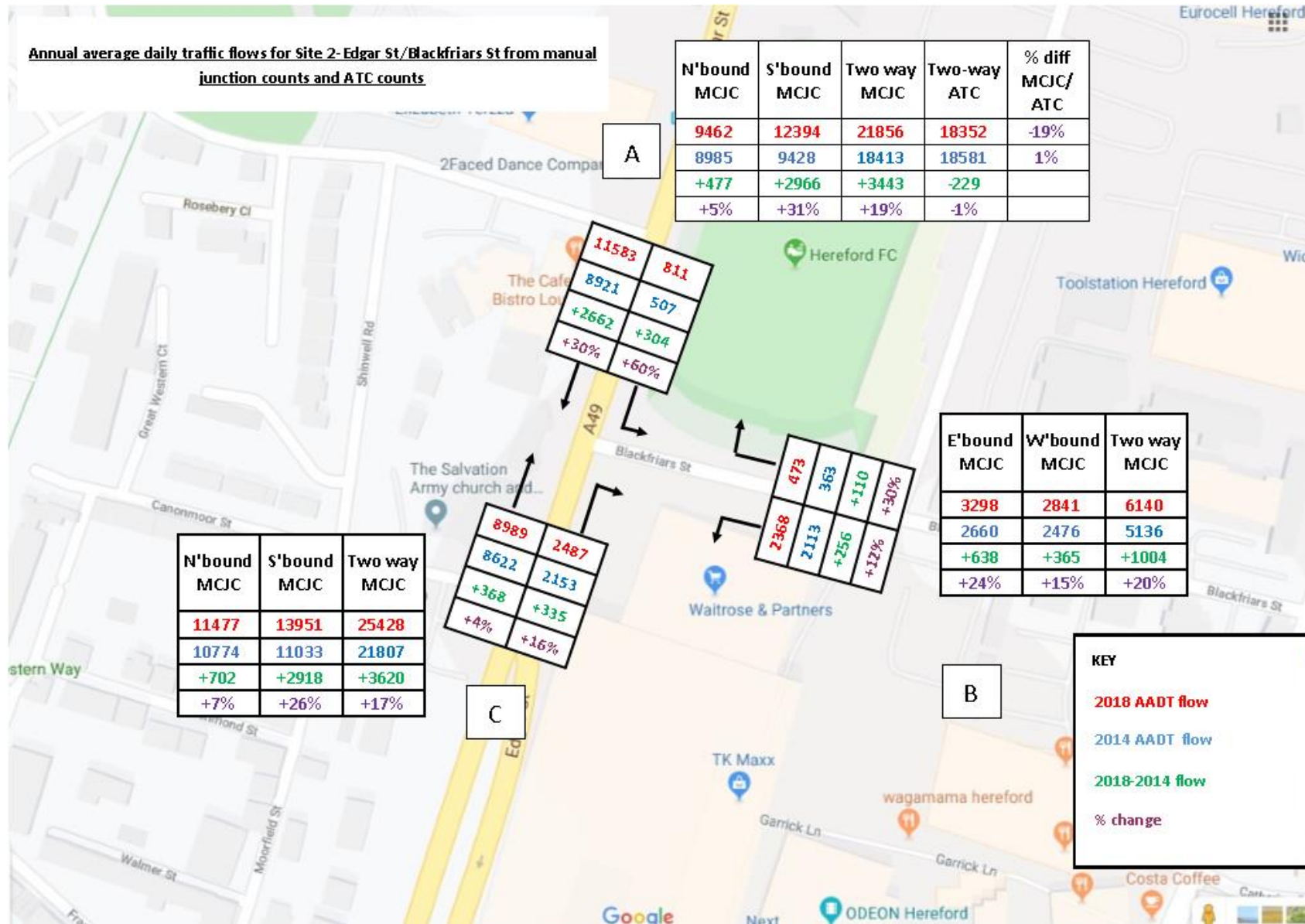
Daily (7am-7pm)

Site 1

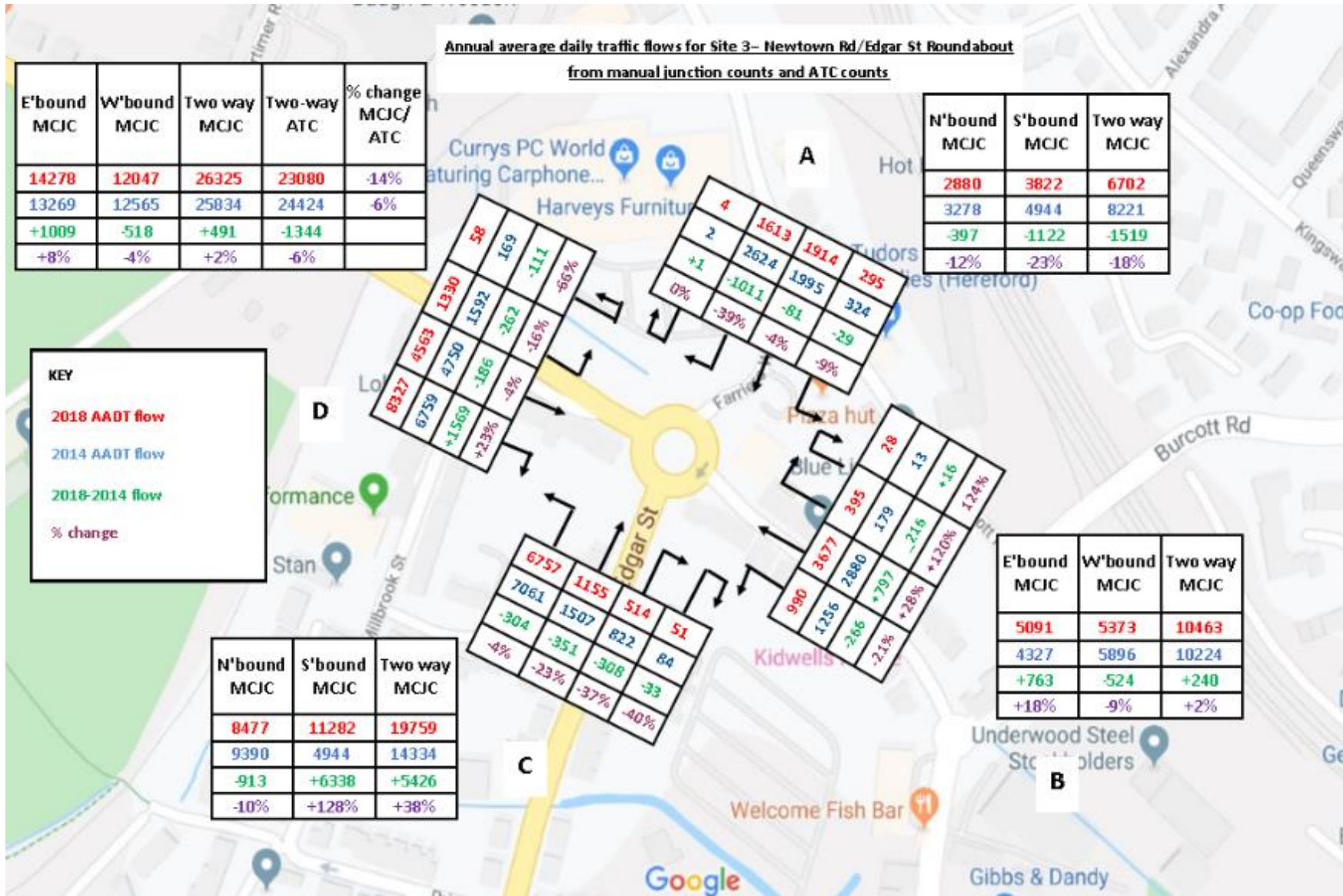




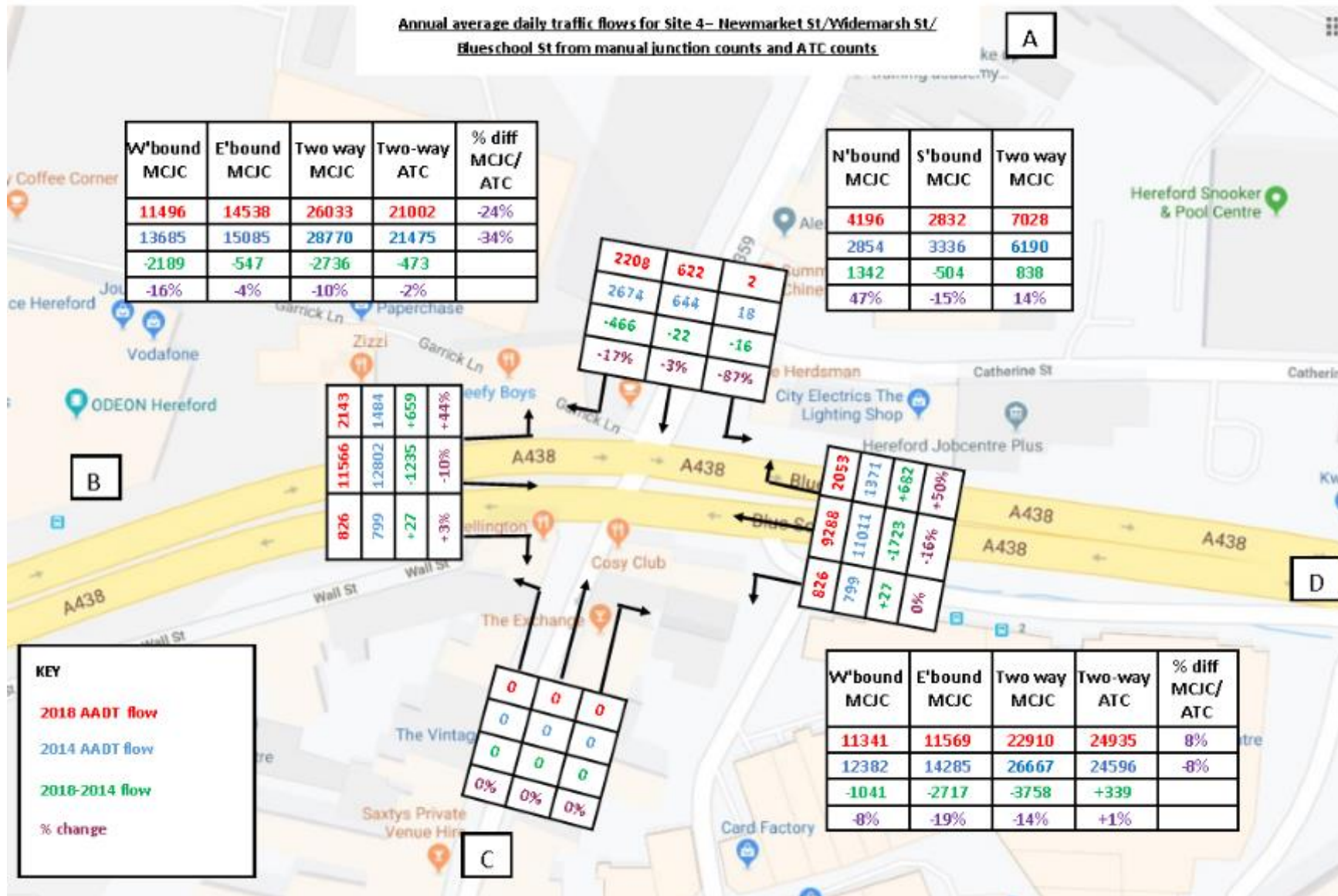
Site 2



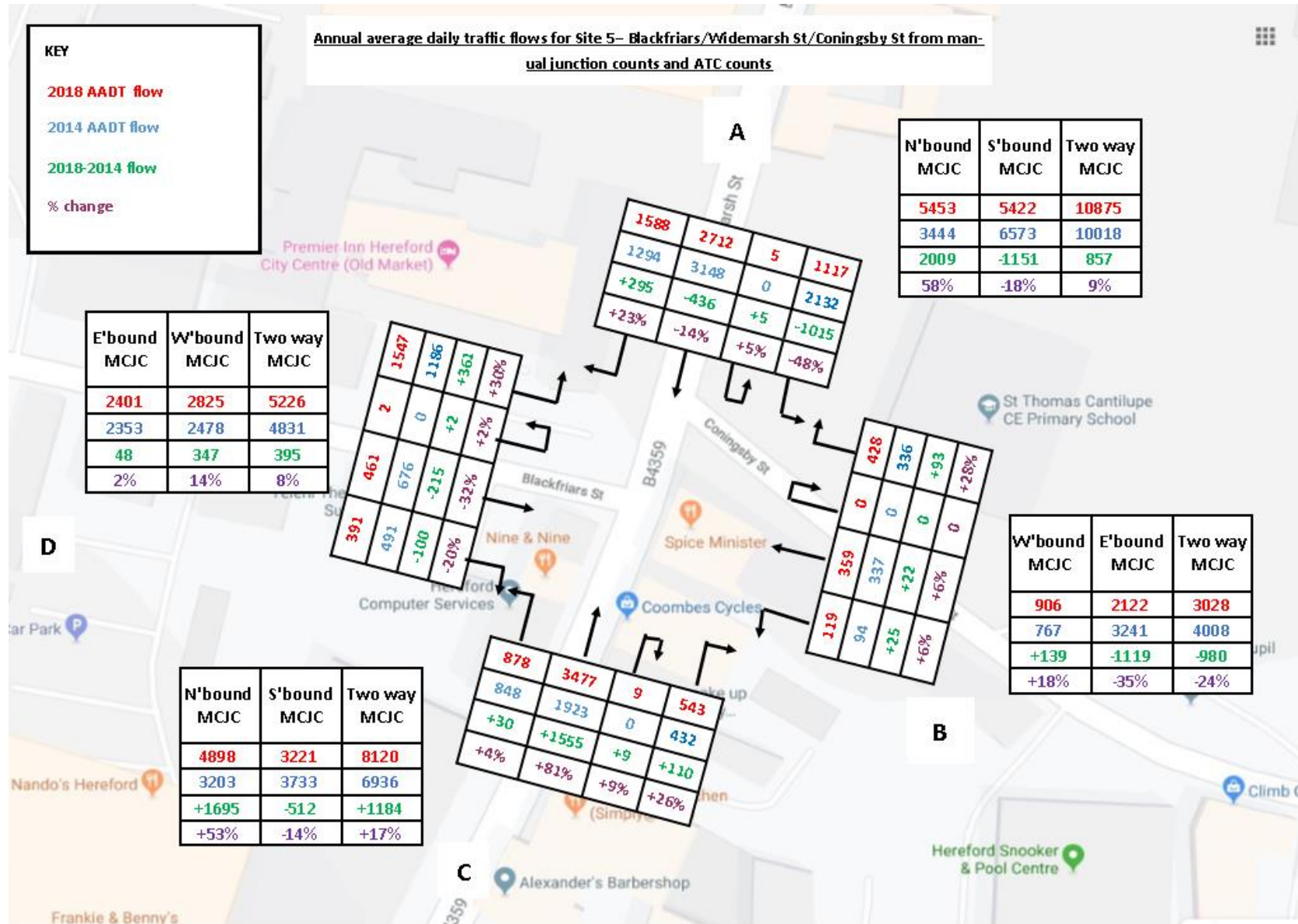
Site 3





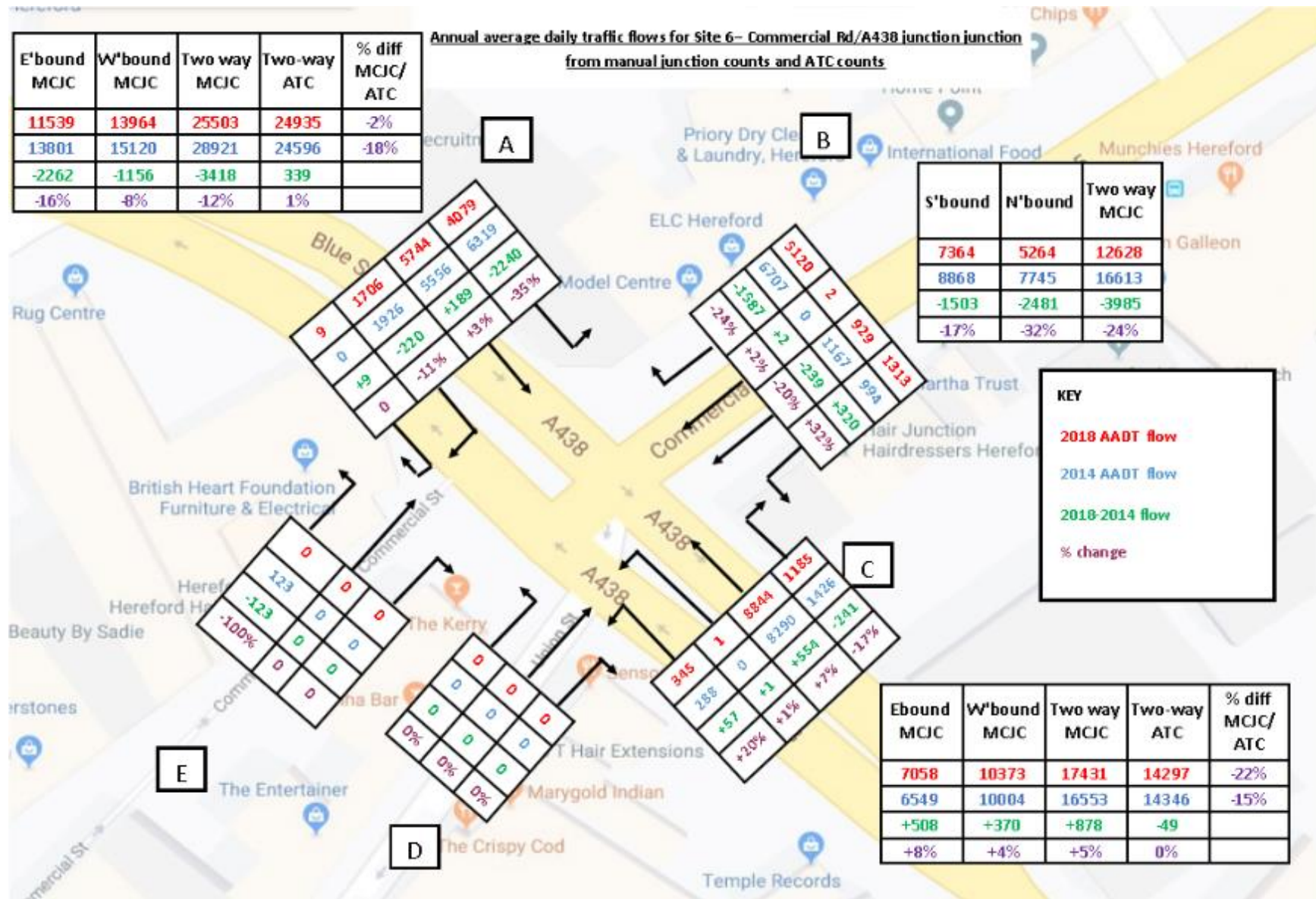


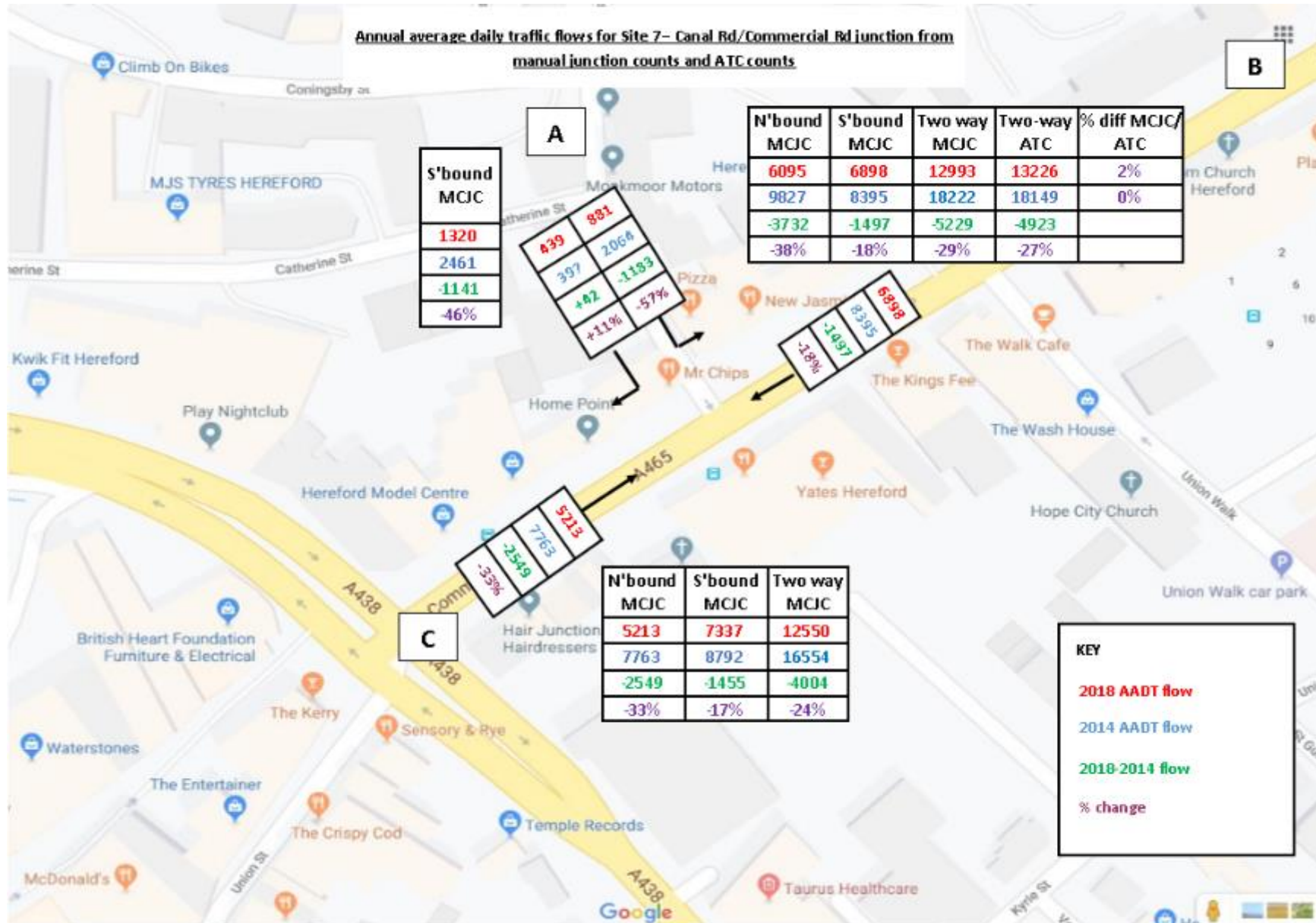
Site 5



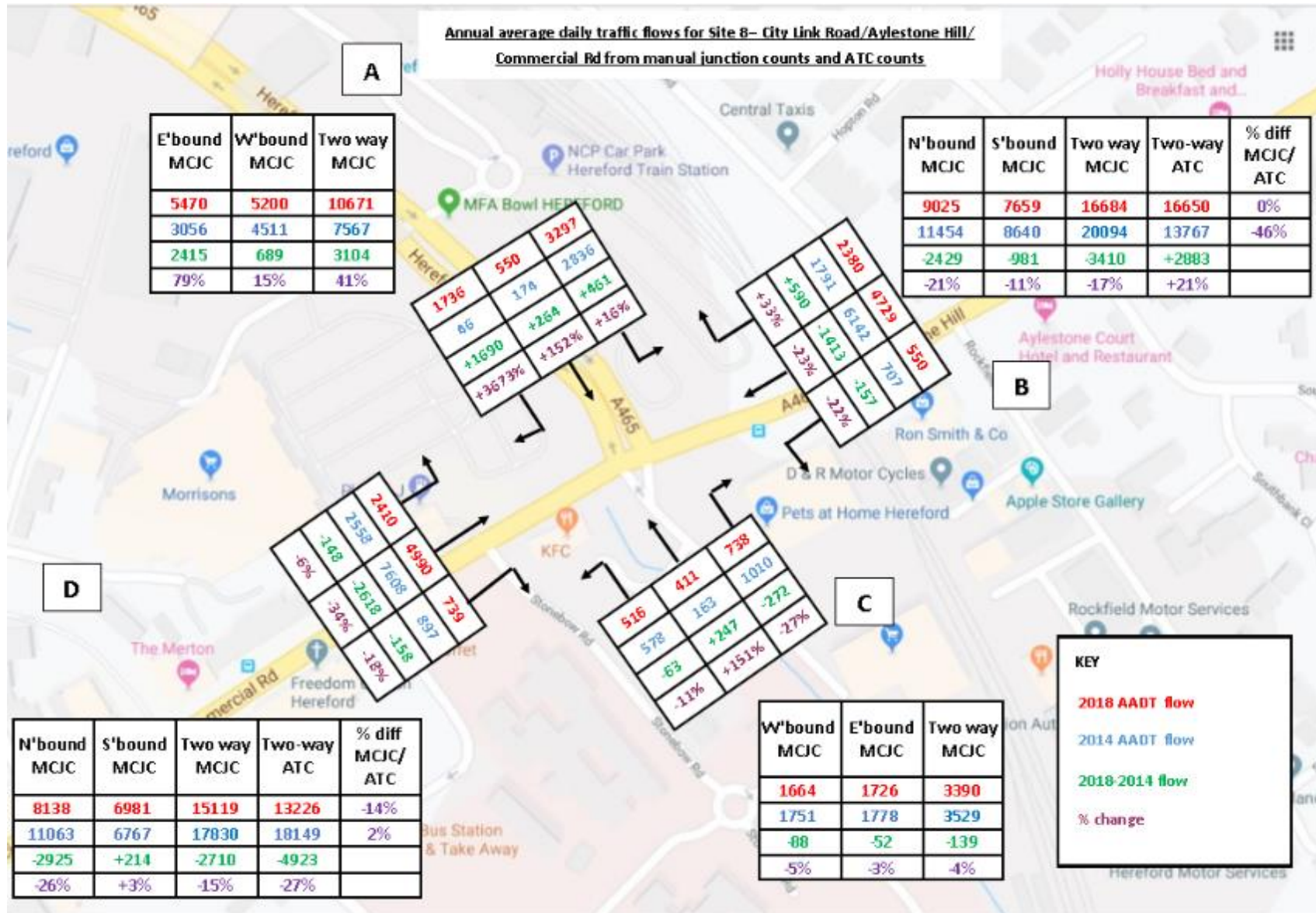


Site 6

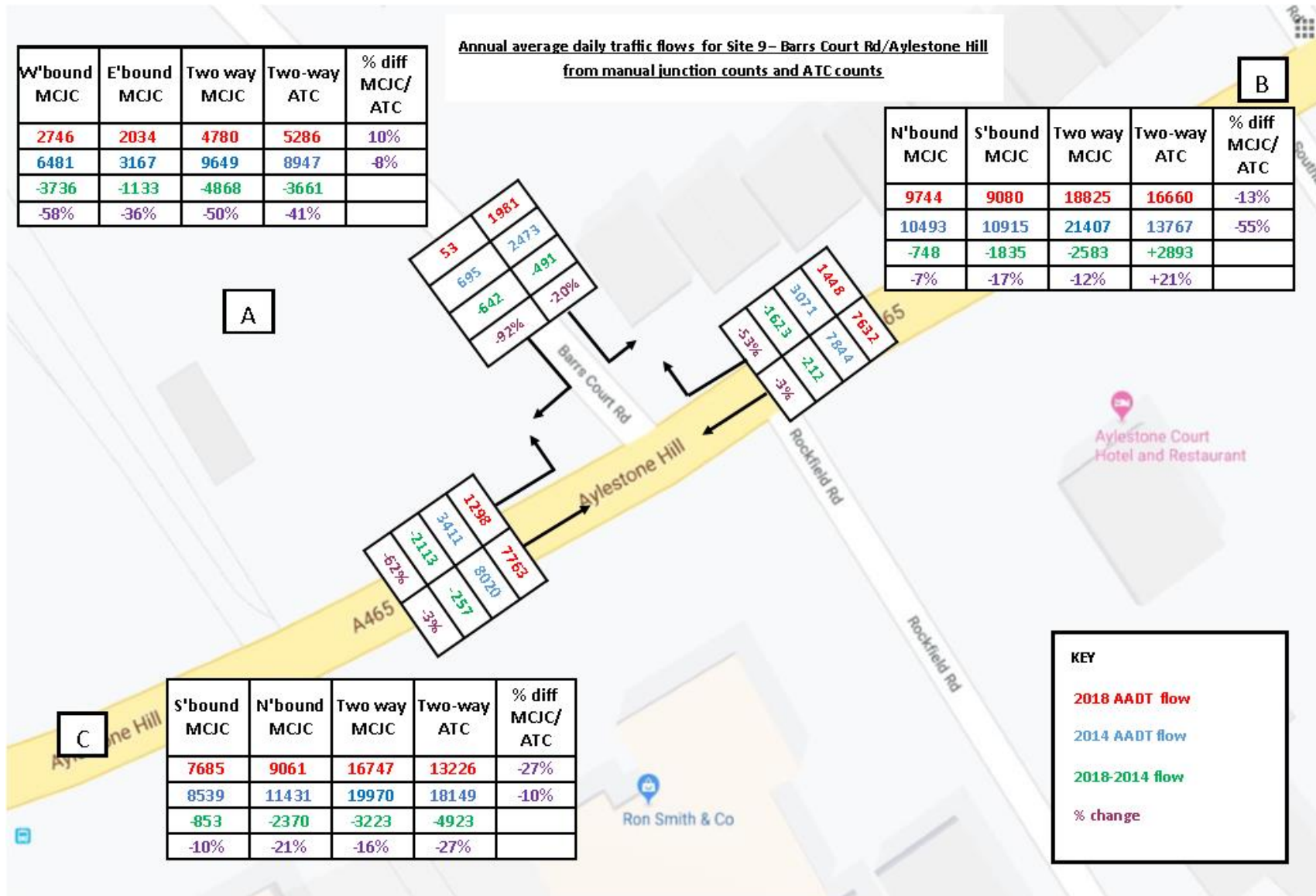




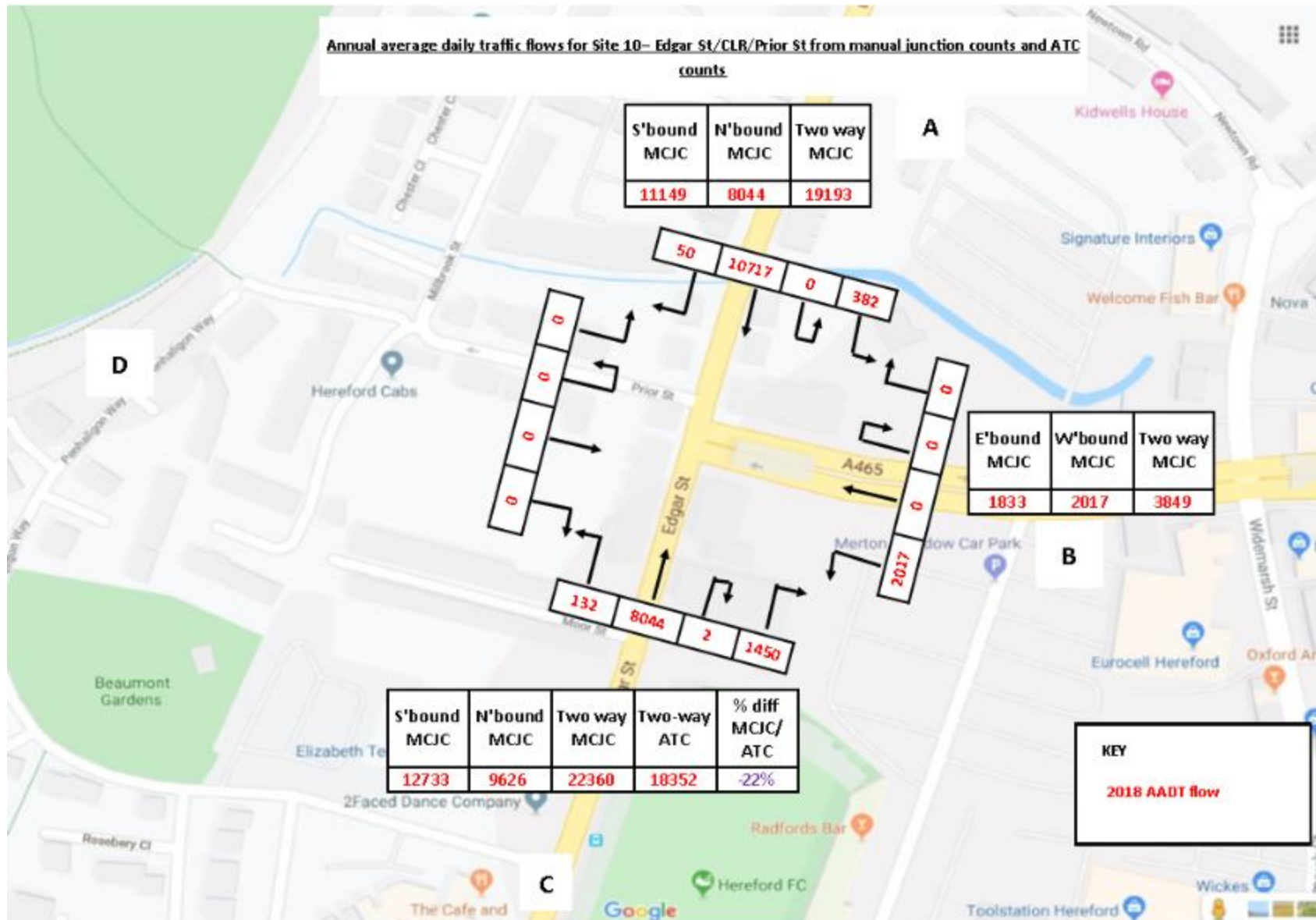




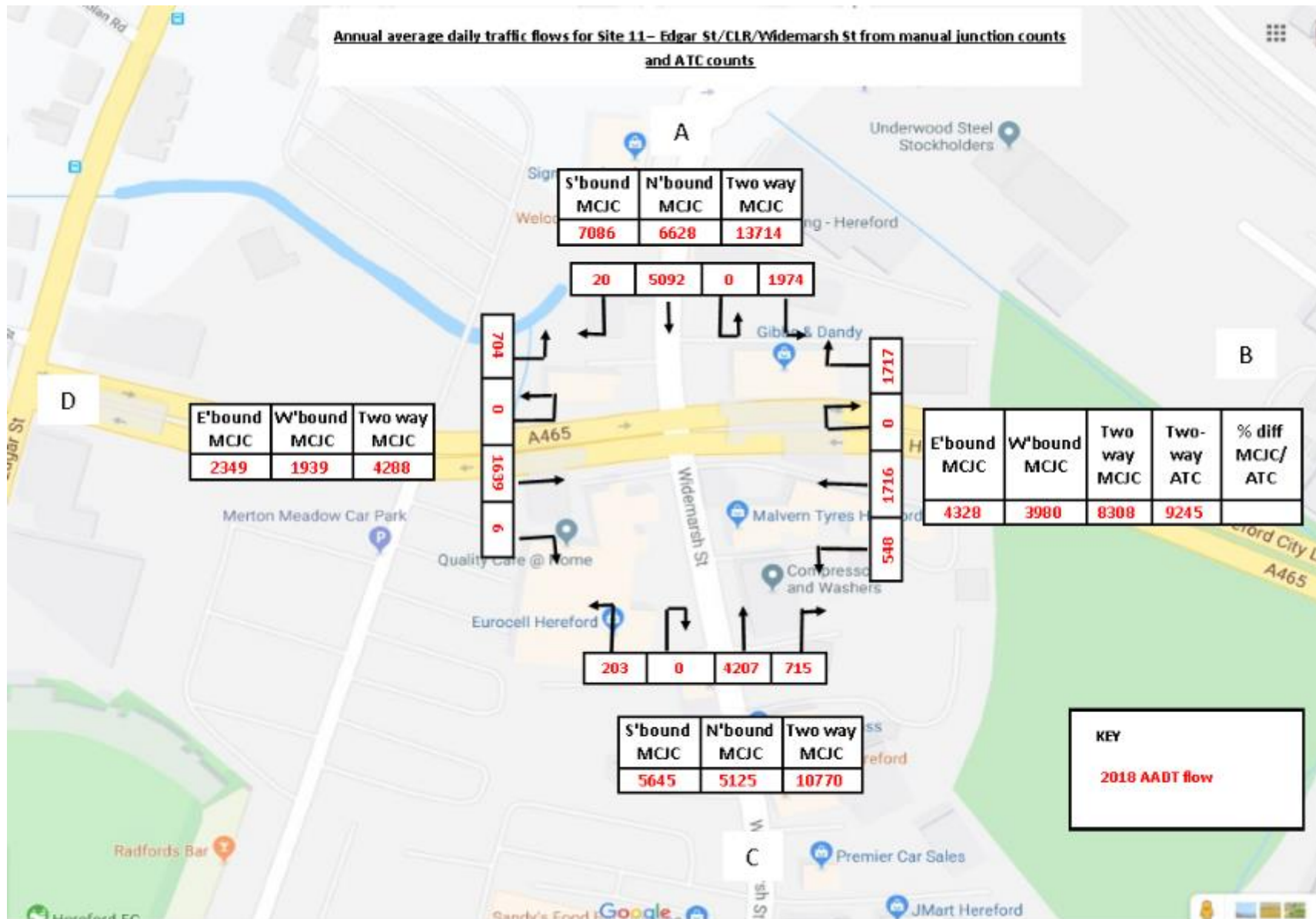
Site 9







Site 11



Site 12

