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INTRODUCTION

This Technical Note sets out the process WSP have been through to undertake a future year validation exercise on the 2019 Coventry Area Strategic Model (CASM). The CASM model, developed in 2015 has a base year of 2013 and was used to support the Full Business Case (FBC) for the A46 Phase 1 Stoneleigh Junction improvements. As part of the assessment of the A46 Phase 1 FBC forecast years for 2019 and 2034 were developed. The 2013 CASM Base Year is now quite old and outside TAG criteria to support the A46 Phase2 Outline Business Case (OBC) which is programmed to be submitted in early 2021. WSP are currently developing an updated 2019 Base Year CASM Model but the delivery is anticipated in late 2021. Therefore, the timescales for the A46 Phase 2 OBC and the CASM update do not align.

WSP have therefore undertaken a 2019 future year validation exercise using the 2019 A46 Phase 1 FBC model and comparing it against 2019 observed count data. Traffic counts have been processed and assessed in 2019 for the whole model area, encompassing 468 counts, and the A46 Phase 2 study area, encompassing 35 counts.

This note provides a summary of the work undertaken, summarising the counts which have been processed and the land use and infrastructure assumptions assumed within the 2019 forecast model in the A46 study area. It then presents the results of the count validation process and the next steps to be discussed and agreed with the DfT to enable the model to be robust to support he A46 Phase 2 OBC.

COUNT PROCESSING

Traffic count data to support an updated 2019 CASM model has been collated from a range of sources including:

- TfWM Data Insight
- Highways England TRIS
- 2015 Coventry Ring Road Junction 4 to 5 Study Traffic Survey
- 2015 Warwick District Council (WDC) A46 Traffic Counts
- 2016 A46 Phase 1 - Stoneleigh Junction Traffic Surveys
- 2016 Eastern Green Developer Counts
- 2016 Kings Hill Developer Counts
- 2016 / 17 University of Warwick Traffic Survey
- 2017 Coventry Station Masterplan Traffic Survey
- 2017 Gateway South Developer Counts
- 2017 / 18 Keresley Developer Counts
- 2018 Air Quality Study Survey
- 2018 Very Light Rail (VLR) Traffic Surveys
- 2019 Spon End

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Key data sources which have been used within the A46 Phase 2 study area are shown in Figure 1 to Figure 10.

Figure 1 presents the locations of the 2015 to 2018 Data Insight ATC and turning traffic counts locations within Coventry and Solihull within the CASM model.

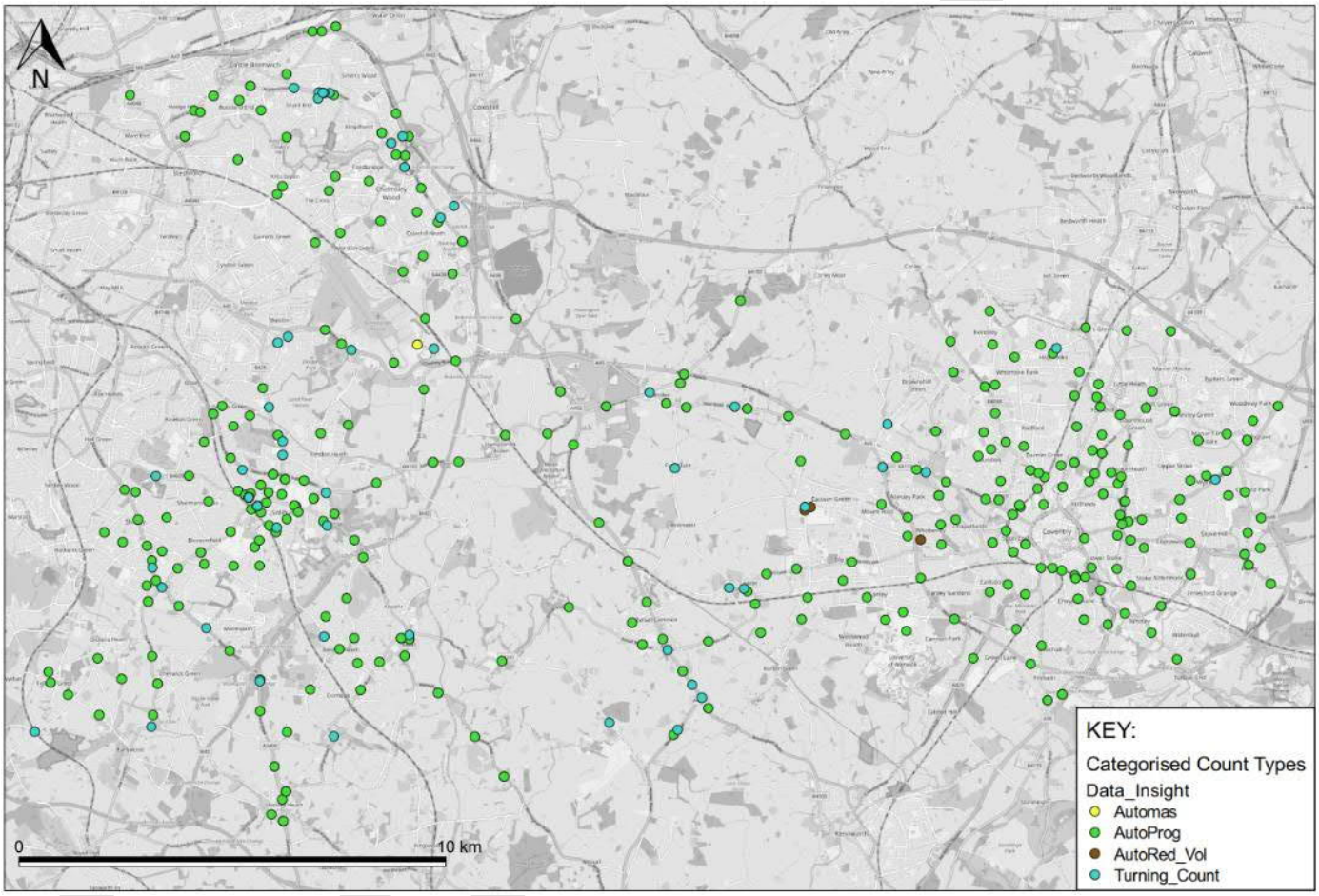

Figure 1: Data Insight Count Site Locations Within Coventry and Solihull

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Figure 2 illustrates the Highways England TRIS count sites from 2017 onwards with data available.

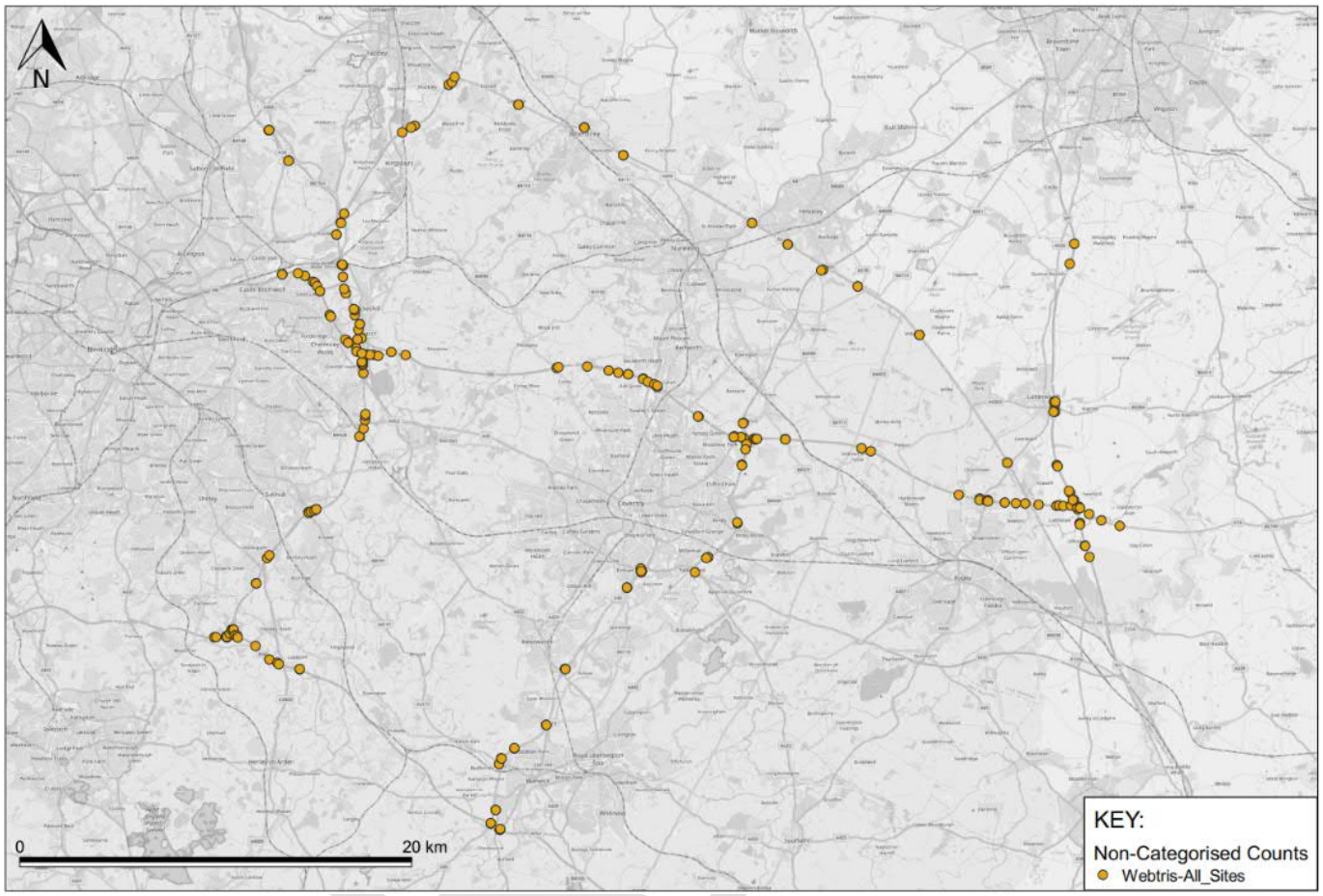

Figure 2: TRIS Count Site Locations

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Figure 3 presents the ATC counts provided by Warwick District Council surveyed on the 16th April 2015 from 0700-1900.

Figure 3: 2015 WDC A46 Count Site Locations

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WSP were provided with ATC (Commissioned between 2015 and 2016) and MCC (Commissioned between February 2016 and May 2016) traffic counts from WCC (shown in pink) and also obtained individual MCC count data at the Stoneleigh/A46 junction (Commissioned 14th June 2016) to the south east of UoW.

More localised ATC (Commissioned 12th August 2016) count data was also taken around the Stoneleigh/A46 junction including Dalehouse Lane and the B4115 either side of the A46 (Figure 5).

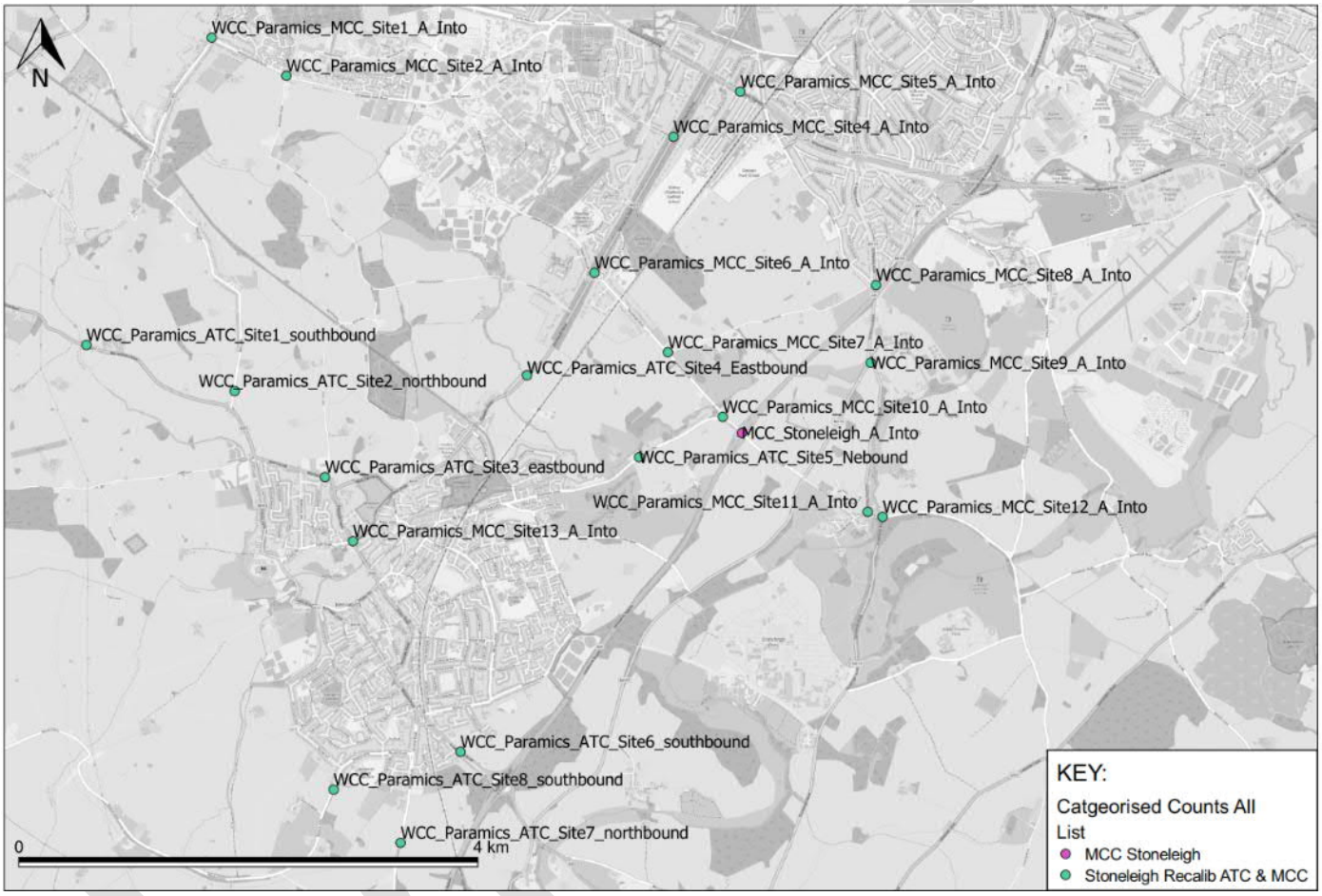

Figure 4: Stoneleigh Count Site Locations MCC and ATC

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Figure 5: Stoneleigh Count Site Locations Local ATC

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Figure 6 presents the following Kings Hill Developer Classified Turning Counts surveyed in November 2016.

Figure 6: 2016 King Hill Count Site Locations

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Arup undertook the following traffic surveys in and around the campus of the University of Warwick in 2016/17. Most of the counts are focused on Kirby Corner Road and Gibbet Hill Road as illustrated in Figure 7.

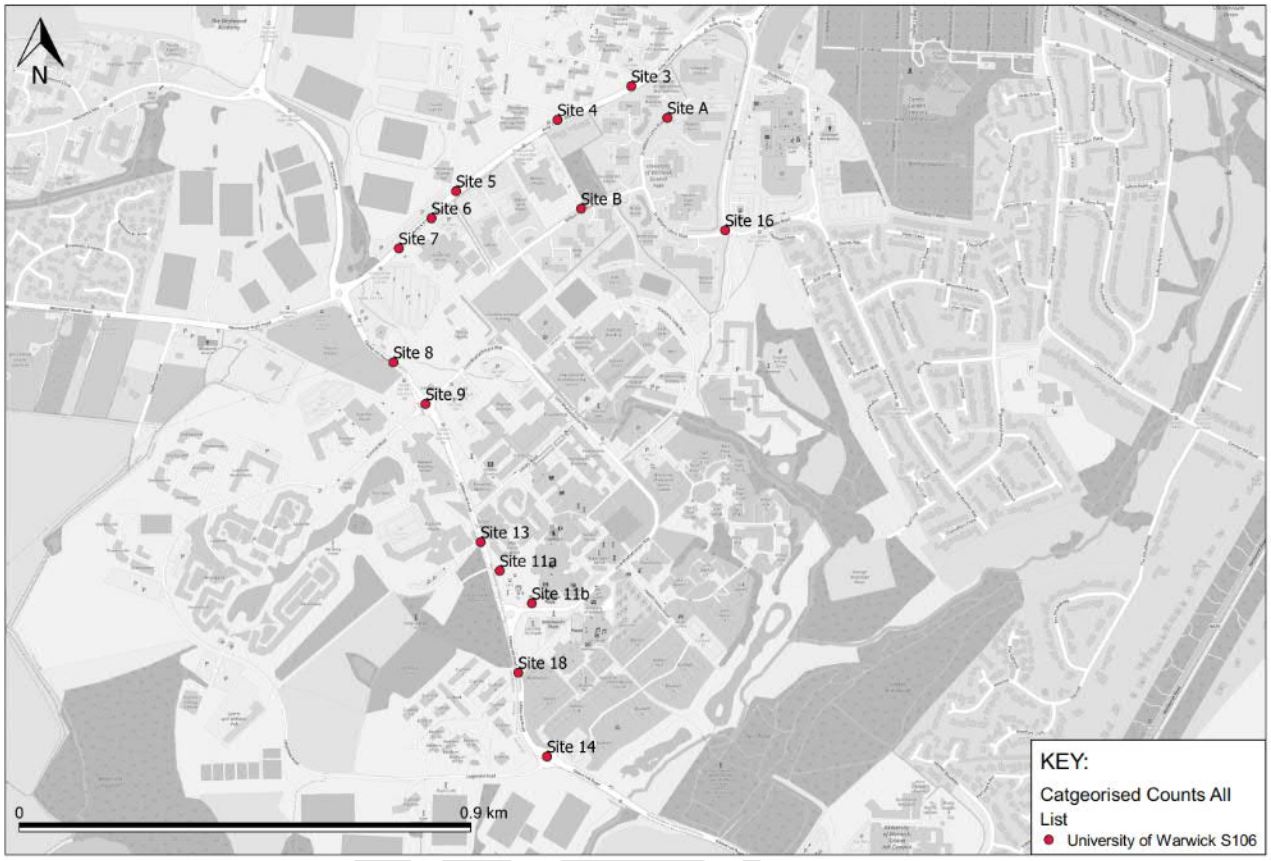

Figure 7: University of Warwick Count Site Locations

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Figure 8 presents the counts undertaken for the 2017 Gateway South Development. The counts were surveyed in April 2017.

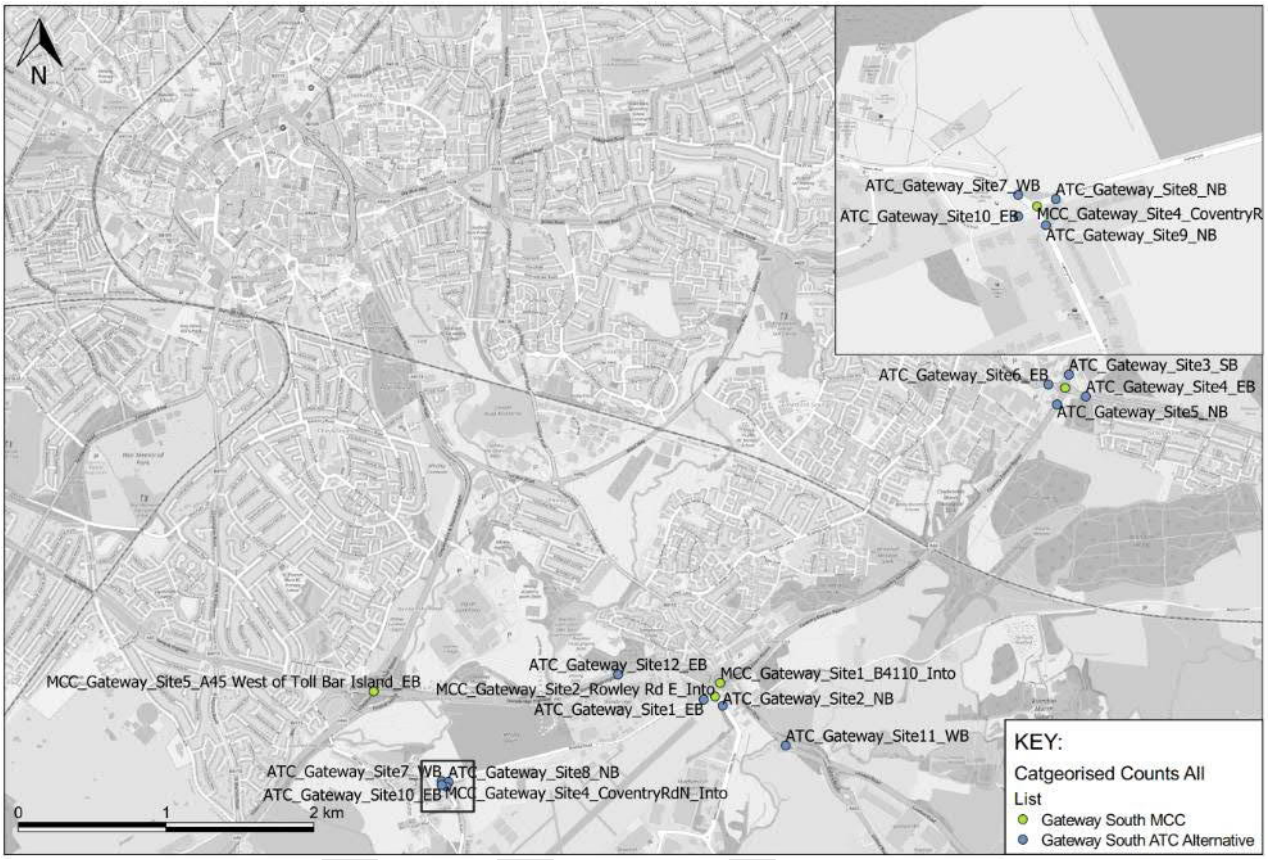

Figure 8: 2017 Gateway South Developer Count Site Locations

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WCC Counts

Figure 9 shows the WCC count locations from the Drakewell data that WSP was given access to and processed for 2019.

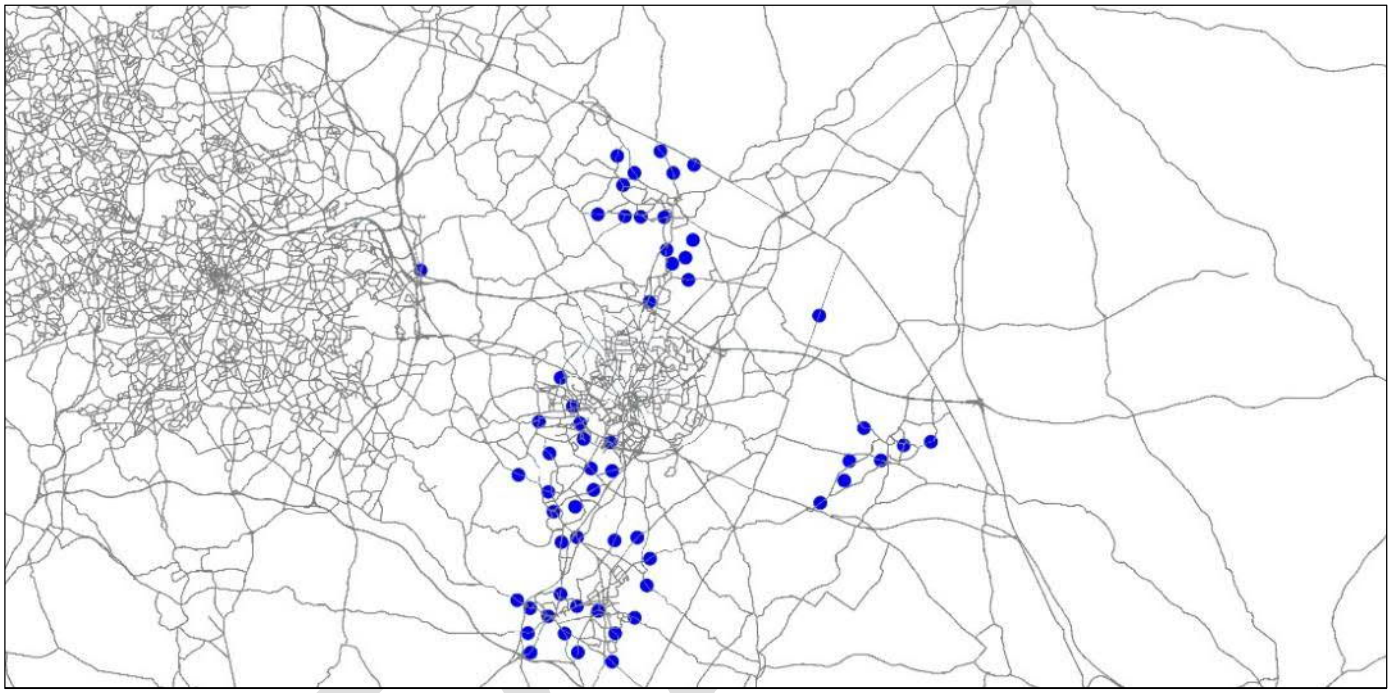

Figure 9: WCC Count Locations

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HE Counts

Figure 10 shows the additional Highways England counts located on key strategic routes processed for 2019.

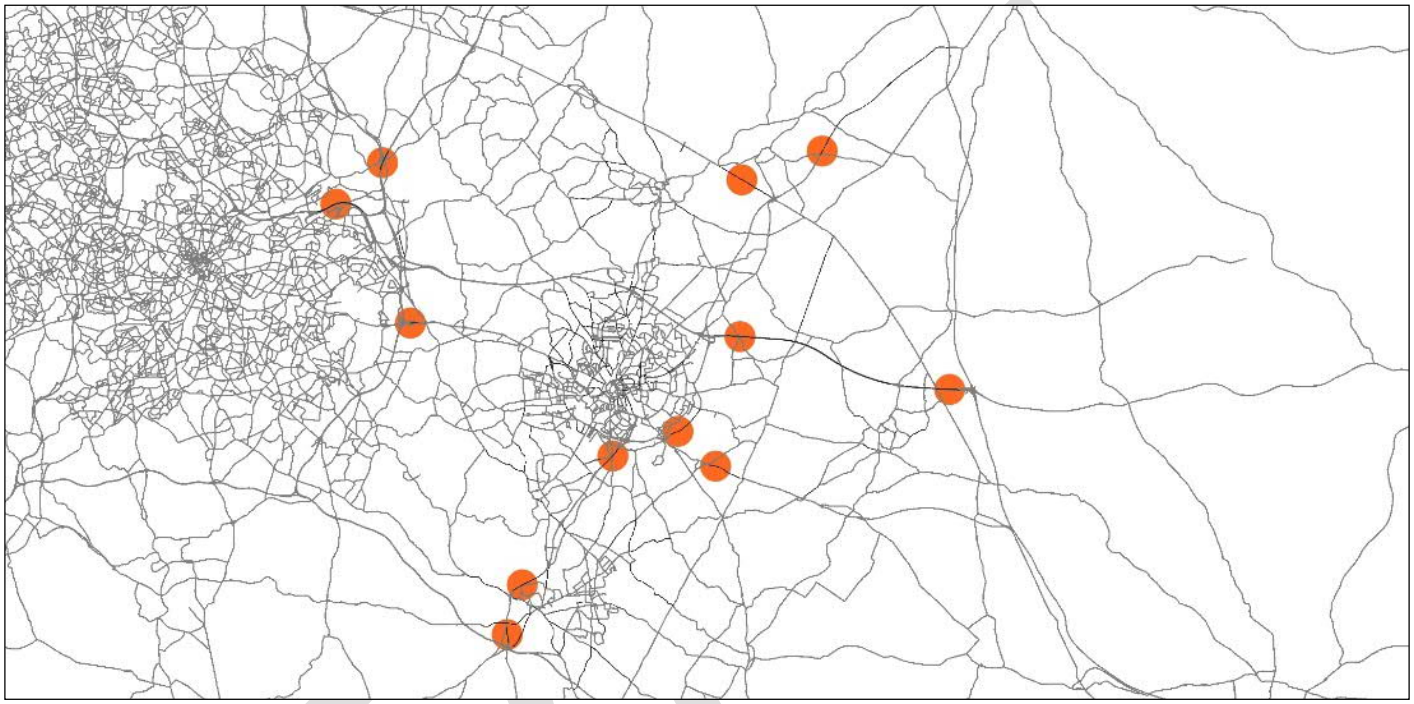

Figure 10: Highway England Sites Location

Overall a wide range of recent count data has been used within the A46 Phase 2 Study area as part of the 2019 future year validation exercise.

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2019 LAND USE AND INFRASTRUCTURE ASSUMPTIONS

This section of the note outlines the forecast year assumptions which were used to develop the 2019 model and compares them to what was delivered and on the ground in 2019 in the vicinity of the A46 Phase 2 study area. The analysis shows that the two schemes which were not delivered in 2019 but assumed within the 2019 forecast scenarios were the M6 Junction 2-4 Smart Motorway scheme and the A46/ A425/ A4177 Birmingham Road scheme on the Warwick Bypass. Both schemes are quite a distance away from the A46 Phase 2 study area but if a 2019 model was re-run it would probably be useful to remove the improvements from the CASM model.

INFRASTRUCTURE SCHEMES

Table 1: HE Scheme

Strategic Scheme	Coded in 2019 Forecast	Status in 2019
M6 Junction 2-4	✓	Under construction

Table 2: Coventry Schemes

Strategic Scheme	Coded in 2019 Forecast	Status in 2019
A444 Whitley Interchange / Leaf Lane	✓	Complete
A46/A428 Junction Signalisation	✓	Complete
Friargate IRR	✓	Complete
Broad Hill / Tile Hill Junctions	✓	Complete
Stoneleigh Road/Kenilworth Road	✓	Complete
A4600 Hospital	✓	Complete

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Table 3: Warwick Schemes

Strategic Scheme	Coded in 2019 Forecast	Status in 2019
A46/A425/A4177 Birmingham Road	✓	Under construction

LAND USE

Alongside the infrastructure assumptions there were population and employment assumptions used in the development of the 2019 forecast for Coventry and Warwick. These will be compared to that was approximately delivered in 2019 in Table 4 to Table 6.

Table 4: Coventry Population

Ref	Name	Population Assumed in 2019 Forecast	Dwellings Assumed in 2019 Forecast	Approx. Number of Dwellings delivered by 2019
C2A	Manor Farm Regeneration Area	593	250	743
C2B	Manor Farm Regeneration Area	1148	484	
C3A	New Century Park (Under Construction)	645	272	170
C3B	New Century Park	954	402	345
C4A	Former Peugeot Site (Under Construction)	100	42	(site completed 2016)
C4B	Former Peugeot Site	645	272	
C5	Coventry College, The Butts	626	262	262 (site completed 2016)
C8A	Canley Regeneration Scheme (Under Construction)	116	49	391
C8B		1025	432	
C9	Acordis/Acetate, Foleshill Road	816	344	277
C10	AXA Tower, Well Street (Under Construction)	678	286	Permitted Development Implemented in 2015
C11	Paragon Park	712	300	138

C12	Central Shopping Area North	214	90	Data unavailable
C13	Willenhall Triangle	484	204	157
C15	Keresley	119	50	0
C21	Land W. of Cromwell Lane	237	100	0
C23	Whitemore Park	712	300	229
C24	Parkside	285	75	377 student rooms
C26A	Town Centre - The Cultural Quarter	152	40	-

Table 5: Coventry Employment

Ref	Name	Employment Assumed in 2019 Forecast	Approx. Number of Jobs delivered by 2019
C7	Friargate Regeneration Scheme (The Business Quarter)	1800	Jobs were delivered in Friargate by 2019
C23	Whitemore Park	50	
Total		**1850**	

Table 6: Warwick Population/ Dwellings

Ref	Name	Population Assumed in 2019 Forecast	Dwellings Assumed in 2019 Forecast	Approx. Number of Dwellings delivered by 2019
W01	Land at Asps Farm - The Asps, Banbury Road	452	200	
W02	Land between Myton Road and Europa Way - Land between Myton Road & Europa Way, Warwick	760	336	
W03	Grove Farm - Grove Farm, Harbury Lane, Bishops Tachbrook	543	240	
W04	Land South of Gallows Hill - Land South of Gallows Hill / West of Europa Way	588	260	
W05	North of Gallows Hill	373	165	

W03	Land at Lower Heathcote Farm - Land at Lower Heathcote Farm	608	269	
W07	University of Warwick - University of Warwick	378	167	
W08	Land at Earl Rivers Avenue	339	150	
W03	Land at Lower Heathcote Farm - Land at Lower Heathcote Farm, Harbury Lane	566	250	
W03	Harbury Gardens - Harbury Gardens, Harbury Lane, Bishops Tatchbrook	249	110	
W11	Woodside Farm - Woodside Farm	509	225	
W12	Land North of - Land north of Common Lane, Kenilworth	210	93	
W13	Land at - Land at Tachbrook Road, Leamington Spa	183	81	
W14	Plot 8002 - Plot 8002, Tournament Fields, Edgehill Drive	136	60	
W15	Land north of - Land North of Oakley Wood Road, Bishops Tachbrook	339	150	
W12	Multilines Unit 1 - Multilines Unit 1, Common Lane, Kenilworth	129	57	
W17	Sydenham Industrial Estate - Sydenham Industrial Estate	323	143	
W18	Land at Station Approach - Station Approach, Leamington Spa	480	212	
W27	Land south of - Land south of St Fremund Way	299	132	
W03	Land North of - Land North of Harbury Lane	179	79	
W03	Harbury Gardens -	204	90	
W53	Land to the South of - Land to the South of	149	66	
W39	Land at - Land at Spring Lane, Radford Semele	147	65	

W55	Land East of Radford Semele - Land East of Radford Semele	136	60	
W23	Land at Montague Road	317	140	
W48	Land at Westwood Heath	509	225	
W49A	Land at Kings Hill Lane	388	200	
W49B	Land at Kings Hill Lane	65		
W55	Land to the South of Offchurch Lane, Radford Semele, CV31 1TN	339	150	
W57	Land off, Seven Acre Close, Bishops Tachbrook	113	50	

There was no change in jobs in Warwick in 2019 compared to 2013.

Figure 11 shows the location of population which was assumed in the 2019 CASM model for the A46 Phase 1 FBC.

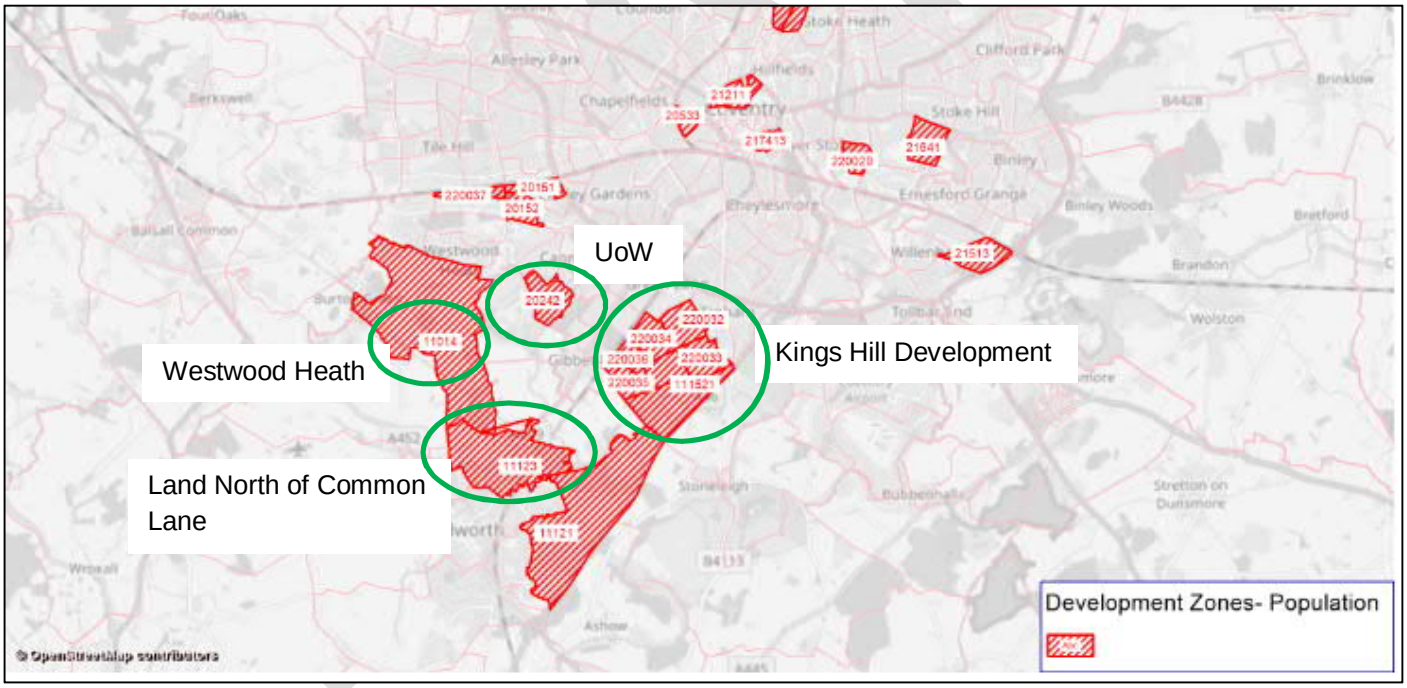

Figure 11: 2019 Population assumed in A46 Phase 2 Study Area

In quite a few of these locations the number of houses that were assumed would be built by 2019 have not been realised, resulting in the model forecasting a higher number of vehicle trips being generated than has actually happened. The site particularly relevant for the A46 Link Road scheme include:

- Kings Hill development
  - 200 houses assumed
    - None built by 2019
- Land at Cromwell Lane
  - 100 houses assumed
    - None built by 2019
- Land at Westwood Heath
  - 2019 forecast assumed 225 dwellings built
    - None built by 2019
- Land north of Common Lane, Kenilworth
  - 2019 forecast assumed 93 dwellings built
    - 34 built by end of 2019/2020 financial year
- University of Warwick
  - 2019 forecast assumed 167 dwellings built
    - 382 purpose-built student accommodation beds complete by end of 2019/2020 financial year

COUNT VALIDATION

This section of the technical note outlines the performance within the CASM AM, Inter peak and PM peak highway assignment model between the observed and modelled flows. Table 7 shows the percentage of counts within the A46 Phase 2 Study area which achieve a GEH of 5 or over. As the table shows the Inter peak performance is the best performing with 74% of counts meeting flow or GEH criteria with the AM and PM peaks having a similar levels of performance of between 51%-54%.

Table 7: A46 Phase 2 Study Area GEH Performance

	AM	IP	PM
Percentage	51%	74%	54%
Absolute Values	18	26	19

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Figure 12 shows the GEH performance in the A46 Phase 2 study area, with all those counts meeting a GEH of 5 shown in green, those with a GEH of between 5-10 orange and those with a GEH over 10 in red.

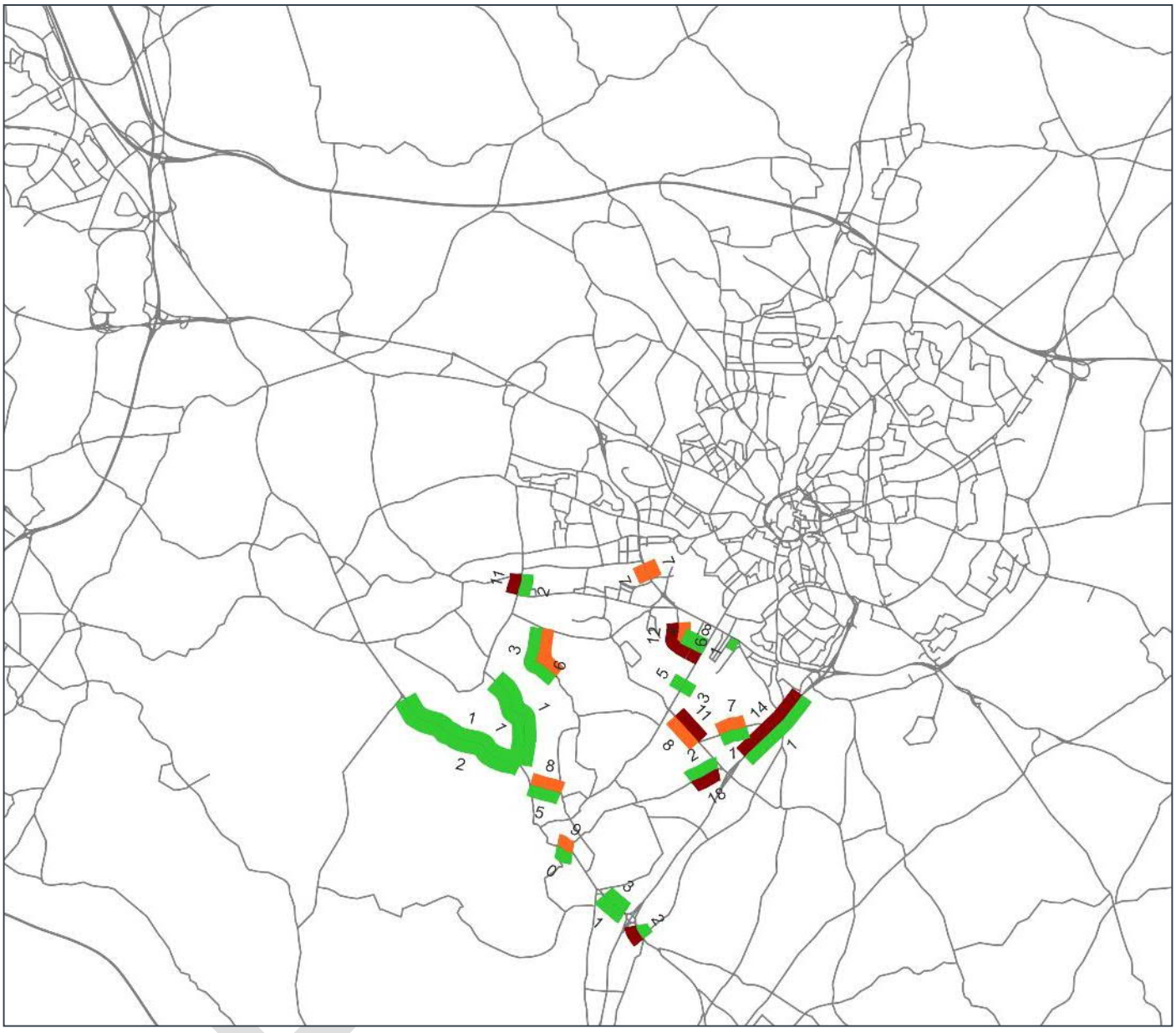

Figure 12: AM Peak A46 Phase 2 Study Area GEH Performance

Figure 13 shows the absolute difference in flow between the observed flows and the modelled flows. All links which are red are links where the modelled flow is higher than the observed flow and those in green where the observed flow is higher than the modelled. There is a mixture of count locations where the modelled flow is both higher and lower than that observed.

Figure 13: AM Peak A46 Phase 2 Study Area Difference in Flow (Observed – Modelled)

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Figure 14 shows the absolute difference in flow between the observed flows and the modelled flows in the Kenilworth Road/ Cannon Hill Road area. All links which are red are links where the modelled flow is higher than the observed flow and it looks like the roads in this area have too much traffic flow on them compared to observations. Cannon Hill Road provides an alternative allowing traffic to avoid the A429/ A45 junction, which can be congested in peak periods, although in uncongested conditions the A429/ A45 route will generally be quicker. This will, therefore, be a challenging part of the network to accurately model for all conditions and all time of day.

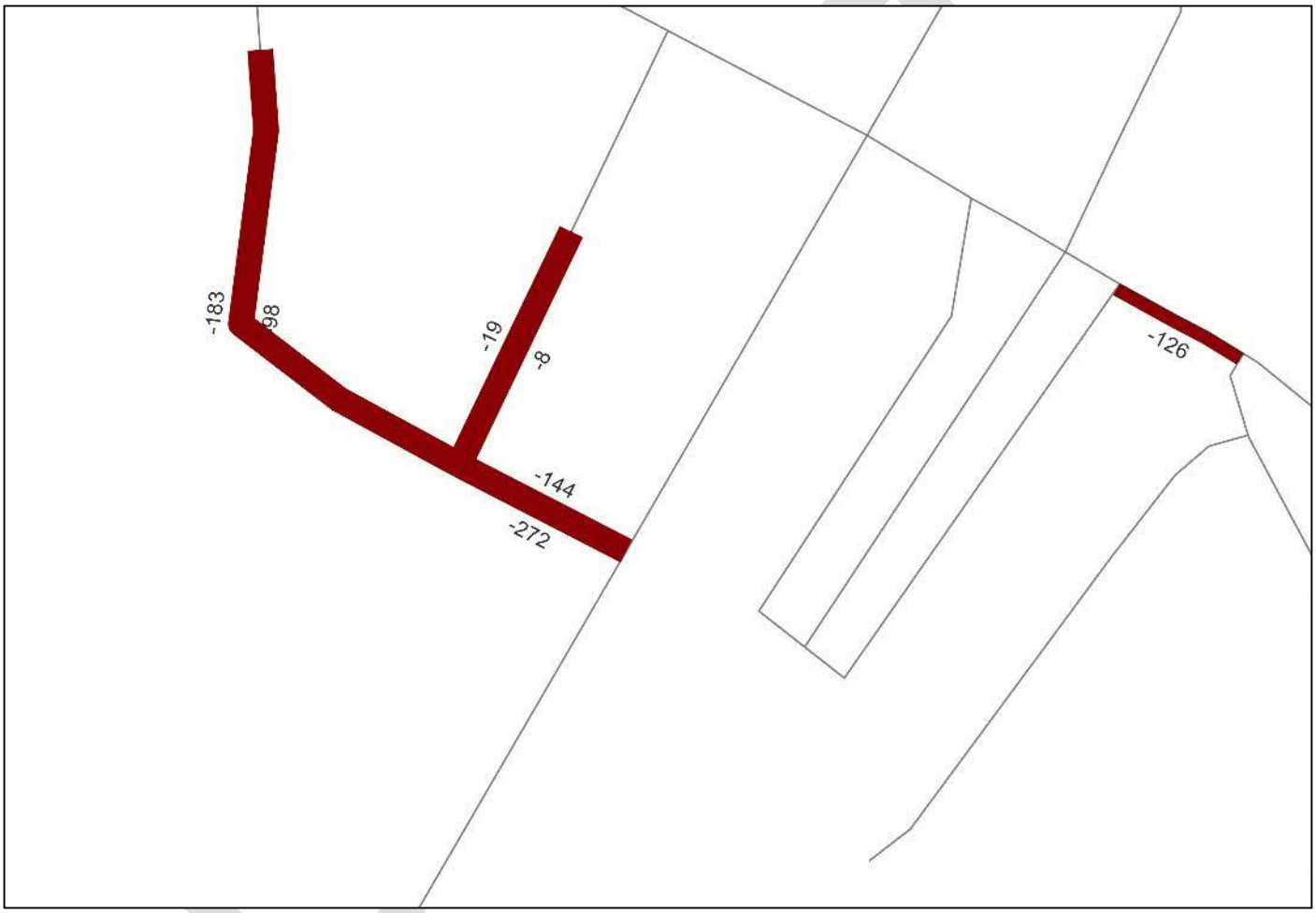

Figure 14: AM Peak A46 Phase 2 Study Area Difference in Flow (Observed – Modelled)

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Figure 15 shows the GEH performance in the A46 Phase 2 study area, all those counts meeting a GEH of 5 are green, a GEH of between 5-10 orange and a GEH over 10 is red. The majority of the links are green within the area around the A46 Phase 2 scheme.

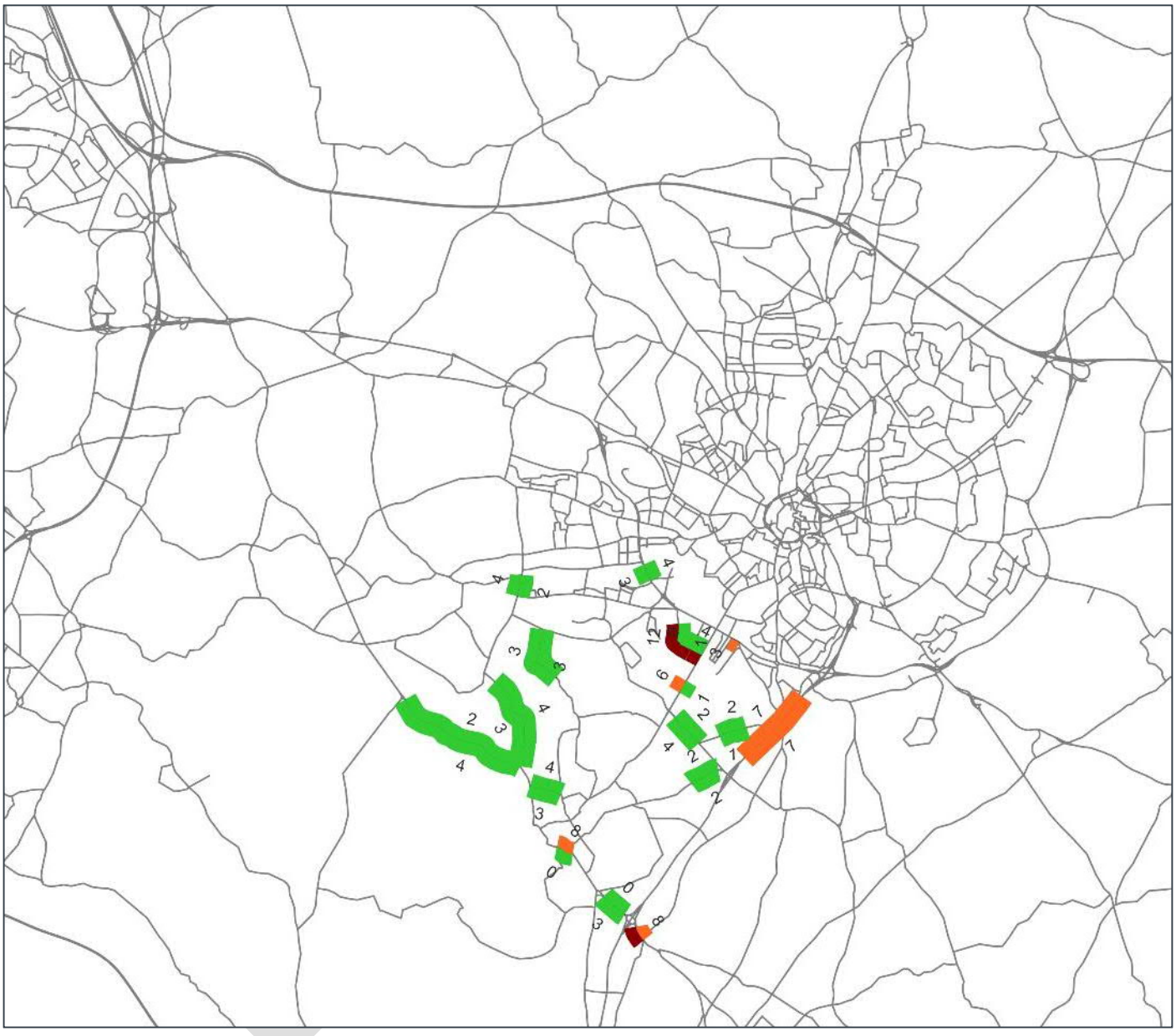

Figure 15: Inter Peak A46 Phase 2 Study Area GEH Performance

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Figure 16 shows the absolute difference in flow between the observed flows and the modelled flows. All links which are red are links where the modelled flow is higher than the observed flow and green where the observed flow is higher than the modelled. There is a mixture of count locations where the modelled flow is both higher and lower than that observed.

Figure 16: Inter Peak A46 Phase 2 Study Area Difference in Flow (Observed – Modelled)

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Figure 17 shows the absolute difference in flow between the observed flows and the modelled flows in the Kenilworth Road/ Cannon Hill Road area. All links which are red are links where the modelled flow is higher than the observed flow and it looks like the majority of the roads in this area have too much traffic flow on them compared to observations.

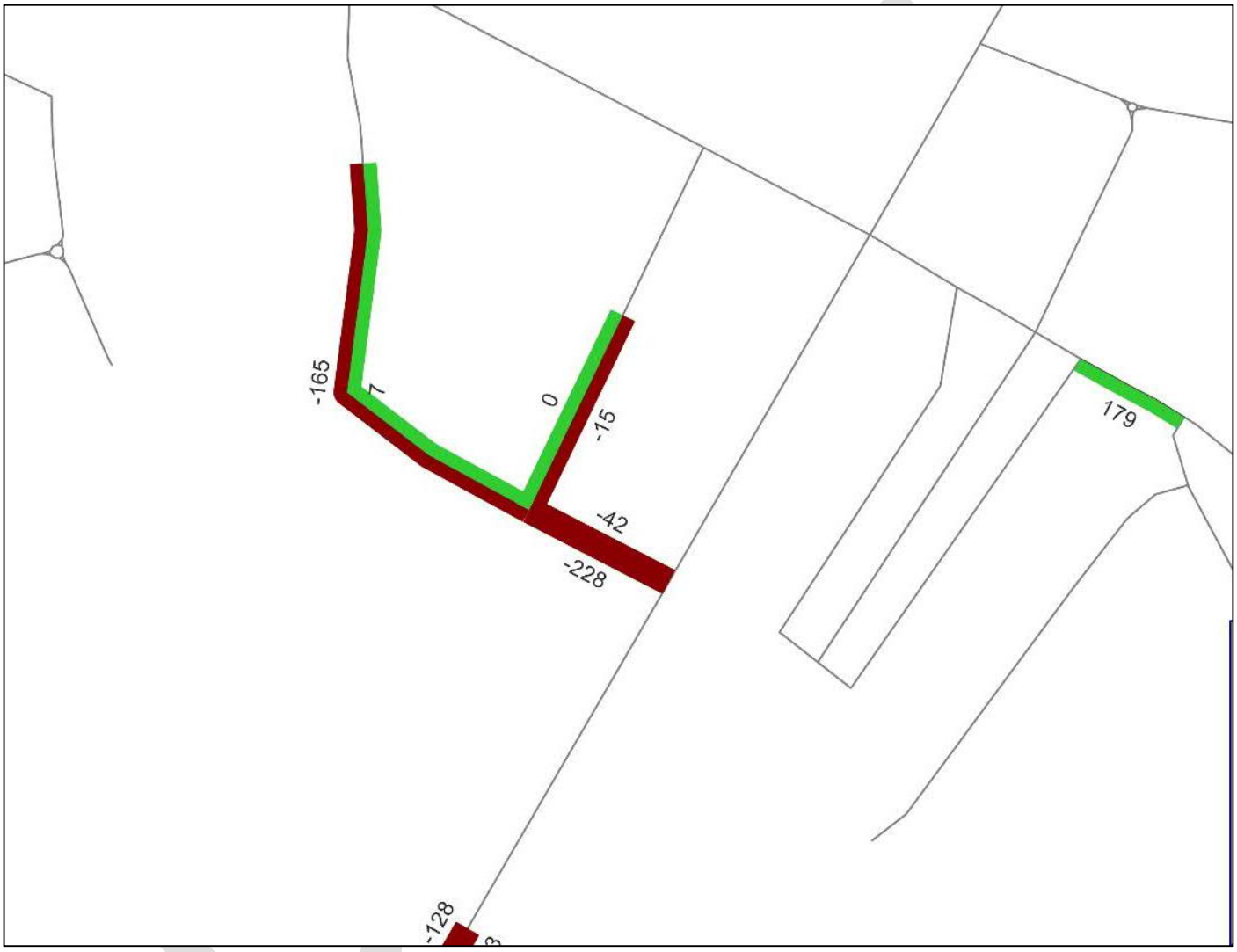

Figure 17: Inter Peak A46 Phase 2 Study Area Difference in Flow (Observed – Modelled)

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Figure 18 shows the GEH performance in the A46 Phase 2 study area, all those counts meeting a GEH of 5 are green, a GEH of between 5-10 orange and a GEH over 10 is red.

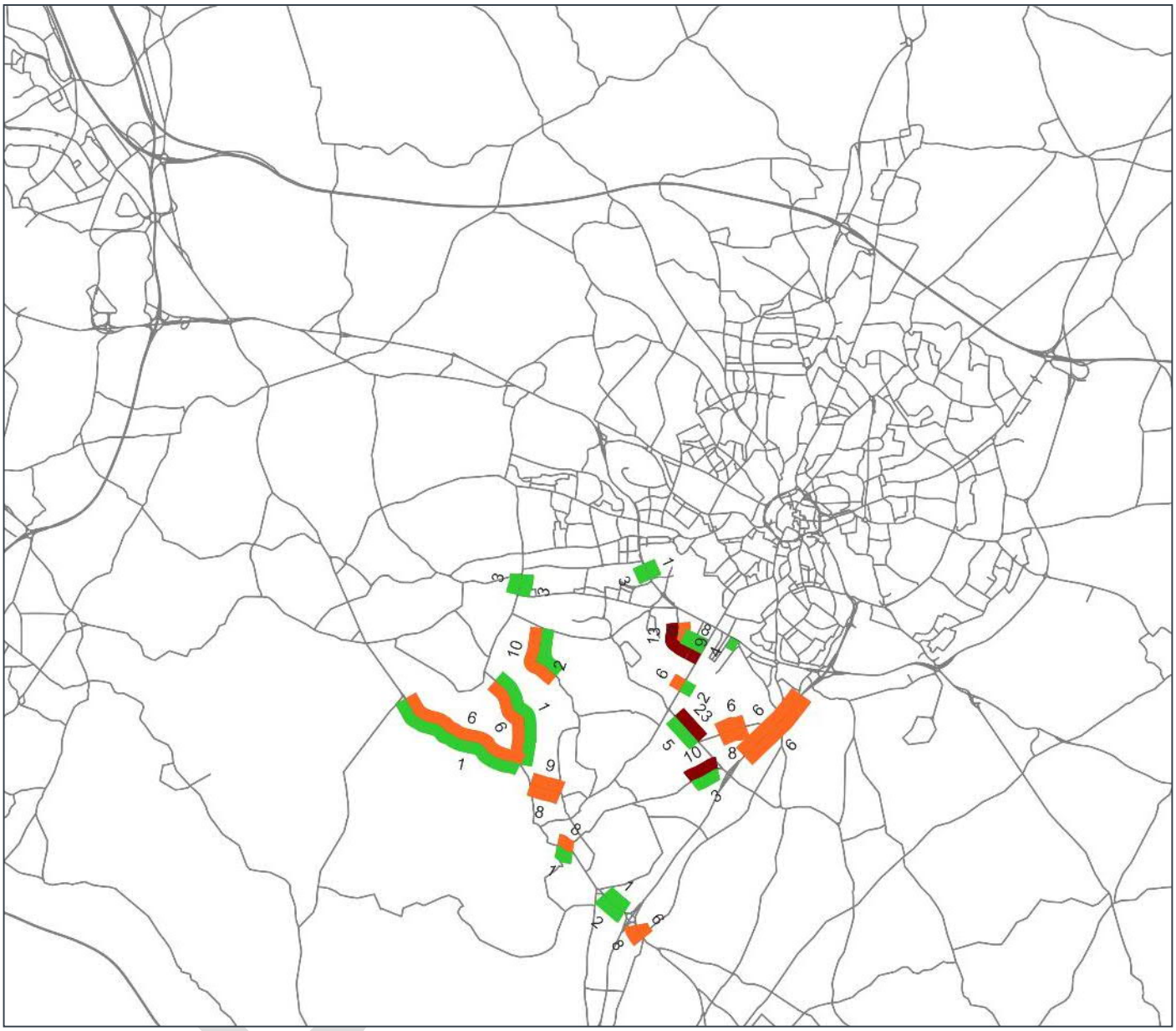

Figure 18: PM Peak A46 Phase 2 Study Area GEH Performance

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Figure 19 shows the absolute difference in flow between the observed flows and the modelled flows. All links which are red are links where the modelled flow is higher than the observed flow and green where the observed flow is higher than the modelled. There is a mixture of count locations where the modelled flow is both higher and lower than that observed.

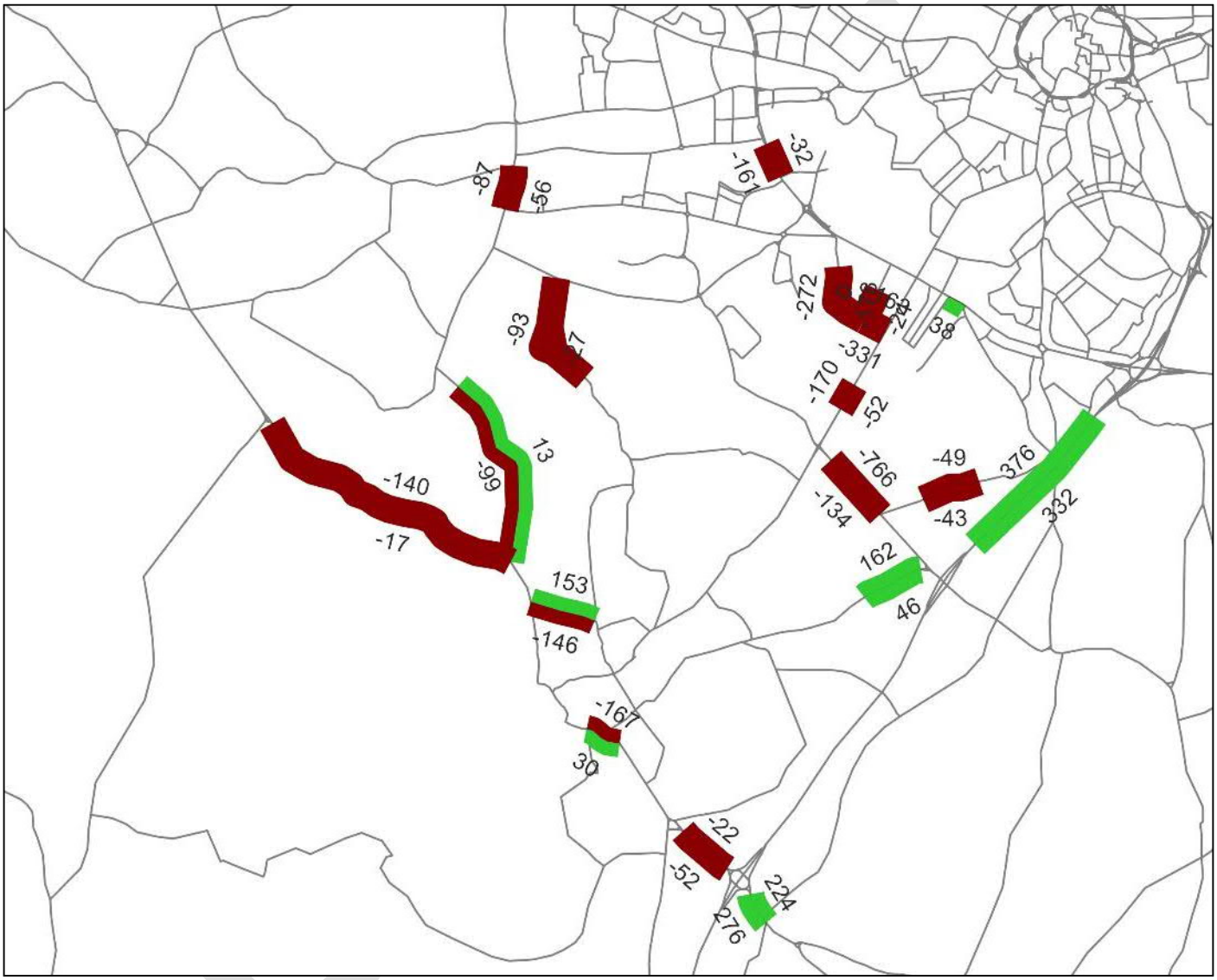

Figure 19: PM Peak A46 Phase 2 Study Area Difference in Flow (Observed – Modelled)

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Figure 20 shows the absolute difference in flow between the observed flows and the modelled flows in the Kenilworth Road/ Cannon Hill Road area. All links which are red are links where the modelled flow is higher than the observed flow and it looks like the roads in this area have too much traffic flow on them compared to observations.

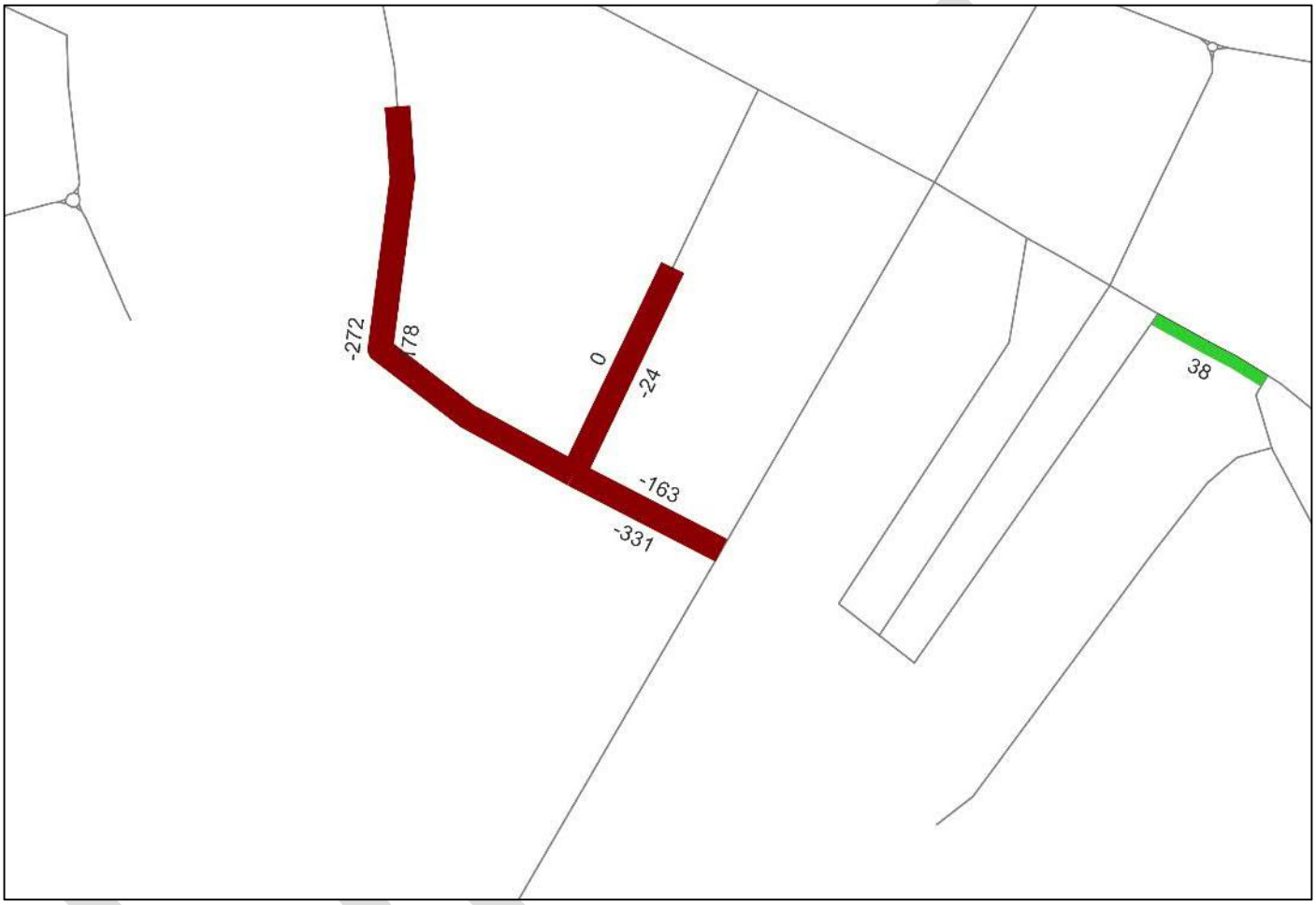

Figure 20: PM Peak A46 Phase 2 Study Area Difference in Flow (Observed – Modelled)

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SUMMARY AND NEXT STEPS

Overall the performance of the counts within the AM and PM peak within the A46 Phase 2 study area are not adequately accurate to form the basis of an acceptable OBC submission for the DfT. However, it is considered that improvements can be made to make the 2019 forecast more reflective of 2019 conditions including:

- Refining the forecast development and infrastructure assumptions for 2019 to reflect what was actually delivered between 2013 and 2019
- Reviewing coding, road capacities and travel speeds in A46 Phase 2 study area and investigating reasons why observed flows do not meet modelled flows in terms of TAG criteria
- Comparing performance of model against 2019 observed Trafficmaster data for key journey time routes in A46 Phase 2 area

However before commencing any of the detailed work above we wanted to agree this approach with the DfT to ensure that it is acceptable and to understand the DfT's expected level of the performance acceptable for an OBC submission.