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Northamptonshire Strategic Transport Model (NSTM)

TRAFFIC FORECASTING REPORT ADDENDUM

NNJPU Core Strategy Assessment

23/01/2015

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NNJPU Core Strategy Assessment

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1 Project background

1.1 Purpose

- 1.1.1 WSP has been tasked by the North Northamptonshire Joint Planning Unit (NNJPU) to provide guidance on how future housing and employment development will impact on the highway network in the boroughs of Corby, Kettering, Wellingborough, and East Northamptonshire district.
- 1.1.2 This addendum details results taken from the Northamptonshire Strategic Transport Model (NSTM). The NSTM has been constructed as a strategic multi-modal model covering Northamptonshire capable of assessing the impacts of future changes in journey patterns within Northamptonshire.
- 1.1.3 The results from the NSTM outlined in the report will be used to inform the Joint Core Strategy being developed by the NNJPU which aims to provide a strategic plan for Corby, East Northamptonshire, Kettering and Wellingborough going forward to 2031. It also provides information on the performance of the draft Infrastructure Delivery Plan (IDP) against forecast traffic flows.
- 1.1.4 This report is an addendum to the 'Northamptonshire Strategic Transport Model (NSTM): Traffic Forecasting Report: NNJPU Core Strategy Assessment' dated 16th January 2015

1.2 NSTM specification

- 1.2.1 The validated base year model which the NSTM forecasts were based on in this report is 2013. The base year model was re-validated in 2014 to inform the assessment of the Chowns Mill (A45 / A6) roundabout for the Highways Agency. The associated Local Model Validation Report (LMVR) is available dated September 2014
- 1.2.2 The NSTM was run for a forecast year of 2031 with an AM peak (0800-0900) and PM peak (1700-1800) model for multiple scenarios detailed in Section 2.
- 1.2.3 SATURN version 11.2.05 is the highway modelling software package used within the NSTM. EMME version 3.1 is used for the public transport and demand model element of the NSTM.

1.3 Report

- 1.3.1 This report is split into the following sections
 - Model inputs (Section 2)
 - Model results (Section 3)
 - Conclusion (Section 4)

1.4 Conclusions and recommendations

- 1.4.1 This report outlines a number of junctions which the NSTM 2031 results suggest will experience congestion problems in the future. Section 4 of the report outlines local junctions which continue to show congestion problems despite the inclusion of the draft Infrastructure Delivery Plan (IDP) in the NSTM. Further analysis of the junction designs in question and their input into the NSTM may be required.

2 Alterations made to previous modelling

2.1 Kettering housing numbers

- 2.1.1 Scenario 2 from the previous modelling was re-tested with alterations made to the balance of housing within the Borough of Kettering. Between 2011 and 2031 the LPA estimated there would be an increase of 10,400 dwellings. Of this increase, 1,204 dwellings were already included in years covered by the NSTM base year model. The remaining 9,196 dwellings were split into five areas within the area covered by the Kettering LPA. Table 2.1 details the alterations made to the dwelling numbers in each area of Kettering borough.

Table 2.1: TEMPRO vs Scenario 2 employment comparison

Settlement	Previous NSTM modelling (dwellings)	Revised NSTM modelling (dwellings)
Burton Latimer	690	1,043
Desborough	1,256	1,203
Kettering (including Barton Seagrave)	5,896	5,473
Rothwell	1,112	1,052
Rural	242	424
Total	9,196	9,196

2.2 Network changes

- 2.2.1 Following comments from Northamptonshire County Council regarding the modelling in the 'Northamptonshire Strategic Transport Model (NSTM): Traffic Forecasting Report: NNJPU Core Strategy Assessment'. The following alterations were made to the NSTM network:
- Appleby Lodge – previously modelled generically as loading traffic onto Sywell Road between Moonshine Gap and Rutherford Drive. A proposed roundabout access on Sywell Road for this development was included in the revised modelling based on a design by Peter Brett Associates (PBA) dated 09/01/2013, drawing number 21728/001/018.
 - A43 Stamford Road / Stamford Road / Priors Hall development roundabout – a review of the saturation flows at this roundabout showed the previous modelling assumed this junction to be a mini-roundabout. At present, this roundabout is significantly larger than this, increased capacity was included at this junction in the revised modelling.
 - A509 Niort Way / A509 Park Farm Way / Sywell Road roundabout – generic saturation flows were included at this junction in the previous modelling. A preliminary design produced by Colin Buchanan on behalf of Bee Bee Developments indicated three lane approaches are proposed for all arms at this roundabout. These proposals were included within the revised NSTM modelling alongside an appropriate increase in capacity at this junction.
 - Isham Bypass / IWIMP / A509 junctions – in the absence of detailed designs along these sections of proposed infrastructure, the proposals at the A509 Niort Way / A509 Park Farm Way / Sywell Road roundabout were taken as a template to change the assumptions at major junctions, namely increasing lane approaches and saturation flows to accommodate three lanes as in the previous modelling two lane approaches were widely assumed. The following junctions included additional capacity in the revised modelling:
 - Isham Bypass / A509 Kettering Road roundabout
 - Isham Bypass / Hilltop Road roundabout

- Isham Bypass / IWIMP roundabout
 - IWIMP / A509 Niort Way roundabout
 - A509 Park Farm Way / Rutherford Drive roundabout
- The Wellingborough Inner Relief Road was removed from the NSTM following advice from NCC it is no longer a proposed infrastructure change. This is listed as 'W25' in page 15, Table 2.17 of the 'Northamptonshire Strategic Transport Model (NSTM): Traffic Forecasting Report: NNJPU Core Strategy Assessment.'
 - Link capacity constraint removed on the A43 and A6003 Rockingham Road on links immediately north and south of the A43 / A43 Corby Link Road / A6003 Rockingham Road / Grange Road roundabout as these links are short (up to 600m) and therefore link capacity constraints relating to speed flow relationships are less appropriate. Link capacity constraints are meant to replicate the behaviour of traffic on longer routes where traffic maintains a constant speed, shorter sections of road between junctions will not show the same driving behaviour as traffic has to accelerate and decelerate rapidly between junctions meaning link capacity constraints can sometimes be removed as junction capacity is a more important factor.

3 Model results

3.1 Scenario 2 re-run - Corby

- 3.1.1 Figures 3.1 and 3.2 detail the V/C ratios at congested junctions within Corby in the 2031 AM peak and PM peak Scenario 2 model re-runs.
- 3.1.2 Due to the increased capacity included at the A43 Stamford Road / Stamford Road / Priors Hall development access roundabout (node 1212), the A43 Stamford Road no longer shows capacity issues in the vicinity of this junction, falling below 75% V/C
- 3.1.3 The following roundabouts continue to show highly significant congestion problems:
- A43 Stamford Road / A6116 Brigstock Road / A4300 Stamford Road / Long Croft Road / Corby Link Road roundabout (node 1206 – AM and PM peak)
 - A427 Oakley Road / A427 Weldon Road / A6080 Geddington Road / Lloyds Road roundabout (node 1201 – PM peak only)

3.2 Scenario 2 re-run – East Northamptonshire

- 3.2.1 Figures 3.3 and 3.4 detail the V/C ratios at congested junctions within East Northamptonshire in the 2031 AM peak and PM peak Scenario 2 model re-runs. Compared to the previous modelling there is no significant change to the V/C results.

3.3 Scenario 2 re-run - Kettering

- 3.3.1 Figures 3.5 and 3.6 shows the V/C values for junctions within Kettering LPA. The alterations to the housing totals for the various locations in Kettering does not have a significant impact on the NSTM results. Near to the boundary with Corby, the other end of the Corby Link Road; A6003 Rockingham Road / Corby Link Road / Newton Road roundabout (node 1034) continues to show highly significant V/C values of over 100% in both peaks, in the AM peak due to the A6003 northern approach (continuing through the A6003 Rockingham Road / Station Road junction – node 26001), whilst in the PM peak the southern A6003 approach shows the greatest problem.
- 3.3.2 Capacity issues on the Isham Bypass have been reduced in both peaks for the Isham Bypass / A509 Kettering Road roundabout due to in the inclusion of additional lanes and capacity. In both peaks these junctions show significant congestion between 85-100% V/C, improving from the previous modelling in which V/C was over 100%.

3.4 Scenario 2 re-run - Wellingborough

3.4.1 Figures 3.7 and 3.8 shows the V/C values for junctions within the boundary of Wellingborough LPA. There is notable improvement in performance of junctions along the Isham Bypass / IWIMIP / A509 corridor, in the PM peak only the Isham Bypass / Hilltop Road roundabout (node 28043) shows significant congestion with V/C between 85-100%, whilst the Isham Bypass / IWIMIP roundabout (28038) is between 75-85%. The remaining junctions along this route fall below 75% V/C in the PM peak. In the AM peak, there is improved performance at the Isham Bypass / Hilltop roundabout (node 28043) and A509 Park Farm Way / Rutherford Drive (node 10432). However the following show the same level of congestion as the previous modelling between 85-100% VC:

- Isham Bypass / IWIMIP roundabout (node 28038)
- IWIMIP / A509 Niort Way roundabout (node 28037)
- A509 Niort Way / A509 Park Farm Way / Sywell Road roundabout (node 10431)

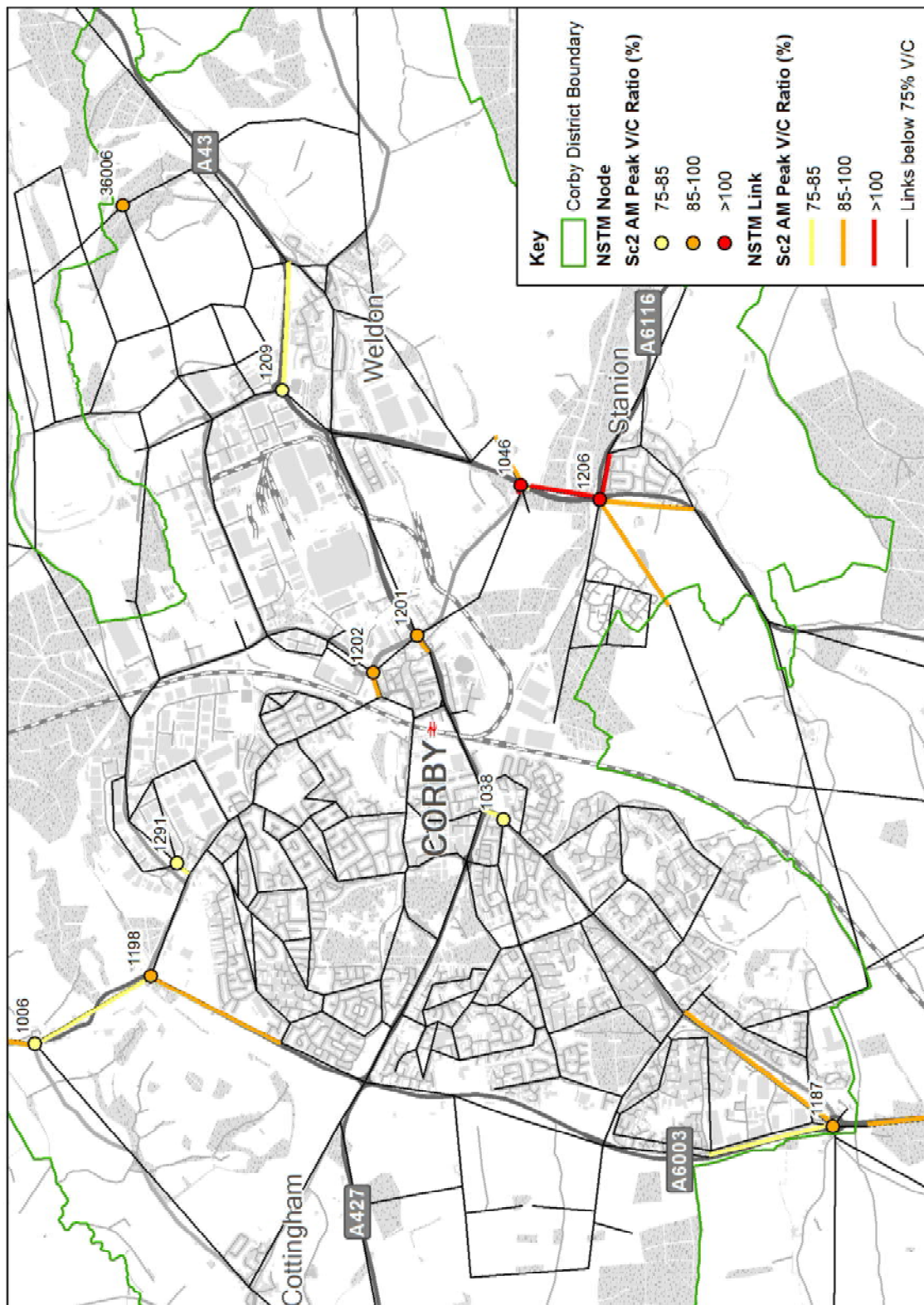


Figure 3.1: Scenario 2 V/C – 2031 AM – Corby

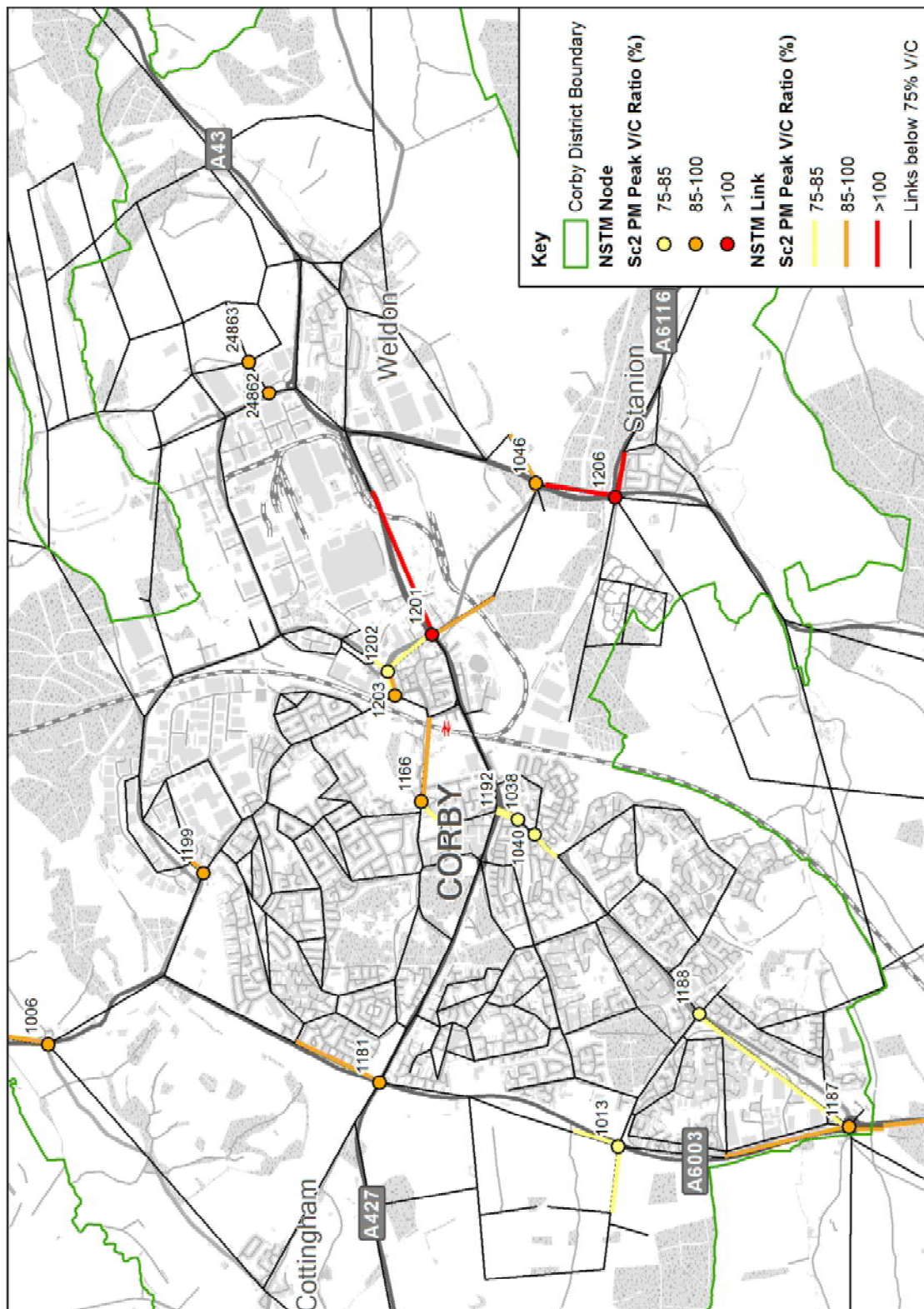


Figure 3.2: Scenario 2 V/C – 2031 PM – Corby

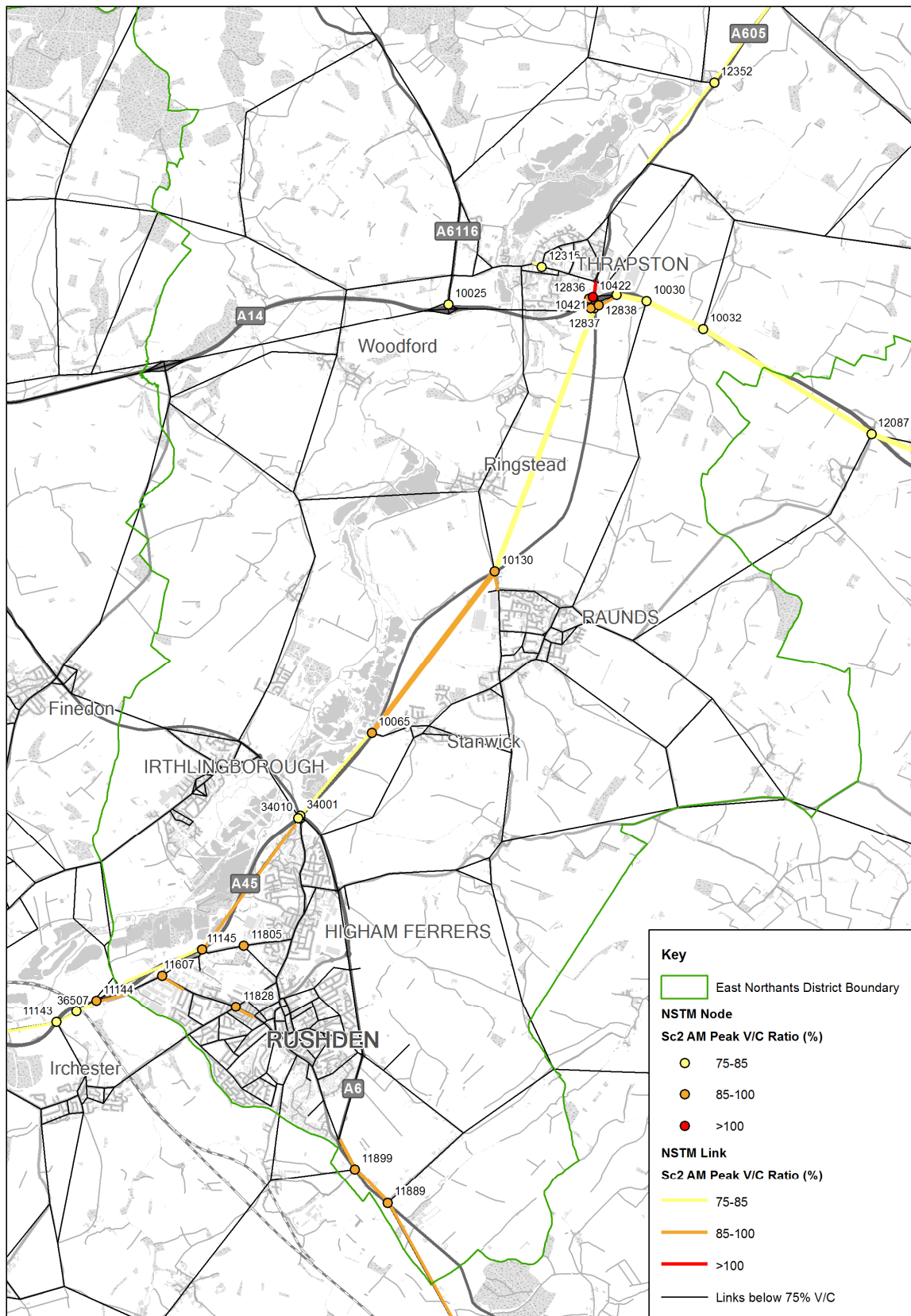


Figure 3.3: Scenario 2 V/C – 2031 AM – East Northamptonshire

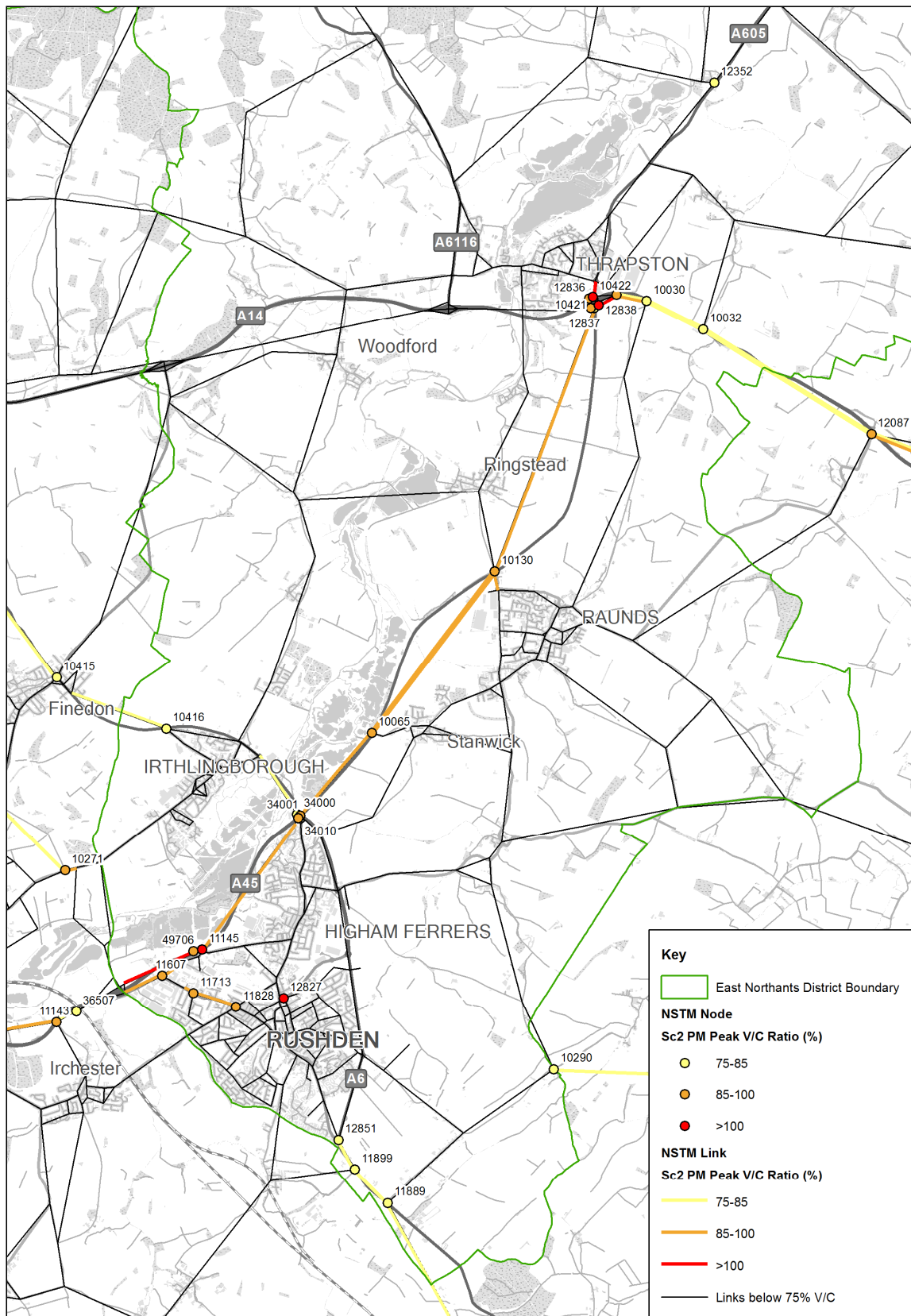


Figure 3.4: Scenario 2 V/C – 2031 PM – East Northamptonshire

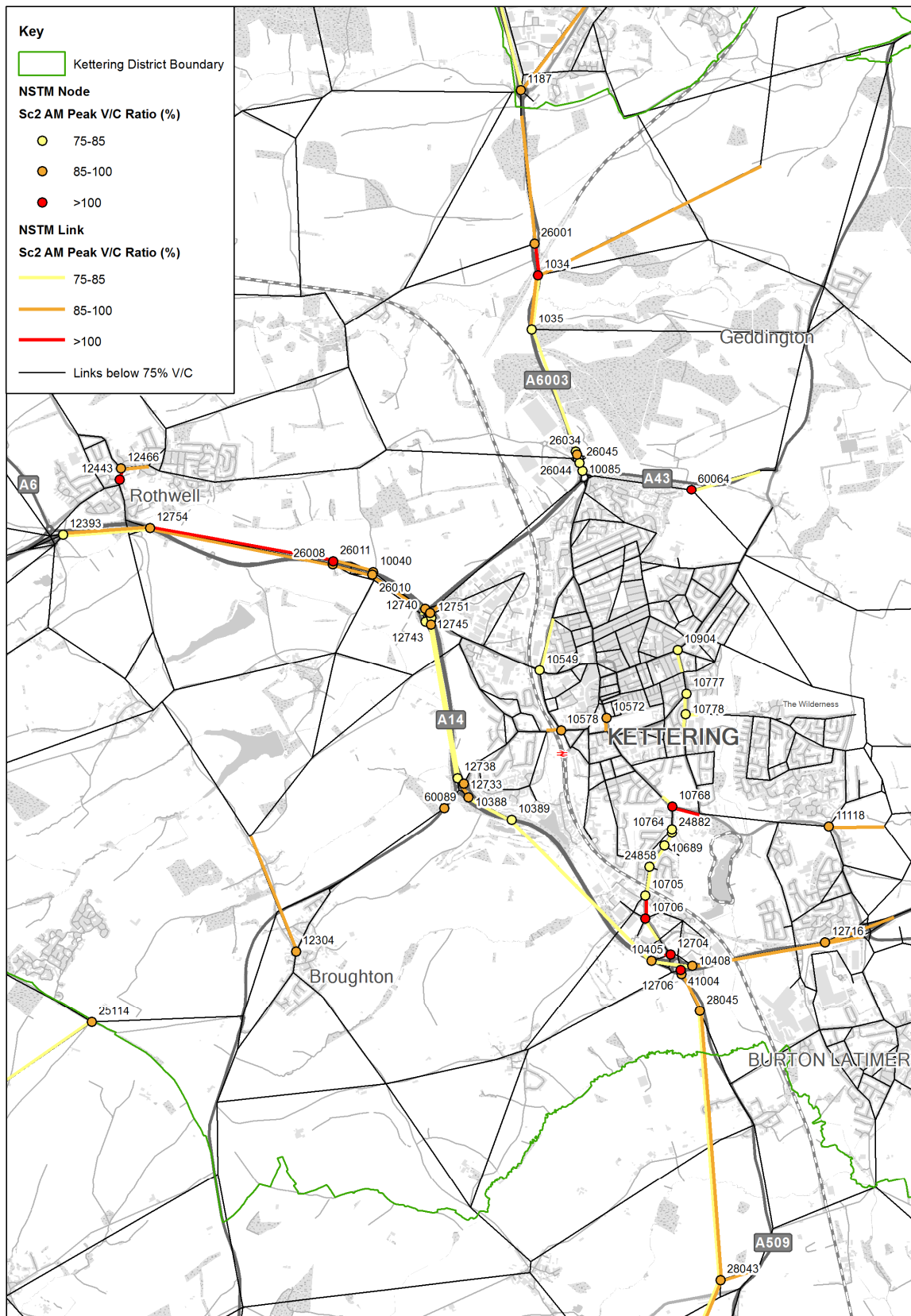


Figure 3.5: Scenario 2 V/C – 2031 AM – Kettering

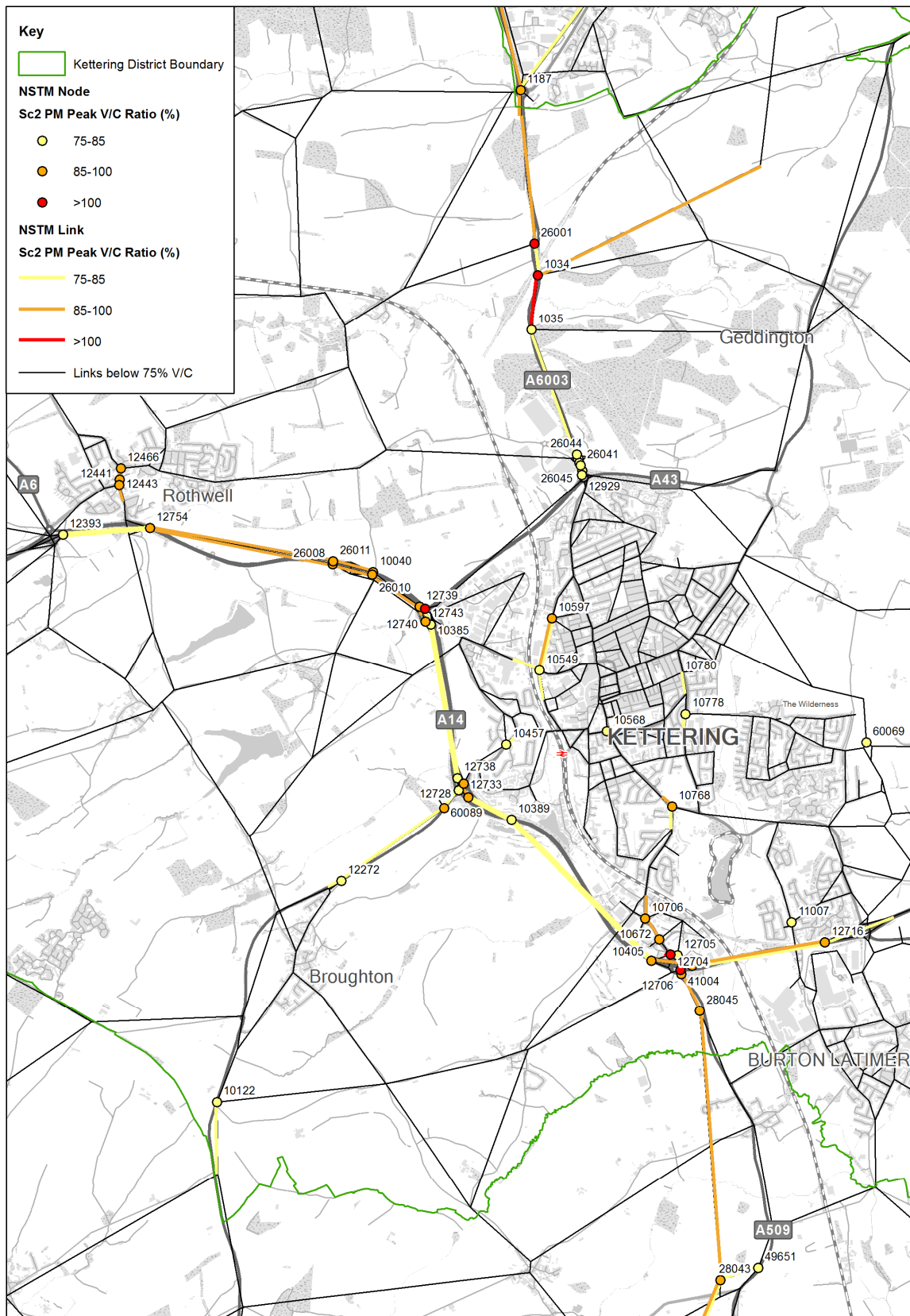


Figure 3.6: Scenario 2 V/C – 2031 PM – Kettering

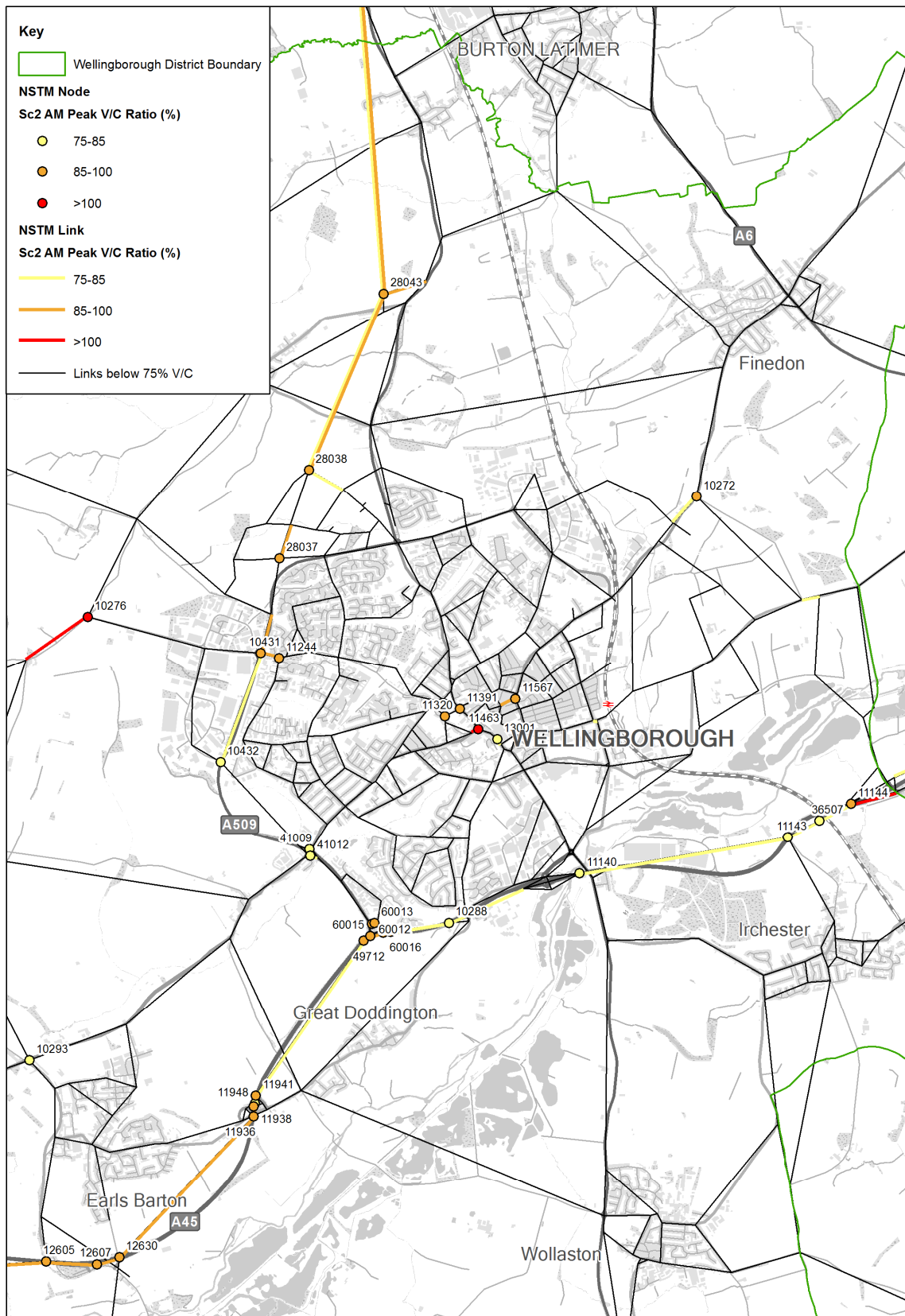


Figure 3.7: Scenario 2 V/C – 2031 AM – Wellingborough

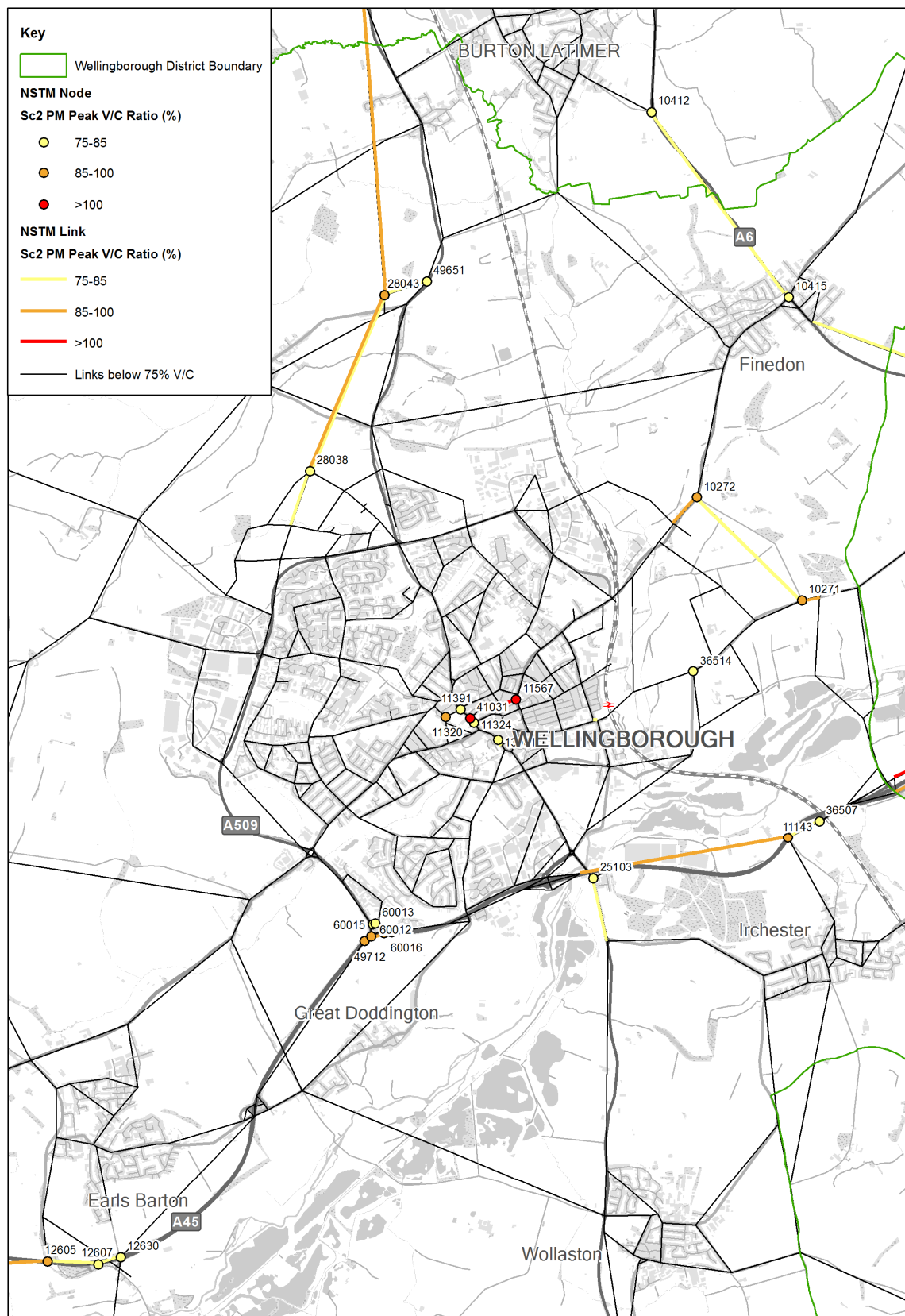


Figure 3.8: Scenario 2 V/C – 2031 PM – Wellingborough

4 Conclusions

- 4.1.1 Scenario 2 was re-run with amendments made to the housing distribution with the Borough of Kettering. Network changes were also made at junctions showing congestion in the previous modelling and for junctions where additional information was supplied.
- 4.1.2 Both junctions on the A43 Corby Link Road continue to show congestion problems based on 2031 forecasts of traffic within the model. An initial review of the coding at these junctions within the NSTM shows it to be appropriate and to include a suitable level of capacity, so further, more detailed investigation and junction modelling is required to understand the reasons for performance issues at these junctions. A review of the coding at these junctions within the NSTM showed it to be appropriate and to include a suitable level of capacity. The results of future detailed junction modelling could be replicated in the NSTM to re-assess the performance of these junctions:
- A6003 Rockingham Road / Corby Link Road / Newton Road roundabout
 - A43 Stamford Road / A6116 Brigstock Road / A4300 Stamford Road / Long Croft Road / Corby Link Road roundabout
- 4.1.3 The modelling within this report indicates improvements to the performance of junctions on strategic routes between Wellingborough and Kettering. However congestion is still apparent along the following routes.
- A14 Junction 9
 - Isham Bypass
 - IWIMP
 - A509 Niort Way / Park Farm Way
- 4.1.4 Further analysis of junctions along these routes will be required to establish whether junction improvement designs and/or detailed junction models are needed.

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