Dear Ms Waye,

**SKDC SAP – ADDITIONAL MATTER – HIGHWAYS + JACOBS STAMFORD TRAFFIC MODEL**

Our Chamber has in its representations made on 18th November 2011 set out its views on highways and connected issues including the JMP work on behalf of our Chamber and the Jacobs Stamford Traffic Model funded by County Highways.

We now provide in Appendix V supplemental material which

1. Sets out correspondence with County Highways on the preparatory work being carried out by Jacobs on their Stamford Traffic Model. (See Appendix V 1.)

2. Provides Note 2b which is a 7th October 2011 Assessment of Jacobs Stamford Traffic Modeling which provides compelling evidence that the Jacobs Stamford Traffic Model is not fit for purpose. (See Appendix V 2.)

3. Is the Jacobs Stamford Traffic Model February 2010. (See Appendix V 3.)

We invite the Inspector to read Appendix V.

Jacobs Stamford Traffic Model is also not fit for purpose for eight additional reasons:

a. It ignores even the possibility of a development-funded ring road, and so gives no thought to the relative merits of the sites in this context.

b. It considers only traffic flows during morning and evening peak hours and consequently ignores a multitude of journeys made in Stamford which are predicated on the location of individual school and college campuses, supermarkets, retail parks, car parks. Most of these are located at the eastern end of the town such that for people living in housing at the eastern side of Stamford, these facilities can be accessed on foot or by bicycle or bus, whereas for people in housing at the western side of Stamford a car journey is inevitably.

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c. It appears to suggest that people living in Stamford when travelling to Peterborough will all travel by car when there is an increasingly busy hourly train service in both directions, with Peterborough Station being well located in the city centre.

d. It appears that the various minor routes between Peterborough and Stamford via Barnack, Bainton, Southorpe, Marholm and other villages are omitted from the Jacobs model. This has the effect of forcing the not insignificant traffic onto either the A1 or the A16/A15.

e. It seems likely that Jacobs have assigned a higher average flow speed on the A1, compared to the A16/A15 route. This means that the model will assign to the A1 a disproportionate share of the total traffic between Stamford and Peterborough.

f. Because Jacobs have not modelled the operation of Peterborough’s road network in detail with its traffic origins and destinations and pinch points, the Jacobs assumptions made about these Stamford/Peterborough flows are likely to be false.

g. It also appears to suggest that all car trips to and from say Peterborough use the A1 and thus cross through Stamford in the peak hours. In reality, this is far from being the case. Significant numbers of such trips use for preference the A16/A15, or via the many village routes referred to in d. above. This is because of Stamford’s major congestion at Stamford Town Bridge and the other two sets of traffic lights, but also congestion on the various approaches to Peterborough during the traffic peaks. Certain parts of Peterborough are best accessed from certain parts of Stamford, However there is no single general rule saying all trips use the A1.

h. Jacobs appear not have taken on board the basic issue that Stamford’s traffic flows are multi directional. In respect of traffic in the Base Year of 2009, the facts taken from Figure A-1 (from their report titled “Stamford Traffic Model Traffic Forecasting Results Report - Evaluation of Urban Extension Sites” of February 2010) show that the rankings of traffic flows across the 8 principal routes to and from Stamford during the period 8.00 am to 9.00 am are:

<table>
<thead>
<tr>
<th>Rank</th>
<th>Route</th>
<th>Inbound</th>
<th>Outbound</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Uffington Road</td>
<td>670</td>
<td>429</td>
<td>1,099</td>
<td>18%</td>
</tr>
<tr>
<td>2.</td>
<td>Ryhall Road</td>
<td>669</td>
<td>255</td>
<td>924</td>
<td>15%</td>
</tr>
<tr>
<td>3.</td>
<td>Tinwell Road</td>
<td>473</td>
<td>428</td>
<td>901</td>
<td>15%</td>
</tr>
<tr>
<td>4.</td>
<td>Kettering Road</td>
<td>427</td>
<td>320</td>
<td>747</td>
<td>12%</td>
</tr>
<tr>
<td>5.</td>
<td>Gt Casterton Road</td>
<td>372</td>
<td>334</td>
<td>706</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>(Old A1 northbound)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Old A1 southbound</td>
<td>328</td>
<td>360</td>
<td>688</td>
<td>11%</td>
</tr>
<tr>
<td>7.</td>
<td>Empingham Road</td>
<td>329</td>
<td>335</td>
<td>664</td>
<td>11%</td>
</tr>
<tr>
<td>8.</td>
<td>Barnack Road</td>
<td>226</td>
<td>139</td>
<td>365</td>
<td>6%</td>
</tr>
</tbody>
</table>

Total AM peak 3,494 2,600 6,094

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We believe we have more than demonstrated that the Jacobs Stamford Traffic Model is not fit for purpose.

This work by SCOT has shown that the proposed allocation of sites cannot be substantiated in terms of the highway issues. As a result, the methods used in the selection of sites for allocation renders the SAP unsound. It is not 'Justified' as:

A. The selection of SKLSCS 2011 Sites proposed to be allocated is not founded on a robust and credible evidence base, and

B. The sites selections are not the most appropriate “strategy” when considered against the reasonable alternatives.

Furthermore:

C. One reasonable alternative, that proposed by SCOT, has not even been considered for inclusion in the selection process.

We invite the Inspector to consider these points, which we consider render the SAP unsound.

Yours sincerely,

Eg. Gilman

F E GILMAN
For Stamford Chamber of Trade & Commerce

01780 482 962 office
0796 833 5725 mobile

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Stamford: The Finest Stone Town in England
1 May 2009

Brian Thompson Esq
Divisional Highways Manager
Lincolnshire County Council
Annex 'C'
Eastgate
Sleaford
NG34 7EB

Dear Mr Thompson

LTP2 - SCHEMES UNDER INVESTIGATION - FEASIBILITY WORK - STAMFORD BYPASS/RELIEF ROAD

It is pleasing to see that Jacobs are on the case and doing a Traffic Survey at Stamford.

We understand from Paul Cawthorne at JMP that it seems they are likely to create a new computer model of Stamford traffic flows, which seems a good idea.

As we have been active in funding work on these issues resulting in JMP's concept for a Stamford Eastern Relief Road, please be aware that we will be pleased to assist this work if appropriate. However, we do not wish to prejudice the independence of Lincolnshire Highways or Jacobs.

Also, having spent some time recording the exact whereabouts of the various traffic recording devices being used by Jacobs, we are surprised by the absence of traffic counting at 6 locations, set out in the attached schedule of locations.

It seems essential to us that for this work to be meaningful, these 6 locations must be traffic counted.

Yours sincerely

Eg. Gilman

EGERTON GILMAN

01780 484888

Stamford: The Finest Stone Town in England
List of LCC/Jacobs Traffic Monitoring Locations observed to be in operation on 28 April 2009:

(“beyond” / “outside” means further from, and “before” / “inside” means nearer to Stamford Town Centre)

A. Locations with “rubber tube” Traffic Counter, plus (on 28 April only) 3 cameras per location performing general video monitoring and (?) number-plate recognition:
   1. B1081 Old Great North Road Before Toll Bar / beyond road to Little Casterton / Tolethorpe
   2. A606 Empingham Road Beyond junction of Arran Road / before A1 slip road
   3. A6121 Tinwell Road Beyond junction of Exeter Gardens / before A1 slip road
   4. A6121 West Street Immediately West of Scotgate Traffic Lights
   5. A6121 North Street Immediately East of Scotgate Traffic Lights
   6. A6121 East Street At the Boys’ School Footbridge
   7. A6121 Ryhall Road At pedestrian crossing near Mini-Roundabout / St Pauls Street
   8. A6121 Ryhall Road Beyond Rutland Road / Gwash Way
   9. A16 Wharf Road Between junctions of St Leonards Street & Brasenose Lane
   10. A16 Uffington Road Beyond entrances to FHG / CWG / Meadow View
   11. A43 Kettering Road Just before junction of Wothorpe Second Drift
   12. B1443 Barnack Road Beyond furthest entrances to Cummins / Newage works
   13. B1081 London Road Beyond junction of Wothorpe First Drift
   14. Town Bridge Immediately North of Water Street / Station Road Traffic Lights
   15. Scotgate Between Red Lion Square and junction of All Saints Street

B. Locations with “rubber tube” traffic count only
   1. Road between Toll Bar and Little Casterton

C. Locations with a single camera performing continuous video monitoring of the general area:
   1. Roundabout at Morrison’s / St Pauls Street / Priory Road / Uffington Road
   2. Mini-Roundabout at St Pauls Street / Ryhall Road
   3. Traffic Lights at East Street / St Pauls Street / Brasenose Lane

D. Locations with manual traffic count / turning count / vehicle classification
   1. Water Street / Station Road traffic lights.

E. Significant locations without any traffic counting in evidence:
   1. Little Casterton Road between Stamford and Little Casterton
   2. Sidney Farm Lane between Old Great North Road and A1 slip road from Empingham Road
   3. Road between Little Casterton and Ryhall
   4. Road between Ryhall and Belmesthorpe
   5. Road between Belmesthorpe and Newstead
   6. Casterton Lane between Tinwell and A1 slip road from A606 Empingham Road
Dear Mr Gilmour,

**STAMFORD TRAFFIC MODEL DEVELOPMENT**

Thank you for your email and enclosures dated 1st May. I have now received comments from our consultants on the suggestions put forward on the need for additional survey work.

The development of the Stamford model took into consideration the key issues that had been identified in the town and the strategic requirements of the area. The study area/scope of the model is focused on addressing strategic demand on and through the Stamford road network. This approach guided the planning of the traffic survey sites.

In this light, the following comments are made to the issues raised:

1) A junction count was performed on Monday 27 April 2009 at the junction of the B1081 Casterton Road in Stamford and Little Casterton Road. This junction count would allow the consultants to adequately quantify the impact of traffic between Stamford and Little Casterton on the Stamford road network.

2) This road section was not surveyed, but the junctions of the slip roads from/to the A1 and Empingham Road were surveyed. Whilst this road section can be expected to carry traffic from the west of Stamford and Great Casterton to and from the A1, it is not expected to have a strategic impact on travel patterns through Stamford. Furthermore, the combination of the traffic surveys and Highways Agency count data should allow us to adequately model traffic movements along Casterton Road, Empingham Road and Sidney Farm Lane.

3) The road sections north of the built environment of Stamford have not been included in the model scope. The focus of the model study area is to describe travel patterns and demand in and through Stamford and not the existing demand between Little Casterton and Ryhall. However, the flows along Toll Bar Road were surveyed in order to establish the link between flows in Stamford and north of the town. Traffic flows in the order of 400 vehicles in the peak hour (both directions combined) were observed from this count point.

...cont'd...
4) Similarly to Point 3, this section of roadway has not been included in the model.

5) It is felt that the traffic demand that is currently using the Newstead Road link between Ryhall and Uffington would be unlikely to be affected by strategic changes to the Stamford road network. As a result, this section of roadway has not been included in the model study area.

6) The model study area extends to the A1 in the west, but not beyond. This section of roadway would need to be addressed on a local level in a separate investigation. The model is being built as a tool to assess strategic changes to the network and the impact of changes to congested sections through the town centre. As such, not all the areas on the outer perimeters of the model will be described in the same detail as the built up areas of the town.

We do recognise the importance of having a robust model that can be used to look at bypass and relief road options but can also be used in the future to assess the highways effects of development proposals and we therefore have agreed to perform an investigative survey (a manual number plate survey) to assess the current traffic movements from Uffington Road (east of Newstead Road) to Old Great North Road via Little Casterton.

Yours sincerely

Brian Thompson
DIVISIONAL HIGHWAYS MANAGER

County Offices, Newland, Lincoln, LN1 1YL
www.lincolnshire.gov.uk
12 June 2009

Brian Thompson Esq
Divisional Highways Manager
Lincolnshire County Council
Annex 'C'
Eastgate
SLEAFORD
NG34 7EB

Dear Mr Thompson

LTP2 - SCHEMES UNDER INVESTIGATION - FEASIBILITY WORK - STAMFORD BYPASS/RELIKE ROAD
STAMFORD TRAFFIC MODEL DEVELOPMENT - YOUR REF: BT/426/1900/HN

Thank you for your letter dated 18 May 2009.

We note the comments made. However, we repeat that unless the six locations detailed in the schedule attached to our letter of 1 May 2009 are traffic counted, we do not believe an accurate picture of traffic flows and patterns in and around our Town will result from Jacobs' survey work. It will be flawed and open to challenge.

We also note the repeated use of the word 'strategic' in your reply. The implication is that the planning of the study was conceived to take a global overview of traffic movements through Stamford from a major road on one side, to a major road on the other side of the town, rather than looking in particular detail at the significant number of local point-to-point journeys between different areas of the town itself which have a significant impact on town centre congestion as previously identified by JMF. As you and Jacobs must know, these 'well established' journeys around the town are undertaken specifically to avoid traffic congestion in its centre.

Unless the peripheral roads are surveyed in a comprehensive and detailed manner, one cannot gain a proper understanding of how traffic avoids town centre congestion in Stamford, and the increasingly important role which these very narrow unsuitable country lanes are having to play in the absence of a proper peripheral distributor road system much nearer the heart of the town.

There is little point in building a complex computer model of traffic flows if significant arteries and veins are omitted, particularly where these provide cross-over links between the main arterial roads or bypasses to local bottlenecks.

We therefore repeat our request for the additional survey work.

Yours sincerely

EGERTON GILMAN
01780 484888

Stamford: The Finest Stone Town in England
Dear Mr Gilmour

RE STAMFORD TRAFFIC MODEL DEVELOPMENT

In response to your comments included in a letter dated 12 June 2009 my consultants Jacobs have provided the following response:

Jacobs does not believe that the exclusion of the count locations indicated in your original letter dated 1 May 2009 would result in a model that is flawed and open to challenge. The motivation for this is indicated in a discussion of each of the six locations as indicated below:

1) As indicated previously, a junction count was performed on Monday 27 April 2009 at the junction of the B1081 Casterton Road in Stamford and Little Casterton Road. Jacobs is confident that this will provide adequate input into the model development to describe the existing demand to and from Little Casterton along this link.

2) As indicated previously, this road section was not surveyed, but the junctions of the slip roads from/to the A1 and Empingham Road were surveyed. This road section can be expected to carry traffic from the west of Stamford and Great Casterton to and from the A1, and could include traffic that has diverted north past the town from the A16 towards Uffington. The combination of the traffic surveys performed at the A1 terminals, Highways Agency count data along the ramps, link counts into and out of Stamford along Empingham Road and the recently completed survey of traffic diverting around the north of Stamford will provide Jacobs with adequate information to model this section of the model with confidence.

3) The road sections north of the built environment of Stamford have not been included in the model scope. Whilst there may be a significant amount of traffic using Newstead Road to bypass Stamford along routes northbound past Ryhall (although journey time surveys don’t support this), this demand would not be included under the consideration of schemes in and for Stamford, as this traffic bypasses the town currently and would be expected to continue to do so in the future.

cont’d...
Any particular road network changes required at junctions in and around Belmesthorpe should be addressed in a separate study which includes consideration of turning counts and junction layouts at these locations. Any subsequent improvements would affect only traffic bypassing the town currently or in future, and not traffic travelling into or through Stamford.

Furthermore, Jacobs have performed an investigative survey into the existing flows around the north of Stamford to the A1 at the junction with Empingham Road. These surveys captured traffic from the A18 Uffington Road which travels along Newstead Road or Ryhall Road up to the link between Belmesthorpe and Little Casterton and then down to Stamford via Toll Bar. This traffic then either travels into Stamford/A1 southbound or along Old Great North Road to the A1 northbound. The surveys indicate that less than 20 trips perform this trip in either direction during the AM and PM peak periods, which does not represent a significant latent demand.

Investigation into the travel times along Ryhall Road indicate that Newstead Road would not be a more attractive alternative route into Stamford from Ryhall and existing traffic from Newstead Road joining the A16 from Uffington is assumed to be local traffic from Belmesthorpe.

4) Refer to Point 3.

5) Refer to Point 3.

6) The model study area does not extend past the A1 in the west. Any road network changes in this area of the network would only affect the local traffic operations and not route selection for persons travelling in or through Stamford.

In your letter dated 12 June 2008 you refer to "local point-to-point journeys between different parts of the town itself which have a significant impact on town centre congestion". The focus of the Jacobs modelling effort is to build a model describing the town centre and the journey patterns which influence demand and resulting congestion through the bottlenecks in the town centre. This will be done by modelling the town centre and key junctions in detail and modelling the trip patterns in and through the town in detail. Hence, the junction counts and other data collection effort have been focussed on these elements, and have been supplemented with a survey to describe traffic diverting around the north of the town.

Yours sincerely

Brian Thompson
DIVISIONAL HIGHWAYS MANAGER
17 August 2009

Brian Thompson Esq
Divisional Highways Manager
Lincolnshire County Council
Annex 'C'
Eastgate
Sleaford NG34 7EB

Dear Mr Thompson

LTP2 - SCHEMES UNDER INVESTIGATION - FEASIBILITY WORK - STAMFORD BYPASS/RELIEF ROAD
STAMFORD TRAFFIC MODEL DEVELOPMENT - YOUR REF: BT/426/1914/HN

Thank you for your letter of 15 July in response to mine of 12 June 2009. I refer to your numbered paragraphs:

1) A count at the junction of the B1081 Casterton Road in Stamford and Little Casterton Road (where there are now unwanted, un-needed traffic lights) will provide no data on the existing demand to and from the Little Casterton - Stamford link.

2) Contrary to the assertions contained in the equivalent paragraph of your letter of 18th May, your consultants now admit they have done 'a recently completed survey of traffic around the North of Stamford'. Please provide full details of what was recently surveyed.

3), 4) and 5). The model scope must include the road sections north of the built environment of Stamford for the work being undertaken by Jacobs to be of any value.

6) The model study area must include the roads past the A1 in the west.

Considering other points:

a. It may be that the Specification prepared by Lincolnshire County Council for Jacobs to carry out the works is itself defective. Please provide a copy of this Specification.

b. As you are aware when JMP undertook the modelling work for our Chamber in 2004, the original JMP/LCC SATURN Model that was developed in 1989 was updated. That model was not extended, nor was the original trip matrix updated with new origin and destination matrix.

c. In our view given that the original O-D matrix is now some 20 years old and that there has been substantial amounts of residential development in the north west sector of the town (either side of Sidney Farm Lane) and additional retail development on the eastern fringe (Ryhall Road), we would expect the highway authority to undertake new surveys to determine the current travel patterns in and around the town. Are Jacobs starting the model afresh or utilising some of the old model?

Continued over.../
d. The original nine (Autumn 1989) roadside interview sites were located on the main approaches within the town (east of Al and west of Newstead). Do you know if Jacobs have undertaken any new roadside interviews or have they used Automatic Number Plate Recognition (ANPR) techniques? Please provide a copy of the Report of Survey, which should explain what type of surveys have been undertaken, where and when.

e. During the consultation period on our JMP Stamford Traffic and Highway Study in April 2005 there was comment from some members of the public, particularly from the Stamford Bypass Group and residents of the Sidney Farm area, that we had not cast the study area wide enough and thus our study was somewhat deficient. Some expressed the view that the credibility of our work was undermined by this deficiency.

f. In semi-rural locations, such as the area around Stamford, it may be that some drivers perceive they are making progress by keeping moving even by using country lanes that result in a longer journey length and possibly a longer journey time. Whilst such numbers of trips might be relatively small, if some form of bypass or relief road is pursued such provision could indeed attract those drivers back into the town.

g. In view of the criticism, a new study model of traffic in Stamford should include all possible outer routes if only to dispel (or prove) the local perceptions that significant numbers of drivers currently seek to avoid congestion within the town and drive around it, whether they are passing through or seeking to access an opposite part of the town.

h. With the benefit of hindsight, if we were to revisit our 2004 JMP work now, we would extend the model network to include the following routes that skirt around the town:-

- North and East - Al6 Uffington - Newstead - Belmesthorpe - Little and Great Casterton - Al via Newstead Road and Toll Bar Lane.
- South - Al6 Uffington - Barnack - Al via Uffington Road and Barnack Drift south of Burghley Park.
- West -
  (a) the Al between A606 Empingham Road junction and A43 Kettering Road junctions; Al between A6121 Tinwell Road junction and A43 Kettering Road.
  (b) Tinwell - Empingham Road - Great North Road via Casterton Lane, and
  (c) Stamford Road - Empingham Road - Great Casterton via Steadfold Lane

Also within Stamford we would model

- Radcliffe Road, New Cross Road and Drift Road;
- Cambridge Road, Edinburgh Road, Kesteven Road and Lincoln Road;
- Recreation Ground Road; Kings Road and Green Lane;

This all would, of course, require data collection in the form of additional junction turning counts at the intersections of these routes with radial routes into the town and some ANPR matching for O-D purposes, but once the data was collected it would not be difficult to model these routes in buffer mode.

Continued over...
We think this work is essential in order to stave off any criticism from the public that the study area was 'too focussed' on the town centre and 'missed' journeys around the town.

We are not satisfied by your or Jacobs' responses to date. To ensure the integrity of the Stamford Bypass/Relief Road feasibility work it is essential that the parameters of this vitally important study are extended as we have outlined. Otherwise the outcome will be flawed and any conclusions drawn from the derived data will be worthless.

We are conscious that the only 'season' remaining in 2009 for traffic surveying etc. is say mid-September to say mid-October. Thus the necessary work described above needs to be put in hand immediately so that it can be done this Autumn.

Yours sincerely

Eg Gilman

F E Gilman
Dear Mr Gilman,

**RE: STAMFORD TRAFFIC MODEL DEVELOPMENT**

In response to your comments included in a letter dated 17 August 2009 my consultants Jacobs have provided the following response:

With reference to the various points raised in your recent letter, (referring to the numbering of the paragraphs in your letter), our response is as follows:

1) Please refer to our previous correspondence on the traffic count performed at this junction and to point 3, below. Jacobs considers the junction count to be adequate to describe demand from Little Casterton Road into the Stamford road network along B1081 Casterton Road.

2) Following your previous comments a number plate survey was undertaken on Wednesday 17 June 2009 along the A16 Uffington Road and Toll Bar to determine the volume of traffic diverting around the north of Stamford (through Belmes Thorpe and Little Casterton) to reach the B1081 Old Great North Road. Furthermore, a count of the turning movements at the junction of Newsstead Road and the A16 Uffington Road was performed.

3) Whilst the focus of the model is on the urban area, the model network does include the wider road network around Stamford. The model includes all the alternative routes around Stamford, including all those routes listed in our previous correspondence. The model simulates the trips made along these routes. Please see the attached network diagrams which indicate all the road links included in the model.

4, 5, 6) Please refer to point 3 above.

As to the further points raised in the letter (a to h) we note the comments. Please refer to our response as per point 3, in addition, a number of specific questions have been asked, and our response to these questions is presented below.

Point a. - Please find attached a copy of the consultants brief.
Point b. - Noted.
Point c. - No data from the previous model was used in the development of the new model.
Point d. - Automatic Number Plate Recognition (ANPR) surveys were applied to the eight major routes leading into town (east of the A1 and west of Newstead Road) and within the town centre. These sites were selected following a site visit to Stamford and consideration of the major routes into, out of and through the town. The ANPR sites along the routes leading into and out of the town were located outside the built-up areas of the town but east/north of the A1 junctions and west of Newstead Road and Barnack.

The information you have requested is contained in the Local Model Validation Report which is currently being finalised.

Point e. - Noted. The County Council are satisfied that the survey and resulting traffic model is sufficient for its needs.

Point f. & g. - The model includes all the road network links in and around Stamford. As such, all the likely route choices in are included and trips bypassing Stamford using these routes can be modelled. However, these wider routes have not been surveyed and the reasons for this are described in the conclusion below. It should be noted, however, that the model will be capable of quantifying the changes in journey length and journey time due to a new relief road/bridge for all the trips in the model which would affect the route choice of travellers.

Points h. - the suggested routes are noted, and the following comments made:

- North and east – these sections have been investigated by means of the manual number plate survey and the links are included in the model.
- South – the links are included in the model but have not been surveyed.
- West – the links are included in the model but have not been surveyed.
- Within Stamford – all the routes suggested are included in the Stamford model but only the junction of Drift Road and Ryhall Road has been included in the junction counts.

The focus of the Jacobs modelling effort is to build a model describing the town centre and the journey patterns which influence demand and resulting congestion through the bottlenecks in the town centre. The model includes the surrounding road network and models the same range of route choice as travellers have in the actual network.

With the development of any transport model, decisions must be taken during the planning of the model on which locations to perform new traffic surveys. Typically, traffic counts are focused upon those routes considered most important in developing a representative model, including routes which carry the highest traffic volumes through the study area. As such, not all the junctions and routes in the wider area and outskirts of the model would be counted. The costs of both counting these routes and determining the origins and destinations of trips along these routes (RSI’s or ANPR surveys would be required) would need to be weighed against the volumes of trips on the routes.
In summary I believe that the transport model will allow all possible bypass/relief road options to be investigated, and other potential developments to be evaluated.

Yours sincerely

Brian Thompson
DIVISIONAL HIGHWAYS MANAGER
The report titled “Stamford VISUM Model Development - Local Model Validation Report : Final Report” (September 2009) provides the following statistics, from the 2001 census:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Households: 9,590</td>
<td>Students 348</td>
</tr>
<tr>
<td>Car Ownership</td>
<td>8,836</td>
<td>Workplace population 11,157</td>
</tr>
<tr>
<td>Employed</td>
<td>8,842</td>
<td>(full-time + part-time)</td>
</tr>
</tbody>
</table>

The report titled “Stamford Traffic Model Traffic Forecasting Results Report – Evaluation of Urban Extension Sites” (February 2010) states that default TEMPRO growth corresponds to 1,876 new houses and 1,904 new jobs in Stamford from 2009 to 2026. Therefore, an average increase of 17% in traffic flows is an entirely reasonable expectation. (For example: 1,904 / 11,157 = 17.1% and 1,876 / 9,590 = 19.6%). And see also Table 3-G in the latter report, which confirms the average increase in growth to be 17% – 20%.

The data in the table below is taken from our analysis of the Jacobs February 2010 Report at Figures A-1 and A-7.

<table>
<thead>
<tr>
<th>Road Link</th>
<th>Section (From – To):</th>
<th>Flow</th>
<th>AM</th>
<th>PM</th>
<th>2009 Base</th>
<th>Scenario 2b (Diff %)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10 Biggest % Losses:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Pauls Street</td>
<td>Morrisons Roundabout – Mini Roundabout</td>
<td>WB</td>
<td>PM</td>
<td>592</td>
<td>235 (-60%)</td>
<td></td>
</tr>
<tr>
<td>Rutland Terrace</td>
<td>Foundry Lane - Roundabout</td>
<td>WB</td>
<td>AM</td>
<td>144</td>
<td>63 (-56%)</td>
<td></td>
</tr>
<tr>
<td>Toll Bar</td>
<td>Old Great North Road – Little Casterton</td>
<td>SB</td>
<td>AM</td>
<td>161</td>
<td>78 (-52%)</td>
<td></td>
</tr>
<tr>
<td>Pinfold Lane</td>
<td>St Pauls Street – Priory Road</td>
<td>SB</td>
<td>PM</td>
<td>251</td>
<td>120 (-52%)</td>
<td></td>
</tr>
<tr>
<td>Kettering Road</td>
<td>High Street St Martins – Wotherope Road</td>
<td>WB</td>
<td>PM</td>
<td>387</td>
<td>191 (-51%)</td>
<td></td>
</tr>
<tr>
<td>Old Great North Road</td>
<td>Toll Bar – Sidney Farm Lane</td>
<td>SB</td>
<td>AM</td>
<td>496</td>
<td>265 (-47%)</td>
<td></td>
</tr>
<tr>
<td>Toll Bar</td>
<td>Old Great North Road – Little Casterton</td>
<td>NB</td>
<td>PM</td>
<td>195</td>
<td>114 (-42%)</td>
<td></td>
</tr>
<tr>
<td>Kettering Road</td>
<td>A1 – Easton on the Hill</td>
<td>WB</td>
<td>PM</td>
<td>176</td>
<td>102 (-41%)</td>
<td></td>
</tr>
<tr>
<td>Empingham Road</td>
<td>Foundry Lane – Scotgate</td>
<td>EB</td>
<td>PM</td>
<td>179</td>
<td>106 (-41%)</td>
<td></td>
</tr>
<tr>
<td>Casterton Road</td>
<td>Scotgate Lights – Empingham Road</td>
<td>NB</td>
<td>AM</td>
<td>319</td>
<td>191 (-40%)</td>
<td></td>
</tr>
<tr>
<td><strong>10 Biggest % Gains:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Priory Road</td>
<td>Morrisons Roundabout – Pinfold Lane</td>
<td>WB</td>
<td>PM</td>
<td>261</td>
<td>853 (+227%)</td>
<td></td>
</tr>
<tr>
<td>Radcliffe Road</td>
<td>New Cross Road – North Street</td>
<td>EB</td>
<td>AM</td>
<td>&lt; 50</td>
<td>145 (+190%)</td>
<td></td>
</tr>
<tr>
<td>Tinwell Road</td>
<td>A1 – Tinwell</td>
<td>WB</td>
<td>AM</td>
<td>88</td>
<td>245 (+178%)</td>
<td></td>
</tr>
<tr>
<td>St Peters Street</td>
<td>Kings Mill Lane – Bus Station</td>
<td>EB</td>
<td>PM</td>
<td>74</td>
<td>198 (+168%)</td>
<td></td>
</tr>
<tr>
<td>Cambridge Road</td>
<td>Pembroke Road – Little Casterton Road</td>
<td>WB</td>
<td>PM</td>
<td>80</td>
<td>208 (+160%)</td>
<td></td>
</tr>
<tr>
<td>Pinfold Lane</td>
<td>St Pauls Street – Priory Road</td>
<td>SB</td>
<td>AM</td>
<td>93</td>
<td>226 (+143%)</td>
<td></td>
</tr>
<tr>
<td>Edinburgh Road</td>
<td>Green Lane – Windsor Close</td>
<td>WB</td>
<td>PM</td>
<td>90</td>
<td>214 (+138%)</td>
<td></td>
</tr>
<tr>
<td>Brazenose Lane</td>
<td>Priory Road – St Pauls Street</td>
<td>NB</td>
<td>PM</td>
<td>235</td>
<td>556 (+137%)</td>
<td></td>
</tr>
<tr>
<td>Radcliffe Road</td>
<td>North Street – New Cross Road</td>
<td>WB</td>
<td>AM</td>
<td>50</td>
<td>116 (+132%)</td>
<td></td>
</tr>
<tr>
<td>Priory Road</td>
<td>Pinfold Lane – Morrisons Roundabout</td>
<td>EB</td>
<td>AM</td>
<td>179</td>
<td>414 (+131%)</td>
<td></td>
</tr>
<tr>
<td><strong>Nonsense Base Flows:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rock Road</td>
<td>Empingham Road – West Street</td>
<td>EB</td>
<td>AM</td>
<td>205</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Austin Street</td>
<td>Kings Mill Lane – St Peters Hill</td>
<td>EB</td>
<td>AM</td>
<td>95</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Austin Street</td>
<td>Kings Mill Lane – St Peters Hill</td>
<td>EB</td>
<td>PM</td>
<td>82</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

When averaged over all the road link flows that we have analysed, the default TEMPRO growth corresponds to an approximate 17% increase in traffic flows between the Base Year (2009) and Scenario 2b in the Forecast Year (2026).

The results shown in column Scenario 2b of our table appear bizarre. How can a 17% increase in traffic flows in 2026 result in such differences with the 2009 Base Year data? It seems clear that no checking for “common sense correctness” has been carried out by Jacobs.

With results like these, no confidence can be given to Jacobs work.
Jacobs Engineering U.K. Limited

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1 Introduction

1.1 Purpose of Report

Jacobs has been commissioned to produce forecasts of traffic flows for Stamford to inform the assessment of the impact of the proposed urban extension development sites. The commission includes the requirement to model a number of different traffic scenarios which are based on different assumptions regarding the location of new land use development, as identified in The Site Allocation and Policies Development Plan Document October 2009.

The purpose of this report is to detail the trip forecasting methodology and development assumptions used to produce the forecasts of traffic volumes in Stamford, as well as the results of the forecast modelling and assessment.

1.2 Overview

Jacobs were commissioned by Lincolnshire County Council (LCC) in February 2009 to develop a Strategic VISUM Transport Model for Stamford. The modelling approach was designed to provide the capability to model both existing and future traffic and land use scenarios, as well as testing road network infrastructure improvement options. The model was validated to a 2009 base year.

After a review of the relevant regional and local planning documents a number of development scenarios have been identified for the forecast year of 2026. The development scenarios are described in Section 2.

The development scenarios for the urban extensions were confirmed with South Kesteven District Council (SKDC) prior to the commencement of the forecast modelling. However, in the interest of completeness, two additional scenarios related to TEMPRO forecasts were included for comparison.

Details of the traffic forecasting methodology are provided in Section 3. TEMPRO provided the basis of the growth factors applied to the 2009 base matrix to produce the 2026 future year matrices. TEMPRO was used to provide factors of the growth in background traffic and additional development generation across urban areas, in particular the zones external to Stamford. Within Stamford, the TEMPRO assumptions with regards to future housing and jobs were altered to reflect the inclusion of new housing and jobs in the various scenarios.

This report describes the future housing and employment forecasts, along with details of how they were applied with TEMPRO to obtain growth factors and how they are applied to produce forecast matrices.

No committed highway improvement schemes are included in the Stamford forecast modelling, as at the time of developing this report no highway improvement schemes had been identified by SKDC.

The results of the assignments of the forecast demand onto the road network are included in Appendix A, and the results of the assessment of the scenarios are provided in Section 4.
2 Policy Background and Development Scenarios

2.1 South Kesteven District Council Local Development Framework

SKDC is in the process of developing its Local Development Framework to replace the 1995 South Kesteven Local Plan.

The Submission Consultation version of the South Kesteven Core Strategy January 2009 sets out the strategic plan for South Kesteven. The document described how the district’s housing allocation of 16,800 dwellings (derived from the Regional Spatial Strategy - Proposed Changes July 2008), to be delivered in the period 2001-2026, will be distributed throughout the district.

The consultation version of the Core Strategy required 1,500 new houses and approximately 24 hectares of employment development to be built in Stamford in the period 2001-2026. Between 2001 and March 2008, 501 houses had been completed and a further 318 houses have been committed, translating into a requirement for a further 681 houses to meet the housing allocation for Stamford (999 new houses) between March 2009 and 2026.

The Regional Spatial Strategy (RSS) was adopted in March 2009. This plan revised the base date for the housing requirement to 2006-2026. Whilst this change does not result in a reduction in the annual completion rate for the district, it does result in the reduction of the overall district requirement to 13,600. To reflect this change the Council has prepared a revised table for the Core Strategy Examination which shows a requirement of 1,140 new houses and approximately 24 hectares of employment development to be built in Stamford in the period 2006-2026 (the base year has been adjusted to 2006). Between 2006 and March 2008, 146 houses had been completed and a further 318 houses have been committed. Therefore a further 676 houses are required to meet the housing allocation for Stamford (994 new houses) between March 2008 and 2026.

The adopted RSS was used as the basis for the assumptions for the forecast modelling described in this report. The Site Allocation and Policies Development Plan Document October 2009 identified a number of urban redevelopment sites within Stamford for consideration for housing and employment. Three urban extension sites have also been identified: land to the west of the town between Tinwell Road and Empingham Road; land to the east of Stamford towards Newstead; and land to the north of Stamford which is in Rutland but will impact on traffic within Stamford.

2.2 Development Scenarios

The 2009 Stamford VISUM model was used as a base from which to test the forecast development scenarios.

Table 2-A presents the forecast scenarios (for the AM and PM peak hours) and lists the new housing and employment which were included in the model for each scenario.

The housing and employment development assumptions are described in more detail in Section 3.
### Employment Development Considerations

- **Urban redevelopment sites**
  - (8.6 ha)

- **Land to east of Stamford**
  - (91.1 ha)

- **Land between Tinwell Rd and Empingham Rd**
  - (28.7 ha)

- **Land to north of Stamford**
  - (26.1 ha)

### Committed Development

- (318)

### Urban redevelopment sites

- (301)

### Land to east of Stamford

- (Capacity 1166)

### Land between Tinwell Rd and Empingham Rd

- (Capacity 861)

### Land to north of Stamford

- (Capacity 735)

### Housing Development Considerations* 

#### 2009 Reference Case

- **2026 Urban Redevelopment Only**
  - 1

- **2026 Tempro Background**
  - 2a
  - TEMPRO growth less Urban Redevelopment & Committed Development
  - ✓

- **2026 Tempro Background**
  - 2b
  - TEMPRO growth ONLY

- **2026 East Stamford – Newstead**
  - 3a
  - ✓
  - 15.4ha**
  - ✓

- **2026 Empingham Road**
  - 4a
  - ✓
  - 15.4ha***
  - ✓

- **2026 North Stamford (Rutland)**
  - 5a
  - ✓
  - 15.3ha****
  - ✓

- **2026 North Stamford (Rutland)**
  - 5b
  - ✓
  - 7.7ha****
  - ✓

### Table 2-A Forecast Development Scenarios

#### Notes:

- **Number of dwellings**
- **Completing 434 units at 40 units/ha requires 10.85ha, with 80.25ha remaining for employment land use. Completing 735 units requires 18.38ha, with 72.73ha remaining for employment land use.**
- **Completing 434 units at 40 units/ha requires 10.85ha, with 17.85ha remaining for employment land use. Completing 735 units requires 18.38ha, with 10.4ha remaining for employment land use.**
- **Completing 434 units at 40 units/ha requires 10.85ha, with 15.3ha remaining for employment land use. Completing 735 units requires 18.38ha, with 7.7ha remaining for employment land use.**
A brief overview of the development scenarios follows:

- The reference case is the 2009 base year model.

- **Scenario 1** assumed that only the considered urban redevelopment sites and the committed developments are completed.

- **Scenario 2a** assumed that in addition to the considered urban redevelopment sites and the committed developments, further background development (as assumed within the TEMPRO forecasts) would take place across Stamford.

- **Scenario 2b** applied TEMPRO forecast growth rates with no adjustments, and assumes that no committed or considered urban or urban extension developments are completed. Only the TEMPRO forecast growth will take place.

- **Scenario 3a** assumed that the urban extension in east Stamford (Newstead) would be completed, along with the considered urban redevelopment sites and the committed developments.

- **Scenario 3b** assumed that the urban extension in east Stamford (Newstead) would be completed, along with the committed developments.

- **Scenario 4a** assumed that the urban extension in west Stamford (Empingham Road) would be completed, along with the considered urban redevelopment sites and the committed developments.

- **Scenario 4b** assumed that the urban extension in west Stamford (Empingham Road) would be completed, along with the committed developments.

- **Scenario 5a** assumed that the urban extension in north Stamford (Rutland) would be completed, along with the considered urban redevelopment sites and the committed developments.

- **Scenario 5b** assumed that the urban extension in north Stamford (Rutland) would be completed, along with the committed developments.

Scenario 2a and 2b were included for the purposes of comparison only, as they represent higher development assumptions than the Regional Spatial Strategy proposes. The default assumptions within TEMPRO are that there would be 1876 new houses and 1904 new jobs in Stamford between 2009 and 2026. This assumed growth exceeds the projections of the Regional Spatial Strategy.

### 2.3 Key Assumptions

In order to compare the impact of each of the proposed urban extensions, the total number of additional houses built in Stamford is the same for all urban extension scenarios (3a, 3b, 4a, 4b, 5a and 5b). It was assumed that a total of 735 additional houses (inclusive of the urban redevelopment sites), which corresponds to the capacity of the smallest urban extension site, would be applied to all the urban extension scenarios. This assumption results in a slightly conservative analysis of the development impact due to the urban extension, as the total of 735 new houses exceeds the requirement of 676 houses identified in the RSS.
Employment development of 8.6 hectares which are considered within the Site Allocation and Policies Development Plan Document are not related to any of the urban extensions or other housing development, and are therefore assumed to be developed in all scenarios. However, the employment development associated with the urban extensions is only included if the housing development for that site is also included. For each scenario it is assumed that the total employment development (including the 8.6ha for urban redevelopment) does not exceed the 24 hectares considered in the Core Strategy.

The 2009 base demand model was used to derive the 2026 forecast demand from the future land use proposals for each development scenario. No significant committed highway improvement schemes were applied to the Stamford network. Analysis was performed for the AM (8:00 – 9:00) and PM (17:00 – 18:00) peak hours.
3 Traffic Forecasting

3.1 Introduction

This section describes the traffic forecasting methodology. It includes the assumptions made and the processes followed in applying the forecast scenarios to the base model in order to create forecast models.

3.2 Overview of Traffic Forecasting

The 2026 forecast traffic volumes are derived by applying TEMPRO growth factors obtained from the Department for Transport (DfT) software to the 2009 base traffic volumes. As the base model includes a fixed mode choice, the costs (Value of Time, Vehicle Operating Costs) were not updated. The land use assumptions were included in the forecast scenarios, resulting in the addition of the trips generated by these developments to the model networks.

The transport model simulates the traffic conditions during the typical weekday peak periods in the AM (8:00 – 9:00) and PM (17:00 – 18:00) time periods. For the scenarios considered, the impact of peak spreading or modal shift was not considered.

3.3 Description of TEMPRO

TEMPRO is a software package created by the Department for Transport (DfT) which provides forecast data on trips for transport planning purposes. The version of the software (Version 5.4) used in this study provides multi-modal trip data for the years 1991 to 2041. Outputs are given in terms of growth factors between the selected base and forecast years or as raw trip end data.

The base travel data used within TEMPRO is the 2001 census output. A combination of forecast data and trends is used to predict population, households and employment changes from the 2001 census base data in individual spatial units. The smallest spatial unit or zone in TEMPRO is defined as a National Trip End Model (NTEM) zone. There are 2,496 NTEM zones in Great Britain and these can be aggregated to Local Authority level.

This version of TEMPRO (Dataset version 5.4) includes policy-based forecasts of dwellings in future years. This policy-based data is given at Local Authority level and is combined with the trend-based population data to estimate the number of households in future years. This version of TEMPRO gives a greater weighting to policy-based forecasts than the trend-based data when estimating household levels.

A key feature of TEMPRO is that it allows the user to view the planning assumptions that have been used in forecasting, and significantly, it allows the user to enter alternative planning data. Alternative levels of households and numbers of jobs can be entered for both base and future and then used to generate alternative growth factors. The number of households will predominantly affect the trip productions and the number of jobs will predominantly affect the trip attractions.

Whilst the TEMPRO software provides factors of the background growth in traffic and additional development generation for urban areas, the zones within TEMPRO are large, and as a result the analysis is coarse (for example, there is one zone for...
the whole of the Stamford administrative area). As such, the application of an overall
growth factor is considered to be inappropriate to assess accurately the impact of
individual committed developments and specifically the proposed developments for
Stamford associated with the urban redevelopment and the considered urban
extensions.

Hence, the forecast modelling methodology adopted in this case required that the
TEMPRO planning data for households and jobs be altered for the future year
(2026) to accurately reflect the planned development in 2026. This necessitated that
the development trips from the known developments be identified and the TEMPRO
planning information adjusted accordingly. The known development trips were then
added into the model to ensure that trips associated with each of the development
components are localised on the network in the appropriate area as opposed to
being distributed over the entire Stamford area.

3.4 Key TEMPRO Assumptions

It should be noted that the TEMPRO planning data does not contain explicit
assumptions that particular developments do or do not go ahead. From 2009 – 2026
the TEMPRO growth is based on an assumed increase of 1,876 households and
1,904 jobs. This assumption significantly exceeds the housing requirements as
identified in the RSS.

As the growth potential in Stamford has been identified by SKDC as being facilitated
in the committed development sites, the urban redevelopment sites and an urban
extension, it has been assumed for the purposes of this report that the only new
housing in Stamford would be allocated to these locations, and that no other
housing growth would take place. To this end, the TEMPRO forecast planning
information was adjusted to reflect zero (0) additional households and zero (0)
additional jobs.

Two scenarios were generated which reflect the base TEMPRO planning
information as a check. These are contained in Scenarios 2a and 2b.

Finally, the planning data for further dwellings and employment was taken from the
adopted Regional Spatial Strategy (RSS). The Site Allocation and Policies
Development Plan Document (October 2009) identified a number of urban
redevelopment sites within Stamford for consideration for housing and employment.
These sites, and the considered urban extension sites, were reviewed by SKDC
before being implemented in this study.

3.5 Process of Developing Scenarios

The process involved in creating the 2026 traffic forecasts for the urban extension
scenarios was as follows:

- The total additional residential and employment development assumed
  within TEMPRO for Stamford was reviewed
- For all the scenarios (with the exception of 2a and 2b), all the assumed
devlopment was removed from TEMPRO (by means of applying alternative
planning data) and the growth rate determined.
- For trips external to Stamford, TEMPRO growth rates for the greater
Lincolnshire were applied without any adjustments to the planning data.
- The resulting growth factors were applied to the 2009 Base year model
productions and attractions
• Trip generation and distribution was performed for the committed and considered developments (urban redevelopment and urban extension) for each forecast scenario.
• Factors from DfT WebTAG guidelines for TEMPRO adjustments due to income and fuel costs were applied (due to the model having fixed mode choice).

The outputs of the scenarios were then assessed – the results are described in Section 4.

### 3.6 Households

The committed developments in Stamford are shown in Table 3-A, and includes all the housing that has been committed and approved up to the development of the 2009 base model. These are established from the Strategic Housing Land Availability Assessment (Annual Review to March 2009) and subsequent advice from Lincolnshire County Council and South Kesteven District Council. For the forecast models the trips produced by these developments were added to specific points on the network.

<table>
<thead>
<tr>
<th>Committed Development</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>North of Chatsworth Road</td>
<td>89</td>
</tr>
<tr>
<td>Roman Mill, Little Casterton Road</td>
<td>14</td>
</tr>
<tr>
<td>28a Scotgate</td>
<td>5</td>
</tr>
<tr>
<td>R/O 52-58 Scotgate</td>
<td>5</td>
</tr>
<tr>
<td>Belton St/ Gas Street</td>
<td>13</td>
</tr>
<tr>
<td>R/O 43-46 St Pauls Street</td>
<td>7</td>
</tr>
<tr>
<td>Tinwell Road Lane, Stamford</td>
<td>1</td>
</tr>
<tr>
<td>Distributed throughout residential areas</td>
<td>184</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>318</strong></td>
</tr>
</tbody>
</table>

*Table 3-A Committed Housing Developments*

The urban redevelopment sites in Stamford represent a potential housing capacity for 301 new dwellings, and are shown in Table 3-B. The locations of the sites are shown on Figure 3-A.

<table>
<thead>
<tr>
<th>Urban Redevelopment Site</th>
<th>Description</th>
<th>2026 Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAM03</td>
<td>Jacksons Building Centre, Radcliffe Road</td>
<td>12</td>
</tr>
<tr>
<td>STAM04</td>
<td>North Street car park</td>
<td>14</td>
</tr>
<tr>
<td>STAM05</td>
<td>Stamford AFC, Kettering Road</td>
<td>60</td>
</tr>
<tr>
<td>STAM06</td>
<td>Sharmans Depot, Barnack Road</td>
<td>13</td>
</tr>
<tr>
<td>STAM07</td>
<td>Welland Quarter, Stamford</td>
<td>-</td>
</tr>
<tr>
<td>STAM08</td>
<td>Off Barnack Road, Stamford</td>
<td>-</td>
</tr>
<tr>
<td>STAM09</td>
<td>Land to the South of Uffington Road</td>
<td>117</td>
</tr>
<tr>
<td>STAM10</td>
<td>Meadow View, Uffington Road</td>
<td>16</td>
</tr>
<tr>
<td>STAM11</td>
<td>Land East of Meadow View, Uffington Road</td>
<td>17</td>
</tr>
<tr>
<td>STAM12</td>
<td>Land North of Uffington Road</td>
<td>52</td>
</tr>
<tr>
<td>STAM13</td>
<td>Adj Tollbar House, Uffington Road, Stamford</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>301</strong></td>
</tr>
</tbody>
</table>

*Table 3-B Urban Redevelopment Site Housing*
Figure 3-A  Urban Redevelopment Sites
3.7 Jobs/Employment

The known employment development in Stamford is limited to two sites – these can be seen in Figure 3-A and Table 3-C and include sites STAM08 and STAM13. The Site Allocation and Policies Development Plan Document assume employment development of 8.6 hectares which are assumed to take place within these two sites, and do not form part of any of the urban extensions.

To estimate the potential number of jobs each site is likely to yield, the TRICS database has been used to obtain typical employment number for similar types and sizes of development. For those sites that may potentially have a number of development types the average has been used. It has been assumed that the split between Employment types B1 (office) and B2 (industrial) is 50%/50%.

<table>
<thead>
<tr>
<th>Urban Redevelopment Site</th>
<th>Size of Site (ha)</th>
<th>Size of Development (sqm)</th>
<th>2026 Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAM08</td>
<td>7.78</td>
<td>25,000</td>
<td>680</td>
</tr>
<tr>
<td>STAM13</td>
<td>0.77</td>
<td>2,500</td>
<td>70</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>27,500</strong></td>
<td></td>
<td><strong>750</strong></td>
</tr>
</tbody>
</table>

Table 3-C Urban Redevelopment Site Employment

3.8 Urban Extensions

The urban extensions considered in Stamford represent a potential housing capacity for a minimum of 735 new dwellings, and as this exceeds the requirement in Stamford this has been assumed to be the maximum new housing in each of the urban extension scenarios. The urban extension zones are described in Table 3-D. The locations of the sites are shown in Figure 3-B (Land south of Empingham Road), Figure 3-C (land East of Stamford) and Figure 3-D (land north of Old Great North Road).

Appendix B includes a number of maps showing the urban extensions in the context of the other development sites (urban redevelopment and committed development).

<table>
<thead>
<tr>
<th>Urban Extension Sites</th>
<th>Scenario</th>
<th>2026 Maximum Housing Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAM01</td>
<td>4a, 4b</td>
<td>861</td>
</tr>
<tr>
<td>STAM02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAM03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAM04</td>
<td>3a, 3b</td>
<td>1166</td>
</tr>
<tr>
<td>STAM05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAM06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAM07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RUT</td>
<td>5a, 5b</td>
<td>735</td>
</tr>
</tbody>
</table>

Table 3-D Urban extension sites under consideration
No improvements to the road network infrastructure, other than basic junction adjustments at the access locations, were applied to facilitate development traffic.

![Figure 3-B Access to Urban Extension in West Stamford (Empingham Road)](image)

3.9 Growth Factors applied

TEMPRO factors were adjusted according to each scenario to reflect the planning data assumption which was applicable. These factors are described in Table 3-E.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prod</td>
<td>Attrac</td>
</tr>
<tr>
<td>1 Urban Redevelopment Only</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>2a Unspecified TEMPRO + Urban Redevelopment</td>
<td>1.033</td>
<td>1.085</td>
</tr>
<tr>
<td>2b Unspecified TEMPRO Only</td>
<td>1.094</td>
<td>1.149</td>
</tr>
<tr>
<td>3a Newstead + Urban Redevelopment</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>3b Newstead Only</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>4a Empingham + Urban Redevelopment</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>4b Empingham Only</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>5a Rutland + Urban Redevelopment</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>5b Rutland Only</td>
<td>0.885</td>
<td>0.937</td>
</tr>
<tr>
<td>External-external</td>
<td>1.158</td>
<td>1.151</td>
</tr>
<tr>
<td>Income/Fuel Adjustment</td>
<td>1.116</td>
<td></td>
</tr>
</tbody>
</table>

Table 3-E Growth Factors applied to Forecast Model Scenarios
Figure 3-C  Access to Urban Extension in East Stamford (Newstead)

Figure 3-D  Access to Urban Extension in North Stamford (Rutland)
The external trip factors were determined from TEMPRO based upon all trips within Lincolnshire between the base year 2009 and the forecast year 2026, using the default housing and employment assumptions in TEMPRO.

DfT WebTAG (unit 3.15.2) guidelines provide an adjustment factor to represent the impacts of income and fuel cost adjustments on traffic growth. These adjustments are applicable to fixed highway models. Whilst the Stamford base model is not a true fixed highway model, it does have a fixed mode share for car trips and as such it was considered applicable to apply a factor of 1.116 in accordance with the guidelines.

### 3.10 Trip Generation

Table 3-F presents the trip generation obtained from the TRICS database for the committed housing and employment developments and urban extension in the AM and PM peak periods respectively.

<table>
<thead>
<tr>
<th>Development</th>
<th>Size</th>
<th>AM Peak</th>
<th></th>
<th>PM Peak</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Prods</td>
<td>Attracs</td>
<td>Prods</td>
<td>Attracs</td>
</tr>
<tr>
<td>Committed Housing Developments</td>
<td>318</td>
<td>305</td>
<td>72</td>
<td>123</td>
<td>194</td>
</tr>
<tr>
<td>Urban Redevelopment Housing</td>
<td>301</td>
<td>288</td>
<td>68</td>
<td>116</td>
<td>184</td>
</tr>
<tr>
<td>Urban Redevelopment / Urban Extension Employment</td>
<td>24ha / 50,000sqm</td>
<td>144</td>
<td>557</td>
<td>437</td>
<td>128</td>
</tr>
<tr>
<td>Urban Extension Housing</td>
<td>735</td>
<td>704</td>
<td>165</td>
<td>284</td>
<td>448</td>
</tr>
</tbody>
</table>

**Table 3-F** | TRICS trip generation during peak periods

The VISUM forecast trip generation is a product of a number of aspects, including the base household trip generation assumptions in the model, the distribution from a zone to work, school and shopping opportunities and internal trips (due to joint housing and employment development. For the forecast models the number of trips generated for the forecast scenarios were checked against the TRICS trip generation to ensure that the correct number of trips was loaded onto the model network.

The numbers of housing and employment trips for the urban extension sites were scaled down according to the scenario and the amount of space available for employment development.

The trip rates obtained from TRICS are multi-modal, based on developments of a similar size in England excluding Greater London. The approximate gross floor area for the employment developments were estimated based on their site size and used to calculate the trips in TRICS.

### 3.11 Final Forecast Matrices

Table 3-G presents the total person trips generated by the modelling process for the scenarios considered. As Scenarios 2a and 2b represent the TEMPRO growth assumptions, which are significantly higher than the planned development, these scenarios represent the highest number of trips.
<table>
<thead>
<tr>
<th>Scenario</th>
<th>AM (08:00 – 09:00)</th>
<th>PM (17:00 – 18:00)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trips</td>
<td>% Growth</td>
</tr>
<tr>
<td>2009 Base</td>
<td>10333</td>
<td></td>
</tr>
<tr>
<td>2026 Urban Redevelopment only</td>
<td>11607 12.3</td>
<td>11851 9.5</td>
</tr>
<tr>
<td>2026 Tempro Background</td>
<td>12638 22.3</td>
<td>12735 17.7</td>
</tr>
<tr>
<td>2a</td>
<td>12583 21.8</td>
<td>12735 17.7</td>
</tr>
<tr>
<td>2b</td>
<td>12361 19.6</td>
<td>12477 15.3</td>
</tr>
<tr>
<td>2026 East Stamford – Newstead</td>
<td>12180 17.9</td>
<td>12364 14.3</td>
</tr>
<tr>
<td>3a</td>
<td>12180 17.9</td>
<td>12364 14.3</td>
</tr>
<tr>
<td>3b</td>
<td>12081 16.9</td>
<td>12276 13.5</td>
</tr>
<tr>
<td>2026 Empingham Road</td>
<td>12426 20.3</td>
<td>12556 16.0</td>
</tr>
<tr>
<td>4a</td>
<td>12048 16.6</td>
<td>12407 14.7</td>
</tr>
<tr>
<td>4b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2026 North Stamford (Rutland)</td>
<td>12403 20.0</td>
<td>12512 15.6</td>
</tr>
<tr>
<td>5a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5b</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 3-G  Total trips for all scenarios*
4 Forecast Modelling Results

4.1 Introduction

This section presents the results of the transport modelling in terms of road network performance in Stamford for each scenario to help inform and develop the emerging LDF for South Kesteven. The various development scenarios have been assessed in terms of total road network performance, performance across key routes and the level of congestion that is likely to occur at a number of key junctions on the strategic road network.

4.2 Road Network Assignment

The results of the assignments of the forecast demand onto the road network are included in Appendix A. The flows shown represent the total assigned flows on the forecast network (i.e. background + development traffic).

4.3 Road Network Performance

Table 4-A and Table 4-B presents the road network performance in the AM and PM peak hours on the network within Stamford Town. The performance is described in terms of total travel time, average speed and journey times across key routes. The routes included in the evaluation can be seen in Figure 4-A and Table 4-C. A ranking has been included which describes how the scenarios compare with relation to their impact on overall journey times across key routes in Stamford.

Definitions of these measures of road network performance are provided below.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Total Travel Time (vehicle hours)</th>
<th>Average Speed (Kph)</th>
<th>Sum of Journey Time Routes (minutes)</th>
<th>Ranking by Sum of Journey Time Routes (1-best, 9-worst)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 Base</td>
<td>414</td>
<td>42.7</td>
<td>90.3</td>
<td>-</td>
</tr>
<tr>
<td>2026 Reference Case</td>
<td>1</td>
<td>481</td>
<td>40.9</td>
<td>99.4 3</td>
</tr>
<tr>
<td>2026 Temprom Background</td>
<td>2a</td>
<td>529</td>
<td>40.3</td>
<td>103.9 8</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>556</td>
<td>38.2</td>
<td>104.2 9</td>
</tr>
<tr>
<td>2026 East Stamford – Newstead</td>
<td>3a</td>
<td>523</td>
<td>40.6</td>
<td>102.1 7</td>
</tr>
<tr>
<td></td>
<td>3b</td>
<td>515</td>
<td>40.6</td>
<td>100.8 6</td>
</tr>
<tr>
<td>2026 Empingham Road</td>
<td>4a</td>
<td>512</td>
<td>40.6</td>
<td>99.5 4</td>
</tr>
<tr>
<td></td>
<td>4b</td>
<td>496</td>
<td>40.8</td>
<td>98.1 1</td>
</tr>
<tr>
<td>2026 North Stamford (Rutland)</td>
<td>5a</td>
<td>513</td>
<td>41.0</td>
<td>99.5 4</td>
</tr>
<tr>
<td></td>
<td>5b</td>
<td>500</td>
<td>40.8</td>
<td>99.1 2</td>
</tr>
</tbody>
</table>

Table 4-A  Road Network Performance in AM Peak Hour

- Total Travel Time (vehicle hours) - the cumulative travel time for all journeys undertaken within Stamford in the peak hour.
- **Average Speed (Kph)** - the average vehicle speed on the road network within Stamford for all journeys undertaken in the peak hour.
- **Sum of Journey Time routes (minutes)** – the journey time along a route represents the average total time taken to complete the journey. Both directions have been considered (refer Figure 4-A and Table 4-C)
- **Ranking by Journey Times** – the lowest sum of Journey Times routes is ranked 1 and the highest sum is ranked 9

### Table 4-B Road Network Performance in PM Peak Hour

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Total Travel Time (vehicle hours)</th>
<th>Average Speed (Kph)</th>
<th>Sum of Journey Time Routes (minutes)</th>
<th>Ranking by Sum of Journey Time Routes (1-best, 9-worst)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 Base</td>
<td>400</td>
<td>42.5</td>
<td>90.6</td>
<td>-</td>
</tr>
<tr>
<td>2026 Reference Case</td>
<td>1</td>
<td>476</td>
<td>40.6</td>
<td>1</td>
</tr>
<tr>
<td>2026 Tempro Background</td>
<td>2a</td>
<td>518</td>
<td>40.3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>556</td>
<td>37.8</td>
<td>9</td>
</tr>
<tr>
<td>2026 East Stamford – Newstead</td>
<td>3a</td>
<td>511</td>
<td>40.7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>3b</td>
<td>511</td>
<td>40.7</td>
<td>6</td>
</tr>
<tr>
<td>2026 Empingham Road</td>
<td>4a</td>
<td>505</td>
<td>40.6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4b</td>
<td>499</td>
<td>40.6</td>
<td>1</td>
</tr>
<tr>
<td>2026 North Stamford (Rutland)</td>
<td>5a</td>
<td>512</td>
<td>40.5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5b</td>
<td>509</td>
<td>40.5</td>
<td>5</td>
</tr>
</tbody>
</table>

### Figure 4-A Journey Time Routes
<table>
<thead>
<tr>
<th>Route No</th>
<th>Route Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kettering Road - Uffington Road</td>
</tr>
<tr>
<td>2</td>
<td>Kettering Road - Ryhall Road</td>
</tr>
<tr>
<td>3</td>
<td>Eppingham Road - Uffington Road</td>
</tr>
<tr>
<td>4</td>
<td>Casterton Road - Uffington Road</td>
</tr>
<tr>
<td>5</td>
<td>Casterton Road - Old Great North Road</td>
</tr>
<tr>
<td>6</td>
<td>Tinwell Road - West St/Scotgate Rd</td>
</tr>
</tbody>
</table>

**Table 4-C  Journey Time Routes Considered**

The modelling results indicate a decrease in the average speed of travel on the network for the 2026 forecast scenarios. There is not a significant difference between the results of the urban extension scenarios (3a, 3b, 4a, 4b, 5a, 5b) and the Reference Case (Scenario 1). As Scenarios 2a and 2b have a higher level of traffic demand spread throughout the existing road network, the average travel speeds for these scenarios is the lowest.

The results indicate an increase in the sum of the journey times across the routes in Stamford for the 2026 forecast scenarios. Scenario 4b, which includes only development in the western-most urban extension south of Eppingham Road, presents the best results in terms of travel times. This is likely due to its proximity to the A1 which means that traffic to/from Peterborough does not need to pass through the town centre road network.

For the same reason, Scenarios 4a, 4b, 5a and 5b provide better results than Scenario 3a and 3b. Scenario 3a presents the worst results, likely due to the urban extension represented being located on the eastern side of Stamford, with a larger proportion of trips using the congested Stamford town centre network.

### 4.4 Junction Performance

The assessment of the forecast scenarios including an assessment of junction performance. VISUM includes a function called Intersection Capacity Analysis, which uses the US Highway Capacity Manual to determine overall delay for signalised and priority junctions. The ARCADY software package was used to analyse the key roundabout junctions in the study area.

**Figure 4-B and Table 4-D** lists the junctions included in the junction assessment. Whilst the list is not exhaustive, it does include the key junctions within the town of Stamford, and in particular junctions which are near to or exceeding capacity in the 2009 base year model. It also serves to allow comparison between the impacts of the urban extension scenarios tested.

The list in **Table 4-D** also provides an overview of the junction performance across the scenarios. For more detailed information please refer to Appendix C. As would be expected based upon the overall increased in development, Scenario 2a and 2b project the highest overall delays.
Figure 4-B  Junctions included in the forecast assessment

<table>
<thead>
<tr>
<th>No</th>
<th>Name/Location</th>
<th>Control Type</th>
<th>2009 Base Performance</th>
<th>2026 Forecast Scenarios Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bridge/High Street St Martins</td>
<td>Signalised</td>
<td>Capacity exceeded</td>
<td>Capacity exceeded</td>
</tr>
<tr>
<td>2</td>
<td>St Pauls St/East St</td>
<td>Signalised</td>
<td>Capacity exceeded</td>
<td>Capacity exceeded</td>
</tr>
<tr>
<td>3</td>
<td>Scotgate/West St</td>
<td>Signalised</td>
<td>Capacity exceeded</td>
<td>Capacity exceeded</td>
</tr>
<tr>
<td>4</td>
<td>Ryhall Rd/Drift Rd</td>
<td>Signalised</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>5</td>
<td>Casterton Rd/Little Casterton Rd</td>
<td>Signalised</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>6</td>
<td>Morrisons rbt</td>
<td>Roundabout</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>7</td>
<td>Ryhall Rd/ Uffington Rd</td>
<td>Roundabout</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>8</td>
<td>High St/Kettering Rd</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>9</td>
<td>High St/Barnack Rd</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>10</td>
<td>St Leonards St/ Brazenose Ln</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>11</td>
<td>St Johns St/Red Lion St</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>12</td>
<td>Old Great N Rd/ Arran Rd</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Capacity exceeded</td>
</tr>
<tr>
<td>13</td>
<td>Empingham Rd/ Arran Rd</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
<tr>
<td>14</td>
<td>Empingham Rd/ Roman Bank</td>
<td>Priority</td>
<td>Within capacity</td>
<td>Within capacity</td>
</tr>
</tbody>
</table>
The signalised junctions within Stamford, with the exception of the Ryhall Rd/Drift Rd and Little Casterton Rd/ Casterton Rd junction, are under significant pressure in the base year and the demand exceeds capacity during peak periods. As no highway network improvements are included in the forecast scenarios, the junctions are over-capacity in the forecast scenarios.

The roundabout junctions are under-capacity for both the base year and the forecast scenarios. The priority junctions assessed are under capacity in the base year, and whilst analysis of the forecast scenarios indicates that delays at these junctions will increase, the delays remain low at the majority of the junctions. Two junctions project higher delays in the forecast scenarios:

- High Street / Barnack Road – this is due to increased flow on Barnack Road due to the employment development along this road as part of the urban redevelopment. It is noticeable that in the 3b, 4b and 5b scenarios the overall delay is lower as the employment is concentrated on the urban extensions.
- Old Great North Road / Arran Road – this junction is projected to experience high delays for scenarios 5a and 5b. This is due to the only access to the urban extension being assumed to be located on this junction.
5 Summary and Conclusions

5.1 Summary

Jacobs were commissioned by Lincolnshire County Council (LCC) in February 2009 to develop a Strategic VISUM Transport Model for Stamford. The modelling approach was designed to provide the capability to model both existing and future traffic and land use scenarios, as well as testing road network infrastructure improvement options. The model was validated to a 2009 base year.

After a review of the relevant regional and local planning documents a number of development scenarios have been identified for the forecast year of 2026. The development scenarios for the urban extensions were confirmed with South Kesteven District Council (SKDC) prior to the commencement of the forecast modelling. However, in the interest of completeness, two additional scenarios related to TEMPRO forecasts were included for comparison.

TEMPRO provided the basis of the growth factors applied to the 2009 Base matrix to produce the 2026 future year matrices. TEMPRO was used to provide factors of the growth in background traffic and additional development generation across urban areas, in particular the zones external to Stamford. Within Stamford, the TEMPRO assumptions with regards to future housing and jobs were altered to reflect the inclusion of new housing and jobs in the various scenarios.

No committed highway improvement schemes are included in the Stamford forecast modelling, as at the time of developing this report no highway improvement schemes had been identified by SKDC.

The transport model was used to assess road network performance in Stamford for the development scenarios and this report includes the assessment of the Urban Extensions. The development scenarios have been assessed in terms of overall network flows, total road network performance and the level of congestion that is likely at a number of key junctions on the strategic road network.

5.2 Conclusions

The urban redevelopment and the urban extensions considered in the town of Stamford will result in significant expansion in housing and employment related development and general background traffic growth.

Several scenarios testing different alternatives for the location of the urban extension and the inclusion of urban redevelopment have been assessed in this report.

The assessment of the scenarios indicates that Scenario 4b – which represents an urban extension (with no urban redevelopment) on the western side of Stamford, south of Empingham Road, shows the best results in terms of overall journey times and average travel speed in the Stamford network.
PM Highway Assignment Result (2009 Base Year)

Figure A-2  PM Peak Hour Model Assignment Result  February 2010

JACOBS  Stamford Forecast Assessment  N.T.S.
AM Highway Assignment Result (2026 Scenario 3a - Urban Redevelopment + Urban Extension in East Stamford/Newstead)

Figure A-9 AM Peak Hour Model Assignment Result February 2010

JACOBS Stamford Forecast Assessment N.T.S.
PM Highway Assignment Result (2026 Scenario 3a - Urban Redevelopment + Urban Extension in East Stamford/Newstead)

Figure A-10  PM Peak Hour Model Assignment Result  February 2010
JACOBS  Stamford Forecast Assessment  N.T.S.
PM Highway Assignment Result (2026 Scenario 3b - Urban Extension in East Stamford/Newstead only)

Figure A-12
PM Peak Hour Model Assignment Result

February 2010

JACOBS
Stamford Forecast Assessment

N.T.S.
PM Highway Assignment Result (2026 Scenario 4a - Urban Redevelopment + Urban Extension in West Stamford/North of Empingham Road)
PM Highway Assignment Result (2026 Scenario 4b - Urban Extension in West Stamford/North of Empingham Road only)

Legend

Volume (Vehicles/Hour)

0 500 1000 2000

Figure A-16
PM Peak Hour Model Assignment Result
February 2010
JACOBS
Stamford Forecast Assessment
N.T.S.
Figure A-19 AM Peak Hour Model Assignment Result February 2010

JACOBS Stamford Forecast Assessment N.T.S.
Scenario 3a – 2026 East Stamford (Newstead) + Urban Redevelopment

STAM11
STAM10
STAM13
STAM12
STAM09
STAM08
STAM06
STAM05
STAM04
STAM03
STAM14
STAM15
STAM16
STAM17

Stamford Forecasting Results Report (Final).doc
Scenario 4b – 2026
Empingham Road only
Scenario 5a – 2026 north of Old Great North Road (Rutland) + Urban Redevelopment
Appendix C  Junction Assessment Results

The roundabouts included in the junction assessment are indicated in Figure C1. The junction numbers refer to Table C1 and Table C2 below, which show the results of the assessment in terms of the average delay at the junctions.

Figure C1  Junctions included in the forecast assessment
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bridge/High Street St Martins</td>
<td>Signalised</td>
<td>99.48</td>
<td>136.87</td>
<td>160.46</td>
<td>155.74</td>
<td>149.62</td>
<td>142.33</td>
<td>135.43</td>
<td>129.71</td>
<td>136.16</td>
<td>129.71</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>St Pauls St/East St</td>
<td>Signalised</td>
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### Table C1: Average Delay per vehicle in seconds at selected junctions in the AM Peak

* It must be noted that these delays are due to all the development traffic accessing the road network through a single point at this junction,
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**Table C2**  
Average Delay per vehicle in seconds at selected junctions in the PM Peak

* It must be noted that these delays are due to all the development traffic accessing the road network through a single point at this junction

- Average delay <25 seconds
- Average delay 25-60 seconds
- Average delay > 60 seconds