City of York Council

City of York Local Plan

Transport Topic Paper Update (2019)

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ACKNOWLEDGEMENT

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1. Introduction and purpose

1.1 The City of York Local Plan (the Plan) is currently in preparation. The Plan will set out the City's targets for employment and housing growth and where this growth will take place over the next 15 years (to 2032) and beyond. The currently expected time for the release of the Local Plan Draft Publication for consultation is early 2018, with an anticipated deadline for submission (for Examination in Public) being April 2018.

1.2 Key parts of the evidence base in support of the Plan include:

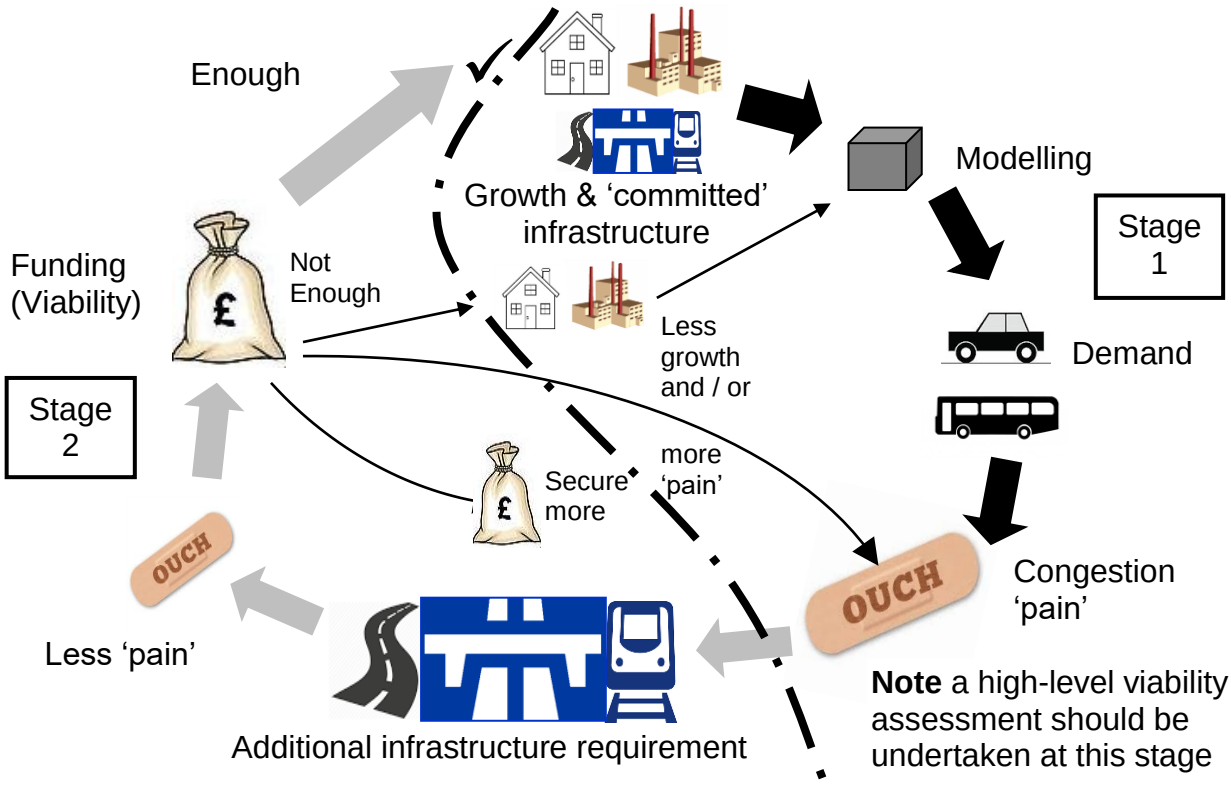
- A Strategic Housing Market Assessment (SHMA) - based on objectively assessed housing need (OAN)
- Employment Land Review (ELR)
- Strategic transport modelling to identify the impacts of this growth on the levels of traffic and congestion, both with and without measures to mitigate it.
- An infrastructure delivery plan (IDP) to identify what infrastructure is needed to enable this growth to take place and set out how it will be delivered
- A viability assessment of the local plan to confirm the planning gain (i.e. direct mitigation or funding secured through development) that can be secured to deliver the IDP, and/or establish the resulting funding gap that will have to be bridged through securing other sources of funding

1.3 With regard to the evidence base parts listed above, this paper is primarily concerned with the strategic transport modelling, whilst cognisant of the other evidence could be influenced by or, indeed, influence the transport modelling.

Interaction between growth, transport, viability and infrastructure

1.4 The Interaction between development growth, transport (traffic growth), viability and transport infrastructure is shown in the following diagram.

Figure 1 Interaction between growth, transport, viability and infrastructure



1.5 Figure 1 shows that the interaction is (or can be) iterative, in that

Stage 1 (to right of chain-dot dividing line in the diagram)

i. The quanta and location of employment and residential growth is established through the SHMA and other evidence;
ii. The transport impacts of the quanta and location of growth together with new infrastructure that has already been implemented since the baseline year or 'committed' for implementation during the plan period is modelled using the City of York transport model;
iii. This establishes the level of demand (traffic growth) against the capacity of the network to accommodate this growth (i.e. the forecast level of congestion 'pain') - the 'do minimum' scenario;
iv. Typically after this initial model run a view can be given on whether this level of pain is (or will be) acceptable. At this point a high-level viability assessment should be undertaken to assess to confirm the 'committed' infrastructure and Local Plan policy requirements can be afforded and to estimate the likely level of 'planning gain headroom' available.

Stage 2 (to left of chain-dot dividing line in the diagram)

v. If the level of congestion 'pain' forecast in iii) it isn't acceptable, additional infrastructure can be identified to mitigate this pain. Re-running the model for this situation – the 'do something' scenario - should show a reduction in 'pain'. However, a larger infrastructure requirement will incur additional expenditure (alternatively, a lower amount of development growth to reduce 'pain' could be pursued and modelled).
vi. A viability assessment is undertaken to ascertain whether the additional infrastructure requirement can be afforded (i.e. there is, or there is a realistic prospect of, sufficient funding in place to fund the investment in infrastructure).
vii. If the viability assessment shows enough funding is available (or can be secured) – all well and good! However, if the viability assessment shows a funding gap that can not be bridged, there are several options available to choose from:
    a. Reduce the amount of growth
    b. Identify ways of bridging the funding gap
    c. Accept a higher than desirable level of pain
viii. If either option a and /or b is chosen the transport model can be re-run to determine the resultant level of 'pain' and, again, a view can be given as to whether this is, or will be, acceptable.

2. Transport Modelling

The Transport Model

2.1 The City of York strategic transport model was last fully upgraded in 2010, and is more than five years old, so any outputs derived from its use may, in the absence of updating / refreshing, have been subjected to challenge. This could result in the local plan being successfully challenged at Examination in Public (EiP).

2.2 In July 2016, a consultancy services provider was commissioned to:

i. Undertake a refresh of the York strategic transport model to ensure that it meets current Web-Tag[1] guidance and thereby provide a robust evidence base that will stand-up to examination and reduce, to an acceptable level, the risk of the outputs being open to legal challenge, and
ii. rerun the transport model to:
    a. Re-establish the baseline;
    b. model future years (principally 2032) with the quanta and location of employment and residential growth together with implemented and 'committed' infrastructure - i.e. the 'do minimum' scenario, see also (iii) above, and
    c. if required following (b), model future years (principally 2032) with 'committed' development and 'required' infrastructure - i.e. a 'do something' scenario, see also (iv) above.

Establishing the 2016 Baseline

2.3 To establish the 2016 baseline position the consultancy services provider:

- Reviewed the 2010 Base year model (SATURN CUBE) to gain an understanding of the process;
- Produced updated base year for 2016 taking into account network and development changes from 2010, and
- Refined the 2016 model to accurately model highway traffic conditions.

2.4 The base year model validation was developed closely following TAG M3.1 'Highway Assignment Modelling' guidance (January 2014). The resultant Local Model Validation Report for this work stated that:

- The latest 2016 York Traffic Model is deemed fit for purpose in terms of its ability to replicate existing strategic traffic movements within the Area of Detailed Modelling (ADM)
- The base year model forms a suitable basis from which forecast year models can be built to create reference case, do minimum and do something scheme testing.
- The model provides a suitable evidence base to underpin Local Plan testing for York.

[1] Transport analysis guidance: WebTAG, *Department for Transport*

2.5 The modelled baseline (2016) traffic speeds were compared with the most up to date (2015) Trafficmaster journey time data available from the Department for Transport (DfT), to assess the degree of correlation between the actual and modelled traffic speeds.

2.6 In addition, the baseline modelling is also able to show:

- Traffic speeds across the network in 2015 compared to 2010
- for the baseline year (2016) the percentage difference between traffic speeds in the am and pm peak hours and the 'freeflow' traffic speeds (the speeds achievable at the quietest time on the network):
- the modelled journey times on sixteen specific routes that could be deemed to be representative of 'typical' trips on the network, and
- the modelled peak-hour travel times compared to the modelled 'freeflow' travel times for these routes.

2.7 Results of the baseline modelling (see also Figure 2 to Figure 10 and Table 1). The modelling shows:

- There is a reasonably close correlation between the modelled traffic speeds for the baseline and actual traffic speeds recorded in 2015 (used to validate the modelled speeds), albeit that there were a few exceptions.
- traffic speeds in 2015 appear to be broadly similar to traffic speeds in 2010
- when comparing the traffic speeds in the peak hours to the 'freeflow' traffic speeds
  - the majority of the network appears to operate at above 50% (or even above 75%) of the free-flow speed;
  - **much of the A1237 ORR, the IRR and the key southern and western radial routes into the city centre appears to operate at below 50% of the free-flow speed;**
  - in the AM peak hour, more of the northern, eastern and southern quadrants of the IRR appear to operate at above 50% free-flow speeds than in the PM peak-hour, and
  - in the AM peak-hour much of the A19 (Fulford Road) appears to operate at above 50% of the free-flow speed and much of the A59 appears to operate at below 50% of the free-flow speed, but this is reversed in the PM peak hour
- the modelled journey times on the specific routes that could be deemed to be representative of 'typical' trips on the network are generally longer in the am and pm peak hours compared to the 'freeflow' journey times. The 'delay' compared to 'freeflow' ranges from a few seconds to more than 15 minutes (on the A1237 northbound, PM peak)

Figure 2 Baseline (2016) modelled traffic speeds AM peak hour

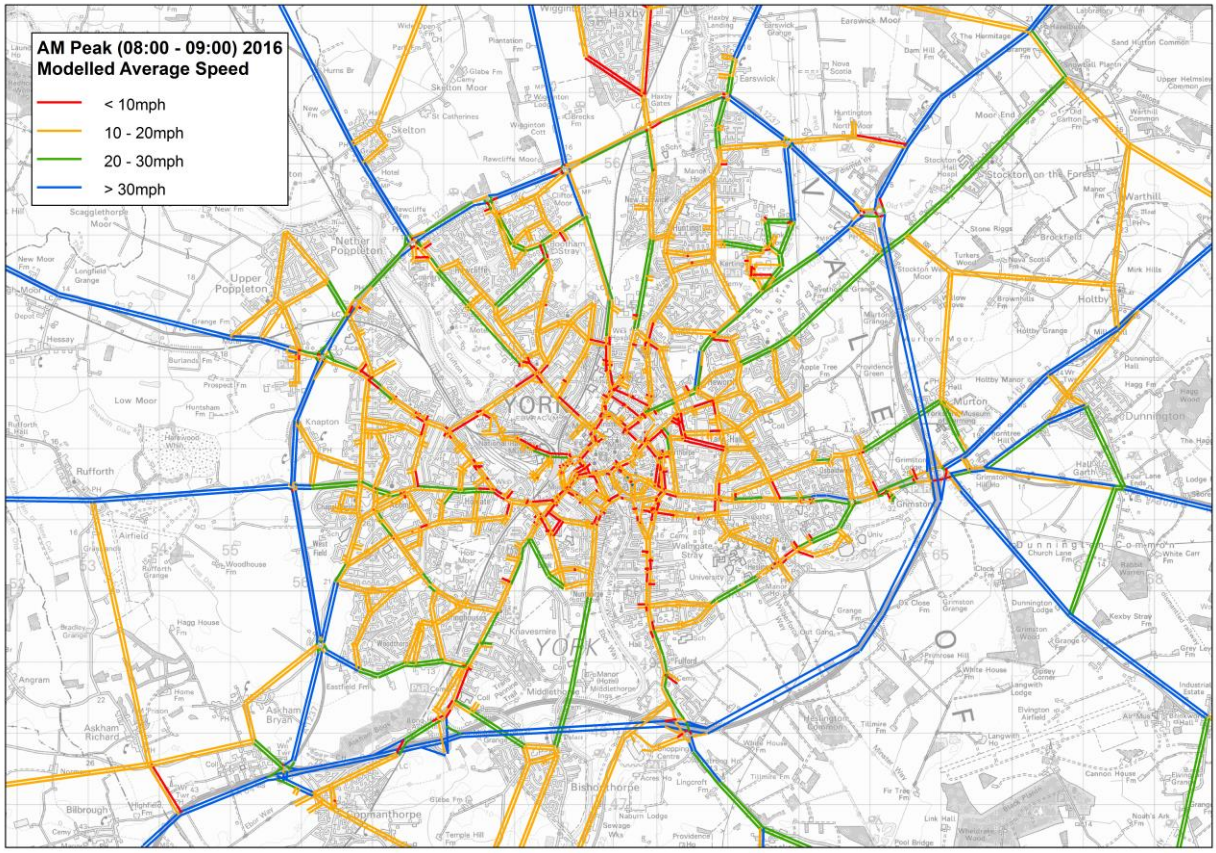


Figure 3 2016 Average AM Peak traffic speed (from Trafficmaster)

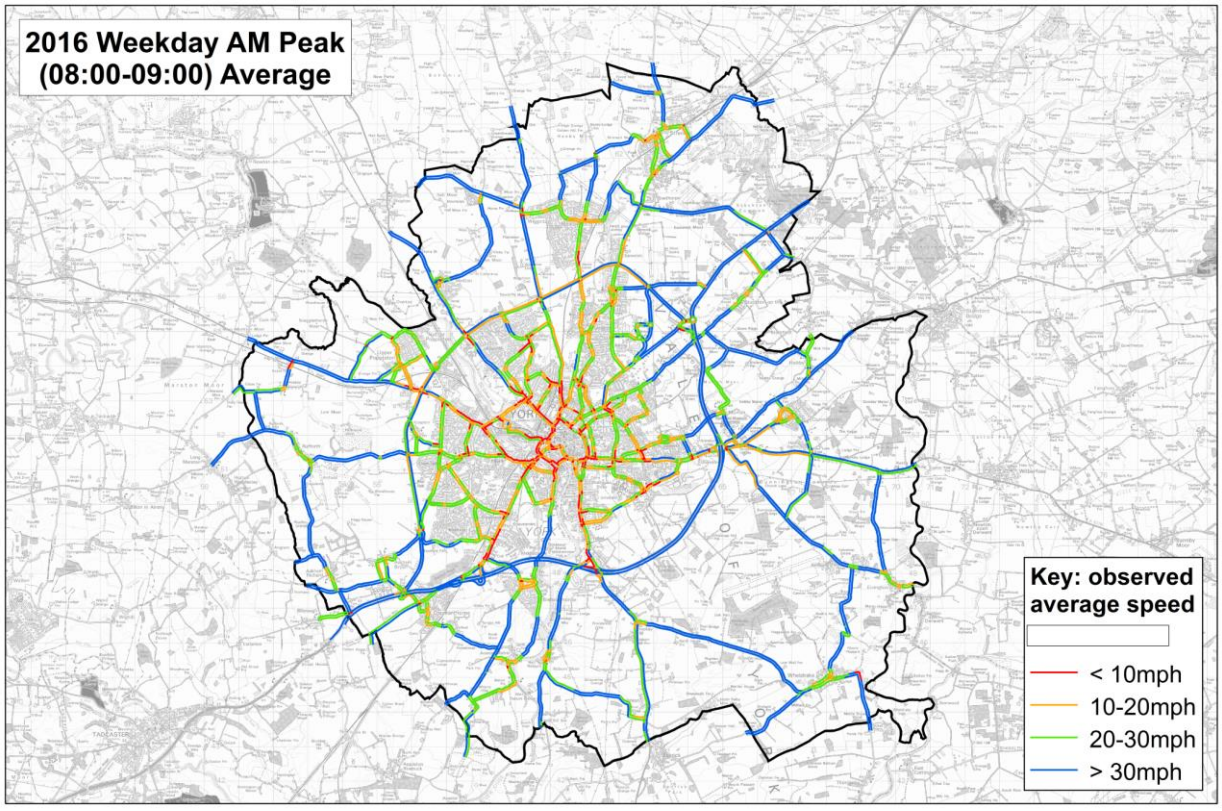


Figure 4 Baseline (2016) Modelled traffic speeds PM Peak Hour

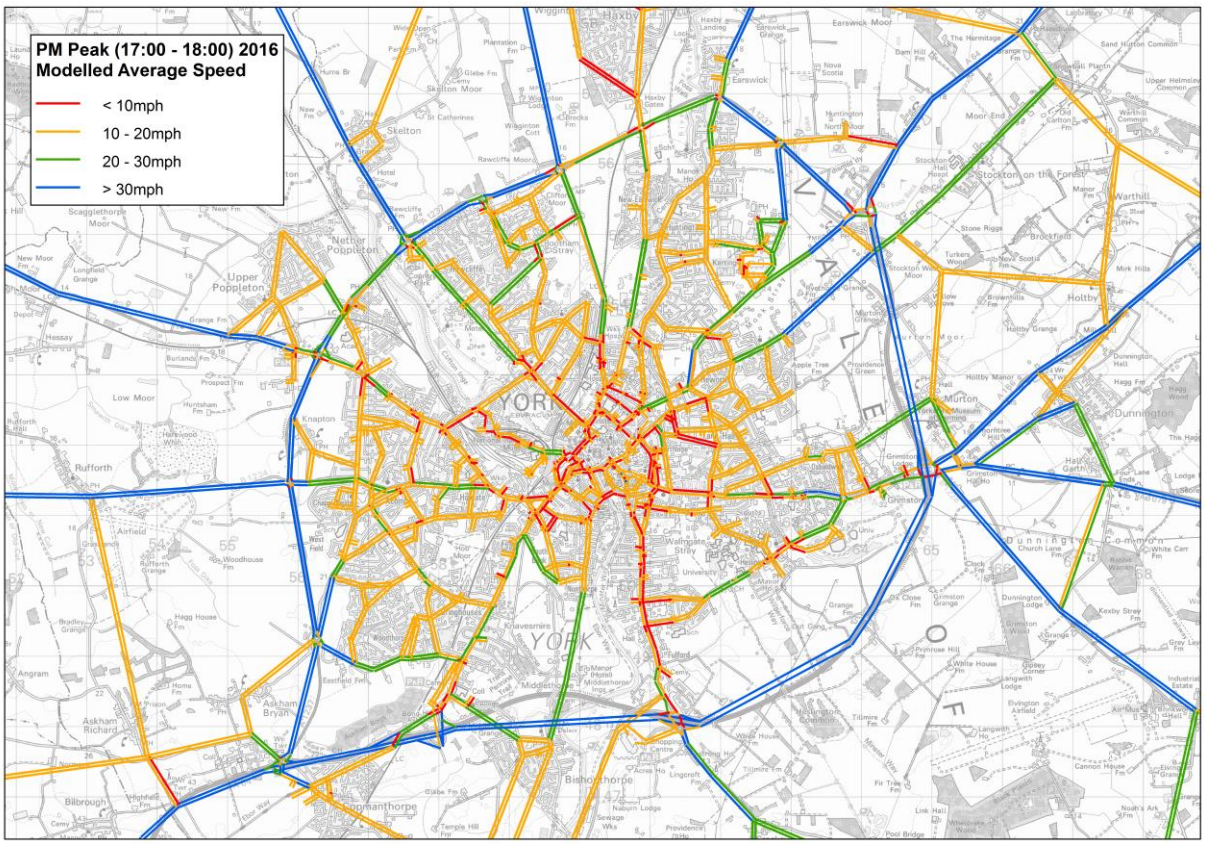


Figure 5 2016 Average PM Peak traffic speed (from Trafficmaster)

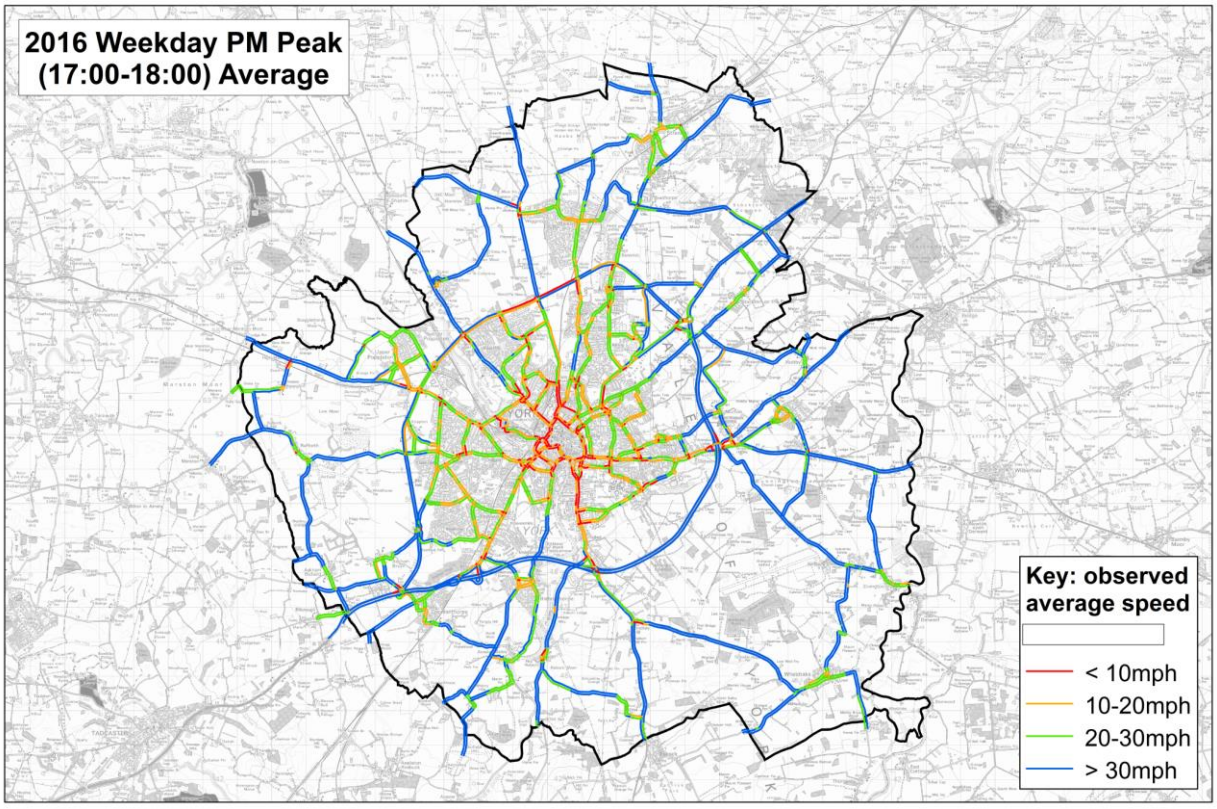


Figure 6 Changes in AM peak-hour traffic speeds from 2010 to 2016

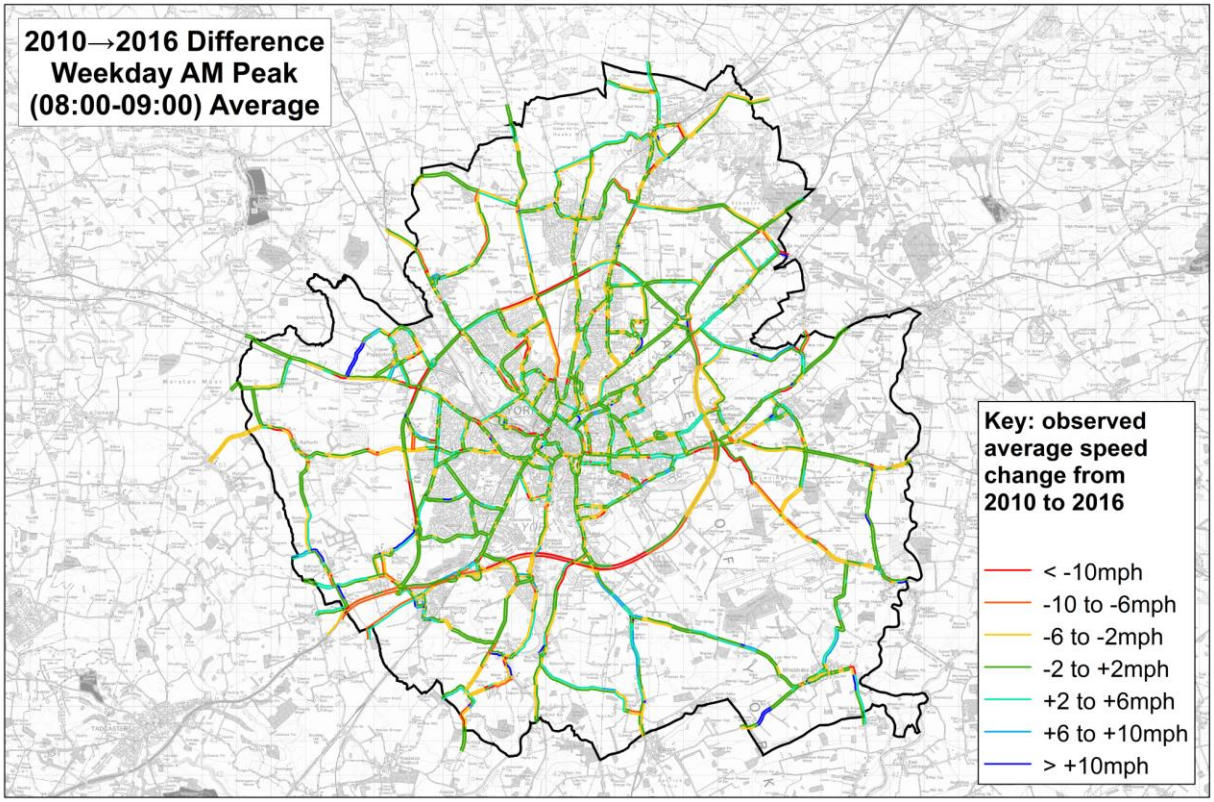


Figure 7 Changes in PM peak hour traffic speeds from 2010 to 2016

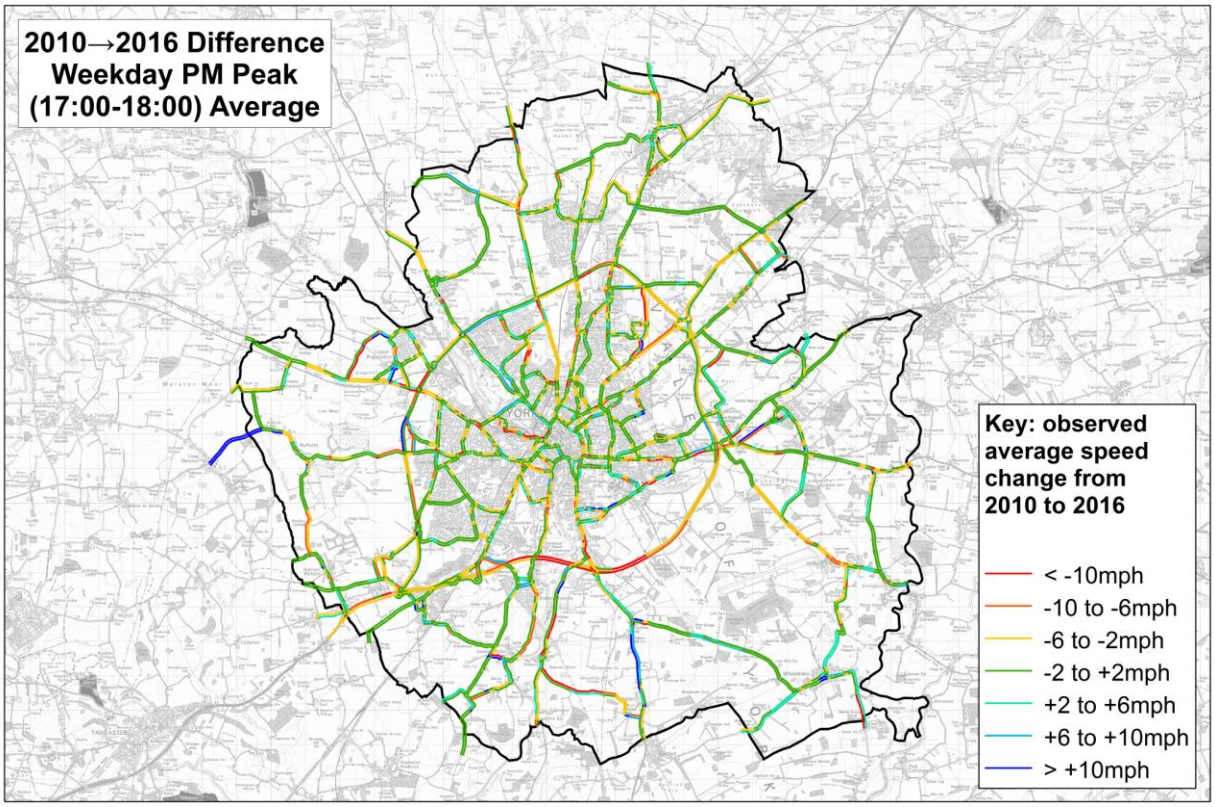


Figure 8 2016 AM Peak-hour traffic speed relative to free-flow traffic speed

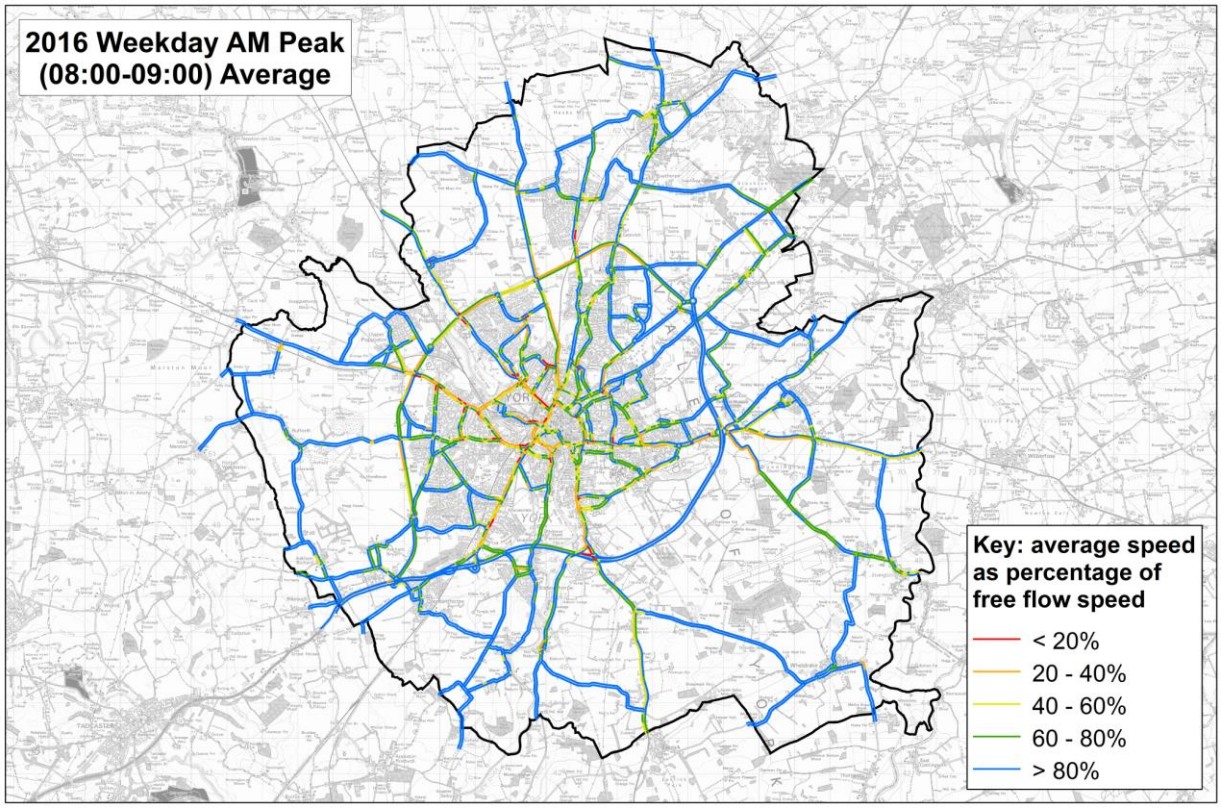


Figure 9 2016 PM Peak-hour traffic speed relative to free-flow traffic speed

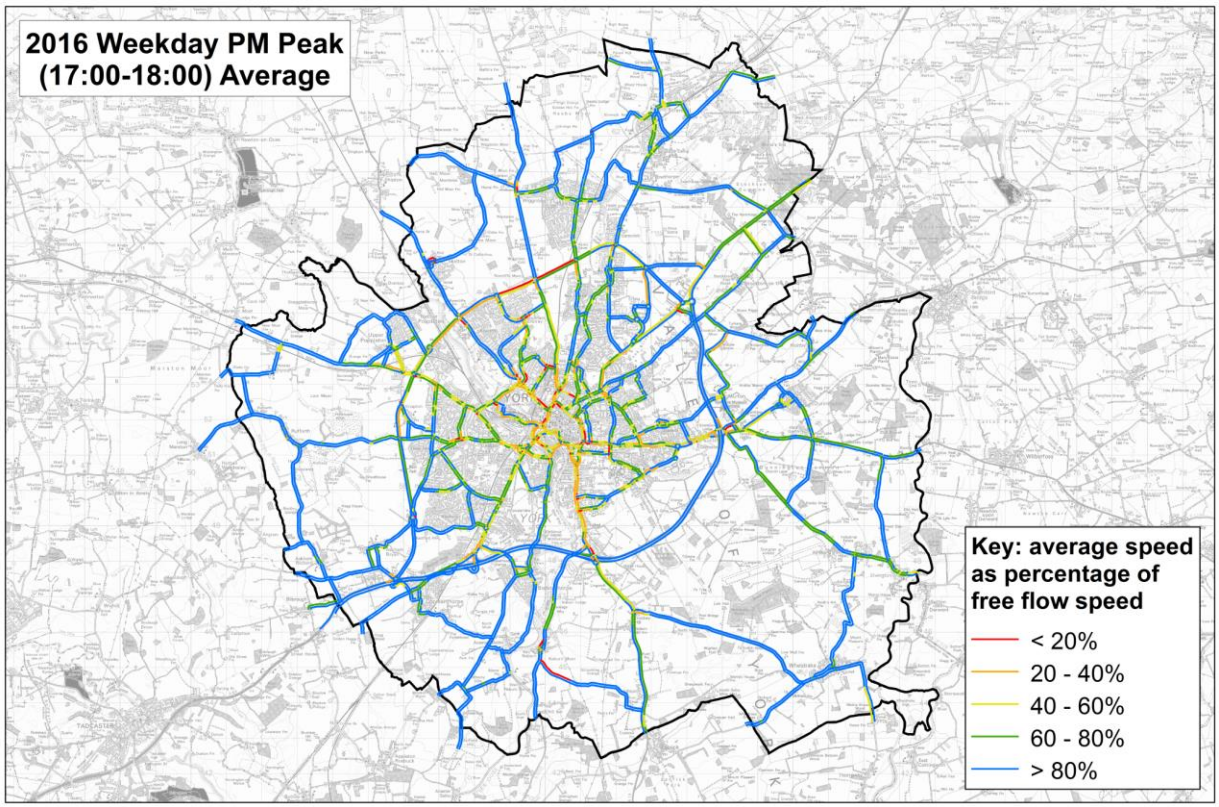


Figure 10 Routes representative of 'typical trips on the network

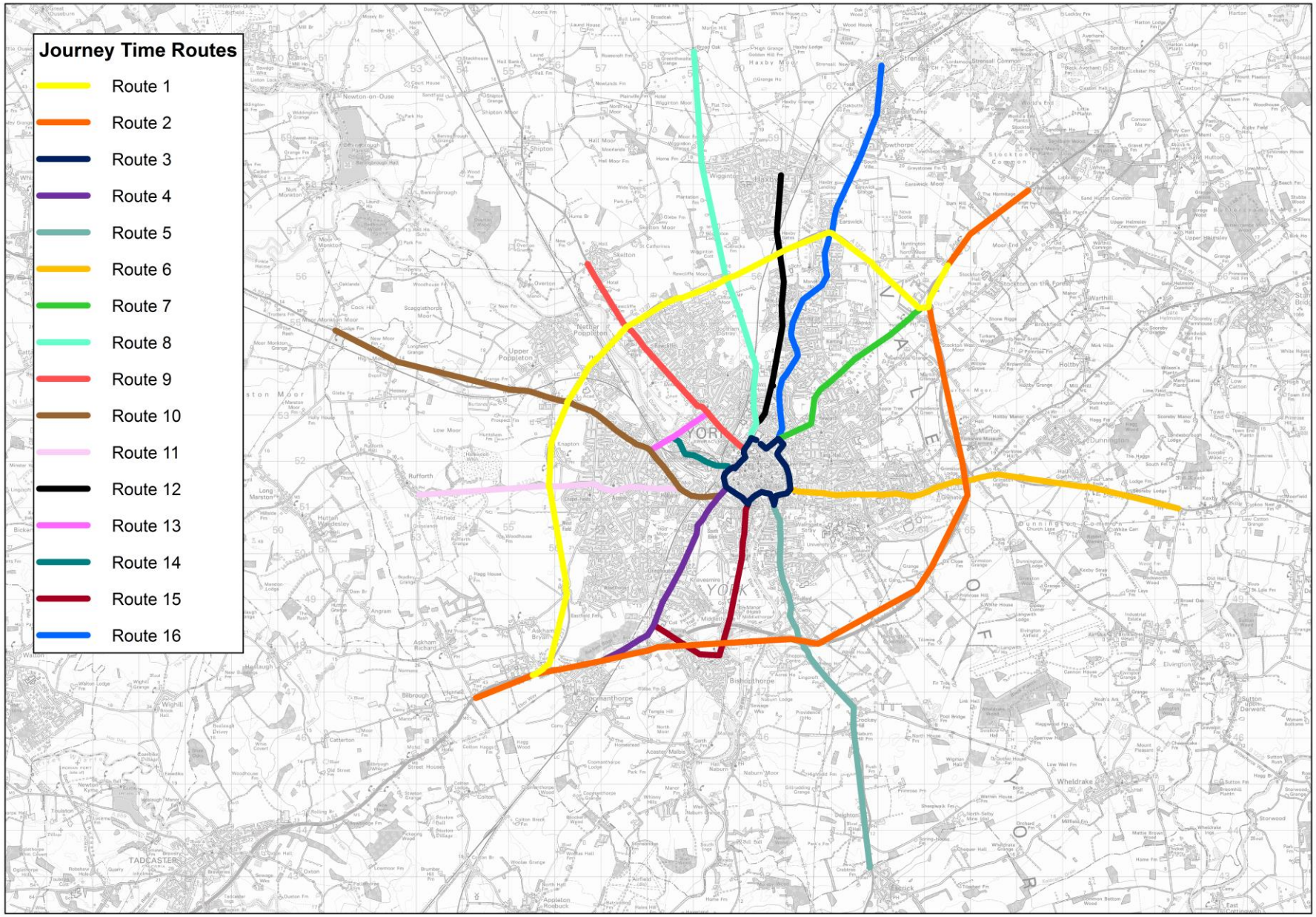


Table 1 Comparison of Peak-hour and free flow times for 'typical' York trips

Trip		Modelled Peak hour trip time (min : sec)		Modelled 'freeflow' trip time (min : sec.)		'Delay' (min : sec) compared to Freeflow	
Route No.	Description	AM	PM	AM	PM	AM	PM
1	A1237 (Northbound)	26:40	34:48	16:53	16:53	**09:47**	**17:55**
	A1237 (Southbound)	26:28	25:56	18:17	18:17	**08:11**	**07:39**
2	A64 (Northbound)	14:07	14:09	12:53	12:56	**01:13**	**01:12**
	A64 (Southbound)	12:43	13:20	11:49	11:51	**00:54**	**01:30**
3	Inner Ring Road (Clockwise)	22:16	25:50	18:07	19:55	**04:09**	**05:55**
	Inner Ring Road (Anti-clockwise)	19:05	21:39	14:02	16:36	**05:02**	**05:03**
4	A1036 Tadcaster Road (Inbound)	13:42	13:24	11:35	11:20	**02:07**	**02:04**
	A1036 Tadcaster Road (Outbound)	11:31	10:36	09:12	09:06	**02:19**	**01:30**
5	A19 Fulford Road (Inbound)	15:53	14:28	13:31	12:55	**02:22**	**01:34**
	A19 Fulford Road (Outbound)	13:26	23:18	11:44	20:23	**01:42**	**02:56**
6	A1079 Hull Road (Inbound)	17:01	15:24	13:37	12:55	**03:24**	**02:28**
	A1079 Hull Road (Outbound)	10:32	13:07	09:53	09:51	**00:39**	**03:16**
7	A1036 Malton Road (Inbound)	08:40	09:01	07:53	08:15	**00:47**	**00:46**
	A1036 Malton Road (Outbound)	07:38	07:47	07:11	07:05	**00:27**	**00:42**
8	B1363 Wigginton Road (Inbound)	14:55	14:21	12:42	12:22	**02:13**	**01:59**
	B1363 Wigginton Road (Outbound)	13:59	13:34	11:17	11:09	**02:42**	**02:25**
9	A19 Shipton Road (Inbound)	17:35	17:19	11:40	10:21	**05:55**	**06:58**
	A19 Shipton Road (Outbound)	10:51	09:21	09:09	08:25	**01:41**	**00:57**
10	A59 Boroughbridge Road (Inbound)	20:29	18:51	16:39	16:10	**03:50**	**02:41**
	A59 Boroughbridge Road (Outbound)	14:42	18:13	13:48	13:23	**00:54**	**04:49**
11	B1224 Wetherby Road (Inbound)	10:23	10:46	08:28	08:32	**01:55**	**02:14**
	B1224 Wetherby Road (Outbound)	07:55	07:54	07:43	07:44	**00:12**	**00:10**
12	Haxby Road (Inbound)	16:20	12:15	14:32	11:51	**01:48**	**00:23**
	Haxby Road (Outbound)	11:23	11:46	11:04	11:04	**00:19**	**00:42**
13	Water End (to northeast)	06:17	04:13	05:47	03:53	**00:30**	**00:20**
	Water End (to southwest)	05:16	05:01	04:33	04:10	**00:44**	**00:51**
14	Leeman Road (Inbound)	05:59	04:12	05:25	03:51	**00:34**	**00:21**
	Leeman Road (Outbound)	04:12	06:28	03:40	05:59	**00:31**	**00:29**
15	Bishopthorpe Road (Inbound)	10:16	08:50	09:56	08:39	**00:20**	**00:12**
	Bishopthorpe Road (Outbound)	08:58	09:15	08:58	09:07	**00:00**	**00:08**
16	Strensall Road (Inbound)	14:22	14:37	13:54	13:40	**00:28**	**00:57**
	Strensall Road (Outbound)	16:01	15:44	15:33	15:23	**00:28**	**00:21**

Future Year Forecasting

2.8 Trip rates for each development allocation were derived using the Development Forecasting Spreadsheet this uses trip rates based on development type and size, time period and location within the city (City Centre, Inner Ring Road or Outer Area).

2.9 Building on the three previous studies of 2011, 2013 and 2014 and considering impacts the future land use allocations are likely to have on the transport network, a number of infrastructure measures have been identified that can be realistically expected to be put in place to support the growth of traffic on the road network – a 'do minimum' scenario.

2.10 The infrastructure schemes are shown in Table 2 and have been categorised:

- Committed Schemes – These are schemes which have already received funding and design / construction is in progress.
- Local Plan Infrastructure (Strategic Measures) – These schemes are strategic and necessary to facilitate the growth in transport associated with the housing and employment aspirations of the Local Plan.
- Development Led Infrastructure – These schemes are related to specific developments.

Table 2 Modelled Infrastructure

Ref	Scheme Description	Scheme Type
Committed Schemes		
HA02	Wetherby Road roundabout	Highway (ORR Jct. imp.)
HA03	Great North Way roundabout	Highway (ORR Jct. imp.)
HA04	Clifton Moor Gate roundabout	Highway (ORR Jct. imp.)
HA05	Wigginton Road roundabout	Highway (ORR Jct. imp.)
HA06	Haxby Road roundabout	Highway (ORR Jct. imp.)
HA07	Strensall Road roundabout	Highway (ORR Jct. imp.)
HA08	North Lane roundabout	Highway (ORR Jct. imp.)
Local Plan Infrastructure (Strategic Measures)		
BA10	ST5 York Central Access and Link Road	Highway and Public Transport (Bus)
Development Led Infrastructure		
HB01	ST7 Land East of Metcalfe Lane – Link Road	Highway (Link Road)
HB02	ST15 Whinthorpe - A64 grade separated jct.	Highway (A64 Jct. Imp.)
	ST14 Land West of Wigginton Road – new access off Clifton Moor Gate Roundabout	Highway (ORR Jct. improvement)
	ST14 Land West of Wigginton Road – new access off Wigginton Road	Highway (new Jct. / Access.)

2.11 The primary outputs from the model as they relate to overall impacts on the network in the am peak and the pm peak are:

- Total trips (and change from 2016 Baseline)
- Total travel time (and change from 2016 Baseline)
- Total delay (and change from 2016 Baseline)

2.12 These are summarised in Table 3.

Table 3 Summary of primary impacts for the 2032/33 future year

Impact	am			pm		
	Number	increase from 2016		Number	Increase from 2016	
		Number	%		Number	%
Total trips (PCUs)[2]	42,245	8,045	23.5	45,309	7,945	21.3
Total travel time (PCU hrs)[a]	11,400	2,945	34.8	12,735	3,344	35.6
Total delay (PCU hrs)	**3,055**	**1,199**	**64.6**	**3,785**	**1,500**	**65.6**

a Taken from the Assignment statistics for the simulation area only

2.13 From Table 3 it can be seen, for the network as a whole (i.e. for all trips on the network), that from the 2016 baseline to 2032/33:

- Total trips increase by approximately 20% to 25%
- Total travel time increases by approximately 35%
- Total delay increases by approximately 65%

2.14 It should be stressed that these are average values and there will be variations throughout the network, with some areas or specific junctions experiencing higher levels of delay that others.

2.15 Because of these local variations throughout the network, the values indicated in Table 3 should not be taken as meaning that the time to undertake a journey in 2016 (baseline year) will be 35% longer in 2032/33 or delays experienced on a journey in 2032/33 will be 65% higher than those currently experienced.

2.16 Greater detail from the modelling output is shown in the mapping contained in Figure 11 to

[2] Passenger Car Units (PCUs) are frequently used in traffic assessment work and are based on the principal of translating all vehicles into one common unit This is achieved by apportioning different PCU values to different types of traffic. Typical values are

Car	=	1.0 PCU
Light Goods Vehicle	=	1.0 PCU
Rigid Goods Vehicle	=	1.9 PCU
Articulated Goods Vehicle	=	2.9 PCU
Public Service Vehicle	=	2.5 PCU

Figure 16. The mapping shows the forecast changes in traffic volume, traffic speeds and changes in traffic speeds at the end of the Local Plan period taking into account the infrastructure committed to be delivered by 2032/33 (see Table 2), traffic growth arising from the growth in development in the Local Plan and general 'background' traffic growth. These show that the main parts of the network forecast to be impacted on are

- The A64
- A1237 from A19 Junction to A64 Hopgrove
- A59/A1237 Roundabout / A59 / Wetherby Road
- Malton Road
- A19 / Fulford Road corridor
- Hull Road corridor
- Wigginton Road
- Strensall Road (north of the A1237)
- Tang Hall Lane (PM Peak)
- Osbaldwick Lane (PM Peak)
- Stockton Lane

2.17 Other areas in the network that are also forecasted to be impacted on significantly, but to a lesser extent than those listed above are

- Water End / Clifton Green / Holgate Road
- Stockton Lane
- Haxby Road
- Fishergate
- IRR eastern side
- Tower Street / Low Ousegate / Rougier Street (PM Peak)

Figure 11 Local Plan growth change in traffic volumes AM Peak 2016 - 2032/33

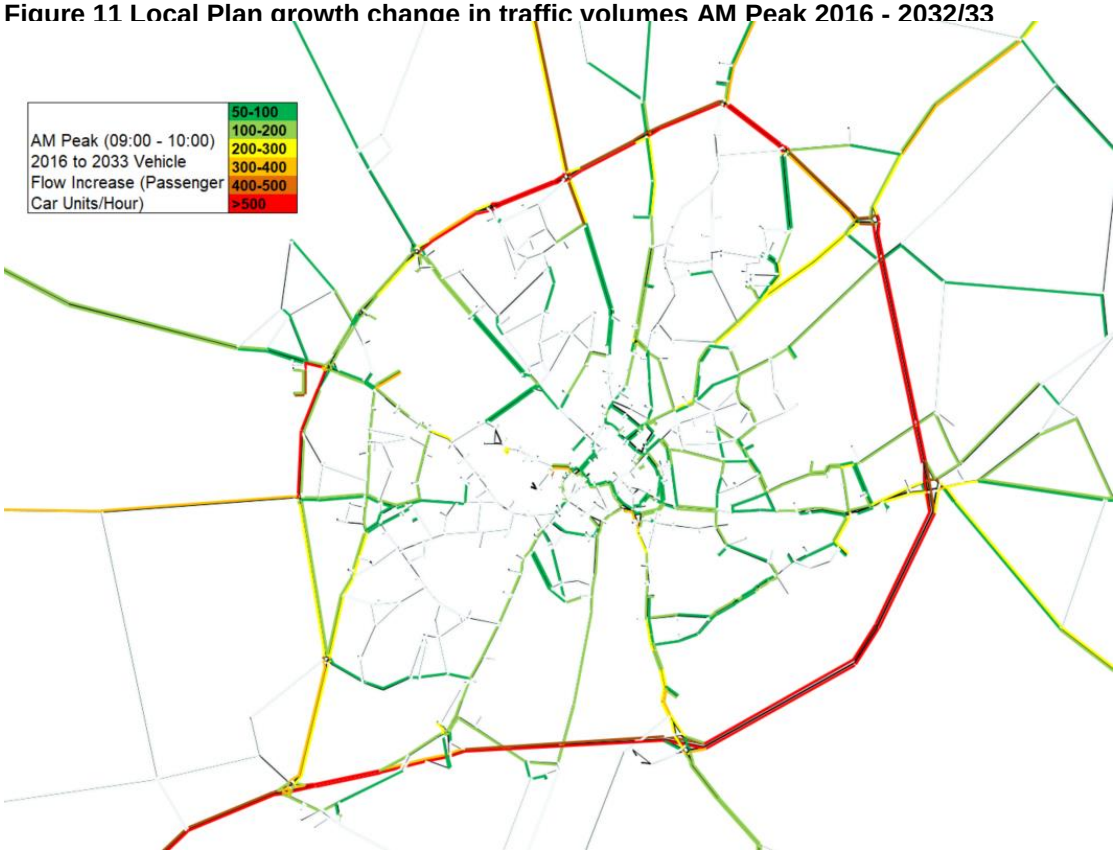


Figure 12 Local Plan growth change in traffic volumes PM Peak 2016 - 2032/33

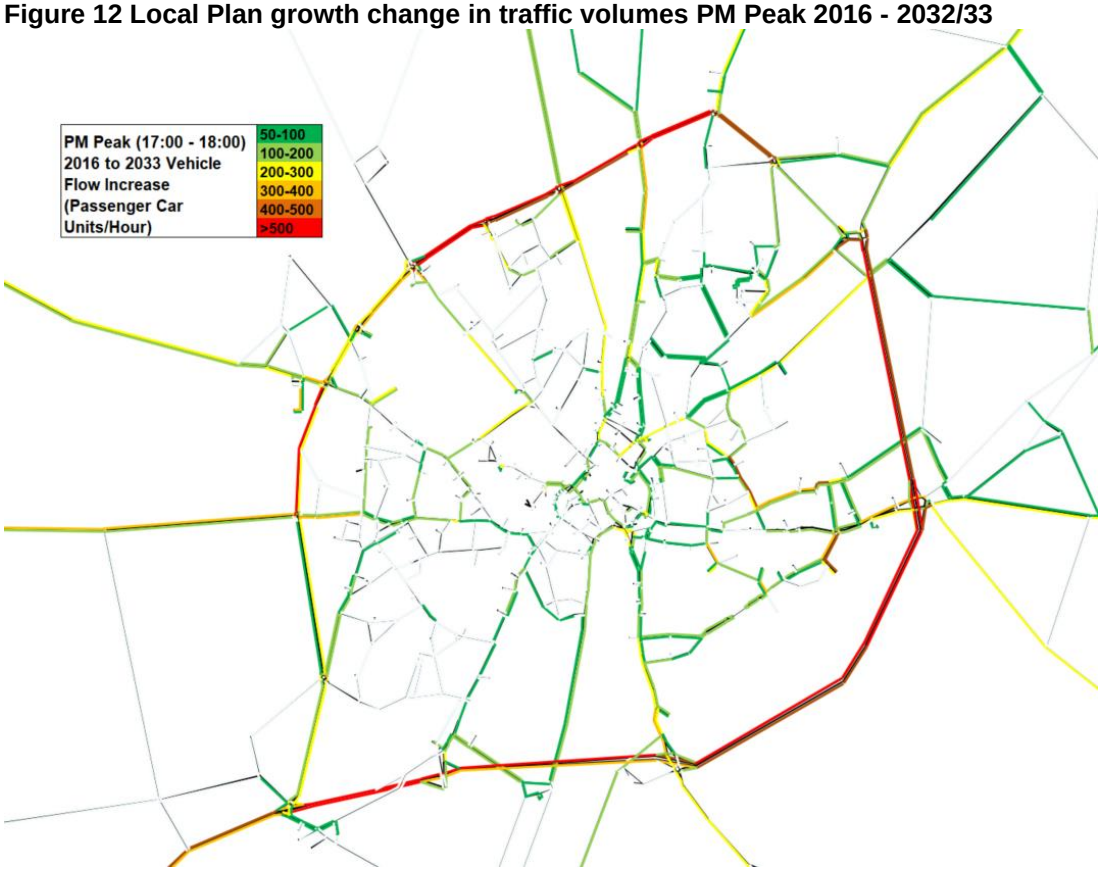


Figure 13 Local Plan growth traffic speeds AM Peak 2032/33

Figure 14 Local Plan growth traffic speeds PM Peak 2032/33

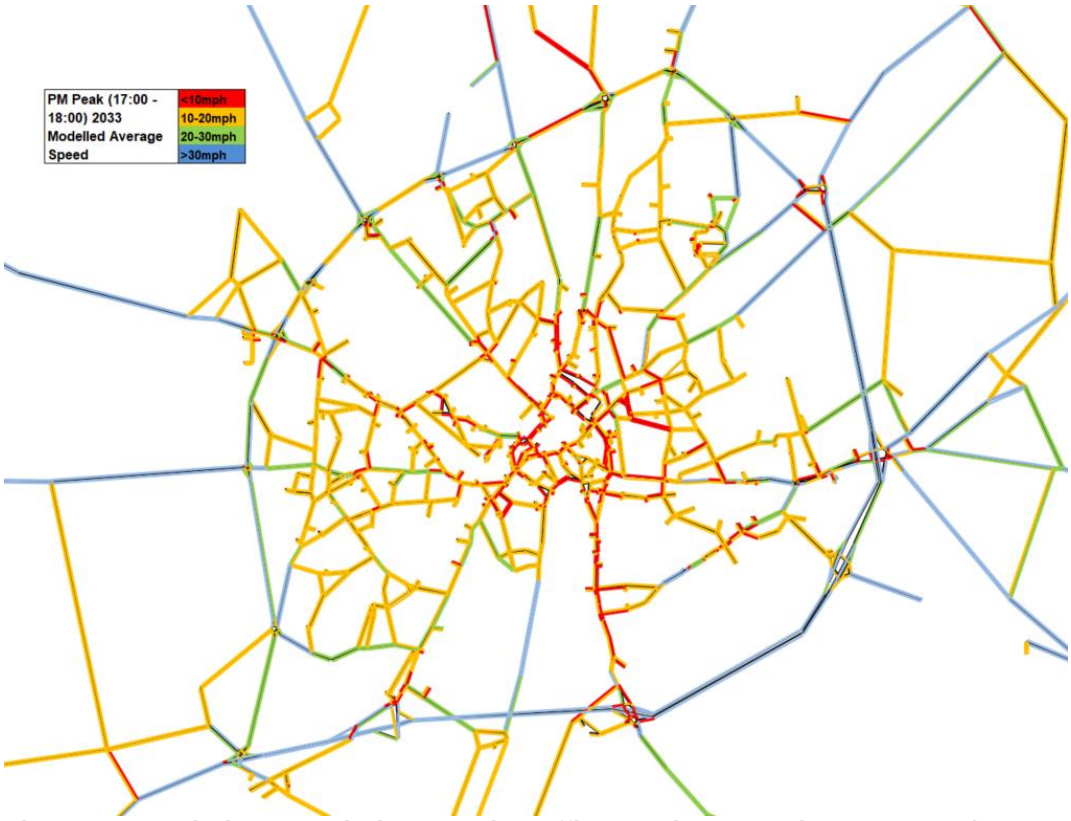


Figure 15 Local Plan growth decrease in traffic speeds AM Peak 2016 – 2032/33

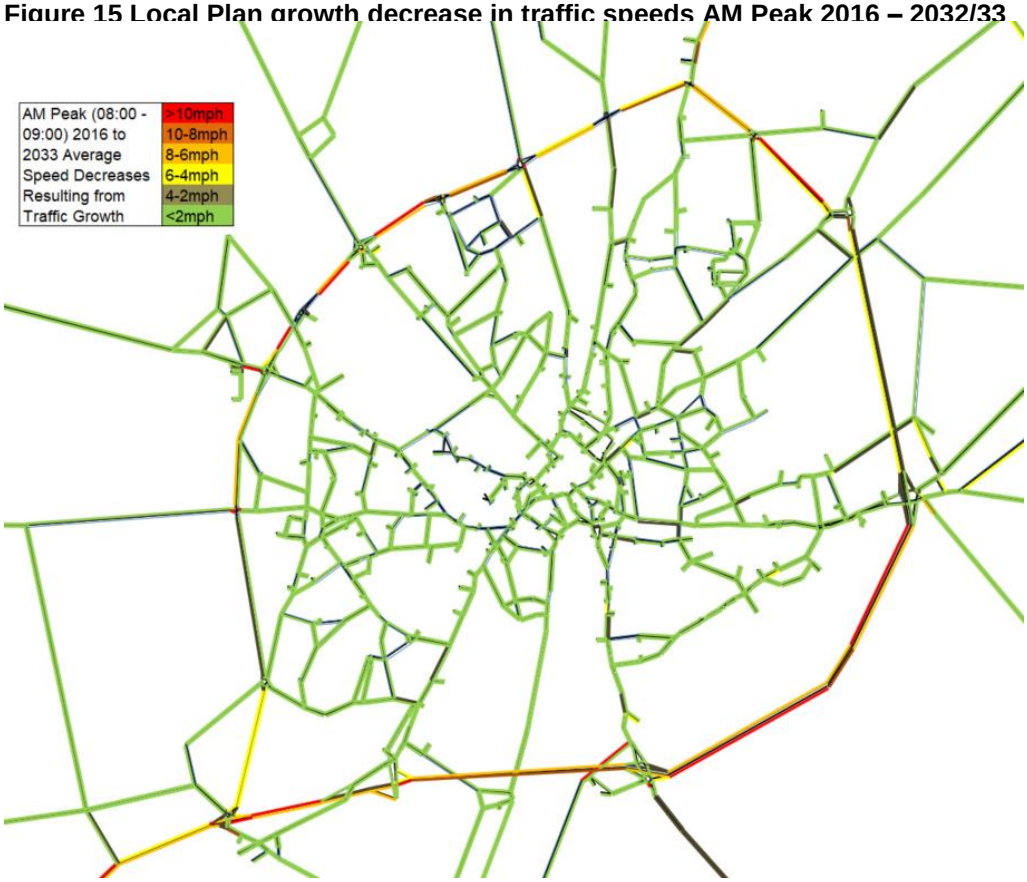
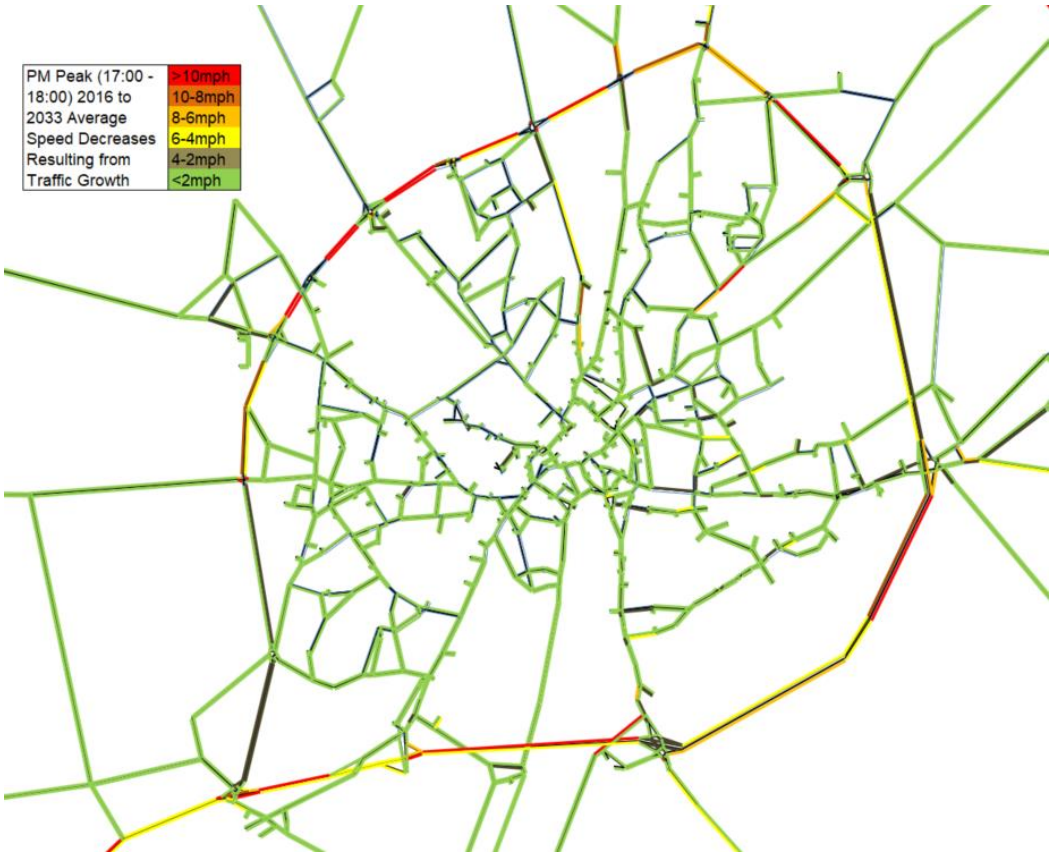


Figure 16 Local Plan growth decrease in traffic speeds PM Peak 2016 – 2032/3



2.18 Although Figure 11 to Figure **16** show the changes in traffic volumes and vehicle speeds across the network they may not necessary give the information that would be of direct relevance to road users undertaking journeys into, around, or through York. To provide a more relevant indication of how a typical journey will be affected in the future year the changes on travel time on the sixteen routes previously reported in Table 1 (see also Figure 10) are shown in Table 4.

2.19 From Table 4 it can be seen that:

1 There are a few routes that have forecast small reductions in travel time in the future year, but, in general, the forecast travel times increase.

2 The majority of the forecast journey time increases are relatively modest (i.e. < 2 mins.)

3 Fulford Road (inbound) and Wigginton Road (outbound) appear to have the highest forecast increase in journey time
- Fulford Road - approximately +6 mins.
- Wigginton Road – approximately +7 mins. in the PM peak hour, with small decrease in the AM peak hour (also small decrease inbound in the AM peak hour)

4 The A1237 Northbound is forecast to have an increase in journey time in the AM peak with a similar decrease in the PM peak.

5 Haxby Road (inbound) is forecast to experience a small decrease in journey time in the AM peak but an approximately equal increase in the PM peak.

3. Conclusions

3.1 The refresh of the York strategic transport model has produced a model that is deemed fit for purpose in terms of its ability to replicate existing strategic traffic movements within the Area of Detailed Modelling (ADM), to form a suitable basis from which to prepare future- year (2032/33) forecasts.

3.2 The modelling work undertaken to date shows that for the baseline year (2016)

- There is a reasonably close correlation between the modelled traffic speeds for the baseline and actual traffic speeds.
- traffic speeds in 2016 appear to be broadly similar to traffic speeds in 2010
- when comparing the traffic speeds in the peak hours to the 'freeflow' traffic speeds
  - the majority of the network appears to operate at above 50% (or even above 75%) of the free-flow speed;
  - **much of the A1237 ORR, the IRR and the key southern and western radial routes into the city centre appears to operate at below 50% of the free-flow speed;**

Table 4 Comparison of future year modelled travel times with baseline year travel times

Trip		2016 Base year modelled peak hour trip time (min : sec)		Future Year (2032/33) Forecast					
				Modelled peak hour trip time (min : sec)		Increase from baseline year (min : sec)		Percentage increase in time from Baseline year	
Route No.	Description	AM	PM	AM	PM	AM	PM	AM	PM
1	A1237 (Northbound)	26:40	34:48	28:56	34:35	**02:15**	**-00:13**	8.5%	-0.6%
	A1237 (Southbound)	26:28	25:56	28:46	30:39	**02:17**	**04:43**	8.7%	18.2%
2	A64 (Northbound)	14:07	14:09	16:35	16:24	**02:28**	**02:16**	17.5%	16.0%
	A64 (Southbound)	12:43	13:20	14:29	16:33	**01:46**	**03:13**	13.9%	24.1%
3	Inner Ring Road (Clockwise)	22:16	25:50	24:33	28:09	**02:16**	**02:19**	10.2%	9.0%
	Inner Ring Road (Anti-clockwise)	19:05	21:39	21:11	24:11	**02:07**	**02:32**	11.1%	11.7%
4	A1036 Tadcaster Road (Inbound)	13:42	13:24	14:37	13:39	**00:55**	**00:15**	6.7%	1.9%
	A1036 Tadcaster Road (Outbound)	11:31	10:36	12:05	11:15	**00:34**	**00:39**	4.9%	6.1%
5	A19 Fulford Road (Inbound)	15:53	14:28	21:57	19:51	**06:04**	**05:23**	38.2%	37.1%
	A19 Fulford Road (Outbound)	13:26	23:18	14:27	24:12	**01:00**	**00:54**	7.5%	3.8%
6	A1079 Hull Road (Inbound)	17:01	15:24	19:33	18:37	**02:32**	**03:14**	14.9%	21.0%
	A1079 Hull Road (Outbound)	10:32	13:07	10:57	16:37	**00:25**	**03:30**	4.0%	26.7%
7	A1036 Malton Road (Inbound)	08:40	09:01	09:19	10:21	**00:39**	**01:20**	7.5%	14.7%
	A1036 Malton Road (Outbound)	07:38	07:47	07:48	08:18	**00:11**	**00:31**	2.3%	6.6%
8	B1363 Wigginton Road (Inbound)	14:55	14:21	14:23	16:39	**-00:32**	**02:18**	-3.6%	16.0%
	B1363 Wigginton Road (Outbound)	13:59	13:34	13:56	20:10	**-00:03**	**06:36**	-0.4%	48.7%
9	A19 Shipton Road (Inbound)	17:35	17:19	15:53	15:56	**-01:42**	**-01:23**	-9.7%	-8.0%
	A19 Shipton Road (Outbound)	10:51	09:21	09:57	09:20	**-00:54**	**-00:01**	-8.2%	-0.3%
10	A59 Boroughbridge Road (Inbound)	20:29	18:51	20:46	19:34	**00:17**	**00:43**	1.4%	3.8%
	A59 Boroughbridge Road (Outbound)	14:42	18:13	16:56	19:09	**02:14**	**00:57**	15.2%	5.2%
11	B1224 Wetherby Road (Inbound)	10:23	10:46	10:57	11:31	**00:34**	**00:46**	5.4%	7.1%
	B1224 Wetherby Road (Outbound)	07:55	07:54	08:02	08:06	**00:07**	**00:13**	1.5%	2.6%
12	Haxby Road (Inbound)	16:20	12:15	15:44	13:02	**-00:36**	**00:48**	-3.7%	6.5%
	Haxby Road (Outbound)	11:23	11:46	11:26	13:36	**00:04**	**01:50**	0.5%	15.6%
13	Water End (to northeast)	06:17	04:13	06:26	05:15	**00:09**	**01:01**	2.3%	24.2%
	Water End (to southwest)	05:16	05:01	05:36	07:55	**00:20**	**02:53**	6.3%	57.6%
14	Leeman Road (Inbound)	05:59	04:12	07:44	05:11	**01:45**	**00:59**	29.3%	23.4%
	Leeman Road (Outbound)	04:12	06:28	04:41	06:37	**00:29**	**00:09**	11.6%	2.4%
15	Bishopthorpe Road (Inbound)	10:16	08:50	10:24	08:53	**00:08**	**00:03**	1.3%	0.6%
	Bishopthorpe Road (Outbound)	08:58	09:15	09:08	09:43	**00:10**	**00:28**	1.8%	5.1%
16	Strensall Road (Inbound)	14:22	14:37	14:45	17:15	**00:23**	**02:38**	2.7%	18.0%
	Strensall Road (Outbound)	16:01	15:44	17:06	16:00	**01:05**	**00:16**	6.8%	1.7%

3.3 For the future year (2032/33) it also shows the impacts of Local Plan development, combined with the infrastructure expected to be implemented by 2032/33, as listed in Table 2 – the 'do minimum' scenario. The main outputs from this are

1 There are a few routes that have forecast small reductions in travel time in the future year, but, in general, the forecast travel times increase.
2 The majority of the forecast journey time increases are relatively modest (i.e. < 2 mins.)
3 Fulford Road (inbound) and Wigginton Road (outbound) appear to have the highest forecast increase in journey time
   - Fulford Road - approximately +6 mins. (AM Peak) and approximately +5.5 mins. (PM peak)
   - Wigginton Road – approximately +7 mins. in the PM peak hour, with small decrease in the AM peak hour (also small decrease inbound in the AM peak hour)
4 The A1237 Northbound is forecast to have an increase in journey time in the AM peak with a similar decrease in the PM peak.
5 Haxby Road (inbound) is forecast to experience a small decrease in journey time in the AM peak but an approximately equal increase in the PM peak.
6 The main parts of the network forecast to be impacted on are
   - The A64
   - A1237 Clifton Moor to A64 Hopgrove
   - A59/A1237 Roundabout / A59 / Wetherby Road
   - Malton Road
   - A19 / Fulford Road corridor
   - Hull Road corridor
   - Wigginton Road
   - Strensall road (north of the A1237)
   - Tang Hall Lane
   - Osbaldwick Lane
   - Stockton Lane

3.4 The council is aware that further work may be required to identify additional transport (and other) infrastructure to lessen the impact of development, taking into account whether

- it is necessary,
- it is feasible,
- it is deliverable, and
- it does not impose such a burden as to render the Local Plan unviable.