3 Reference Case Results

3.1 Introduction

3.1.1 This section presents the results of the 2026 Reference Case developed for the study, and represents the scenario against which each of the development options are compared. This contains detailed land-use and site specific growth beyond 2010, as well as committed network enhancements in the Loughborough area.

3.1.2 The Reference case is developed from the validated 2005 base year multi-modal model, as described in the previous section.

3.2 Reference Case Development for 2026

3.2.1 A 2026 forecast year has been created within the Loughborough Transport Model. Utilisation of a 2026 forecast year is important in terms of the overall transport assessments and strategy recommendations as each option must be assessed in terms of a 'worst case' scenario, which incorporates the full development impacts, including background traffic growth up to a time horizon when the development options will be fully complete and occupied. Previous developments tests undertaken using the Loughborough Traffic model did not consider growth beyond 2010.

3.2.2 In order to derive a 2026 Reference Case year, standard modelling conventions have been followed, which include:

- Utilisation of additional land use planning and allocation details provided by Charnwood Borough Council for the period beyond 2010. MVA Consultancy have utilised the available planning data in order to derive growth and changes in employment and housing demands at a zonal level across the modelled area. Whilst growth occurs across the modelled area, there are a number of key expansion sites within this overall growth, most notably at Grange Park (Land south of Loughborough A-D), Peartree Lane, Dishley Grange, Burder Street, Great Central Road, Schofield Centre, Clarence Street and Station Park;
- Additional growth beyond these land-use and planning allocations has been derived from the national trip end forecasting tool- TEMPRO version 5.4. Overall growth between 2010 and 2026 has been constrained to the TEMPRO growth level, which has been applied to all zones within the modelled area on a disaggregated sector basis, at a ward and borough level;
- Known network improvements have been incorporated into the highway model, which include; pedestrianisation between Market Place and Baxter Gate; the Eastern Gateway; Dishley Grange proposals; the Inner Relief Road in the town centre; and small junctions and access routes as required for smaller, opportunity developments around the town; and,
- Likely bus route changes that currently use between Market Place and Baxter Gate have also been incorporated; including the loop along Fennel Street; two-way operation along Baxter Gate; the 'Sprint' serving the Dishley Grange and Service 5 serving the Grange Park development.

3.2.3 As only known or committed transport improvements have at this stage been implemented within the model for 2026, this worst case scenario is only therefore likely to result if there are no further interventions e.g. to manage travel demand or improve transport provision in the town over and above schemes already outlined.

3.2.4 Overall levels of predicted growth up to 2026 are shown in Table 3.1, which are derived from the TEMPRO database. This represents an average for the Loughborough area. The growth levels have also been run through the variable demand model for Loughborough (VDM), which essentially represents an own-cost elasticity based model calibrated and developed for the Inner Relief Road scheme. This reduces demand within the Loughborough area in line with increases in congestion, which lead to people either changing their destination, the time of day they choose to travel (termed 'peak spreading'), their mode, or the frequency of which they travel to Loughborough in the first place.

3.2.5 Table 3.1 shows the 'congestion constrained' level of growth output from the calibrated variable demand model is approximately 3% lower than the TEMPRO unconstrained scenario. However, if TEMPRO targets and projections for housing and employment (which are broadly linked to the RSS targets and trip data from the National Transport Model) are not met, then clearly traffic growth for Loughborough will also be correspondingly reduced from the levels of growth forecast from the most likely scenario in Table 3.1.

Table 3.1 Loughborough Reference Case Growth 2010-2026- TEMPRO Averaged

	Unconstrained Matrix Totals to TEMPRO		Constrained Matrix Totals after VDM	
	AM Peak	**PM Peak**	**AM Peak**	**PM Peak**
2005	18,073	17,743	18,073	17,743
2026	22,865	22,958	22,620	22,584
% Growth	**27%**	**29%**	**24%**	**27%**

3.2.6 When assigned to the network, this constrained level of traffic growth results in increased levels of traffic flow within Loughborough, as shown in Figure 3.1 for the AM peak. Links indicated in green represent increases in flow with the size of line and depth of color indicating larger increases in flow. The lightest green colour represents a change of less than 20 vehicles, whilst the darkest represents increases of over 200 vehicles per hour by 2026.

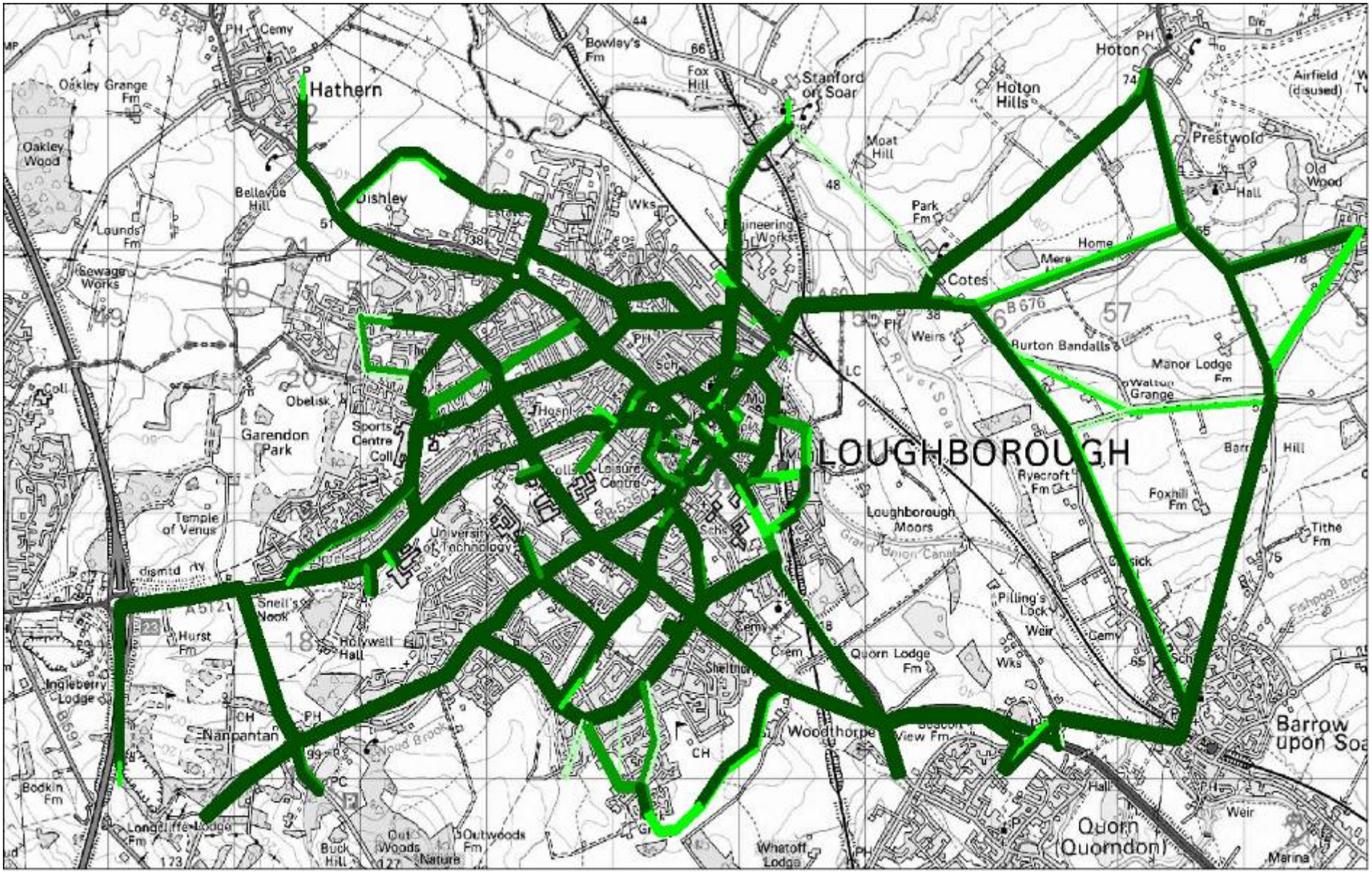
3.2.7 It may be seen that whilst locational specific growth is noted around Dishley Grange and south of Loughborough, traffic growth is generally widespread on the key radial and orbital routes within each quadrant of Loughborough. Most experience growth of over 200 vehicles per hour, although traffic growth in the town centre, in part due to the Inner Relief Road, is less noted. However, the general pattern of traffic increase is also supported by forecast growth in neighbouring districts and boroughs, as well as organic growth within Loughborough itself.

3.2.8 A very similar pattern to the AM peak flow increases noted in Figure 3.1 is observed for the PM peak.

3.2.9 Checks of the Reference Case outcomes for 2026 have been made with both Charnwood Borough Council and Leicestershire County Council in order to ensure that the scenario appears robust and passes a number of common-sense checks in terms of future year application

3.2.10 .

Figure 3.1 Forecast Reference Case Traffic Growth 2010-2026 in Loughborough- AM Peak



3.3 Testing of the Science Park to the West of Loughborough

3.3.1 The Science Park is proposed next to Loughborough University, to the west of Loughborough, and whilst included within the Reference Case against which each of the developments are compared, is also assessed separately at the request of Charnwood Borough Council within this section.

3.3.2 The main access road for the option is A512, which links with the M1 via junction 23, although access is also provided onto Snell's Nook Lane. The A512 is a high frequency bus corridor served by the following services:

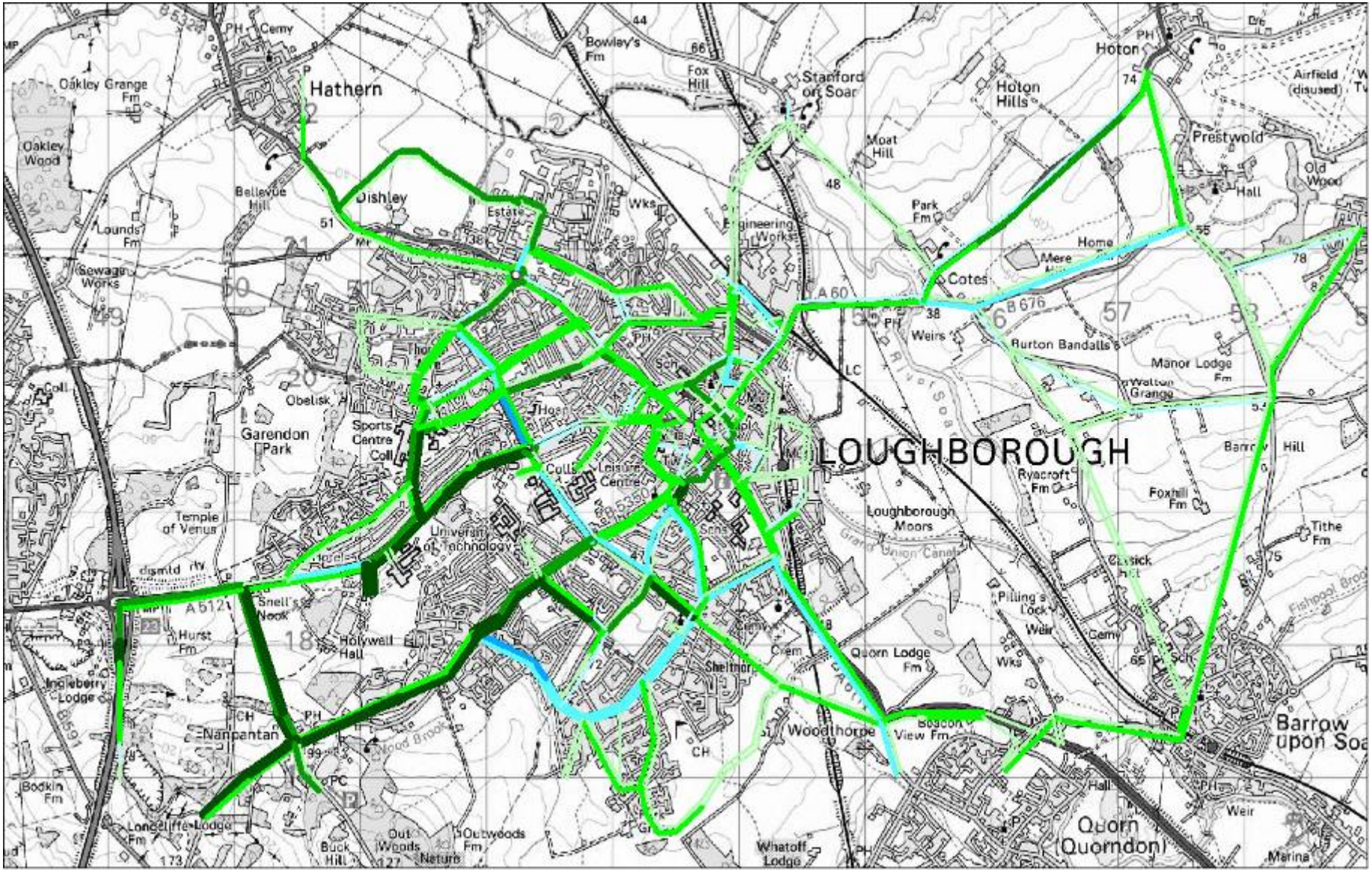
- Service 4, which runs every half hour between Shepshed and Loughborough
- Service 99, which runs every hour between Coalville and Nottingham
- Service 127, which runs between Loughborough and Leicester, with services every 20 minutes from Shepshed to Old Ashby Rd, and every 10 minutes onwards to Leicester
- The Sprint service, which runs every 12 minutes during term time from the University via the town centre to the rail station.

3.3.3 Currently, approximately 25% of the option lies within 400m of a bus stop on the current path of at least one bus route. There is a cycle route between Loughborough and Shepshed on the north side of the A512 to Epinal Way and a shorter section on the south side in the vicinity of the University. These routes link into the town's wider network.

3.3.4 The flow change induced by the Science Park is shown in Figure 3.2. Links indicated in green represent increases in flow with the size of line and depth of color indicating larger increases in flow. The lightest green colour represents a change of less than 20 vehicles, whilst the darkest represents increases of over 200 vehicles by 2026. Similarly, the lightest blue represents a reduction of less than 20 pcu's.

3.3.5 It may be seen that the largest flow increases are forecast to be along the A512, Nanpantan Road and Snell's Nook Lane, as might be expected. Links through Thorpe Acre and to the North of Epinal Way are also forecast to increase in traffic flow, although no additional increase is forecast along Epinal Way. This is primarily because of increased rat-running through neighbouring areas such as Shelthorpe and Thorpe Acre as Epinal Way is already close to capacity.

Figure 3.2 Forecast Traffic Flow change associated with the Science Park Development



3.4 Congestion in 2026 Reference Case

3.4.1 Overall levels of congestion within this 2026 Reference Case provide and indicator of 'available capacity' in the vicinity of each of the development options. It is emphasised that the levels of congestion presented within the diagrams represent a 'worst-case' scenario, primarily because future schemes beyond those committed beyond 2012 are not included within this scenario because the nature and types of scheme likely to be implemented at this point in time are not known. However the implementation of other measures to manage travel demand and improve transport provision could lead to lower levels of congestion than those suggested by this worst case scenario.

3.4.2 However, it is important to ensure that the developments are fully mitigated in such a situation, because it is unknown at this stage if any future major schemes will be progressed over and above those already committed, and also because the Reference Case presents the likely traffic situation in Loughborough by the time these developments would be complete. Assessment of background traffic for a 'post-development' year of 2026 has not previously been considered within studies undertaken by LCC.

3.4.3 The forecast levels of congestion for 2026 are shown in Figure 3.3 for the AM Peak and Figure 3.4 for the PM peak.

3.4.4 The Reference Case Congestion plot in Figure 3.3 is scaled according to the level of volume/capacity along the link and junction approach. Green shows roads that have a volume/capacity ratio of less than 85%, yellow links represent a volume/ capacity ratio of between 85-99% (deemed at or approaching operational capacity), whilst red links indicate links forecast to be over 100% of their absolute capacity. This colour scheme is utilised throughout the report.

3.4.5 Figure 3.3 for the AM peak shows that there are a number of roads and junctions across the Loughborough area, which are forecast to be at or over their operational levels of capacity by 2026. Indeed many of these are already congested and at operational capacity already. These are induced by both background growth within and beyond Loughborough up to 2026, as well as the spatial implications of growth in future years within the Loughborough area, most notably due to the Science Park and Dishley Grange extensions. The key forecast congestion locations within Loughborough are:

- Epinal Way by the University;
- A512/Epinal Way inbound;
- Ratcliffe Road/ A60/ Station Approach;
- Belton Road inbound;
- The A6/ Dishley Industrial Park roundabouts, inbound;
- Parts of Forest Road and Nanpantan Road;
- Snell's Nook Lane;
- Local accesses through Cotes and Hoton inbound; and
- Parts of Thorpe Acre due to future A512 congestion.

3.4.6 Figure 3.4 shows that there are similar congestion points within Loughborough within the PM peak, although the movement of traffic and congestion pinch points are typically reversed in directions.

3.4.7 As a result of this future year analysis, it is clear that there are a number of junctions in the vicinity of each of the development options that are likely to exceed their operational capacity with the development option in place, because even without the development, they are forecast to be at, or approaching, operational capacity. These pinch-points include, for each development:

Cotes

- A60/ Ratcliffe Road;
- Hoton and Cotes villages;
- Local routes through Prestwold and Barrow;
- Meadow Lane;
- Belton Road West towards Dishley; and,
- The A6 inbound (North and South Loughborough).

South Loughborough

- The A6 inbound from the South;
- Epinal Way;
- Parts of Park Road/ Shelthorpe Road inbound; and
- Local accesses within Quorn.

South-West Loughborough

- Epinal Way;
- Beacon Road;
- Forest Road inbound;
- Parts of Park Road/ Shelthorpe Road inbound; and
- Nanpantan Road/ Snell's Nook Lane.

West Loughborough

- A512 inbound;
- Thorpe Acre;
- Epinal Way;
- Nanpantan Road/ Snell's Nook Lane; and
- The A6/ Dishley Industrial Estate accesses.

3.4.8 For the purposes of the development options analysed within this report, it is only impacts induced by the developments over and above this Reference Case that will be required to be mitigated as this represents the development induced congestion impact.

3.4.9 However, it should be noted that there may also be instances where the provision of infrastructure is required to ensure that network enhancements can be delivered in practice, irrespective of a development's congestion impact. One such example, is the provision of bus priority schemes, where additional traffic management or signal/ junction improvements may be required in order to deliver effective, and highway-neutral, bus priority provision.

3.4.10 As a result, there are clearly very strong reasons for developing synergy between the development option mitigation proposals and 'background' traffic congestion, and these synergies are developed through the sifting of the mitigation proposals developed in Chapter 6. This is particularly the case given the levels of congestion forecast within Loughborough by 2026, and the wider impacts of this on the town in terms of noise, pollution, severance, commercial vitality, as well as the town's ability to accommodate significant economic growth.

Figure 3.3 Forecast Volume/Capacities associated with the 2026 Reference Case- AM Peak

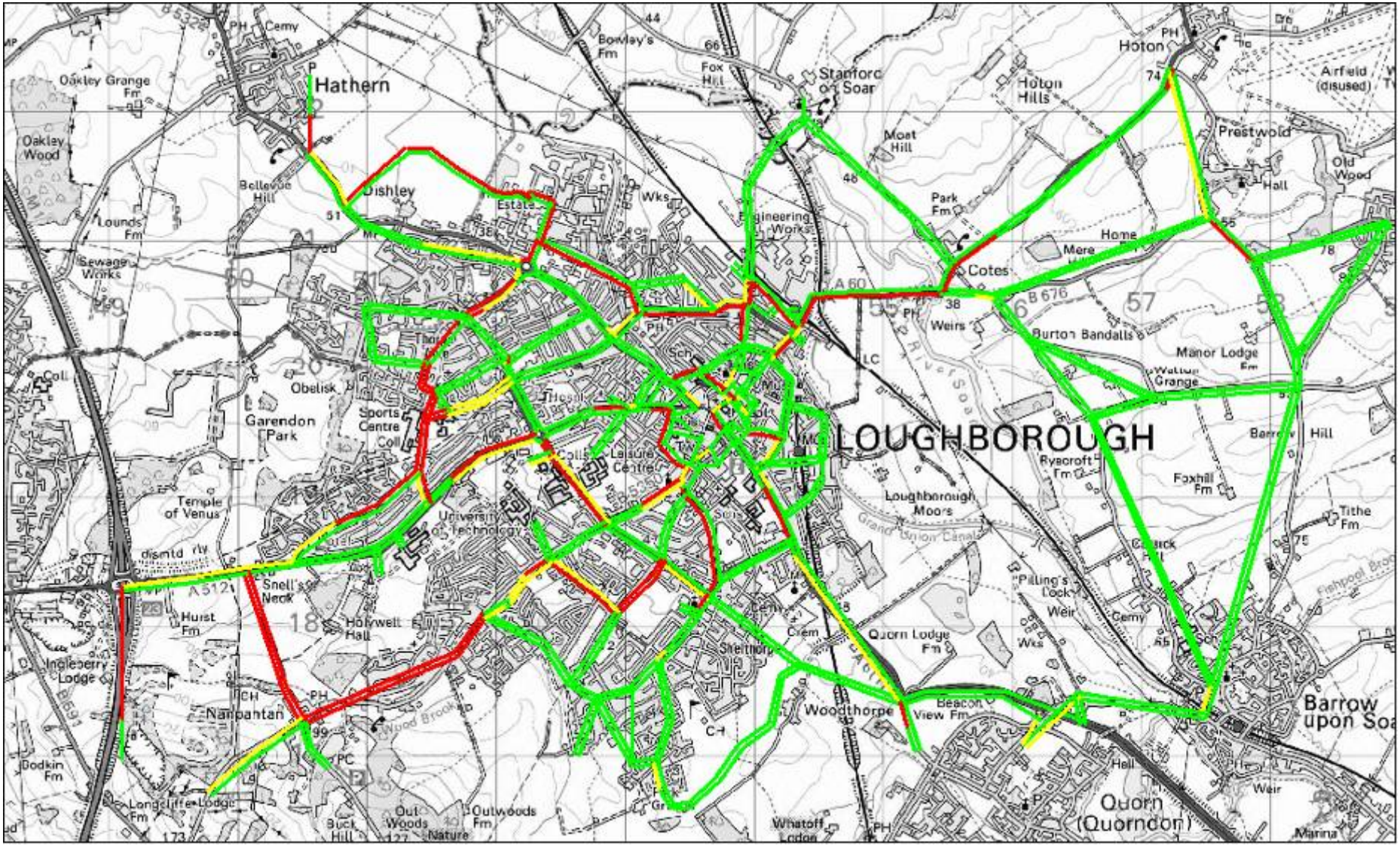
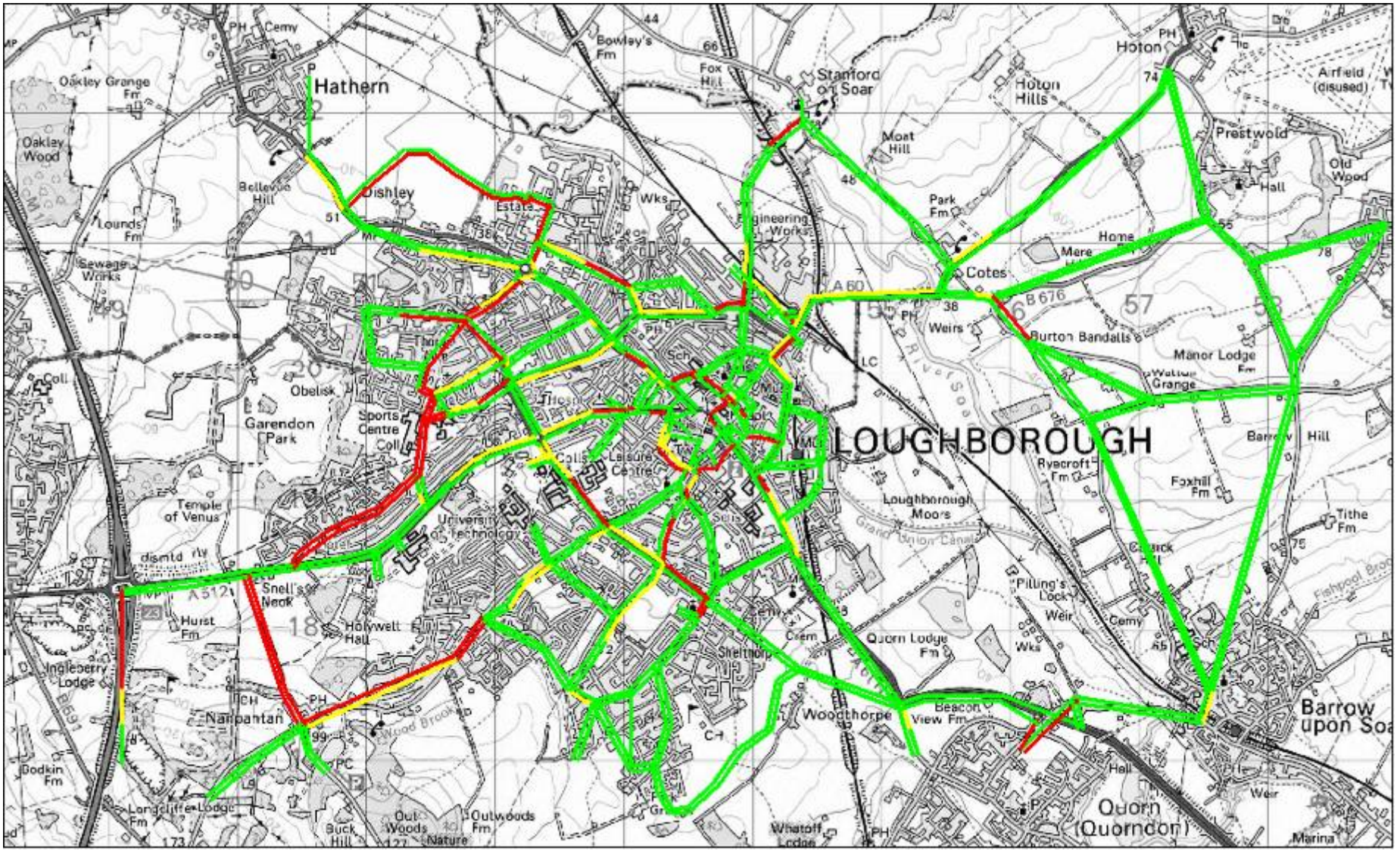


Figure 3.4 Forecast Volume/Capacities associated with the 2026 Reference Case- PM Peak



3.5 Reference Case Conclusions

3.5.1 Each development appears to have a number of key pinch-points likely to be exceeded, in congestion terms, by the impact of the development option. Each of these is likely to require mitigation, so as to not unduly affect the operation of the highway or public transport networks.

3.5.2 At this stage, there does not appear to be a substantial difference in terms of number pinch-points surrounding each development option under consideration, although it is the ability of these routes to take additional flow, or where parallel routes exist to create limited levels of capacity through traffic reassignment, which is potentially more important in determining the overall transport impact of the development options. This is examined in the next section.

3.5.3 This magnitude and pattern of congestion represents the scenario against which each of the development options are compared against. The inclusion of the Science Park within the Reference Case is important so that interactions with the SUE options can be considered and forecast within each of the development option tests. These have not been previously been modelled to any considerable degree, and form the starting point for the no-mitigation results of each development option within the next section.