ATKINS

Stafford Growth Options Study

Initial Option Assessment Report

December 2008

Plan Design Enable

(This page is intentionally left blank)

ΛTKINS

Stafford Growth Options Study

Initial Option Assessment Report

December 2008

Notice

This report was produced by Atkins for Staffordshire County Council for the specific purpose of Stafford Growth Options Study.

This report may not be used by any person other than Staffordshire County Council without their express permission. In any event, Atkins accepts no liability for any costs, liabilities or losses arising as a result of the use of or reliance upon the contents of this report by any person other than Staffordshire County Council.

Document History

JOB NUMBER: 5023650			DOCUMENT REF: INITIAL OPTION ASSESSMENT V1.4_RF.doc				
2	Final Draft	RF	TD	SB	CS	01/12/08
1	Initial Draft	RF	TD	SB	CS	01/12/08
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date

Plan Design Enable

(This page is intentionally left blank)

Contents

Section

Page

List of Tables

List of Figures

Appendices

1. Introduction

1.1 Atkins Transport Planning has been appointed by Staffordshire County Council (SCC), to carryout a technical study to understand the implications of proposed growth around Stafford on the transportation network as part of the 2003 Call on Commission.

Background

1.2 The key element of the commission was to develop a new transport model to identify the most sustainable locations, in transport terms, for new housing and employment development in Stafford.

1.3 The Stafford Model built was required to contain provisions to incorporate the emerging development sites identified from currently ongoing studies.

Purpose of the Stafford Transport Model

1.4 The purpose of the Stafford Transport Model (STM) is to:

- **Represent** in more detail the local and other movements in the Stafford Area. To provide a reliable forecast model by ensuring a good base year representation of trip patterns and incorporating multi-modal travel;

- **Assess** the impact of additional traffic on the performance of highway and transportation networks due to proposed developments;

- **Provide an Evidence Base** to support the selection of preferred options through Local Development framework process; and,

- **Develop, Test and Report** the effectiveness of transport strategies that will be put forward to achieve sustainable growth.

Report Structure

1.5 This Initial Options Assessment Report summarises the development and the results of the initial option tests for the land use scenarios developed in conjunction with SCC.

1.6 Sections contained in this report are as follows:

- Land Use Options;

- Model Assumptions;

- Performance Indicators;

- Initial Option Assessment; and,

- Summary.

Integration into Overall Study

1.7 The overview and scope of the Stafford Options Assessment is detailed in the Atkins report *"Understanding the Transport Implications of New Developments in Stafford: Inception Report (July 2007)",* the **Inception Report,** which was the culmination of Phase I of the study.

1.8 The study has five key phases, being:

Phase I   Inception;

Phase II   Base Year Model Development;

Phase III   Forecast Model Development;

ATKINS

Phase IV	Initial Land Use Option Assessment; and
Phase V	Detailed Transport Option Assessment.

1.9 This report completes Phase IV of the study which includes the following tasks:

Task 13	Initial Option Assessment; and
Task 14	Identification of Key Growth Issues

(This page is intentionally left blank)

2. Land Use Options

2.1   The development of the land use options for the Stafford Growth Options Study has been detailed in the **Land Use Options Report**. This has been undertaken through consultation between SCC/SBC and Atkins and has resulted in four Land Use Options being developed for assessment within the model.

2.2   Within these options different levels of both housing and employment allocation has been identified and these are outlined below.

Housing

2.3   The housing allocations have been developed from various sources. These include:

- Stafford Transport Assessments (TAs);
- SCC/SBC Committed Housing sites;
- SCC/SBC Housing Options; and
- Windfall Sites – Quantity known but specific site locations unspecified.

2.4   Based on these data sources four potential development scenarios have been developed, each tested in a different option. A breakdown of the number of housing units contained within each of the development scenarios, to be provided between 2007 and 2026, is shown below in Table 2.1.

Table 2.1 – Breakdown of the Housing Options

	Do Minimum	Option 1a	Option 1b	Option 1c
Stafford TAs	1448	1448	1448	1448
SCC/SBC Committed Sites	391	391	391	391
SCC/SBC Housing Option	0	4500	4500	4500
Windfall	661	661	661	661
TOTAL	**2500**	**7000**	**7000**	**7000**

2.5   All four schemes contain the same TAs, Committed Sites and Windfall housing numbers so it is noted that the key difference between the scenarios is the Housing Options, which are not considered in the Do Minimum. The total number of houses is identical for Options 1a, 1b and 1c, but they are made up of different combinations of development sites, as noted in Appendix A.

2.6   This report analyses the transport effects of the Growth Options to provide a total of 7,000 dwellings in different parts of the town in order to identify a preferred option. This preferred option will need to be agreed by the client group before the study moves on to the next stage, which is to assess the transport effects of Options 2 and 3, i.e. 10,000 and 13,000 dwellings. These tests will use the results of the Option 1 tests as the basis for the location of these larger development proposals.

2.7   Whilst it is noted that that overall number of houses are consistent between the options the key differences are as follows:

- **Option 1a** – Housing growth is focussed towards the **North and West** side of Stafford;
- **Option 1b** – Housing growth is focussed towards the **North and East** side of Stafford; and,
- **Option 1c** – Housing growth is focussed towards the **South and East** side of Stafford.

Employment

2.8   The employment options have been developed from a variety of sources. These include:

- Stafford Transport Assessments (TAs);
- SCC/SBC Committed Employment sites; and
- SCC/SBC Employment Options sites.

2.9   A summary of the employment developments included in each of the tested scenarios is provided in Table 2.2 below. These figures represent the growth in employment sites between 2007 and 2026.

Table 2.2 – Breakdown of the Employment Options (Jobs)

	Do Minimum	Option 1a	Option 1b	Option 1c
Stafford TAs	6986	6986	6986	6986
SCC Committed Employment Sites	1668	1668	1668	1668
SCC Employment Options	0	8621	8621	8621
TOTAL	**8653**	**17274**	**17274**	**17274**

2.10   The key difference between the scenarios is the SCC/SBC Employment Options, not present in the Do Minimum. The total Employment Option jobs and sites are identical for Options 1a, 1b and 1c.

2.11   It is noted that for the purpose of this assessment the land uses for these employment sites has been based on an assumed percentage split between the different employment land use categories.

2.12   Full details of the methodology applied to convert these employment sites to jobs is outlined in the **Land Use Options Report**.

Land Use Options

2.13   Table 2.3 provides an overview comparing the four land use scenarios in terms of housing and job numbers between 2007 and 2026. The locations of the sites are provided in Figures 2.1 to 2.4.

Table 2.3 – Land Use Scenarios to be tested in the Stafford Transport Model

| Development Test Scenario	Housing Option	Employment Option	Employment Option	2007 - 2026		Spatial Focus of Housing Options
				Total Households	Net Total Jobs	
Do Minimum	Do Minimum	Do Minimum	Do Minimum	2500	8653	-
Option 1a	Option 1a	Option 1a	Option 1a	7000	17274	North-West
Option 1b	Option 1b	Option 1b	Option 1b	7000	17274	North-East
Option 1c	Option 1c	Option 1c	Option 1c	7000	17274	South-East

Figure 2.1 – Land Use Do Minimum
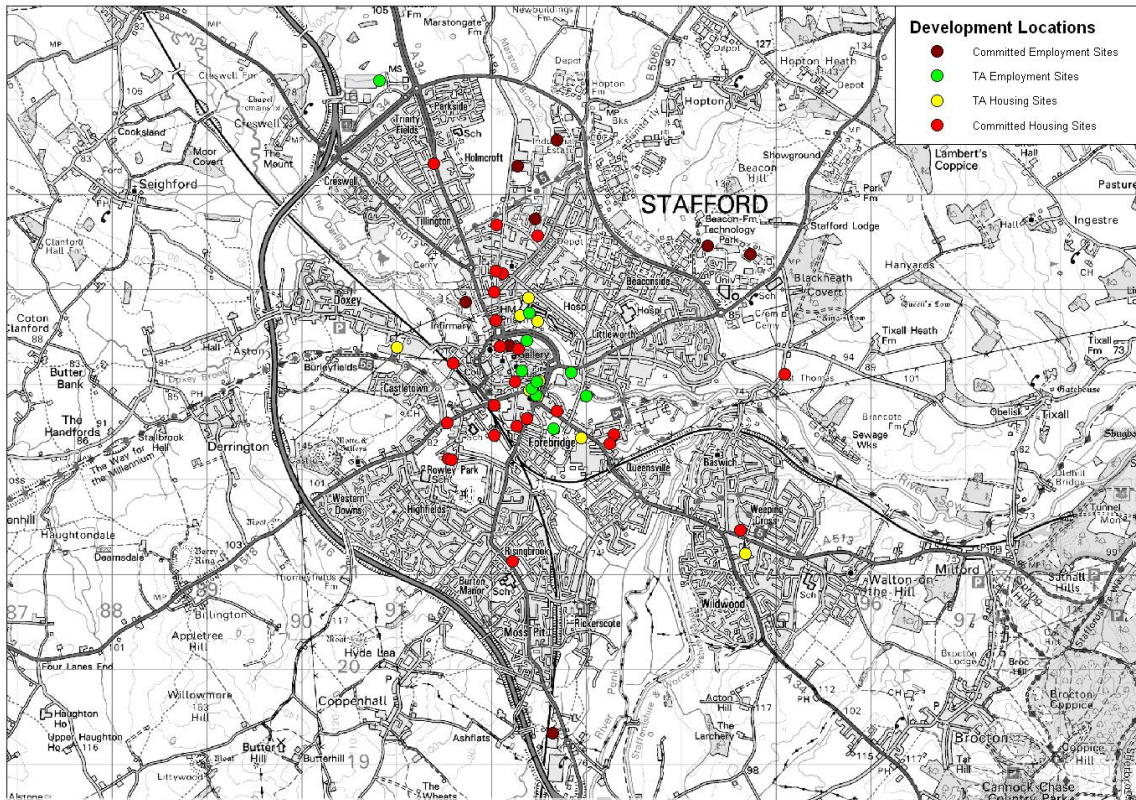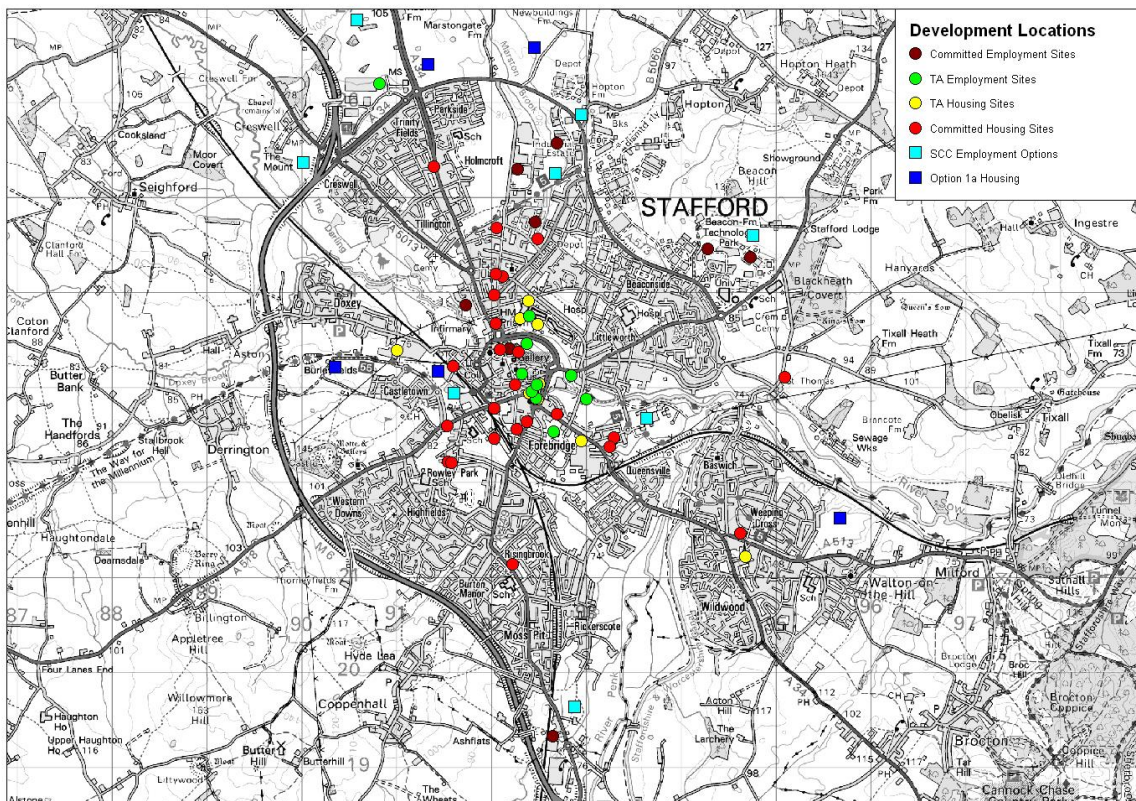
Figure 2.2 – Land Use Option 1a
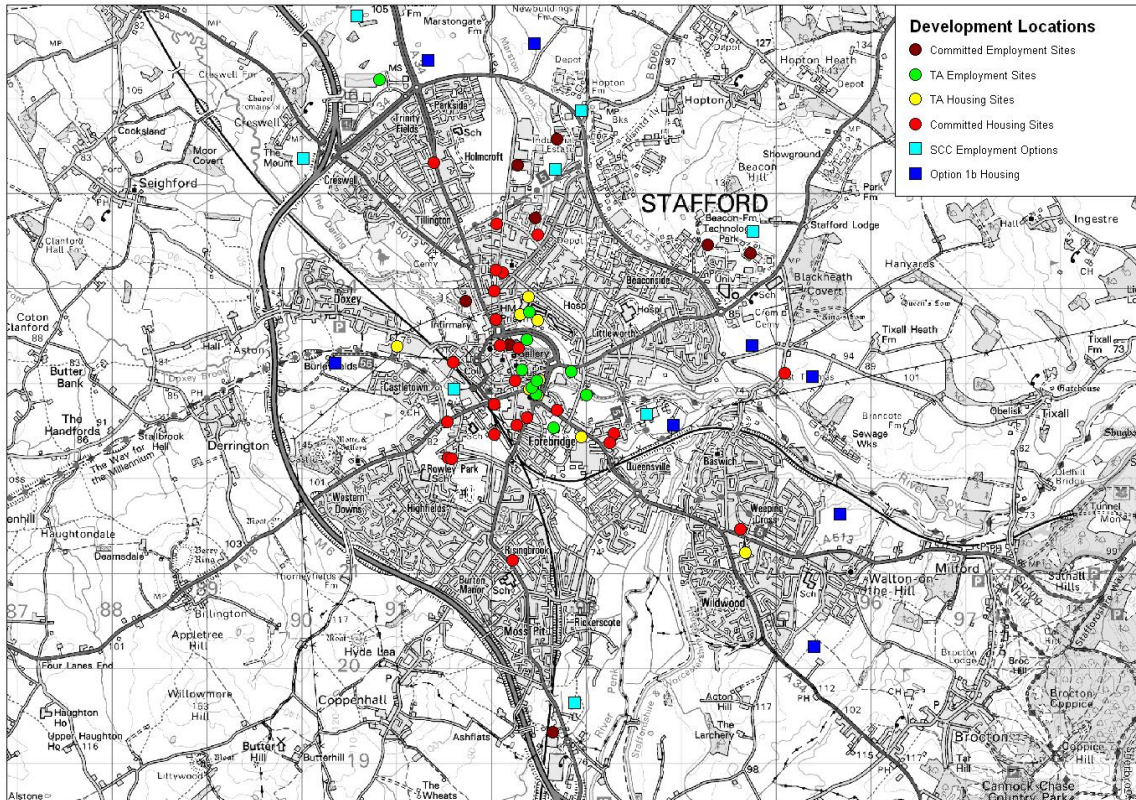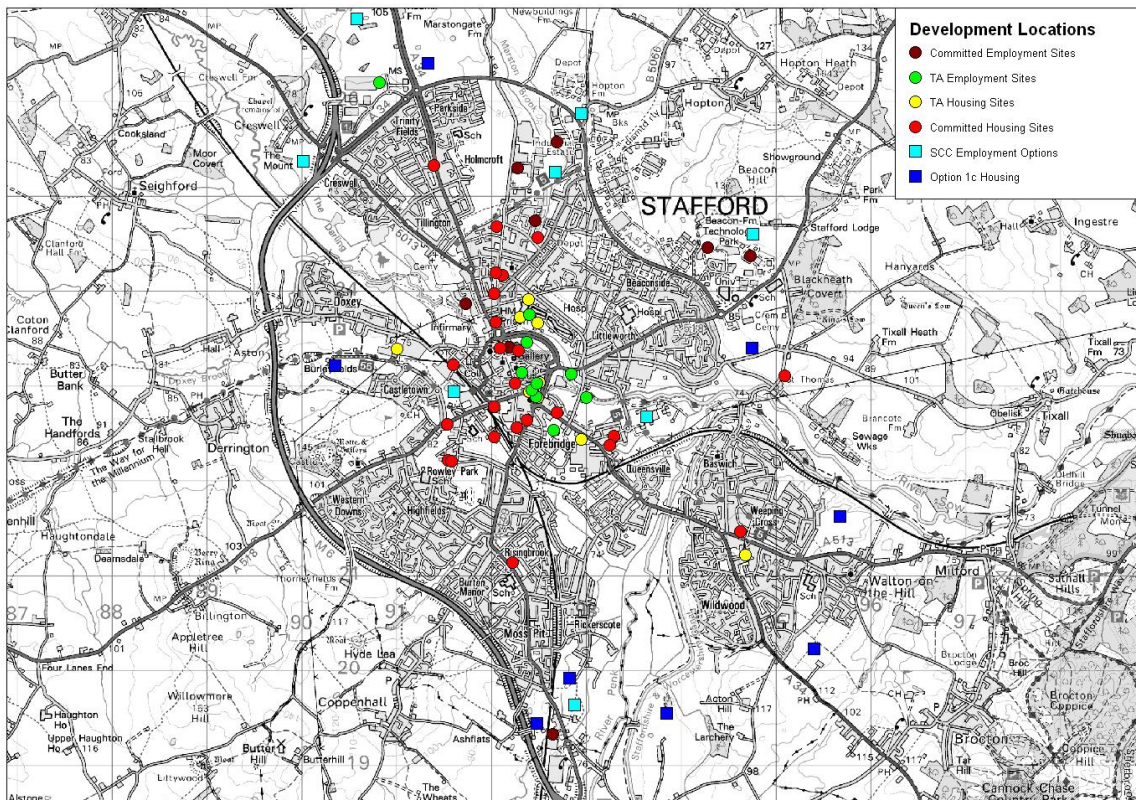
Figure 2.3 – Land Use Option 1b

Figure 2.4 – Land Use Option 1c

(This page is intentionally left blank)

3. Model Assumptions

3.1   The development of the forecast models used in the initial assessment of the land use options has been detailed in the 'Stafford Transport Model – Forecasting Report' (the **Forecasting Report**) and may be summarised as follows:

Model years

3.2   Forecast models have been developed for 2026 AM and PM peak hours. This future year has been determined in conjunction with the scenarios set out in the Regional Spatial Strategy (RSS) which forms the basis for this study. The Regional Spatial Strategy identifies Stafford as a Local Regeneration Area and considers three levels of house building in the town leading up to 2026.

Do Minimum Networks

3.3   A Do Minimum network has been developed and has incorporated proposed schemes as defined in the following:

- Stafford Urban Area Transport Model Study; and

- Stafford Town Centre Traffic Management Measures.

3.4   Full details of each scheme are provided in the '**Forecasting Report**'.

Forecast Demand Matrices

3.5   Forecast demand matrices have been developed for each of the four initial land use options outlined in Section 2. These have accounted for the following:

- Development type and gross floor areas as specified by SCC;

- Household densities of 40 units per Hectare;

- Development vehicle trip rates, as agreed with the Highways Agency and SCC;

- Light vehicle trip distributions based on the 2001 Journey to Work Census data;

- Heavy vehicle trip distribution has been based on existing heavy vehicle movements across the study area;

- Consideration for trips between new developments is made to ensure that double counting is removed. This process is discussed in detail within the '**Forecasting Report'**; and

- Overall matrix growth constrained to TEMPRO growth factors, adjusted to account for the forecast levels of household and job growth within the study area for each of the four land use options.

3.6   Based on this the overall matrix totals for the Base Year and 2026 land use options are as shown in Table 3.1.

Table 3.1 – Land Use Options Trip Matrix Totals

Year	Option	AM Peak	PM Peak
2007	Base Year	35888	37572
2026	Do Minimum	45908	49232
	Option 1a	48452	52288
	Option 1b	48452	52288
	Option 1c	48452	52288

3.7 Overall, Options 1a, 1b and 1c are identical in terms of matrix totals and represent the maximum growth scenarios. We would expect this given that they each contain the same number of new households and jobs.

Forecast Assignments

3.8 As demand for the road network increases over time, so does the level of congestion. This increase in journey time for trips can result in various responses including:

- Decide to continue to travel;

- Re-schedule the journey (to a different time period, perhaps when it is less congested);

- Mode shift (e.g. car to bus etc); and,

- Decide to no longer travel (suppression).

3.9 As a result, an elasticity approach has been adopted. This enables these responses to be accounted for in the future year assignment and reduces the potential for unrealistic growth to occur in a congested network. Details of this approach are outlined in the **'Forecasting Report'.**

3.10 It is noted that as this response reflects individual's responses to increased congestion over time, no elasticity is allowed to those users of the new developments as these will be new trips.

3.11 Overall the model matrix totals have been reduced by a maximum of 3.2% in 2026 as a result of the elasticity effects of increased congestion. Further details are presented in the forecasting report.

4. Performance Indicators

4.1   A key stage in the Stafford Transport Model is the definition of the preferred land use option. At present some four key options have been defined and modelled as outlined in Sections 2 and 3.

4.2   In determining the preferred option, an initial assessment has been undertaken of the key performance indicators for each. This assessment focuses on the 2026 forecast year assignments to evaluate performance.

4.3   The assessment of the options has considered the appropriateness of each against a series of criteria. In developing this criteria it is recognised that the Partnership for Growth and Government offer the following guidelines for areas in growth as outlined in the DCLG Advice - Annex C, namely:

- Exploit existing public transport networks in determining the most sustainable locations for growth;

- Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;

- Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport; and,

- Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.

4.4   As a result, the assessment of the options has concentrated on the merits of each option against the key issues for the region. These issues have been grouped into the following objectives to address the DCLG guidelines outlined above:

- Impact on all users;

- Impact on strategic routes;

- New development trips;

- Network impacts;

- Environmental impacts;

- Access to existing public transport; and,

- Access to non motorised modes.

4.5   These criteria have been further split into 18 local sub objectives to provide a comprehensive assessment of the options. The overall Key Performance Indicators (KPIs) are shown in Table 4.1.

4.6   The assessment of the four land use options against the KPIs is summarised in the following section.

Table 4.1 – Key Performance Criteria

Objective	Local Sub Objective
Impact on all users	Vehicle Hours
	Vehicle Kilometres
	Average Speed
	Average vehicle distance per trip
	Demand
Impact on strategic routes	Change in Flow on the M6
New Development Trips	Development Trip Vehicle Hours
	Development Trip Vehicle Kilometres
	Development Trip Average Speeds
	Development Trip average trip length
	Development Demand
Network Impacts	Junctions
	Links
Environmental Issues	Impact on CO2 emissions
	Impact on NOX emissions
Access to Existing Public Transport	Total Number of existing services passing the developments
	Direct access to Rail
Access to non motorised modes	Access to national cycle network

5. Initial Option Assessment

5.1　This section outlines the assessment of the Key Performance Indicators (KPIs) and the comparison of these for each land use option.

5.2　For all of the objectives outlined in Section 4, the performance of each of the final options have been compared against these criteria, and the options subsequently ranked between 1 to 4, with 4 being the worst, according to how they compared against one another.

5.3　The rankings were reviewed to allow options to be, for example, second-equal, if the differences between two options were insignificant.

5.4　Appendix B – Detailed Evaluation of Options contains the detailed qualitative and quantitative information used for the rankings, and shows how the options were ranked for each of the 18 local sub-objectives. The methodology used to rank the options against each objective is also described.

5.5　A summary of each of the sub objectives is provided in Table 5.1. We should expect that the Do Minimum scenario will score best on most objectives as the Do Minimum scenario considers only 2500 new houses and 8653 new jobs instead of the 7000 new houses and 17274 new jobs provided by options 1a, 1b and 1c. The network is the same for all options and no improvements are included in any of the options. Therefore, during the analysis, it shall be assumed that the Do Minimum performed best unless stated otherwise. With this in mind the key points to note are as follows:

Impact on All Users

5.6　The assessment of the impacts on all users has noted the following:

- The number of vehicle hours in a model is the sum of trip times for all trips that occur in the model. Therefore, if you assign the same demand to two networks, the network with the lower vehicle hours is the one that, on average, allows users to complete their trips in less time. Excluding the Do Minimum, Option 1a provides the lowest overall vehicle hours while Option 1b performs the weakest. There is little fluctuation between the options however as the AM and PM peak hour totals span just 251 hours from the lowest to the highest. The greatest difference is a 3% increase from Do Minimum to Option 1c PM. The Do Minimum scores significantly better due to the much lower additional jobs/housing;

- Overall average speeds give an indication of how well the network keeps traffic moving on the network. If the average speed is increased without providing more capacity on the road (i.e. new roads etc) then this indicates that the network is coping with the demand better and that junctions are performing well. There is minimal variance between the options for average speed, ranging from 54.7kph to 60.2kph including the Do Minimum. The average speed across peak periods is only split by 0.3kph when comparing Options 1a, 1b and 1c, thus demonstrating how closely they all perform;

- The trip length indicator shows how average journey length will change in response to variations in the size and location of new development, but also how it changes in response to congestion within the model. Peripheral development locations will cause journey lengths to increase but greater congestion will have the effect of reducing journey lengths. The Do Minimum performs worst on the average trip length with an average, across peak period, trip length of 17.9km. The three remaining options all score equally with an average cross peak period trip length of 17.4km; and

- Overall, the level of development demand is consistent with the level of household and employment provided in each option. As a result Options 1a, 1b and 1c cannot be separated as each induces similar demand on the network.

Table 5.1 – Option Evaluation Summary Table

Objective	Local Sub Objective	Potential Options			
		Do Minimum	Option 1a	Option 1b	Option 1c
Impact on all users	Vehicle Hours	1	2	4	3
	Vehicle Kilometres	1	2	3	4
	Average Speed	1	2	4	3
	Average vehicle distance per trip	4	1	1	1
	Demand	1	3	3	3
Impact on strategic routes	Change in Flow on the M6 Motorway	1	2	4	3
New Development Trips	Development Trip Vehicle Hours	1	2	3	4
	Development Trip Vehicle Kilometres	1	2	4	3
	Development Trip Average Speeds	1	4	2	3
	Development Trip average trip length	4	1	3	2
	Development Demand	1	3	3	3
Network Impacts	Junctions	1	3	4	2
	Links	1	3	4	2
Environmental Issues	Impact on CO2 emissions	1	3	3	3
	Impact on NOX emissions	1	3	3	3
Access to Existing Public Transport	Developments with access to bus network	1	2.5	2.5	4
	Direct access to Rail	1	1	1	1
Access to non motorised modes	Access to national cycle network	1	1	1	1
	Percentage of development land with access to the town centre within 15 minutes	1	2	3	4
Effects of large developments		1	2.5	2.5	4
Overall Average Ranking (Assuming Even Weighting)		**26**	**45**	**58**	**56**

Key: 1 = best, 4 =worst

Impact on Strategic Routes

5.7 The assessment of the changes in trips on the M6 around Stafford has shown the following:

- On the M6 North of Stafford, all three of the Options perform better than the Do Minimum, i.e. it has less traffic with those options. Options 1a, 1b and 1c perform similarly for this section of the M6;

- The M6 through Stafford - between junctions 13 and 14 – delivers the expected result that the Options perform less favourably than the Do Minimum. Option 1a performs best with Option 1b worst on this section of road. This is likely to be due to the location of the housing developments. In Option 1b the housing is centrally located to the east of Stafford. Trips originating or terminating at these housing developments effectively deter trips into rerouting on to the motorway. Specifically, those wishing to make north-south (or vice versa) movements through Stafford find it easier to use the motorway with the additional housing development traffic on the network;

- For the M6 south of Stafford, the Do Minimum, Option 1b and Option 1c scenarios all perform similarly for this southern section of the M6. Option 1a scores least favourably though it should be mentioned that the variability between all four scenarios is noticeably low; and

- The overall scoring of the M6 flow indicator is derived by considering all three sections of road together, summing these to provide a means for comparison. As we would expect, the Do Minimum performs best overall, but it should be noted that in general none of the options performed poorly in relation. Option 1a was the best of the high demand options with Option 1b the worst performing.

5.8 It appears that the growth of traffic on the M6 does not cause immediate problems to the M6 junctions 13 and 14 as their volume over capacity ratio is still significantly below 85%. It is however, the 3 lane M6 itself that exceeds 85% volume over capacity for all four scenarios suggesting that congestion issues will arise regardless of the development in Stafford.

Impacts on New Development Trips

5.9 The assessment of impacts on new development trips has shown that:

- Similarly to the 'all users' assessment, the Do Minimum performs best for all indicators except average trip length. This is expected due to this being a low growth option compared to the others;

- Option 1a is the strongest of the high growth options providing the lowest vehicle hours, vehicle kilometres and shortest average trip length. Options 1b and 1c score similarly to each other with Option 1b being strong on vehicle speeds and Option 1c strong on trip length. Option 1a tends to locate development closer to the town centre which contributes to its better performance on these indicators; and

- Due to the development demand being equal for Options 1a, 1b and 1c they have each been scored 3 as they cannot be separated.

Network Impacts

5.10 An assessment has been undertaken of the overall network impacts in the key study area. These have considered the following:

- Average junction stress – where the volume to capacity (V/C) ratio is >85%; and

- Average link stress on the approach to each junction – where the volume to capacity (V/C) ratio is >85%

5.11   A V/C ratio has been used as the criteria for this indicator as it is recognised that where V/C increases above 85% then the link or junction is assumed to be at capacity and hence any additional flow may cause increased delays and queuing (i.e. over capacity).

5.12   Diagrams showing links >85% within the key simulation network for each option and time period are provided in Appendix C. In addition, average vehicle queue length plots are also presented to identify potential locations of excessive queuing and blocking back in the highway network.

5.13   This indicator has highlighted the following points:

- Predictably, the Do Minimum has few V/C problems as there is only relatively small growth;

- Option 1a, 1b and 1c are directly comparable due to their identical development growths. Option 1c performs slightly better than the others, but the difference between the options is quite small, particularly in the AM peak where there appears to be much fluctuation from one scenario to another;

- There is some inconsistency between the impact on the Network Impacts and the Impact on All Users and on New Development Trips. Option 1a has the best results across the whole model but Option 1c has the best results in terms of links and junctions. The explanation for this is that Option 1a has localised impacts that have more of an impact on certain sensitive links and junctions, but its overall impact is superior to Option 1c.

- Option 1b is the least competitive option. However, all options indicate that some remedial work may be necessary in conjunction with developments.

Environment

5.14   A review of the environmental indicators extracted from the SATURN model runs has been undertaken. It is recognised that SATURN provides only a simplified emissions model and hence the validity of these results should be treated in this light. The results do, however, provide a like-for-like comparison of the options and hence the results have highlighted:

- For both the Carbon Dioxide and Nitrogen Oxide levels the model demonstrates a direct correlation between demand and pollution. The Do Minimum is strongest due to it's lower demand and the Options are similar to each other with proportionately heavier pollution; and

- The differences between Options 1a, 1b and 1c are so small that they are scored equally.

Access to Public Transport

5.15   A diagram of the developments from all scenarios with the bus routes is shown in Figure 5.1.

5.16   It is considered reasonable that patrons walk up to 400 metres to a bus stop. With this in mind, a diagram for each option showing an indicative area around the central point of each development that a patron could walk to take a bus is shown in Appendix D.

5.17   The diagrams in Appendix D have been used as evidence to rank the options with regards to bus access. It is recognised however that this indicator does not consider the frequency of bus services or the location of bus stops and hence should be considered in this light.

5.18   The results of this methodology highlight the following:

- The land use option that has the best access to the bus network is the Do Minimum. However, the best of the large growth scenarios are Options 1a and 1b; and

- The main reason for Option 1c performing the least favourably is due to the SCC Housing Site SF8. This large site (2,000 dwellings) is particularly isolated in the south-east of Stafford with little access arrangements known at this time.

5.19   The results of the rail access assessment were:

- The rail station in Stafford is centrally located and so 14 bus routes serve the station directly. However, due to its central location it is noted that any of the current bus routes could be combined with a short walk to reach the rail station. For this reason, all four options are scored equal for access to rail. It is noted that in all cases the introduction of a new bus service to access a specific development site could change these results and hence could be considered as a condition.

Figure 5.1 – Access to Public Transport Networks
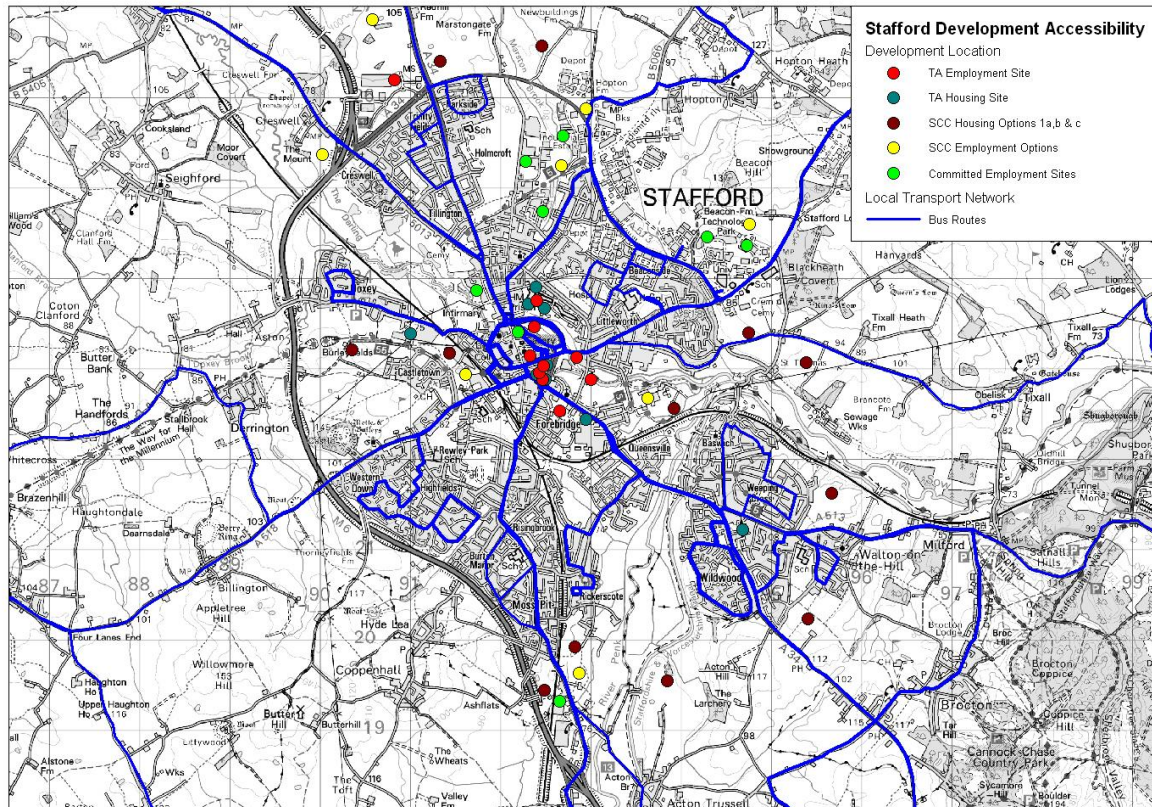
Access to Non Motorised Modes

5.20   This indicator considers what proportion of land use can access the town centre within 15 minutes through cycling. This assumes a cycle speed of 16kph and that cycling distance is 1.3 times the 'crow-fly' distances. Accession, upon the DfT's guidance, uses the factor 1.2 to move from 'crow-fly' distance to actual travelling distance between two points. Based on our experience the factor 1.3 is chosen as an adjusted version of the DfT's recommended walking distance factor. The adjustment is made based on the assumption that cyclists are less likely to be able to take as many shortcuts as people travelling on foot and so will travel further on average. This indicator has highlighted the following;

- The Do Minimum provides the best access to the city centre from developments with 89% of developments within a 15 minute cycle of the centre; and

- Of the high growth options, Option 1a performs the best providing access to the centre for 78% of developments. Option 1c performs least favourably with 72% of developments able to access the centre.

5.21   The second cycle indicator is access to the national cycle network. Due to the spatial nature of the cycle routes, all options will provide access to the cycle network for a high number of sites. In fact,

due to the comprehensive cycle access shown in the Staffordshire County Council urban map all options have been assessed as equal for access by cycle.

Effects of Key Developments

5.22   This measure shall consider the localised impact of new large developments installed in options 1a, 1b and 1c compared to Do Minimum. Given that the employment options sites are identical for all three options, only network impacts related to the housing options sites shall be considered for comparison unless housing and employment side-by-side cause a notable impact.

5.23   The Beaconside/Stone Road housing development adds additional stress to the already stressed A34/A513 roundabout to the north of Stafford. This development is in all three Options but not in the do minimum. The volume over capacity (V/C) percent at the junction in the Do Minimum is 91%. This rises to between 99% and 101% over the three options that include this development.

5.24   Option 1c adds three new housing developments to the south of Stafford, all loading off the A449 Moss Pit road that runs from M6 Junction 13 to Stafford town centre. This creates extra stress on this road that manifests itself in an increase of junction V/C along this corridor. The V/C of the junctions on this corridor is between 40% and 50% in the Do Minimum rising to between 60% and 70% in Option 1c. While this still doesn't put the V/C over the 85% level at which the junction begins to fail, it does result in a substantial increase in stress.

5.25   In general, the network appears to cope well with the introduction of large developments on a local level. The more notable impacts are seen on a strategic level as demonstrated by the other indicators.

5.26   The Do Minimum scores best for this measure but has fewer developments. Option 1a and 1b create few localised issues around the housing developments and thus score identically. Option 1c however, due to causing significant V/C rises on the key route from the M6 to the town centre, scores least favourably. However, due to the use of SATURN for this analysis the micro elements of localised issues are not explored thoroughly and so these results are only indicative.

Weighted Comparison of Options

5.27   Table 5.1 combines the results of each indicator to show an overall ranking for the Do Minimum and Growth Options. As already stated, the Do Minimum is clearly the best performing, purely because the level of development and, therefore, the transport impact is significantly lower than the other options. To achieve a better comparison a weighting has been applied to the results to take account of the greater level of development. If the original option rankings are weighted by the number of new jobs and households included in the scenario the following scoring is given.

Table 5.2 – Weighted Option Ranking

	Do Minimum	Option 1a	Option 1b	Option 1c
Overall Average Ranking (Assuming Even Weighting)	26	45	58	56
Weighted by additional houses plus additional jobs	0.0023	0.0019	0.0024	0.0023
Ranking (based on weighting)	2.5	1	4	2.5

5.28   The weighted ranking shows that, per household and job, Option 1a is the preferred option. To put it another way, the most efficient way of increasing households and jobs in Stafford is to follow Option 1a. Option 1b scores the least favourably of the scenarios.

6. Summary

6.1 Overall this assessment has highlighted the impacts of the four development options on the key indicators outlined in section 4. The indicators assessed within this report are based on those designed and developed by the Partnership for Growth and Governments. The indicators are defined in the DCLG Advice - Annex C: Conditions of Partnership for Growth. The guidelines encourage development to:

- Exploit existing public transport networks in determining the most sustainable locations for growth;

- Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;

- Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport; and

- Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.

6.2 Overall it is considered that the indicators assessed within this report have highlighted that as jobs and households increase between the options the level of impact on the overall network increases accordingly. Therefore, it is easy to conclude that the Do Minimum option will have the least impact on the transport network. However, it is worth considering that if growth is desired, Option 1a provides the best growth to adverse reaction ratio; it fosters a lot of growth in the most sustainable manner.

6.3 The key results compared with the DCLG advice highlights the following:

Exploit existing public transport networks in determining the most sustainable locations for growth:

- The Do Minimum developments have the best access to the bus network if considering those developments within a 400m walk of a bus route. However, the Do Minimum developments are contained within all the other options and so of the high growth options the development sites in Options 1a and 1b are the best connected to the bus network;

- Option 1c has the worst access to the bus network. This is largely due to development SF8 in the south-east of Stafford which is currently without access arrangements. Remedial work through redesigning the bus routes to incorporate this site would make this scenario competitive with the others; and

- At present all bus routes go to the town centre and thus within walking distance of the train station which is centrally located. Specifically, some 14 services go directly to the train station. Consequently options are seen as equal unless bus schedules are changed between scenarios.

Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities:

- Options 1a, 1b and 1c all show a reduction of average journey distance in comparison to the Do Minimum. This is due to the increased employment and housing opportunities inside Stafford itself meaning there is less need for long-distance commuting, but is also related to the impact of increased levels of congestion having a suppressing effect on trip making. The journey times for all of the options are higher than the Do Minimum suggesting with a corresponding increase in congestion; and

- Opposing this improvement in journey distance is the environmental effect. All of the options generate significantly more CO_2 and NOX than the Do Minimum due to the additional trips in Stafford;

Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport:

- The Options contain all the Do Minimum developments plus additional developments and so Option 1a, which provides 78% of its developments with cycling access to the town centre, is very competitive for a high growth option. In fact, it is the best of the high growth options that range from 72-78% cycle access to the town centre.

Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network:

- Traffic flows on the M6 are adversely affected in the high growth scenarios but not severely;

- As expected, the largest growth in traffic is seen between M6 Junction 13 and 14 (i.e. through Stafford); and

- Traffic from the North via the M6 actually decreases in the high growth options. This is likely to be due to more housing and jobs being inside of Stafford meaning that less people have to commute to/from Stafford.

6.4   Based on these results the following next stages are proposed:

- Submission of the Initial Option Report to SCC;

- Discussions and presentation of findings;

- Agreement of preferred Option;

- Detailed assessment of preferred Option; and

- Assessment of the higher growth Options 2 and 3 of 10,000 and 13,000 dwellings.

A.1 Appendix A – Development Information

A.1.1 Many of the developments in the land use options are consistent across the four scenarios. Specifically, all of the options contain the Do Minimum developments. Therefore for brevity, Table A1.1 contains the Do Minimum developments, while

A.1.2 Table A1.2 to Table A1.4 detail just the additional development information for the three land use Options; A, B and C respectively.

Table A1.1 – Do Minimum Developments

Group	Development Name	Site ID	Dev Type	Dev Size (Units)	Dev Size (Floor Area)	%HGVs	Dev Zone Number	2007	2026
Committed TA Sites	Former Riverside Recreation Site (A)	TA1	Industry	-	1.3	3%	2001	0%	100%
	Former Riverside Recreation Site (A)	TA1	Housing	105	-	1%	2101	0%	100%
	Former Riverside Recreation Site (B)	TA1	Industry	-	1.9	2%	2002	0%	100%
	Former Riverside Recreation Site (B)	TA1	Housing	293	-	1%	2102	0%	100%
	Former Riverside Recreation Site (C)	TA1	Industry	-	0.1	3%	2003	0%	100%
	Former Riverside Recreation Site (C)	TA1	Housing	67	-	1%	2103	0%	100%
	St Georges A	TA2	Housing	136	-	1%	2104	0%	100%
	St Georges Offices	TA2	Industry	-	3.6	2%	2004	0%	100%
	St Georges B	TA2	Housing	175	-	1%	2105	0%	100%
	Crooked Bridge Boiler House	TA8	Housing	173	-	1%	2106	0%	100%
	Lammascote Road Leisure Centre	TA3	Industry	-	0.6	3%	2005	0%	100%
	Former Universal Grinding Wheel, Doxey Rd	TA4	Housing	150	-	1%	2107	0%	100%
	Former Staffordshire Police Headquarters	TA5	Housing	80	-	1%	2108	0%	100%
	Prime Point 14, J14 M6	TA6	Industry	-	1.7	5%	2006	0%	100%
	GEC A34 Lichfield Road	TA7	Industry	-	0.7	2%	2007	0%	100%
	GEC A34 Lichfield Road	TA7	Housing	181	-	1%	2109	0%	100%
	Kingsmead / North Walls	TA8	Industry	-	2.3	3%	2008	0%	100%
	Kingsmead / North Walls	TA8	Housing	37	-	1%	2110	0%	100%
	Tipping Street	TA9	Industry	-	1.8	2%	2009	0%	100%
	Friars Terrace	TA10	Housing	51	-	1%	2111	0%	100%
Committed Employment Sites	Tollgate Business Park	CE01	Industry	-	3.1	10%	2018	0%	100%
	Staffordshire Technology Park	CE02	Industry	-	0.2	2%	2019	0%	100%
	Greyfriars Ind Est	CE02	Industry	-	0.2	2%	2020	0%	100%
	Land at Beacon Business Park	CE03	Industry	-	0.2	40%	2021	0%	100%
	Moss Pit	CE04	Industry	-	0.3	15%	2022	0%	100%
	Common Road Ind Est	CE05	Industry	-	0.6	10%	2023	0%	100%
	Astonfields Ind Est	CE06	Industry	-	0.1	15%	2024	0%	100%
	17 Salter St	CE07	Industry	-	0.0	2%	2025	0%	100%
Committed Housing Sites	Brunswick Terrace	CD01	Housing	59	-	1%	2124	0%	100%
	Derelict Land, Foregate Street	CD03	Housing	42	-	1%	2126	0%	100%
	The Former Eagle Inn & 14/14A Newport Road	CD04	Housing	32	-	1%	2127	0%	100%
	Land At Castle Wharf/Castle View/Castle Stree	CD05	Housing	24	-	1%	2128	0%	100%
	9 - 10 Salter Street	CD06	Housing	21	-	1%	2129	0%	100%
	Site Off Mill Bank	CD07	Housing	20	-	1%	2130	0%	100%
	Westgate, Bellasis Street	CD08	Housing	18	-	1%	2131	0%	100%
	88 Wolverhampton Road, Forebridge	CD09	Housing	18	-	1%	2132	0%	100%
	24 St Leonards Avenue, Queensville	CD10	Housing	15	-	1%	2133	0%	100%
	The Former Bed Centre, Rowley Street	CD11	Housing	15	-	1%	2134	0%	100%
	Westhorpe And The Laurels, Rowley Avenue	CD12	Housing	12	-	1%	2135	0%	100%
	16 & 17 Lichfield Road	CD13	Housing	12	-	1%	2136	0%	100%
	11-11A Princes Street	CD14	Housing	12	-	1%	2137	0%	100%
	Land At Albert Terrace	CD15	Housing	11	-	1%	2138	0%	100%
	St Thomas Priory	CD16	Housing	25	-	1%	2139	60%	100%
	18 - 20A Browning Street	CD17	Housing	10	-	1%	2140	0%	100%
	Land To Rear Of 7,9,11,13,15 Weeping Cross	CD18	Housing	9	-	1%	2141	0%	100%
	North Stafford Garage, Stone Road	CD19	Housing	8	-	1%	2142	0%	100%
	The Hawthorns, 27 Newport Road	CD20	Housing	6	-	1%	2143	0%	100%
	The Royal Oak, Rising Brook	CD21	Housing	6	-	1%	2144	0%	100%
	Former Staff Houses, Rotherwood Drive, Rowl	CD22	Housing	6	-	1%	2145	0%	100%
	Land Between 56 -57 Queensville Avenue	CD23	Housing	5	-	1%	2146	0%	100%
	176 Sandon Road	CD24	Housing	5	-	1%	2147	0%	100%

Table A1.2 – Option 1a Developments

Group	Development Name	Site ID	Dev Type	Dev Size (Units)	Dev Size (Floor Area)	%HGVs	Dev Zone Number	2007	2026
SCC Housing sites	Beaconside / A34 Stone Road	SF1	Housing	800	-	1%	2112	0%	100%
	North of Beaconside	SF2	Housing	1500	-	1%	2113	0%	100%
	East of Stockton Lane	SF6	Housing	100	-	1%	2117	0%	100%
	South of Doxey Road	SF11	Housing	1800	-	1%	2122	0%	100%
	North of Castle Street	SF12	Housing	300	-	1%	2123	0%	100%
SCC Employment sites	East of Beaconside	SF-a	Industry	-	1.6	10%	2010	0%	100%
	West of Tollgate Drive	SF-b	Industry	-	3.6	10%	2011	0%	100%
	East of Fairway	SF-d	Industry	-	2.8	10%	2013	0%	100%
	East of Kingsway	SF-f	Industry	-	1.6	10%	2015	0%	100%
	West of Stone Road A34	SF-h	Industry	-	16.0	10%	2017	0%	100%

Table A1.3 – Option 1b Developments

Group	Development Name	Site ID	Dev Type	Dev Size (Units)	Dev Size (Floor Area)	%HGVs	Dev Zone Number	2007	2026
SCC Housing sites	Beaconside / A34 Stone Road	SF1	Housing	300	-	1%	2112	0%	100%
	North of Beaconside	SF2	Housing	1550	-	1%	2113	0%	100%
	South of Tixall Road	SF3	Housing	800	-	1%	2114	0%	100%
	West of Baswich Lane	SF4	Housing	700	-	1%	2115	0%	100%
	East of Fairway	SF5	Housing	350	-	1%	2116	0%	100%
	East of Stockton Lane	SF6	Housing	300	-	1%	2117	0%	100%
	East of Cannock Road A34	SF7	Housing	300	-	1%	2118	0%	100%
	South of Doxey Road	SF11	Housing	200	-	1%	2122	0%	100%
SCC Employment sites	East of Beaconside	SF-a	Industry	-	1.6	10%	2010	0%	100%
	West of Tollgate Drive	SF-b	Industry	-	3.6	10%	2011	0%	100%
	East of Fairway	SF-d	Industry	-	2.8	10%	2013	0%	100%
	East of Kingsway	SF-f	Industry	-	1.6	10%	2015	0%	100%
	West of Stone Road A34	SF-h	Industry	-	16.0	10%	2017	0%	100%

Table A1.4 – Option 1c Developments

Group	Development Name	Site ID	Dev Type	Dev Size (Units)	Dev Size (Floor Area)	%HGVs	Dev Zone Number	2007	2026
SCC Housing sites	Beaconside / A34 Stone Road	SF1	Housing	300	-	1%	2112	0%	100%
	West of Baswich Lane	SF4	Housing	700	-	1%	2115	0%	100%
	East of Stockton Lane	SF6	Housing	300	-	1%	2117	0%	100%
	East of Cannock Road A34	SF7	Housing	300	-	1%	2118	0%	100%
	Btwn Cannock Rd A34 and Wolverhampton Rd	SF8	Housing	2000	-	1%	2119	0%	100%
	West of Wolverhampton Road A449	SF9	Housing	300	-	1%	2120	0%	100%
	South of School Lane	SF10	Housing	400	-	1%	2121	0%	100%
	South of Doxey Road	SF11	Housing	200	-	1%	2122	0%	100%
SCC Employment sites	East of Beaconside	SF-a	Industry	-	1.6	10%	2010	0%	100%
	West of Tollgate Drive	SF-b	Industry	-	3.6	10%	2011	0%	100%
	East of Fairway	SF-d	Industry	-	2.8	10%	2013	0%	100%
	East of Kingsway	SF-f	Industry	-	1.6	10%	2015	0%	100%
	West of Stone Road A34	SF-h	Industry	-	16.0	10%	2017	0%	100%

ATKINS

A.2   Appendix B – Detailed Assessment of Options

Objective: **Impact on All Users**

Sub Objectives: **Various Traffic Indicators**

Methodology

This objective has considered the following:

Vehicle Hours	Total vehicle hours for trips within the model area
Vehicle Kilometres	Total vehicle kilometres for trips within the model area
Vehicle Speeds	The Average speed for trips within the model area
Average Trip Length	The Average trip length for trips within the model
Development Demand	The total trip demand

Results

	Do Minimum AM	Do Minimum PM	Option 1a AM	Option 1a PM	Option 1b AM	Option 1b PM	Option 1c AM	Option 1c PM
Vehicle Hours	13607	14403	14836	15650	14952	15785	14919	15726
% Change Rel to DM	-	-	9.0%	8.7%	9.9%	9.6%	9.6%	9.2%
Vehicle Kilometres	818536	839575	833893	862053	834693	864183	836169	864895
% Change Rel to DM	-	-	1.9%	2.7%	2.0%	2.9%	2.2%	3.0%
Vehicle Speeds (km/hr)	60.2	58.3	56.2	55.1	55.8	54.7	56.0	55.0
% Change Rel to DM	-	-	-6.6%	-5.5%	-7.2%	-6.1%	-6.8%	-5.7%
Average Trip Length (km)	18.3	17.5	17.8	17.0	17.8	17.0	17.8	17.0
% Change Rel to DM	-	-	-2.7%	-2.7%	-2.7%	-2.4%	-2.5%	-2.4%
Network Demand	44775	48084	46885	50719	46914	50744	46942	50734
% Change Rel to DM	-	-	4.7%	5.5%	4.8%	5.5%	4.8%	5.5%

Overall Score

Objective	Sub Objective	Options Do Minimum	Options Option 1a	Options Option 1b	Options Option 1c
Development Impacts	Vehicle Hours	1	2	4	3
	Vehicle Kilometres	1	2	3	4
	Vehicle Speeds	1	2	4	3
	Average Trip Length	4	1	1	1
	Demand	1	3	3	3

ATKINS

Objective:	**Impact on Strategic Routes**

Sub Objectives:	**Flows on the M6**

Methodology

This assessment has considered the total flows on the M6 around Stafford

Results

	Do Minimum		Option 1a		Option 1b		Option 1c	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
M6 North of J14								
Nortbound	3379	3444	3316	3415	3322	3413	3326	3413
Southbound	3296	3556	3287	3483	3290	3483	3277	3487
Total	6676	7000	6604	6898	6612	6896	6603	6900
% Change Rel DM	-	-	-1.1%	-1.5%	-1.0%	-1.5%	-1.1%	-1.4%
M6 Between J13 and J14								
Nortbound	4046	4084	4197	4133	4417	4142	4300	4129
Southbound	3645	4202	3678	4375	3614	4515	3648	4394
Total	7691	8286	7876	8509	8032	8657	7948	8523
% Change Rel Opt 1	-	-	2.4%	2.7%	4.4%	4.5%	3.3%	2.9%
M6 South of J13								
Nortbound	3759	4148	3817	4177	3712	4169	3749	4181
Southbound	3801	4072	3848	4077	3855	4022	3849	4046
Total	7560	8220	7665	8254	7566	8191	7598	8227
% Change Rel Opt 1	-	-	1.4%	0.4%	0.1%	-0.4%	0.5%	0.1%

Overall Score

Objective	Sub Objective	Options			
		Do Minimum	**O1a**	**O1b**	**O1c**
Strategic Impact	**Flows on the M6**	**1**	**2**	**4**	**3**

Objective: **Impacts on Development Users**

Sub Objectives: **Various development Traffic Indicators**

Methodology

This objective has considered the following:

Vehicle Hours	Total vehicle hours for trips to and from the new developments
Vehicle Kilometres	Total vehicle kilometres for trips to and from the new developments
Vehicle Speeds	The Average speed for trips to and from the new developments
Average Trip Length	The Average trip length within the model area for trips to and from the new developments
Development Demand	The total trip demand to and from the new developments

---

Results

	Do Minimum		Option 1a		Option 1b		Option 1c	
	AM	PM	AM	PM	AM	PM	AM	PM
Vehicle Hours	663	937	1788	2094	1844	2131	1844	2135
% Change Rel to DM	-	-	169%	123%	178%	127%	178%	128%
Vehicle Kilometres	29782	40665	72159	85064	74562	87188	74352	86890
% Change Rel to DM	-	-	142%	109%	150%	114%	150%	114%
Vehicle Speeds (km/hr)	44.9	43.4	40.4	40.6	40.4	40.9	40.3	40.7
% Change Rel to DM	-	-	-10.1%	-6.4%	-9.9%	-5.7%	-10.2%	-6.2%
Average Trip Length (km)	10.7	10.8	10.3	10.5	10.6	10.8	10.6	10.7
% Change Rel to DM	-	-	-4.0%	-2.5%	-0.8%	-0.1%	-1.1%	-0.4%
Development Demand	2783	3777	7022	8103	7022	8103	7022	8103
% Change Rel to DM	-	-	152%	115%	152%	115%	152%	115%

Overall Score

Objective	Sub Objective	Options			
		Do Min	O1a	O1b	O1c
Development Impacts	Vehicle Hours	1	2	3	4
	Vehicle Kilometres	1	2	4	3
	Vehicle Speeds	1	4	2	3
	Average Trip Length	4	1	3	2
	Development Demand	1	3	3	3

Objective: Network Impacts

Sub Objectives: Impacts on Junctions and Links

Methodology

This objective has considered the following:

Junctions   An assessment has been undertaken of the number of junctions with an average V/C of >85%

Links   An assessment has been undertaken of the number of links with an average V/C of >85%

Note:

These indicators have been assessed using the SATURN model for the key simulated area

A V/C Ratio of 85% is considered to represent links and junctions which are approaching capacity and hence beyond this significant delays and queuing may occur.

Results

	Do Minimum		Option 1a		Option 1b		Option 1c	
	AM	PM	AM	PM	AM	PM	AM	PM
No of Junctions V/C >85%	72	89	103	129	109	127	101	124
% Change Rel to Opt 1	-	-	43.1%	44.9%	51.4%	42.7%	40.3%	39.3%
No of Links V/C >85%	24	28	27	34	28	37	25	34
% Change Rel to Opt 1	-	-	12.5%	21.4%	16.7%	32.1%	4.2%	21.4%

Overall Score

Objective	Sub Objective	Options			
		Do Minimum	Option 1a	Option 1b	Option 1c
Network Impacts	Junctions	1	3	4	2
	Links	1	3	4	2

Objective: **Environment**

Sub Objectives: **CO2 and NOX**

Methodology

An assessment of the levels of both Carbon Dixoide and Nigrogen Oxide has been undertaken.
This has used the direct outputs from the SATURN forecast model assignments and hence
the accuracy of these results should be considered in this light.

Results

	Do Minimum AM	Do Minimum PM	Option 1a AM	Option 1a PM	Option 1b AM	Option 1b PM	Option 1c AM	Option 1c PM
CO2 (Kg/hour)	22551	24084	25083	26222	25331	26635	25149	26403
NOX (Kg/hour)	514	549	564	591	566	603	565	596

Overall Score

Objective	Sub Objective	Options Do Minimum	Options Option 1a	Options Option 1b	Options Option 1c
Environment	**CO2**	1	3	3	3
	NOX	1	3	3	3

Objective: **Access to Public Transport**

Sub Objectives: **Access to existing services**

Methodology

Access to Buses

The number of AM Peak development trips with access to existing bus routes within a 400m walk

It is noted that in all four options some developments are not within a 400m walk (333m straight-line distance) of the bus network. The schemes have been scored dependent on the number of developments that don't have walkable access to the bus network.

Access to Rail

Qualitative Statement

Existing direct bus services which pass the rail station are:

9, 74, 75, 76, 101, 481, 482, 825, X1, 880, 835, 836, 837, 490

The routes are shown opposite.

All bus services pass through the city centre and so all buses are technically eligible for connecting to the train service. Therefore, all options are scored equally.

Overall Score

Objective	Sub Objective	Options			
		Do Minimum	Option 1a	Option 1b	Option 1c
Access to Public Transport	Bus	1	2.5	2.5	4
	Rail	1	1	1	1

ATKINS

A.3 Appendix C – Network Impacts

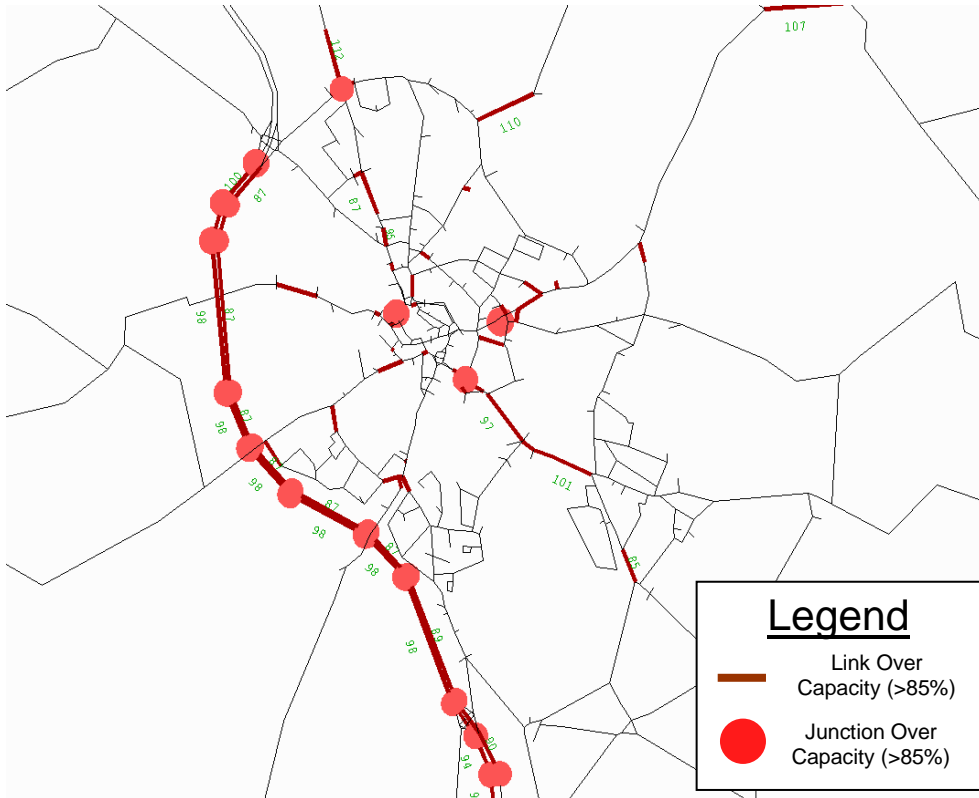**Figure A3.1 – Do Minimum 2026 AM Peak: Link Volume / Capacity Ratio > 85%**

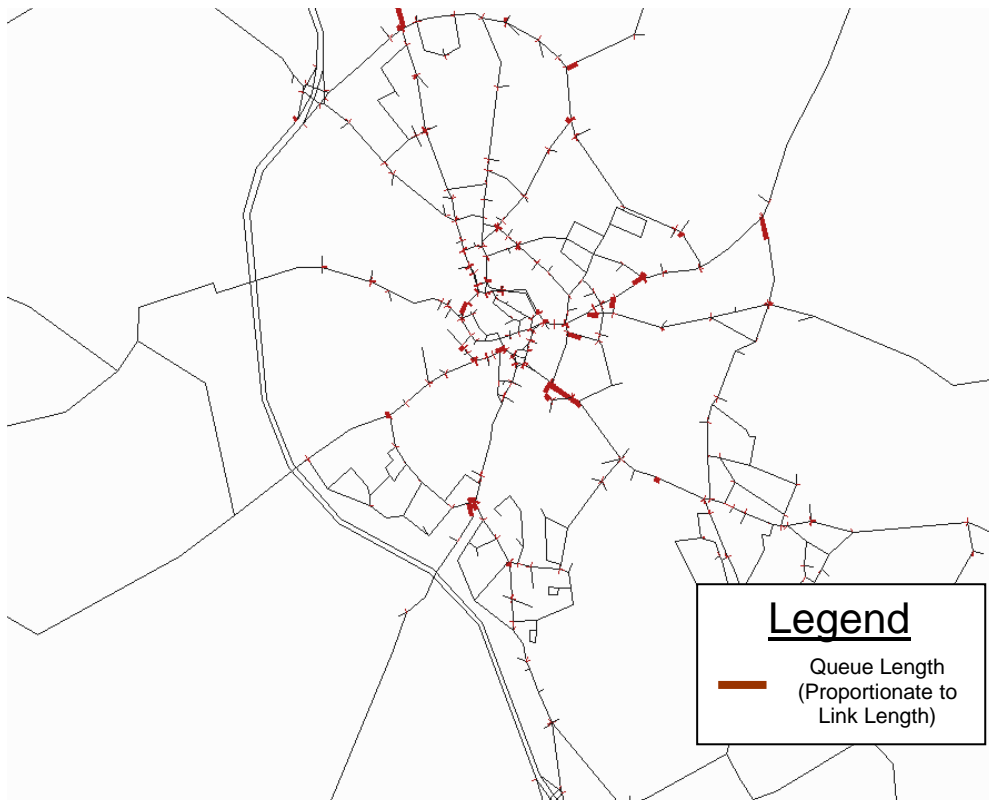**Figure A3.2 – Do Minimum 2026 AM Peak: Relative Queue Lengths**

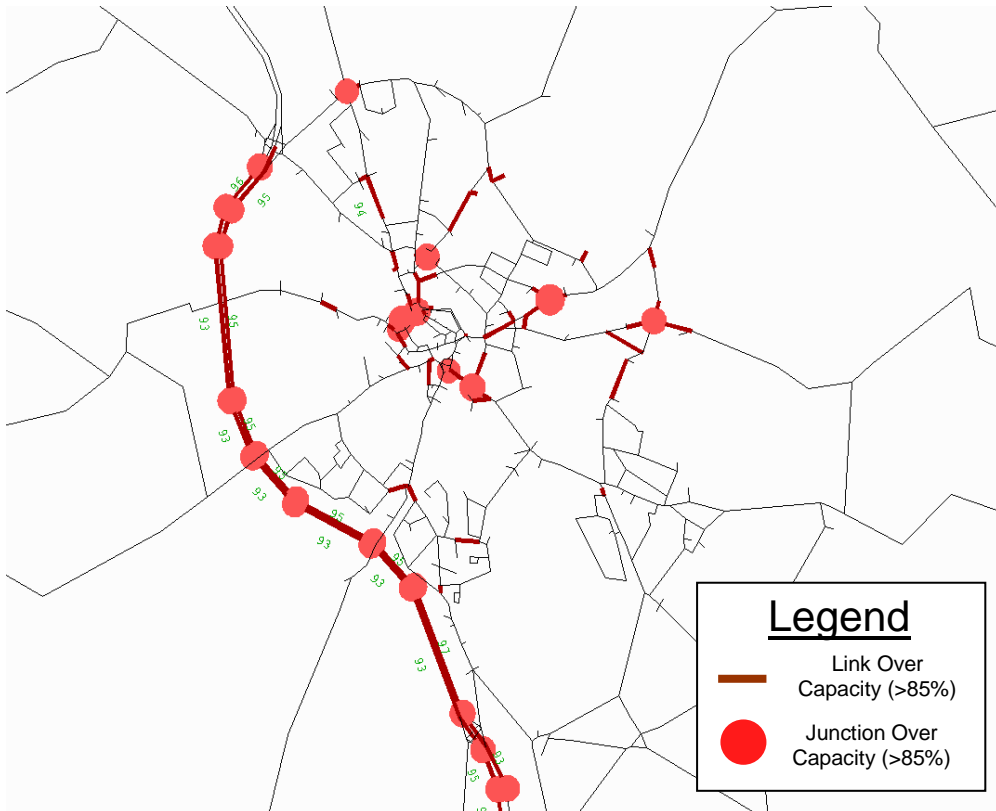**Figure A3.3 – Do Minimum 2026 PM Peak: Link Volume / Capacity Ratio > 85%**

Legend

— Link Over Capacity (>85%)

● Junction Over Capacity (>85%)

Figure A3.4 – Do Minimum 2026 PM Peak: Relative Queue Lengths

Legend

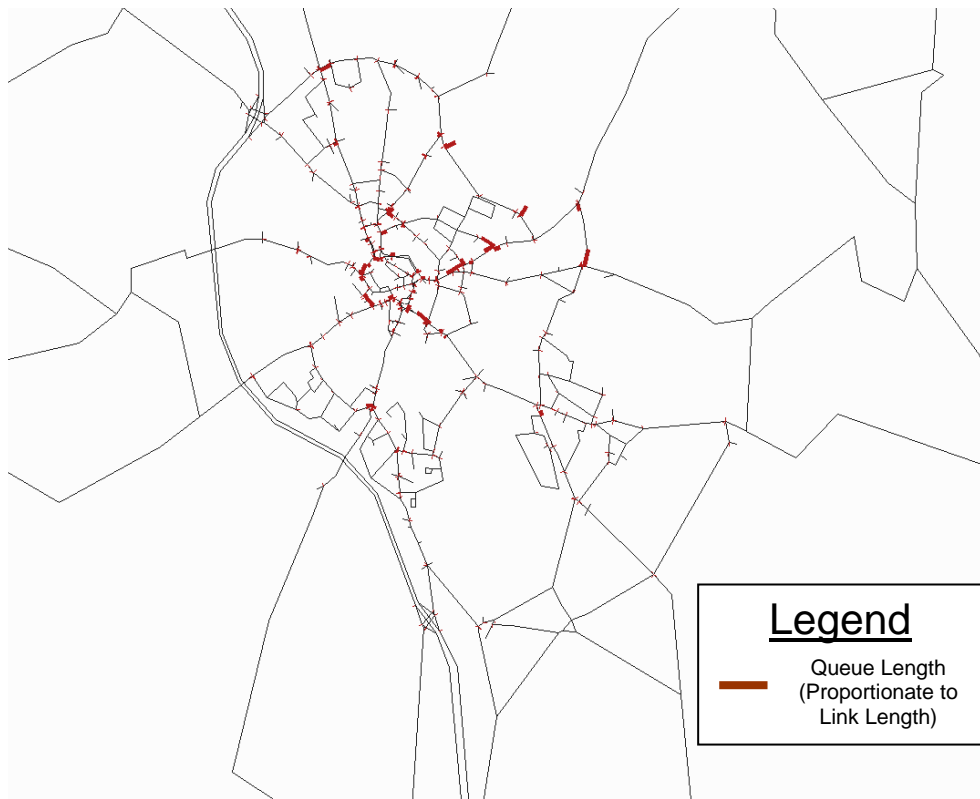— Queue Length (Proportionate to Link Length)

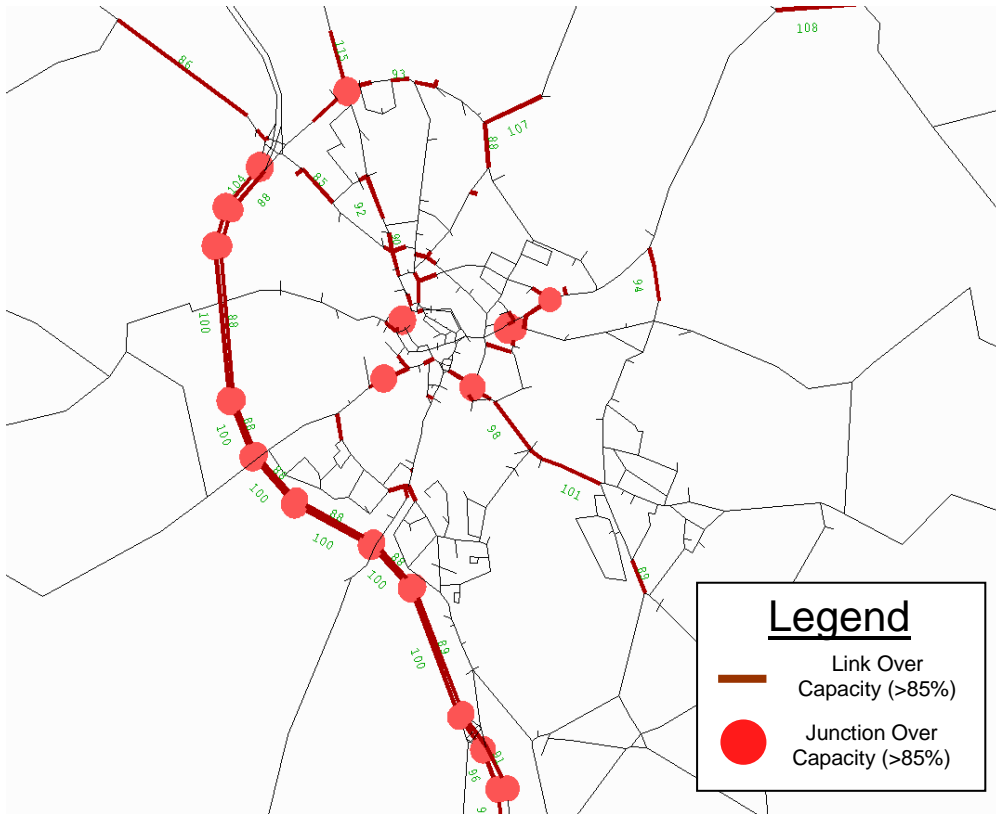**Figure A3.5 – Option 1a 2026 AM Peak: Link Volume / Capacity Ratio > 85%**

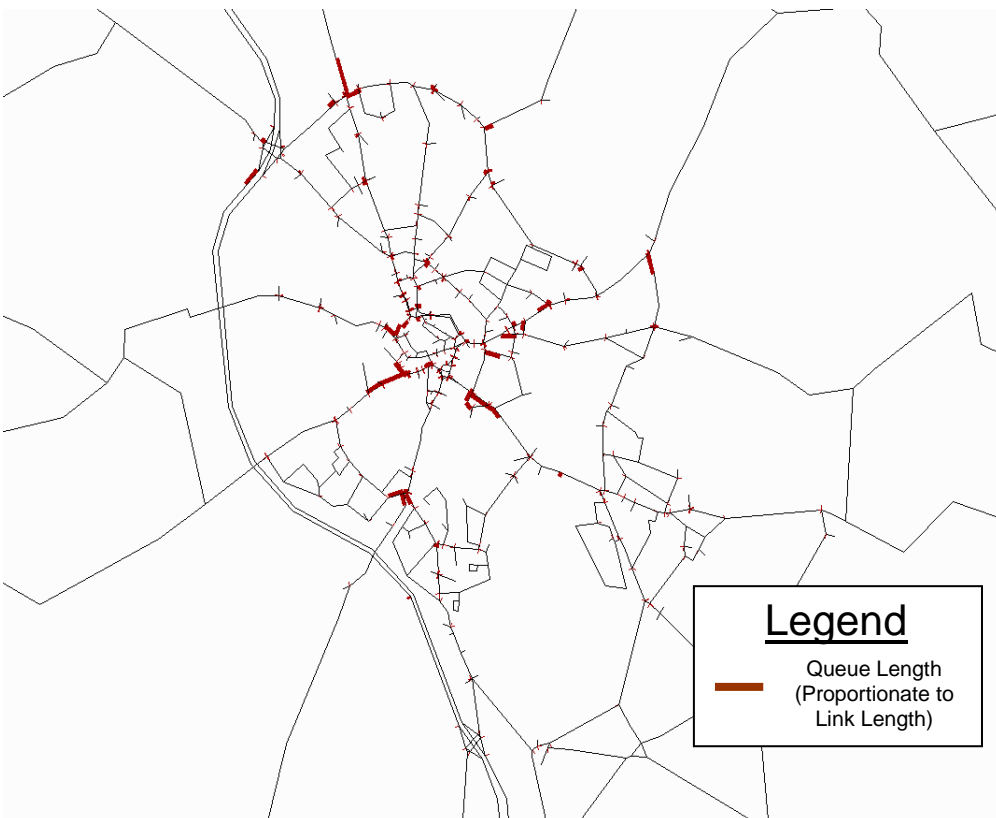**Figure A3.6 – Option 1a 2026 AM Peak: Relative Queue Lengths**

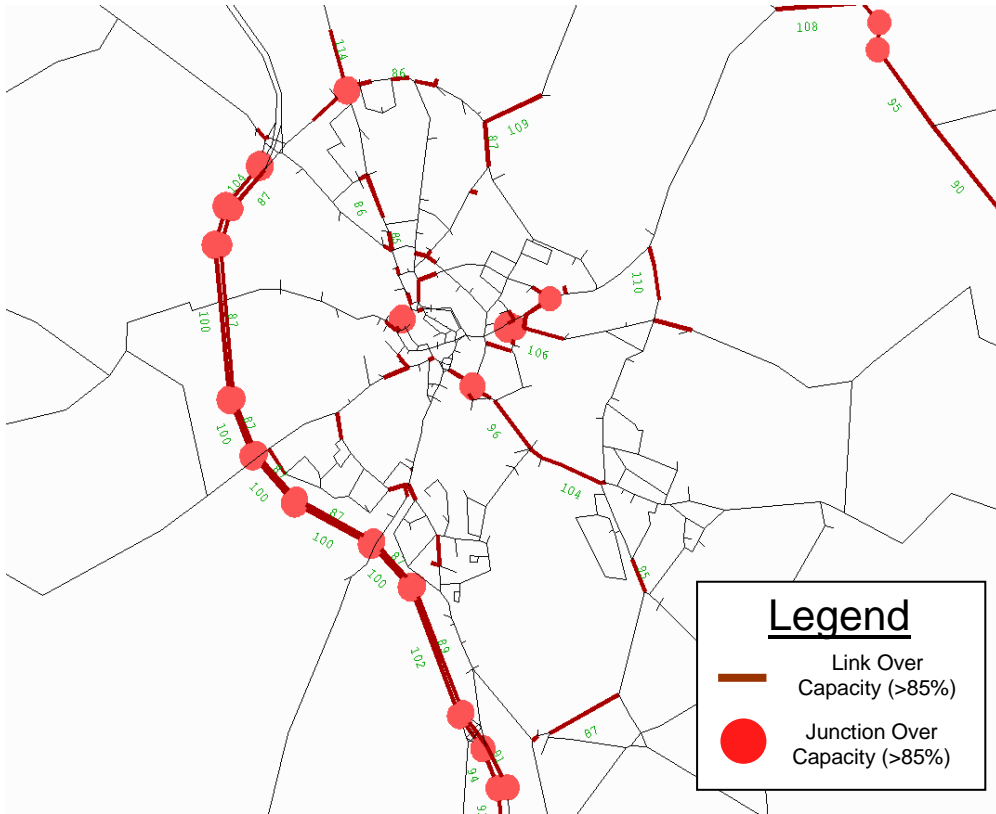**Figure A3.7 – Option 1a 2026 PM Peak: Link Volume / Capacity Ratio > 85%**

Legend

Link Over Capacity (>85%)

Junction Over Capacity (>85%)

Figure A3.8 – Option 1a 2026 PM Peak: Relative Queue Lengths

Legend

Queue Length (Proportionate to Link Length)

Figure A3.9 – Option 1b 2026 AM Peak: Link Volume / Capacity Ratio > 85%

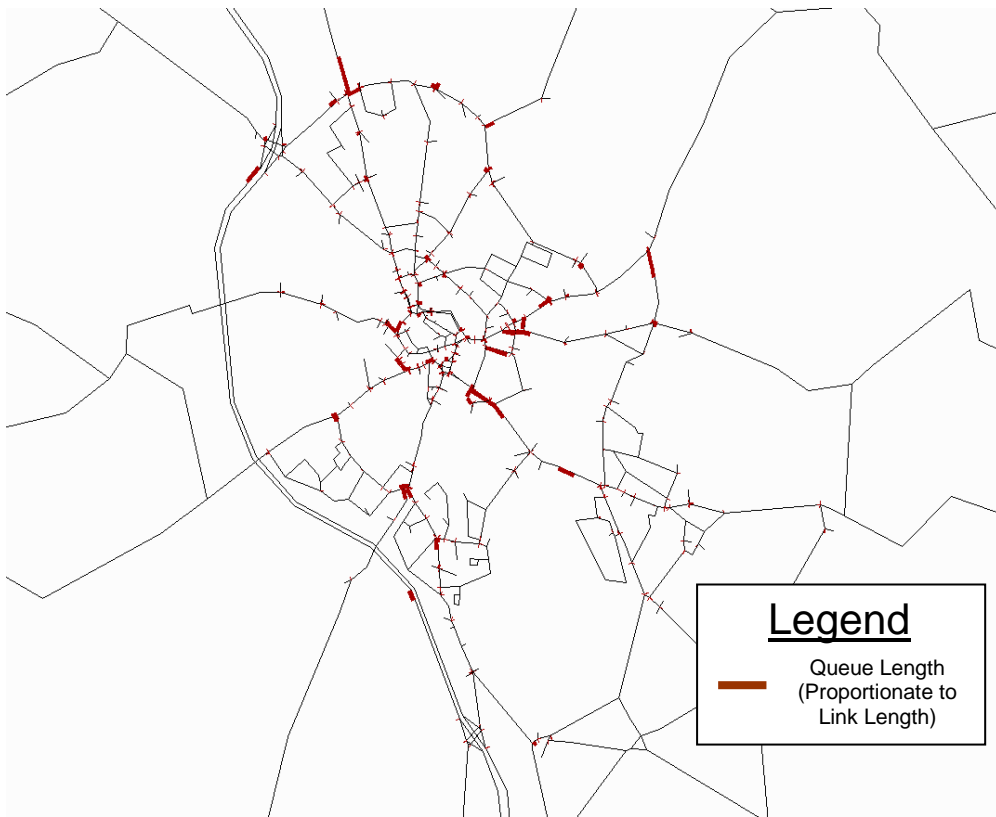**Figure A3.10 – Option 1b 2026 AM Peak: Relative Queue Lengths**

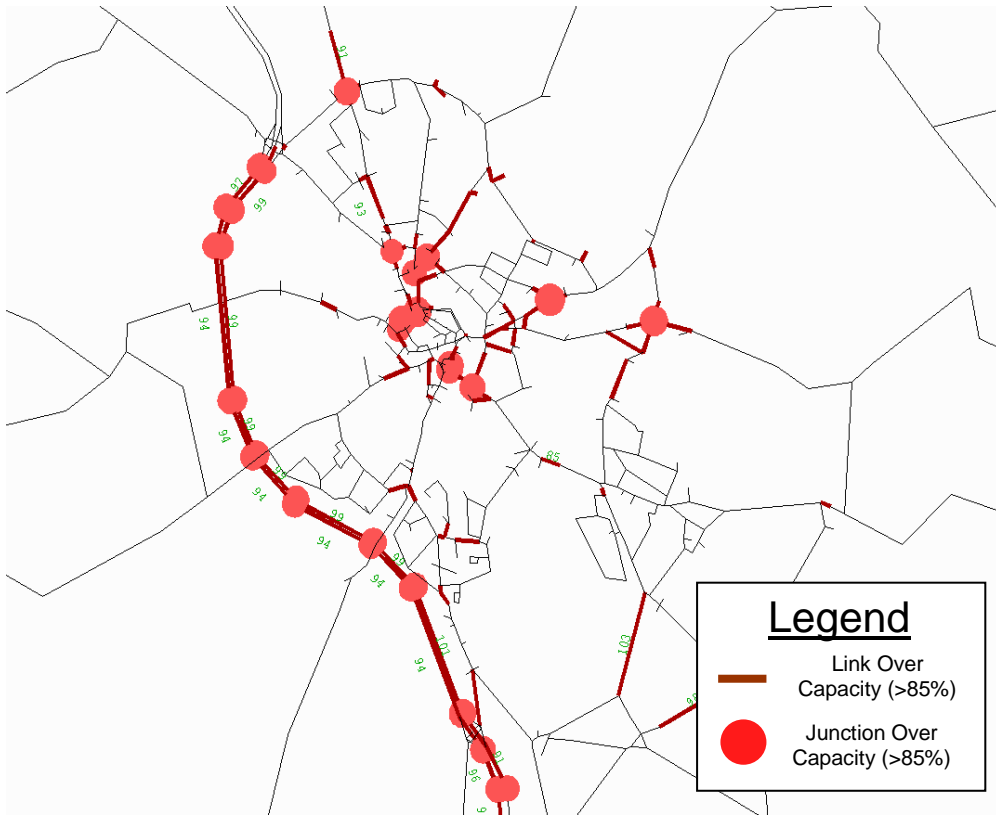**Figure A3.11 – Option 1b 2026 PM Peak: Link Volume / Capacity Ratio > 85%**

Legend

Link Over Capacity (>85%)

Junction Over Capacity (>85%)

Figure A3.12 – Option 1b 2026 PM Peak: Relative Queue Lengths

Legend

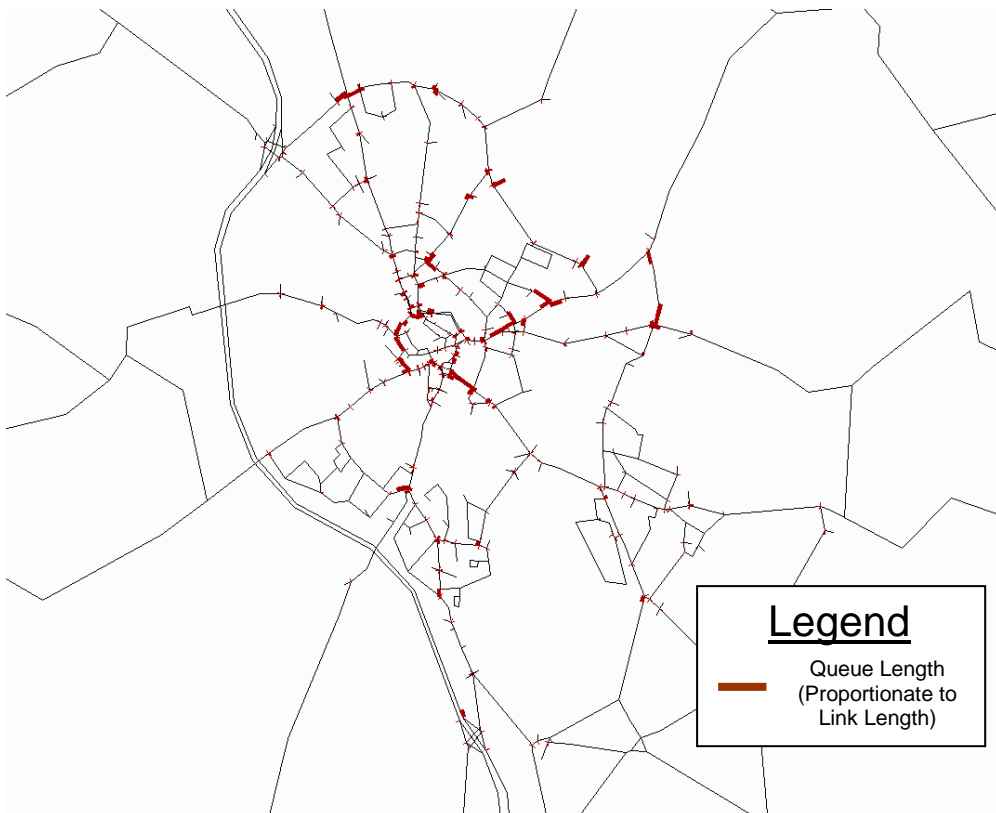Queue Length (Proportionate to Link Length)

Figure A3.13 – Option 1c 2026 AM Peak: Link Volume / Capacity Ratio > 85%
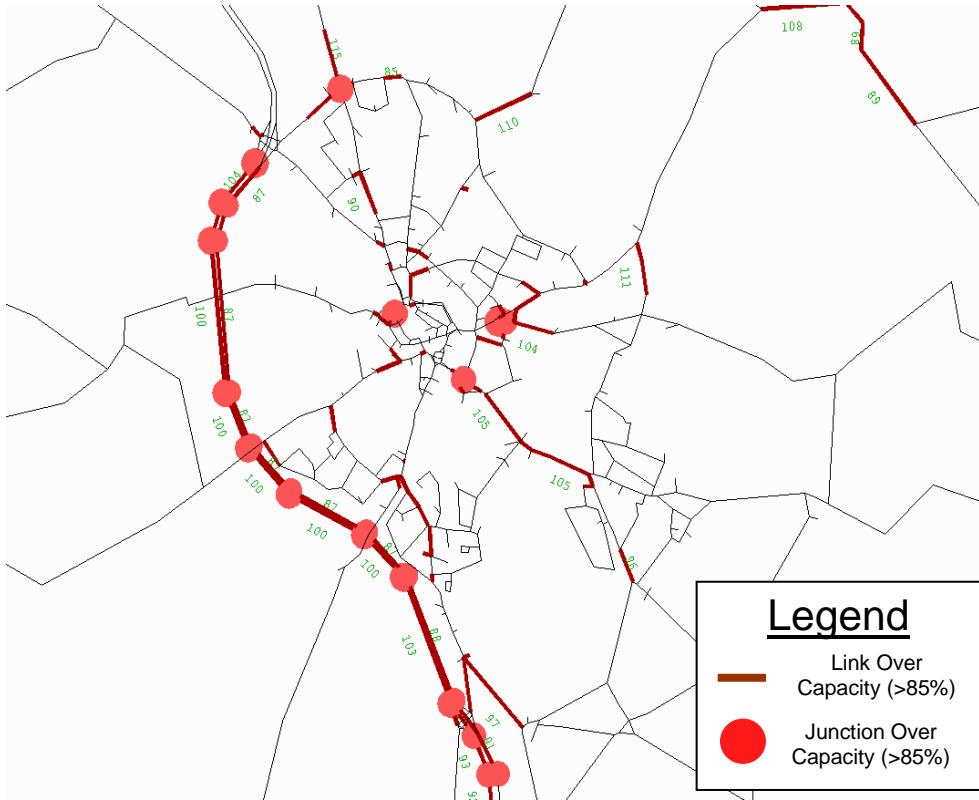

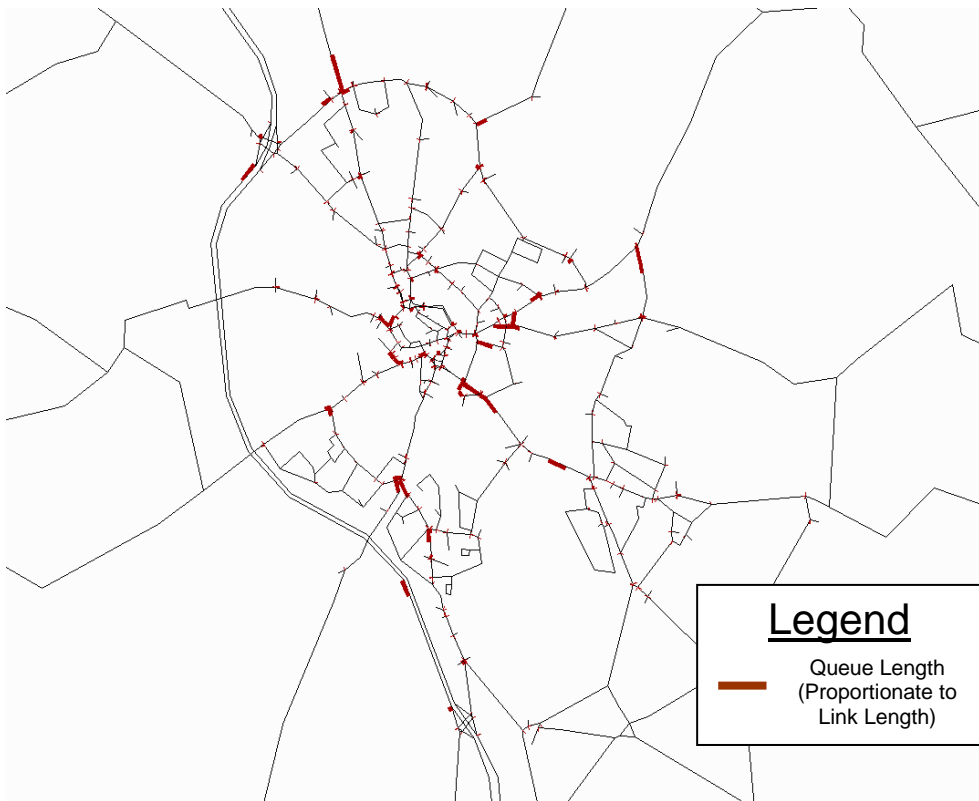**Figure A3.14 – Option 1c 2026 AM Peak: Relative Queue Lengths**

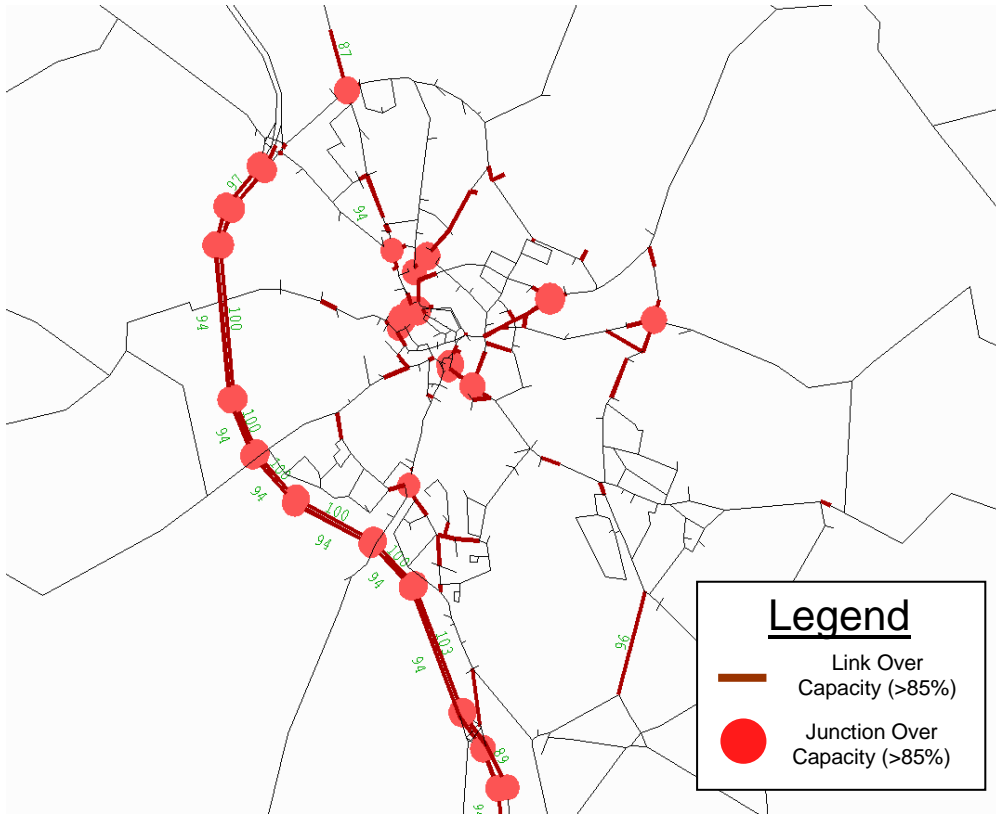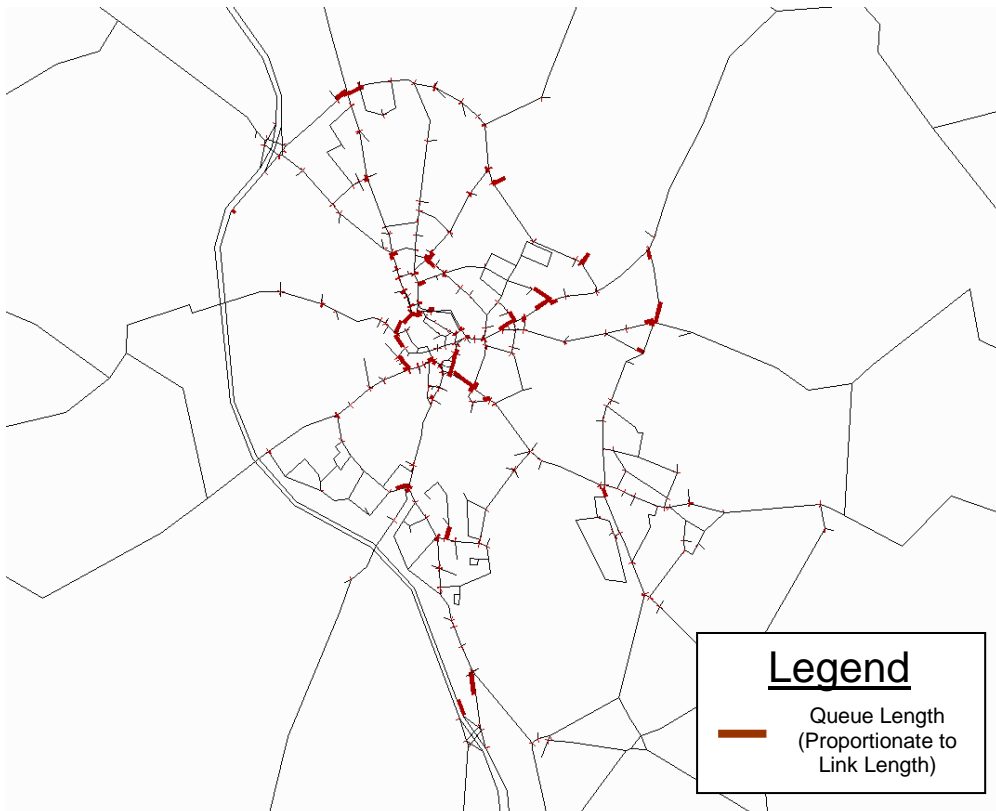**Figure A3.15 – Option 1c 2026 PM Peak: Link Volume / Capacity Ratio > 85%**

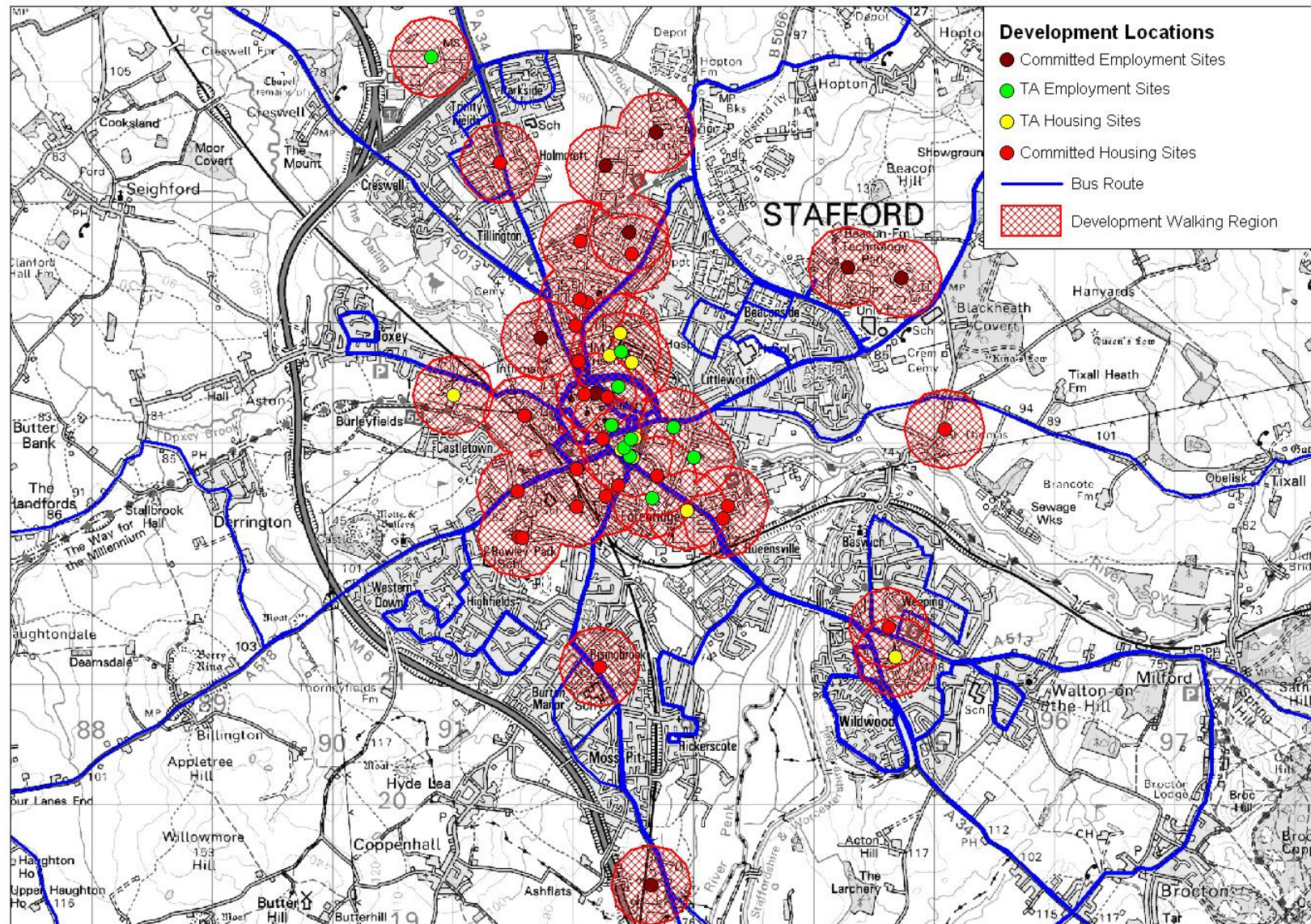**Figure A3.16 – Option 1c 2026 PM Peak: Relative Queue Lengths**

A.4 Appendix D – Bus access within 400 metres of new developments

Do Minimum

ATKINS

Development Locations

- ● Committed Employment Sites
- ● TA Employment Sites
- ● TA Housing Sites
- ● Committed Housing Sites
- —— Bus Route
- ▦ Development Walking Region

Option 1a

Development Locations

- ● Committed Housing Sites
- ● Committed Employment Sites
- ● TA Employment Sites
- ● TA Housing Sites
- ● SCC Employment Option Sites
- ● SCC O1a Housing Options
- —— Bus Route
- ▨ Development Walking Region

ATKINS

Option 1b

Development Locations

- 🔴 Committed Housing Sites
- 🔴 Committed Employment Sites
- 🟢 TA Employment Sites
- 🟡 TA Housing Sites
- 🔵 SCC Employment Option Sites
- 🟢 SCC O1b Housing Options
- ▬ Bus Route
- ▨ Development Walking Region

ATKINS

Option 1c

Development Locations

- ● Committed Housing Sites
- ● Committed Employment Sites
- ● TA Employment Sites
- ● TA Housing Sites
- ● SCC Employment Option Sites
- ● SCC O1c Housing Options
- — Bus Route
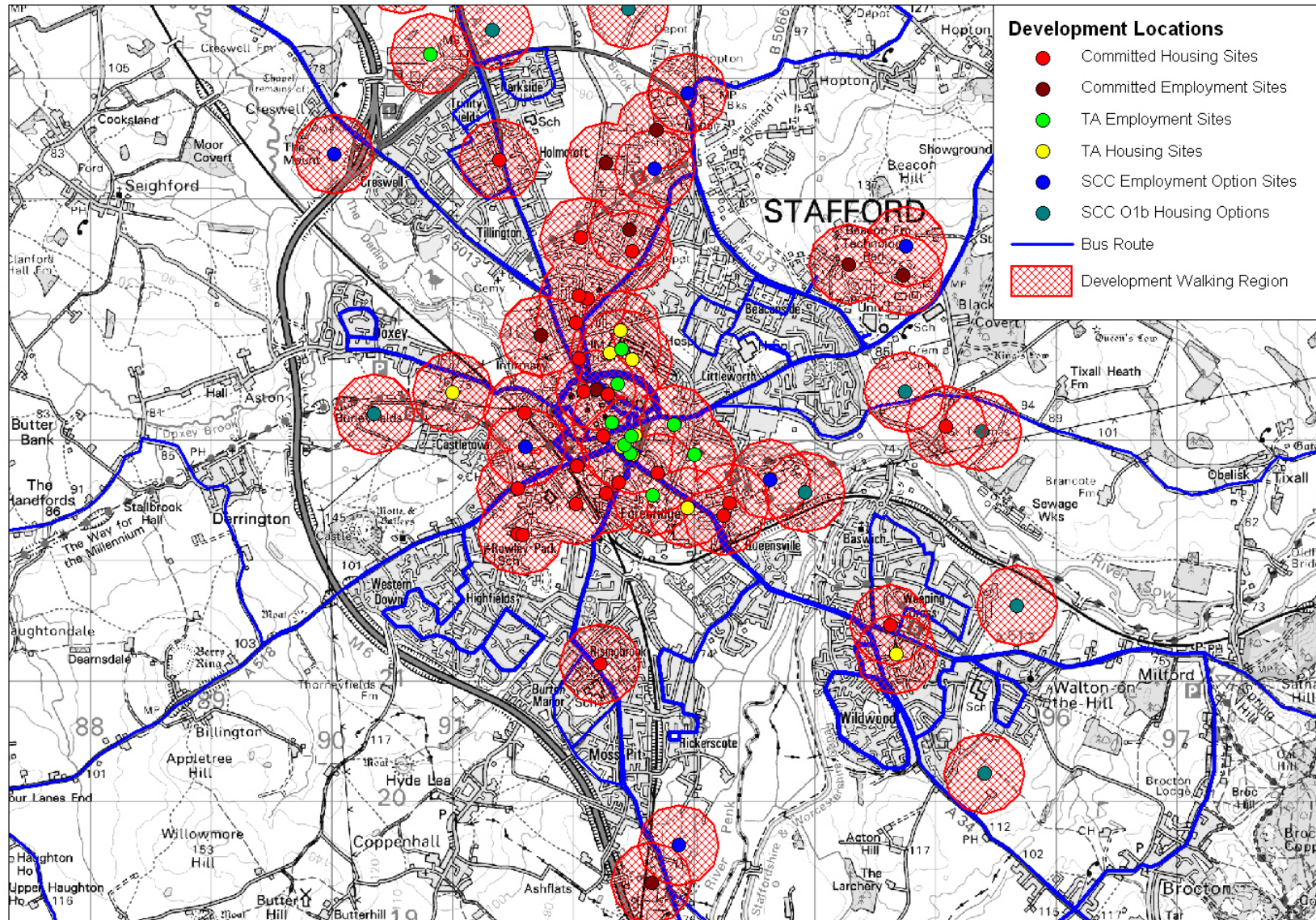- ▨ Development Walking Region
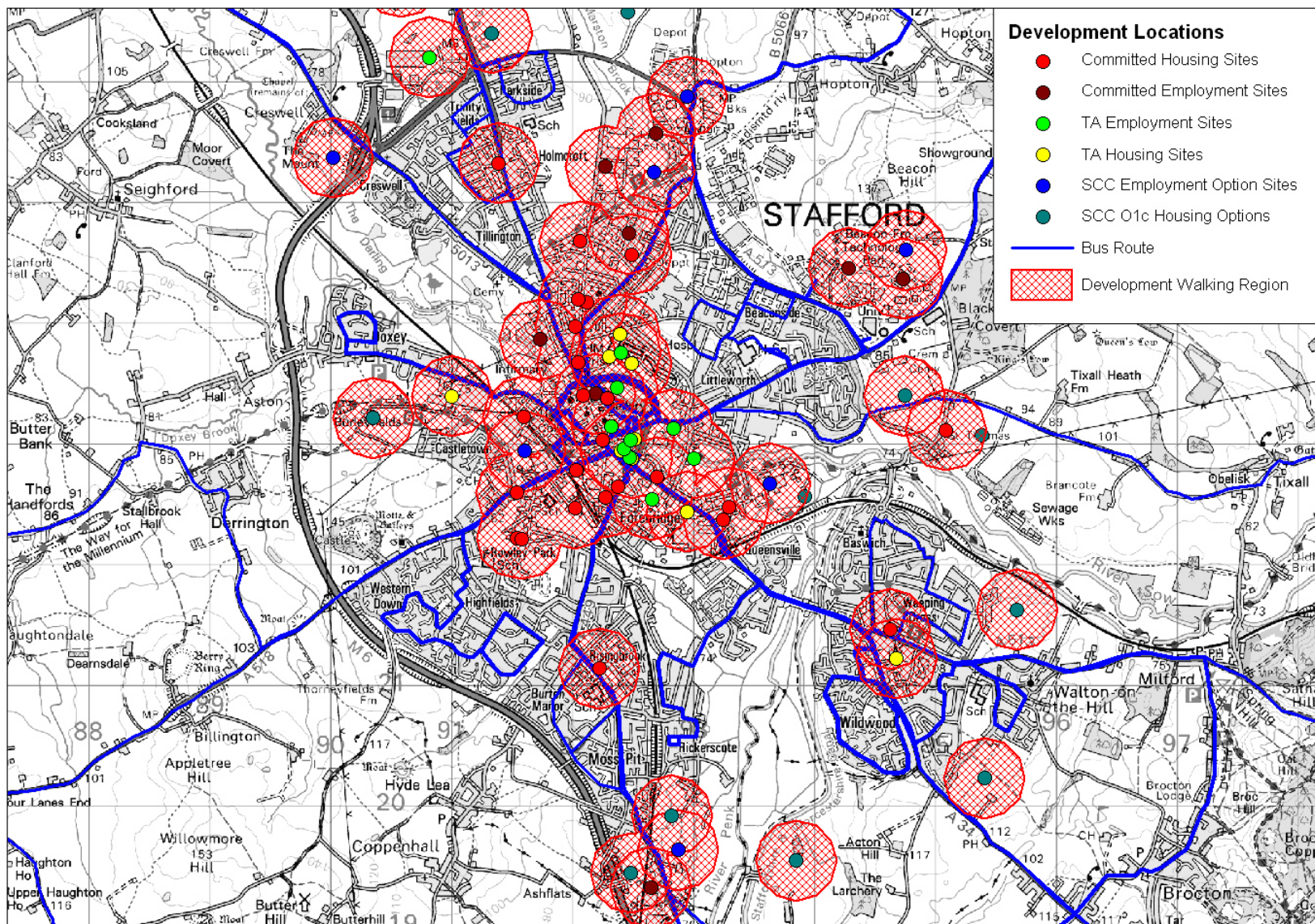
A.5   Appendix E – Cycle access to the City Centre within 15 minutes

Objective: **Access to Non Motorised Modes**

Sub Objectives: **Access to existing Cycle Network**

Methodology

Access to the Cycle Network

Ref: Staffordshire CC Stafford Urban Cycling Map

Key Points:

In general, Stafford caters well for cyclists and other non-motorised users. The diagram shows a reasonably comprehensive cycle network.

Within 15 minutes cycle of town centre

This is tested by assuming that cyclists travel from each development at 16kph. The indicator assumes that the distance travelled to the town centre is 1.3 times the 'crow-fly' distance from the development to the centre.

Results

	Do Minimum AM PM	Option 1a AM PM	Option 1b AM PM	Option 1c AM PM
% Developments within 15 minute cycle of town centre	89%	78%	74%	72%

Overall Score

Objective	Sub Objective	Options			
		Do Minimum	Option 1a	Option 1b	Option 1c
Access for Non Motorised Modes	**Access to the Cycle Network**	1	1	1	1
	Within 15 minutes cycle of town centre	1	2	3	4

Atkins Transport Planning
The Axis
10 Holliday Street
Birmingham
B1 1TF

Direct Line: 0121 483 6144
Direct Fax: 0121 483 5252

Craig.shipley @atkinsglobal.com

www.atkinsglobal.com

ATKINS