Daventry Infrastructure Studies

Transport Technical Report

January 2009

WNDC

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Executive Summary

Introduction

The Milton Keynes – South Midlands Sub-Regional Strategy (part of the East Midlands Regional Spatial Strategy or RSS) has identified that Daventry's population will grow substantially over the next two decades. It has identified that the town of is expected to grow towards a population of 40,000 by 2021 and that Daventry District, as a whole should continue to grow at an equally steady rate beyond 2021 until at least 2026. This study therefore sets out infrastructure requirements for expected population and dwelling growth for both 2021 and 2026 accordingly.

In order to help West Northamptonshire Development Corporation better understand the implications of these targets for the growth of Daventry in terms of certain types of infrastructure, they have commissioned a series of infrastructure studies from consultants, URS Corporation, ISU Limited and LDA Design.

This technical report covers social infrastructure, and sets out a series of preliminary conclusions for the infrastructure requirements in association with the growth targets set down in the Regional Spatial Strategy (RSS).

Purpose of the DIS

The DIS has been produced in accordance with an initial brief received from WNDC. This brief in turn had been developed and consulted upon in mid-2007 by WNDC and has been developed further as the course of the project progressed following consultation and engagement with partners. The views of several major applicants, who were in discussion with WNDC regarding existing or potential planning applications for development in and around Daventry, were also canvassed when the work was commissioned.

The objectives of the DIS have been refined and are:

1. To identify the likely infrastructure investment priorities for Daventry required to deliver long term sustainable growth as set out in the RSS, and recognise how and when they could be delivered;
2. To evaluate the current infrastructure constraints and opportunities for development in the medium to longer term (i.e. to 2021) and having regard to development up to 2026 and beyond;
3. To consider infrastructure development scenarios (but not to allocate land for development or predetermine planning decisions);
4. To consider how infrastructure could be phased alongside growth;
5. To allow consideration of the relationship between infrastructure investment and growth proposals for the town to assist in making planning decisions in the short to medium term; and
6. to provide an evidence base which may be used by other local planning authorities to support the plan making process for Daventry town as a whole.

Key Conclusions - Baseline

The Technical Report has found that the baseline transport infrastructure is:

- Subject to careful assignment of growth, Daventry's internal road infrastructure could accommodate the forecast growth without significant modification, provided adequate sustainable transport alternatives and demand management measures are in place to reduce journeys by private motor vehicles;
- Specific details for the town can only be finalised once preferred development options are confirmed and tested, however the need for local junction improvements on main corridors is evident amid limited road widening and link improvements, primarily to improve public transport reliability
- The current level of public transport services is insufficient to support the target mode share for sustainable modes in some corridors and enhancement will be required to support development and achieve the required modal shift;
- Daventry's public transport bus interchange needs improved capacity to accommodate the proposed volumes of bus passengers by 2021;
- Improved interurban bus transport to link the town with neighbouring centres are required, especially for journeys involving Northampton and possibly Coventry, Solihull and Birmingham, Leamington Spa and Warwick, Towcester and Milton Keynes
- The strategic trunk road network is not sensitive to development locations, although proposed growth will impact on specific junctions to include A5 junctions with the A45, A428, Norton Road, B4036 Long Buckby Road and the junction with Crockwell Hill/ B5385 north east of Welton;
- The A5/ A45 junction at Weedon is the most contentious as it is already at capacity and faces severe congestion in the face of the predicted expansion of Daventry town. The level of improvement required is significant and may not be appropriate for central Weedon, though the potential for the Flore-Weedon bypass may negate the need to improve this junction;
- Resolution of the Flore-Weedon bypass issue and identification of specific improvements required for the A45 between Daventry and Weedon are subject to further investigations. In spite of this it is likely that both will be required before 2021 to accommodate growth

Key Conclusions – Infrastructure Requirements

This Technical Report has concluded that the key strategic additional infrastructure requirements for a population of at least 45,000 (which would be reached with an increase in population of 20,000 as is likely by 2026) are:

- Local junction improvements on main corridors amid limited road widening and link improvements, primarily to improve public transport reliability
- Improved public transport services to support target mode share for sustainable modes in some corridors with further strengthening to sustain development through increased frequencies and services, new vehicles, bus priority measures and enhanced bus stop infrastructure and marketing
- Increased capacity at Daventry's public transport bus interchange to accommodate the proposed volumes of bus passengers by 2021;
- Improved interurban bus transport to link the town with neighbouring centres, especially for journeys involving Northampton and possibly Coventry, Solihull and Birmingham, Leamington Spa and Warwick, Towcester and Milton Keynes
- Improvements to the Trunk Road network involving A5 junctions with the A45, A428, Norton Road, B4036 Long Buckby Road and the junction with Crockwell Hill/ B5385 north east of Welton;
- While resolution of the Flore-Weedon bypass issue and identification of specific improvements required for the A45 between Daventry and Weedon are subject to further investigations likely that both will be required before 2021 to accommodate growth
- Improvements to the A361 Daventry to M40 to discourage through traffic and limit impact on villages of Byfield, Chipping Warden and Wardington;
- Daventry to A5 and onwards to Long Buckby to cater for growth and improve access to the rail network, especially for sustainable travel modes;

Depending on further modelling work and feasibility studies there is also likely to be the need for route improvements for:

- A45 South and South East of Daventry
- A361 north of Daventry to Kilsby;

A Sustainable Infrastructure Strategy

Based on the investigations undertaken, the report outlines that transport impact and demand for associated infrastructure will be highly dependant on the locational interrelationship between existing and proposed facilities and ultimately the development land-use mix of a specific site and overall cumulative impact.

The A45 corridor east of Daventry is particularly sensitive to change and would require significant investment in highway capacity to support growth alongside it (e.g. dualling) supplemented by suitable measures to ensure sustainable linkages with the existing town. Any development south of the A45 will require suitable sustainable linkages across it to include at-grade crossings for pedestrians and cyclists with effective direct arrangements for the movement of buses.

Overall sustainable travel behaviour needs be encouraged and maintained and it is essential to provide highly convenient access to services and facilities that cater for non-car modes, with networks provided that are fully accessible, effective and thoroughly integrated with the existing fabric of the town to satisfy local travel demands.

Use of the private car should be seen as the least convenient/ least desirable mode, especially for local journeys. It will be essential to internalise and therefore minimise as many trips as practicable within the town and in particular within any new development;

Cross-town integration of direct public transport services will be crucial, with high quality and frequent services sustaining development.

Strong emphasis should be placed on demand management measures and smarter choices, including travel planning.

Sustainable transport infrastructure and initiatives should be phased to coincide with those of development to ensure the required measures are in place before developments (residential or otherwise) become inhabited.

1 Introduction

1.1. Background

1.1.1. This technical report is part of the Daventry Infrastructure Studies (DIS). URS has been appointed by the West Northamptonshire Development Corporation (WNDC) to assist in the preparation of the Daventry Infrastructure Studies (DIS). The DIS will form part of WNDC's evidence base and will be a material consideration that will help to inform decisions about the future expansion of the town and the infrastructure required to support that growth. It should also be of assistance to Daventry District Council (DDC) in determining planning applications which fall (in whole or part) outside of WNDC's planning functions area or beneath the threshold for determination by WNDC within that area. The DIS will also be used in the development of WNDC's infrastructure delivery programme for West Northamptonshire, within the WNDC Regeneration Framework. This technical report forms part of the DIS.

1.1.2. WNDC has the statutory function of securing regeneration of its three Urban Development Areas (Daventry, Northampton and Towcester) but also has a duty to consider planning applications which fall to it for determination in accordance with proper planning grounds.

1.1.3. The DIS is a wide-ranging multi-disciplinary task, with utilities constituting one of the five infrastructure elements under investigation. In the context of this study, water and sewage infrastructure encompasses that infrastructure associated with the supply of potable water and disposal of wastewater.

1.1.4. The DIS will be used as a tool to assist WNDC in considering proposals for growth and change to the town of Daventry. It will form part of the WNDC's evidence base and will be a material consideration that will help to inform decisions about the future expansion of the town and the infrastructure requirement to support that growth. Further, the findings of the DIS will be used in the development of the WNDC's infrastructure delivery programme for West Northamptonshire, within the WNDC Regeneration Framework.

1.2. Methodology and Scope of the Report

1.2.1. For the purpose of the Daventry Infrastructure Studies and this Technical Report transport infrastructure includes the potential for journeys by all modes, with a primary focus on promoting sustainable travel behaviour in support of sustainable development.

1.2.2. Given the predominantly desktop nature of the study and the strategic level of analysis conducted, a number of assumptions have been necessary to define the infrastructure needs arising as a result of population growth in the town of Daventry. Such assumptions will be discussed in the relevant section of this report and can be broadly summarised as follows:

- Assessment of baseline conditions: For transport, baseline has been assessed for the existing movement framework to include the walking, cycling and public transport network and also includes a review of the current level of public car parking provision. This has been supplemented by a review of the internal and adjacent highway network serving Daventry Town, both local and trunk. Assumptions on existing patterns of movement have been based on 2001 journey to work census data and ACCESSION[1] mapping. Rail and bus information has been secured from timetable and other published information by the operators. The capabilities of the road network has been founded on published output from the Daventry Transport Model provided by Northamptonshire County Council (NCC) supported by its consultants ARUP, with additional information for the trunk Road provided by the Highways Agency (HA) and its consultants Faber Maunsell. Demands for transport infrastructure and the potential for future transportation initiatives are based on a review of published local planning documents and supporting studies referenced in the report. Direction on the sustainable transport strategy has been based on existing best practice and government policy, which is also reference in the report
- Infrastructure requirements and programme: The infrastructure requirements for transport are based on assumptions that the objective will be to cater for growth through a sustainable transport strategy aligned with sustainable development. It has also been assumed that transport schemes confirmed from current transport policies and plans to date will be delivered to accord with published schedules
- Cost estimates for additional infrastructure requirements: All costing for transport infrastructure is based on estimates obtained through a variety of means collated from published transport strategies and policies, supplemented by face-to-face interviews with the Highways Agency (HA) and Northamptonshire County Council (NCC) as local highways authority and referenced where relevant in the report

1 ACCESSION - Accessibility planning software that helps local authorities and other agencies draw together transport, land use and socio-economic information to identify whether people can get to jobs, education, health and other key activities. Output provided by Northamptonshire County Council.

1.2.3. NCC is undertaking further work in their capacity as the local highway authority. This is principally to provide the necessary evidence base in support of the transportation strategy and includes both primary data capture and network modelling to both develop and confirm the various transportation assumptions and impacts.

1.2.4. The scope of this report is therefore to provide a robust and credible technical evidence base to inform the DIS. The technical report covers, accordingly; the existing (baseline) infrastructure position; the infrastructure requirements that will accompany growth to a population of about 40,000; and the opportunities and constraints for the delivery of that infrastructure as they affect the development opportunities adjoining the town. The overall aim of this paper is thus to assist and help guide the evolution of the DIS.

1.3. Report Framework

1.3.1. The report is presented in the following format:

- Section Two provides a description of the existing movement network in and around Daventry;
- Section Three outlines the patterns of movement based on analysis of census data;
- Overall existing transportation network operations to include those available to encourage sustainable transport are examined in Section Four;
- The indications of policy for improved Daventry transportation infrastructure is discussed in Section Five
- Section Six provides focus on issues related to the opportunities and constraints of sustainable development and growth in Daventry
- Section Seven examine the core elements required to promote a sustainable transport strategy
- Section Eight divides the town into sectors and takes the infrastructure requirement assessment further by looking at and analysing the potential infrastructure requirements that would arise from significant development in each sector
- Section Nine reports on the sustainable infrastructure study findings to include the highway aspects associated with assumed growth scenarios
- Section Ten suggests a sustainable development scenario for transport to accommodate the proposed growth in respect (only) of transport and in particular, on the basis of an accessibility assessment mapping exercise that has examined the relative accessibility levels of different sites within the town
- Section Eleven, completes the report and identifies a schedule of the pieces of strategic transport infrastructure that are required

2 Existing Movement Network

2.1. Introduction

2.1.1. The following section will describe Daventry and the current state of the transport infrastructure that serves the town, including both intra-urban and inter-urban/ ex-urban transport links.

2.1.2. Daventry is located some 20 km (12 miles) west of Northampton. The town comprises a historic market centre surrounded by much modern housing and light industrial development. On the edge of the town centre is the popular Daventry Country Park and reservoir.

2.1.3. Significantly the modern growth of Daventry occurred from the early 1960s onwards as part of a planned expansion of the town, when the town was designated an 'overspill' to house people and industry moved from Birmingham. This planned expansion was carried out as part of an agreement with Birmingham City Council. The plan did not however live up to expectations. The target population by 1981 was 36,000 however actual growth was much slower achieving only 22,367 in 2001. The town's road network was however designed for development, partly under the previous expansion plans that foresaw an extensive system of dual carriageways.

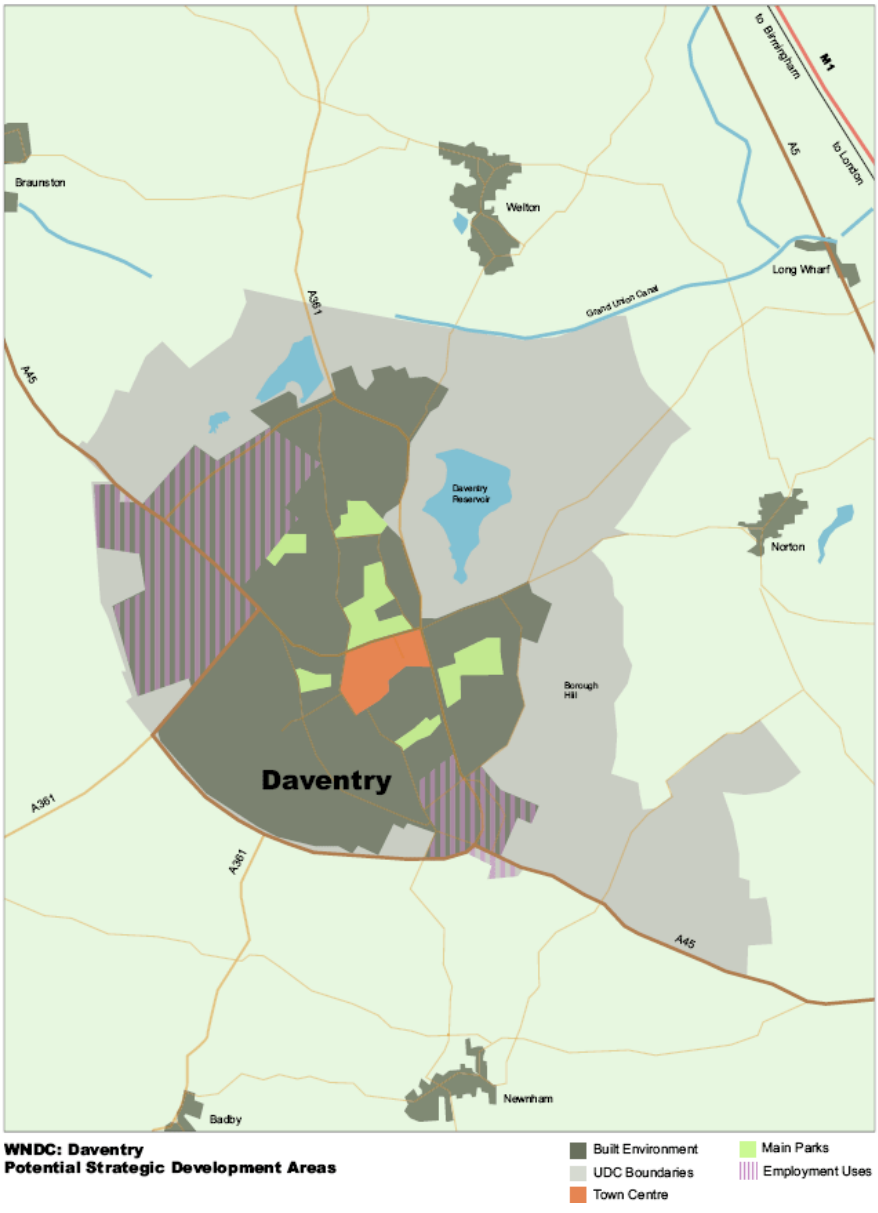
2.2. General Location

2.2.1. Daventry lies to the west of both the M1 motorway and the A5 Trunk Road and strategically is served mainly by the A45. The town once had a railway station on the former London and North Western Railway, branch-line from Weedon to Leamington Spa however this was closed in September 1958. The nearest railway station is at Long Buckby, located about seven kilometres (five miles) to the north east.

2.2.2. 10 kilometres north of the town centre Daventry International Rail Freight Terminal (DIRFT) is a major terminal for freight interchange between road and rail that provides a 500-acre (202 hectares) site of regional, national and international importance.

The facility provides a rail port and logistics centre and is located between three main roads, the A5, A428 and M1. It is in a prime location with access to these roads and links to the A45, M6, A14 and A426. In rail terms DIRFT has direct access to major UK and European destinations via the existing International Railport at DIRFT Logistics Park, which accesses the Northampton Loop of the West Coast Main Line (WCML). The general location and road network supporting Daventry is shown in Figure 2 1. While the extent of the Daventry UDA is shown for reference, this does not prejudge the appropriate extents of urban development of the town.

Figure 2-1: Daventry - General Location



2.3. Pedestrian Network

2.3.1. In common with most urban areas, facilities for pedestrians are mainly provided in the form of footways alongside main carriageways and crossing facilities at particular focal points. Access to the central shopping area from outlying areas is via a combination of routes following both the main road network and quieter residential streets. Some exclusive footpath routes are however provided, which enables some pedestrians to escape exposure to traffic for part of their journey. Unfortunately the relative isolation of some of these footpaths could result in feelings of threat for users during the evening and over the hours of darkness in cases where they are not over-looked by an active neighbourhood.

2.3.2. The extent of shared use cycle/ footways available on the fringes of the urban area established in the cycle section below provides a network of relatively direct traffic free routes that provide links to a variety of destinations around the town although the majority of the radial routes into the town centre require some element of roadside footways.

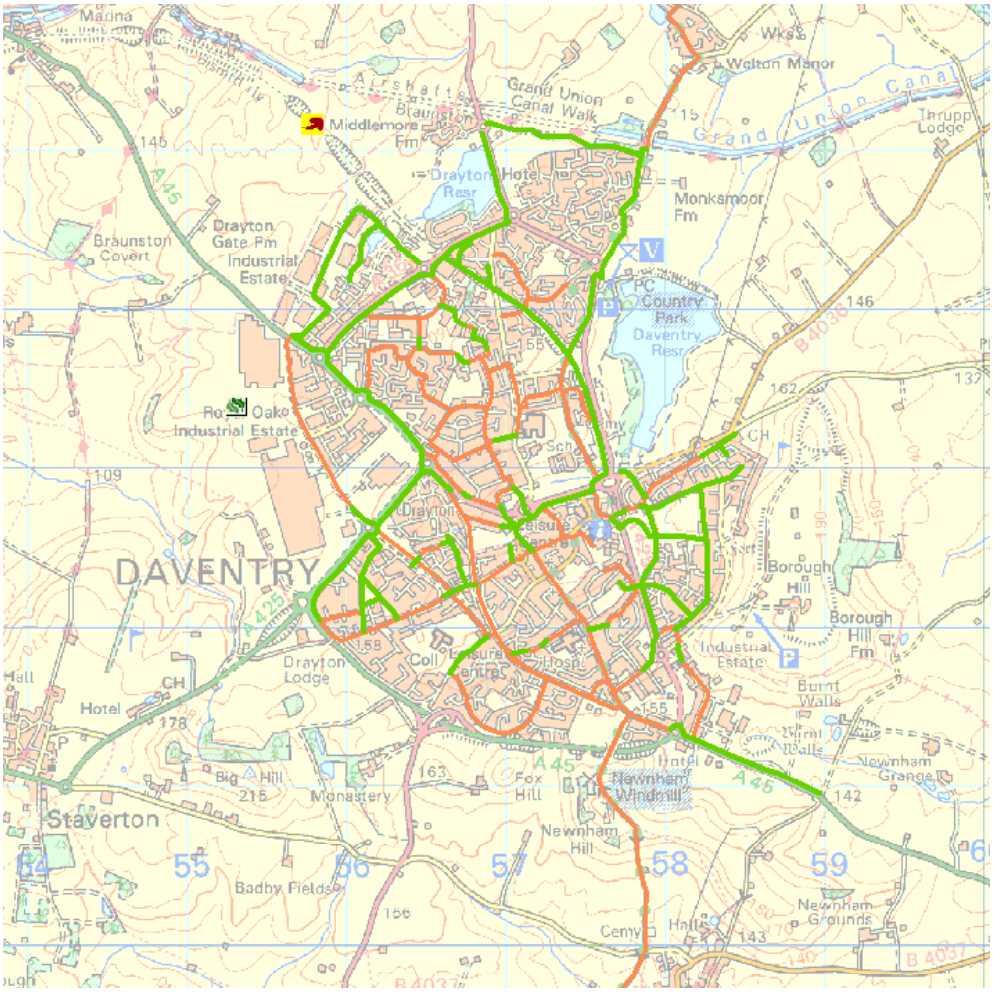
2.4. Cycle Network

2.4.1. The urban area of Daventry is reasonably well served by a network of existing cycle routes and the current walking and cycling networks within the town are of good quality. Further improvement is however possible to encourage additional use and the networks will need to be extended to serve any new development sites. Generally the cycling routes are divided into two main categories; signed on-road routes and traffic free cycle routes. According to the Sustrans Website none of these are currently included as part of the National route Network. The extent of the local cycle network is shown in Figure 2-2.

2.4.2. The current distribution of cycle routes shows that the majority of the traffic free routes are found on the edges of the urban area including the A45 and A361. Signed cycle routes that share road space with other road users cover the majority of the internal urban area.
The arrangement of routes means that travelling within the urban area relies on following quieter residential street and sharing road space with other road users. This could become a major issue on some routes in the event that traffic volumes increase.

2.4.3. The use of on-road cycle routes can discourage cycling as a result of either real or perceived dangers associated with on-road cycling; this arrangement can also lead to conflict with pedestrians as cyclists use non-designated footways to avoid cycling on the road. Future needs require focus on making highway infrastructure as safe and convenient for cyclists as practicable. While dedicated cycle routes can be an important part of cycle provision, good on-street facilities are also essential if cycling is to be encouraged. In accordance with IHT guidelines[2] a hierarchical approach is recommended, with appropriate weight given to moderate the volumes and speeds of motor vehicles, as well as using traffic management techniques to reduce accidents and offer cyclists a positive advantage.

Figure 2-2: Daventry - Existing Cycle Network



2 Cycle-Friendly Infrastructure: Guidelines for Planning and Design. The Institution of Highways & Transportation and others (1996)

2.4.4. Overall the founding principle is that measures for both pedestrians and cyclists should offer a positive standard of provision that reduces delay, diversion and minimises risk. Design solutions are therefore needed that takes into account the hierarchy of users and hierarchy of provision, coupled with achievable traffic conditions to determine the most appropriate design solutions.

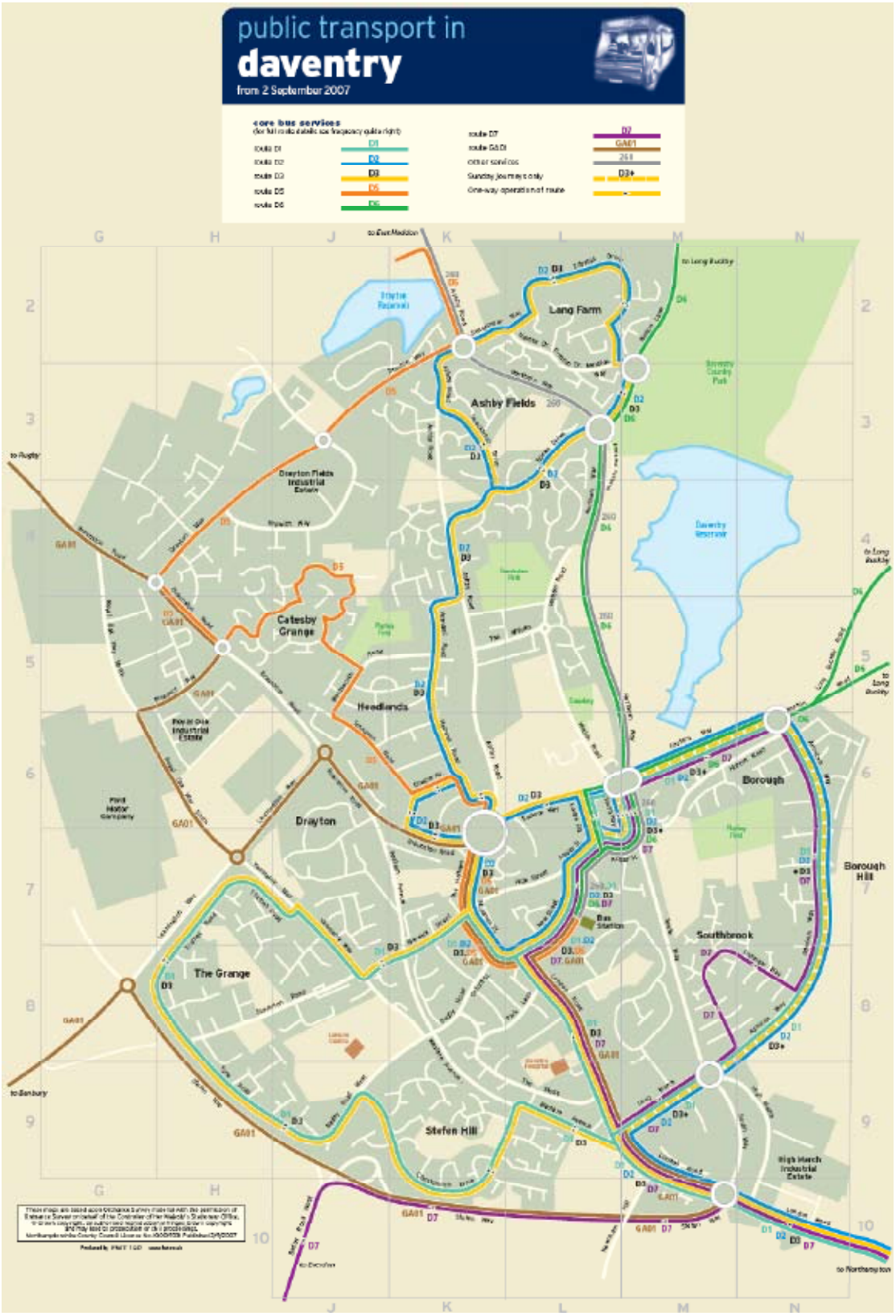
2.5. Bus Network and Operations

2.5.1. A review of existing patterns of movement associated with Daventry is provided in Section 3 below, which confirms that current public transport usage within Daventry is quite low, with only 2% of internal trips being made by bus (Figure 3 2). This partly reflects the relatively small size of the town at present. There are currently seven bus services serving the town with routes (indicated in one direction) and frequencies shown in Table 2 1. NCC and DDC either wholly or partially support all services. Local bus routes are illustrated in Figure 2-3 opposite.

Table 2 1: Daventry Bus services

Service	Operator	Route	Frequency			Last Bus from Town Centre (Weekday)	Sunday
			AM	Inter	PM		
D1	Stagecoach	Northampton -Daventry-Grange Estate	Half hourly	Half hourly	Half hourly	19:55	N
D2	Stagecoach	Northampton-Daventry-Lang Farm				19:25	N
D3	Stagecoach	Northampton -Daventry	Hourly	Hourly	Hourly	21:55	Y
D5	Stagecoach	Daventry Town Centre-Middlemore	Hourly	Hourly	Hourly	18:25	N
D6	Stagecoach	Daventry -Long Buckby	Once	Two hourly	Once	17:50	N
D6 Taxi	Stagecoach	Daventry -Long Buckby	Hourly	n/a	Hourly	18:30	No weekend
D7	Stagecoach	Daventry -Newnham	n/a	Hourly 10:00-13:00	n/a	13:05	N
GA02	Geoff Amos	Woodford Halse -Rugby	Hourly	Hourly	Hourly	18:50	Friday only
260	Catterall's	East Haddon -Daventry	Once Only			12:15	N

Figure 2-3: Daventry Bus Services, September 2007



2.5.2. All services currently offer routes around the town and all of them pass through the town centre and enter New Street bus station. Services to satisfy some travel requirements for journeys around the surrounding rural area are also available based on connections to neighbouring towns such as Banbury, Rugby and Northampton.

2.5.3. The majority of the services provide an hourly frequency throughout the day Monday to Saturday. Although the individual bus services are at best hourly for certain destinations, for example Northampton, the combined service provision offers at least a half hourly service. Only service D3 currently operates an evening service (two-hourly frequency). D3 is also unique as the only service that currently operates a Sunday/ Bank Holiday service (three buses throughout the day).

2.5.4. The current service arrangements can make it difficult for commuters to use this mode for journeys into town. Published timetables show most routes offer a minimum frequency of only one bus per hour. This can discourage other potential users due to the potential journey delay if a bus is missed. In addition the absence of services in the evenings and on Sundays is also a major deterrent, as are the slow journey times and limited number of destinations served.

2.5.5. Between them the D1 and D2 service timetabling, operated by Stagecoach, provide approximately a half hourly frequency between Daventry town centre and Northampton rail and bus stations. Improvements to the bus stop infrastructure are also planned for 2007/08, which will provide a good basis from which to further grow services to serve the expanding town.

2.5.6. All bus services currently use the bus station in the town centre, which enables interchange opportunities. Any increase in the frequency of these services or provision of additional services would have an impact on the level of usage currently experienced at the bus station. Adequate capacity and convenient access to accommodate future service growth at the bus station is an important issue that could impose a constraint on enhanced bus service provision as the town expands.

2.5.7. The bus station has undergone enhancements relatively recently, although these were largely aesthetic in nature. The principal benefit was to amend the access to the adjoining car park so that buses now have easier access and egress to the bus bays. The bays are laid out in an end-on 'saw tooth' type arrangement, which is less efficient than an arrangement where buses can drive in and out without having to reverse. Vehicle access to the bus station is solely from New Street, which is traffic calmed by means of road humps. These make access slower and less comfortable for passengers.

2.5.8. With six bays an estimated capacity of the bus station (excluding the nearby on road bus stops) is 36 buses per hour[3]. Due to the confined nature of the bays however, it may only be practicable to use five at one time, which would reduce the capacity to 30 buses per hour. Given the limited waiting facilities it is unlikely that the bus station could accommodate the passenger demand that this would generate, particularly during inclement weather.

2.5.9. To supplement regular Public Transport services DDC and the town council also sponsors the Daventry Area Community Transport (DACT) initiative. This free dial-a ride-service is open to all Daventry residents aged 65 and over and transports people into the Town Centre on market days (Tuesdays and Fridays). Eight areas have currently been identified from which Dial-a-Ride will operate, taking older shoppers right into the Town Centre, by the Bus Station, where Shop Mobility is available for those who need it.

2.5.10. As noted in Section 3 'The Daventry Transport Study Public Transport and Non-Motorised Modes Strategy Working Paper' highlights a number of possible improvements to bus services in Daventry to accommodate growth.

2.5.11. ACCESSION mapping commissioned through NCC has indicated the current level of bus accessibility surrounding Daventry when related to key community facilities to include the town centre, post-16 education, hospitals and GP surgeries. The results are presented as a series of diagrams in Appendix A.

2.5.12. The mapping confirms that convenient access to the town centre by public transport diminishes fairly dramatically with distance, with journeys from the fringe areas of the town taking between 15 and 30mins and in some cases up to one hour.

2.5.13. Notably some of the industrial estates are relatively remote from the current bus network, which does not present an attractive alternative to comparable car journey in terms of time and convenience. A similar situation can be observed when related to access for post-16 education.

2.6. Rail Services

2.6.1. The West Coast Main Line is the main railway in the area and links London with the west midlands, north-west England and Glasgow. This means that fast line stations used by many Northamptonshire passengers are just outside the county at Rugby and Milton Keynes Central. Between Roade and Rugby the slow lines diverge from the main lines as the Northampton loop, with stations at Northampton and Long Buckby.

2.6.2. Daventry lacks a railway connection; it was on a branch line (Leamington - Weedon) from 1888 but the town's station closed in 1958, with the line closing to all traffic in 1963. The nearest railway station is located in Long Buckby, which is approximately 7km (4 miles) to the north east of the town.

2.6.3. Long Buckby station is served by the Northampton to Birmingham line operated by London Midlands, which provides links to towns such as Northampton, Rugby, Coventry, Birmingham and London. Direct access to West Coast Main Line trains is not available from Long Buckby Station and as a consequence passengers are required to change at stations such as Northampton, Rugby, and Birmingham if they wish to travel to use the Virgin Trains services that operate between London and Scotland.

3 Assuming each bus takes ten minutes at the bus station including alighting/boarding and allowing for 5 minutes layover.

Table 2-2: Long Buckby Rail Service Frequency (weekday)

Route	Direction	Frequency Mon-Sat (minutes)			
		AM Peak (0700-1000)	Inter Peak	PM Peak (1600-1900)	Evening
London/ Birmingham	Northbound	30 then 60	60	30 then 60	60
	Southbound	60	60	60 then 30	60
Birmingham/ Northampton	Northbound	30 then 60	60	30 then 60	60
	Southbound	30 then 60	60	60 then 30	60
Trent Valley	Northbound	06:17 only	n/a	n/a	n/a
	Southbound	08:07 only	n/a	n/a	n/a

2.6.4. In addition to these services there are four trains southbound and 8 trains northbound before 7am, split equally between the London and Northampton routes.

Station Accessibility

2.6.5. The B4036 Long Buckby Road, Daventry and Station Road, Long Buckby combine to link Daventry with the station. Both are relatively narrow, winding rural roads that are not suitable for use by large volumes of traffic. The route is also unattractive as a reasonable route for both pedestrians and cyclists due to its lack of facilities, as there is no off-carriageway cycle track and in part no footway, and relative remoteness. The route also demands that these vulnerable road users are required to cross the A5 trunk road as part of their journey.

2.6.6. The D6 bus follows the B4036 and currently provides the only service between the station and Daventry. The frequency of service D6 is set out in the bus section above. The 07:15 from the bus station provides the first available bus in the morning, arriving at the station at 07:32. This would enable passengers to board the 07:51 for Northampton and London, to subsequently arrive at these destinations for 08:05 and 09:25 respectively. This combined with the last possible return journey of 16:55 from Euston arriving at 18:13 for the last bus at 18:47, which delivers passengers to Daventry at 19:01.

2.6.7. The connectivity and service patterns between the two modes suggest that this is not an attractive proposition for commuters, which means that the majority of journeys by rail users to the station are currently by car. This demand is catered for by the offer of some 90 free car parking spaces at the station. There is an ongoing recognition of the shortfall in parking capacity at the station coupled with a desire to increase provision alongside improvement to other facilities. It is hoped that some of the increase in parking capacity can be delivered by the new franchisee operating at the station.

2.6.8. London Midland took control of the franchise in 2007 and is required to add 3,000 additional parking spaces along it's route. Long Buckby is considered to be a strong candidate to receive some of these spaces due to the current shortfall, although as yet there is no firm commitment. As part of the franchise London Midland is also required to improve cycle storage facilities at stations.

2.6.9. For those able to reach the station the service frequency and potential need to change at Northampton for trains to London also means that many commuters are currently more likely to drive to Northampton, Rugby or even Milton Keynes rather than Long Buckby to access the rail network.

2.6.10. The time required to undertake journeys by train from Long Buckby compared with the same journey by car from Daventry is another deterrent to journeys by rail. For example the train journey from Long Buckby to Birmingham is 56 minutes according to National Rail Enquires on-line, which excludes the journey time to the station. The RAC journey planner states that the worst-case time for the journey from Daventry to Birmingham by road is 62 minutes.

Daventry International Rail Freight Terminal

2.6.11. Mainly Direct Rail Services and Freightliner (UK) operate rail services to and from DIRFT. There is a small group of services that are provided by English Welsh & Scottish Railway (EWS), and also First GBRf. Trains originate from as far as Mossend in Scotland to as near as Stoke-on-Trent.

2.6.12. A substantial extension (DIRFT2) is planned along the A428 between Hillmorton and the Halfway Garage. This will feature a new rail port. Planning consent has been obtained to build the 1.945 million sq. feet development, which will have both distribution and manufacturing sections. This planned extension should see a large growth in rail freight traffic both to and from Daventry District, although the site is relatively distant from the town of Daventry as it is actually closer to Rugby.

2.7. Road Network

2.7.1. The road network serving Daventry is broadly characterised by a radial road network focused towards the town centre. Importantly a network of roads forming a ring-road system embedded within the outer fringes of the town, caters for through traffic and interrupts this general radial pattern. Local connections inside the ring road system provide routes across the area, with a general focus towards the town centre.

2.7.2. The key routes serving Daventry are:

- **A361** that enters the town from the north linking with Kilsby and the A5, both north of the M45 and to the south east of Rugby;
- Welton Lane from the north east that emerges from the settlements of Watford and West Haddon. While this may not strictly be considered a strategic route it does provide an alternative access from the A5 that is likely to be attractive if other roads and routes towards the town centre become congested;
- **B4036** Long Buckby Road that enters the town from the A5 east of the town and provides a link to Long Buckby and significantly the railway station found there. On the outskirts of the town the B4036 also connects with Norton Way that offers an unclassified rural road connection with the settlement of Norton and also crosses the A5 further east towards Whilton and beyond
- **A361** from the south that joins with the A45 south of the town and provides a connection to the M40, Banbury and Oxford;
- **A425** approaching from the south west and Royal Leamington Spa with links to Coventry via the A423. The A425 joins the A45 in the south western quadrant of the town; and
- **A45** from the north west, M45, Coventry and Rugby, which then circles the town to the south before continuing west towards Northampton, crossing both the A5 at Weedon and the M1 motorway at junction 16

Of these, only the A45 is identified in the current Local Transport Plan as a strategic corridor and potential target for significant investment.

2.7.3. All roads are single carriageway to various standards, with roundabouts a notable junction strategy to control traffic movements at key junctions, especially where the radial routes join the ring road. The B4036 Northern Way - A425 South Way - A45 Stefen Way - A45 Leamington Way - A45 Braunston Road forms the ring road itself with the circuit finally completed by the A361 Drayton Way.

2.7.4. The more recent opening of Daventry Town Roads 13 and 14, Northern Way as part of the town development scheme has completed the orbital road network around Daventry. A comprehensive primary road network is therefore available to serve the current built-up area of Daventry.

2.7.5. The A45, which was de-trunked in 2002, dominates the ring road from the west and to the south of the town. The route previously connected the centre of Birmingham with Felixstowe. With the introduction of the A14 the current route of the A45 is now truncated and runs for less than half its original length, although it still provides an important link between Birmingham, Coventry and Leamington to Northampton and the M1, for those wishing to avoid the M6. Significantly in the context of Daventry the route passes through or adjacent to the main industrial estates located on the outskirts of the town to include Royal Oak and Drayton Fields in the west and the Marches in the south east.

2.7.6. Within the ring road the relatively compact town centre is focused on an area bounded by:

- Eastern Way to the North;
- South Way to the east;
- Abbey Street and New Street form the most easily identifiable barrier to the south, although there is some development (namely parking and a supermarket) south of these roads; and
- Oxford Street, St James Street and The Hollow to the west.

2.7.7. Plans for the town set out in the DDC Interim Draft Daventry Masterplan seek to further downgrade Eastern Way and The Hollow so that they do not pose a barrier to pedestrian movement within the expanded town centre. This is likely to involve a reduction in speed limits to 20mph and the removal of the current roundabout junction between these roads.

2.7.8. High Street runs broadly east to west and bisects the town centre to link Abbey Street through the Market Square in the east with Tavern Lane and subsequently St James Street/ Warwick Street/ The Hollow junction further west. The High Street currently operates a one-way system for westbound traffic, with vehicle access restrictions, and is pedestrianised twice a week.

2.7.9. The network has recently been assessed by consulting engineers Arup with the conclusion that with some relatively minor modifications, the road system will meet the needs of the target population of some 40,000 people in 2021. The baseline assessment guiding this conclusion is discussed in more detail later in this report.

2.8. Town Centre Car Parking

2.8.1. Daventry provides a total of 13 public car parks surrounding the town centre, which are either owned or regulated by DDC, or in one case Tesco (New Street car park) under an agreement with DDC. A mix of short and long-term parking is available, by way of some 1,029 spaces. All offer free parking within certain time restrictions. In general, the more central spaces present a shorter time limit, while those on the periphery provide 'All day facilities'. The various car park names indicating their locations and the parking restrictions that currently apply within them are provided in Table 2-3.

2.8.2. Short-stay facilities operate with time limits of up to 3-hours, 1.5-hours or 30 minutes. A 4-hour non-return period applies, which also restricts return to any other short-stay car park within that period. Long stay 'All Day' parking is available at six of the public car parks. Lodge Road varies from others in this category as it includes allocations of short-stay spaces that cater for parking up to 30 minutes and also 3 hours.

2.8.3. Around 50 disabled spaces are specifically allocated in the town centre car parks, which are also highlighted in Table 2 3. Further opportunities are provided for 'Blue Badge' holders to park as long as necessary in a general space at any of the Council's car parks including the short-stay ones – the time limits are not applied to Badge holders.

2.8.4. A series of permits are also available to cater for other activities in the town centre. Secured by approval and payment of prescribed fees these allow a specific vehicle to remain in a short-stay car park beyond the normal time limits:

- **Residents' Exemption Permit** - Annual permits that may be provided to local residents of the town centre with insufficient private off-street parking for residents' vehicles only. Nominal charge for first permit with much higher fee for second and subsequent vehicles. Not only provides exemption in short-stay car parks but also allows parking in "D1" residents parking bays where these are signed on streets
- **Temporary Permit** - For the duration of construction work or similar
- **Business Loading Permit (BLP)** - Monthly or annual permits for local businesses to cover a specific vehicle frequently used either to transport goods to customers, or to transport customers
- **Special Exemption Permit** - Free of charge. Only available for people engaged in a form of community service that require quick access to their vehicle - for example, reserve fire fighters

2.8.5. A specific motorcycle bay with a secure locking bar is available in the Primrose Hill car park, although these vehicles may also use conventional bays and are not subject to the time limits.

Table 2-3: Daventry Town Centre Main Car Parking Facilities

Car Park Name	Time Limits Available (Hrs)				No of Spaces
	All Day	3	1.5	0.5	
Welton Road	•				106
Lodge Road ♿	•	•		•	111
Golding Close	•				17
St Johns Square ♿		•		•	63
Chapel Lane	•				80
Primrose Hill		•			129
High Street ♿			•	•	22
Brook Street		•			10
Bowen Square ♿					79
Newlands ♿		•			77
St James Street		•			30
Chaucer Way	•				160
Old Gas Works	•				145
New Street ♿		•			373
TOTAL SPACES					**1,402**

KEY: ♿ Indicates dedicated parking bays for Blue Badge Holders

2.8.6. With the move towards promoting sustainable transport solutions it is perhaps surprising that free car parking is available in the town centre. It is however acknowledged that the present strategy is perhaps biased towards satisfying short duration trips to encourage shopping and leisure to promote town centre facilities, given the current relative weakness of the town centre retail offer. In particular the offer provided by the Tesco car park directly adjacent to the bus station appears in direct competition with effective bus promotion, especially when it is considered that buses and cars share the same route to this central area and as a consequence incidents of congestion at busy times could impact on bus journey time reliability.

2.8.7. The availability of free car parking is a significant obstacle to mode shift towards sustainable modes, particularly with regard to public transport and development of related initiatives. The Daventry Town Centre Vision and the Interim Draft Masterplan and DDC's moves to implement them will have significant impacts on the locations and quantities of parking.

2.9. Summary

2.9.1. Generally the existing urban area provides a reasonably comprehensive footway and cycle network for relatively direct and convenient journeys throughout the town. Some footpath connections are not overlooked by an active neighbourhood, which may reduce their appeal, especially during the hours of darkness. A network of shared use cycle/ footways is available on the fringes of the urban area, which offers relatively direct traffic free routes to link a variety of destinations around the town although the majority of the radial routes into the town centre require some element of roadside footways.

2.9.2. While seven bus services serve the town, current timetabling and the absence of evening and Sunday services on six of them is not an incentive to use. Convenient access to the town centre by public transport diminishes sharply with distance, with some journeys from the town fringe taking up to one hour. The bus network poorly serves the industrial estates and this is also the case when considering access to post-16 education. All services currently pass through the town centre, which allows interchange opportunities. Improvements to service frequencies and bus stop infrastructure are progressing in the town, although any increases in the frequency of buses or additional routes are likely to impact on the operational capabilities of the bus station. Current public transport linkages and interface with Long Buckby rail station services can be considered poor.

2.9.3. Daventry lacks a railway station however services are available at Long Buckby, which is served by the Northampton to Birmingham line and provides links to towns such as Northampton, Rugby, Coventry and Birmingham. A direct link to West Coast Main Line trains is not available with passengers currently required to change at Northampton for journeys south of Northampton or north of Birmingham. The service frequency and potential need to change at Northampton suggests that many commuters would choose to drive to Northampton, Rugby or even Milton Keynes rather than Long Buckby to access the rail network.

2.9.4. A comprehensive distributor road network serves the current built-up area of Daventry and a recent assessment has confirmed that this is likely to meet the needs of a population of some 40,000 people in 2021, although some relatively minor modifications will be necessary to improve some local links and junctions. Car parking for some 1,400 vehicles is readily available in the town centre and free for most short to medium duration visits close to the centre, with permits or payment required for longer stays. Long stay free parking is also available on the fringes of the town centre. Town centre parking and management is however anticipated to alter to a large extent as DDC implements plans for the regeneration and development of the area.

3 Patterns of Movement

3.1. Introduction

3.1.1. 2001 Census data for journey to work has been used to assess patterns of both internal and external movement involving Daventry. While this is now somewhat dated, it remains the only comprehensive source of information on this subject.

3.2. Travel to Work

3.2.1. Examination of the census data indicates that some 70% of the residents living within Daventry town also remain there for work purposes. In addition almost 60% of the Daventry workforce travel less than 5 kilometres to their place of work, with a further 9% of them working mainly from home. Other principal destinations for work are confirmed by Table 3 1 and include Northampton, South Northamptonshire and Rugby.

Table 3-1: Principal Work Destinations from Daventry Town

Destination District	Work Population (2001)	%
Daventry	**7,760**	**69.8%**
Northampton	1,027	**9.2%**
South Northamptonshire	415	**3.7%**
Rugby	345	**3.1%**
Coventry	196	**1.8%**
Cherwell	180	**1.6%**
Milton Keynes	167	**1.5%**
Warwick	130	**1.2%**
Other	895	**8.1%**
TOTAL	**11,115**	**100.0%**

3.2.2. 59% of the town residents in employment have a work place within Daventry. Figure 3-1 shows the mode share of journey to work trips from Daventry town to Daventry District, (including the urban area of Daventry), Northampton and all other destinations.

3.2.3. It is evident from Figure 3 1 that car trips dominate and that the mode share of all other modes, including car passengers, decreases further for work journeys outside the town boundary. Overall sustainable modes (walk, cycle, bus) account for well below 10% of all trips.

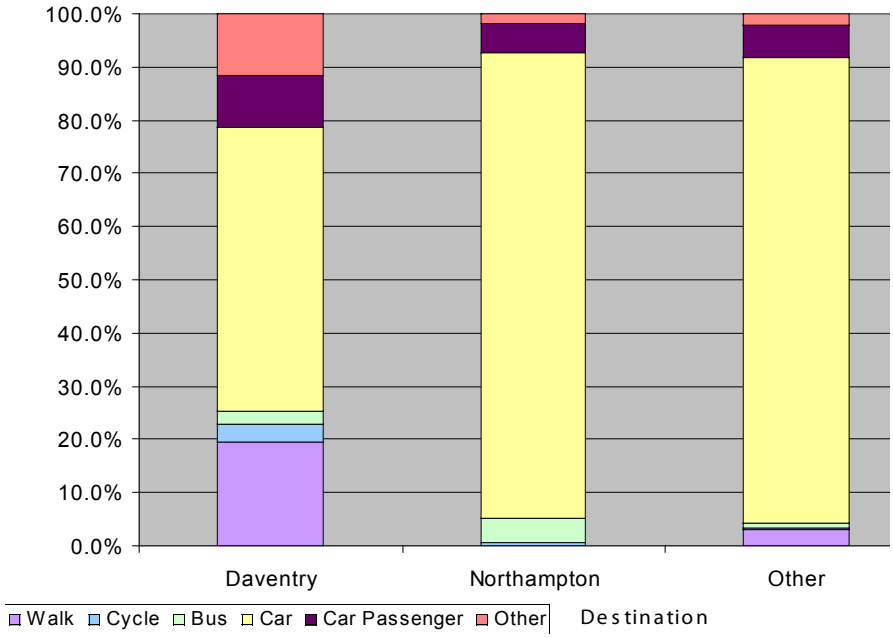
3.3. Resident Population - Travel to Work Behaviour

3.3.1. For the purposes of examining local travel behaviour in more detail the wards of Daventry town have therefore been used as the origin/ destination. These wards essentially encompass the urban area and a small rural area to the east. These are:

- Abbey North;
- Abbey South;
- Drayton; and
- Hill

3.3.2. Figure T1 in Appendix B illustrates movement patterns associated with Daventry town residents on their journey to work. Notably 60 to 75% either work within their own ward or within the town centre ward of Abbey South, which is a net importer of local employees. Both Abbey North and Hill wards are however significant exporters of employees, despite both having apparently substantial employment areas to the west and south respectively. This is unexpected with respect to Hill as it supports a small residential area when compared with other wards such as Drayton and Abbey North. Drayton contains the largest employment area in the town with a reasonably even balance between the number of Daventry employees who both live and work there.

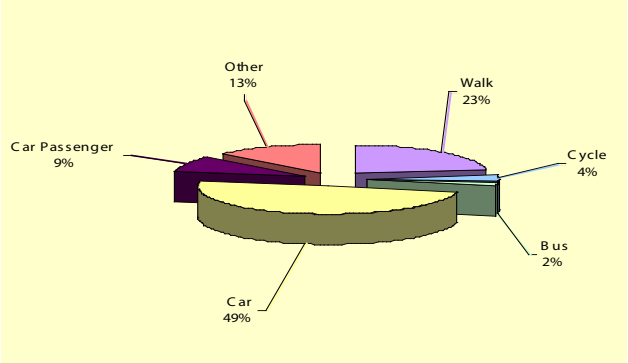
Figure 3-1: Daventry Town Residents Mode Share Journey to Work by (District) Destination



3.3.3. The mode share of journey to work for Daventry town residents who work within the town boundary is shown in Figure 3-2. Overall around 28% travel by sustainable modes (rail, bus, bicycle and foot). It should be noted that 'Other' includes those working or studying at home (755 people). Rail trips are not included in the graph as this mode cannot be used for journeys internal to Daventry, use of this mode for such journeys must be considered a idiosyncrasy of the census data, which is indicative of rounding of observed data to prevent reverse engineering to identify specific individuals.

3.3.4. Car dominates all work journeys, particularly those requiring travel outside Daventry town. Although the proportion of people driving to work is lower than in some other parts of Northamptonshire, car use should still be considered relatively high given the small geographic area covered by Daventry, the availability of local facilities and the fact that some 20 to 25% of households are without a car.

Figure 3-2: Internal Mode Share of Journey to Work in Daventry Town



3.3.5. Encouragingly a significant proportion of people do walk. Cycle use is however low despite the relatively good conditions that should support this mode. This may respond to weak cross-town cycling facilities and local attitudes to the benefits of this mode. The indications of low bus use may reflect the comparatively poor service levels available. In addition very few people currently choose to travel by rail. Table B1 in Appendix B confirms journey to work mode share in more detail and is accompanied by a plan (Figure T2) to show key modes by ward.

3.4. Travel to Daventry District for Work

3.4.1. It has been noted in 3.2.1 above that the majority of local employment is currently satisfied by local residents that both live and work in Daventry District. Other principal districts that supplement this local workforce are shown in Table 3-1 and include Rugby, Northampton and South Northamptonshire.

Table 3-2: Principal Origins for People Working Within Daventry District

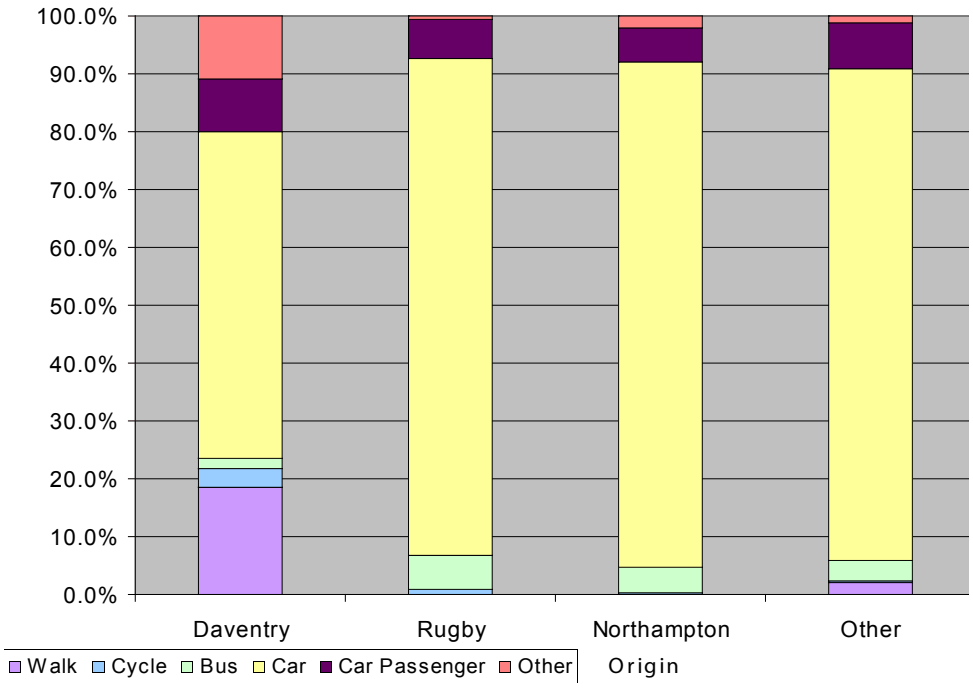
Origin District	Work Population (2001)	%
Daventry	**8,369**	**69.0%**
Rugby	969	**8.0%**
Northampton	757	**6.2%**
South Northamptonshire	412	**3.4%**
Coventry	194	**1.6%**
Startford-on-Avon	152	**1.3%**
Warwick	139	**1.1%**
Other	1,131	**9.3%**
TOTAL	**12,123**	**100.0%**

3.5. Non-Resident Population - Travel to Work Behaviour

3.5.1. The prevalence of car in residents' journeys from Daventry is reflected in journeys made by people travelling to work in Daventry, as illustrated in Figure 3-3. 54% of Daventry employees live in the town.

3.5.2. For home origins outside Daventry the mode share of car increases significantly to the detriment of all other modes, with the notable exception of bus trips, particularly from Rugby. The percentage of people using bus from Daventry District is just under 2%, but from other districts this range rises from 3.5% in 'Other' districts to as high as 5.8% (56 people) from Rugby. Unfortunately it is not possible to identify the services that these passengers would be likely to use given the start date of particular services relative to the age of the census data. Again very few people choose to travel by rail, which is likely to reflect the relative inaccessibility and level of service available to this mode at present.

Figure 3-3: Daventry Town Employees Mode Share of Journey to Work from District of Origin



3.6. Summary

3.6.1. In summary the main travel characteristics associated with existing journey to work travel patterns and behaviour indicate that:

- 59% of employed residents both live and work in Daventry with around half of them travelling less than 5km to their place of employment;
- The other principal work destinations for Daventry residents are Northampton, South Northamptonshire and Rugby;
- Mainly people commuting from Rugby, Northamptonshire and South Northamptonshire supplement the local workforce
- Car dominates all work journeys, particularly those requiring travel outside Daventry town;
- Nearly one half of local work trips are made by car, despite the fact that some 20 to 25% of household are without a car;
- Overall sustainable modes (walk, cycle, bus) account for well below 10% of all work trips
- Encouragingly a significant proportion of residents do walk, however cycle, bus and rail use for journeys to work are all low

4 Current Demand for Transport Infrastructure

4.1. Cycle and Pedestrian Network

4.1.1. Daventry is approximately 3.5 kilometres from north to south and approximately 3 kilometres from east to west. This means that at a reasonable pace the length of the town could be walked in about 30 to 45 minutes or cycled in 15 to 20 minutes. There is also relatively little difference in elevation across the town. For most internal trips walking or cycling should be an attractive, or at least practicable option, with benefits for the environment (reduced emissions), community (cleaner air and fewer vehicles on the roads, possibly reducing accidents) and for the individual's health. The existing walking and cycling network can generally be considered to be good. Future extension and expansion of facilities should however consider:

- Walking and cycling facilities, including high quality bike storage facilities located directly adjacent to trip attractors;
- Improvements on roads towards and junctions with the A5;
- Upgrade of roads towards Long Buckby, for pedestrians and cyclists in particular (including crossing of the A5); and
- minimising junction improvements that completely mitigate all congestion in peak periods as this will encourage the car culture, making it harder for sustainable modes to compete

4.2. Bus Network

4.2.1. The existing capacity of buses is based on a Mercedes Citaro, offering a carrying capacity of 41 passengers[4]. The capacity for Route D1 reflects the AM peak, while all other routes are from the PM peak. The AM peak capacity of Route D1 is 30.75 people.

4.2.2. It can be seen from Table 4 1 that a maximum of around seven buses per hour will currently pass through Daventry town centre. This is well within the capacity of the existing bus station at headway of 8 minutes.

4.2.3. Increased service frequencies will however mean pressure may be placed on the service facilities. For example if the service frequency of all routes is doubled in line with the doubling in population then the headway will be reduced to 4 minutes.

4.2.4. With six bus bays in the bus station it would require further increases in the number of buses to put severe pressure on this facility. Such pressure may evolve from the NCC bus strategy, which seeks a 10-minute frequency for all services. This would mean 6 buses per hour on each service (48 buses) plus the need to accommodate any additional routes that would be required to service sustainable new development. With this many buses and reference to the passenger capacity shown in Table 4 1, a potential passenger demand of 1,968 people in each direction (inbound and outbound of the bus station) can be anticipated. If there were additional bus services serving the town centre to accommodate development this would place more focus on bus facilities in the town and as a consequence there would be a need to consider:

- Improved bus station including more bus bays that operate more efficiently than the existing layout (perhaps utilising a shallow saw-tooth 'drive-thru' arrangement), offering better waiting facilities and with a capacity in excess of potential services that may be required for the total 40,000 population;
- Bus priority along existing and new roads to ensure that bus is a more attractive transport offer than the private car;
- Direct and frequent services along major corridors; and
- improved waiting facilities along bus routes, including bus shelters and Real Time Passenger Information (in line with NCC new development draft guidance), and major improvements at the Bus Station

Table 4-1: Capacities of Bus Services Serving Daventry Town Centre Study Area

Route	Peak Frequency (BPH)	Vehicle Type	Capacity per bus	Max Hourly Capacity
D1	1	Mercedes Citaro assumed for purposes of capacity.	41	**41**
D2	1		41	**41**
D3	1		41	**41**
D5	1		41	**41**
D6	0.5		41	**20.5**
D6 Taxi	1		41	**41**
D7	1		41	**41**
GA01	1		41	**41**
TOTAL	**7.3**			**266.5**

4 Source: http://www.evobus.co.uk/inter-evobus-uk/

4.2.5. Promoting the use of inter-urban buses (for example, to Northampton) may require facilities focused on those trips, including the potential need for an interchange point that inter-urban buses or coaches can access with minimal vehicle inconvenience, thereby reducing journey times and avoiding traffic calmed roads. Local parking facilities for a "park and link" type arrangement could be avoided by incorporating the interchange with improved facilities for local Daventry buses to encourage truly sustainable interchange. This may require the reengineering of some streets (for example those that have been inappropriately traffic calmed) to improve passage for all buses.

4.3. Rail Network

4.3.1. Current usage of Long Buckby rail station can be considered low, which reflects the station's relative isolation in transport terms and the limited availability of services to key destinations. The proposed promotion and improvement of Long Buckby station will however attract passengers to this valuable local facility, especially as regular through services to London Euston have been restored. To accommodate this anticipated growth in a sustainable way it will be necessary to provide effective and direct public transport linkages with Daventry to prevent the station simply becoming a satellite car parking area. As highlighted earlier in this report NCC already considers that there maybe a case for providing regular public transport links from Daventry to the station with associated road improvements, although further work is required to demonstrate sufficient demand.

4.4. Road Network

4.4.1. The operational capabilities of the existing Daventry road network is informed by a SATURN traffic model that has been developed for the town by Ove Arup and Partners on behalf of NCC. The model was originally commissioned to inform The Daventry Transport Study[5] (DTS).

4.4.2. The data used during its construction, together with the model development itself, is contained within a number of working papers prepared by ARUP, which includes the Base Year Model and Validation Working Papers. 2004 is confirmed as the base year model, based on a series of surveys that provided link flows for the base network.

4.4.3. The Daventry Transport Model has been used by ARUP to develop a 'Comparator (Base) Case' model, founded on the 2004 validated base as a starting point. The model was developed to indicate traffic flow and the highway network in 2021 without any growth area development or associated infrastructure. The 'Comparator Case' confirms that in the absence of development all links on the Daventry network would remain within their theoretical design capacity both now and up to 2021. This tends to reflect the town's fairly recent history, which has provided a highway network that is fairly typical of that found in a new town, offering large roundabouts and wide carriageways with broad verges that has created a relatively high capacity road network.

4.4.4. The Highways Agency commissioned Faber Maunsel through the Agency's Spatial Planning Framework to assess the likely trunk road infrastructure costs associated with the proposed expansion of Daventry. The assessment was based on Chapter 5 of the Arup Daventry Transport Study – Highway Improvements Working Paper – Addendum Paper – Option 4 (Final Draft) and gave a preliminary evaluation of the impact of development on nine trunk road junctions. The results were presented to the Agency in a report dated November 2006.

4.4.5. The report concluded that:

- Traffic figures for the trunk road network were for the AM peak only and had several anomalies, both within the model and when compared to the existing traffic flows;
- Flows on the trunk road network may not have been modelled as accurately as those of NCC roads;
- A need to refine and extend the Arup model to include additional junctions to enable the full impact on the surrounding trunk road network to be assessed
- At present the following junctions could not be assessed, as future year traffic data was not available from the current model. To provide this information the Arup model should be extended to include:
- A5/ A361 junction;
- A5/ DIRFT junction; and
- M45/ A45 junction
- Arup did not validate traffic flows for the M1 or A5 trunk roads and therefore the model requires fully validated flows to carry out a proper assessment for any improvement works
- Modelling of the trunk road network needs to be more robust to be able to carry out junction assessments more accurately and determine any necessary improvement works and their associated costs

4.4.6. Based on the information available and limited data gathered during site visits, Table 12 of the Faber report listed a number of junctions and indicative costs to accommodate the anticipated traffic. For reference the information is reproduced in Table 4 2 below:

5 The Daventry Transport Study - Highways Improvements Working Paper (July 2006). Ove Arup & Partners Ltd

Table 4-2: Junction form and HA predictions for junction improvements 2021 without development based on AM capacity assessment results

Junction	Existing form	2004 Base	2021 Without Dev
M1 Junction 16	Grade Separated Roundabout	x	x
M1 Junction 18	Grade Separated Roundabout	x	x
A5/ A45 junction	Signalised Crossroads	x	Improved layout & staging existing signalised junction
A5/ Norton Road	Priority Crossroads	x	x
A5/ B4036	Priority Crossroads	x	x
A5/ B5385	Priority Crossroads	x	x
A5/ A361	Roundabout	Unknown – No model data	
A5/ DIRFT	Roundabout	Unknown – No model data	
M45/ A45	Roundabout	Unknown – No model data	

5 Potential Transportation Initiatives

5.1. Introduction

5.1.1. This section discusses in more detail the specific transport proposals and initiatives emerging from the regional and local transport polices. Table 5-1 summarises the core transport principles derived from the policy review and provides a context for the overview of potential transport initiatives. It indicates the emphasis on sustainability, safety, and good network management.

5.1.2. Transport is not a commodity in itself; it is a demand that is derived from the need to travel that is generated by different land uses. As such, transport tends to differ from some other disciplines such as utilities, ecology and heritage in that the transportation requirements are development and land use sensitive; as such specific requirements can only be determined once specific land uses are confirmed[6].

5.1.3. As a consequence the transportation infrastructure requirements known at this time comprise a mix of what is planned and what could be gained from possible infrastructure improvements, especially to the benefit of sustainable travel in the area. The key proposals and initiatives with regard to Daventry arising from a review of the transportation policy framework is therefore summarised in Table 5-2.

5.1.4. A clear distinction is drawn whenever practicable between assumed proposals and less firm initiatives that could become committed proposals depending on the location of specific developments and the availability of suitable funding sources.

Table 5-1: Core Transport Principles Derived From Policy Review

Development Principles		Policy Source
1.	**Sustainable Travel** – Fundamental principle that promotes: • More travel choices for people and freight. • Improved accessibility by public transport, walking and cycling. • A reduction in the need to travel, especially by car.	PPG 13
2.	**Reduces the need to, and distances travelled by private car by:** • Sequential development location selection, prioritising on relation to existing services and facilities and sustainable travel opportunities. • Provision of key services and facilities within or close to site. • Layout and Design that facilitates convenient walk, cycle and public transport access.	PPG13, RSS, LTP, Joint LDF
3.	**Encourages Mode shift (including freight transfer) through:** • Provision of high quality alternative travel opportunities from development outset, which are viable in the longer term. • Better integration with other modes. • Pre-planned and deliverable infrastructure.	PPG13, 2004 White Paper, RSS, RTS, TSFG Vision
4.	**Will be well connected:** • Provides linkages by all modes and accessible for all. • Internal to the development. • Internal - external local. • Internal - external sub-region and beyond.	RSS, LTP
5.	**Improves and regards Road Safety:** • Through design and layout (including encouraging safer modes).	RTS, LTP
6.	**Assists in Better Transport Management:** • Traffic – to improve flow, air quality, reduce accidents, congestion and delays • Asset – network and fleet maintenance to improve performance. • Demand – to encourage mode shift and appropriate trip routing.	LTP, SP
7.	**Is integrated with other policy area aims and objectives. Such as:** • Regional economic, social and environmental strategies. • Local Action Plans, Development Documents and strategies.	IRS, RSS8, RTS, LTP
8.	**Protects and enhances Quality of Life/environment through:** • Design - Layout and quality • Physical impact on air quality, noise and landscape.	2004 White Paper, TSFG

6 The baseline review of existing patterns of movement and the emerging work from NCC/ ARUP, which will include revised network modelling, informs the expected patterns for future movement to aid conclusions and decisions on the likely transportation impacts attached with growth.

Table 5-2: Daventry – Key Proposals and Initiatives

Initiative Area		Description
Policy	Regional Transport Strategy	The RTS includes the following proposals that are of relevance to Daventry; • E-W movement public transport in A14 corridor including junction with M1/ M6 • The A45; • The A428 east-west route; • Modernisation of the West Coast Main Line; • Widening of the M1 motorway;
	Daventry Accessibility Action Plan	NCC's LTP2 (2006-2011) sets out the intention to develop accessibility action plans for major centres in Northants over the life of the plan. The intention is to roll one out per year.
	Daventry Town Centre Vision	Under heading of Sustainable Development suggests looking to promote both improved bus services and a new PRT system.
	Interim Draft Daventry Masterplan	Proposes a development strategy which includes highly attractive and sustainable public transport, in the form of Personal Rapid Transport (PRT) if practicable, otherwise bus-based, and in any event complemented by bus services on inter-urban corridors etc. PRT seen as a means of making the town both more environmentally sustainable and more attractive as an investment etc. location.
	Transport Strategy For Growth.	Key proposal is to address modal shift with targets of 5% in existing areas and 20% for the new. Core route schemes in the Daventry area are as yet unprogrammed but still included as a commitment, namely: • A361 (Daventry – M40) traffic management scheme and • B4036 (Long Buckby Station – A5) Daventry identified for provision of high quality interchange facilities between modes. It is recognised that a parking strategy needs to be developed, with parking located near radial routes and Park and Ride considered for the most heavily trafficked roads into Northampton first and then possibly other towns. No mention or opinion provided on PRT. Conscious of Town Centre Vision and draft Masterplan commitment to develop a town strategy and suggestion that this is likely to include junction improvements, limited road widening and a small amount of new road construction plus public transport, walking and cycling improvements. No detail provided of these improvements. No other schemes included in the prioritisation of transport schemes list incorporated as Appendices.
Walking & Cycling	New Walking and Cycling Facilities	The Daventry Transport Study - Public Transport and Non Motorised Modes Strategy Working Paper highlights a number of possible improvement packages to cycling and walking facilities as a result of growth in Daventry. The total cost of all of the packages is estimated to be £2m in 2005 prices. Each package is linked to specific development site as follows: South East Approach Development Site. The existing cycle way along London Road could be extended along the A45 from the town centre to development. It may be possible to provide a segregated cycle / pedestrian route along the A45. An alternative to providing a route along the A45, the Marches access link could be introduced as a public transport / cycle / pedestrian only link, to provide a safer route for cyclists and pedestrians. This route could follow the former railway line. It is also considered practicable to provide a cycle / pedestrian route between the A45 and the B4036 along a potential development access link, providing north to south access provision to a proposed development site. Long Buckby Road Development Site. The existing cycle route from the town centre adjacent to the B4036 that currently ends at the Norton Road junction could be extended to as far as the development site along the B4036. As outlined above the potential for a link between the A45 and the B4036 could also be implemented as a public transport / cycle / pedestrian only link. It may also be possible to provide a fully segregated cycle/ pedestrian route between this site and the Monksmoor Farm site. Monksmoor Farm Development Site. Regional Cycle route 70 runs adjacent to this site and with minor modification could provide a cycle/ pedestrian route to the town centre. As outline above, a route could also be provided between this development site and the Long Buckby Road development site.

Initiative Area		Description
Walking & Cycling	New Walking and Cycling Facilities	A45 North West of Daventry - Drayton Park Development Site. If development was to be implemented here, then a route along the A45 to the town centre may be feasible, as this would also provide access for the Royal Oak industrial estate sites. An alternative would be to use the old railway line as a possible pedestrian/ cycle route into Daventry from the Drayton Park area. Interim Draft Daventry Masterplan – includes a comprehensive set of proposed walking and cycling routes as part of the overall development approach. Key routes include using the towpath alongside the proposed Daventry WaterSpace (canal arm) between the NE development area and the town centre, and a walk/ cycle/ PT only link on the former rail alignment between the SE urban extension and the Marches.
Public Transport	Improved Rail Services from Long Buckby Station	Direct services from Long Buckby to London are currently suspended during construction work at Rugby station; due to be completed in 2008. Network Rail has undertaken that the Long Buckby to London service will be restored once work to Rugby station is complete. In NCC's revised Transport Strategy for Growth (September 2007), the Transport Prioritisation Framework includes as a priority the restoration of all-day through services between Long Buckby and London Euston at a minimum hourly frequency. This is to be achieved by service alterations and improvements scheduled for December 2008 as part of the new West Midlands rail franchise. It is also proposed that revised services between London and the North West will include some additional stopping trains for Long Buckby.
	Improved access to Long Buckby Station	The Daventry Development Transport Study (DDTS) includes options for PRT or bus links between Daventry and the station. The PRT option, if combined with an in-town PRT network, could improve accessibility between the town and the station at all times. Both options are costed as in the order of £5 million – capital in the PRT case, and the capital effect of revenue subsidy payments in the bus case.
Public Transport	Improvements to Existing Bus Services	The Daventry Transport Study Public Transport and Non Motorised Modes Strategy Working Paper highlights a number of possible improvements to bus services in Daventry to accommodate growth. These include: • Services 40/ 41/ X42/ 94 to be re-routed and the service frequency improved to serve development in the South East sector of Daventry; • Extend Service 95 beyond Daventry Town Centre to serve Drayton Park development (on the A45 north west of Daventry), and improve frequency; • Services 40 and 41 to be extended to serve development along Long Buckby Road; • Services 40/41/96/97 operate on routes on the B4036 to the south side of Long Buckby to be re-routed via development to offer a link to Long Buckby station; • Service 99 connects Daventry Town Centre the residential areas to the north east of Daventry. This service to be extended to service the Monksmoor Farm development site (Note: These service numbers and to some degree patterns have been superseded. Details of the current services has been provided above.) The LTP2 refers to upgrading the existing hourly X42 Daventry to Northampton bus service to half hourly frequency with new vehicles and quality infrastructure.
	New Bus Services	• A service to connect the town centre with Long Buckby Road and South East sector sites could be implemented to use the possible new development access link between the A45 and B4036; • A new service operating between the town centre and Monksmoor Farm could be introduced, as this site is not currently well served by public transport; • Re-routing of services along the A45 to use the proposed South East Approach development site via High March link road, to avoid the A45 / Stefen Way roundabout; • Linkages with other growth areas in Northamptonshire should also be considered Service improvement should also be considered with towns such as Towcester and Milton Keynes, Corby, Kettering and Wellingborough

Initiative Area		Description
Public Transport	Long Buckby Station Improvements Improved Bus Link to Long Buckby Railway Station	The LTP2 outlines the provisional funding through the Community Infrastructure Fund (CIF) for £1.2m to provide improvements to Long Buckby Railway Station. Station upgrade to improve disabled access, public transport facilities (including improved bus links to Daventry) and a new bus/rail interchange facility. As part of the overall package of improvements to existing bus services identified in the Daventry Transport Study - Public Transport and Non Motorised Modes Strategy Working Paper are a number to improve access to Long Buckby Railway Station. This will involve co-ordination between rail and bus services as well as increases in service frequencies (subject to demonstration of sufficient demand).
Highways	New Road Links	The LTP2 (2006-2011) makes references to the A45 Weedon-Flore Bypass, a scheme to improve the A45 connection from the east of Daventry to the M1. Provision of a bypass to Weedon, Flore and Upper Heyford. The LTP says this would probably be constructed as a dual-carriageway and could be continued through to Daventry. The scheme is considered to be delivered by the LTP process, led by the local authority. The A45 Weedon-Flore Bypass is regarded as a relatively complex (and expensive) scheme that will take several years to progress through consultation, design and statutory processes. In addition, detailed work needs to be undertaken in this regard at an early stage, so that it can be considered for forward programmes of regional funding.
	Road Improvements	NCC in the Daventry Transport Study Highway Improvements Working Paper - Addendum Paper - Option 4 identifies a number of road improvements. These proposals are intended to cater for growth in Daventry, specifically on the A45 (London Road and Braunston Road) and the B4036 (estimated construction costs in 2005 prices £11m). In addition, a package of 19 junction improvements (estimated construction costs in 2005 prices some £9m) was also identified. The total package of highway improvement proposals arising from the Daventry Transport Study is therefore approximately £20m. In NCC's adopted Transport Strategy for Growth (September 2007), the Transport Prioritisation Framework indicates that the County Council is currently working with both the Highways Agency and developers to bring forward highway schemes to be included in future programmes, including; • A361 (Daventry – M40) traffic management scheme. This involves downgrading road to B road status, implementing traffic calming/ management measures to discourage use by through traffic and mitigate traffic impacts on villages of Byfield, Chipping Warden and Wardington) • B4036 (Long Buckby Station – A5) improvements (£3m). Series of road improvements, including realignment, surfacing and widening. The scheme will also include a foot and cycle path and new public transport facilities. The document says that it is likely that most of the dwellings proposed in Daventry town centre will be accommodated to the north and east of the town, off the B4036 Depending on the results of further modelling work improvements to the A361 between Daventry and Kilsby to accommodate additional traffic may also be included. The above are considered by NCC to be relatively straightforward schemes that can be introduced at an appropriate time following a short period of public consultation and scheme development. Other highways schemes identified in NCC'S Transport Strategy for Growth include: • A428 West Haddon Bypass, committed • A5 Towcester Bypass, for future consideration • A45 Flore-Weedon Bypass, for future consideration • A43 Towcester Roundabouts Grade Separation, for future consideration • A43 Blisworth/ Tiffield junction Grade Separation, for future consideration
Rail Additions	Proposed Railway Spur to WCML	Daventry District Council and the Northamptonshire Partnership commissioned WS Atkins (WSA) in 2005 to assess the constraints and opportunities for development in Daventry. As part of the study scope, WSA briefly considered the feasibility of constructing a rail link to the WCML at either Long Buckby, Rugby or Northampton. The cost (2004 prices) was estimated at up to £58m. WSA concluded that the option was not likely to be feasible in terms of cost, likely demand and operational feasibility (signalling and available train pathways on WCML).

Initiative Area		Description
New Approaches	Personal Rapid Transit (PRT)	Personal Rapid Transit (PRT) is a radical personal transit system using demand responsive automated vehicles and segregated guideway. It is currently being advocated by DDC as a transport option for further progression. PRT does not feature in the RTS, NCC's Transport Strategy for Growth or LTP2, although based on the studies to date (the DDTS and the Daventry PRT Pilot Scoping Study (DPPSS)) it could have capacity to deliver: • High levels of patronage, capturing significant market share from the car • Greatly reduced levels of transport energy use and pollution (especially emissions of carbon dioxide) • A highly accessible transport system – open, for example, to those unable to drive due to income, age or disability Daventry District Council intends to commence procurement of a Pilot phase of the PRT network imminently.
	Inter-urban	The emerging Strategic Economic Action Plan for Northamptonshire (SNEAP), prepared by SWQ for Northamptonshire Enterprise, WNDC and the North Northamptonshire Development Company, includes a proposal that the County should develop a transformational quality approach to public transport, including very high quality inter-urban routes, considering options such as radically enhanced bus through to Maglev. While flows between Northampton and Kettering, for example, may be higher, it is important that Daventry is not relatively 'cut off'.

5.2. Status of Proposals

5.2.1. The standing of the various policies and initiatives established in the previous section guide the status of transportation proposals discussed in this section. The summaries provide preliminary views regarding the extent to which account should be taken of the above initiatives when preparing the infrastructure assessment for Daventry. This is based on information currently available and is subject to change as more work is undertaken.

5.2.2. The initiatives have been categorised as either **Assumed** (in which case the initiative should be assumed to be committed as part of any infrastructure package for growth in Daventry) or **For Assessment** (in which case there is insufficient policy or funding commitment at this stage to require assessment of the various options against the OIG Criteria).

Regional Transport Strategy. The RTS is part of the adopted RSS and, therefore schemes identified within it should be regarded as a material consideration with regard to Daventry:

- E-W movement public transport in A14 corridor including junction with M1/ M6
- The A45;
- The A428 east-west route;
- Modernisation of the West Coast Main Line;
- Widening of the M1 motorway;

The timescale for implementation of the schemes is inevitably in the medium to longer term. **(Assumed)**.

Accessibility Action Plan. With regard to Daventry, the target is for an Accessibility Action Plan to be developed 2008/9 and implemented during 2009/10 including a new urban bus network. **(Assumed).**

Daventry Town General Improvements. These comprise both relatively straightforward schemes (traffic management, urban design and bus improvements), which should be largely implemented in the short term **(Assumed)** and more ambitious proposals such as the canal link. **(For Assessment).**

Transport Strategy for Growth. While some distinction needs to be made between aspirational targets and more specific/ committed proposals, it is assumed that the policies and schemes included within it should be regarded as a material consideration with regard to highway considerations for Daventry **(Assumed).**

New Walking and Cycling Facilities. The package of schemes identified for Daventry are (a) straightforward (b) specifically linked to development and (c) supported by NCC and DDC, and as such are regarded as likely to be implemented in the short term in step with development. **(Assumed).**

Long Buckby Station - Improved Rail Services. Network Rail has undertaken that the Long Buckby to London service will be restored once work to Rugby station is complete. NCC's revised Transport Strategy for Growth includes as a priority the restoration of all-day through services between Long Buckby and London Euston at a minimum hourly frequency. This is to be achieved by service alterations and improvements scheduled for December 2008 as part of the new West Midlands rail franchise. **(Assumed). Improved Station Facilities:**

These have strong local support and appear in LTP2 **(Assumed). Improved Station Access:** It is very feasible that improved public transport access to the station will be implemented in the short and medium term, especially as developments come forward **(Assumed).**

Interurban Public Transport: Bus Services: A package of improvements to bus services providing longer distance connections to other towns are clearly identified in Daventry Transport Study Public Transport and NCC's LTP2, and these (or more novel forms of public transport) are also in SNEAP **(Assumed).**

Proposed Railway Spur to WCML. WSA noted that the restoration of direct London - Birmingham services from Long Buckby in December 2008, together with improved bus and road links from Daventry would achieve greater benefits to users at far less cost. The assessment concluded "...it would appear that a new railway line and station for Daventry would not only be extremely costly but would also bring little benefit above that which could be achieved by increasing rail services to Long Buckby and running a bus from there to Daventry linked to the train timetable." (**For Assessment** - although in the absence of any supporting material not proposed for further work).

Highway Improvements:

Flore-Weedon Bypass. URS understand that a joint bid has been submitted by NCC and WNDC for GAF3 funding to support preparation work for the Flore Weedon Bypass and if successful seek to commence preliminary assessment work to start in March 08. Design would follow during 2010-11, which would include economic justification etc. All this is subject to suitable financing. Delivery of the bypass is proposed via funding from the LTP process. As a consequence the bypass will need to compete with other schemes. The expansion of Daventry will obviously contribute to the bypass demand, however contributions to local traffic growth are also likely from general traffic growth across the region as a whole to include Northampton and other areas. It is highly unlikely that developers within Daventry would fund the bypass exclusively. There is currently no firm financial commitment or delivery date. **(For Assessment)**

A361 (Daventry – M40) Traffic Management Scheme (For Assessment)

B4036 (Long Buckby Station – A5). (Assumed)

A361 Daventry – Kilsby Improvements (For Assessment)

5.3. Additional Public Transport Initiatives

5.3.1. During consultation on this document a number of additional public transport initiatives promoting improved inter-urban travel were suggested by NCC that, while they may not form part of an existing policy or strategy, deserve consideration to serve both the expansion of Daventry and in the shorter-term the town's existing residents. These are:

Alternative Bus/ Rail Interchange: Bus services/ improvements to Rugby and Northampton stations should be considered in addition to or as alternatives to enhancement of the service to Long Buckby station as these stations offer more frequent and direct services to a greater number of destinations. These should be considered with a view to the disbenefit (real or perceived) of a longer bus journey.

Towcester and Milton Keynes: A test service provided by a developer along a route serving these towns proved popular and experienced a rapid growth in patronage, although unfortunately the service was short-lived. The proven attractiveness and success of the route suggests that a kick-start scheme may be beneficial, with revenue support being phased out as the usage grows.

Leamington Spa and Warwick: A service operated to these towns until de-regulation in 1986. It is understood that members of the public have indicated a desire for such a service to be reinstated and this may be supported by the presence of The University of Warwick.

Coventry/ NEC/ Solihull and Birmingham: Despite the historic links between Daventry and Birmingham there has not been a local bus service for some years and although there is a National Express coach service this operates only once per day in each direction at times that are not suited to commuters or day trippers. A service through to Birmingham may be practicable or alternatively provision of through ticketing via Coventry (which would reduce the cost of any initial revenue support).

A5 links: Daventry is located close to the A5 trunk road, which provides routes to Milton Keynes in the south and London (via the M1) as well as regional links to the north. A route into Leicestershire via towns such as Hinkley is worthy of investigation.

5.3.2. All of these potential routes would require business cases to be drawn up including a demonstration of sufficient demand that the service would be commercially viable, or minimise revenue funding where the service was considered to serve a particular social need.

6 Key Transport Infrastructure Issues

6.1. Introduction

6.1.1. This section draws together the different strands of research that have informed the collection of baseline data for transportation infrastructure in the previous sections and draws some preliminary conclusions that are important to note in going forward to the identification of the infrastructure requirements for the growth of Daventry. In doing so, this section discusses the current transportation provision to establish the foundation for subsequent decisions related to the potential and need for future improvements and requirements.

6.2. Key Issues

6.2.1. The future planning of transportation infrastructure in support of the growth agenda for Daventry will need to satisfy both national and regional policy objectives. These validate and cascade through existing and emerging local policy documents to indicate the need for new development to follow sustainable principles with core objectives aimed at:

- Achieving a high quality living environment;
- Reducing the need to travel, especially by private car;
- Managing and enhancing natural and cultural resources;
- Provision of employment;
- Achieving a sustainable town through growth; and
- locating development to maximise sustainability

6.2.2. A key feature is the need to address modal shift and achieve objective targets such as those set by NCC for 5% in existing areas and 20% for the new.

6.2.3. NCC has proposed that a target of a 20% modal shift away from car use is applied for new development, based upon modal shift levels currently found in the 2001 census datasets[7] (reproduced as Table 6 1). For larger urban areas the most appropriate ward data is recommended. In terms of monitoring levels of modal shift and assessing the modal share of new developments, NCC's 20% reduction is to be measured against the current census data for single car occupancy journey to work as a percentage reduction against current base levels in adjoining Wards. (i.e. a percentage reduction from an existing car use percentage).

Table 6-1: NCC Mode Split 2001 Census Data for Daventry

Train	Bus	Taxi	Car (driver)	Car (passenger)	Motorcycle	Cycle	Walk	Other
1.3%	2.0%	0.3%	75.8%	7.1%	1.0%	1.7%	10.2%	0.5%

6.2.4. The census data is being used as a baseline as NCC considers it is a reliable figure and census data will be collected at timing points that are applicable to the growth area development proposals i.e. 2011 and 2021. Further site-specific data will be needed as part of the monitoring exercises.

6.2.5. The target of 20% has been chosen, as the development areas identified in the RSS are urban extensions. NCC has therefore assumed that if these were to be built in a traditional car focused development then the modal use levels would be higher then the whole town census levels and that car reduction for the actual development, based on 'No action' baseline scenario, would actually need a shift of 30-40%.

6.2.6. As a consequence walking, cycling, public transport, and demand management must feature strongly in development strategies.

6.2.7. At present Daventry is a relatively compact town with transport infrastructure that is dominated by a road network designed to cater for the convenience of motorised vehicles and in particular the car. The town centre is, broadly speaking, located at the heart of the urban area and forms the hub of a strong radial road network in all compass directions that can be utilised by motorised transport, pedestrians and cyclists. A reasonably comprehensive footway and cycle network throughout the existing urban area supports this, although the network generally follows trafficked routes. Cyclists in particular are largely limited to on-road routes in much of Daventry, or off-road routes that follow the road network. Direct connections across the main radial routes are however less well provided for.

6.2.8. There is scope for a high proportion of sustainable journey to work trips, however public transport usage within Daventry is currently low, which partly reflects the relatively small size of the town at present and local reliance on the private car. For most internal trips walking or cycling should be attractive as the existing walking and cycling network can be generally considered to be good. However, in the expanded town most potential sites for urban extensions would fall outside a generally acceptable walking distance to the town centre and most major employment zones. Even in the current town most major employment zones are outside convenient walking distances from most residential areas.

6.2.9. Although rail is available at neighbouring Long Buckby the service is not attractive due to the relative isolation of the station, low service frequencies and poor public transport integration. Car parking availability in the town centre is attractive and currently is not charged for, which can encourage car use.

7 Transport Draft for Cabinet 8 January 2007 13 - Guidance on Creating Lasting Modal Shift. NCC

6.2.10. The road network as a whole has recently been assessed by consulting engineers Arup with the conclusion that with some relatively minor modifications, the local road system will meet the needs of a population of some 40,000 people in 2021. Journey to work data from the 2001 census indicates broad movement patterns that focus on Northampton, South Northamptonshire and Rugby. The data reveals that around 59% of residents living within Daventry town also remain there for work purposes.

6.2.11. Daventry has evolved with a significant car culture with some 60% of internal trips made by car, despite such short distances being travelled. Some three-quarters of employees working in Daventry also live there and over 50% of people travel under 5km to work. A further 15% travel from Rugby and Northampton. Both of these towns have transport interchanges combining bus and rail however over 90% of these work journeys are by car, with most transporting only the driver.

6.2.12. Journey to work data suggests that motorised travel to and from Daventry focuses on:

- A45 and other routes east surrounding Northampton;
- A45 and north west surrounding Coventry and Rugby;
- A5 Trunk Road for journeys north and south and to a lesser extent the M1 Motorway; and
- A361 towards Rugby.

6.2.13. Outside the main urban area the Highways Agency has raised issues related to the potential impact of growth on the trunk road and motorway network. Although no trunk road improvements are scheduled in the vicinity of Daventry the agency suggests there will be a need to take into account the local A5 trunk road and M1 motorway junctions and in particular M1 junction 19. The agency considers it essential for this impact to be tested using an updated, preferably multi-modal, transport model. The agency is also concerned about the cumulative impacts of development, the timetable for delivery of mitigation measures and how proposed LTP schemes may be related to the timing and phasing of the release of land. In addition the Agency is mindful of the consequences of additional pressure being placed on the strategic network as a result of various development scenarios and in particular the timing of the Weedon - Flore bypass (for example the impact on traffic prior to and following scheme completion and the potential demands on HA funding streams).

7 Transport Infrastructure Strategy

7.1. Sustainable Transport Strategy – Core Elements

7.1.1. The sustainable transport strategy for Daventry is based on the core principles noted in the DIS Main Report. Assumptions about the future demand regarding the role of Daventry and economic growth will need to be qualified given the emerging Joint Core Strategy and other Local Development Documents, which may possibly re-define respective roles and functions for towns and other settlements in West Northamptonshire.

7.1.2. The core elements of the overall strategy for the provision of a sustainable transport infrastructure network in Daventry, as it grows to a population of 40,000 people by 2021, are listed below:

a) The delivery of and accessibility to effective sustainable travel modes is key and will require development to be fully integrated with the existing urban areas in Daventry with the necessary supporting infrastructure to maximise the opportunities for trip internalisation; both within the development and through suitable linkages with the town as a whole; although not specifically a transport issues this critically depends on as wide a range of suitable employment and services as possible being available within the town and individual developments;

b) Walking and cycling provision should receive precedent over all other infrastructure, as these modes are highest in the Department for Transport's (DfTs) modal hierarchy. This means that provision should be at grade, along desire lines, and have excellent connectivity with local facilities and across the town. Provision should also ensure maximum permeability for these modes within and between areas of Daventry (both existing and new) whilst at the same time providing lower levels of permeability for travel by private car.

c) The need to apply NCC targets of 20% and other more general policy requirements e.g. PPS1, RSS8 and the Climate Change Bill for modal shift from car for new developments as justification for the necessary infrastructure required to encourage sustainable modes;

d) Delivery of a comprehensive network of cross-town and orbital bus routes (most likely enhancing or replacing the existing network), which complies with NCC guidance for bus provision in new developments. This guidance should be applied across the town to provide a consistent network that encourages mode shift amongst existing and new residents and integrates the new development with the old. It is likely to require a new/reformatted and upgraded bus station and bus routing within the town centre to support cross town bus movement;

e) Where practicable, provision for public transport/ bus priority at both junctions and along identified links to ensure that buses are prioritised across the network and journey time reliability and advantages over the car. This may require reducing the existing road space dedicated to private vehicles to promote sustainable modes and encourage development of Daventry as a sustainable town. High quality passenger waiting facilities must be provided both at transport interchanges and at all waiting points across the public transport network;

f) Priority should not be given to promoting additional road capacity for the private car. Some local junction improvements (e.g. local widening) may be provided where necessary to satisfy specific local considerations although any new or improved junctions should only cater for generated traffic once target mode shares promoted by Northamptonshire County Council have been achieved. In addition, there should be no provision for a new orbital route for cars between newly developed sites so as to actively promote only sustainable travel modes between both the existing town and new development; and

g) No significant development would be able to proceed without suitable enhancement that will mitigate traffic impact at junctions with the trunk road network to the satisfaction of the Highways Agency. This should predominantly be through the robust and proven achievement of modal shift targets.

7.2. Transport Demand Management including Travel Planning

7.2.1. Demand Management and travel planning must form a significant part of development and improvements for transport around Daventry. This is not only because they are central to sustainable principles but also because there is evidence that they can deliver substantial mode shift. For example research presented on the DfTs website indicates that Personalised Travel Planning can deliver an average mode shift from single car occupancy 5% is a reasonable expectation, indeed the average in a DfT study was 10%[8].

7.2.2. There is considerable potential for travel plans and marketing to achieve modal shift in the Daventry area, supplemented by initiatives such as the role of integrated ticketing and smartcards. All measures should be in line with NCCs 'Guidance on Creating Lasting Modal Shift'. Some key demand management initiatives are briefly detailed below:

- Marketing and local travel information points should be used to support all Demand Management measures, this includes information boards at bus stops and transport interchanges, town and district centres, notice boards at places of work, community facilities, and retail areas, and information sent to homes. It is essential that all information is kept up to date;

8 http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/personalisedtravelplanningev5774?page=6#a1018, 15 May 2008.

- Workplace, school, and home travel plans that are consistent across all developments including any development (including eligible existing development) within the existing urban area. These would include promotion of the local bus services, cycle purchase schemes (supported by the Government's national scheme), walking buses, and supported by home zones and safer routes to school;
- Cycle facilities to support cycle routes, such as secure and convenient cycle parking and integral shower and changing facilities that are convenient and safe to access for each destination and provide storage for cycle clothing and equipment, including cycle storage at dwellings;
- Personalised Travel Plans (PTP) that are co-ordinated centrally and supported by PTP across Daventry. Research commissioned by DfT indicates that in the Sustainable Travel Towns PTP has reduced single car occupancy trips by an average of 5%, with some schemes experiencing much greater changes[9]. Strong branding must support PTP developed by specialists in this field and, for maximum impact, be implemented across Daventry. Research suggests that travel behaviour can be altered at least in the medium term (5 years), long term analysis is not possible due to the relatively recent introduction of PTP [10]
- Incentives can be used to encourage the use of sustainable modes, such as bike purchase incentives, competitions, and also through marketing to impress the health and financial benefits of sustainable transport upon residents and employees; and
- integrated ticketing and smartcards. NCC is currently promoting its own smartcard project
  - Smartcard schemes can be particularly successful when linked with other functions, such as the London Oyster Card, which enables small cashless transactions to be made for various goods and services;
  - Integrated ticketing makes multitrip journeys considerably easier. This does not only apply within modes and across operators, but should be extended to cover multiple modes. In recent years the Plusbus scheme (http://www.plusbus.info/), promoted by a consortium of bus operators and train operating companies, has proved to be popular. Plusbus schemes currently operate in Rugby and Northampton but none extend to Daventry, there would appear to be an opportunity to establish this in the short-term so that it is well established by the time development comes on-stream, thereby helping to achieve mode shift on journeys to and from Long Buckby Station

7.2.3. It is important that all demand management measures have central co-ordination, both within developments and across the whole of Daventry. This should ensure consistency of approach and level of quality so that all people in Daventry can understand the measures across the town, no matter whether they live in an existing part of the urban area, a new development, or come from outside the town. Central co-ordination will also help to develop a more recognizable brand for sustainable transport and allow savings in total cost through economies of scale.

7.2.4. Demand management also requires that developments are extremely permeable for sustainable modes but less so for private vehicles. This can be achieved through the use of bus gates, routes through open spaces for walking and cycling and other measures specific to sustainable modes. It is essential that, if the use of sustainable modes is to be cultivated, permeable routes are perceived to be secure by their users, requiring a good quality of lighting and maintenance to ensure that the environment does not become enclosed and threatening. Paragraph 76 of PPG13 states that

'In preparing their development plans and in determining planning applications, local authorities should:

1. In conjunction with work on preparing the local walking strategy, review existing provision for pedestrians, in order to identify the network of routes and locations including the links between key uses such as schools, town centres and transport interchanges) where the needs and safety of pedestrians will be given priority, and the measures that will be taken to support this objective;
2. Pay particular attention to the design, location and access arrangements of new development to help promote walking as a prime means of access;
3. Promote high density, mixed use development in and around town centres and near to major transport interchanges;
4. Promote and protect local day to day shops and services which are within easy walking distance of housing;
5. Create more direct, safe and secure walking routes, particularly in and around town centres and local neighbourhoods, and to schools and stations, to reduce the actual walking distance between land uses, and to public transport; and
6. ensure that the personal security concerns of pedestrians are addressed

9 http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/personalisedtravelplanningev5774?page=6#a1018, 9 April 2008
10 http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/makingptpworkresearch, 9 April 2008, page 135.

7.3. New Development

Developments should conform with the same principles of sustainable transport provision that apply to the larger towns, although these may be tailored to reflect the circumstances of a smaller town and should therefore apply the principles of non-car oriented land use planning. In terms of infrastructure new developments should:

- Provide high quality frequent bus services to serve the development;
- Ensure a design to ensure that all properties are within reasonable walking distance of a bus stop;
- Manage parking supply to promote sustainable travel alternatives;
- Deliver good pedestrian and cycle linkages both within the development and connecting with the existing surrounding area;
- Offer robust travel plans; and
- provide a conveniently located travel choices information centre that offers advice on and access to alternatives to the car, supported by travel information points throughout the town both on street and in public and private buildings

7.4. Developer Contributions

7.4.1. Developer contributions (secured by agreement under Section 106 of the Town and Country Planning Act 1990 (as amended) or Section 278 of the Highways Act 1980 (as amended) or potentially via Community Infrastructure levy) will be required to mitigate any adverse effects of the travel patterns created by development on existing transport infrastructure or services, or the wider community, and should address any shortfalls in the choice of transport available to the development.

7.4.2. There should be a presumption against development whose travel demands (identified by a transport assessment) will not be satisfied by the following measures:

- Proposed car parking spaces up to the maximum number for the development;
- Existing or possible new public transport; cycling, walking and other non-car measures.

7.4.3. Mitigation should favour measures that reduce development impacts through sustainable measures, rather than by catering for private vehicles.

7.4.4. It is the intention of NCC to identify the transport improvements local to Daventry to accommodate the levels of growth proposed. These improvements can then be costed and a 'pooled developer contribution' figure derived for each development coming forward.

7.4.5. In summary, developments will therefore be expected to mitigate safety, strategic, and local transportation impacts to reflect and manage the magnitude of their impact and Section 106 agreements will need to be secured in this respect. This is likely to include appropriate contributions to aid the delivery of significant infrastructure improvements such as the Flore / Weedon bypass and also at local junctions where sustainable measures cannot reasonably cater for the additional demand imposed by private motor vehicles.

8 URS Accessibility Audit by Sector

8.1. Accessibility Mapping Process - Review of Results

8.1.1. URS has undertaken an assessment of accessibility to the town centre, the major employment areas in the west, northwest, and southeast of the town, Long Buckby Station and Northampton.

8.1.2. The analysis was informed by the initial mapping based on a series of ACCESSION plots provided by NCC. These initial maps indicate journey time by different modes to Daventry Town Centre and by foot and cycle to other facilities such as schools and healthcare (see Figures T3 to T8 in Appendix C).

8.1.3. The accessibility assessment mapping results can be found as Appendix D. As is evident from the plans, the assessment is based upon the existing built-up area of Daventry and areas surrounding the town where future development could potentially be considered.
The accessibility assessment is indicative and based on the following factors:

- Distance (taking into account the necessity for circuitous routes);
- Topography;
- Barriers (such as main roads) and the ability to overcome them; and
- the walking and cycling environment.

8.1.4. A summary of the results is provided in Table 8 1 to Table 8 6. The tables are colour coded to allow for easy visual assessment of general accessibility by mode for each of the town's sectors. Accessibility is rated on a scale of Good, Moderate (Mod) and Poor. Where 'None' is stated this indicates that there is no practical accessibility. In addition, barriers such as steep gradients that inhibit convenient and easy walking and cycling are indicated on the maps as areas of severe inaccessibility. Such sites include Borough Hill and Daventry Reservoir.

8.1.5. At this stage it is important to recognise the principle importance of distance in accessibility. This is that the further away from a destination a person is, the less accessible that destination is to them. However, the mode that person uses makes a relative difference to the level of accessibility. For example 2 kilometres may render a destination inaccessible by foot but be considered a reasonable distance by cycle. The geographic barriers to accessibility are then a separate consideration in the overall assessment of levels of accessibility.

8.1.6. Accessibility has not, at this stage, been specifically assessed for journeys to facilities such as food shops (both local shops and superstores), education, and health facilities instead the analysis has been focused on access for employment and residential development;. Existing infrastructure provision for foot and cycle (as described in Section 4.1 and the ACCESSION mapping) indicates that this is not currently an issue in Daventry.

Table 8-1: Town Centre

	Town Centre	North-East	South-East	South-West	North-West
Car	Good	Mod	Mod	Good	Mod
Bus	Good	Mod	Mod	Mod	Mod
Walk	Good	Poor	Poor	Mod	Mod
Cycle	Good	Mod	Mod	Mod	Mod

Table 8-2: Long Buckby Station

	Town Centre	North-East	South-East	South-West	North-West
Car	Mod	Good	Mod	Mod	Mod
Bus	Good	Good	Mod	Poor	Poor
Walk	None	Mod	Poor	None	None
Cycle	Mod	Good	Mod	Poor	Poor

Table 8-3: Western Employment Area

	Town Centre	North-East	South-East	South-West	North-West
Car	Good	Mod	Mod	Good	Good
Bus	Good	Mod	Mod	Mod	Good
Walk	Good	Poor	Poor	Mod	Good
Cycle	Good	Mod	Mod	Good	Good

Table 8-4: North-Western Employment Area

	Town Centre	North-East	South-East	South-West	North-West
Car	Good	Mod	Mod	Good	Mod
Bus	Good	Good	Mod	Mod	Good
Walk	Good	Poor	Poor	Poor	Good
Cycle	Good	Good	Mod	Mod	Good

Table 8-5: South-Eastern Employment Area

	Town Centre	North-East	South-East	South-West	North-West
Car	Good	Good	Good	Good	Mod
Bus	Good	Mod	Mod	Mod	Mod
Walk	Mod	Poor	Mod	Mod	Poor
Cycle	Good	Mod	Good	Good	Mod

Table 8-6: Northampton Town

	Town Centre	North-East	South-East	South-West	North-West
Car	Mod	Poor	Mod	Mod	Poor
Bus	Mod	Poor	Poor	Poor	Poor

However, as the town expands it is imperative that access to these facilities is at least within the standards outlined in the DfTs key core accessibility indicators[11] to local authorities. Ultimately accessibility should be a matter for detailed consideration in masterplans for future growth proposals on a site-by-site basis. Because of the small geographic extent of Daventry new development should aim to come within the lower thresholds indicated by the DfT indicators.

8.1.7. When considering the results of the accessibility-mapping analysis, the following observations can be made for each of the sectors in the town:

Town Centre

8.1.8. It is evident that the town centre scores highly in respect of accessibility with almost all relevant destinations. As is to be expected, access to services and facilities clustered within the town centre is excellent for those walking or cycling. Meanwhile, direct public transport and road routes ensure that access from the town centre to the other locations surveyed, including Long Buckby Rail Station, the western, north-western, and south-eastern employment areas, and Northampton were all judged to be either moderate or good.

Northeast Sector

8.1.9. The north east sector has good accessibility with Long Buckby Station and the north western employment area but moderate to poor accessibility to other locations. However, as is to be expected, the level of accessibility to the town centre and its shops, services and facilities declines as the distance from the town centre increases. Therefore, there is a marked drop off in accessibility levels, which would reduce the ability of locations further from the town centre to support walking and cycling. The caveat to this is that the route to Long Buckby offers the potential to enhance accessibility, especially by sustainable modes including cycling and public transport, to the rail station. North of Daventry Reservoir, in the vicinity of Monksmoor Farm, accessibility is good as this location is only approximately 1.5 kilometres from the town centre and sites of major employment.

8.1.10. This helps to boost the level of accessibility of the north-east sector although it is important not to overstate the importance of accessibility involving Long Buckby station. While it is desirable to achieve mode shift to both bus and train there are currently approximately only 50 two-way trips in each peak hour for the purpose of work involving the rail station. With Daventry's growth this may rise to approximately 100 two-way trips. Given the relatively established car culture in Daventry it may be assumed that the majority of these currently travel to the station by car. The potential demand for travel to the station by public transport, even with the desired mode shift target of 20% from car, may only justify one vehicle in each direction in 2021.

Southeast Sector

8.1.11. Accessibility in the south-east sector is generally moderate. In this sector accessibility differs markedly between those areas that are located along the road corridors extending out from the town to Norton and Weedon / Northampton, and those areas that are located behind Borough Hill and which are effectively cut off from the facilities and services located within Daventry, including the town centre and the main employment centres. The physical impact of Borough Hill demands circuitous trips to access most services and facilities located in Daventry. For the remainder of the sector accessibility is particularly good. The area around the A45, due south of Borough Hill has benefit in terms of its proximity to the town centre and routes to Northampton and to the Marches employment area although accessibility, particularly by sustainable modes, declines as the distance from the town centre and existing built up area of Daventry increases.

Southwest Sector

8.1.12. The southwest sector generally has good to moderate accessibility. Access to Long Buckby station is currently poor but specific public transport enhancements could improve this to a large extent. Accessibility to areas of employment is generally good and sustainable modes currently have moderate levels of accessibility into Daventry town centre. The A45 currently presents a physical boundary to the south of the town. Breaching this feature, especially by providing suitable mitigation measures to accommodate sustainable travel modes, would enable this sector to exploit the advantages of proximity to the neighbouring urban area.

Northwest Sector

8.1.13. Taking the northwest sector as a whole, it generally achieved a good level of accessibility. However, this assessment is heavily influenced by the positive contribution made by infrastructure attached to the existing built environment. If this sector is considered purely on the merits of the area that is available for substantial development (i.e. the area outside the existing town boundary) then its accessibility is moderate to poor. The main reason for this, common with the other sectors, is that the distance from facilities, including those in the town centre, is too great for those areas beyond the existing built up area of the town.

8.1.14. The area around Drayton Reservoir initially appears to be reasonably accessible; however it is noted that most of this area is already committed for development within the Middlemore scheme that is currently being delivered, and parkland.

11 'GUIDANCE ON ACCESSIBILITY PLANNING IN LOCAL TRANSPORT PLANS', Department for Transport, August 2004, Page 74.10 http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/makingptpworkresearch, 9 April 2008, page 135.

8.1.15. The area further north of Middlemore is considered to be less accessible due to the increasing distance from the town centre and other services and facilities; as such there is little scope for further accessible development.

8.1.16. To the west of the Middlemore development existing employment land uses are laid out in such a manner that they are impermeable to sustainable modes and would also present an unattractive walking and cycling environment at night and at times of low building occupancy (e.g. the weekend). In addition, analysis of the local topography indicates that the gradients beyond the Middlemore Farm area would be unattractive to pedestrians and cyclists as the land undulates and rises away from the town centre, therefore proving a barrier to sustainable modes.

8.2. Accessibility Mapping Process – Summary of Results

8.2.1. Based on the information presented in Table 8 1 to Table 8 6 and reviewed in Section 8.1 the URS accessibility mapping process suggests that the following locations present the sustainable locations for development in terms of accessibility and potential linkages with the existing urban fabric:

a) Within the existing urban area;

b) North-east of Daventry between the A361 and B4036. No road link, other than for sustainable modes, should be provided between these two roads;

c) The south-west of Daventry with suitable mitigation measures to enable access across the A45 for sustainable transport modes to include at-grade facilities to promote convenient crossing movements in safety by pedestrians and cyclists, with subsequent direct onward linkages with the existing urban area;

d) North of the existing Middlemore development; and

e) To the south-east of Daventry located between the A45 and Borough Hill extending approximately to the eastern extent of Newnham Hill, provided that the gradient along the southern flank of Borough Hill is suitable for sustainable access routes directly from Admirals Way.

9 Sustainable Infrastructure Study – Highways Assessment

9.1. The Local Road Network

9.1.1. To build on the URS accessibility assessment and inform consideration of the potential highway implications for Daventry attached with growth NCC commissioned Arup to study and report upon the local network capabilities upon consideration of the Daventry Transport Model. Arup in the 'Daventry Sustainable Development Study (DSDS), Final Report' dated April 2008 formally presented the results. The objectives of the study, outlined on page 2 of the Arup report were:

- To provide a framework to inform decisions for the DIS by incorporating sustainable transportation criteria and an sustainable development strategy;
- To inform the scale and location of permitted development, allowing for current and future applications to be assessed consistently; and
- to test the transport impacts of development and evaluate supply and demand based on different levels of transport investment

9.1.2. The study was undertaken to contribute to the assessment of current and future planning applications on an equal basis across the local road network serving Daventry. The methodology included an assessment of the URS accessibility assessment discussed in the previous chapters of this report, with particular reference to the core elements of the Sustainable Transport Strategy in Section 7.1 above. The Arup work maintained the emphasis that priority should not be given to promoting additional road capacity for the private car.

9.1.3. The study was based on a corridor approach with the corridors identified in Figure.10 1). The future capacity for each corridor was assessed based on traffic forecasts. The methodology used by ARUP is summarised below, a detailed explanation can be found in Section 3 of the DSDS report:

1. **Defining the Study Corridors** – to provide a suitable level of assessment the URS sectors were broken down into corridors by ARUP based on the main transport links. For the main highway links information on road characteristics, speed limits, and junction type were collected. For public transport, service detail, frequency, and length of operation were recorded.
2. **Compiling Transport Supply and Demand** – Supply data was compiled based on the highway and public transport information collected as part of Stage 1. Existing demand was calculated using 2001 Census data and the Daventry Transport Model. This allowed for the broad level of saturation of the transport network to be identified, indicating the spare network capacity for development. This gave a transport network on which the impact of, and potential for, future development could be assessed.
3. **Evaluation Framework Parameters and Assumptions** – An evaluation framework that includes quantitative, semi-quantitative, and qualitative indicators supplemented the capacity analysis. The following criteria were adopted; accessibility, sustainable mode share, use of existing infrastructure, efficiency of public transport, and minimum cost of mitigation for generated trips. Each has associated assumptions, for example a reduction in sustainable mode use as distances increase.
4. **Transport Investment and Development Trip Scenarios** – This stage ensured that any additional planned capacity in the transport network, not associated with the development potential of Daventry, has been taken into consideration. An element of background growth in traffic was also included at this stage. The process of loading the development trips onto the network was undertaken alongside an exercise in identifying areas where the transport network could be made more efficient. Transport interventions were identified that would achieve an identified level of sustainable mode share (not the 20% mode shift identified by NCC policy). The identification of capacity for development trips on the road network took account of routing from Daventry across the local road network to towns outside Daventry. Journey patterns were based on 2001 Census data.
5. **Impact Assessment and Stress Mapping** – Based on the assessment model (completed for the AM peak) and the evaluation framework a scoring proforma was used to prioritise interventions and strategies. No weighting has been applied to the criteria. The scoring is presented on page 25 of the DSDS report.
6. **Reporting and Recommendations** – The recommendations of the report and the process outlined above were presented in the 'Daventry Sustainable Development Study Final Report'

9.1.4. The principles adopted by Arup in the DSDS were[12]:

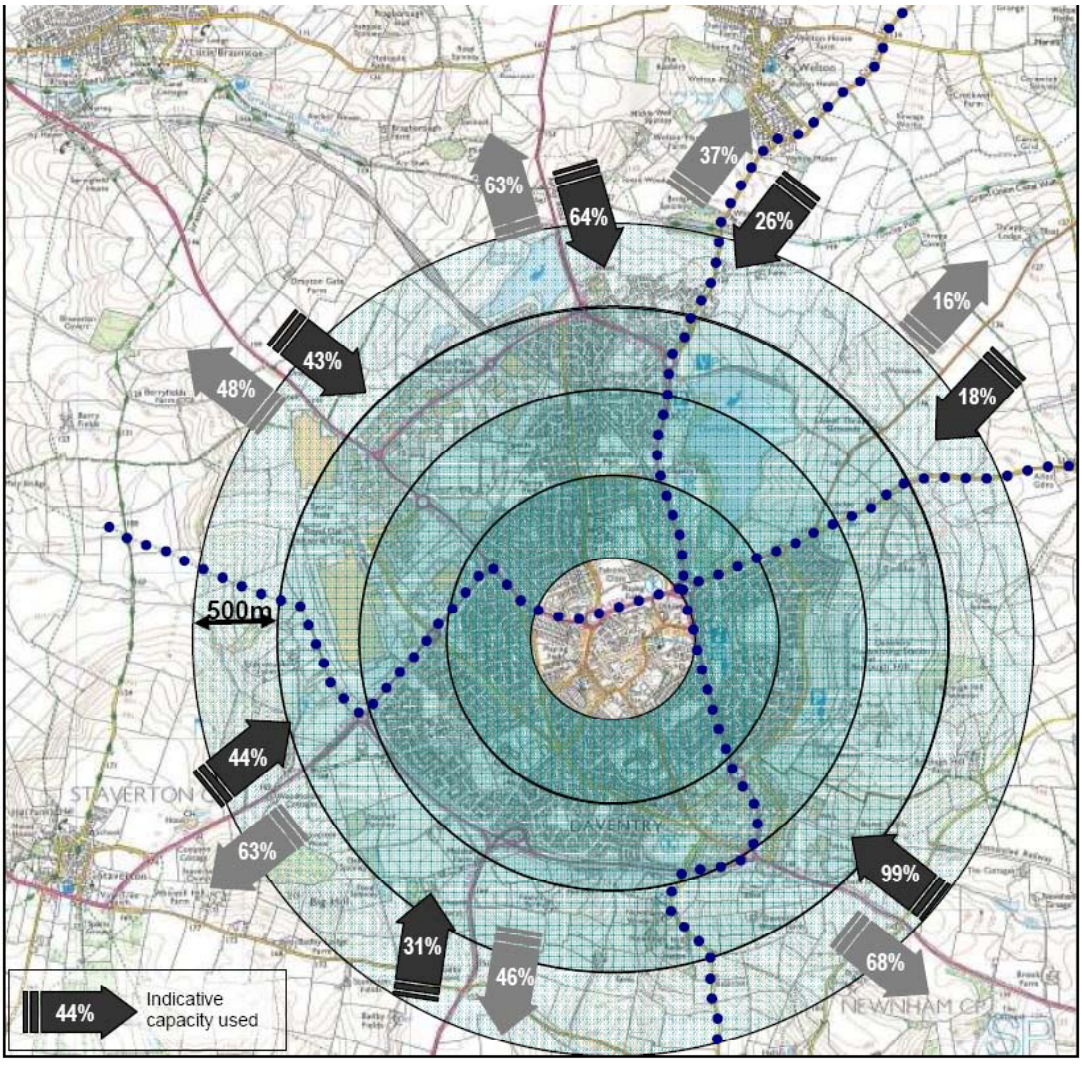
- Maximise the opportunities for trips to be made internally, within the development and within Daventry;
- Apply the target of 20% sustainable mode share for new developments as justification for new infrastructure;
- Avoid additional road capacity, other than local junction improvements, and do not provide new orbital routes between developed areas;
- Do not proceed with development unless suitable mitigation of impacts on the trunk road network are agreed to the satisfaction of the Highways Agency;
- Provide a consistent network of bus routes across the town, integrating existing built-up areas with new development;
- Provide bus priority to ensure journey time reliability and to promote use of sustainable modes, if necessary at the expense of roadspace for cars; and
- walking and cycling should take precedent over other infrastructure and should provide connectivity with local facilities offering ease of movement

9.1.5. The corridors that ARUP identified for assessment were:

- B4036 and Welton Road;
- A361 south;
- A425 west;
- A361 north; and
- A45 northwest.

9.1.6. Figure 9-1 presents the base case corridor capacity utilisation for Daventry from the DSDS. It indicates that the roads into and out from Daventry are operating well within capacity in most cases. It is important to note, however, that the A45 to the south-east of Daventry, heading into the town, is at 99% of its capacity meaning that this approach is already under significant pressure from traffic.

Figure 9-1: Highway Capacity Taken Up By Base Demand (no new development)[13]



12 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 33.
13 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 21.

9.1.7. Arup assumed that development would take place on the outskirts of the existing built area, although URS has identified that there is capacity, in land terms, for development to take place within the existing built environment. Based on analysis and assumptions ARUP identified a distribution of residential development, based on the following principles[14]:

- If there is little or no spare highway capacity within the corridor it is recommended that no additional development takes place;
- If the target for total dwellings cannot be reached unless some development is permitted in each corridor then the minimum amount will be allocated to corridors where little or no highway capacity is available. Priority would however be given to all other suitable locations if this is the case; and
- the qualifying locations will be ranked based on an evaluation, which includes accessibility, sustainability and efficiency criteria

9.1.8. Arup's comparative assessment results for each corridor are summarised in Table 9-1. The table and accompanying notes present an extended approach from the original accessibility assessment undertaken by URS to include transport capacity in terms of trips. The Arup accessibility assessment is based on a corridor approach related to distance only, while the original URS analysis focused on sectors with consideration of other factors such as gradient and physical barriers. This accounts for some differences in the levels of accessibility indicated for comparable areas, although does not impact on the overall method.

Table 9-1: Comparative Assessment Results for Each Corridor[15]

	A361 (S)	A361 (N)	A425 (W)	A45 (SE)	A45 (NW)	B4036 (E)	Welton Lane
Transport Capacity (trips)[1]	69%	36%	56%	1%	57%	82%	74%
Accessibility[2]	High	Low	High	Low	Med	Med	Med
Sustainable mode share[3]	20%	16%	27%	10%	10%	11%	14%
Infrastructure efficiency[4]	High	Med	Med	Low	Med	High	High
Bus network efficiency[5]	Med	Med	Med	High	High	Low	Low
Cost of interventions[6]	Low	Low	Med	High	Med	Med	Med
Overall rank	**High**	**Med**	**High**	**Low**	**Med**	**High**	**High**

1 Inbound capacity from Daventry Transport Model (shown as potential reserve capacity).

2 Score based on distance from the town centre.

3 Share for bus, walk, and cycle from new development assuming no intervention.

4 Based on reliable use of existing infrastructure without demand exceeding highway capacity.

5 Based on likelihood of securing greater bus mode share without intervention.

6 Likelihood for costly intervention in order to secure sustainable mode shares.

9.1.9. Based this assessment process and an assumption for new dwellings of 6,160 Arup subsequently produced a recommended distribution of dwellings (reproduced as Table 9-2 below) aligned to each corridor. The scale of development is reported as dwelling numbers but it is important to recognise that these numbers are based on trip rates, with vehicles loaded onto the road network at the edge of the existing built environment. Without demand management measures any addition of commercial development, services and facilities would require a relative reduction in dwellings equivalent to the trips generated by the alternative land uses.

Table 9-2: Recommended Distribution of Dwellings[16]

Corridor	Dwellings
A361 south	1,400
A361 north	700
A425 west	1,000
A45 southeast	0
A45 northwest	570
B4036 east	1,560
Welton Road	930
Total	**6,160**

9.1.10. The Daventry Town Population and Dwelling Model, developed by URS, has now identified that between 2007 and 2021 6,337 dwellings could be reasonably anticipated to cater for the projected 40,000 population. This figure includes an estimate for 1,250 that could potentially be accommodated within the existing urban area on brownfield sites. The difference of 177 dwellings between the earlier Arup estimate input to the Daventry Transport Model and the more recent URS work, plus the associated employment, services and facilities, will need to be accommodated by reducing the use of private motor vehicles using the methods identified in previous chapters of this report.

15 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 27.

14 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 27.

16 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 29.

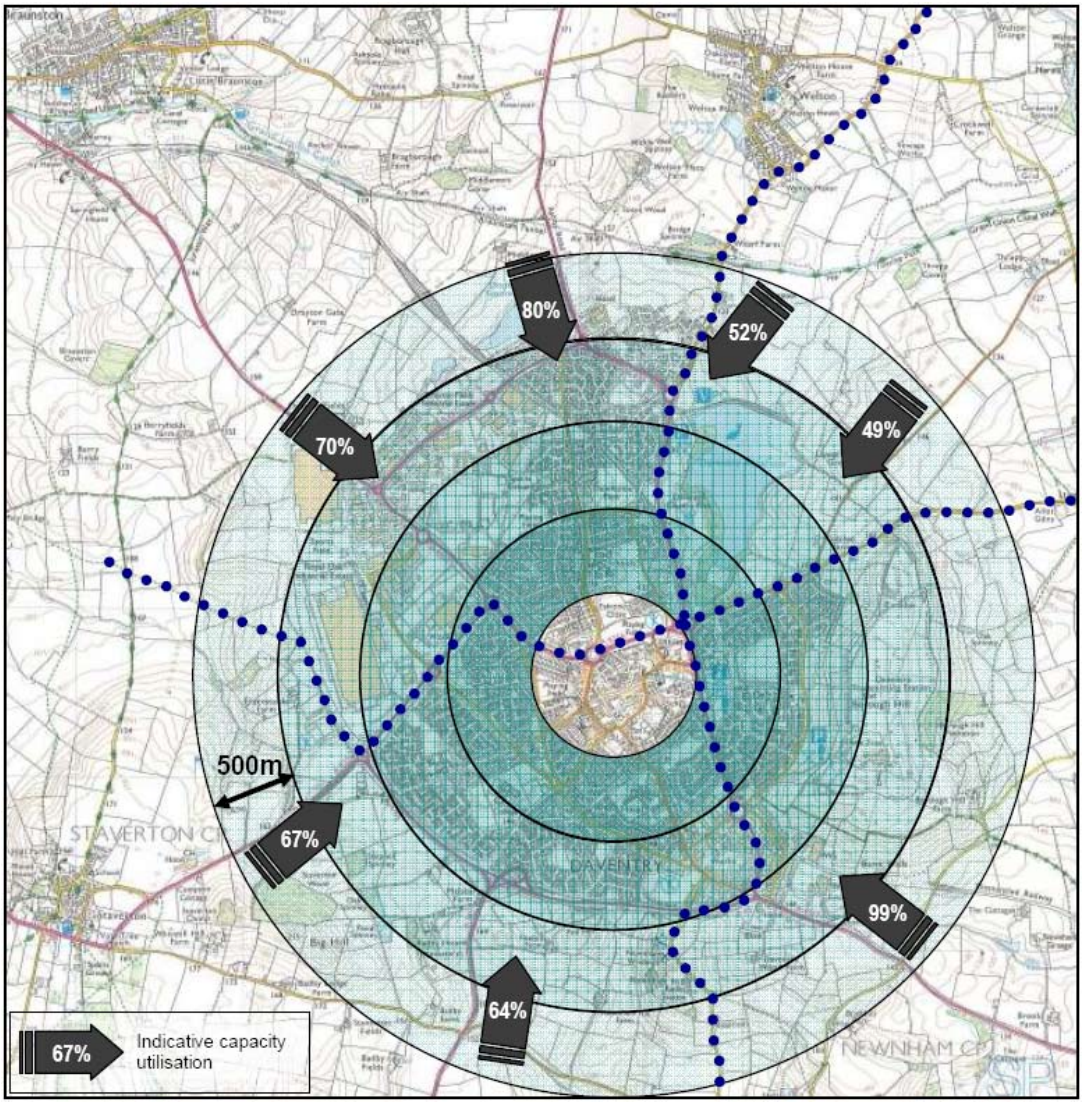
9.1.11. Arup assessed the A45 to the southeast of Daventry as a corridor and found it to have almost zero reserve capacity. As such, it has not been recommended to serve direct access for future development. The impact of the development on the corridors into Daventry is shown in Figure 9 2, which indicates that in terms of capacity utilisation:

- The A45 (SE) remains at 99% with no development recommended for this corridor;
- The A361 (S) doubles but remains well within total corridor capacity;
- The A425 (W) increases by about half and is still well within capacity at 67%;
- The A45 (NW) approximately doubles but remains within capacity; based on the Arup assessment, would not be over capacity
- The A361 (N) increases to 80%, which is beginning to reach a comfortable effective capacity
- Welton Road doubles to 52%, which should not be to be a cause for concern; and
- the B4036 doubles although there remains significant spare capacity

Figure 9-2: Inbound Capacity Utilisation Including Development[17]

9.1.12. In summary the results of the Arup capacity assessment confirm that there is spare capacity on the Daventry road network to accommodate significant population growth and suggests infrastructure investment to enhance the existing transport network, however Arup has concluded that:
The assessment does not allow for the detailed planning of new infrastructure investment on the basis of value for money, nor does it provide evidence of specific mode shift or attributable benefits from generic improvements. The rationale for investment is based on the desire to achieve a greater mode share for sustainable modes and to support development in accessible locations, where access by bus, walking and cycling can be readily achieved or is already offered.[18]

9.1.13. Arup has also identified interventions for two options for infrastructure improvements with a further recommendation that enhanced footpath and cycle facilities are provided alongside the B4036. The elements of these are listed in Section 11 (Required Transport Infrastructure). The DSDS explicitly recognises that that this would reduce the road space for general traffic, concluding that this will increase the total transport capacity for development, particularly on the corridors of the A361 (N), A425 (W), A45 (NW), and A45 (SE)[19].



17 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 28.
18 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 33.
19 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 30.

Further conclusions/ recommendations made by Arup are that[20]:

- The current highway network is capable of supporting the scale of development anticipated in terms of peak trips for journeys to work estimated by the analysis, although only on the basis of careful distribution of development to a number of corridors;
- The estimate of the amount of land available for development differs significantly in some corridors and it is recommended that a minimum capacity estimated under two approaches (highway capacity or land available) is taken;
- The current level of public transport services is insufficient to support the target mode share for sustainable modes in some corridors and enhancement would be required;
- Following the presumption against additional highway capacity unless necessary to meet growth it is not recommended that residential development takes place in the A45(SE) corridor unless the decision is taken to support significant investment in highway capacity (i.e. dualling the A45);
- If supported by a major investment in highway capacity (for example dualling the A45 to the south and south east of Daventry) further development in this corridor could take place but significant efforts would be required to support sustainable modes and to encourage work trips to remain in Daventry; and
- with the proposed growth distribution there is no specific requirement for strategic highway improvements, including the Flore-Weedon Bypass that can be evidenced by this analysis to support development distributed around Daventry. However, further study of the impacts of other developments on traffic feeding onto the A45 is required.

9.2. The Trunk Road Network

9.2.1. The Highways Agency instructed Faber Maunsell to assess the impact of population growth at Daventry on the Trunk Road network. The assessment builds on the work, which Fabers completed, on behalf of the Highways Agency, in November 2006 in response to the Daventry Transport Study. This original report was developed on limited available information and a number of assumptions had to be made with regards to the existing operation of the Strategic Road Network (SRN) and the potential future impacts on the Strategic Road Network (SRN) of the growth of Daventry. The report recommended that further data collection be carried out specifically for the junctions on the SRN that could potentially be affected by the planned growth in Daventry.

9.2.2. Subsequently, on 4th December 2007, 12-hour traffic counts for these relevant were carried out. Following on from which both Faber Maunsell and Arup have been tasked with updating the local and strategic models respectively in order to enable a more robust assessment of existing conditions and future impacts on the SRN to be carried out.

9.2.3. The junctions included in the assessment are:

- M1 Junction 16
- M1 Junction 18
- A5/ A45 Junction
- A5/ Norton Road Junction
- A5/ B4036 Junction
- A5/ B5385 Junction
- A5/ A361 Junction
- A5/ DIRFT Junction
- M45/ A45 Junction

9.2.4. The base year modelling carried out in 2006 was updated using the 2007 traffic flows collected during the counts mentions above. Junction assessments were modelled using Picady, Arcady or Linsig depending on the junction type.

9.2.5. Arup provided future year traffic flows from the Daventry Transport Model. While Faber Maunsell has not reviewed the modelling output provided by Arup, the methodology for developing flows on the SRN was agreed. The scenarios provided were:

- 2021 Forecast Flow – Background Growth
- 2021 Forecast Flows – Option 3 + Background Growth
- 2021 Forecast Flows – Option 4 + Background Growth

9.2.6. Initially these were tested in the Base Year models (existing junction geometry). Where these were shown to be over capacity then mitigation options were developed and tested in the appropriate transportation-modelling package.

9.2.7. Option 3 includes mixed-use developments at Monksmoor, Long Buckby Road and East of Borough Hill, with employment only at Drayton Fields.

9.2.8. Option 4 includes mixed-use developments at Monksmoor Farm, Long Buckby Road and South East Approach with employment only and A45 NW of Daventry.

9.2.9. Technical notes detailing the modelling at each of the junctions are included in the Appendices to this document.

9.2.10. From the analysis it has been determined that five junctions will require mitigation works to accommodate the predicted growth in traffic as a result of the expansion of Daventry to accommodate a population of about 40,000. This is equally the case whether Option 3 or Option 4 is taken forward. There is minimal difference in impact between the two scenario's.

20 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 34.

9.2.11. The A5 / A45 junction at Weedon is the most contentious of these junctions. The junction is at capacity at the moment and becomes a point of severe congestion in the Option 3 and Option 4 scenarios, with traffic generated by the development travelling to and from Northampton increasing significantly. The level of improvement required in order to accommodate traffic generated by Option 3 and Option 4 is significant. It is anticipated that this level of improvement may not be appropriate to this small village due to the severance it may cause. We appreciate that the potential proposals for the Flore-Weedon bypass may negate the need to improve this junction.

9.2.12. The study by Faber Maunsell has demonstrated that the Strategic Road Network is relatively insensitive to the location of growth in Daventry. It has shown that, for either options tested, the following junctions will require mitigation to accommodate the proposed growth:

- A5/ A45 Junction
- A5/ Norton Road
- A5/ B4036
- A5/ B5385
- A5/ A428

9.2.13. Potential mitigation measures have been assessed to identify any potential issues with delivering the improvements. Of these, the most challenging is the A5/ A45 junction as significant land take will be required. Whilst the Flore-Weedon bypass would negate the need to improve this junction there remain uncertainties about the future and timing of the scheme. Therefore it is suggested that a review of all potential options to address the junction are carried out.

9.2.14. The implications of this study will need to be fully addressed in the Transport Assessments of developments proposed in Daventry.

10 Sustainable Development Scenario Assessment

10.1 Introductory Analysis

10.1.1. A transport infrastructure-led sustainable development scenario has been developed by having regard to the work undertaken by URS and the network assessments completed for NCC and the HA and represents the sustainable locations for development in terms of transport. This has concluded that the sites that provide the greatest opportunity to achieve the core transport principles would be:

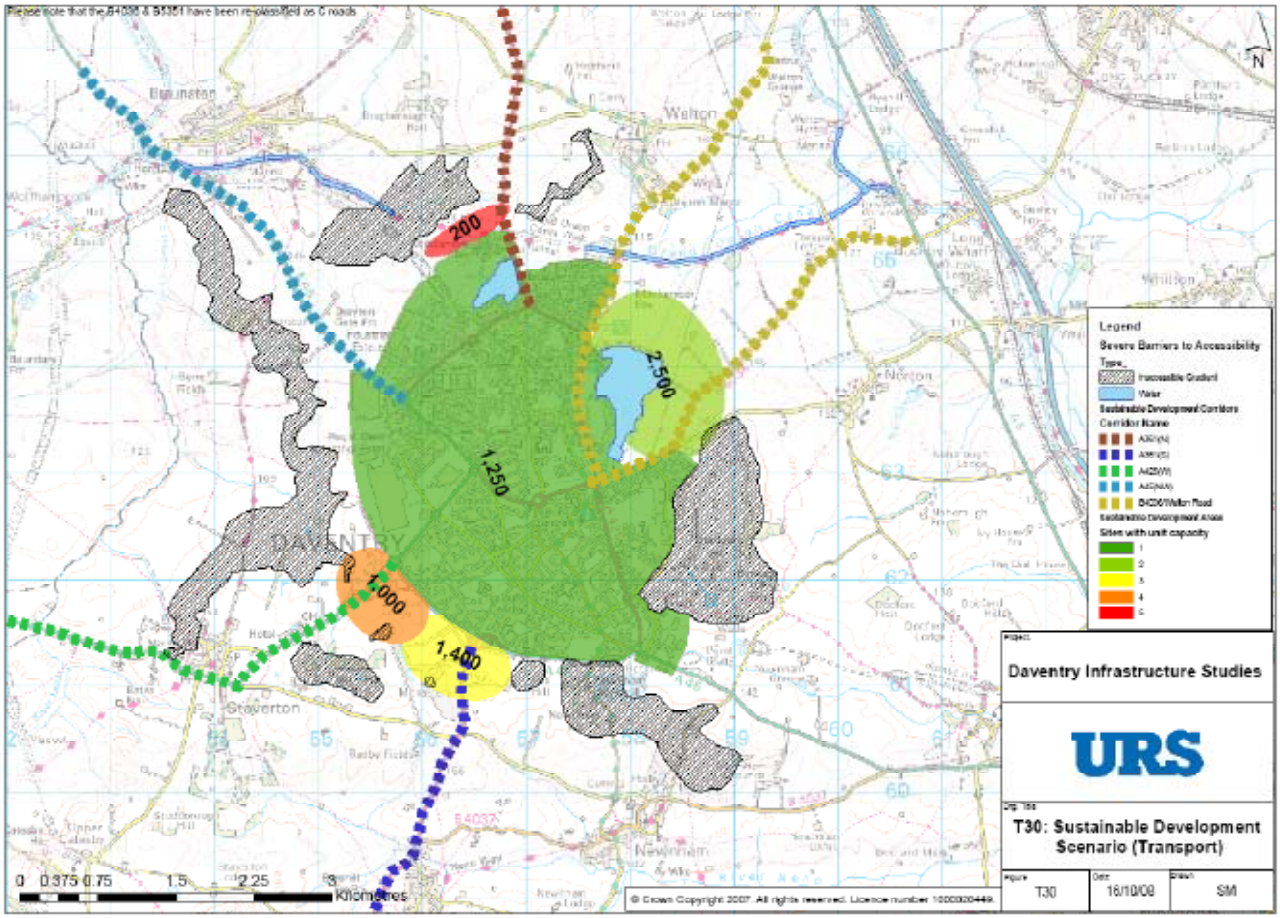
1. Within the existing boundaries of the town's built-up area;
2. Northeast of Daventry along the B4036 and Welton Road, but ensuring that development from Welton Road and the B4036 does not coalesce and provide through routes for private vehicles;
3. South of the town around the A361;
4. Southwest of Daventry around the A425, with care taken not to provide through routes for private motor vehicles between the A425 and the A361 (except on the existing A45); and
5. North of the Middlemore Farm development

10.1.2. The sustainable transport strategy reflects the infrastructure and other measures required to provide for development in the sustainable development scenario. Figure.10 1 (reproduced in Appendix E as Figure T32) shows the sustainable scenario for growth with the sites listed above numbered for identification. The Arup work identified capacity for development by corridor but in order to ensure permeable development (see the sustainable transport strategy Section 7.1 above) and avoid linear development. It is necessary that the development potential for corridors is interpreted into approximate sites for development. These do not prejudice the location of future development but indicate the spatial approach to development that should be adopted to ensure sustainable growth for Daventry. A sector based approach is unsuitable for transport as the location of development has a direct impact on the transport network, in a hypothetical northern sector the impact of development on the A45 would be very different from that on Welton Lane.

10.1.3. Because of the damage that excessive linear development can have on efforts to achieve sustainable transport habits, the sustainable development scenario indicates the potential for urban extensions to cling to the existing urban area as a homogenous block that can operate sustainably and efficiently, to highlight the presumption against linear development along road corridors. Excessive linear development is undesirable, as it tends to discourage sustainable access to local facilities, particularly by walking and cycling and can impede integration with the existing built environment of the town. Linear development is also less suited to sustainable multi-purpose trip making as desirable destinations are less likely to be focused in one location (e.g. local shops, doctors surgery, leisure activities, schools). The nature of non-linear development means that public transport provision must also so be somewhat less corridor based, to ensure that dwellings, employment, services, and facilities, comply with the parameters for accessibility to bus stops determined by the DfT.

10.1.4. The sustainable development scenario shows the sustainable transport infrastructure led development scenario for Daventry's growth under which development could be accommodated in urban extensions around certain corridors. Particular points of note in relation to the scenario as it is shown are described below. The corridors identified by Arup in the DSDS are shown in Figure.10 1, and the dwelling numbers assigned to the indicative sites around each corridor are based, principally, on their capacity assessment as part of the DSDS.

Figure 10-1: Sustainable Development Scenario



Site 1

This encompasses the existing urban area of Daventry, where URS has identified a number of brownfield sites that can accommodate approximately 1,250 dwellings. Development in this site would take advantage of the existing infrastructure and although in some respects this is currently below the standards required to achieve sustainable development across Daventry this could be rectified with relative ease. Site 1 would also benefit from the short distances to existing employment, services, and facilities making walking and cycling a much more attractive prospect than locations outside the existing urban area may provide.

Site 2

URS has identified that this site has generally good levels of accessibility provided that the sustainable transport strategy is appropriately applied. This includes improvements to public transport infrastructure and routes above that identified by Arup and ensuring that a secure and attractive transport link is provided between the B4036 and Welton Lane (across the Daventry Reservoir overspill channel) but that no provision for private vehicles is made along this alignment. Good levels of accessibility exist by sustainable modes to locations across the town from Site 2, allowing people to easily access employment and facilities within these and other parts of the town.

Site 2 has good proximity to the town centre and, via the B4036, has good links to Long Buckby station, the strategic road network, and DIRFT. Improvements for sustainable modes are likely to be required along to the B4036 towards the station. Any HGV traffic generated by development at should be discouraged from penetrating development in any of the identified sites. This would be achieved by locating the relevant land use appropriately, giving consideration to good accessibility by sustainable modes.

Arup have identified that the corridors that run through this site (Welton Road and the B4036) have substantial spare capacity once development traffic is taken into consideration (see Figure 9 2). Both have approximately 50% spare capacity. Although they do not identify particularly high sustainable mode share this is without interventions to achieve the NCC mode shift targets. A good level of transport network efficiency can be achieved for a relatively low cost.

Site 3

The accessibility assessment of this site, undertaken by URS, identified that although it has good levels of accessibility provided, the sustainable strategy is implemented, and is close to the town centre the A45 was considered a significant barrier to development south of the town. However, NCC have indicated that the A45 should not be considered a barrier to development as they would be prepared to undertake/ accept at grade crossings for sustainable modes (both motorised and non-motorised) across this busy road. The advantages of this are the proximity of Site 3 to both the town centre and existing employment in both the southeast and west of Daventry. The site also has easy access to the strategic road network via the A45, although it is recognised that this is currently under significant stress. Development to the south of Daventry would make cross town public transport services a very viable proposition as they would increase the potential number of passengers for a service by lengthening the route.

Arup indicate that there is substantial spare capacity on the A361 (S), even once development consisting of approximately 1,400 dwellings is taken into consideration. It is possible that land constraints will be more of a constraint on development around Site 3 because of gradients in the area. Analysis suggests that there is space for both the 1,400 dwelling sof Site 3 and the 1,000 dwellings of Site 4 to the south of the A45 but topographical constraints are likely to restrict any further development as the gradients will become too steep for non-motorised users.

The proximity of this site to the strategic road network makes it more suitable for land uses generating HGV trips than other sites, such as in the existing urban area, although any location of large buildings must consider the impact on the landscape.

Due to the current road layout to the south of the town it is important that direct links from at grade crossings over the A45 are provided towards the town centre and other locations. The current route would require sustainable modes, particularly buses, to access the town centre via Stefen Way and London Road. This circuitous route will be a deterrent to using sustainable modes. Better alternatives would use Badby Road West and Christchurch Drive to access the town centre, with private vehicles still using Stefen Way/ London Road.

Site 4

Site 4 offers much the same benefits as Site 3, as its location is almost identical. Access for public transport is more direct via Leamington Way but would still require direct at grade crossings across the A45 to ensure that sustainable modes have an advantage over private vehicles.
Arup have identified that both Sites 4 and 3 offer relatively high sustainable mode shares (before NCC targets are achieved), with a low to medium cost of achieving the transport network efficiency necessary to maintain the mode share. The A425 is expected to operate at 67% of capacity once development is completed.

Site 4 is likely to be less suited to land uses that generate HGV traffic due to its increased distance from the strategic road network and DIRFT. It will also be less easy to access for HGVs as the at grade crossings provided for sustainable modes along the A45 will generate poorer driving conditions for goods vehicles, which are more suited to smooth flowing traffic.

Site 5

This site was identified on the basis of its good access to both the town centre and the northwestern and western employment areas. Due to the smaller number of dwellings it is important that sustainable transport links into the town centre and other areas of new development are of the highest quality to ensure good accessibility to employment, services, and facilities, which a smaller development may not be able to sustain.

Arup have identified that the A361 (N) will be approaching capacity once development is accounted for. It is beneficial that the interventions they have identified to achieve a pre NCC target sustainable mode share is expected to be low.

The topography surrounding Site 5, and the limited spare capacity on the A361, mean that the number of dwellings that can be located to the north of the Middlemore Farm development is smaller than in other locations. However, this is not a restraint on development in and around Daventry due to the capacity at other sites around the town both in terms of land and the transport network.

Corridors not considered as sustainable for development

The A45 (SE) would require significant investment to accommodate any development along and around it as Arup have identified that this corridor is effectively at capacity. This would be likely to discourage the use of unsustainable modes across the town due to an increase in capacity into and out of Daventry along this corridor.

Although Arup identified that there is capacity around the A45 (NW) corridor this is not considered a sustainable location. The existing employment development is likely to cause both a physical and psychological barrier to sustainable mode use, the latter being caused by an unappealing and apparently unsafe environment for walking and cycling in particular. Access around existing employment land uses to the northwest of Daventry would be circuitous, further discouraging sustainable mode use due to increased journey times, assuming it would be possible to address environmental and personal security aspects of such routes.

10.1.5. The Sites in the sustainable development scenario and their size in hectares (based on the greatest land requirement at 35 dwellings/hectare) are confirmed in Table 10 1. The land requirements include accommodation for dwellings, education, employment, local centres, and open space. The number of dwellings identified in the Sustainable Development Scenario (Transport) accord with the number of dwellings required as identified by the Daventry Town Population and Dwelling Forecast, which has been calculated for the purposes of the Daventry Infrastructure Strategy."

Table 10-1: Size of Sustainable Development Scenario Sites

Site Reference	Corridor Name	Dwellings
1	Existing urban area	1,250
2	B4036 and Welton Road	2,490
3	A361 south	1,400
4	A425 west	1,000
5	A361 north	197
Total	**All**	**6,337**

10.2. Considerations for a Sustainable Transport Strategy

10.2.1. The Sustainable Transport Strategy reflects the infrastructure and other measures required to provide for the sustainable development scenario noted above.

TOWN WIDE CONSIDERATIONS

10.2.2. In transport terms the fundamental objective is to provide development in locations that offer inherent land use characteristics which minimise the need for people to travel inappropriate distances for the majority of their everyday needs. Minimising the need to travel by unsustainable modes, promoting accessibility and providing close links between services and facilities is key to facilitating sustainable transport choices and trip behaviour. This requires the delivery of tailored and integrated infrastructure that will maximise the opportunity for people to embrace sustainable travel behaviour for movement around the whole of Daventry. It is essential for walking and cycling to be encouraged as the mode of choice, supported by direct and highly attractive public transport facilities to cater for other essential journeys that fall outside the walking and cycling ranges. This needs to be supported by the form, structure, and development location when related to the range of existing facilities on offer and the development mix itself.

10.2.3. Use of the private car should be seen as the least convenient/least desirable mode, especially for local journeys. To achieve sustainable travel behaviour it will be essential to provide highly convenient access to services and facilities that cater for non-car modes, with networks provided that are fully accessible, effective and thoroughly integrated to satisfy local travel demands. Cross-town integration of direct public transport services will be essential.

(ORBITAL) PUBLIC TRANSPORT SERVICES

10.2.4. Determining the need and appropriate routing of an orbital public transport service (suggested in Section 7.1 above) linking developments around the existing urban area would require a detailed study and careful planning dependent upon the physical form taken by the urban extensions and growth of Daventry. It may be practicable to route orbital services from Site 3 to Site 2 via the western side of Borough Hill through the existing residential area east of the A425. Alternatively it may be more attractive to route an orbital public transport service via the north - south alignment of the A45 to the west of Daventry.

10.2.5. The requirement for an orbital public transport route will depend on the final form of Daventry's growth. For instance, if only Site 2 is progressed then trips to the town centre and employment areas would be feasible through cross town services. If Sites 3 and 4 are also taken forward however then there is a strong case for an orbital route that links the site to employment in the northwest and on to the west and south of the town. An orbital route would provide for trips between new development (as well as trips between intermediate origins and destinations) without the interchange that would otherwise be required for some journeys through the town centre. This would offer potentially reduced journey times and an improved journey experience for passengers compared to cross town interchange, while promoting much improved interconnectivity between sites.

10.2.6. It would be advisable to develop optimal public transport network recommendations once the final development pattern, taking on board all disciplines has been resolved. This would help to inform desirable elements for inclusion in developer transport assessments and requirements for developer schemes/contributions through statutory processes.

10.3. Conclusions

10.3.1. The transportation impact and demand for associated infrastructure is highly dependent on the locational interrelationship between existing and proposed facilities, and ultimately the development land-use mix of a specific site. This impact can be predicted through testing particular development scenarios using the Daventry Transport Model.

10.3.2. Against this background, outside the town centre Sites 2, 3, 4, and 5 have been identified as those locations best suited to growth from the point of view of sustainable transport and an sustainable transport strategy. Sections 9 and 10 have identified that, in addition to the requirement for walking, cycling and public transport facilities identified above the strategic road network will also require selective improvements. The DSDS indicates that contributions from developers is unlikely to justify funding fund the total cost of the Flore/Weedon bypass as the expansion of Daventry will only have a minimal impact on this scheme and the junction of the A45/ A5. If further studies support this conclusion the contribution from developers towards this highway scheme would be minimal (see Section 9.1.12)[21]. Improvements to Long Buckby Road between Daventry and the A5 may also be required. Network assessment of specific development options will be necessary before these can be confirmed.

21 'Daventry Sustainable Development Study: Final Report' Arup, May 2008. Page 34.

11 Required transport infrastructure

11.1. Population Growth and Dwelling Development

11.1.1. Infrastructure demand is a function of population and dwelling growth.

11.1.2. The assumed population of about 40,000 people for the town of Daventry by 2021 is contained in paragraph 124 of the Milton Keynes and South Midlands Sub-Regional Strategy (MKSM SRS), which constitutes part of the RSS. The population of Daventry in 2007 has been estimated at 25,379[22]. Taking this figure, it was estimated that there are approximately 10,192 dwellings in Daventry[23]. If all of this growth were to be accommodated within or immediately adjacent to Daventry's urban settlement area, then the town could be expected to grow by another 6,337 dwellings (assuming an average household size of 2.42 persons[24]) and at least 14,622 people. Table 4-1 provides a summary of these assumptions.

11.1.3. This growth forecast for the town is in the context of stated RSS policy that the entire Daventry District area (i.e. the town and the rest of the district) should grow by 540 dwellings per annum between 2001 and 2021. Assuming growth in the town of 453 dwelling per annum to reach the stated population target, this equates to the town assuming an 84% share of the growth in dwelling numbers expected of the District.

11.1.4. At the present time, the draft RSS introduces an extension of the planning period to 2026 during which time it is identified that the entire Daventry District local authority area would be required to make continuing provision for housing growth at the same annual average rate of 540 dwellings per annum over the plan period[25]. Assuming that the town continues to absorb the same proportion of development (within the District) after 2021, as it does before – it could be expected to grow by a further 5,222 people and 2,265 dwellings in the ensuing five year period. These assumptions are summarised in Table 4-1

Table 4-1: Population and Dwelling Increase Assumptions, 2007 - 2026

Relevance / Status:	Population (Actual or Expected)	Dwellings (Actual or Expected)	Likely Year / Time Period	Daventry AHS (NCC Projection)
Census Record:	21,774	8,837	2001	2.46
Estimated Baseline:	25,379	10,192	2007	2.49
MKSM Figure:	40,000	16,529	2021	2.42
2026 with continued constant growth:	45,222	18,792	2026	2.41
Estimated Increase:	**+ 14,622**	**+ 6,337**	**2007 - 2021**	**NA**
Estimated Increase:	**+ 19,843**	**+ 8,600**	**2007 - 2026**	**NA**

Source: URS calculations derived from various information sources including ONS Census Data and Mid-Year Population Estimates, DDC Dwelling Completion estimates, NCC estimation of existing and projected average household size in Daventry.

11.1.5. A critical output of the DIS is the estimation of the key trigger points[26] for new infrastructure. Most trigger points will be judged in terms of the increase in population and/or the increase in dwelling numbers. In order to identify the increase in population and set this against an approximate date (in this case a year) the DIS uses the MKSM SRS population level of 40,000 for the year 2021 applying an even rate of population increase over that period, as shown in Table 4-2.

Table 4-2: Simplified Population and Dwelling Increase Assumptions, 2007 - 2026

Relevance / Status:	Population (Actual or Expected)	Dwellings (Actual or Expected)
Annual Growth	1,044	453

Source: URS calculations

11.1.6. It should be noted that these annual growth rates are an average and growth in terms of population and dwelling completions is likely to vary from year to year depending on the availability of developable land, economic circumstance and other factors. It is however a useful starting point when projecting growth over a medium to long term period.

22 This figure was estimated using ONS mid year population projections for 2001 to 2005 and extrapolating forward to 2007. The methodology used was confirmed as the best available by K. Palmer, Senior Research and Information Officer, Planning and Growth Department, Northampton County Council and also agreed with DDC.

23 This is based on an average household size of 2.49. Figure supplied by K. Palmer, NCC, 14/02/08.

24 Average household size figures obtained from K. Palmer, NCC, 14/02/08.

25 This number is specific to the whole local authority area rather than for the town of Daventry in isolation.

26 The term trigger point refers to a certain population level, or number of dwellings, which once reached triggers the requirement for additional infrastructure because existing spare capacity has been used up by preceding population and/ or dwelling growth. It is a useful concept for identifying the stage at which new infrastructure must or should be provided.

11.2. Critical Infrastructure Item Trigger Points

11.2.1. Assessment of the existing transport network indicates that it is not currently operating efficiently. With a relatively small number of schemes, identified in the DSDS, the network can be made to operate more effectively and in favour of public transport with a limited impact on the road network as the improvements for buses would be anticipated to increase the capacity of the overall transport network in Daventry.

11.2.2. Timing and funding of all items of infrastructure and alternative measures will be dependent on the phasing of development in the sub region and the availability of funding from appropriate resources (including developers, CIF and GAF). It will require its own detailed study to identify the exact infrastructure required and potentially further modelling based on specific land allocations and cumulative impacts. Timing will be dependant on development phasing, although the required transport infrastructure should precede occupation of development. and respond to cumulative impacts

11.2.3. The Flore-Weedon bypass and any interim measures is an important consideration in this respect. It is subject to further deliberation at this time as a consequence of the Daventry planning appeals. Further clarity on this matter is expected in the new year. The work to date however has indicated that growth associated with Daventry will not of itself, be enough to generate funds for the construction of the bypass, although it is anticipated that a bypass will be required to satisfy total sub-regional growth.

11.2.4. Sustainable transport initiatives and supporting infrastructure should also be in place early in any development strategy.. This will enable sustainable travel patterns to be developed immediately and avoid the risk that journeys by car will become embedded in travel behaviour due to the absence of sustainable alternatives at time of occupation.

11.2.5. Schemes identified by Daventry District Council will supplement the benefits to the growth in travel throughout the town, particularly for existing residents, contributing towards changing the travel behaviour of existing residents. These would work in tandem with the demand management measures and smarter choices highlighted by URS.

11.2.6. The assessment on behalf of the Highways Agency has demonstrated that the Strategic Road Network is relatively insensitive to the location of growth in Daventry and as a consequence, the need for and likely scale for improvement associated with the Trunk road will remain relatively consistent.

11.2.7. It is important to recognise that the schemes identified in this section are however based on the sustainable development scenario for growth. At a local scale a different pattern of development is likely to mean that a small number of these schemes may need to be reconsidered, as alternative investment may be more appropriate. Further schemes will be required to achieve NCC's policy requirement for a 20% mode shift from cars compared with the existing mode share in new developments and 5% for trips in the existing urban area.

11.3. Transport Infrastructure Requirements

11.3.1. From the above strategy a number of transport infrastructure options have emerged that are necessary to improve the accessibility, sustainability and efficiency of the transport system within Daventry to maintain and accommodate the increasing travel needs of the community. To understand in detail those routes that could be taken for each trip and by which mode, a traffic assignment model is required once specific land uses and locations are determined. At this stage however the most likely infrastructure requirements are:

Sustainable Transport

- Enhanced walking and cycling routes and supporting facilities to encourage further use of existing urban networks and provision of suitable extensions to serve and integrate with new development areas. This to include routes serving:
  - Long Buckby Station;
  - Weedon and Flore;
  - Staverton; and
  - Braunston.
- Improved public transport services to support target mode share for sustainable modes in some corridors with further strengthening to sustain development through increased frequencies and services, new vehicles, bus priority measures and enhanced bus stop infrastructure and marketing. The costs of any town wide bus improvements to accommodate growth and achieve NCC's mode shift objectives are likely to be part funded by Developer contributions
- Increased capacity at Daventry's public transport bus interchange accompanied by and to supplement town wide infrastructure in support of increased public transport services to accommodate the proposed volumes of bus passengers by 2021;
- Improved interurban bus transport to link the town with neighbouring centres, especially for journeys involving Northampton and possibly Coventry, Solihull and Birmingham, Leamington Spa and Warwick, Towcester and Milton Keynes;
- Provision of an (at least) hourly through train throughout the day between Long Buckby and London
- Improvements to interchange and car parking facilities at Long Buckby rail station to advance access to the national rail network;
- Provision of high quality public transport links between Long Buckby station and Daventry;
- At journey origins and destinations – new housing developments, employment, retail and leisure locations the provision of Marketing, information, smartcards, travel plans (potentially to include Personalised Travel Planning), incentives and a range of measures (in accordance with NCCs Guidance on Creating Lasting Modal Shift) that will lead to a reduction in the proportion of trips made by the private car

Local Road Improvements

Specific details of the Daventry town transportation infrastructure can only be finalised once preferred development options are confirmed and modelled. It is however likely that there will be a requirement for:

- Local junction improvements on main corridors amid limited road widening and link improvements, primarily to improve public transport reliability.
- A45 Weedon, Flore and Upper Heyford Bypass with dualling of the A45 through to Daventry;
- A361 Daventry to M40 traffic management scheme to involve downgrading of the A361 to a 'B' road together with traffic calming/ management measures to discourage use by through traffic and limit impact on villages of Byfield, Chipping Warden and Wardington;
- Daventry to A5 and onwards to Long Buckby to improve access from Daventry to the rail network, especially for public transport connections.

Depending on further modelling work there is also likely to be the need for route improvements for:

- A45 South and South East of Daventry
- A316 north of Daventry to Kilsby

While local junction and link improvements are necessary (primarily to improve public transport reliability) the East to West corridor (A4036, A4256 and A45) has also been identified through detailed modelling for potential improvements to accommodate growth in Daventry. Further detailed study of the specific impacts on these roads is however required.

The A45 corridor east of Daventry is particularly sensitive to change and would require significant investment in highway capacity to support growth alongside it (e.g. dualling) supplemented by suitable measures to ensure sustainable linkages with the existing town. Any development south of the A45 will require suitable sustainable linkages across it to include at-grade crossings for pedestrians and cyclists with effective arrangements for the movement of buses.

Trunk Road Improvements

From analysis carried out by Fabers on behalf of the Highways Agency it has been determined that five trunk road junctions will require mitigation works to accommodate the growth in traffic as a result of the growth of Daventry.

The A5/A45 junction at Weedon is the most contentious of these junctions. The junction is at capacity at the moment and becomes a point of severe congestion with the addition of traffic generated by the predicted expansion of the town, with trips to and from Northampton increasing significantly. The level of improvement required to accommodate the traffic generated in this case is significant. It is anticipated that the level of improvement may not be appropriate within the centre of this relatively small village due to the severance it may cause. The HA appreciate that the potential proposals for the Flore-Weedon bypass may negate the need to improve this junction.

Overall the assessment has demonstrated that the Strategic Road Network (SRN) is relatively insensitive to the location of growth in Daventry. It has shown that, for either options tested, the following junctions will require mitigation to accommodate the proposed growth:

- A5/ A45 Junction;
- A5/ Norton Road;
- A5 /B4036;
- A5/ B5385; and
- A5/ A428.

Potential mitigation measures have been assessed, to identify any potential problems with delivering the improvements. Of these, the most challenging is the A5/ A45 junction as significant land take will be required. While the Flore-Weedon bypass would negate the need to improve this junction, uncertainties remain about the future and timing of the scheme. Therefore it is suggested that a review of all potential options to address the junction are carried out.

The implications of this study will need to be fully addressed in the Transport Assessments of the developments proposed in Daventry.

New Development

Although these measures require very little in the way of hard infrastructure they must be considered to be as important as the need for infrastructure such as bus facilities, walking and cycling routes, junction mitigation, and station improvements.

Developers should design and construct their developments based on the strategy and principles embodied within this document, as well as the transport Sustainable Infrastructure Criteria. This includes ensuring that the layout of development is sensitive to the requirements of sustainable transport and promotes the use of sustainable modes above the use of the private car, reducing the use and presumption to use private vehicles.

Developments should conform with the same principles of sustainable transport provision that apply to the larger towns, although these may be tailored to reflect the circumstances of a smaller town and should therefore apply the principles of non-car oriented land use planning. In terms of infrastructure new developments should:

- Provide high quality frequent bus services to serve the development;
- Ensure a design to ensure that all properties are within walking distance of a bus stop as outlined in good practice;
- Manage parking supply to promote sustainable travel alternatives;
- Deliver good pedestrian and cycle linkages both within the development and connecting with the existing surrounding area including key trip attractors;
- Offer robust travel plans that are monitored and include penalties for poor performance;

- Provide a conveniently located travel choices centre that offers advice on and access to alternatives to the car;
- Deliver sustainable transport infrastructure and initiatives early in the development cycle, phased where appropriate, before developments (residential or otherwise) become inhabited

11.3.2. The elements outlined in the Infrastructure Schedule in Section 12 below do not include the full extent of infrastructure required to achieve mode shift targets required by NCC. Developers will be required to show that their developments achieve this both through appropriate design and 'smarter choices' and through Section 106/ 278 requirements and or potentially through a Community Infrastructure Levy.

12 Infrastructure Programme and Cost Estimates

12.1.1. While it is recognised that the impact of population growth will not be limited to Daventry town, a detailed assessment of infrastructure requirements is only practicable associated with the urban area and sustainable extensions to it. Beyond this it is only possible, at this stage, to identify strategic infrastructure. More detailed requirements beyond the town may be identified once the precise impact of growth can be assessed as part of the detailed transport assessments accompanying planning applications for growth, including consideration of the cumulative impacts of such proposals.

12.1.2. The work by ARUP has determined a sustainable spread of development based on a corridor approach. This has established a framework for transport infrastructure delivery that should minimise infrastructure spend and wider areas of stress on the network. The work on behalf of the Highways Agency has indicated the need for some improvements on the trunk road network, although in all cases the likely programme to determine actual trigger points will be subject to further study and testing.

12.1.3. A critical element involves the outcome of the timing of the Flore-Weedon bypass, which is necessary to inform decisions on the form of improvement required to accommodate the anticipated capacity issues highlighted at the A5/ A45 junction and also the potential interface with the possible need for improvements to cater for traffic impact on the A45 between Daventry and Weedon. Both the resolution of the bypass issue and the identification of specific improvements required for this section of the A45 are subject to further investigation and assessment at this time, however it is likely that both will be required before 2021 to accommodate growth in this area.

12.1.4. On this basis a substantial number of schemes have been identified that are required to accommodate growth around Daventry in a sustainable way (Table 12 1) by 2021. At the local level these are largely to improve the efficiency of the local transport network, while at the more strategic level these aim to mitigate impact within a threshold that is acceptable to the Highways Agency. Trunk road scheme costs will be defined by the Highways Agency in discussion with developers and the local highway authority.

12.1.5. As identified in Section 9 the measures generated from the DSDS do not seek to achieve the mode shift required of new development and so do not represent the full extent of required infrastructure and demand management/ smarter choices. As a consequence the promotion of a demand management strategy and travel planning will be essential to minimise trips and maximise local network capabilities.

12.1.6. Costs given are taken from the available evidence base and in the absence of detailed design of improvements. More accurate costs would require detailed studies for each piece of infrastructure, potentially including, for example topographic and traffic surveys and Major Scheme Appraisals. In the absence of more accurate information related to specific land use allocations the HA is concerned that providing estimated costs for trunk road infrastructure improvements is inadvisable at this time as it could prejudice the process with respect to negotiations with developers for specific infrastructure requirements when more detail is known. As a consequence cost estimates for likely items of trunk road infrastructure are not provided.

12.1.7. In transport terms the DIS has identified a framework for decisions based on network assessment up to 2021. Further work is required to confirm specific transport infrastructure details and timing for major infrastructure on the basis of more detailed modelling to project future conditions and network sensitivities and eventually individual transport assessments; this is also subject to a firmer commitment to actual specific land use allocations, which should be determined by the planning authority as it falls outside the remit of WNDC. Ultimately NCC and the Highways Agency as highway authorities are tasked with determining if or when major pieces of infrastructure such as the Flore-Weedon bypass can be justified on its network.

Table 12-1: Local Transport Infrastructure Schedule Including Scheme and Cost Source[27]

Scheme	Cost Range (£000s)	Source
Bus Priority on Ashby Road/ Henmans Road (1.1km)	700 – 1,200	DSDS
Bus priority on Drayton Way/ Braunston Road (2.5km)	1,500 – 2,200	DSDS
Bus Priority Along Leamington Way (1.2km)	800 – 1,200	DSDS
Improvement at Henmans Road/ Eastern Way/ Braunston Road junction	500 – 800	DSDS
Improvement at Eastern Way junctions	800 – 1,200	DSDS
Improvement at Stefen Way/ Leamington Way junction	500 – 800	DSDS
Enhanced crossing facilities of Stefen Way	200 – 800	DSDS
Enhanced footpath and segregated cycle facilities alongside the B4036	200 - 500	DSDS
Improved pedestrian crossing facilities to access the town centre	Uncosted	DSDS
Walking & Cycling Networks	8,000	DDI
Upgrade of Long Buckby Station	1,000	DDI
Downgrade B361 to 'B' road	1,000	DDI
Enhanced In town bus infrastructure including Daventry Bus Station	5,000	DDI
Infrastructure to support enhanced interurban bus services	5,000	DDI
Enhancements of bus infrastructure on route to Long Buckby Station	2,000	DDI
Personalised Travel Planning	1,300	DfT
Support for Green Travel Plans	1,000	DDI
Suppoort for improved bus services to Long Buckby Station, Daventry Town, and interurban	25,000	DDI
Townwide travel information	500	URS
A5/ A45 Junction – Potential increase in junction size to accommodate capacity improvements with more effective traffic signal control; subject to outcome of Flore-Weedon bypass		ITRN
A5/ Daventry Road – potential roundabout		ITRN
A5/ B4036 Long Buckby Road – potential roundabout		ITRN
A5/ Crockwell Hill/ B5385 Station Road – potential roundabout		ITRN
A5/ A428 – Potential Removal of existing roundabout and replacement with traffic signals		ITRN

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DSDS = 'Daventry Sustainable Development Study: Final Report' Arup, May 2008.

DDI = 'Daventry Development Infrastructure', report to Strategy Group 11th October 2008, Daventry DC.

DfT = Element costed based on information found at http://www.dft.gov.uk/pgr/sustainable/travelplans/ptp/.

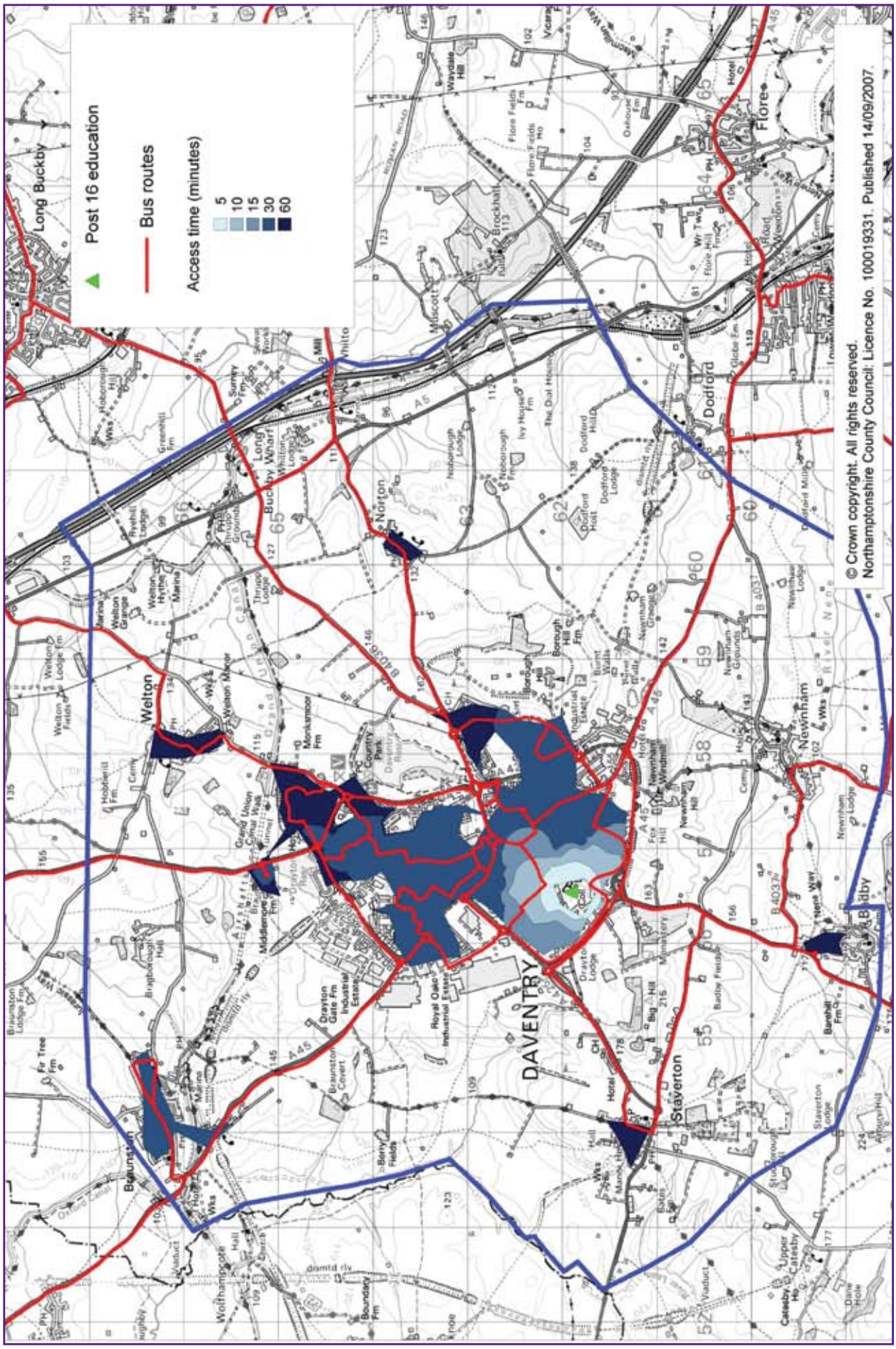
URS = Element costed by URS based on information from other sources.

ITRN = 'Daventry Infrastructure Study - Impact on Trunk Road Network' Faber Maunsell, May 2008.

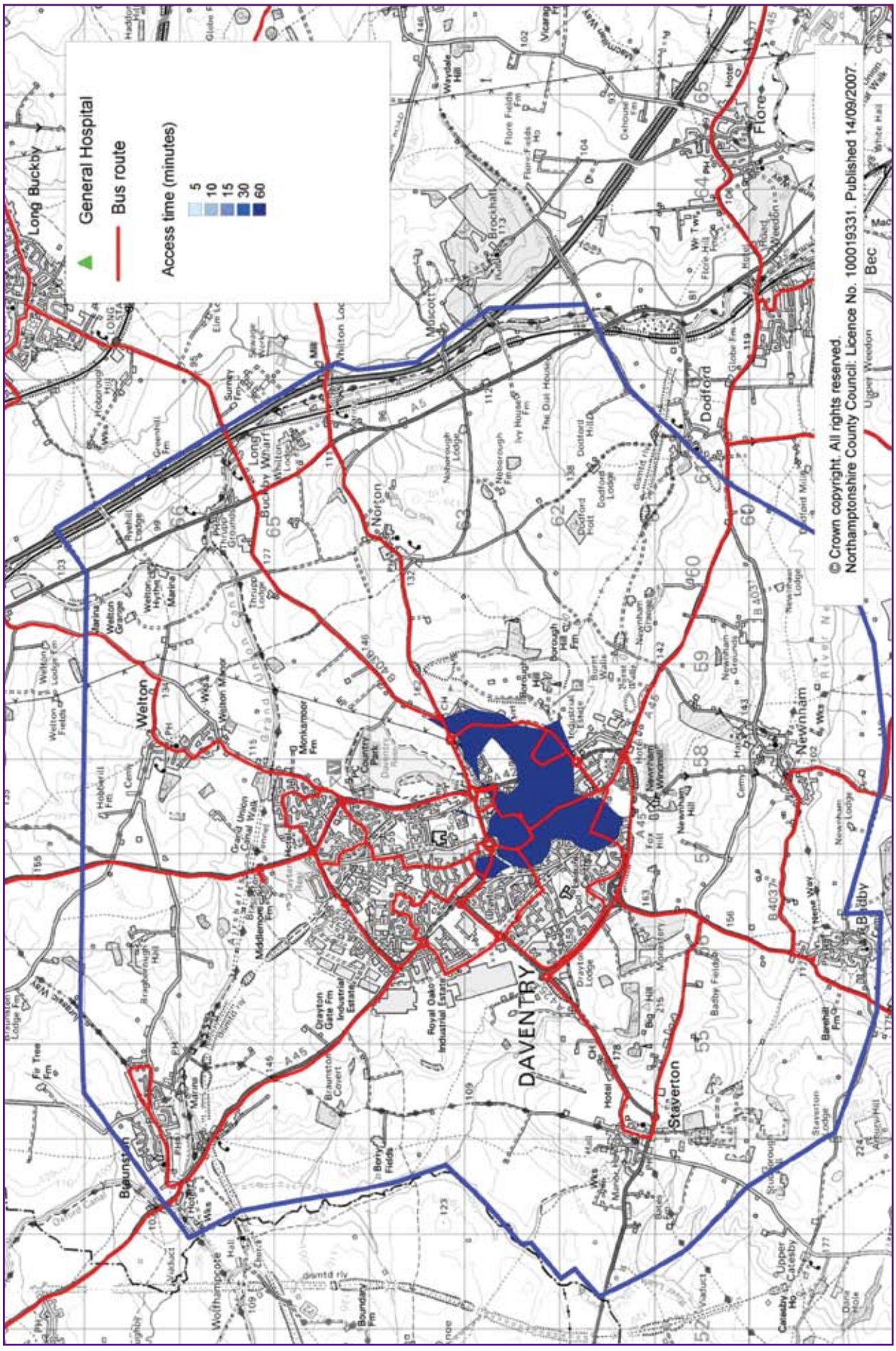
Appendix A Northamptonshire County Council Accession Mapping

ACC1 - Access to Main Town Centre by Public Transport (400m walk and/or public transport). Postcodes in Daventry Study Area

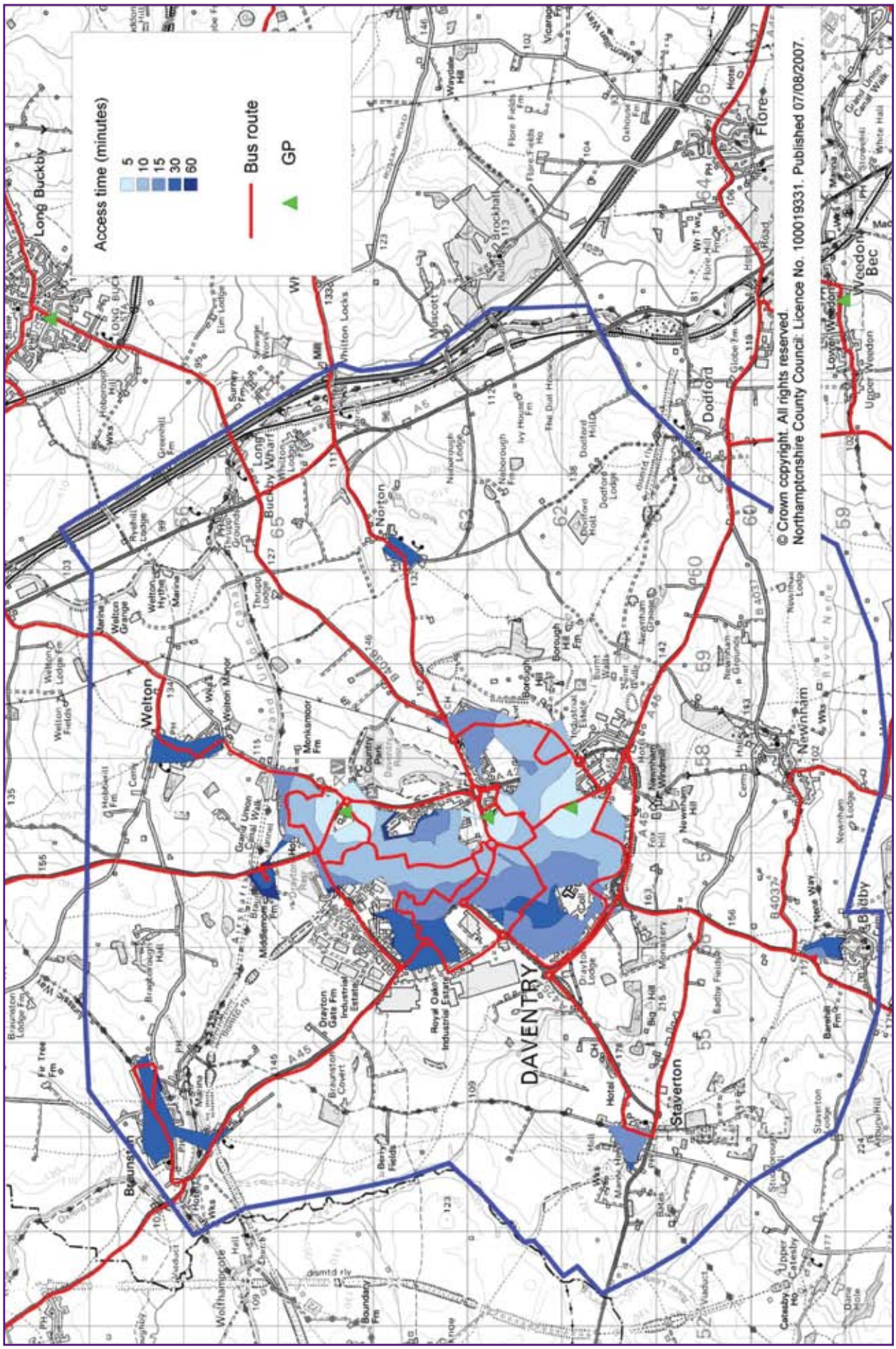
ACC2 - Access to Post 16 Education by Public Transport (400m walk and/or public transport). Postcodes in Daventry Study Area.



ACC3 - Access to General Hospital by Public Transport (400m walk and/or public transport). Postcodes in Daventry Study Area.



ACC4 - Access to GP by Public Transport (400m walk and/or public transport). Postcodes in Daventry Study Area.

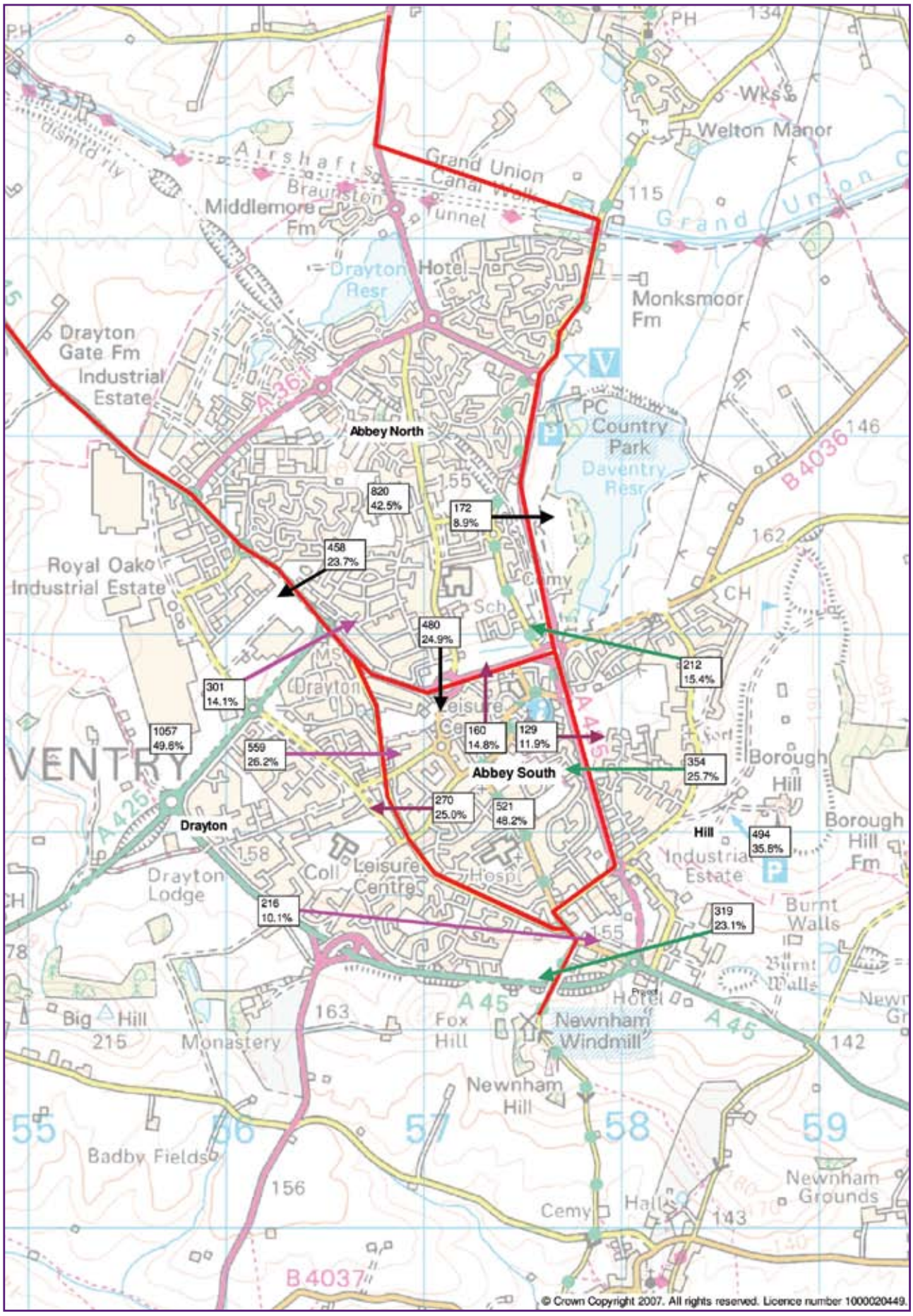


Appendix B Patterns of Journey to Work

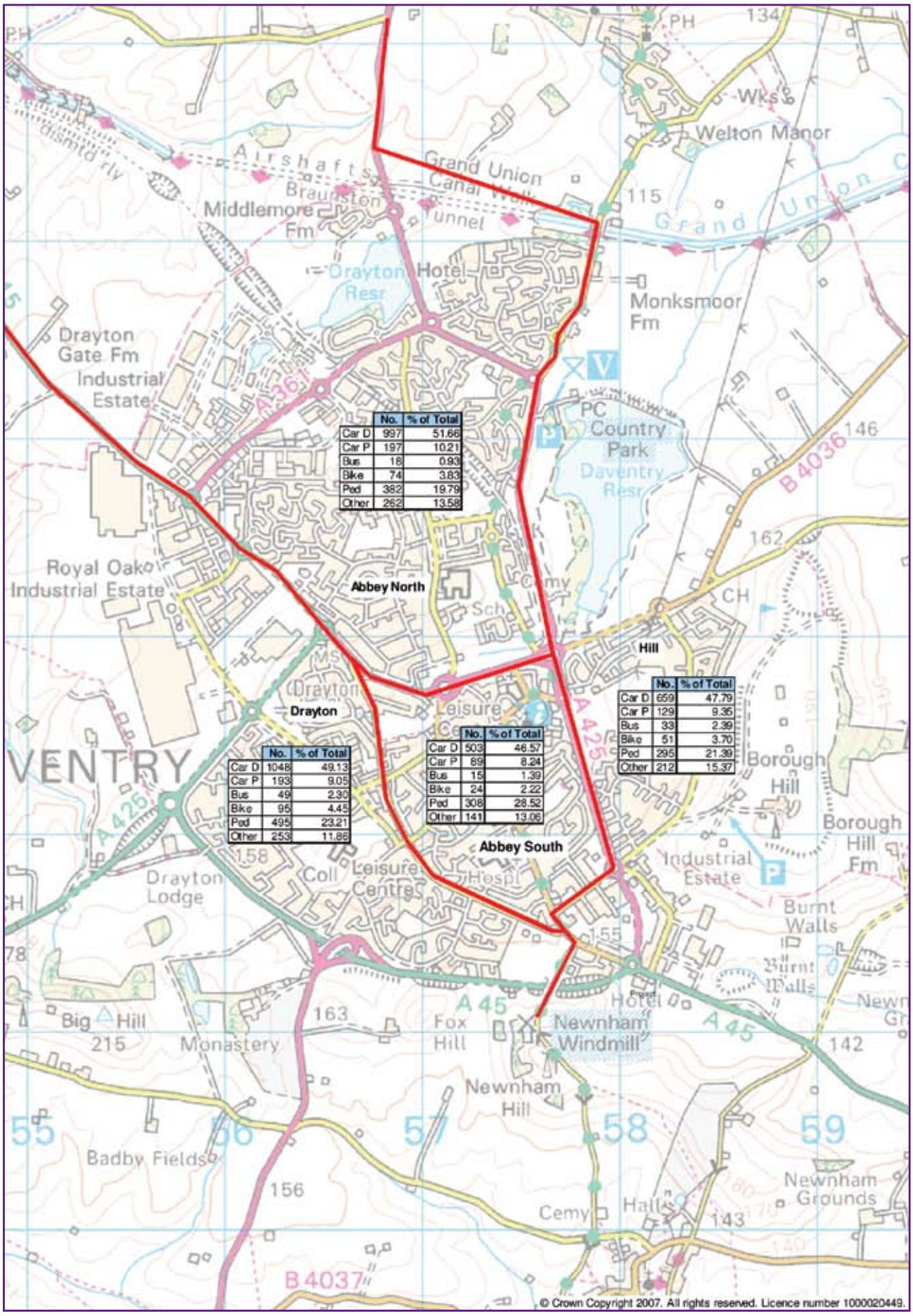
Table B1: Mode Share of Internal Journeys to Work

	Walk	Cycle	Bus	Car	Car Passenger	Other	Total
Abbey North	19.8%	3.8%	0.9%	51.7%	10.2%	13.6%	100%
Abbey South	28.5%	2.2%	1.4%	46.6%	8.2%	13.1%	100%
Drayton	23.2%	4.5%	2.3%	49.1%	9.0%	11.9%	100%
Hill	21.4%	3.7%	2.4%	47.8%	9.4%	15.4%	100%
Total	**22.7%**	**3.7%**	**1.8%**	**49.2%**	**9.3%**	**13.3%**	**100%**

T1 - Employees Internal Movement to Work

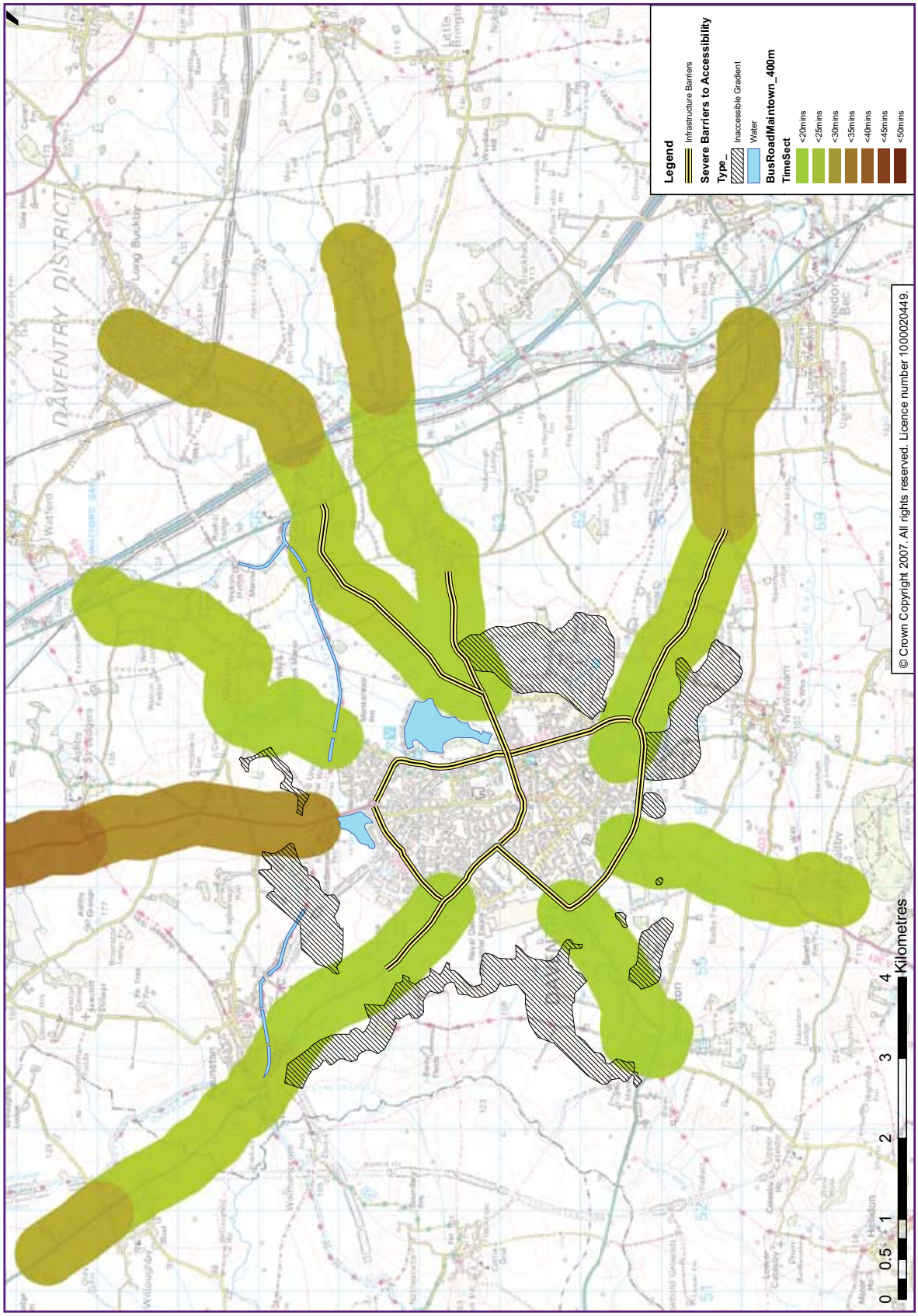


T2 - Employees Internal Movement Modeshare

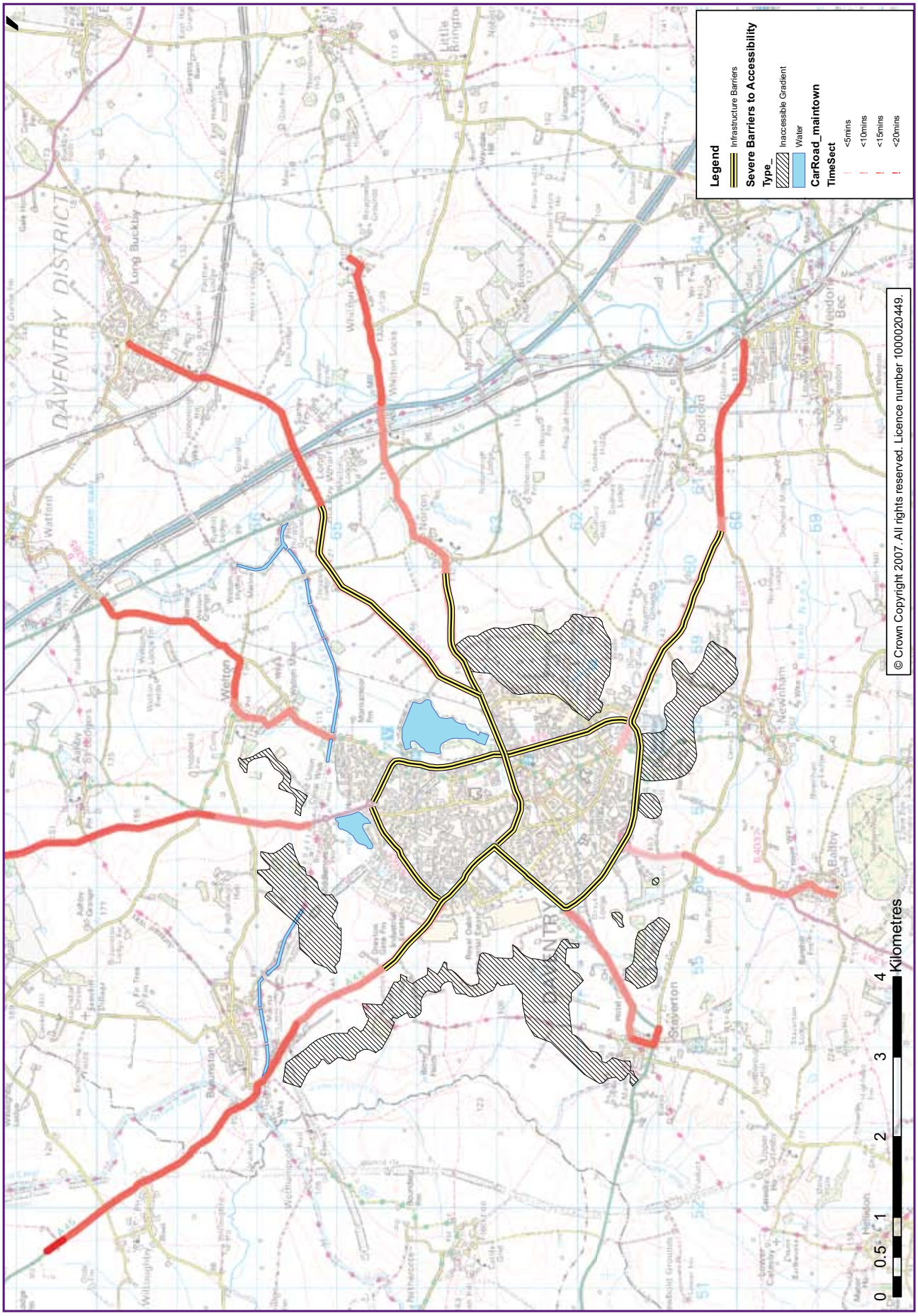


Appendix C Sustainable Development Scenario

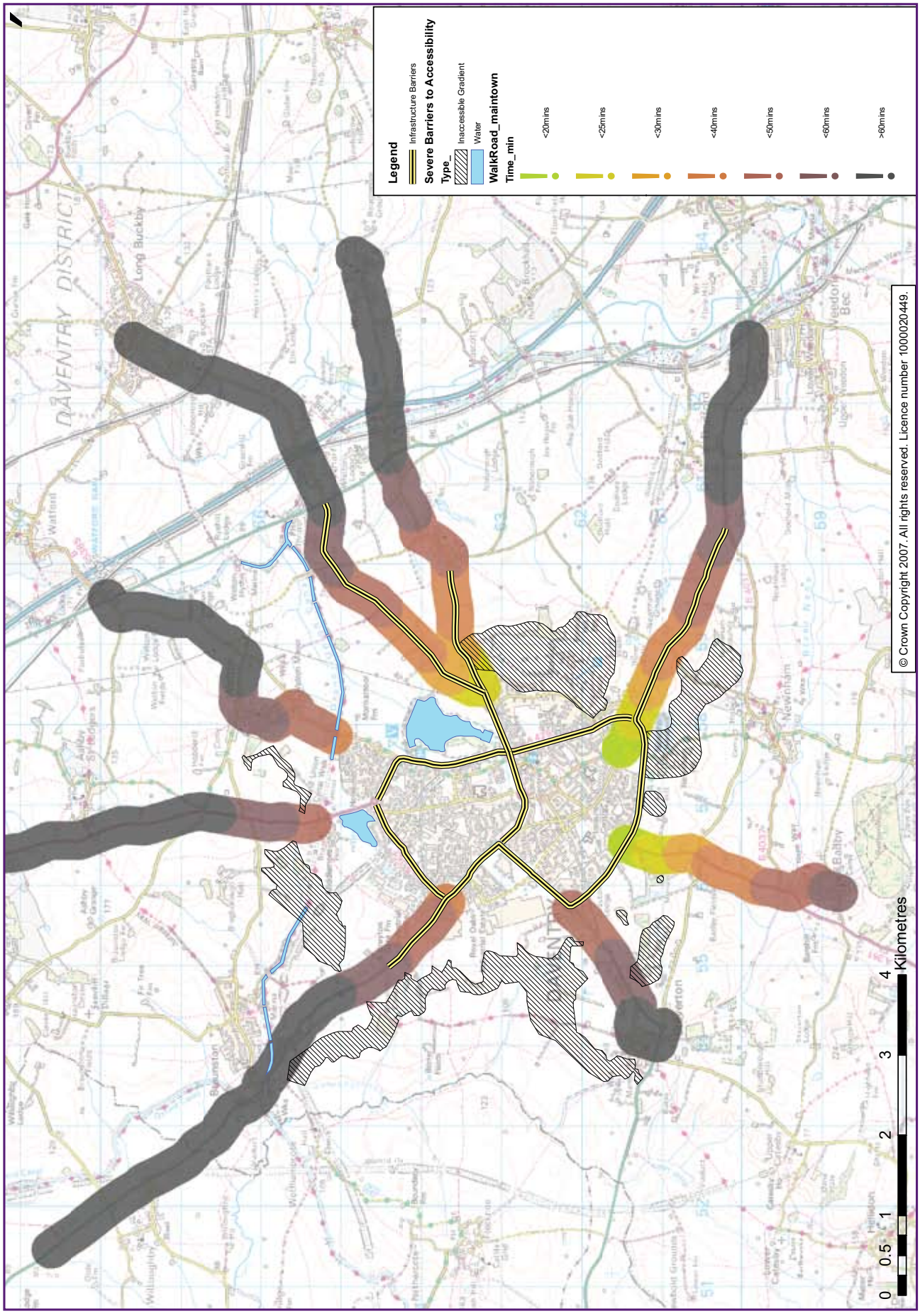
T1 - Town Centre Accessibility by Bus:



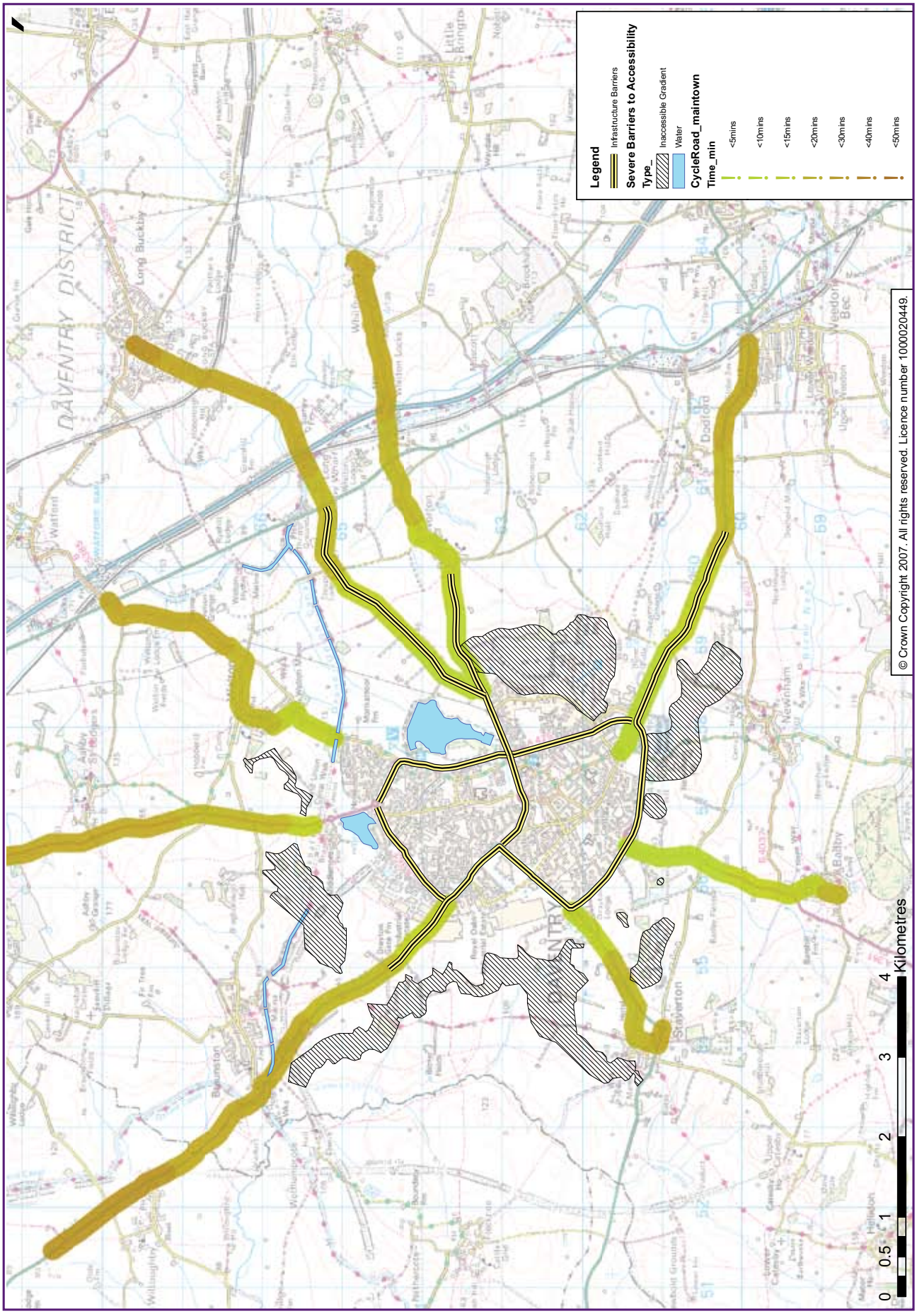
T2 - Town Centre
Accessibility by Car



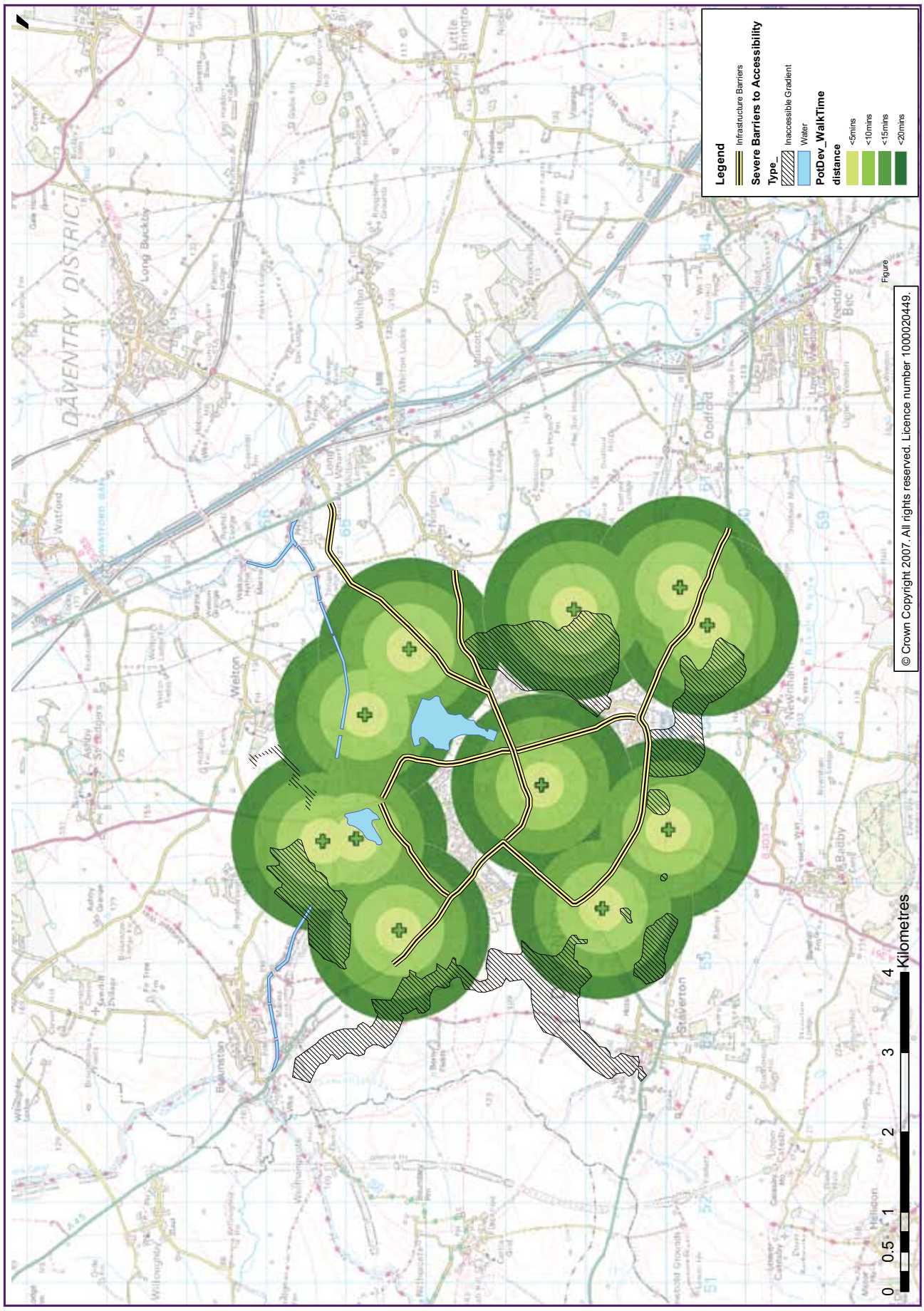
T3 - Town Centre
Accessibility by Foot



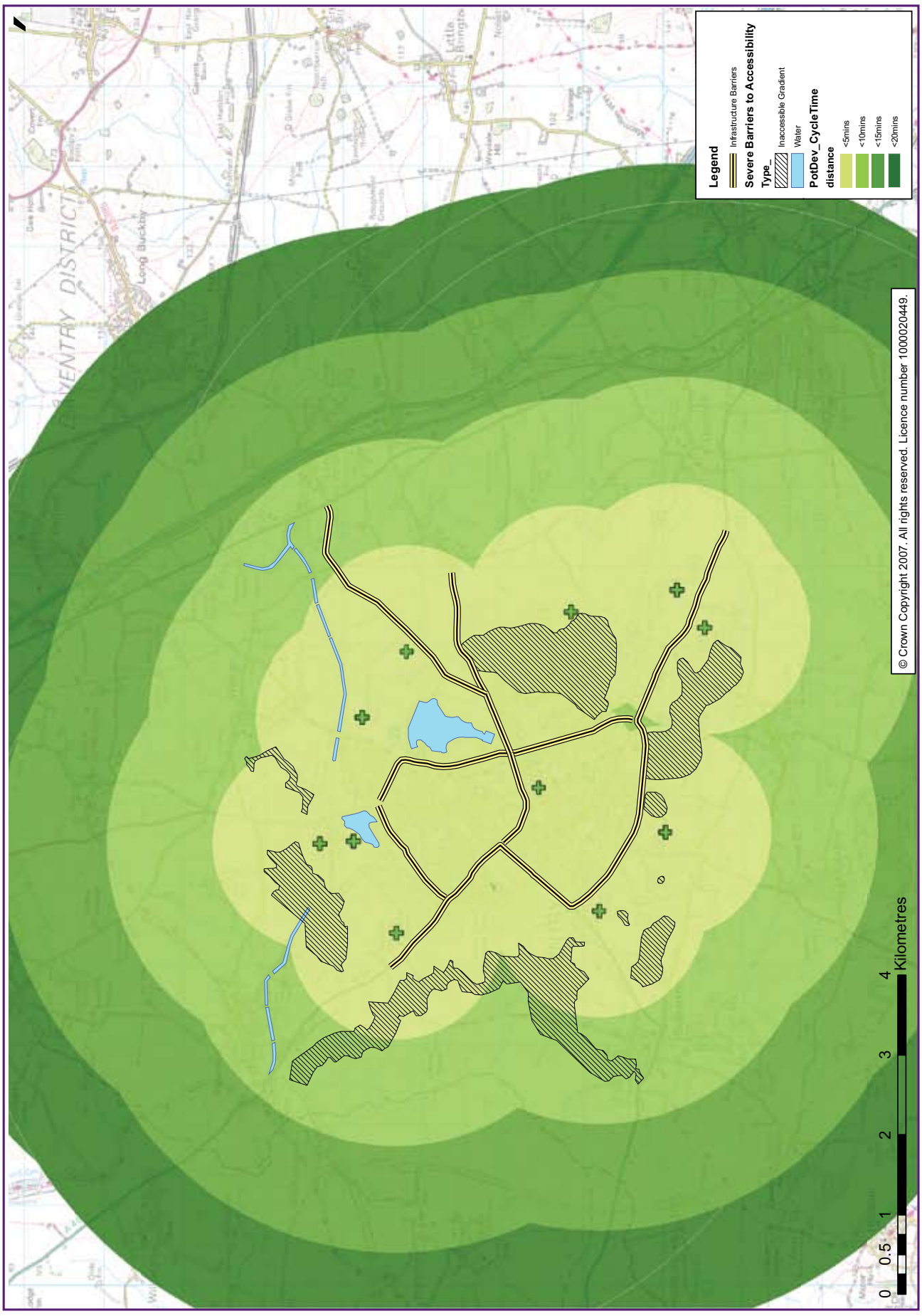
T4 - Town Centre
Accessibility by Cycle



T5 - Potential Development Accessibility By Foot

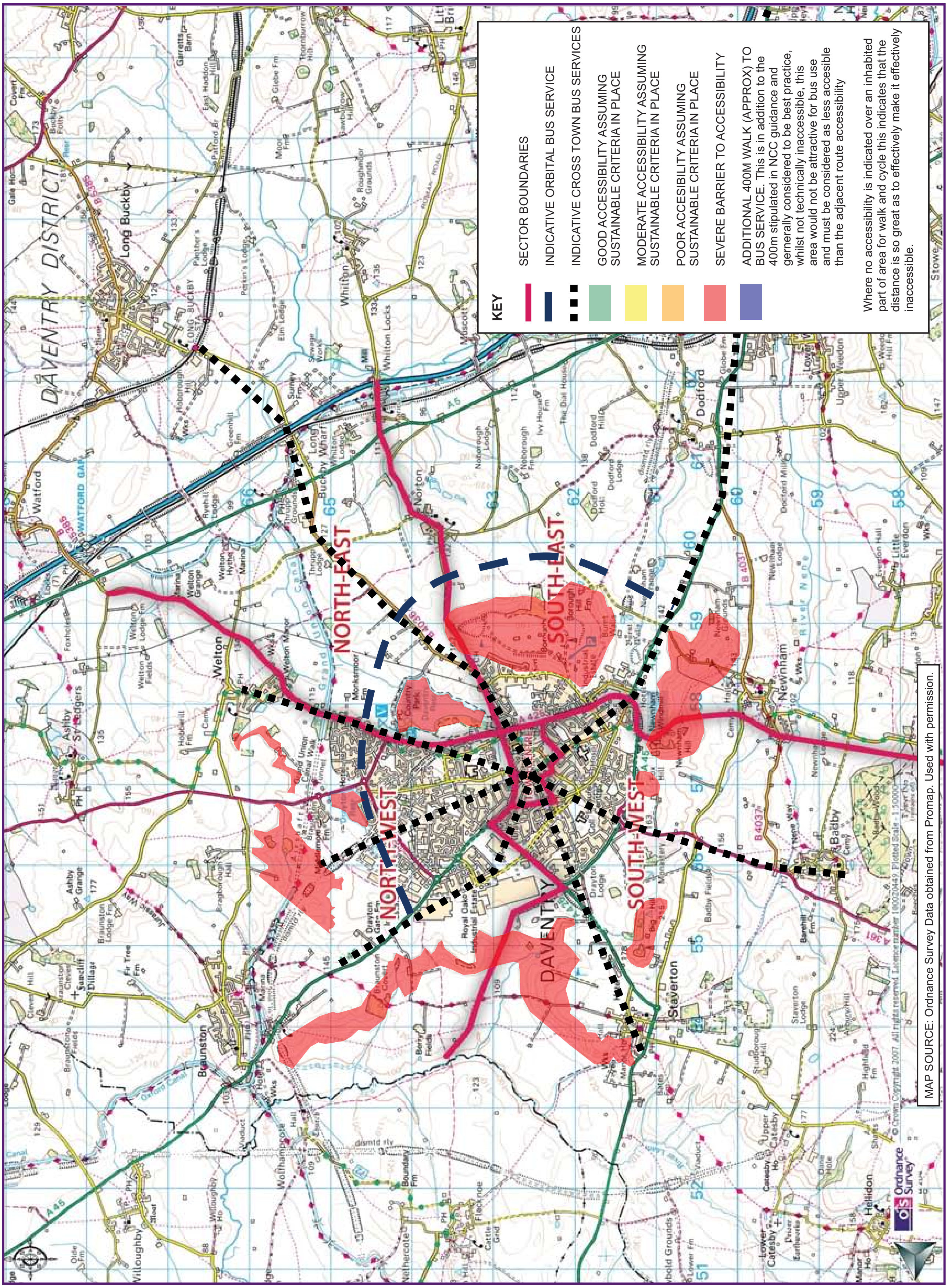


T6 - Potential Development Accessibility By Cycle

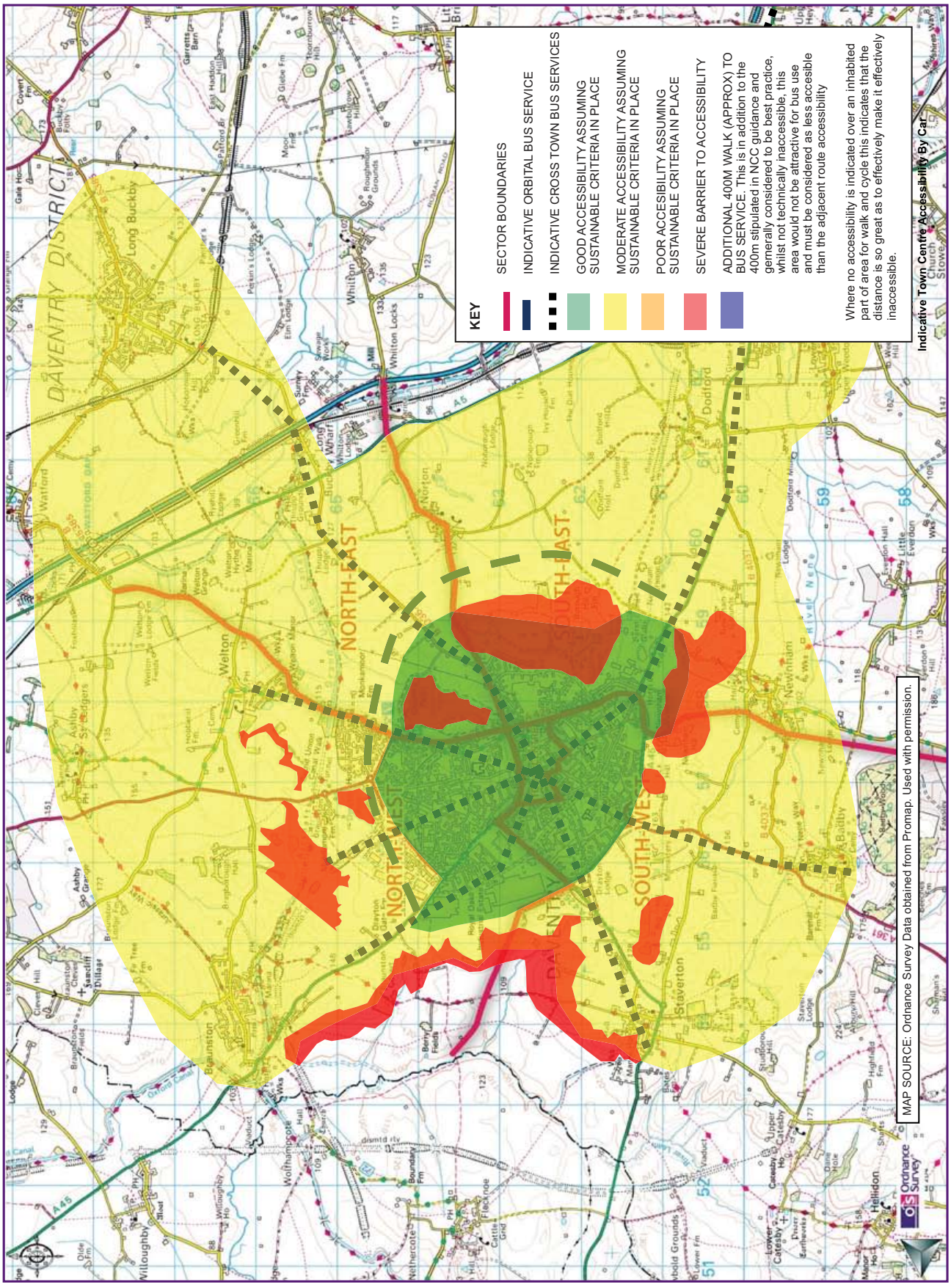


Appendix D Accessibility Mapping

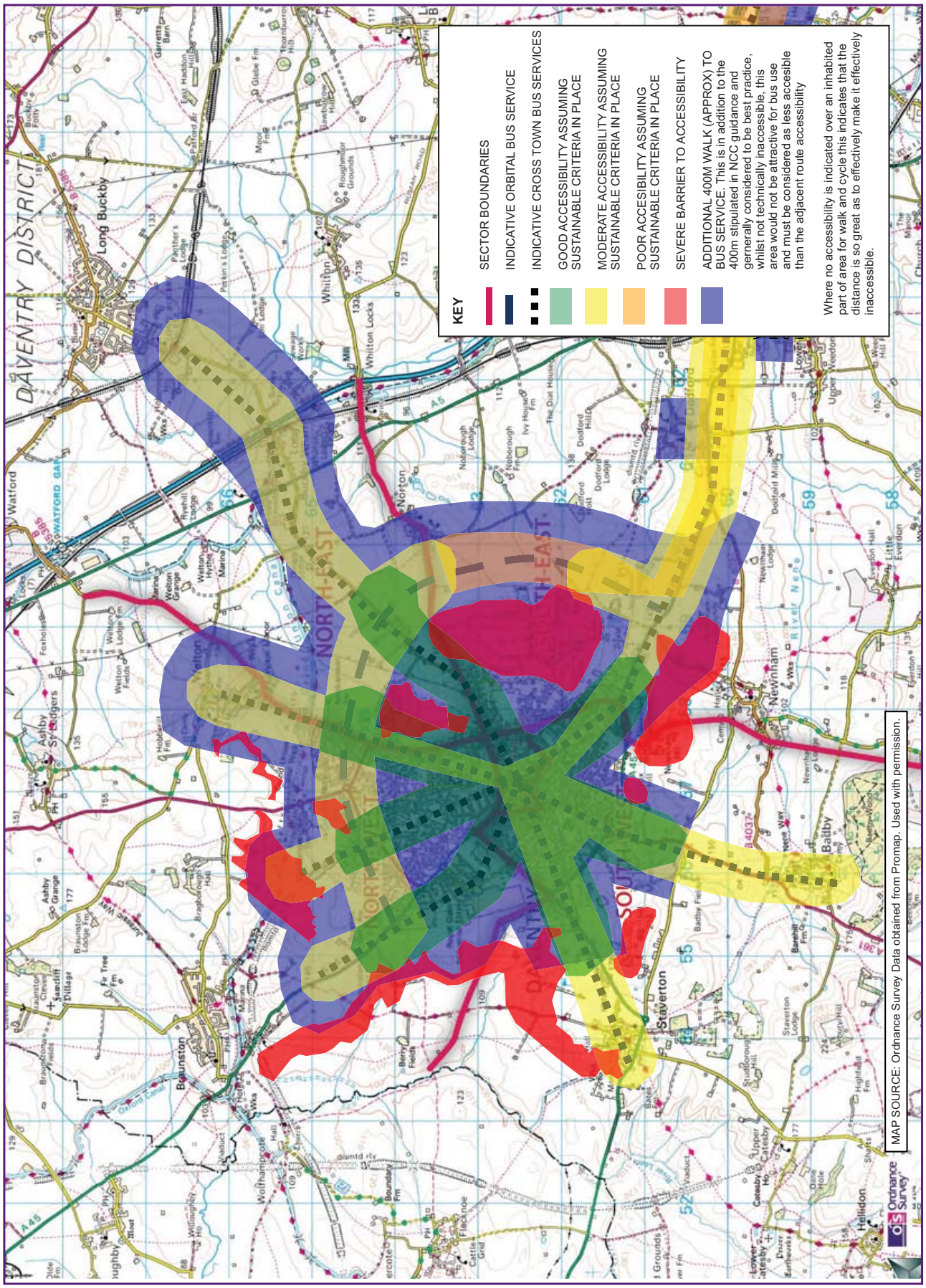
T9 - Town Centre Indicative Accesibility Summary



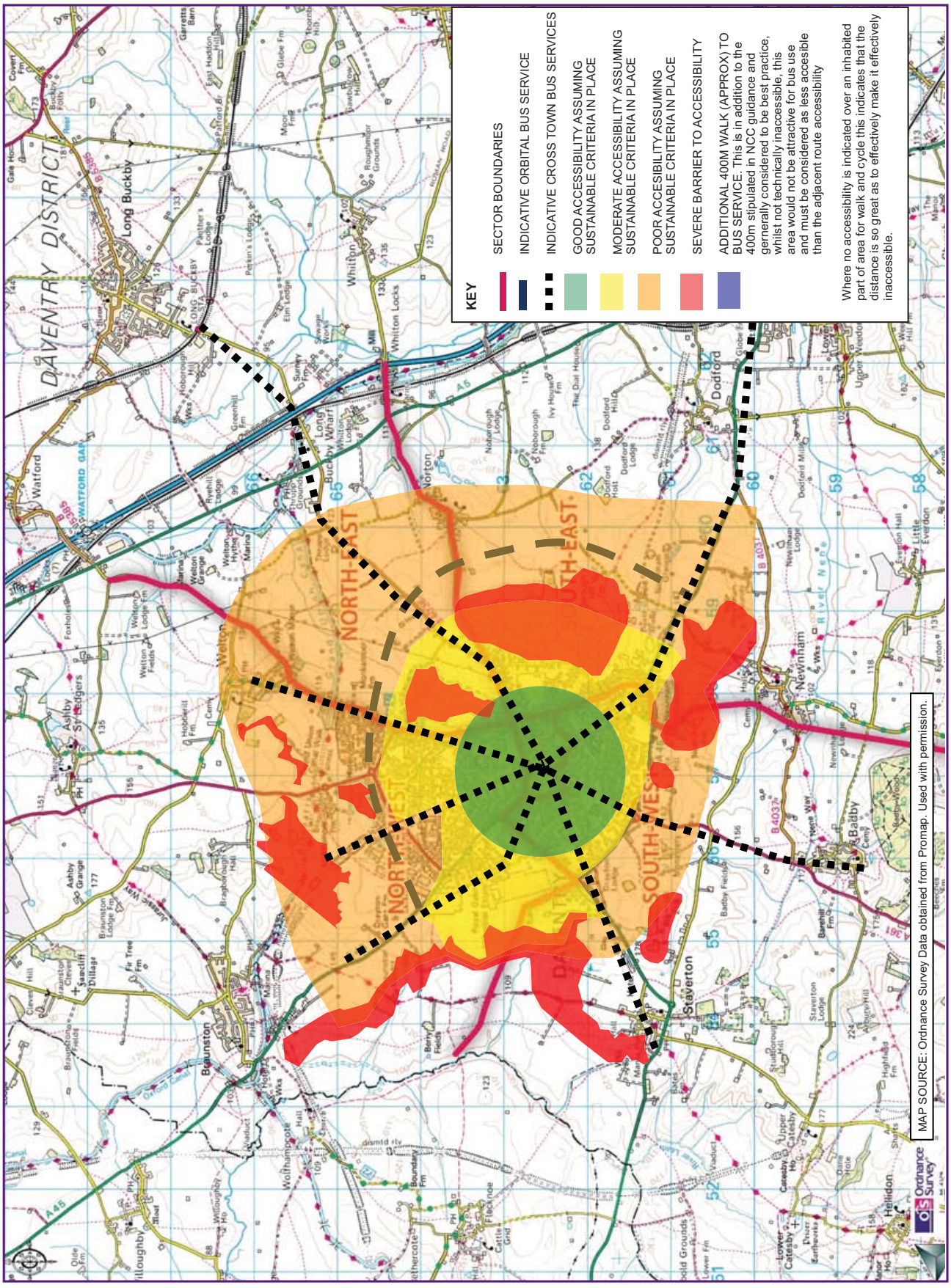
T10 - Indicative Town Centre Accessibility by Car



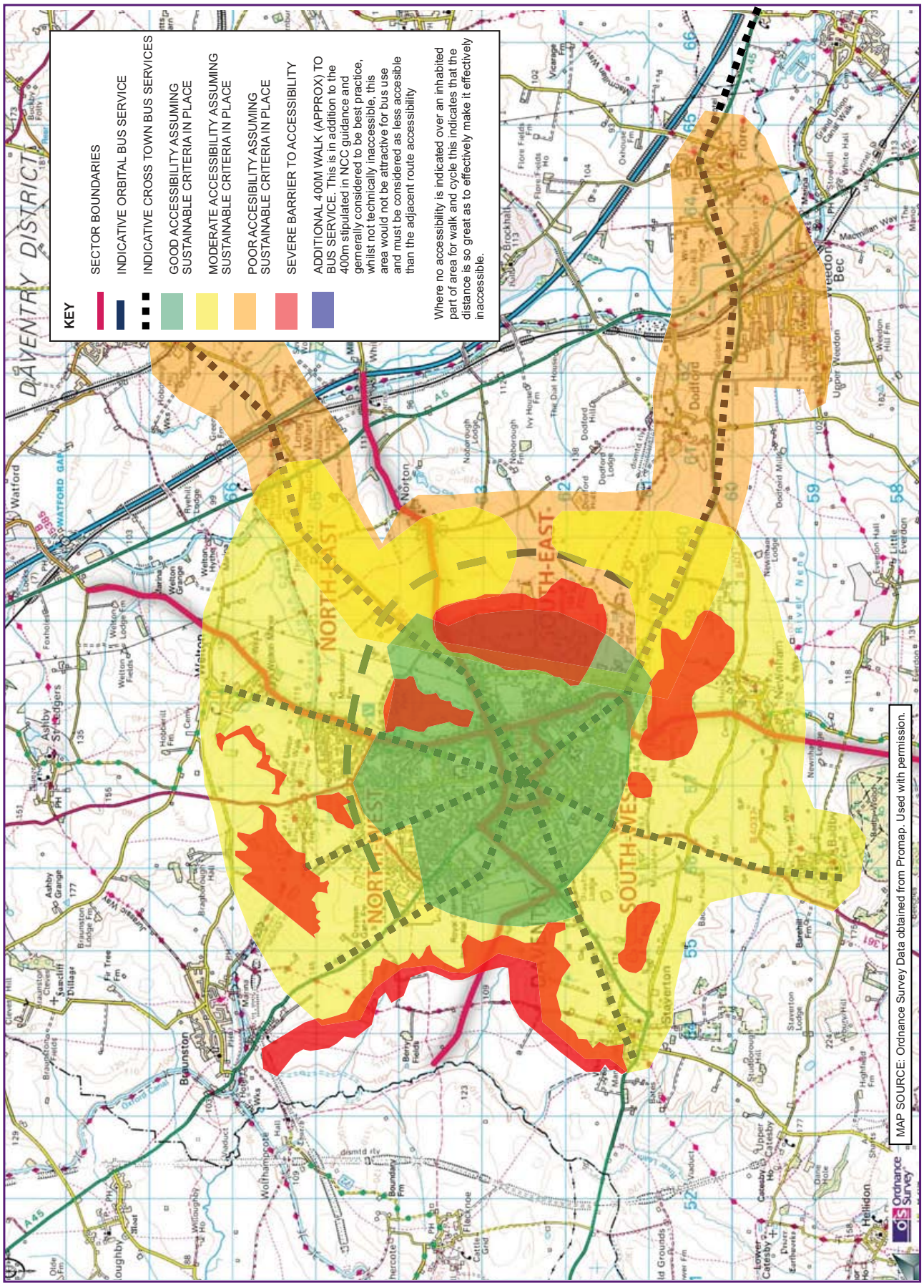
T11 - Indicative Town Centre Accessibility by Bus (assume 400m walk to stop)



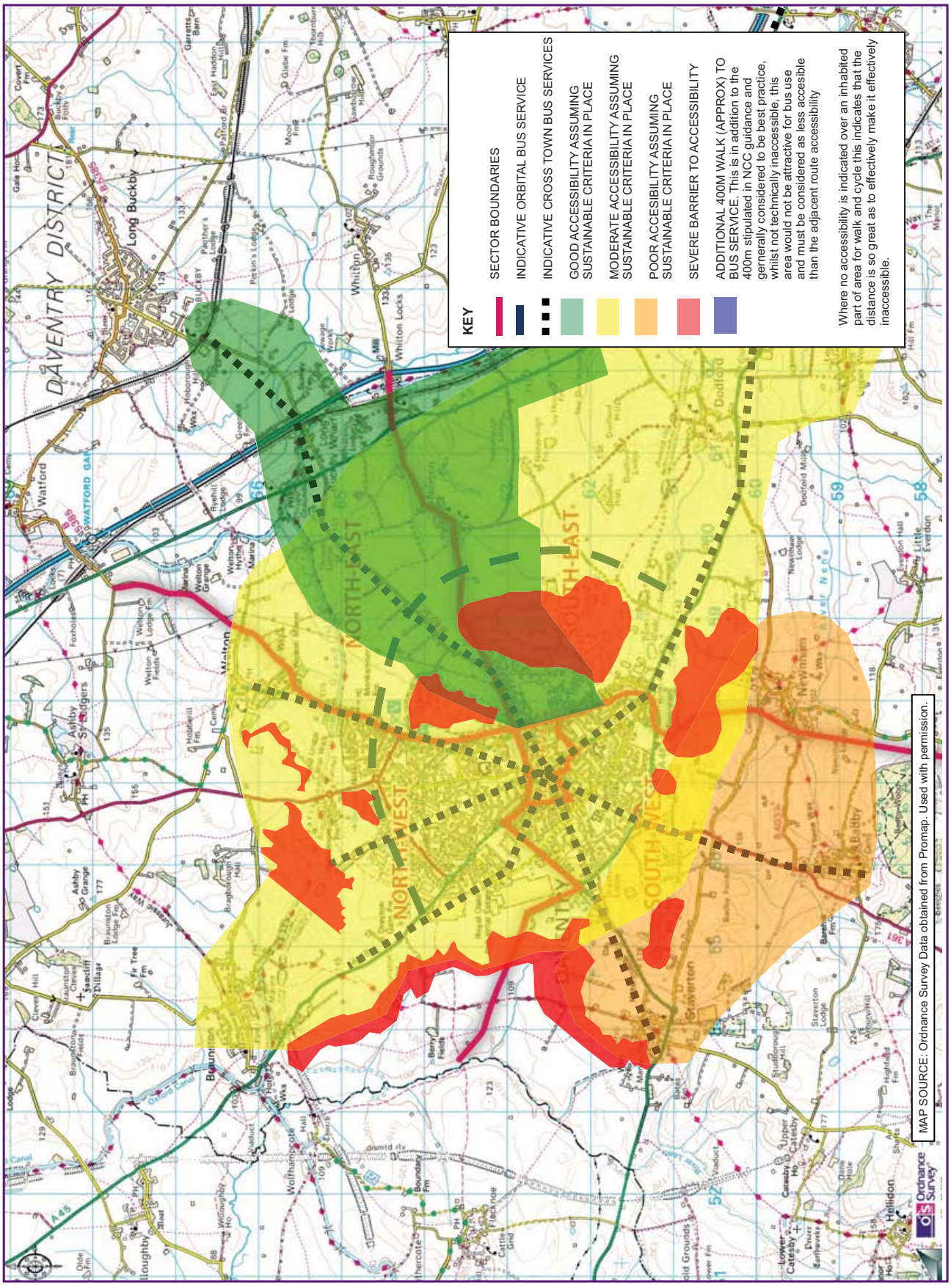
T12 - Indicative Town Centre Accessibility by Foot



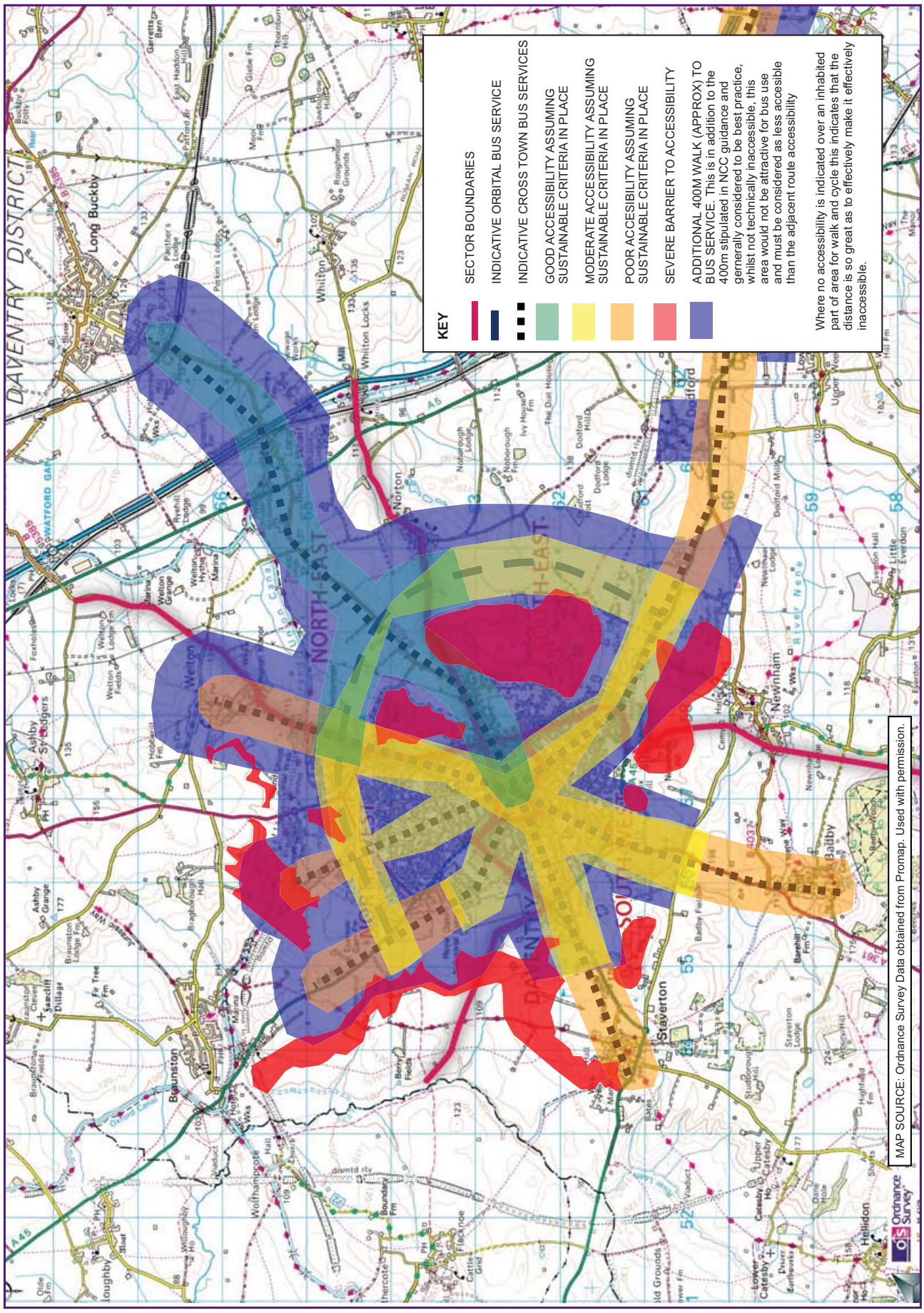
T13 - Indicative Town Centre Accessibility by Cycle



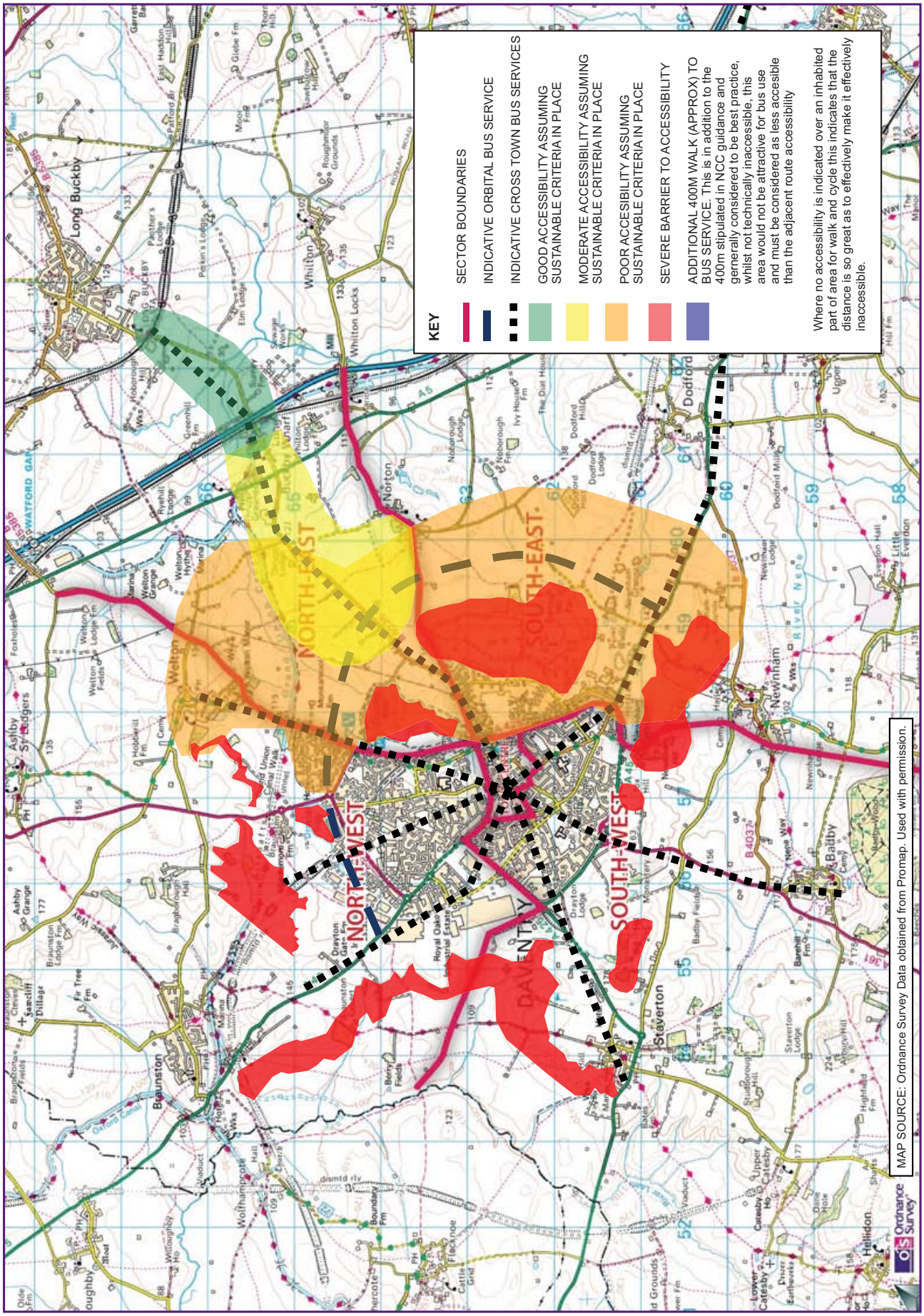
T14 - Indicative Town Centre Accessibility by Car



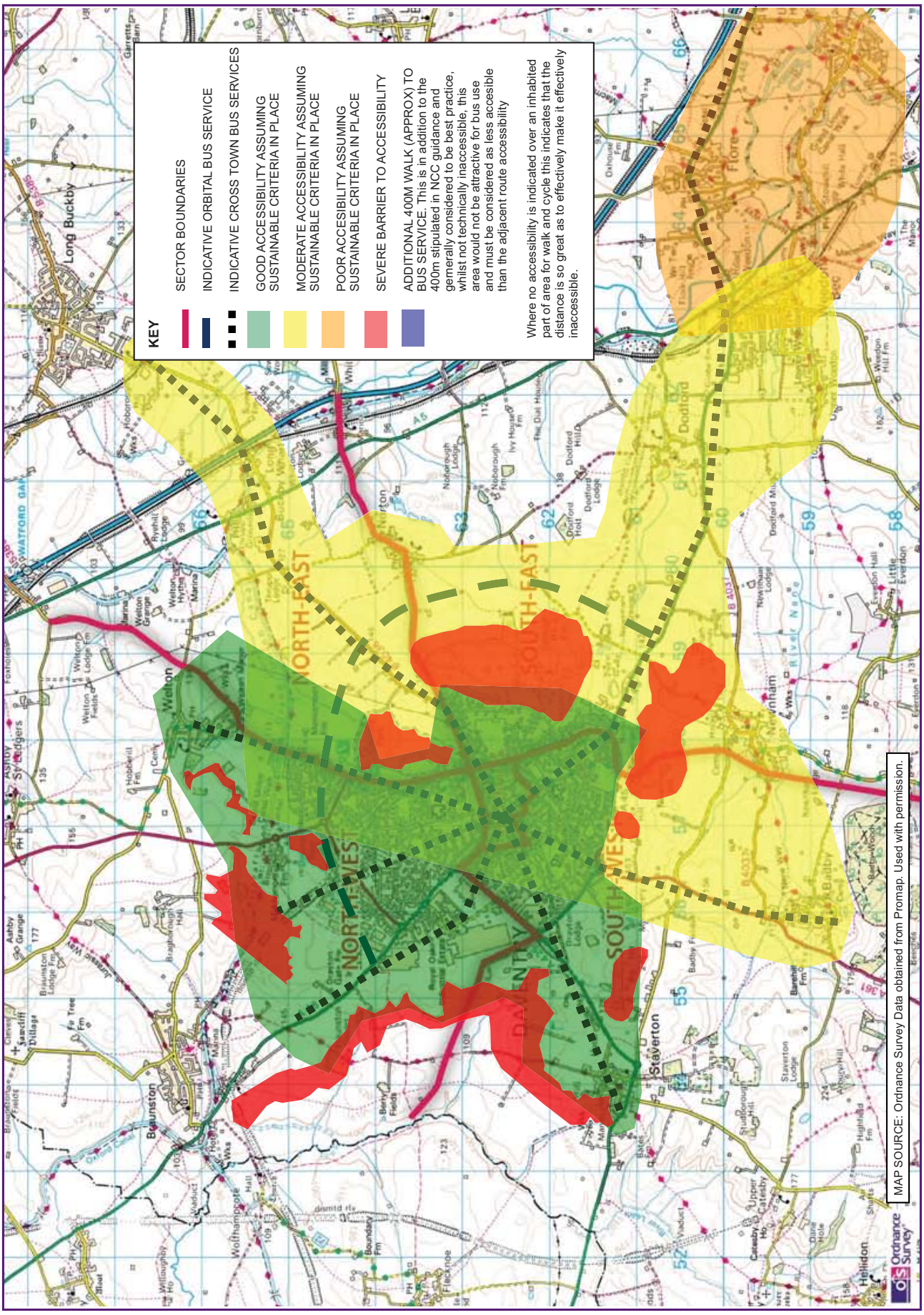
T15 - Indicative Long Buckby Station Accessibility byBus (assumes 400m walk to stop)



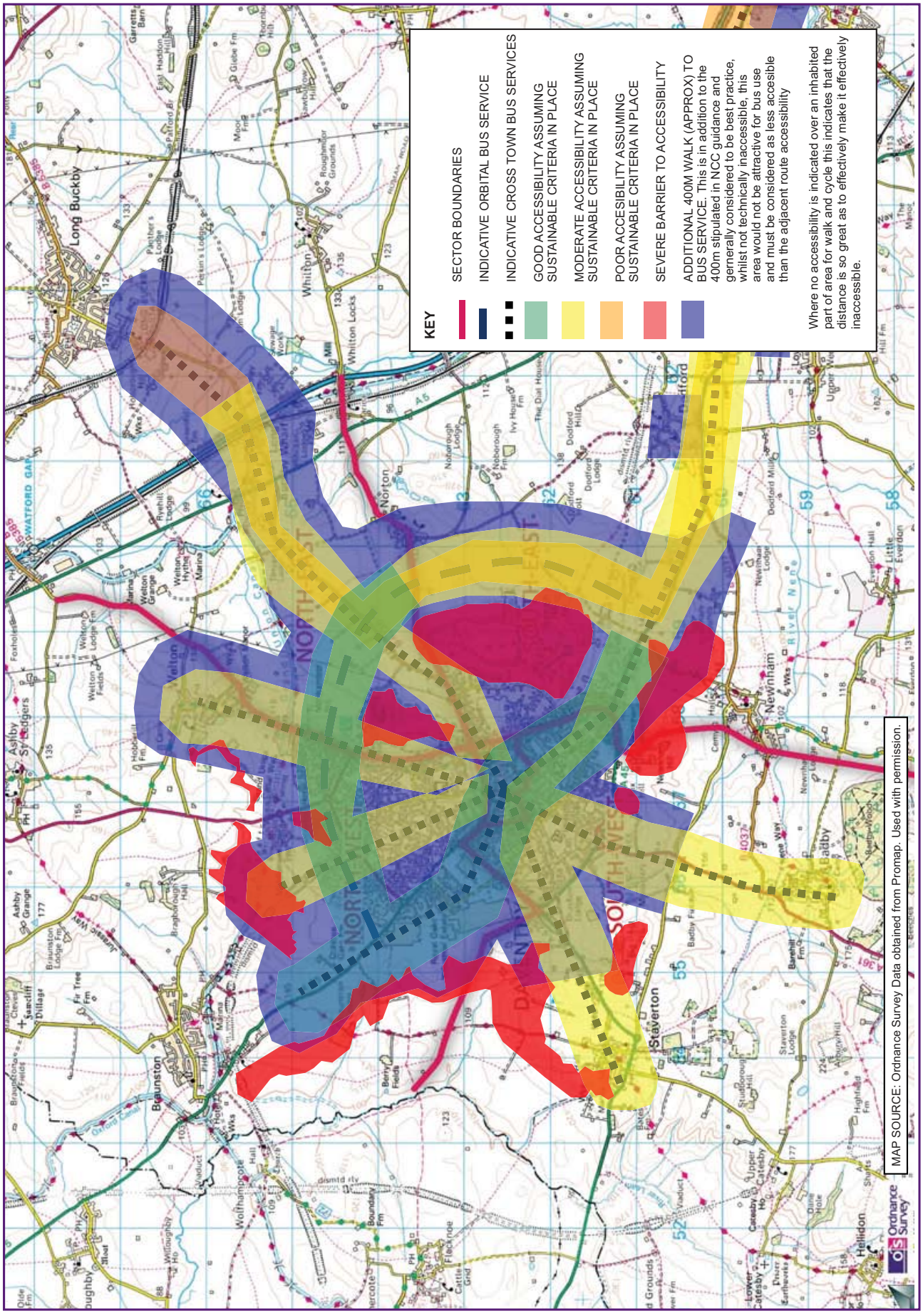
T16 - Indicative Long Buckby Station Accessibility by Foot



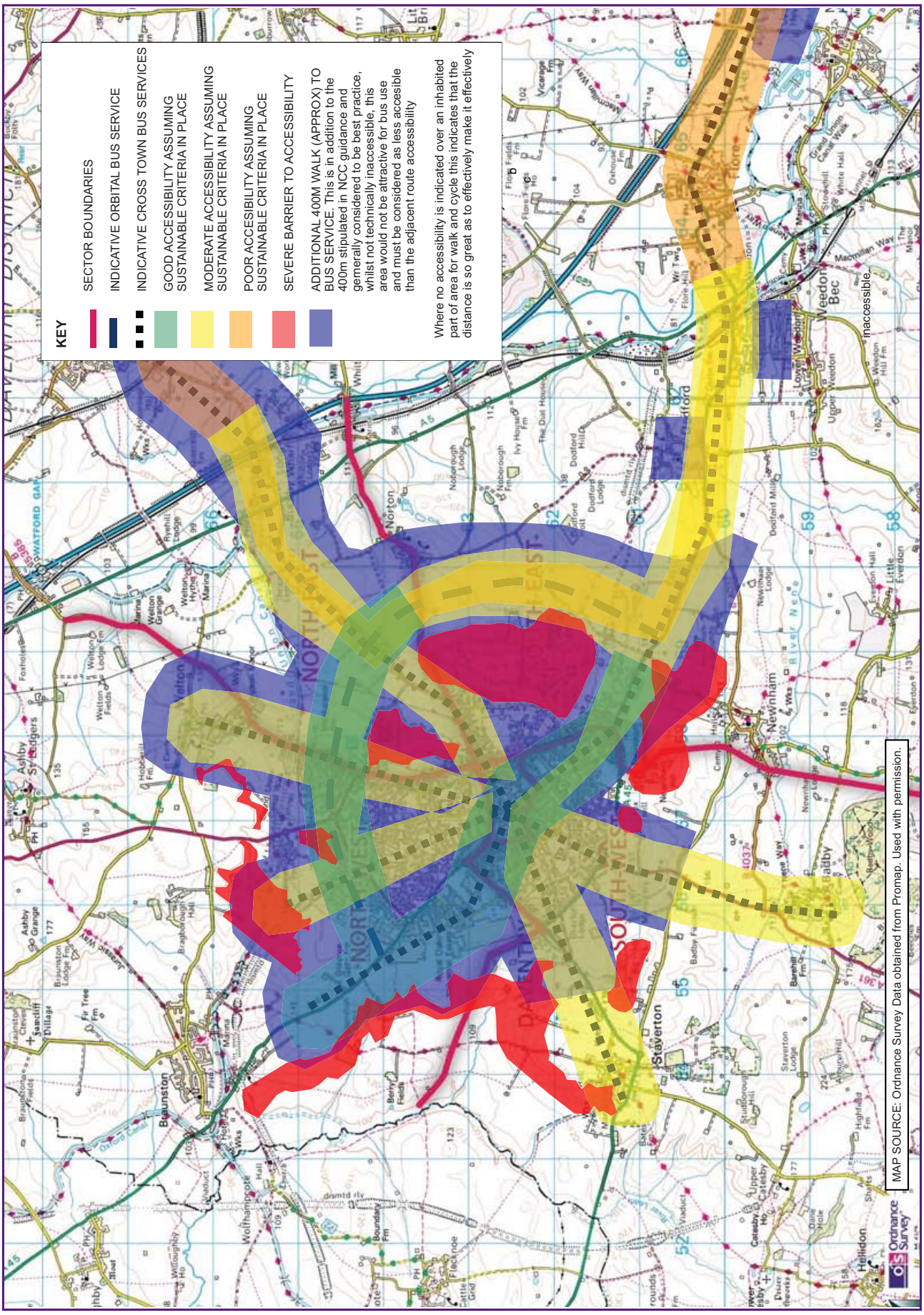
T17 - Indicative Long Buckby Station Accessibility by Cycle



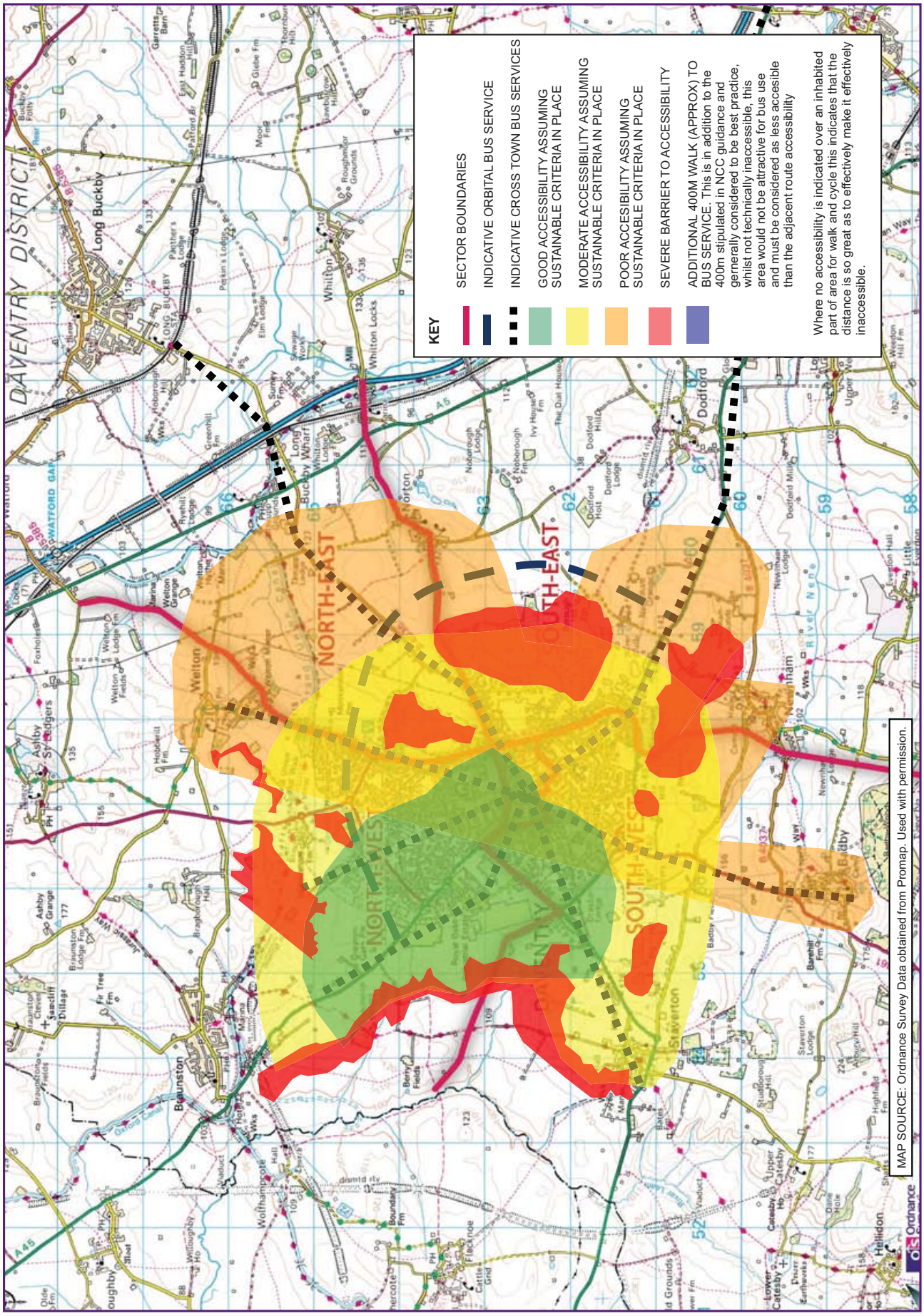
T18 - Indicative Western Employment Area Accessibility by Car



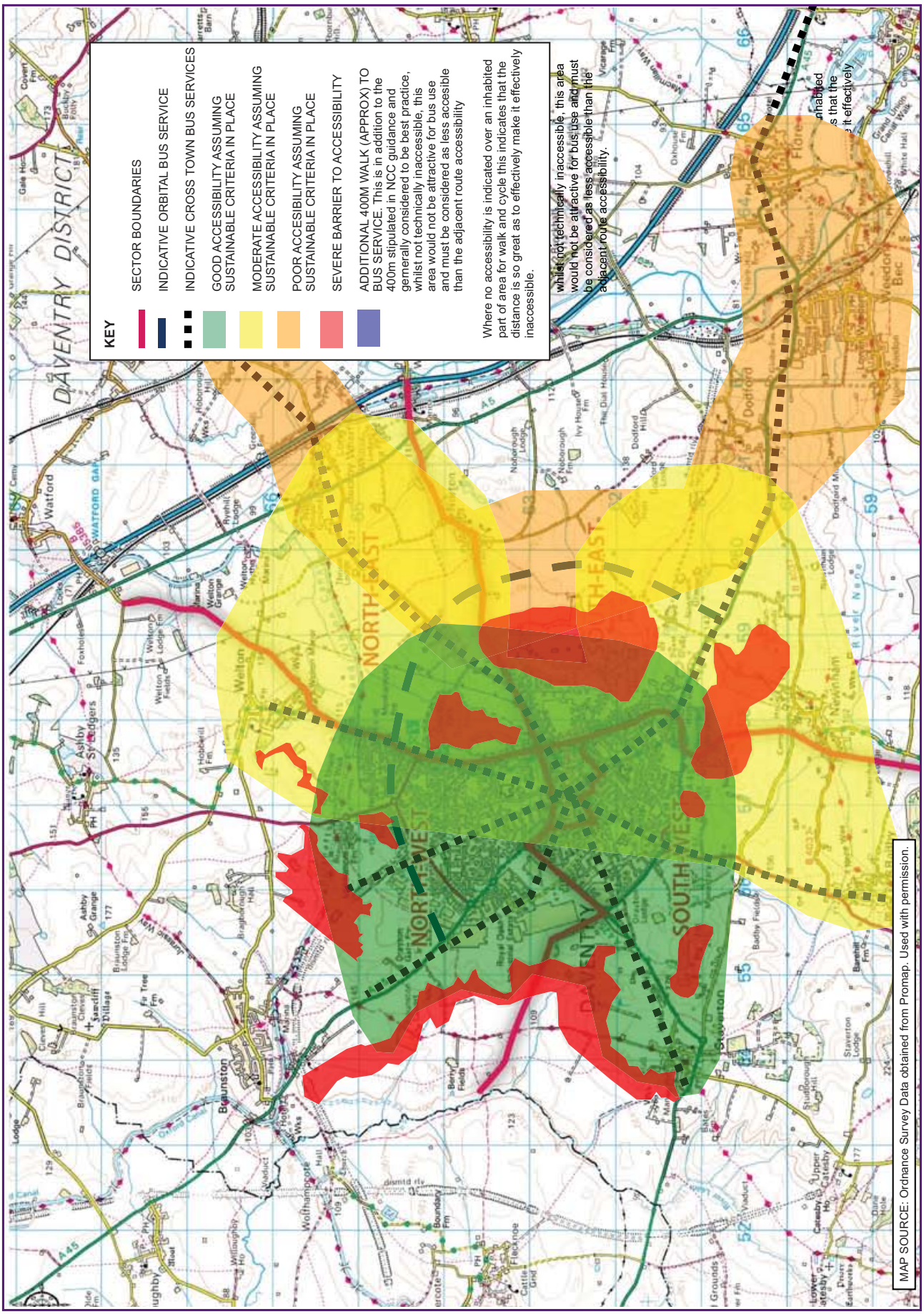
T19 - Indicative Western Employment Area Accessibility by Bus assumes 400m walk to stop)



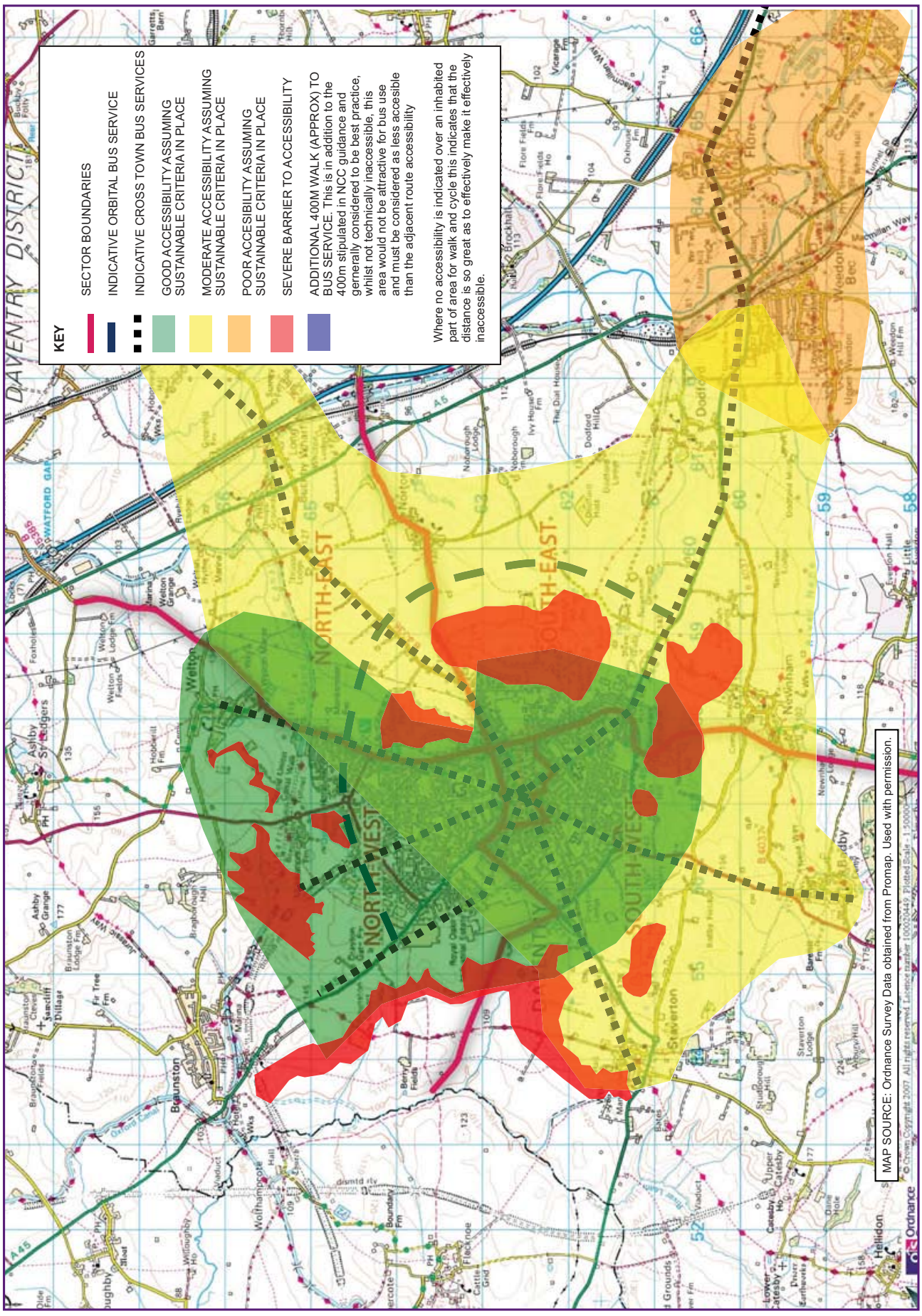
T20 - Indicative Western Employment Area Accessibility by Foot



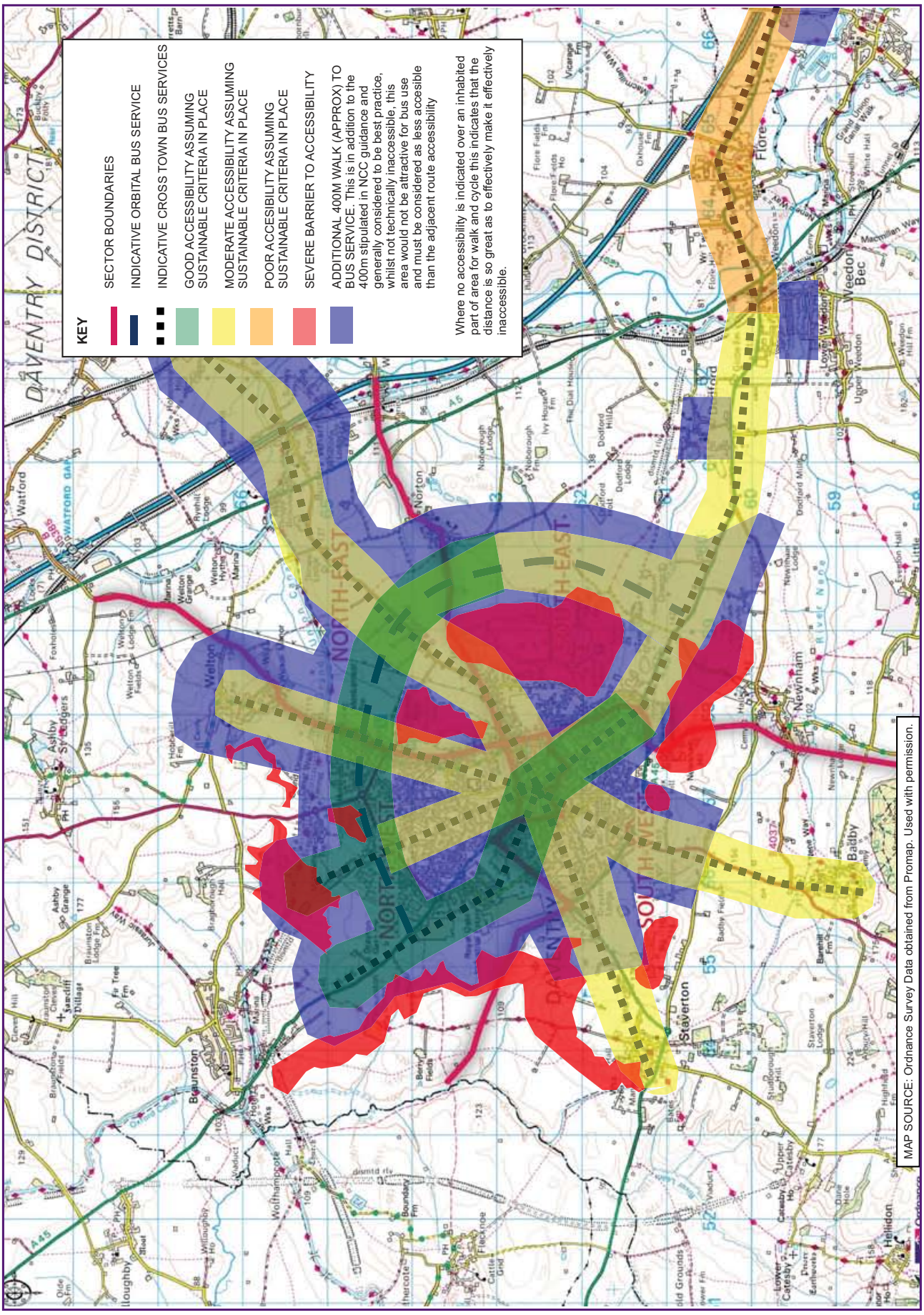
T21 - Indicative Western Employment Area Accessibility By Cycle



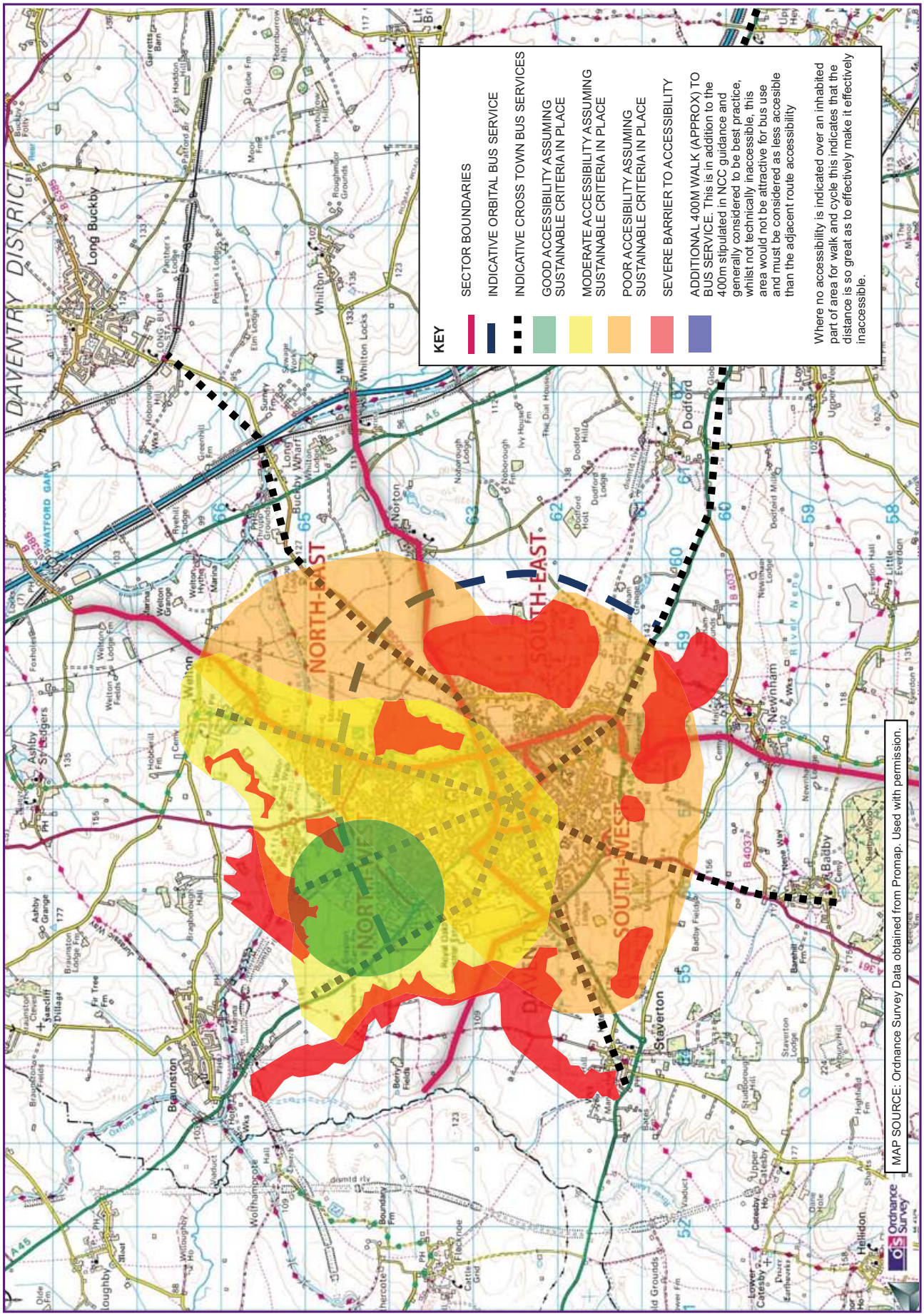
T22 - Indicative Western Employment Area Accessibility by Car



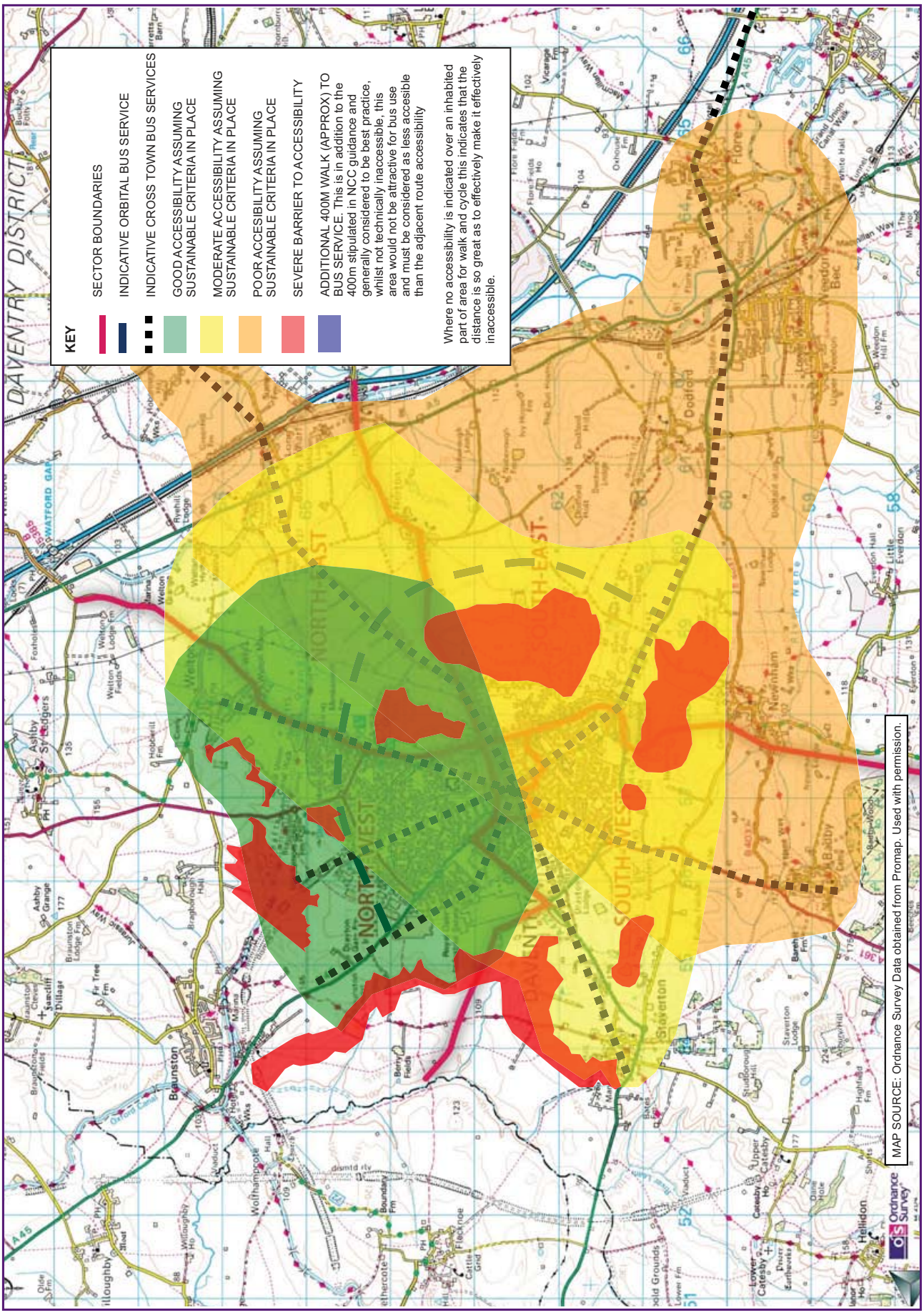
T23 - Indicative Western Employment Area Accessibility by by Bus (assumes 400m walk to stop)



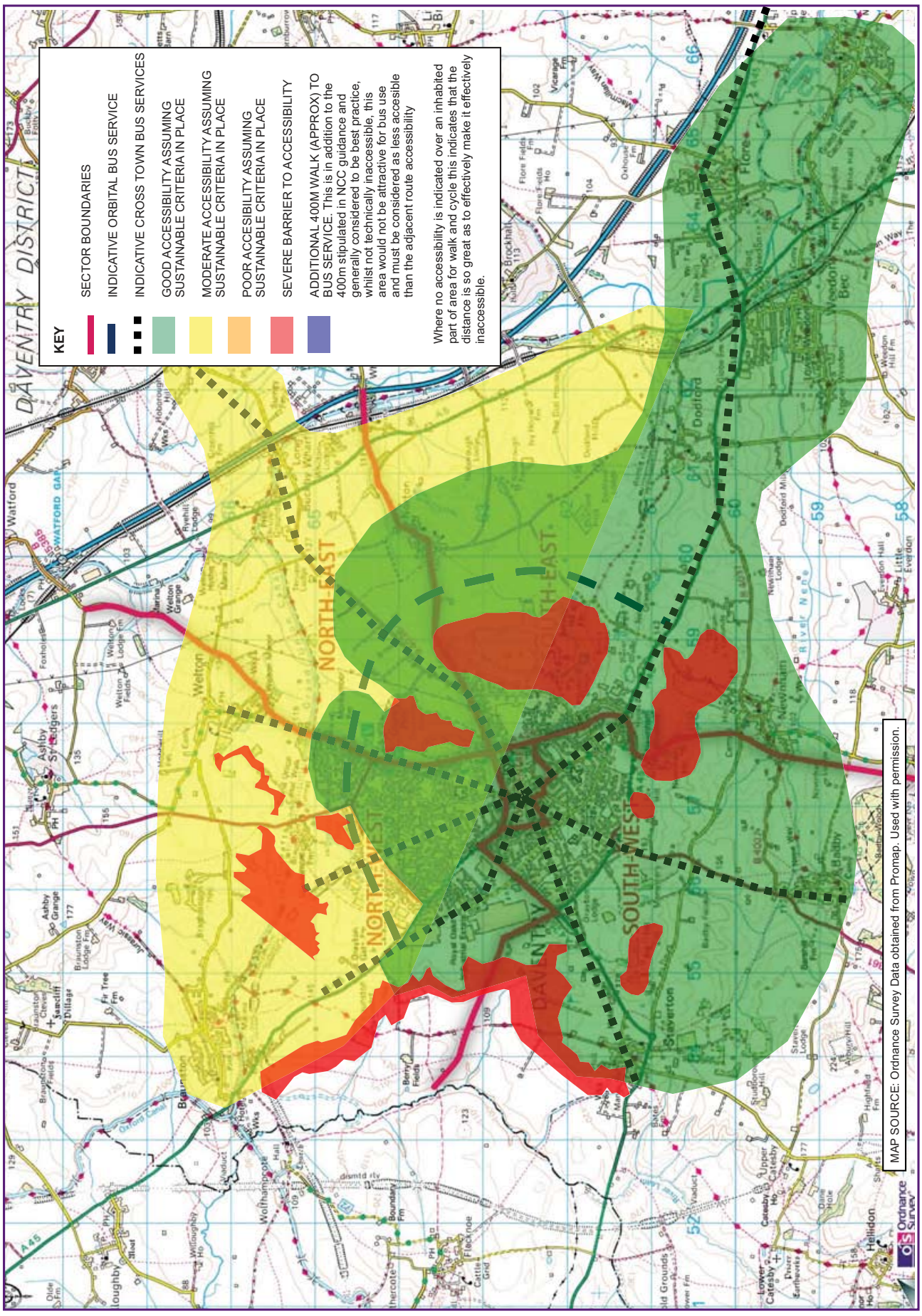
T24 - Indicative North-Western Employment Area Accessibility by Foot



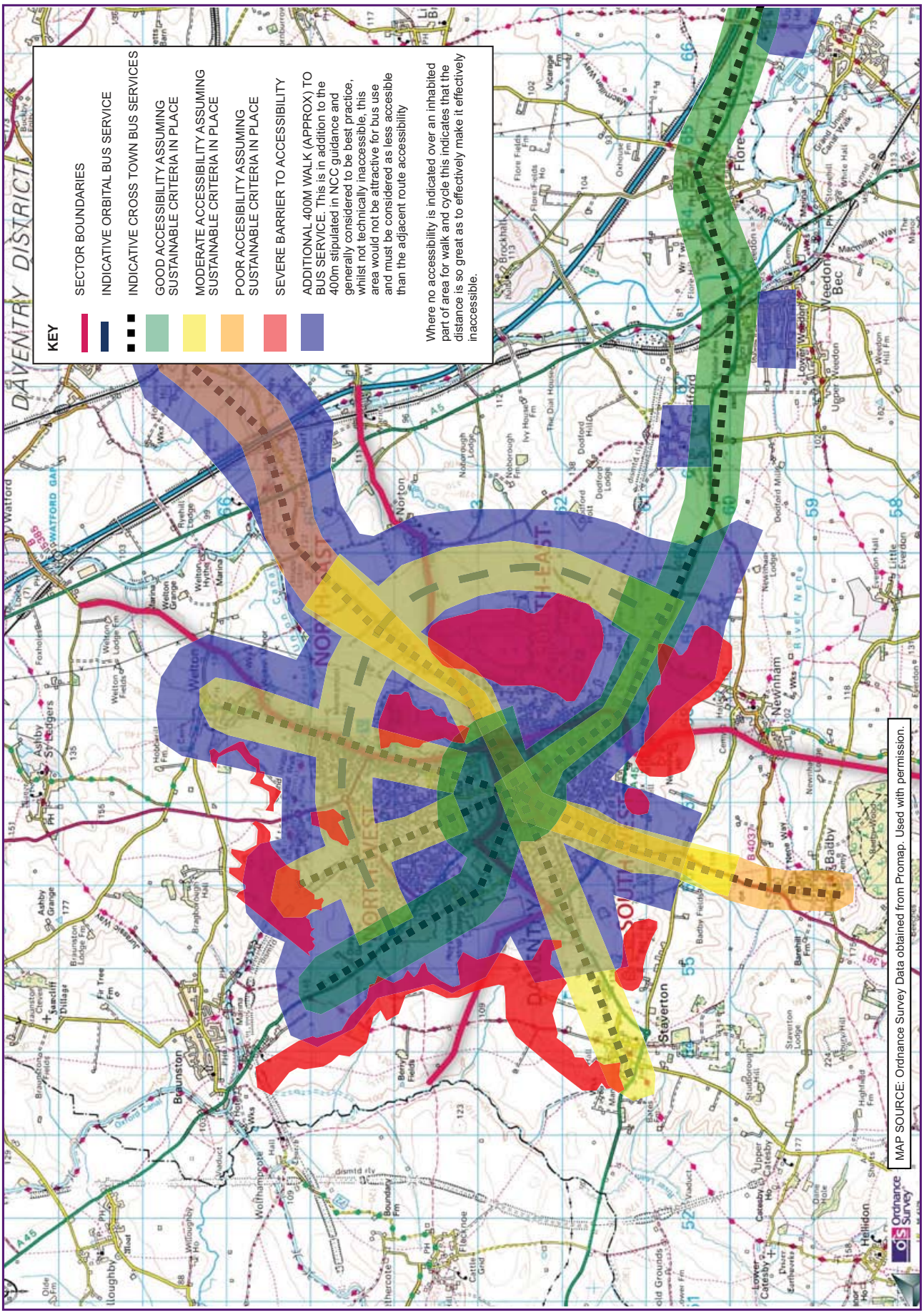
T25 - Indicative North-Western Employment Area Accessibility by Cycle



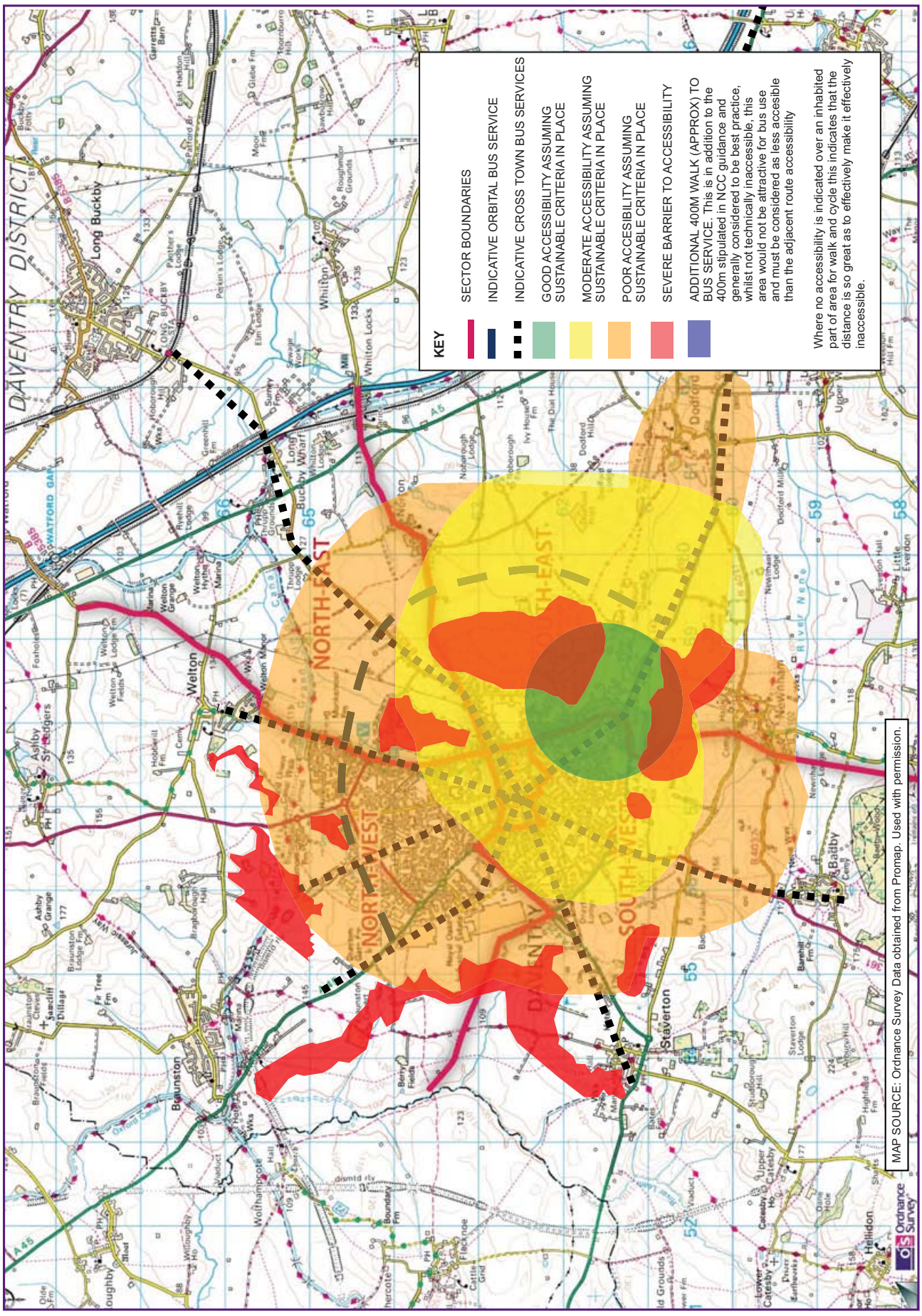
T26 - Indicative North-Western Employment Area Accessibility by Car



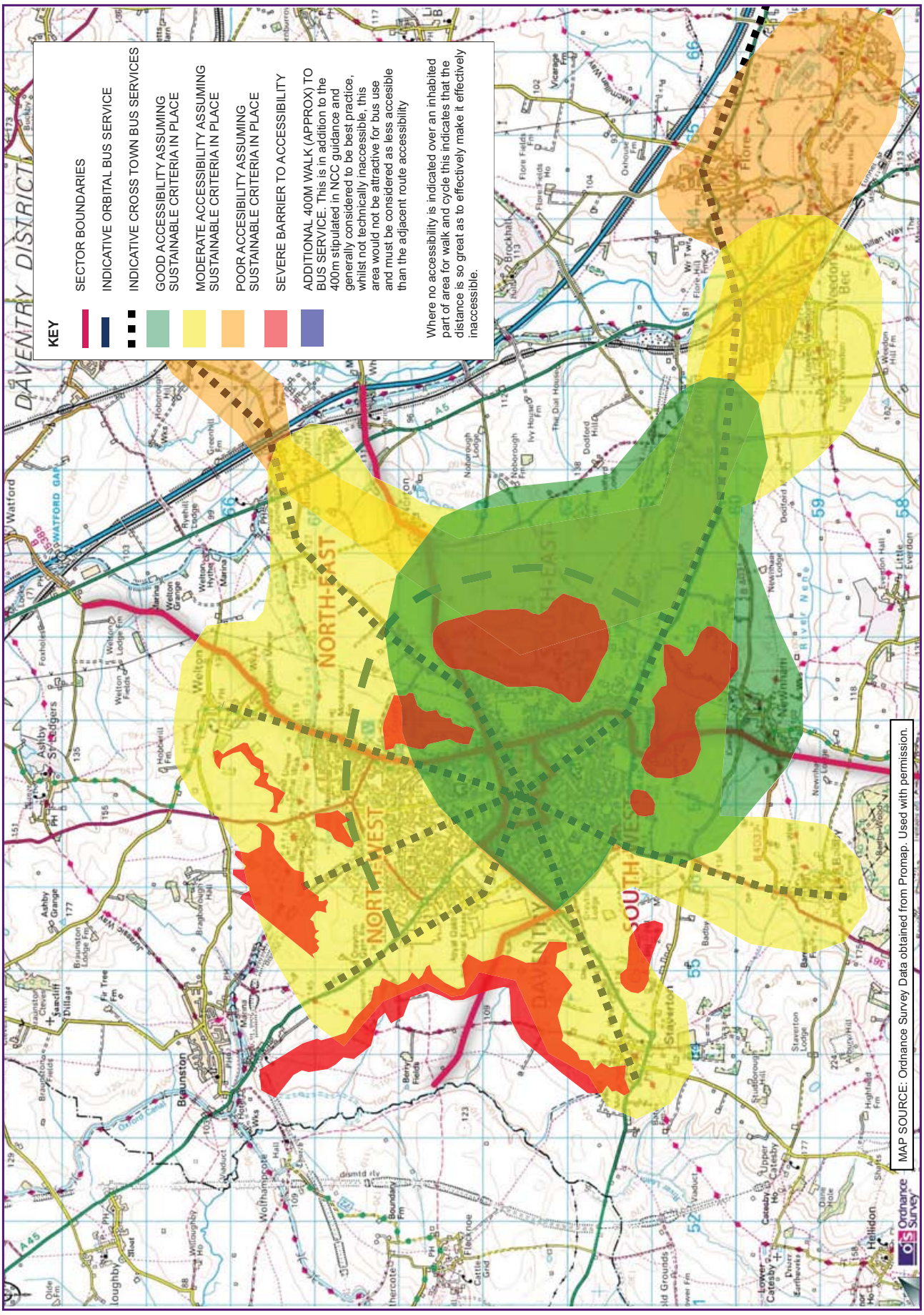
T27 - Indicative North-Western Employment Area
Accessibility by Bus (assume 400m walk to stop)



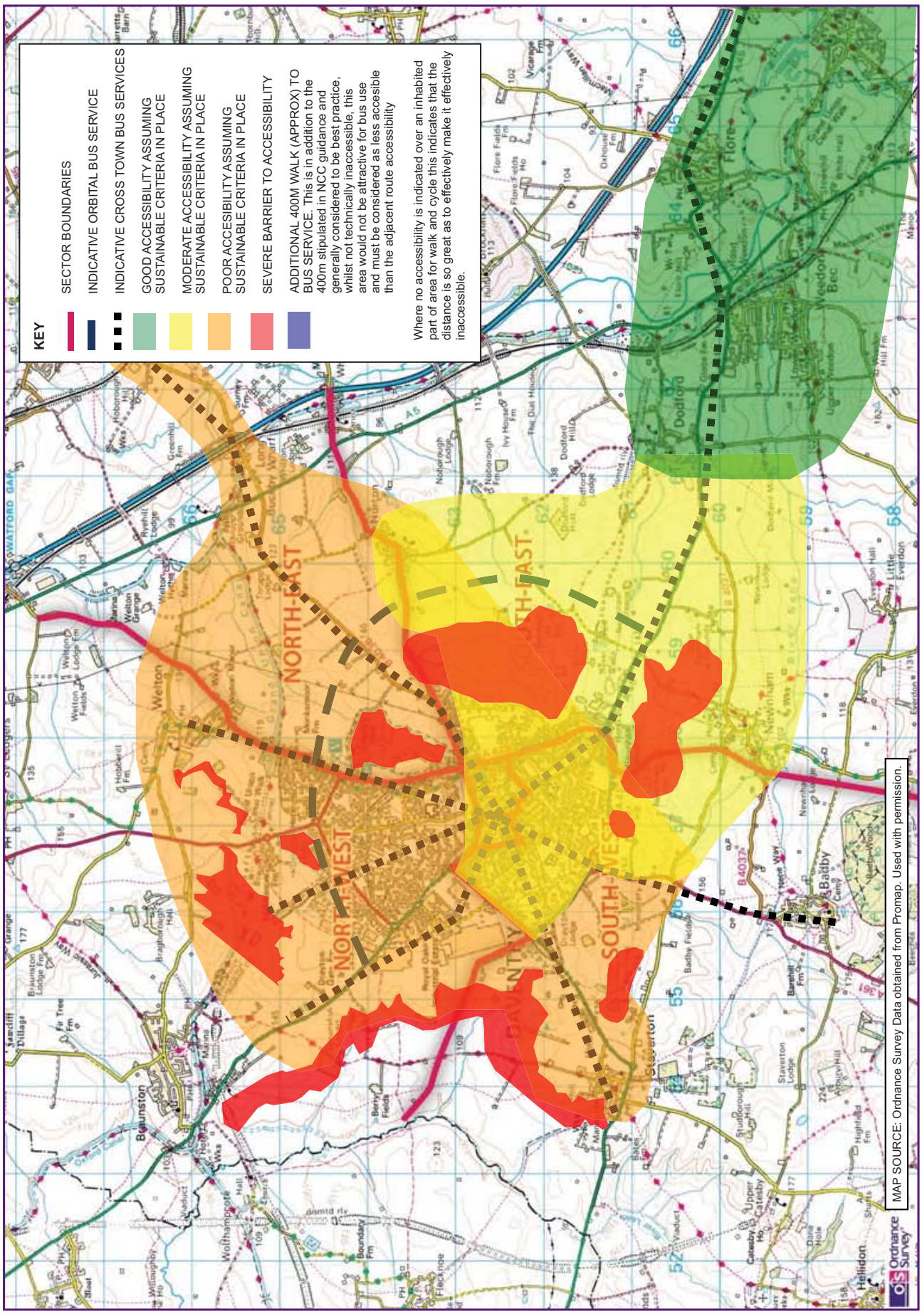
T28 - Indicative South-Eastern Employment Area Accessibility by foot



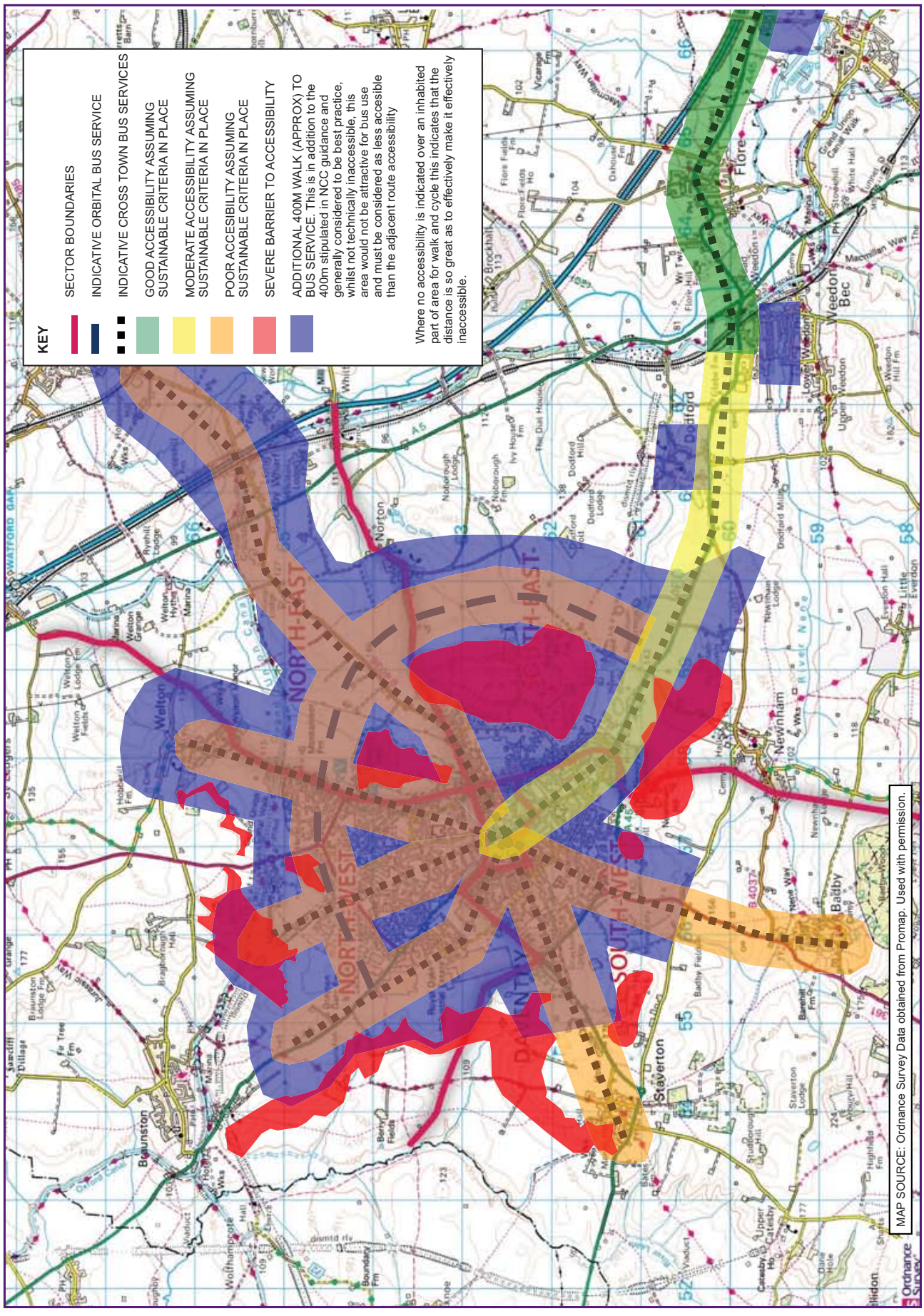
T29 - Indicative South-Eastern Employment Area
Accessibility by Foot



T30 - Indicative Northampton Town Accesibility by Car

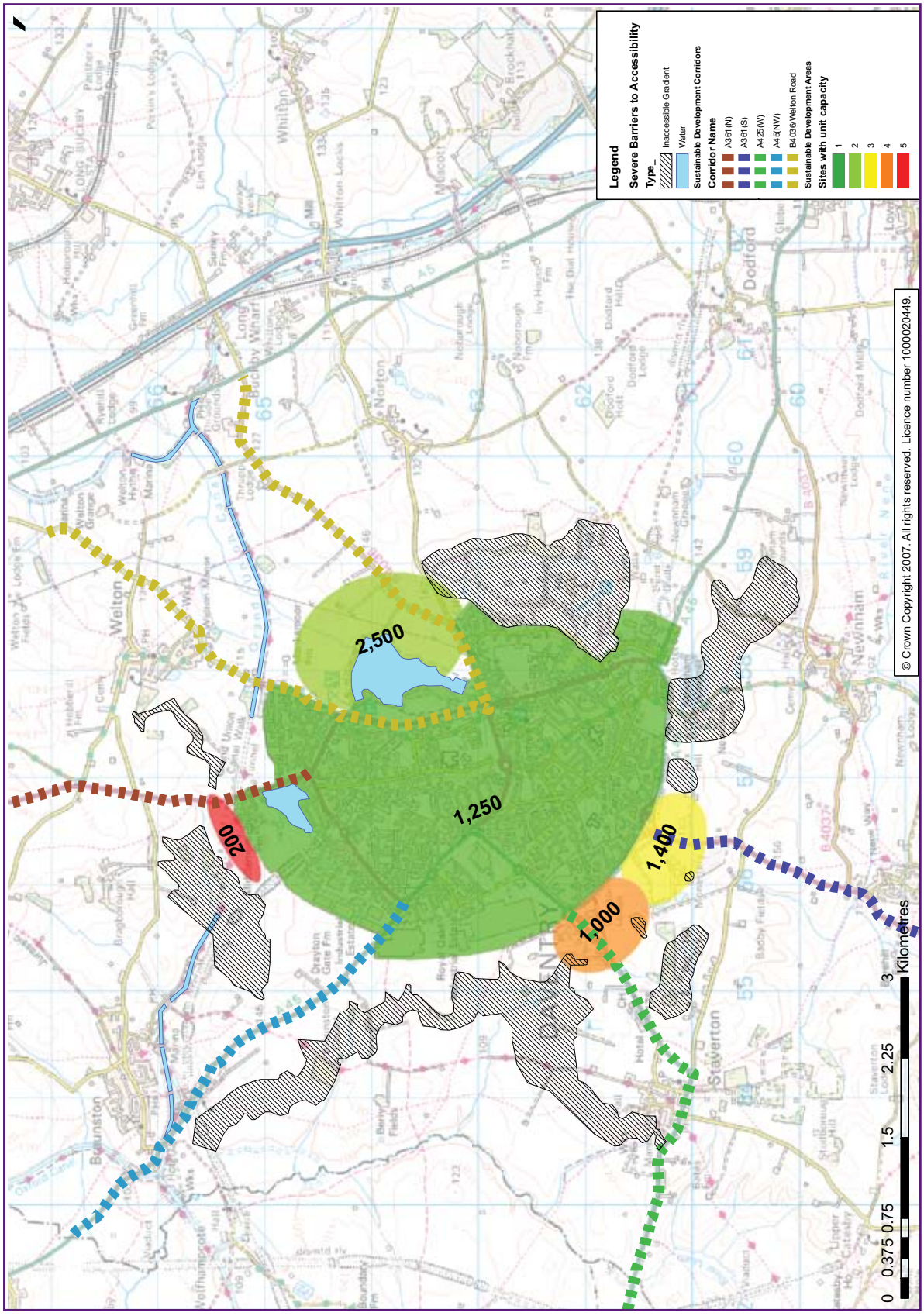


T31 - Indicative Northampton Town Accesibility byRegional Bus



Appendix E The Sustainable Transport Scenario

T32 - Sustainable Development Scenario (Transport)



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