Milton Park - Local Development Order

Document: 1 Version: 3

Assessment of Transport Issues

25 September 2012

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Document history

Milton Park – Local Development Order, Assessment of Transport Issues

This document has been issued and amended as follows:

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00	10/08/2012	Interim draft report	JR	HS	MH
01	03/09/2012	Draft report	JR	HS	MH
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02	25/09/2012	Revised report	JR	HS	MH
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Appendices

1 Executive Summary

The purpose of this report is to provide an assessment of transport issues related to new development associated with the Milton Park Local Development Order (LDO). This assessment of transport issues is one of a number of technical documents that have been prepared to support the LDO. The production of the complete LDO is being coordinated by Terence O'Rourke Ltd, for the Vale of White Horse District Council and MEPC.

This assessment of transport issues presents a summary of the existing transport situation in the area around Milton Park, describing the transport demand and linking this in with the wider local and regional transport conditions. The technical assessment of the supporting transport infrastructure and identification of any capacity changes that result from further development of the Milton site will provide the basis for the justification of further growth at Milton Park through the Local Development Order.

A review of the relevant local, regional and national transport and planning policies has been made and shows that the LDO development is inline with these policies.

Work has been undertaken to understand the current transport issues, this work shows that highway congestion on the network surrounding Milton Park exists at:

- Milton Interchange;
- Steventon Signal Controlled Junction;
- Rowstock Roundabout;
- Featherbed Lane;
- Power Station Roundabouts; and
- Culham River Crossing.

The assessment shows that the site is located near to parts of the highway network that currently experience congestion issues. These congestion issues are further exacerbated in the future year Do Minimum scenario.

The strategic assessment shows that LDO development will not have a significant traffic impact. The transport modelling work shows that the highway network responds to the LDO development by re-routeing trips, re-distributing trips and switching some trips to public transport.

Further assessment work was undertaken to assess the impacts of the LDO development at key junctions that would be used by Milton Park traffic. This analysis shows that the LDO traffic does not significantly increase the congestion issues in the Do Minimum scenarios.

Mitigation schemes have been identified along with the need to progress the measures identified in the travel plan to increase the use of sustainable modes of transport by existing Milton Park users, new Milton Park users and other travellers in the area.

The specific junction improvements at the Milton Park/High Street (western end of Milton Park) and Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park) junctions will need to

be developed further with the County Council taking into account local opinion (in line with comments in Chapter 11). The resultant schemes need to be developed to a level such they can be costed.

It is recommended that the County Council include the schemes at Milton Interchange, Steventon signal controlled lights and the Power Station roundabouts within the strategic SVUK package as it is not reasonable or justified to seek the full costs of these schemes from the development proposed.

Mitigation measures

Location	**Issue**	**Solution**
Milton Park - general	Increased demand to access Milton Park.	Progress measures in the travel plan to increase the proportion of employees/users of the site by non-car means.
Didcot and surrounding area - general	Increased car demand at Milton Park associated with the LDO, displaces traffic in the Didcot area and increases the demand for public transport.	Measures to increase the attractiveness of public transport in the wider Didcot area
Milton Village	Change in the transport demand.	Discuss traffic management options with residents.
Sutton Courtenay Village		
Milton Park/High Street junction (Milton Park West);	Change in the transport demand. The solution needs to have a minimal impediment to dominant traffic flow between Milton Interchange and Milton Park not increase traffic through Milton village.	Restriction of traffic movement through banning right-turn movements leaving Milton village. Right turn movement to be made by turning left and making a U-turn at the roundabout. If the scheme to restrict movements at the junction is not supported locally, consideration could be given to converting the junction to a SCJ to enable the demand to be managed. A roundabout solution would not be suitable as it would significantly impede traffic flows between Milton Park and Milton Interchange and it would attract more traffic through Milton village.

Location	Issue	Solution
Milton Park/Sutton Courtenay Road/Milton Road junction (Milton Park East)	Milton Park traffic uses the junction and results in changes in demand for the traffic between Didcot and Milton Park.	A scheme is to be considered to increase the capacity at the junction by increasing the number of access lanes at the southern western approach arms. The engineering feasibility of this scheme is to be considered further.
Power Station roundabouts	Milton Park traffic uses the Basil Hill Roundabout and results in a change in demand. The junction has significant capacity issues in the Do Minimum scenario and that the LDO does not change this situation considerably. Milton Park traffic Mendip Height roundabout, and results in a change in demand. Minimal impact to the junction capacity.	A scheme for the junction is required to address to Do Minimum issues. This should be provided as part of the SVUK strategic infrastructure
Steventon Signal Controlled Junction	Milton Park traffic uses junction, and results in a change in demand. The Milton Park LDO scenario reduces the practical reserve capacity of the junction by 3%.	A scheme for the junction is required to address to Do Minimum issues. This should be provided as part of the SVUK strategic infrastructure
Milton Interchange	This modelling work shows that the junction is at capacity in the Do Minimum scenario and the LDO scenario increases queue lengths (in particular the A34 southbound of slip and A4130 Didcot approach in the AM peak and the Milton Park arm in the PM peak).	The assessment work is showing a need for a scheme to address the issues at Milton Interchange under the Do Minimum scenario. This should be provided as part of the SVUK strategic infrastructure.
Accesses onto the A4130	Demand to access A4130 directly	Two new signal controlled junctions to be designed once layout of developments are known. These junctions' controls should be linked.

2 Introduction

2.1 Purpose of Report

The purpose of this report is to provide an assessment of transport issues related to new development associated with the Milton Park Local Development Order (LDO). This assessment of transport issues is one of a number of technical documents that have been prepared to support the LDO. The production of the complete LDO is being coordinated by Terence O'Rourke Ltd, for the Vale of White Horse District Council and MEPC.

This assessment of transport issues presents a summary of the existing transport situation in the area around Milton Park, describing the transport demand and linking this in with the wider local and regional transport conditions. The technical assessment of the supporting transport infrastructure and identification of any capacity changes that result from further development of the Milton site will provide the basis for the justification of further growth at Milton Park through the Local Development Order.

The scope of this project was not to assess (in broad terms) the transport implications of the LDO development, not to produce a traditional Transport Assessment (TA) for the development. The report has been structured such that it covers similar topics to a TA, but does not include as much detail as a TA. For example, it is intended that road safety issues associated mitigation measures would be addressed when the schemes are designed and developed further.

2.2 Context

The Vale of White Horse is located in south west of Oxfordshire and stretches from Oxford and Didcot in the east to the Borough of Swindon in the west, with the River Thames to the north and east and the Berkshire Downs to the south. The district covers an area of 224 square miles and has a population of 121,000 (2011 Census). The three historic market towns of Abingdon, Wantage and Faringdon hold just over half of the population along with two other settlements, Grove and Botley. The employment areas of Milton Park and Harwell Oxford Campus are located within the Vale of White Horse. The Vale is supported by key transport links, with the A34 trunk road that runs from the M40 south towards the M4 and the London to Bristol train line with Didcot station in the neighbouring South Oxfordshire District.

Didcot sits within South Oxfordshire, a rural district of Oxfordshire County that extends over 253 square miles with the small market towns of Henley, Thame and Wallingford together with the larger town of Didcot acting as local service centres for people living in the surrounding villages and countryside. The boundary of South Oxfordshire extends from the edge of the city of Oxford in the north-west, along the borders of Buckinghamshire and Berkshire to the edge of Reading in the south and along to Didcot in the west.

The major urban centres of Oxford and Reading lie outside the district but have close economic and social links. South Oxfordshire has a total population in the region of 134,300, with low unemployment and a high proportion of residents in well-paid employment. South Oxfordshire

experiences many of the same pressures for development that are seen in the rest of the South East, particularly for more affordable housing.

In 2007 Didcot was designated Growth Point status under the Growth Points Initiative, which sees a commitment to extra infrastructure investment from government in return for enhanced housing and employment growth. Through this Growth Point allocation Didcot is set to be the focus for almost 9000 new homes by 2027. The Growth Points programme has enabled a new transport interchange and upgraded station forecourt at a cost of £5.6 million to be developed at Didcot, with the main improvement work starting in the autumn of 2012; a range of other regeneration projects have been delivered or are planned for the town.

Didcot is also located within the heart of the Science Vale UK area with Milton Park, Harwell Oxford and Culham Science Centre all within six miles of the town. This group of science and business parks brings significant opportunities to the area, offering a range of employment prospects to the local population. This Milton Park area is allocated for development within the Vale of White Horse Local Plan as a site for business development and protected as a key site for business. The Local Plan will eventually be replaced by the Vale of White Horse Local Development Framework, which will be made up of a series of Development Plan Documents, of which the Core Strategy will be the main document.

Milton Park is located within the Vale of White Horse districts to the west of Didcot and to the south of Abingdon. The A34 runs directly to the west of Milton Park, with access to the site provided directly off the grade separated A34/A4130 junction.

2.3 Background

A successful bid by the Oxfordshire Local Enterprise Partnership in September 2011 resulted in land at MEPC Milton Park together with Harwell Oxford comprising to make up the Science Vale UK Enterprise Zone. The Government introduced Enterprise Zones in 2011 to stimulate private sector investment and support business development, with the ambition of making Britain the best place in the world to start and grow a business. Enterprise Zones are specific areas where a combination of financial incentives, reduced planning restrictions and other support is used to encourage the creation of new businesses and jobs, contributing to the growth of the local and national economies.

Didcot is also located within the heart of the Science Vale UK area with Milton Park, Harwell Oxford and Culham Science Centre all within six miles of the town. This group of science and business parks brings significant opportunities to the area, offering a range of employment prospects to the local population. Milton Park is allocated for development within the Vale of White Horse Local Plan as a site for business development and protected as a key site for business, and within the Local Development Framework (LDF) as an area that continues to create employment. Milton Park is located within the Vale of White Horse district, located to the west of Didcot and to the south of Abingdon. The A34 runs directly to the west of Milton Park, with access to the site provided directly off the grade separated A34/A4130 junction. Milton Park covers approximately 250 acres and with over 160 companies employing around 6,500 people, is one of Europe’s largest multi-use business parks.

2.4 Structure of report

Following this introductory Chapter, Chapter 3 of this report sets out the relevant local, regional and national transport and planning policies, Chapter 4 provides a review of previous transport strategies and assessment work and Chapter 5 sets out the development proposals. Chapter 6 identifies the local network conditions through existing models and traffic count data, Chapter 7 provides a review of the Milton Park Travel Plan and Chapter 8 outlines the modelling assumptions. Chapter 9 details the transport impacts identified from the strategic modelling work and Chapter 10 details the junction assessment work. Chapter 11 provides detail of the existing and proposed mitigation measures and Chapter 12 concludes the report.

3 Policy Framework

3.1 Introduction

It is important to understand the context within which the proposals sit and so this chapter sets out the existing and emerging planning and transport policy from the regional, county and local levels.

3.2 Transport policy

3.2.1 Regional Policy

The County of Oxfordshire sits within the South East region of the country. On 6 July 2010 the Secretary of State formally revoked Regional Strategies and returned decision making powers on housing and planning to local councils. The regional strategic documents contained many relevant aims and objectives, and so they have been reviewed here for this reason.

The South East Regional Sustainability Framework and South East Plan share the same vision: 'A socially and economically strong, healthy and just South East that respects the limits of the global environment. Achieving this will require the active involvement of all individuals to deliver a society where everyone, including the most deprived, benefits from and contributes to a better quality of life. At the same time the impact of current high levels of resource use will be reduced and the quality of the environment will be maintained and enhanced'. Sixteen core objectives are set out in the South East Plan covering a variety of economic, environmental and social issues.

Apart from London, the South East is the region with the widest range of social deprivation and economic disparities. Essentially this means that parts of the region's population continue to live in poverty, experiencing low quality housing, poor health, with limited opportunities and central Oxfordshire is not exempt from this.

The South East Plan recognises the role the planning system can play in developing and shaping healthy sustainable communities. Furthermore, the core objectives for the South East Plan include the need to identify new initiatives to promote the tackling of skills deficits, thus increasing opportunities for all. Increasing the supply of affordable housing and ensuring that transport links are improved to provide access for all, especially disadvantaged groups and the ageing population, will also be essential in contributing towards the achievement of these objectives.

In order to deliver a strong and healthy society the region requires a world class economy. It is recognised that providing the right kind of business and housing development in the right locations will provide jobs locally and relieve the pressure on the transport infrastructure. Policies should increase participation in education and training through improved access, particularly by good public transport, to help tackle the skills deficits for all sections of society.

The Regional Economic Strategy sets out the vision for the South East: 'to be a world class region achieving sustainable prosperity'. There is a need for the region to achieve global competitiveness, spread the benefits of competitiveness to encourage smart growth, and ensure that competitiveness is consistent with the principles of sustainable development. It includes three headline targets:

- Achieve an average annual increase in GVA per capita of at least 3%;
- Increase productivity per worker by an average 2.4% annually, from £39,000 in 2005 to at least £50,000 by 2016 (in constant prices); and
- Reduce the rate of increase in the region's ecological footprint (from 6.3 global hectares per capita in 2003, currently increasing at 1.1% per capita per annum), stabilise it and seek to reduce it by 2016.

This will support the core objective in the South East Plan related to sustaining economic growth and competitiveness in the region.

The Regional Economic Strategy also recognises that there is a need 'to address congestion and avoid the tipping point that will undermine the region's competitiveness'. There will be a focus on solving bottlenecks on the network, on promoting investment in and promoting the use of public transport wherever possible, and on developing mechanisms such as congestion charging to improve demand management on the existing transport system. Increasing containment by providing education, services and employment in accessible locations within Science Vale UK could also contribute towards this.

Furthermore, within the Regional Economic Strategy, Oxford and Central Oxfordshire is identified as one of eight major concentrations of growth potential 'Diamonds for Investment and Growth'. These areas are described as having the greatest potential for significant contributions to economic growth in the South East and have the ability to act as a catalyst to stimulate prosperity across wider areas. The justification for Oxford and Central Oxfordshire to see significant growth potential comes from its reputation and prosperity in the knowledge economy and the hi-tech sector, notably in Science Vale UK.

The Science and Innovation Investment Framework 2004-2014 recognises that for the UK economy to succeed in generating growth through productivity and employment in the coming decade, it must invest more strongly than in the past in its knowledge base, and translate this knowledge more effectively into business and public service innovation. Indeed, it sets out that 'The Government's long-term objective for the UK economy is to increase the level of knowledge intensity in the UK (as measured by the ratio of Research and Development across the economy to national GDP), from its current level of around 1.9% to 2.5% by around 2014'.

From the policy review it is clear that there is a goal for 'the region to stand out as a top location for international business'. However, it is also clear that there is a need to ensure that competitiveness is consistent with the principles of sustainable development. As such, the importance of containment is recognised.

The South East Plan recognises the quality and variety of the environment as a defining characteristic of the region, and also a major economic asset. It sets out the importance of sustainable natural resource management, including mitigating climate change impacts, greater efficiency in using resources, reducing pollution and waste and protecting and enhancing wildlife and

landscapes. This is in recognition of increasing environmental pressures, including diminishing natural resources and climate change.

New development should be of a high quality sustainable design and construction, and be an asset to the region. The existing built and natural environment needs to be protected, and enhanced where possible, to underpin the social and economic development of the region. As such, the improvement of transport links and provision of new development and infrastructure needs to be delivered in a manner which 'mitigates the effects of, and adapts to, climate change'.

Specifically with reference to the Central Oxfordshire sub-region, the South East Plan emphasises the need 'to strive to be a world leader in education, science and technology by building on the sub-region's economic strengths in ways which will:

- Ensure the provision of infrastructure which is essential to the proper functioning and future development of the area;
- Protect and enhance the environment and quality of life of the sub-region;
- Protect the setting and character of Oxford;
- Make best use of previously developed land within urban areas to reduce the need for Greenfield development; and
- Concentrate development where the need to travel, particularly by single occupancy car use, can be reduced'.

3.2.2 County Policy

Employment growth is recognised in policy at County level historically through the Oxfordshire Structure Plan 2011, which was adopted in August 1998. While this document was replaced by the South East Plan it provides some useful background to development of Milton Park. The general strategy was to provide a sustainable planning framework for development to meet housing, economic and other requirements over the period 1996 to 2011. The plan stated that the preferred locations for development would be Banbury, Bicester, Didcot and Witney and that, in the rural areas, local plans will make appropriate provision for development and in doing so will have regard to the economic and social well-being of local communities.

Oxfordshire 2030 is the overarching strategic plan for the future of Oxfordshire. It sets out the long-term vision for Oxfordshire County's future. The ambition provides a local focus with a clear desire to create a world class economy for Oxfordshire, building particularly on the hi-tech sector. This is in recognition of the county having the highest level of research and development in Western Europe, a concentration of high-wage, hi-tech industry, and world-renowned universities. However, with the current global economic conditions and competition, securing a world class economy will be a significant challenge.

There is also an ambition to have healthy and thriving communities, which is increasingly challenging considering the diversity of the population. This is in terms of where people live, their age and their skill level. Affordable housing and accessibility to key services, including education, are issues that need to be addressed to encourage the development of thriving communities.

With regards to the environment, the challenge is to meet the demands of modern day life and an expanding and ageing population, alongside protecting both the built and natural environment in the county. Indeed, the role the county has to play in contributing to wider environmental targets, such as carbon reduction, needs to be balanced against this.

A Local Investment Plan for Oxfordshire was finalised in March 2010; this is the first formal document resulting from Oxfordshire's 'Single Conversation' with the Homes and Community Agency. The Plan outlines and integrates the plans of Cherwell, Oxford, South Oxfordshire, Vale of White Horse and West Oxfordshire District Councils, Oxfordshire County Council, the HA, Network Rail, the Environment Agency and the Oxfordshire Primary Care Trust to deliver housing and economic growth and associated infrastructure. The resulting Plan has been by agreed by the five District Councils in Oxfordshire.

The Local Investment Plan acknowledges that Oxfordshire is recognised internationally as a 'centre of excellence for learning and research, with the highest concentration of science and biotechnology industries in western Europe'. It also recognises the difficulties faced by partners in meeting economic, housing and regeneration pressures and providing sufficient infrastructure, alongside considering the environmental quality of the county and the impact on environmental sustainability. As such, four strategic objectives have been identified:

- Deliver new housing, including affordable homes;
- Support economic growth;
- Achieve regeneration and tackle deprivation; and
- Contribute to meeting strategic infrastructure needs.

With regards to supporting economic growth, the importance of maintaining a strong diverse economy and provide opportunities for growth and inward investment is recognised. As part of this, there is also a need to raise educational attainment, improve skills levels to support the needs of local businesses and help young people find work.

The Local Investment Plan recognises the need to invest heavily in transport to facilitate new development; improve accessibility by alternative modes of transport; and enable people to get to work, education and other services. This includes enabling the A34 and the network in its vicinity to fulfil its various local and international roles.

Transport in Oxfordshire is considered further in Local Transport Plan 3 (LTP3). The goals for LTP3 are the same as DaSTS; which are:

- To support the local economy and the growth and competitiveness of the County;
- To make it easier to get around the County and improve access to jobs and services for all by offering real choice;
- To reduce the impact of transport on the environment and help tackle climate change; and
- To promote healthy, safe and sustainable transport.

The County Council has agreed objectives for LTP3. Furthermore, they have agreed the objectives for DaSTS should be the same. The objectives have been agreed as:

- Improve the condition of local roads, footways and cycleways, including resilience to climate change;
- Reduce congestion;
- Reduce casualties and the dangers associated with travel;
- Improve accessibility to work, education and services;
- Secure infrastructure and services to support development;
- Reduce carbon emissions from transport;
- Improve air quality, reduce other environmental impacts and enhance the street environment;
- Develop and increase the use of high quality, welcoming public transport; and
- Develop and increase cycling and walking for local journeys, recreation and health.

LTP3 is based on four types of area within the County for which strategies and eventually schemes will be developed. The Oxfordshire County Council Cabinet has agreed a prioritisation of the objectives for each of the four settlements types that will be considered in the Plan. The settlement types are:

- Oxford City;
- Larger Towns (Banbury, Bicester, Witney, Abingdon, Didcot, Wantage and Grove);
- Smaller Towns (Chipping Norton, Kidlington, Carterton, Faringdon, Wallingford, Henley-on-Thames, Chinnor and Thame); and
- Rural Oxfordshire.

3.2.3 Local Policy

The Science Vale UK area encompasses parts of two Oxfordshire Districts: South Oxfordshire and the Vale of White Horse. Both these authorities have prepared their Core Strategies for the Local Development Framework (LDF) and are at various stages with the supporting Development Plan Policies (DPPs). The LDF will eventually fully replace the existing Vale of White Horse Local Plan (2011) and the South Oxfordshire Local Plan (2011).

Following the Inspectors report a publication period is currently taking place for the South Oxfordshire Core Strategy. The main purpose of the South Oxfordshire Core Strategy is to identify the issues and directions of growth for new development up to the year 2027. The Core Strategy aims to ensure that residents continue to enjoy the quality of life that the district has to offer but there are pressures and challenges to address:

- Housing. Availability of housing for the younger and older members of the population present different issues for the district.
- Employment. Wages are not comparable to other parts of the county and the skills base provides businesses with recruitment issues.
- Local facilities. Villages in the district are struggling with the loss of facilities and amenities such as shops and schools, and the market towns face varied competition from the larger towns and cities.
- Climate change and concern for future generations demand that habits are changed and the availability of resources is considered.

The South Oxfordshire Sustainable Community Strategy 2010-2027 focuses on ways to ensure a good quality of life for all people who live and work in the area is achieved. As with the LDF, the Strategy recognises the role of the economy, environment and thriving communities in achieving the aims of the District.

In support of the South Oxfordshire Local Development Framework the Didcot Area Action Plan will plan comprehensively for the future of Didcot, meeting the requirements of the Oxfordshire County Council Core Strategy and other national guidance. The Development Plan Document (DPD) is currently being prepared along with a Sustainability Appraisal Report. The document is scheduled for approval in April 2013 and will contain a number of policies retained from the South Oxfordshire Local Plan 2011.

The emerging Core Strategy for the Vale of White Horse has an overarching vision for a sustainable Vale:

- With prosperous, inclusive and thriving communities that have good access to a range of housing, jobs and services;
- Where everyone can enjoy life; and

- Where needs can be met without compromising the natural and built heritage of the ability of future generations to meet their needs.

The Vale has a higher than average number of employees in service jobs, and almost six times the national average of Research and Development jobs. As such, there is a need to ensure the skill levels of local people match job requirements in the area for the hi-tech and science based industries. This will further encourage containment within the area, which is being sought at each policy level.

The Core Strategy sets out that the population of the Vale is likely to increase by 17.8% by 2026 over 2006 levels. Notably, the proportion of the population that is over 65 will rise by 47%. With house prices nearly nine times higher than average incomes, people continue to find it difficult to buy their own homes, particularly in rural areas. About half the people in the Vale live in villages where transport options are limited. As such, the car will continue to be the main form of travel, but the challenge to address is to ensure alternative modes of transport are improved for the benefit of all.

The Core Strategy focuses on the designation of Didcot as a new growth point and the potential of the established research and business parks for further growth, identifying Milton Park as an area that continues to create employment in a range of high quality business units, attractive to businesses that offer well paid secure jobs.

It has been recognised that a significant challenge for the Vale is to create attractive local shopping environments that encourage key retailers and retain expenditure in the area. Retaining the existing provision while enabling new shops and services to set up in response to initiatives from local entrepreneurs, particularly in larger villages, will provide further opportunities for containment.

The Vale Strategy for Sustainable Communities 2008-2016 identifies a number of priorities which reflect what is set out in the LDF. These include social progress which recognises the needs of everyone, maintenance and stable levels of economic growth and employment, along with effective protection of the environment and wise use of natural resources.

The Science Vale UK Partnership Board has set out that the vision for Science Vale UK is to create ‘a global hot spot for enterprise and innovation in science, high technology and the application of knowledge’. Building on the very significant strengths of the area in science, technology and innovation, Science Vale UK has the potential to make an even greater contribution to the South East’s and the United Kingdom’s competitiveness in the face of intensifying international competition.

The Science Vale UK Partnership Board is working on five themes of work. These are:

- Promoting Science Vale UK;

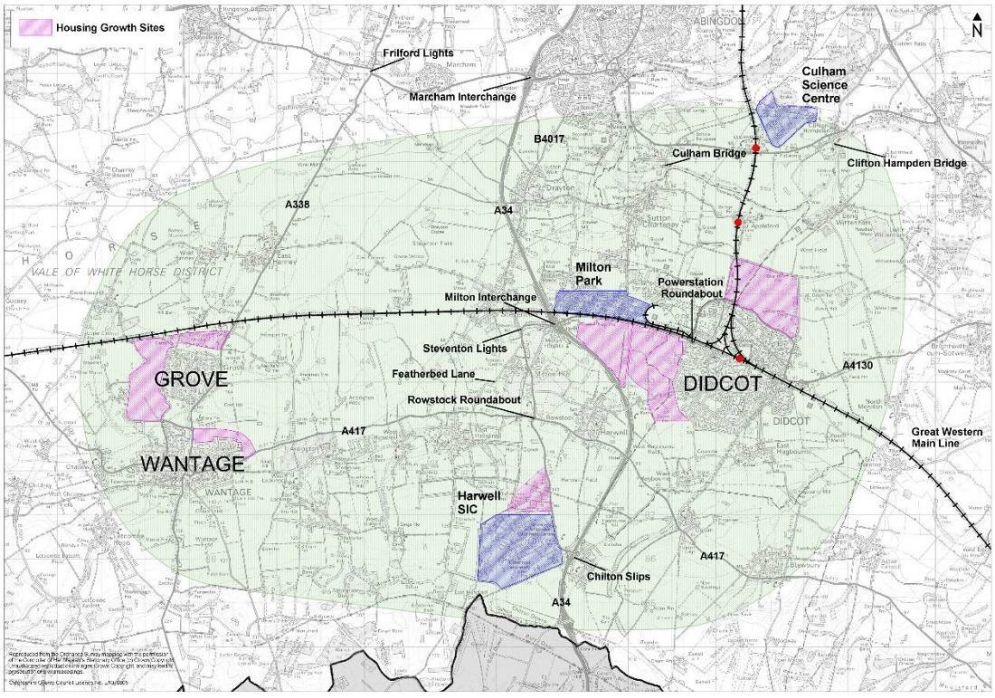
- Providing appropriate skills;

- Attracting necessary infrastructure and investment;
- Developing Science Vale UK as an attractive and thriving place; and
- Strengthening the Science Vale UK Partnership and improving its effectiveness.

The Science Vale UK Partnership Board believes that 'Science Vale UK is a key and established area for economic growth and one that is recognised as making a significant contribution to UK competitiveness in the future. It has the land capacity to accommodate the growth and existing and emerging spatial and economic development plans already acknowledge and reflect this. There are weaknesses in the transport system serving the area and there is a need for strategic (environmentally sensitive) investment to ensure that the economic and related potential of the area is realised in a sustainable way that does not stifle the growth which it is intended to support. This is, and should be, a priority for Oxfordshire and the South East'.

Figure 3.1 shows the main locations of proposed development in the Science Vale UK area. It also shows key junctions in the area.

Figure 3.1: Key locations in the Science Vale UK area



3.3 Enterprise Zones and Local Development Orders

Enterprise Zones are specific areas where a combination of financial incentives, reduced planning restrictions and other support is used to encourage the creation of new businesses and jobs as well as contribute to the growth of the local and national economies. Simplifying the planning process through deregulation and ambitious approaches applied to new or existing businesses within an enterprise zone allows both time and money to be saved.

The application of Local Development Orders (LDO) sees planning permission granted automatically for the type of development specified within the order and so removes the need for a planning application to be made by a developer. The planning authority, Vale of White Horse in this instance, have the power to make an LDO which applies to a certain site, encouraging specific types of development within an area. An LDO can be granted unconditionally or may be subject to conditions such as size and scale limitations or set design criteria. Planning authorities are responsible for ensuring that the limitations and conditions applied to an LDO meet the case law and policy requirements. Eventually, after consultation, the LDO must be sent to the Secretary of State after which all or part of the LDO may be rejected for modification, prior to the Secretary of State giving notice to the Local Planning Authority to adopt the LDO.

As outlined above in September 2011 the Oxfordshire Local Enterprise Partnership (LEP) made a successful bid for the allocation of two of the Science Vale UK sites as an Enterprise Zone where 200,000m^2 of private sector development will be accommodated by 2015. This newly allocated Enterprise Zone includes both Harwell Oxford and Milton Park.

Milton Park, managed by MEPC, currently has 250,000 square metres of employment and ancillary floor space and provides high quality offices, laboratories, industrial units and warehousing. The inclusion of Milton Park as an Enterprise Zone means that businesses within the park can benefit from financial incentives and business support through discounted rates.

4 Review of previous transport strategy/assessment work

4.1 Introduction

This section provides a short review of a number of other studies that have been completed covering the Science Vale UK area, drawing on this previous work to identify the existing transport conditions, limitations and planned improvements. The work undertakes a comprehensive analysis of the transport challenges anticipated in the area as a result of the housing allocations and planned employment growth, identifying the mitigation measures required to accommodate the planned growth. The studies reviewed include the Southern Central Oxfordshire Transport Strategy (SCOTS), Delivering a Sustainable Transport System (DaSTS) Central Oxfordshire, Didcot Area Integrated Transport Strategy (DidITS) and the Science Vale UK (SVUK) Area Transport Strategy (ATS).

4.2 Southern Central Oxfordshire Transport Strategy (SCOTS)

The SCOTS final report was published in October 2008. The Recommended Strategic Transport Package Report was approved in December 2009. The purpose of SCOTS was to set out a comprehensive strategy for transport in the Southern Central Oxfordshire region, focusing on transport measures to support planned housing and employment growth. The Strategy builds on existing National, Regional and Local policies and supports South Oxfordshire and the Vale of White Horse District Council's Core Strategies and all site allocation documents.

SCOTS was split into a number of stages of technical work spanning two years, with the SCOTS Final Report representing the final stage of the study. The study aimed to identify the most sustainable location for additional dwellings in transport terms, as well as to understand the associated infrastructure requirements and public transport/cycle/safety improvements. The area of focus for the SCOTS included the settlements of Wantage, Grove and Didcot, including the employment sites of Milton Park and Harwell Oxford where a total of 6400 dwellings have been allocated to be built by 2026, additional to growth approved to 2016.

The main SCOTS objectives were as follows:

- To establish a transport network that supports economic investment and growth through Science Vale UK to position Oxfordshire as a world-class economy;
- To set out the transport infrastructure necessary to deliver the proposals in the district councils' LDFs;
- To provide a framework for securing funding for the infrastructure needs, both from developers and via national and regional processes (for example Regional Funding Allocation (RFA)); and
- To provide a context for transport improvements across the southern central Oxfordshire area to be included in the 3rd Local Transport Plan (LTP3) from 2011.

To inform the SCOTS work a Central Oxfordshire Transport Model (COTM) was produced allowing for the examination of impacts over a wide area; this variable demand transport model included both highway and public transport elements in both a SATURN model and variable demand model. The work presented evidence of the transport impacts of the key LDF development sites. The Final Recommended Strategic Transport Package (2009) list of schemes is summarised in 4.5.

4.3 Didcot Area Integrated Transport Strategy & Science Vale UK Area Transport Strategy

In 2004 Halcrow prepared a report that undertook an Assessment of Schemes as part of Phase 2 of the Didcot Area Integrated Transport Strategy (ITS). This report was presented to Members prior to the Local Plan Inquiry for Didcot. The work presented a technical analysis of those potential schemes that had been identified to help accommodate the predicted traffic growth and travel demand associated with the housing and employment allocations in the Didcot Area.

Since then a new area strategy has been developed for the Science Vale UK area as part of the third Local Transport Plan (LTP3), an area that is essentially the same as that covered by the Didcot Area ITS and so the Science Vale UK (SVUK) Area Transport Strategy (ATS) replaces the Didcot ITS.

The SVUK ATS focuses on achieving containment of trips within the SVUK area and builds on the previous work undertaken in the SCOTS and Delivering a Sustainable Transport System (DaSTS). The objectives are:

- Highway infrastructure and traffic management – to discourage private car trips in/around Didcot, Wantage and Grove where alternative modes of travel are available as well as improving existing and providing new infrastructure to accommodate real travel needs. Also to ensure that the road network can accommodate car trips which are required for longer distance journeys and access.

- Public transport – work with local bus companies and developers to improve bus services on the existing Premium Routes to increase accessibility from the existing and new residential areas of Didcot, Wantage and Grove to key facilities. Also to work with the rail industry to explore the potential for new stations and train services.

- Walking and the pedestrian environment – improve facilities for all pedestrians (including disabled people) in Didcot, Wantage and Grove through developing good, clear routes from residential areas to the town centre, other services and facilities around the towns, together with ensuring that urban links join up with the rights of way.

- Cycling – To ensure there is an appropriate network of suitable cycle routes to key destinations and that these are well publicised. Provide a suitable number of good quality cycle stands at the key destinations and appropriate infrastructure where required along the key routes from residential areas to the town centres, employment and education in the towns.

- Promoting travel choice – Increase awareness and promote better infrastructure for walking, cycling and public transport in and around Didcot, Wantage and Grove. Influence travel choice by encouraging schools, businesses and organisations to make fewer trips by car. Use more efficient and lower emission vehicles as they become available and encourage a greater number of trips by walking, cycling and public transport.

The major transport schemes mirror those as set out within the SCOTS and summarised in 4.5.

4.4 DaSTS

Future transport solutions are now being progressed through the Delivering a Sustainable Transport System (DaSTS) work, which focuses on the infrastructure requirements for the Science Vale UK area. The purpose of this work is to provide an understanding of the deficiencies in the current transport network in delivering "sustainable economic growth" in Central Oxfordshire and to outline a wide range of packages of investment post 2013/14. Clearly this overlaps with the SCOTS work but concentrates on the economic side rather than the LDF housing allocations. DaSTS builds on the knowledge gathered through SCOTS but could add to or even alter some of the package elements.

DaSTS is running parallel to the development of Oxfordshire's LTP3 to ensure a consistent approach is adopted; the LTP3 goals reflect DaSTS goals, and specific objectives have been identified for LTP3 which are reflected in DaSTS. The Central Oxfordshire Transport Model (COTM), a multi-modal demand model, has been used to assist the DaSTS study enabling the interrogation of the performance of the transport network in both 2007 and 2026. The geographical coverage and up to date base data mean the model was ideal for use with DaSTS. Further to COTM the Integrated Transport Appraisal Simulation tool (INTRA-SIM) enabled strategic choices to be simulated to develop sustainable travel.

To deliver a balanced approach DaSTS developed three transport options, which are being consulted on in conjunction with Oxfordshire's LTP3. These are:

- Emphasis on major improvements to walking and cycling;
- Emphasis on spreading investment over a wide range of transport interventions to promote transport choice; and
- Emphasis on improvements to the road and rail networks, together with bus services and facilities, and small sale improvements to walking and cycling.

Additional to the transport solutions DaSTS also identifies non-transport solutions to maximise the potential of the Science Vale UK area. These include:

- Next Generation Access high-speed broadband;
- Creation of an innovation learning pack to address learning and development needs of employees in all sorts of businesses and further education needs across the area;

- Provision of affordable housing, schools and other infrastructure, based on Local Investment Plan submitted to Homes and Communities Agency (March 2010); and

- Working with planners to ensure opportunity to live and work close together and adopt masterplanning and urban design principles to encourage use of sustainable modes of travel.

4.5 Summary of local and strategic measures

The list of schemes set out below has been taken from both the SCOTS and the Science Vale UK Area Transport Strategy.

Highway schemes

- Harwell strategic link road (from A4130 east of Milton interchange to the A417) – this link is vital to keep the transport network operating in 2026 with all the development in place.

- Harwell Field link (from the A417 to the entrance of Harwell Oxford on the A4185, including increased capacity roundabout at Harwell Oxford entrance). This replaces some of the alternative links and provides relief to Rowstock roundabout without adversely affecting Harwell village or Chilton.

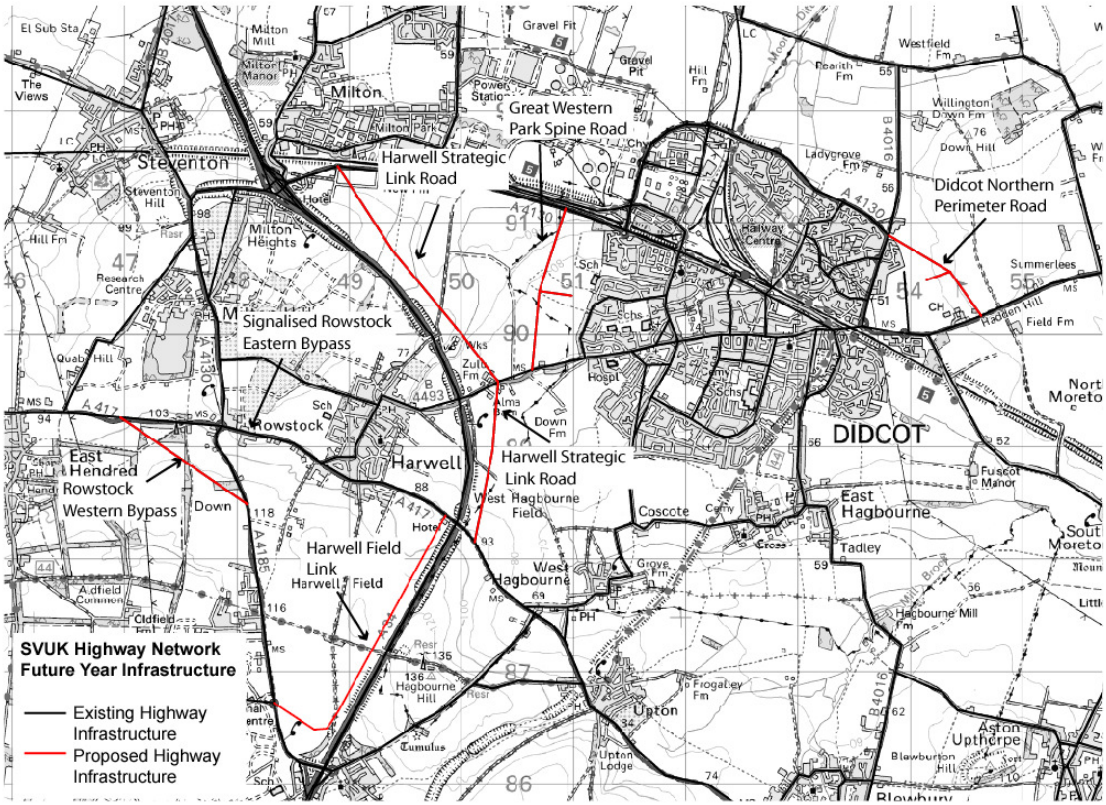
- Rowstock western link road (from the A417 Wantage Road to the A4185 Newbury Road, to the south west of Rowstock junction). This would provide benefit for people travelling between Wantage/Grove and Harwell Oxford.

- Improvements to Featherbed Lane junctions would aid access on to the A417 and A4130 and to improve potential safety issues at these junctions.

- Wantage Eastern Link Road (WELR). An important strategic route linking Mably Way and the A417 to allow trips from Grove to avoid Charlton Village Road and Wantage town centre. This provides an east-west route that aids travel towards Didcot, Harwell Oxford and Milton Park from Wantage and Grove.

The locations of the infrastructure components in the vicinity of Milton Park are shown in Figure 4.1.

Figure 4.1: SVUK Future Year Infrastructure Options



Public transport schemes

Improvement to public transport services across the area including between:

- Didcot and Oxford. Development of the Premium route between Didcot and Oxford via Milton Park and Abingdon, with four buses an hour;
- Didcot and Milton Park;
- Didcot and Harwell Oxford Campus, with a frequency of two per hour increasing services during peak times;
- Wantage/Grove and Oxford. A Premium Route from Wantage to Oxford with four buses per hour;
- Wantage/Grove and Milton Park/Didcot. An interlink route to connect Wantage and Grove with Milton Park, Didcot Parkway and the Orchard Centre with two buses per hour;
- Wantage/Grove and Harwell Oxford Campus;

- Around Didcot and Wantage & Grove; and
- Improving public transport links to important external; destinations, such as Oxford, Newbury, Reading and Swindon.

Walking and the pedestrian environment

Improve facilities for all pedestrians (including disabled people) in Didcot, Wantage and Grove through developing good, clear routes from residential areas to the town centre, other services and facilities around the towns, together with ensuring that urban links join up with the rights of way.

Cycling schemes

The cycle network needs to include attractive, quick, safe routes between the major new housing sites and the key employment locations. Other local routes will also be important to enable residents at the new developments to cycle to other facilities, such as schools.

- Ensure there is an appropriate network of suitable cycle routes to key destinations and that these are well publicised.
- Provide a suitable number of good quality cycle stands at the key destinations and appropriate infrastructure where required along the key routes from residential areas to the town centre, employment and education in the town.
- Route 1 – West Lockinge to A417/Hungerford Road
- Route 2 – Wantage and Grove to East Hanney
- Route 3 – East Hanney to Steventon and Milton Park (alternative proposal)
- Route 4 – Didcot to Harwell Village
- Route 5 – Milton Park to Drayton and Abingdon
- Route 6 – NCN44 at Harwell Oxford to Milton Interchange
- Route 7 – from the southern end of The Winnaway at the signalised crossing on NCN44 to Didcot
- Route 8 – Wantage to NCN44 link
- Route 9 – Back Hill Lane tunnel

Promoting travel choice

Increasing awareness and promoting better infrastructure for walking, cycling and public transport in and around Didcot, Wantage and Grove would also have an impact. Travel choice could also be

influenced by encouraging schools, businesses and organisations to make fewer trips by car. Using more efficient and lower emission vehicles as they become available and encouraging a greater number of trips by walking, cycling and public transport will also improve the situation.

5 Development proposals

5.1 Introduction

This chapter sets out details of the development proposals and other committed/planned development. To enable the impacts of the LDO to be assessed transport modelling work has been undertaken to assess a Do Minimum and Do Something LDO Scenarios.

5.2 Summary of proposals set out in the main LDO document

The Milton Park LDO scenario contains the landuse and transport assumptions set out in the Do Minimum scenario, with the addition of the development shown in Appendix A.

5.3 Other committed/consented/planned development proposals

The Do Minimum Scenario includes developments that are committed in broad policy terms. This therefore includes some developments for which Transport Assessments have been produced and others which there is less information about the development and associated mitigation available. The transport infrastructure included in the Do Minimum scenario also represents transport policies and commitments.

A detailed list of the growth assumptions included in the Central Oxfordshire Transport Model Reference Case Scenarios and 2030 is shown in Appendix B. This forms the basis of the Do Minimum scenario developed for this work, and includes significant developments at:

- Milton Park (consented development);
- Harwell Oxford;
- Culham Science Centre;
- Didcot town centre;
- Great Western Park Didcot;
- Valley Park Didcot;
- Ladygrove East, Didcot;
- North East Didcot;
- NE Wantage/Crab Hill; and
- Grove Airfield.

The consented development at Milton Park is set out in Appendix A.

Growth assumptions have also been made outside the Science Vale UK area (see Appendix B for further details).

5.4 Committed Strategic transport schemes

Appendix B sets out a comprehensive list of the infrastructure assumptions associated with the Do Minimum scenario. The Do Minimum scenario includes the following:

- Great Western Park Link Road;
- Milton Interchange slips lengthened;
- Rowstock Roundabout improvements;
- Harwell Strategic Link Road;
- Harwell Field Link Road, including increased capacity roundabout at Harwell Oxford entrance;
- Rowstock Bypass (western section only);
- Featherbed Lane improvements;
- Wantage Eastern Link Road;
- Mendip Heights Roundabout Improvements;
- Grove Northern Link Road; and
- Didcot Northern Perimeter Road (NPR3).

The schemes included in the Do Minimum scenario are within the approved SCOTs recommended strategic transport package or are schemes related to developments.

5.5 Other committed transport schemes

The Great Western Park developer is promoting schemes for the Power Station roundabouts. These are considered in the junction assessment work reported in Chapter 10.

6 Local Characteristics

6.1 Introduction

The Central Oxfordshire sub-region, and the Science Vale UK area in particular, has numerous local characteristics that need to be understood in order to set the context for the Milton Park LDO. Consideration has been given to the 2001 census data, outputs from the Central Oxfordshire Transport Model (COTM) and feedback from stakeholders in identifying these characteristics.

This Chapter therefore provides a series of background statistics, data and a summary of the existing transport network.

6.2 Milton Park Local Business Aspirations (taken from the 2010 DaSTS work)

Discussions were held with representatives from Milton Park, providing information about the existing situation and transport issues.

Milton Park is one of Europe's largest mixed-use business parks, and has more science and bio-tech companies than elsewhere in Oxfordshire. The park currently has 250,000 square metres of employment and ancillary floor space and provides high quality offices, laboratories, industrial units and warehousing. There are over 165 businesses on the site, employing around 6,500 people. The site is located in close proximity to the A34, with direct access via Milton Interchange (Photograph 6.1).

Photograph 6.1: Entrance to Milton Park

6.2.1 Background

The site is managed by MEPC. Companies on the site include a lot of 'just in time' freight, such as TNT and DHL. Other companies have national/international links with other companies. As such,

some companies have shift workers (such as the logistics companies), whereas others operate 9-5 hours of operation.

Despite this, the purpose of the site has evolved and will continue to do so. A critical mass has now developed for science based research/technology companies, which has created a snowball effect. This has resulted in the demographic of the workforce on the site changing, which has been happening over the last decade as more technological/scientific companies have moved into the area. As such, there is positive long-term growth for this sector but the plan will be to grow the site rather than change the balance of company make-up.

6.2.2 Transport Issues and Aspirations

The Travel Plan for Milton Park is being updated for 2012; details about the plan are set out in Chapter 7. The Travel Plan provides information about current travel patterns, and measures being taken to increase travel by sustainable modes such as the promotion of Milton BUG., Milton Park bike maintenance scheme and the promotion of bus services.

6.3 Existing Highway Network

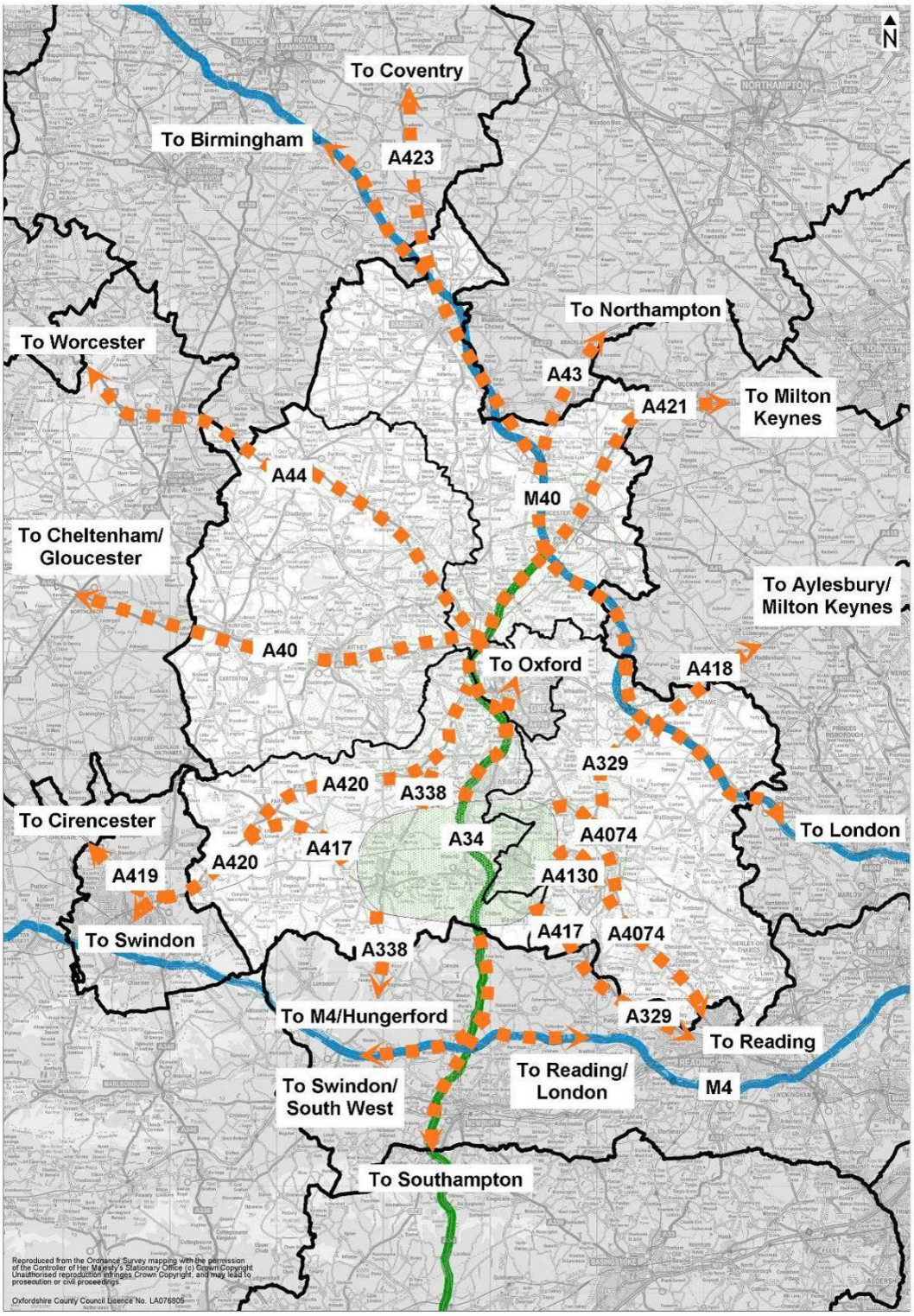
Milton Park is located adjacent to the A34 dual-carriageway (Photograph 6.2), a key north-south route running from junction 9 on the M3 at Winchester through to junction 9 on the M40 near Bicester. This links to destinations north, and Newbury and destinations south (and the M4).The A34 functions on a number of important levels. It is nationally and regionally important as it connects the South Coast to the Midlands. The A34 also forms a vital part of Oxfordshire's road network as it provides local access to many settlements in the Central Oxfordshire sub-region.

Photograph 6.2: A34 looking North from A417 Harwell

Science Vale UK is served by a highway network that links the main settlements by single carriageway A class and B class roads.

Figure 6.1 shows the main highway routes in and out of the Science Vale UK area.

Figure 6.1: Main links into/out of the Science Vale UK area



Due to the nature of the topography, access to the area is constrained by river crossings and the North Wessex Downs. That said, the area is well served by main road links that provide access to the strategic road network.

Within the Science Vale UK area the road network has not changed significantly in recent years. Other highway links in the area are not built to the current standards and are thus subject to various speed reductions over the unrestricted National Speed Limit. The A417 passes east-west through the southern part of the Science Vale area. It is subject to various speed restrictions whilst passing through the area. Photograph 6.3 shows a section of the route to the east of Wantage.

Photograph 6.3: A417 between Wantage and Rowstock

There are four highway routes into/out of Milton Park. The routes vary in characteristics are explained below:

- High Street, via Milton – The rural section of this route has an unrestricted speed limit and in the village the speed limit is 30mph. Within Milton village there are a number of properties with direct frontages onto the route and the footpaths are narrow in places. There are some traffic calming measures within Milton village.

- High Street, via Sutton Courtenay – Similarly to the Milton village route, this route has a rural section with an unrestricted speed limit and within the village of Sutton Courtney the speed limit is 30mph and there are traffic calming measures.

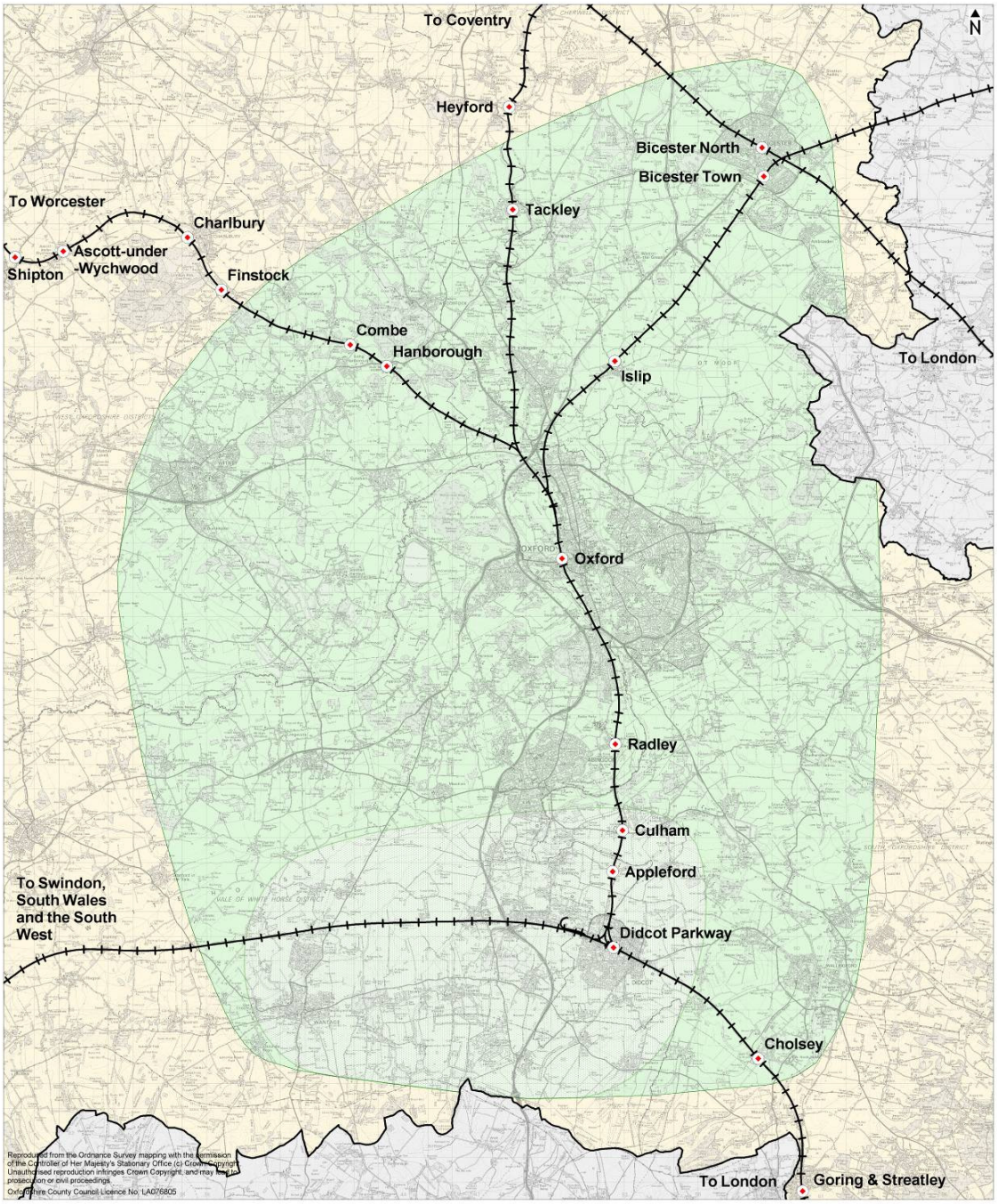
- Power Station Roundabouts – These junctions provide access to the site from Didcot. The four arm Mendip Heights Bridge roundabout is constrained by the railway located north of the roundabout. The five arm Basil Hill roundabout is north of the railway. Both roundabouts are of a similar scale and capacity to others in the Didcot network.

- Milton Interchange. Milton Park has a dedicated slip lane exit from the southbound A34 carriageway and entry/exit to the junction itself.

6.4 Existing Rail Network

The existing railway network is shown on Figure 6.2. Services on the network comprise of fast services from the South West and South Wales to London, services from Oxford and the Cotswolds to London and cross country services from the north via Reading to the south coast. There are also commuter stopping services on the Oxford to London line.

Figure 6.2: Rail network and stations serving Central Oxfordshire sub-region



Didcot station (Photograph 6.4) has historically been a key node on the Great Western Main Line, primarily as a result of being the junction at which the London to Bristol and South Wales routes diverge from the London to Oxford route. This is significant in capacity terms as the lines to the north (Oxford) and west (Swindon) are two-track, whereas the line to the east (Reading) has four tracks, operating on a paired up/down 'fast' and 'slow' basis.

Photograph 6.4: Didcot Parkway Station

Operationally, passenger services run by the First Great Western franchise dominate passenger train provision through the Science Vale UK area, primarily made up of local stopping and limited stop fast services between London and Oxford, and high speed services between London and Bristol/South Wales.

Didcot Parkway provides the largest rail gateway to the Science Vale UK area, with direct services available to Oxford, Reading, London Paddington, Bristol, Cardiff, Swansea and Cheltenham; as well as all intermediate stations on these lines. Approximately one hundred passenger trains in each direction serve Didcot Parkway each day. Oxford rail station offers services to Worcester, Bicester, Birmingham and the North, as well as services to the South Coast.

Most lines in the sub-region are operating between 70% and 90% of their capacity as more trains are now being provided on the same infrastructure to meet the demand for travel. Several planned interventions, including the Reading station upgrade and the potential development of East West Rail, will start to address 'pinch points' along the route.

There are plans to develop the rail network within Oxfordshire itself. This includes the proposal to electrify the Great Western Railway Line, including the spur to Oxford. Additionally the East-West Rail and the Chiltern Rail 'Evergreen 3' enhancements will offer new rail services from Oxford towards Milton Keynes and beyond and London respectively (both via Bicester).

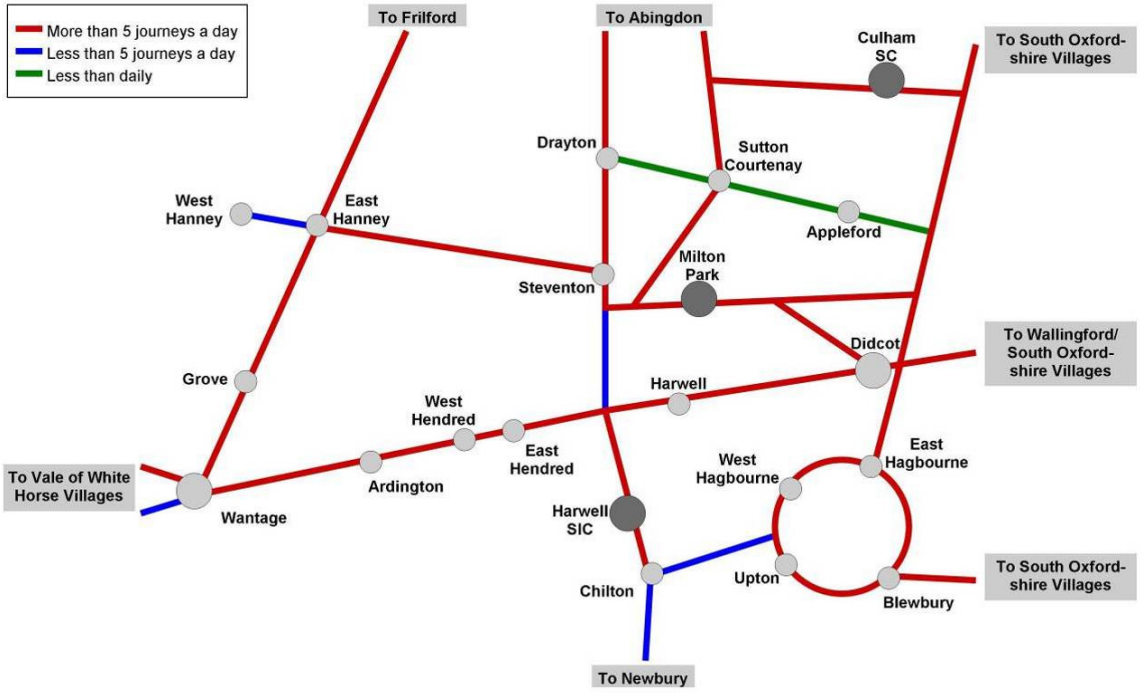
Inter-modal container traffic accounts for much of the freight activity on railways in Oxfordshire. This is mostly as a result of deep sea container traffic using the key rail freight link from the Port of Southampton and the Midlands and North of England, which routes inter-modal trains through Reading, Didcot and Oxford.

MEPC provide a shuttle bus that connects Milton Park with Didcot Parkway train station throughout the day, with a higher frequency service in the peaks.

6.5 Existing Bus Network

Within the Science Vale UK area public transport has been identified as a key concern by local stakeholders. The existing bus network is shown in Figure 6.3 and shows the coverage of the bus network in the Science Vale UK area, as well as the frequency of bus journeys.

Figure 6.3: Existing bus routes in the Science Vale UK area (2010)



The network is more robust in the east of Science Vale UK, and that the majority of bus route corridors cater for a service that has more than 5 journeys a day. There are, however, some bus route corridors which have less than 5 journeys a day on them. These corridors are mainly located to the very west or south of Science Vale UK, although one corridor (to the south of Steventon) is located centrally in Science Vale UK.

Milton Park is located approximately 2.5 miles west of Didcot Parkway Station. MEPC has a contracted shuttle bus service linking Didcot Parkway station with Milton Park. The shuttle bus was registered as a public service with effect from 30 May 2005, enabling fare-paying members of the public to travel on the route. Procured privately, information supplied by MEPC in 2010 shows there are an average of 3,500 single user trips on the shuttle service per week.

6.6 Existing Pedestrian and Cycle Network

From the centre of Milton Park analysis indicates that within 10 minutes the whole of the site is accessible by foot. Within 30 minutes Sutton Courtenay, Steventon and Milton Hill are accessible by foot, with the western part of Didcot accessible by foot within 40 minutes.

By bicycle, the western edge of Didcot is accessible within 10 minutes, with the whole of Didcot accessible with 20 minutes. Analysis also indicates that both Harwell Oxford and Culham Science

Centre are accessible by bicycle from Milton Park in just over 20 minutes. Abingdon is also accessible by bicycle within 30 minutes, with Wantage accessible by bicycle within 40 minutes.

There are a number of barriers to walking and cycling, these include:

- The land to the north, south and west of Milton Park is mainly rural in nature;
- The site is also bordered to the west by the A34 and south by the A4130;
- Travelling to the east, the rail line from Didcot towards Oxford could act as a barrier; and
- To the north the Thames is again a barrier, mainly due to the limited number of crossing points.

6.7 Existing Highway Performance

The transport network in the Central Oxfordshire sub-region is dominated by two factors - travel to and from Oxford, and travel along the A34 through Oxfordshire. The Central Oxfordshire sub-region is heavily reliant on the A34 to provide access to/from the north and south. However, at times, the amount of traffic on the A34 can lead to considerable access problems in the sub-region. This is because the A34 provides both local access and strategic access - local access within the sub-region and within Oxfordshire, and important national links between south coast ports and the Midlands and the north.

As demand to use the A34 has steadily increased, from both local and strategic traffic, local traffic has increasingly found alternative routes. The local road network has some A and B class roads, but is also characterised by a network of more minor roads through villages and suburban areas around Oxford. In recent years measures have been put in place to deter the use of more minor roads, but as the demand for travel has increased, the peak hour congestion on the A34 has resulted in existing demand management measures not being sufficient to deter use of the local road network. Figures 6.4 and 6.5 show the volumes of traffic, in the AM (08:00-09:00) and PM (17:00-18:00) peak hours, across the Science Vale UK area.

The analysis set out in this section has been undertaken using transport modelling and data collection work undertaken in 2007. Given the transport infrastructure has not changed significantly since this time, it is deemed a good basis for understanding the current highway performance issues.

Figure 6.4: Traffic volumes in the 2007 AM peak (08:00-09:00)

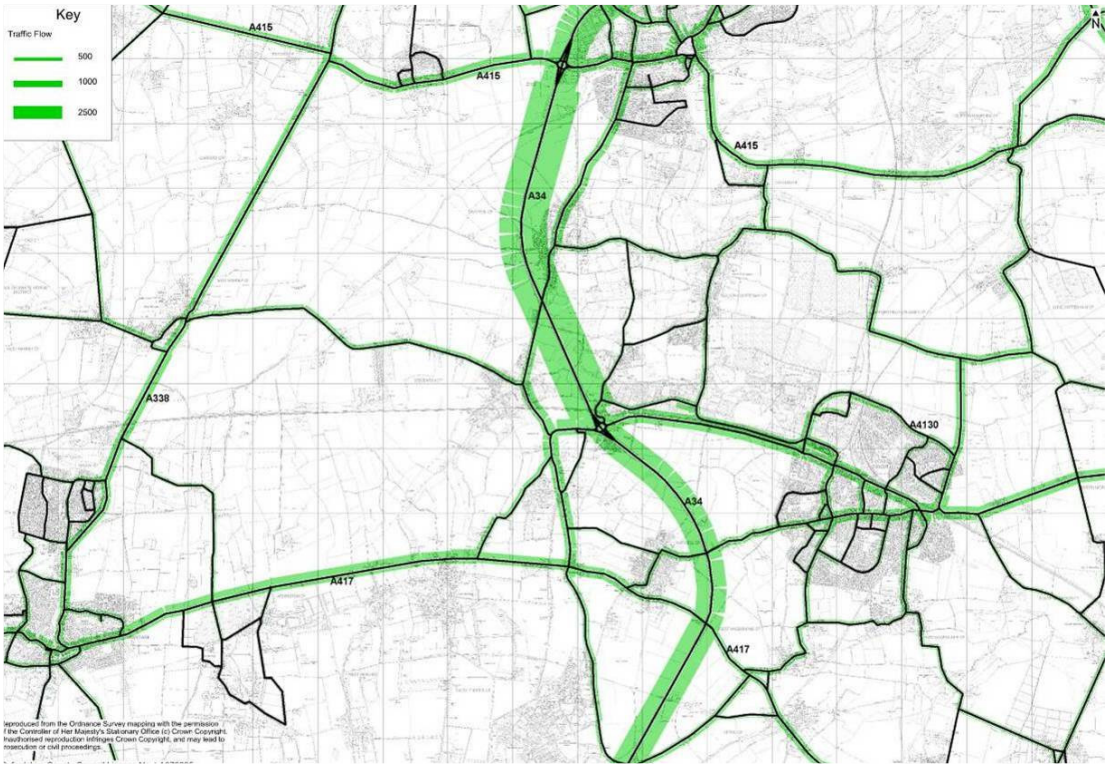
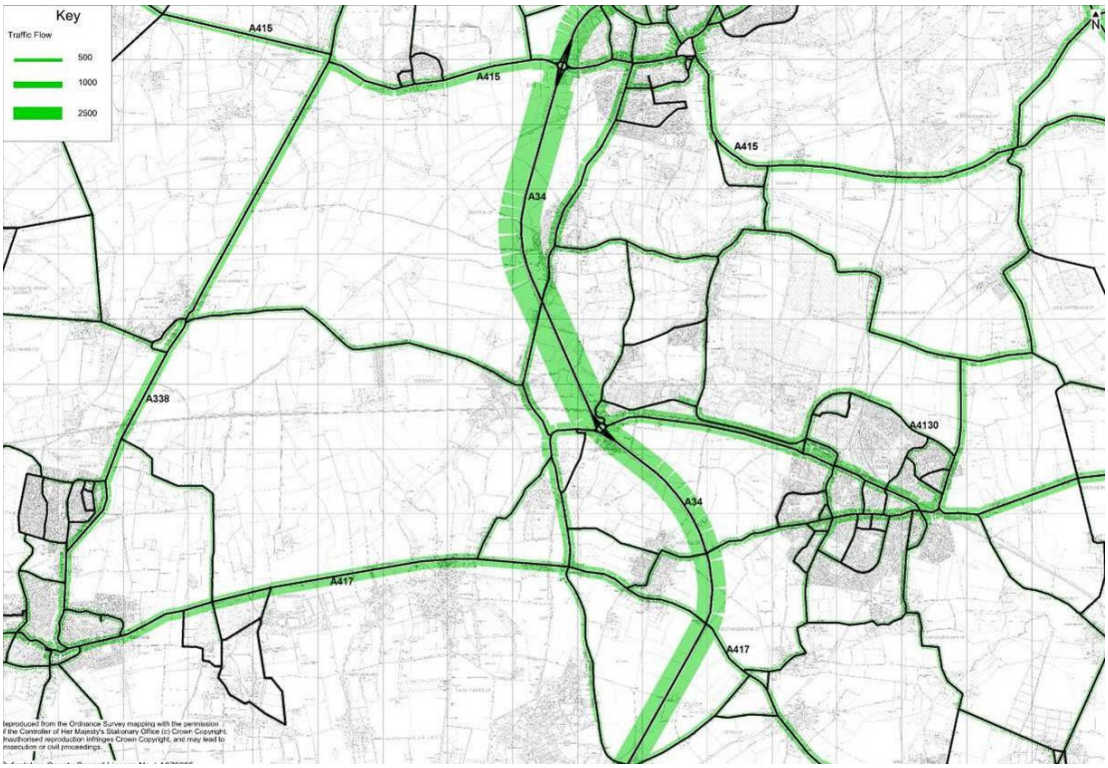


Figure 6.5: Traffic volumes in the 2007 PM peak (17:00-18:00)



There are three identifiable areas of existing pressure on the wider network:

- The Oxford area - where the A34 forms part of the local network (Oxford ring road);
- M40 Junction 9 – where the A34 has a junction with the M40 and A41; and
- The Science Vale UK area – where the A34 acts as a spine road linking and providing access to housing and employment areas.

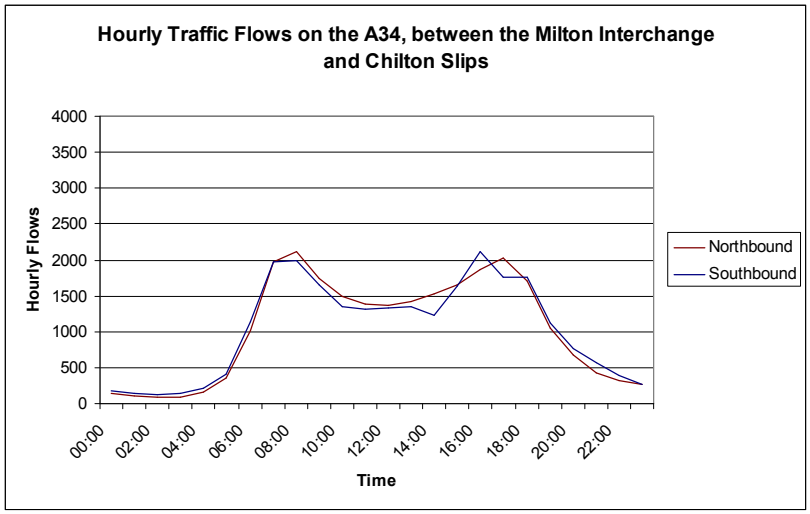
Further details about pressure on the network in Science Vale UK is shown later in this section (see Figure 6.9).

6.7.1 Daily profile of traffic

The transport model provides data on existing peak hour flows. This is useful in considering the most likely congested locations where the demand to use the road network is greatest. In order to demonstrate the considerable off-peak demand to use the A34 during the day, and to show the significant and tidal peaks of the remainder of the network in the area off peak, selected 24 hr traffic data results have been analysed.

Figure 6.6 shows the daily profile of traffic on the A34. Data from the Highways Agency's TRADS website is available for a site between Milton Interchange and Chilton Interchange. This site shows a much flatter profile than more northern sections of the A34, as currently south of the Milton Interchange the proportion of commuter traffic is much less, and thus the regional and national role of the A34 is more predominant.

Figure 6.6: Hourly flows on A34



Figures 6.7 and 6.8 show the daily profile of two roads providing access with the Science Vale UK area. Both the roads display a significant difference between peak and off-peak demand. They also show how the roads are highly tidal in nature.

Figure 6.7: Hourly flows on A417

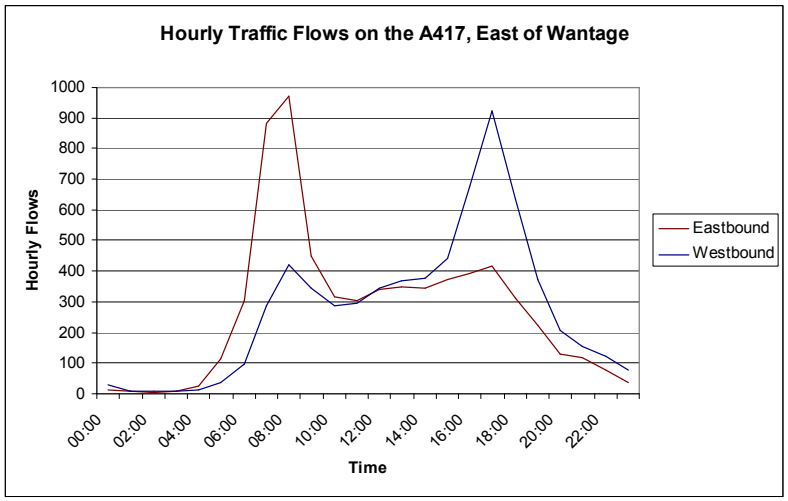
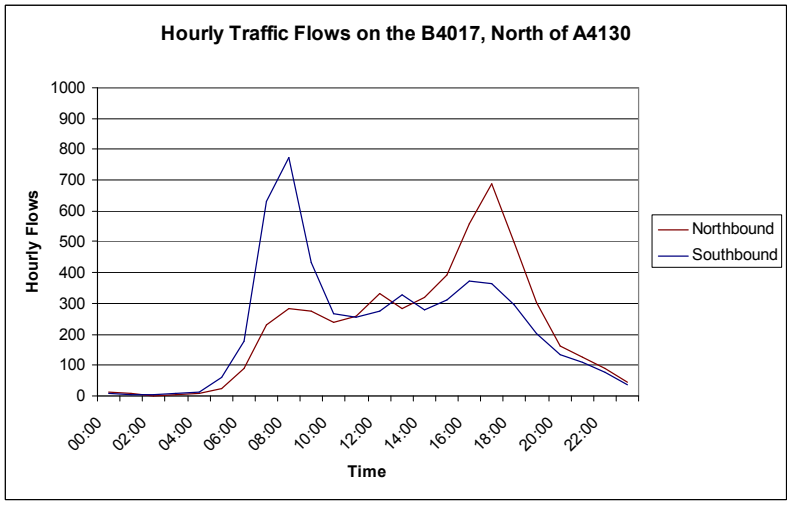


Figure 6.8: Hourly flows on A4017

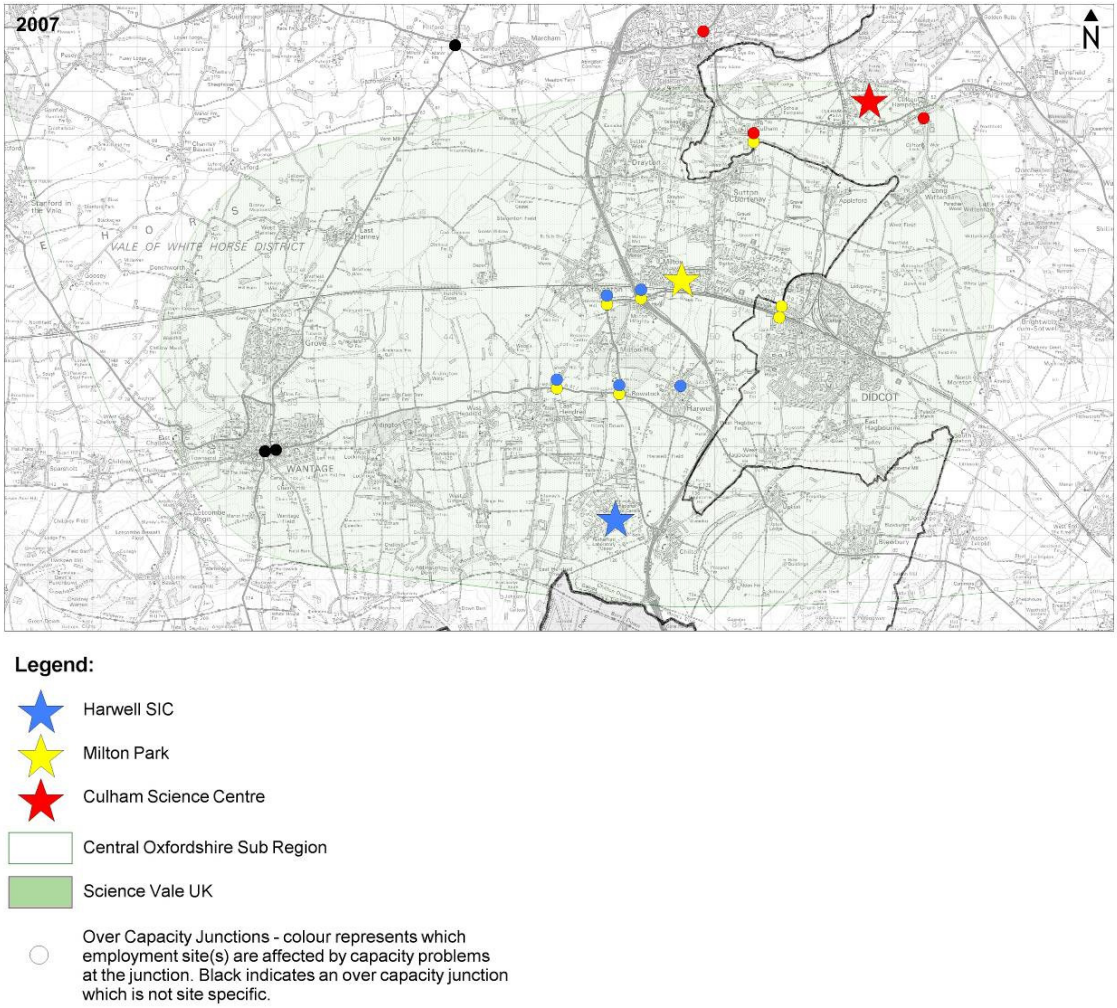


The daily profile of trips on the A34 show that the road acts as both a key strategic route as well as a more local commuter route for the sub-region as it approaches Oxford. The profile on other roads in the Science Vale area show a much more 'traditional' commuter profile, with significant peaks and tidality. This shows a strong demand to use the network for commuting, but travel throughout the day for other purposes is much lower.

6.7.2 Congestion locations 2007

Figure 6.9 shows the location of congested junctions on the highway network in the Science Vale UK area in 2007. These junctions have been related to the three main employment sites. Whilst the network is relatively free of congested locations, it can be seen that the locations highlighted form important gateways to the employment areas.

Figure 6.9: Location of congested junctions 2007 – AM and/or PM



This shows that currently congested highway locations associated with Milton Park are:

- Milton Interchange;
- Steventon Signal Controlled Junction;
- Rowstock Roundabout;
- Featherbed Lane;
- Power Station Roundabouts; and
- Culham River Crossing.

Figures 6.10 and 6.11 show the location of links shown to be over capacity in the 2007 COTM AM peak and PM peak hours. These congested links are related to the congested junctions. The AM and PM results illustrate the tidal nature of some of the congested links and hence how individual junctions have different 'problem links' between the peak travel time periods.

Figure 6.10: Location of congested links AM peak hour 2007 (08:00-09:00)

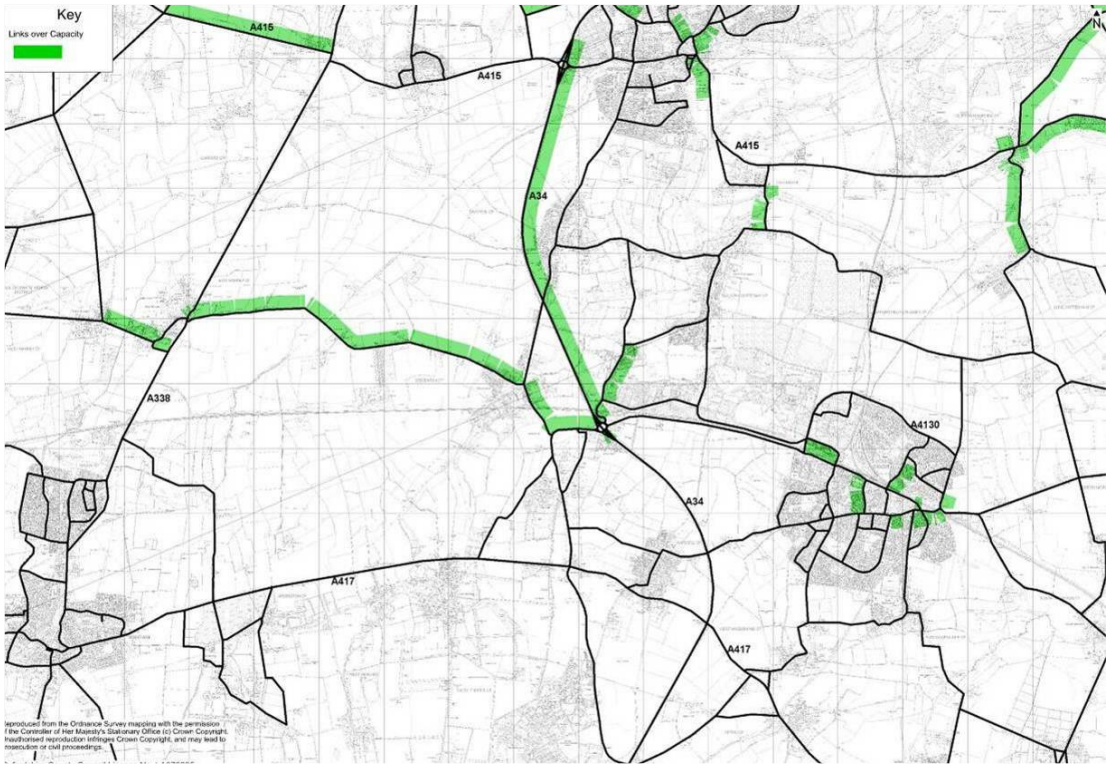
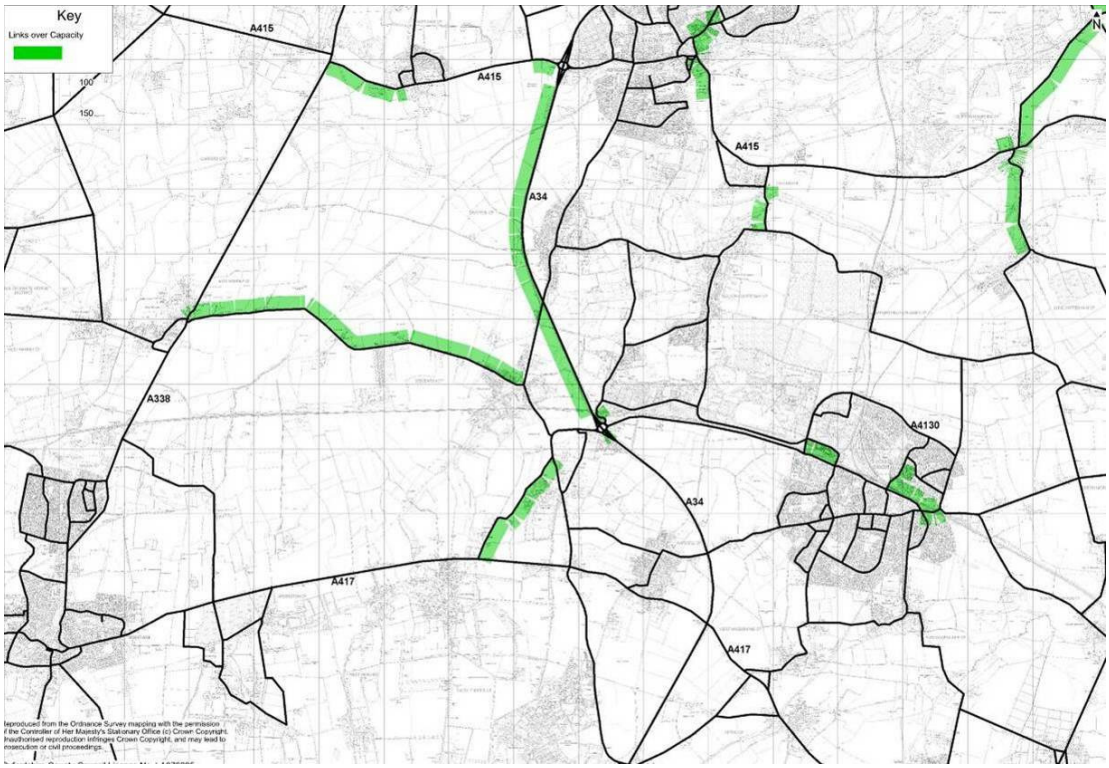


Figure 6.11: Location of congested links PM peak hour 2007 (17:00-18:00)



6.7.3 Milton Interchange

Milton Interchange has been the subject of a number of capacity enhancement projects. It is a major interchange between the A34 and the A4130, and provides a direct access to Milton Park. Indeed, there is a direct access from the southbound off slip from the A34 to the Milton Park link. The junction has been signalised. The Milton Park arm of the junction is shown on Photograph 6.5.

Photograph 6.5: Milton Interchange

7 Review of the Travel Plan for Milton Park

7.1 Introduction

In line with work to prepare a Local Development Order (LDO) for the site, Glanville Consultants have drafted an update to the Travel Plan on behalf of MEPC Ltd and in consultation with the TP co-ordinator. The revised Issue 1 of the Travel Plan document has been reviewed for the purposes of this report. This chapter provides a summary of the Travel Plan.

7.2 Travel Plan History

Milton Park has had a Travel Plan (TP) in place since January 2002, with the most recent adopted version prepared in December 2008. The Milton Park TP is a package of measures aimed at reducing single car occupancy, promoting sustainable travel and developing better transport links. It works with the various occupiers of the park, the public authorities and transport operators to ensure the objectives and targets are achieved. Since 2002 a TP co-ordinator has been in place to manage delivery of the TP, a key aspect of which is to work directly with the numerous employers within Milton Park.

A 2012 version of Travel Plan is currently being updated (Issue 1 was available at time of the review set out in this chapter).

7.3 The Travel Plan Update

The updated TP for Milton Park is an all-inclusive document which encourages a consistent approach across the Park, with employers working together to achieve the travel initiatives by increasing awareness of the travel opportunities and adopting the objectives. Milton Park is able to help organisations prepare Action Plans, as well as provide professional advice on implementation of the travel plan measures if the employers commit to the TP. In return they are encouraged to:

- Commit to and adapt to the Travel Plan;
- Designate a manager responsible for promoting it within their organisation;
- Agree an Action Plan in partnership with the Milton Park TP co-ordinator; and
- Monitor the take-up of the measures by staff in their organisation.
- The TP is a dynamic document that continues to evolve with the development and growth of Milton Park.

7.4 Existing Travel

The TP describes the existing travel and transport situation in Section 3.0 Local Transport Provision and Site Facilities. It identifies that a comprehensive network of footways are provided throughout Milton Park and the surrounding area, with dropped kerbs, tactile paving, central refuges and good street lighting. Section 3 states that “the cyclist is well catered for” with traffic-free routes, cycle lanes, designated areas at junctions and suitable space for cycle parking. The available bus services are described in full with details of routes and timings provided.

To fully update the Travel Plan and obtain an understanding of the existing travel and transport situation at Milton Park, a staff travel survey was undertaken during October 2011 through an online questionnaire. From the 6,500 employees at Milton Park, 549 completed the travel survey. While this response rate is low, it still provides an indication of the existing situation.

Section 4.0 of the TP provides detail of the survey results. These are summarised below:

- Car – single occupancy = 74%;
- Car – car share = 8%;
- Car – passenger = 3%;
- Train = 5%;
- Bus = 2%;
- Shuttle bus = 2%;
- Cycling = 4%;
- Walking = 1%;
- Motorcycle = 0%; and
- Work from home = 1%.

The results show that the existing mode share 74:26 (single occupancy car: other modes) has increased from the figure obtained through the 2008 surveys which saw less single car occupancy (63:37). The postcode data collected identifies that 53% of respondents live within Didcot, Abingdon, Wantage and Oxford, which implies there is an opportunity to increase the non-car mode share.

7.5 Travel Plan Framework

Section 5.0 of the TP makes reference to the fact that many employees at Milton Park could readily travel by means alternative to the car. The TP therefore aims to reduce unnecessary travel by car associated with Milton Park and increase the number of journeys made using alternative modes. A target modal split of 69:31 is to be achieved by July 2015. The above statement has been translated into challenging and achievable objectives:

i) To reduce unnecessary single occupancy car use as a means to travel to and from Milton Park.

ii) To establish walking, cycling, the use of public transport and car sharing as feasible and realistic alternatives to single occupancy car use for the journey to work where appropriate.

iii) To be acceptable to employers on Milton Park and their employees.

iv) To be ongoing and adaptive, monitoring impacts and learning from experience and, above all, pro-active.

v) To encourage employing organisations on Milton park to adopt the Travel Plan strategy within their operations, designate a manager to be responsible for its promotion, agree to an action plan produced in partnership with Milton Park and work in partnership with Milton Park to promote the measures I the plan and monitor their take up within their organisation.

For these objectives to be achieved, the TP also sets out a range of initiatives that are to be implemented in stages over an initial five year period, with progress of these initiatives assessed against specific targets. A summary of these initiatives is provided in a Table in Section 8.0 of the TP. This has been included below as Table 7.1:

Table 7.1: Travel Plan Initiatives and Targets (from Issue 1 of the Glanville Travel Plan document)

Initiatives	**Target**	**Timescale**	**Responsibility**
Review measures to encourage Partners to travel to the branch by alternative modes	Undertake travel survey	Snapshot - Annually Comprehensive -Every two years	Travel Co-ordinator
Provide an annual review to OCC		After every snapshot and comprehensive Travel Survey has been undertaken	Travel Co-ordinator
General			
Mode Share	Improve car driver : other modes car share to at least 69:31	Within two years	Travel Co-ordinator
Walking and Cycling			
Encourage staff to walk or cycle to work	Increase proportion cycling to more than 4% and walking to more than 2%	Within five years	Travel Co-ordinator
Promote health benefits of walking and cycling		Ongoing	Travel Co-ordinator
Provide information on walking and cycling	Display details of the Local Authority network of cycle routes and walking routes	Ongoing	Travel Co-ordinator
Promote "Travel Buddy" system		Ongoing	Travel Co-ordinator
Promote 'Walk to Work Week'		Ongoing	Travel Co-ordinator
Promote the Milton Park bike maintenance scheme		Ongoing	Travel Co-ordinator
Promote available Cycle Salary Sacrifice Schemes		Ongoing	Travel Co-ordinator

Initiatives	Target	Timescale	Responsibility
Promote the use of online cycle route planners		Ongoing	Travel Co-ordinator
Offer cycle training days in partnership with OCC		Ongoing	Travel Co-ordinator
Promote MiltonBUG		Ongoing	Travel Co-ordinator
Public Transport			
Encourage staff to use public transport to travel to work	Increase proportion using public transport to work to more than 9%	Within five years	Travel Co-ordinator
Promote the health benefits of using public transport		Ongoing	Travel Co-ordinator
Continue to provide the Milton Park Shuttle Bus		Ongoing	Travel Co-ordinator
Promote the public transport options available for staff to travel to Milton Park	Display information on local public transport network and make timetables available	Ongoing	Travel Co-ordinator
Monitor local public transport conditions	Alert those responsible for the upkeep of public transport facilities where necessary	Ongoing	Travel Co-ordinator
Promote the Real Time Information website www.oxontime.com to staff		Ongoing	Travel Co-ordinator
Driving			
Encourage staff not to drive alone to work	Decrease proportion of staff driving to work alone by at least 5%	Within five years	Travel Co-ordinator
Encourage car sharing to existing car drivers	Display publicity material for car sharing Make employees aware of www.miltonparkcarshare.co.uk and provide internet access if required	Ongoing Ongoing	Travel Co-ordinator Travel Co-ordinator

Section 7.0 of the TP provides detail of the TP co-ordinator responsibilities, and identifies that the current TP co-ordinator, Dawn Crawford, is to continue in that role at MEPC's offices on Milton Park. The role of the TP co-ordinator at Milton Park has been in place since the first Travel Plan was prepared in 2002. Some of the key responsibilities include:

Monitor the effectiveness of the TP and collect regular survey data with reports of the results;

Liaise with occupiers on Milton Park to secure their commitment to the Travel Plan and to provide support in preparation of their own Action Plans;

Liaise with local authorities, transport operators, transport forums, neighbouring businesses and Milton Park managers; and

To handle day to day enquiries and to act as the point of contact for staff and occupiers to provide travel to work information.

7.6 Summary

The Milton Park Travel Plan has been designed to instigate and maintain an effective and tangible shift in travel behaviour at Milton Park, specifically aiming to reduce the unnecessary travel by car to and from the site. The results from the TP survey outline the existing travel patterns at Milton Park, showing that 74% of staff surveyed travel alone in a car.

The TP identifies a number of objectives that have been set out, with suitable initiatives and travel management mechanisms selected to achieve the target modal shift. These initiatives and measures are to be phased over time, and will be flexible to allow adjustment in response to the results of the monitoring and in consultation with the local authority.

The existing TP co-ordinator has been referenced within the document, with her specific role and responsibilities redefined.

In conclusion the Milton Park Travel Plan will be set in place to reduce trips by car to the site, with the management and monitoring allocated to the existing TP co-ordinator. Over the five year timescale it is anticipated that car trips to the site will reduce by a minimum of 5%.

8 Model framework and assumptions

8.1 Introduction

This Chapter provides details of the modelling work that forms the basis of this technical assessment of transport issues.

8.2 Central Oxfordshire Transport Model

In June 2011 Halcrow updated the Central Oxfordshire Transport Model (COTM) to include Oxfordshire latest housing, employment and infrastructure forecasts for 2030 (using data supplied by the District Councils). These 'Reference Case' future year forecast models include agreed housing and employment growth and additional highway infrastructure assumptions for the Science Vale UK area. This work has been used as the basis for the Milton Park LDO work.

For further details of the model development, structure, validation and forecasts see the:

- Highway Local Model Validation Report (August 2009);
- Public Transport Local Model Validation Report (2008) ; and
- Forecasting Report (July 2011).

COTM is a 'variable demand model' built to the latest WebTAG guidance for strategic transport models. COTM comprises of a highway model (SATURN), and public transport model (emme/3) and a demand model (combination of emme/3 and spreadsheet). The Base Year assignments (including calibration and validation) operate as independent highway and public transport models. The future year assignments operate as a Variable Demand Model (VDM), whereby the highway and public transport models interact with each other through the VDM.

As COTM is a VDM, it has mode shift, redistribution and suppression functionality. Where highway networks are at capacity, COTM therefore adjusts the initial trip matrices to more realistic levels of demand. The assessment will be undertaken using both initial trip matrix scenarios (a fixed trip assignment), and the final COTM output matrix scenarios. This will allow the full extent of congestion issues to be understood, and the likely changes to trip pattern in conditions of congestion.

The assessment year for this work is 2030, and models are available for AM (08:00-09:00) and PM (17:00-18:00) peak periods.

8.3 Geographical coverage of COTM

The SATURN model of COTM consists of a detailed 'simulation' network which covers most of the county area extending to just south of Banbury in the north, Thame to the east, Chilton Downs and Cholsey to the south, and Burford to the west. Definition of the 'simulation' network involves detailed specification of both link and node-based data and consists of all A-class and B-class roads as well as other major roads. The 'simulation' network contains:

- 1360 priority junctions;
- 170 roundabouts;

- 100 traffic signal controlled junctions; and
- 100 external nodes.

A series of external nodes are used to connect the 'simulation' network to the 'buffer' network.

The 'buffer' network includes all the key external roads connecting Oxfordshire to the rest of the country. These include all the motorways and any other major roads that are key for routeing through Oxfordshire. Definition of the 'buffer' network consists of link-based data only without any node-based data. The extent of the 'buffer' network lies between the M6 to the north, the M1 and M25 to the east, the M4 to the south and the M5 to the west.

8.4 Characteristics of COTM

COTM has, for future year analysis, a variable demand (VDM) function. This means that through its internal processes it compares the cost of travel by public transport and by car in order to decide on mode choice and route choice. COTM can conclude that the cost to undertake a trip is prohibitive and thus the trips will not be made (the trip is 'suppressed'). COTM also, based on the results of the comparisons of cost of travel by public transport and car, can make changes to the destinations of trips reflecting new total journey times between origins and destinations.

COTM assumes that all users have perfect knowledge of the public transport and highway networks. That is, each trip understands how long it will take and the fuel cost to undertake the trip by car, and how long and how much it will cost to undertake the trip by public transport. Conversely, COTM assumes that all highways operate smoothly (i.e. there are no delays due to accidents or planned/emergency road works) and that all public transport networks operate to timetable.

Considering public transport in more detail, there are factors in COTM that reflect the 'reluctance' to use public transport. These take account of the way in which, for example, potential passengers perceive waiting time and the time it takes to interchange between public transport services. These time costs, when added to the journey time and fare, provide a total cost to undertake the trip by public transport.

8.5 COTM Interpretation

COTM output is much more closely aligned to actual outcomes than traditional fixed trip modelling assignments. That is, as COTM will not produce the large queues and delays as exhibited by congested fixed trip matrix models. COTM attempts to work within the highway capacities defined in the model network coding (as these are the actual capacities). It can do this because the model allows trips to be reassigned (change destination), transfer mode or decide not to travel.

In the COTM model, the differences between actual and demand flows on highway links are not as large as could be shown by a fixed trip model. That is, as trips have other 'choices' (suppression, change destination, mode choice). However, when analysing the model, consideration should be given to the differences shown and attention drawn to highway links where the actual flow equates to the capacity of the link and there is a difference in flow between the actual and demand flows. This shows that if 'problems' were solved up stream from that point, more flow could demand to use the section of highway under consideration.

That is, though both demand and actual traffic volumes on the highway network in the SATURN are generally shown to be within modelled capacity of the highway (there are not significant delays), as with real life experience, if delays and queues, notably on the highway network become unacceptably large, people make other choices as opposed to simply 'joining the end of the queue' which has traditionally been the case with model assessments of this nature. Thus, a 'with development' model test that does not show any major delays or queues does not necessarily mean that a proposed development is acceptable.

For this reason, the initial "fixed trip" matrix assignments are also considered in this assessment to understand the potential traffic impact without changes in transport conditions resulting from the variable demand modelling.

The highway model used in COTM is SATURN. A notable feature of this model is the production of Actual and Demand flows. The SATURN manual contains the following definition.

> *'We therefore define "flow" in SATURN in two distinct ways:*
>
> *1) As the "assigned" or "demand" flow. This is the flow given by the assignment stage and corresponds to the total demand independent of when the flow arrives.*
>
> *2) The "actual" or "simulated" flow which corresponds to the actual flow during the time period simulated.'*

Thus, in addition to the characteristics of the variable demand model described above, there is a need to consider both the actual and demand flows when interpreting the COTM outputs.

In more detail, within COTM all trips in the matrix are given the opportunity to travel. However, trips demanding to leave the site can be subject to the following:

- Suppression – which means that the COTM calculates that there is no reasonable cost to travel available, and hence COTM predicts that trip does not travel during that modelled hour.
- Change destination – for some trips, COTM compares the choice of destinations and hence COTM can change the destination of a trip if the total journey time becomes too long and an alternative exists.
- Model split – if the cost of the trip is acceptable (either by public transport or highway (car)), COTM calculates whether the trip would be undertaken by public transport or highway (car).
- Queue – if the trip is calculated to use the highway, it may be subject to queuing at some point on its journey.

8.6 Trip rates and trip generation

For the purpose of this assessment it has been the proposed LDO development on the Milton Park site that has been based on the trip rates shown in Table 8.1 from the TRICS database.

Table 8.1: Trip rates used in the assessment

	AM		PM	
	Arrivals	Departures	Arrivals	Departures
B1 Office	1.52	0.179	0.183	1.214
B2 Industrial	0.486	0.217	0.133	0.422
B8 Warehousing	0.179	0.096	0.109	0.173

The trip rates have been to the LDO development quantums/types set out in Appendix A and the resultant trip generation for the initial matrices is shown in Table 8.2.

Table 8.12: Trip generation

	AM		PM	
	Arrivals	Departures	Arrivals	Departures
LDO development - north of the railway	504	80	80	410
LDO development - south of the railway	10	50	10	40

9 Transport impacts

9.1 Introduction

This Chapter presents the results of the strategic modelling work undertaken using the Central Oxfordshire Transport Model (COTM). This contains information about changes to modelled highway link flows, highway capacity issues and changes in public transport patronage.

9.2 Strategic highway impact assessment

The Do Minimum and LDO model scenarios have been interrogated to ascertain changes in traffic flow on the road network associated with the LDO scenario.

Actual flow, demand flow and volume to capacity data has been extracted from the final variable demand assignments (see Appendix C) and the initial fixed trip matrices assignments (see Appendix D). In addition, a matrix of modelled traffic flows at Milton Interchange has been produced, see Appendix E.

The fixed trip matrix assignment modelling shows that during the AM peak hour the LDO scenario increases demand traffic flow (greater than 5% and 100PCUs/hr[1]) on:

- Milton Park/High Street junction (Milton Park West);
- Milton Park/Sutton Courtenay Road/Milton Road junction (Milton Park East);
- Milton Interchange;
- Steventon Signal Controlled Junction; and
- Milton Park Road (East of Milton Park).

The COTM modelling shows that during the AM peak hour the LDO scenario increases demand traffic flow (greater than 5% and 100PCUs/hr) on:

- Milton Park/High Street junction (Milton Park West); and
- Milton Park/Sutton Courtenay Road/Milton Road junction (Milton Park East).

[1] Flows differences of less than 5% or 100PCU are not considered significant, as changes of this magnitude often occur with seasonal variations.

The fixed trip matrix assignment modelling shows that during the PM peak hour the LDO scenario increases demand traffic flow (greater than 5% and 100PCUs/hr) on:

- Milton Park/High Street junction (Milton Park West);
- Milton Park/Sutton Courtenay Road/Milton Road junction (Milton Park East)
- High Street, Milton;

The COTM modelling shows that during the PM peak hour the LDO scenario does not increase demand traffic flow greater than 5% and 100PCUs/hr.

Figures 9.1 and 9.4 contain SATURN plots showing the changes in modelled actual traffic flow. Note changes in green indicate increases in traffic flows associated with the LDO, and blue indicate reductions.

Figure 9.1: AM peak (08:00-09:00) differences in modelled actual traffic flow between Do Minimum and LDO scenarios (using the COTM scenarios)

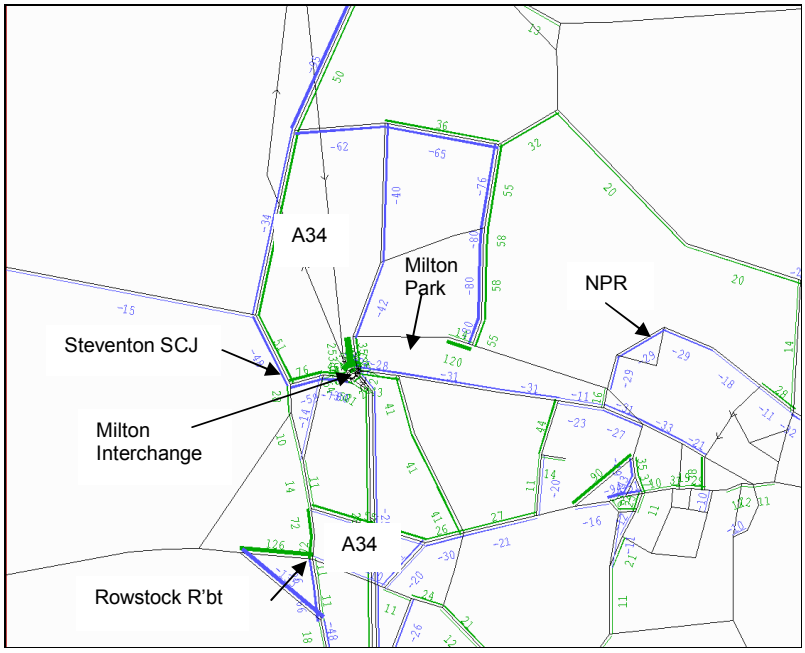


Figure 9.2: PM peak (17:00-18:00) differences in modelled actual traffic flow between Do Minimum and LDO scenarios (using the COTM scenarios)

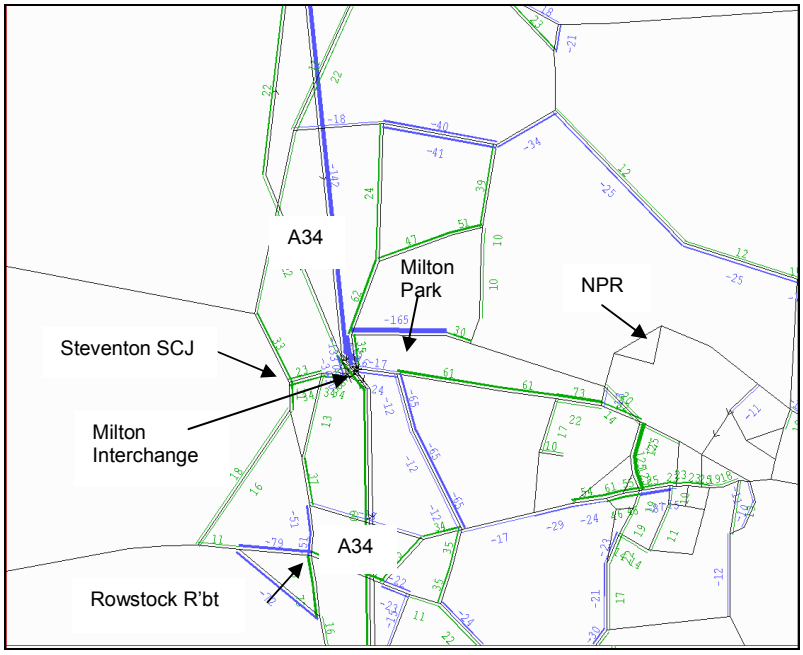


Figure 9.3: AM peak (08:00-09:00) differences in modelled actual traffic flow between Do Minimum and LDO scenarios (using the fixed trip assignment scenarios)

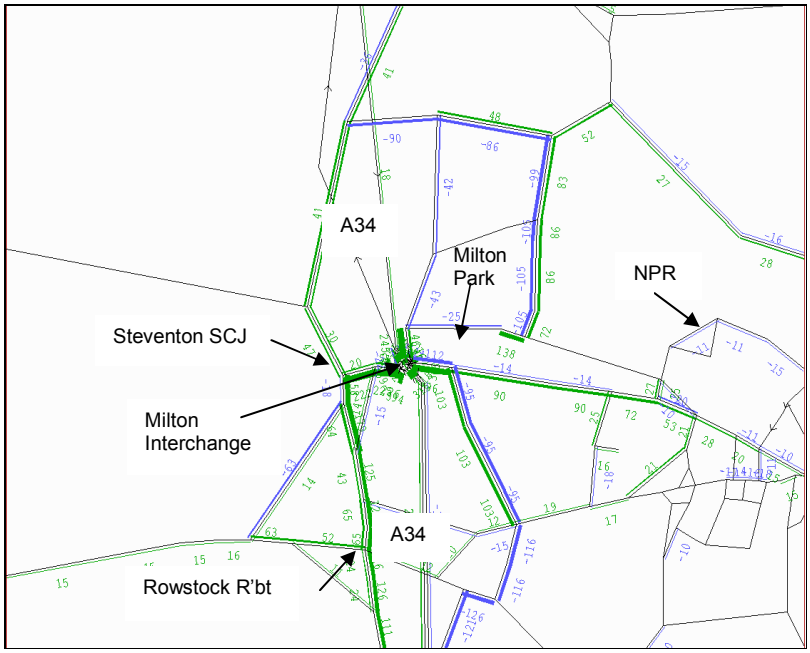
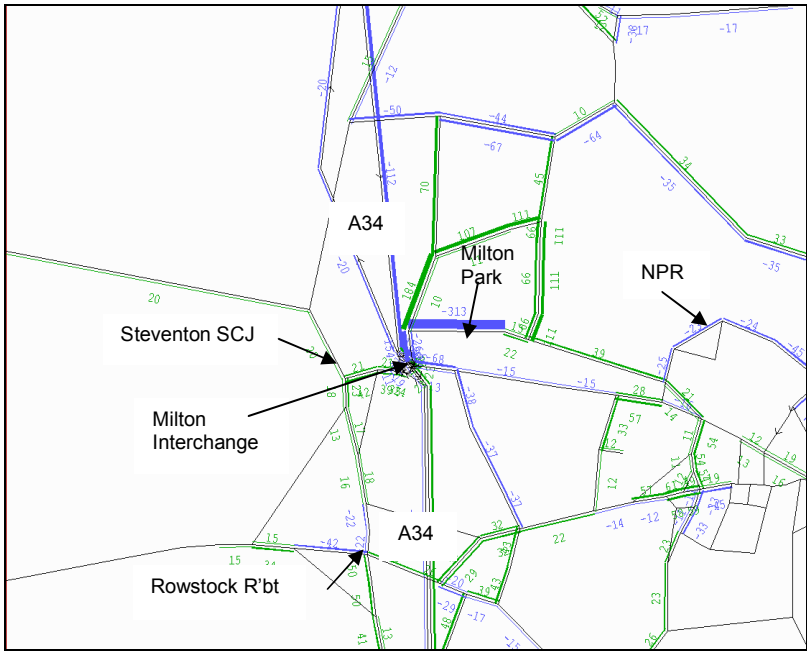


Figure 9.4: PM peak (17:00-18:00) differences in modelled actual traffic flow between Do Minimum and LDO scenarios (using the fixed trip assignment scenarios)



The changes in traffic flow are low and suggest that the increase in traffic at Milton Park associated with the LDO creates both rerouting of trips within the highway network and re-distribution of trips to other modes.

The difference plots indicate minor re-routeing of trips around the development, including:

- The displacement of some trips making through trips through Milton Park in the Do Minimum scenario; and
- The displacement of some trips using the river crossing to the north of Didcot in the Do Minimum scenario.

To understand the demand from the site, a number of Select Link Analysis's have been undertaken on the northern area of the development, to ascertain the distribution of trips from the site as a whole (including current, consented and LDO traffic). Figure 9.5 and 9.6 show the modelled distribution from Milton Park area.

Figure 9.5: AM peak (08:00-09:00) distribution of all traffic to Milton Park area

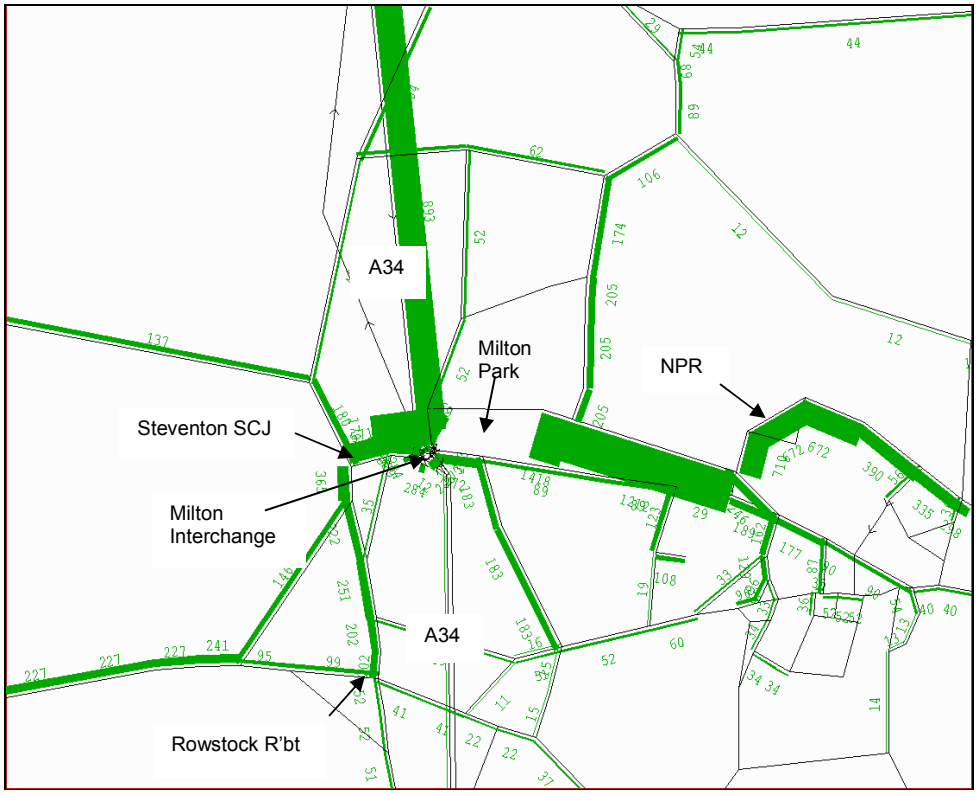
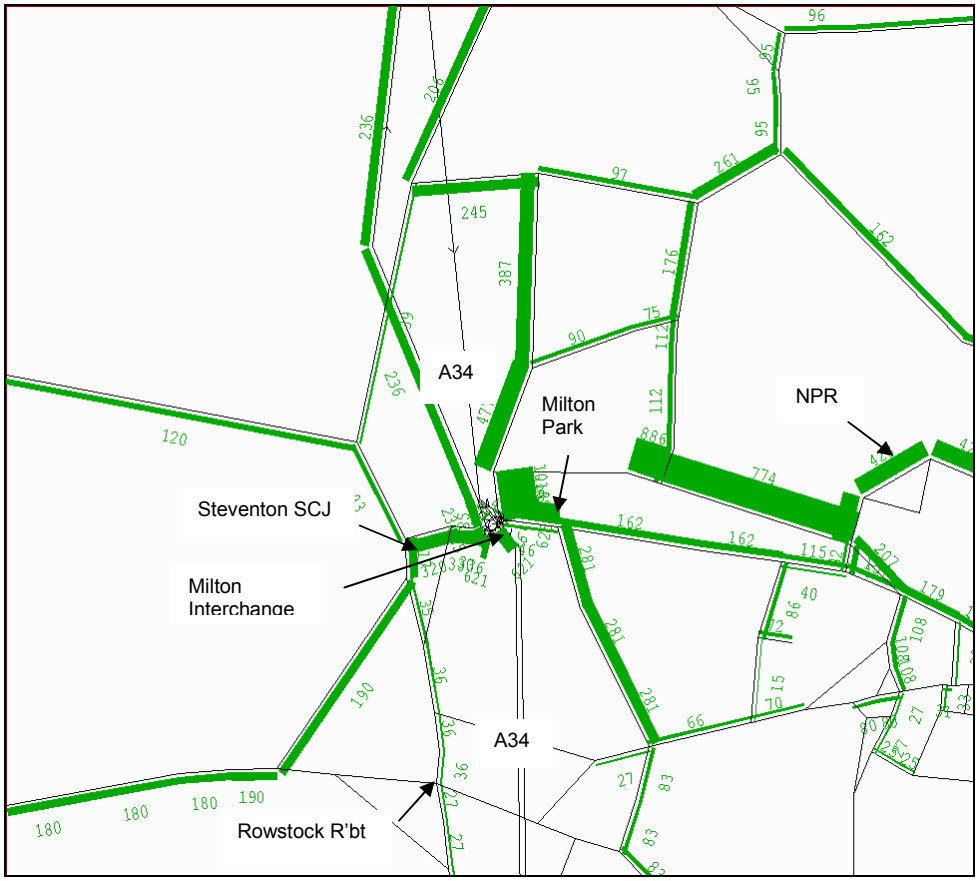


Figure 9.6: PM peak (17:00-18:00) distribution of traffic from Milton Park area



This shows that there is a difference between the changes in traffic on the local road network resulting from the LDO scheme, and the routeing of traffic from Milton Park.

The junction capacity issues in the area result in trips rerouting, redistributing and changing mode etc to avoid congestion. Hence some of the locations showing increases in traffic flow are showing indirect changes in traffic flow, resulting from traffic that has been displaced from other routes by the development traffic.

Figures 9.7 to 9.10 show the locations in the model with volume to capacity ratios on links greater than 85% (i.e. reaching capacity).

Figure 9.7: AM peak (08:00-09:00) Do Minimum scenario (V/C ratios greater than 85%)

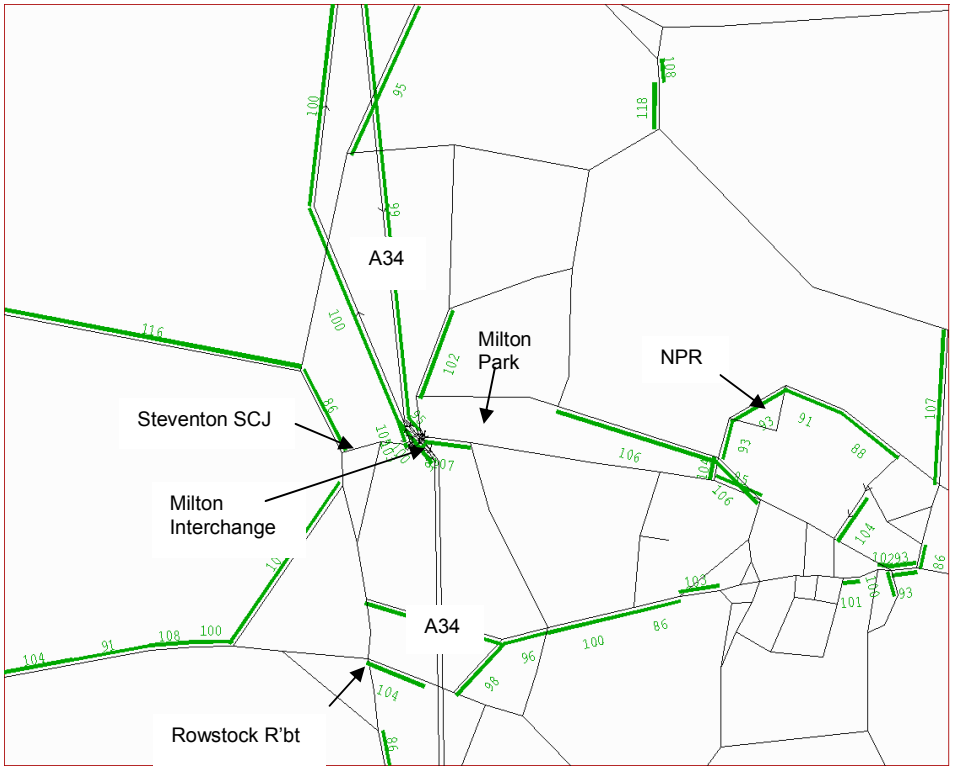


Figure 9.8: AM peak (08:00-09:00) LDO scenario (V/C ratios greater than 85%)

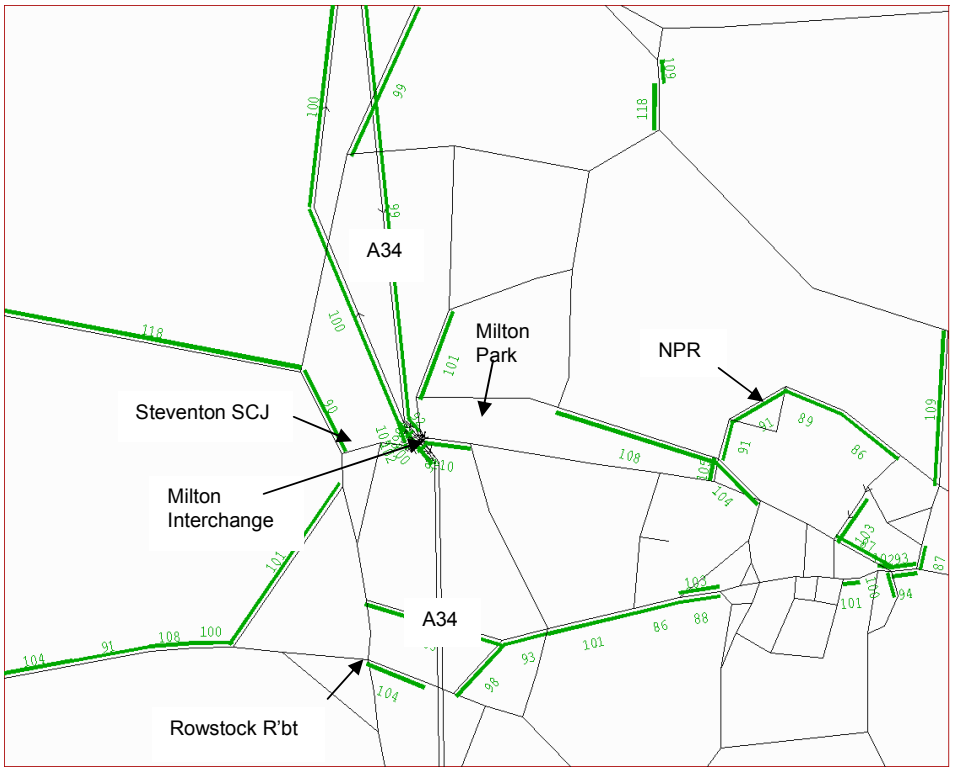


Figure 9.9: PM peak (17:00-18:00) Do Minimum scenario (V/C ratios greater than 85%)

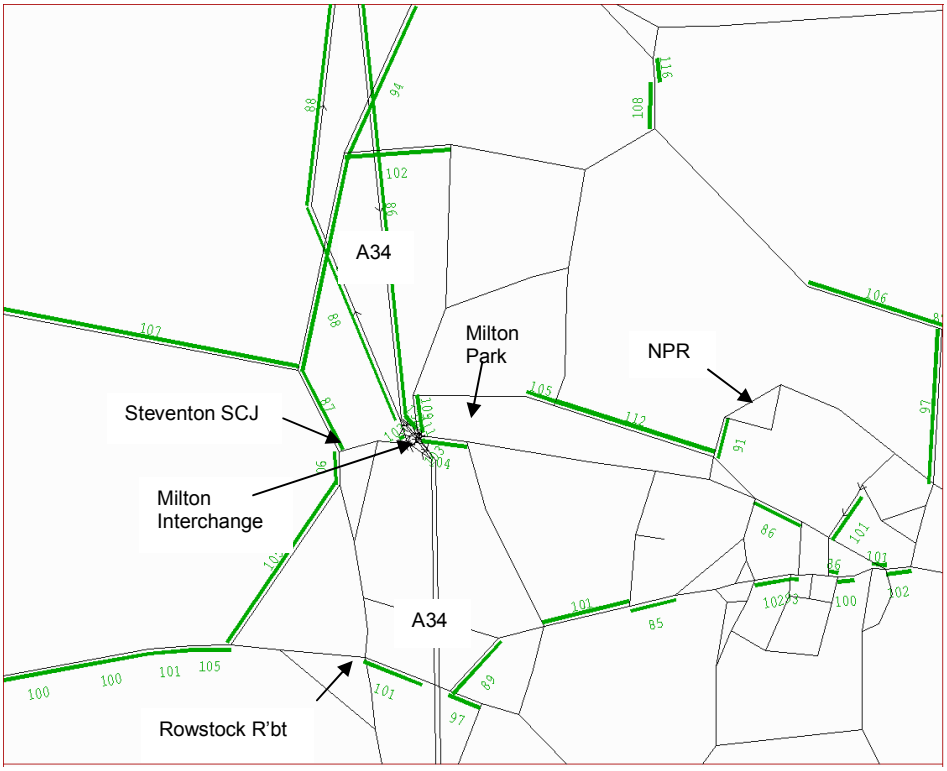
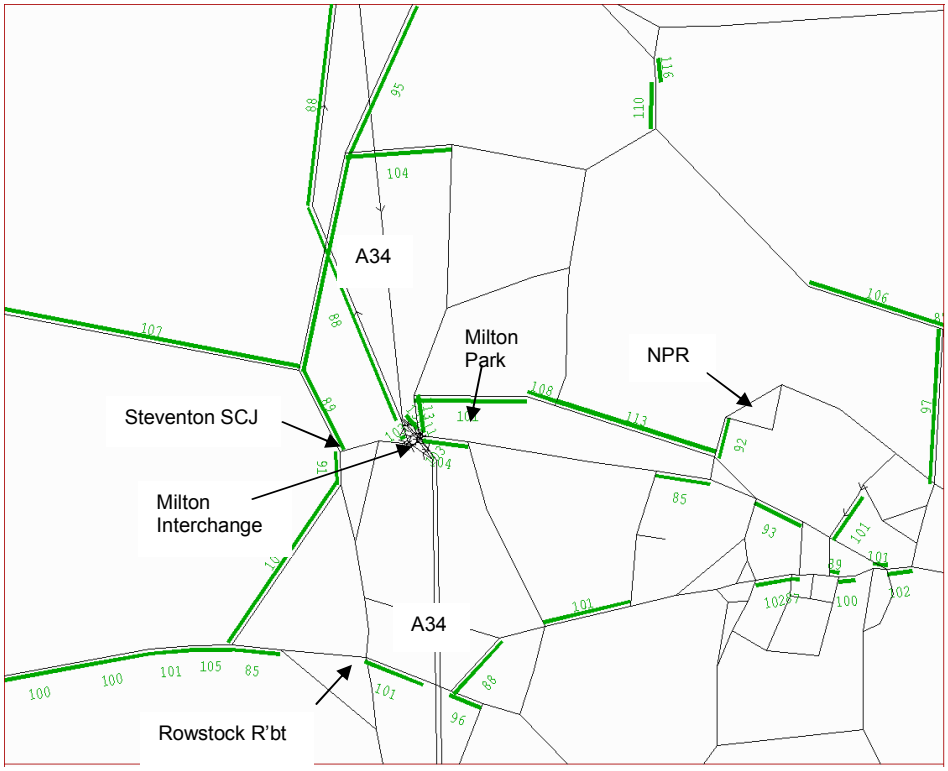


Figure 9.10: PM peak (17:00-18:00)) LDO scenario (V/C ratios greater than 85%)



The modelling work shows the following junctions are at capacity in the AM peak Do Minimum and LDO scenarios under both COTM and fixed trip traffic conditions:

- Milton Interchange;
- Steventon signal controlled junction;
- Power Station Roundabouts (Mendip Heights and Basil Hill Roundabouts);
- Milton Park/High Street (western end of Milton Park); and
- Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park).

The modelling work shows that generally in the AM peak model the LDO development adds some traffic to locations experiencing congestion in the Do Minimum scenario. Hence the V/C data for the Do minimum and LDO scenarios are similar.

The modelling work shows the following junctions are at capacity in the PM peak Do Minimum and LDO scenarios under both COTM and fixed trip traffic conditions:

- Milton Interchange;
- Steventon signal controlled junction;
- Power Station Roundabouts (Mendip Heights and Basil Hill Roundabouts);
- Milton Park/High Street (western end of Milton Park); and
- Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park).

The PM peak fixed trip assignment is showing capacity issues in the LDO scenario that were not evident in the Do Minimum scenario at the

- B4016 Drayton Road/Milton Road junction; and
- Brook Street/Church Street/High Street junction in Sutton Courtenay.

9.3 A34 Strategic Road Network impact

The modelled flows through Milton Interchange are shown in Appendix E. This data shows that the fixed trip and COTM model assignments show an increase in demand to Milton Interchange in the AM peak model. The modelling does not show notable increases in traffic from Milton Park in the PM peak, due to the re-routeing/re-distribution associated with the modelling work. The changes in traffic flow at Milton Interchange are related to capacity issues in the area. Figures 9.1-9.4 show, the A34 link flows in the modelling do not change much between the Do Minimum and LDO Scenarios.

Further work on the demand and capacity issues at Milton Interchange is reported in Chapter 10.

9.4 Assessment of public transport/suppressed trips

The COTM modelling work shows that the Do Minimum and LDO scenarios exhibit a level of congestion in the highway models, such that some trips switch modes to public transport. The change in public transport use is set out in Table 9.1.

Table 9.1: Changes in public transport use

Scenario	Trips	Increase in public transport passengers trips (comparing the final COTM and fixed trip matrices)
AM Do Minimum	To Milton Park/Didcot area	80
	From Milton Park/Didcot area	320
AM LDO	To Milton Park/Didcot area	90
	From Milton Park/Didcot area	340
PM Do Minimum	To Milton Park/Didcot area	370
	From Milton Park/Didcot area	50
PM LDO	To Milton Park/Didcot area	420
	From Milton Park/Didcot area	60

This shows that some of the trips in the LDO scenarios are switching to public transport (up to 60 passengers/hour). This is within the targets set in the travel plan (see Chapter 7). The numbers switching mode are such that these changes can in accommodated by the current services such as the dedicated bus service from Milton Park to Didcot. The modelling work also shows that in this area of COTM, that highway trips are not being suppressed.

9.5 Summary of the results of the transport modelling

The results of the modelling show that the transport impact of the LDO development is complex and is a function of the proximity of developments to junctions that are congested in the Do Minimum scenario. The modelling shows the impact is not significant and demonstrates a local highway impact rather than a strategic impact, and these local impacts are considered further in Chapter 10.

The modelling work does not show a significant change in the A34 main carriageway trips, however the modelling is showing that the additional traffic associated with the LDO development is creating re-routeing of trips in the area, indicating that network capacity issues are affecting the routeing of traffic.

In summary the LDO scenario has the following transport impacts when compared to the Do Minimum scenario:

- Small increase in public transport trips;
- Increase in demand on approaches to Milton Park; and

- Re-routeing of trips in the Do Minimum scenario in the vicinity of congested junctions.

The traffic impacts requiring further investigation are:

- Milton Interchange;
- Steventon signal controlled junction;
- Power Station Roundabouts and Milton Park/Milton Road/Sutton Courtenay Road roundabout to the east of Milton Park (these junctions are linked as they all accommodate the transport demand between Didcot and Milton Park; and
- Milton Park/High Street (western end of Milton Park);
- Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park); and
- Milton High Street and Sutton Courtenay High Street.

10 Detailed junction assessment

10.1 Introduction

This Chapter sets out details of junction assessment work undertaken to further explore capacity issues highlighted in the previous chapter. This chapter includes work on:

- Power Station Roundabouts;
- Steventon signal controlled junction;
- Milton Interchange; and
- Access on A4130.

Chapter 9 also identified capacity issues associated with the Milton Park/High Street (western end of Milton Park) and Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park) junctions. The demand issues are discussed in this chapter.

10.2 Power Station Roundabouts

ARCADY junction assessment models have been developed for the Power Station Roundabouts using arrival flows from the fixed trip assignment SATURN models. The schemes promoted by the Great Western Park, as well as the existing situation have been assessed in this model.

The results of the Basil Hill Roundabout ARCADY analysis are shown in Appendix F and the results of the Mendip Heights Roundabout ARCADY analysis are shown in Appendix G.

The Basil Hill junction assessment work results are summarised in Table 10.1.

Table 10.1: Summary of Basil Hill junction assessment work

Scenario	Impacts
AM – Existing layout	Three of the four arms are over capacity with the exiting layout simply due to demand exceeding capacity provided by the single lane approaches to the roundabout.
AM – Great Western Park layout	The A4130 (approach A) remains over capacity in all AM peak flow sets with a maximum queue of 22 vehicles. Despite the additional lane the dominant movement from this approach is travelling to Milton Road, a movement which remains constricted by a single lane. In addition approach B (Basil Hill) experiences large queues (maximum 238 vehicles) as a consequence of capacity improvements an arm A which have increased the circulatory conflict with Arm B. Coupled with the single lane approach on arm B.
PM – Existing layout	In the PM peak Milton Park approach is considerably over capacity with a maximum queue of 731 vehicles across the four PM flow sets. This is due to a large flow (1400 vehicles) approaching the roundabout in a single lane.
PM – Great Western Park layout	In the PM peak, three of the four arms are over capacity: A4130 (N), Basil Hill Rd (E) and Milton Road (SW). This is a result of the large number of vehicles approaching the roundabout from Milton Road (Arm D). In particular the dominant movements from D to A, D to B and D to C which present greater circulatory conflict making it increasingly difficult for traffic on arm A and B to enter the roundabout.

The results show that the scheme proposed by Great Western Park developed for the Basil Hill Roundabout improves the capacity issues associated with the SW Milton Road but creates capacity issues on Basil Hill arm. The modelling work shows that at this junction, under COTM model flows, that the LDO scenario increases maximum queue length on the SW Milton Road arm by 10 vehicles in the AM peak and 60 vehicles in the PM peak. The junction assessment demonstrates that the junction has significant capacity issues in the Do Minimum scenario and that the LDO does not change this situation considerably. The modelling work shows that the congestion originating from this junction does not create blocking back issues.

The Mendip Heights junction assessment work results are summarised in Table 10.2.

Table 10.2: Summary of Mendip Heights junction assessment work

Scenario	Impacts
AM – Existing layout	In the AM peak two approaches are over capacity: Station Rd (E) and the A4130 (W). With queues of up to 109 vehicles on Station Road and 35 vehicles on the A4130 (W). This is due to large right turn and ahead movements approaching the roundabout in one lane from Station Road, this also increases the circulatory conflict for the A4130 approach.
AM – Great Western Park layout	With the scheme in place three of the four approaches are at or over capacity, albeit to a lesser extent than with the existing layout: ▪ Despite the addition of a second lane on Manor Bridge (approach A) it remains over capacity with a maximum queue of 18 vehicles, this is due to the dominant right turn. ▪ Approach B (Station Road) performs slightly better with a maximum queue of 20 vehicles as a result of the additional lane however, demand exceeds capacity on this approach. Approach D (A4130) remains over capacity in the scheme tests with a maximum queue of 23 vehicles. There is a large ahead movement of which the majority (70%) is assumed to travel in the dedicated ahead lane, with the remaining 30% utilising the merge on exit via the ahead and left lane.
PM – Existing layout	Across the four flow sets two approaches are over capacity: Manor Bridge (N) and Station Road (E), with maximum queues of 131 and 40 vehicles respectively. This is predominantly caused by a large right turn flow from Manor Bridge which increases the circulatory conflict with Station Road.
PM – Great Western Park layout	In the PM peak the scheme design provides an improved arrangement as only one approach is over capacity. Manor Bridge approach, with a maximum queue of 126 vehicles (which would have a knock on effect to the Basil Hill Roundabout). This is caused by the large right turn movement on this approach which, despite the additional lane, remains an issue.

The results show that the scheme proposed by Great Western Park developed for the Mendip Heights roundabout does not remove the capacity issues. The modelling work shows that at this junction, under COTM model flows, the LDO scenario increases the maximum queue length on some arms by up to 10 vehicles. Thus, the LDO does not have a significant impact to the junction performance. The modelling work shows that the queues on Manor Bridge North arm are such that blocking back would affect the Basil Hill Roundabout. Also, the queues on Station arm are such that blocking back would affect the Foxhall Road Roundabout.

In summary, the junction assessment work shows that there are congestion issues associated with the Power Station roundabouts in the Do Minimum scenario. The LDO scenario adds some traffic to these junctions but is not the source of the congestion issues.

10.3 Steventon signal controlled junction

A LINSIG junction assessment model has been developed for the Steventon signal controlled junction, again using arrival flows from the fixed trip assignment SATURN models, the results are shown in Appendix H.

The modelling work shows that in the AM peak the LDO scenario does not have an impact to practical reserve capacity, under COTM flow conditions. In the PM peak the modelling work shows that the LDO scenario reduces the practical reserve capacity by 3%. Both AM and PM models show that the A4130 South arm of the junction experiences most queuing. This junction is not near other junctions and hence the modelled congestion would not create blocking back issues.

The assessment work shows that at the Steventon signal controlled there are congestion issues associated with the Do Minimum scenario traffic. The LDO scenario adds some traffic to this junction but is not the source of the congestion issues.

10.4 Milton Interchange

A TRANSYT analysis has been undertaken of the Milton Interchange under the Do Minimum and LDO scenarios. The results of this work are shown in Appendix H. This modelling work shows that the junction is at capacity in the Do Minimum scenario and the LDO scenario increases queue lengths (in particular the A34 southbound off slip and A4130 Didcot approach in the AM peak and the Milton Park arm in the PM peak). The modelling work shows that in the AM peak the demand for the A34 southbound off slip is such that the queue length is a similar length to the slip lane length, therefore the LDO development increases the queue length such that the length of the slip lane could be exceeded.

The COTM modelling work also showed that the changes in demand Milton Interchange do not have a significant impact of the A34 link flows.

The modelling work shows that the queues on the A4130 approach from Didcot would affect the development accesses on the A4130 near to the interchange.

The TRANSYT assessment work indicates that there is a need for a strategic junction improvement scheme to address the congestion issues associated with the Do Minimum scenario (in particular the A34 southbound and A4130 from Didcot arms). The LDO scenario changes the traffic patterns at this interchange but is not the source of the congestion issues.

10.5 Access on A4130 (south of the railway line)

The Milton Park development to the south of the railway will require two signalled controlled accesses onto the A4130. The layouts of the junctions would have to be developed when more details of the development layout are known. If the junctions were to be located in similar locations to the existing junctions, then they could be controlled separately to the Milton Interchange junction, thus not requiring upgrading Milton from MOVA to SCOOT. This work undertaken indicates that in principle two accesses are suitable at this location and their signal operations need to be linked.

10.6 Milton Park/High Street (western end of Milton Park)

The modelling work shows that there is an increase in demand for movement at this junction (towards Milton Park in the AM peak, and from Milton Park in the PM peak. Due to the layout of the

junction, the delays are associated with the Milton village arm and the right turn towards Milton village.

Milton village residents use this junction to access the wider network and hence mitigation measures are required. A scheme was developed to ban the right turn from the Milton village arm to Milton Interchange (Option 1), however this scheme results in excessive queuing associated with the movement from Milton Park to Milton village. The scheme was revised to ban both the movement from Milton Park to Milton village and the movement from Milton village to Milton Interchange (Option 2). The Option 2 design has the following benefits:

- No excessive queuing at the junction; and
- Reduced attractiveness of routeing through Milton village for longer distance trips.

However the following detours would be required:

- To travel from Milton village to Milton Interchange – U-turn at the Milton Park Innovation Centre Roundabout; and
- To travel from Milton Park to Milton village – U-turn at Milton Interchange.

The scheme proposals and assessment is set out in Appendix J. It is recommended that Milton village residents are consulted about these options before further work is undertaken developing the scheme option.

10.7 Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park)

The modelling work shows that there is an increase in demand for movement at this junction between Milton Park and Didcot. Congestion at this junction effects routeing of traffic toward Sutton Courtenay and hence mitigation measures are required.

The scheme proposal and assessment is set out in Appendix K.

11 Mitigation measures

11.1 Introduction

This Chapter sets out the suitability of measures to mitigate against the impacts of the LDO development. The impacts of the LDO are set out in Chapters 9 and 10.

11.2 Ongoing measures

Table 7.1 sets out the Travel Plan Initiatives and Targets. The Travel Plan sets out the commitment by MEPC to provide and promote sustainable transport measures. A significant measure in the Travel Plan is the continuation of Milton Park Shuttle Bus. Other measures being taken to increase travel by sustainable modes include the promotion of Milton BUG., Milton Park bike maintenance scheme and the promotion of bus services.

11.3 Other measures

Table 11.1 sets out a summary of the LDO impacts (from Chapters 9 and 10) and provides information about the suitability of mitigation measures.

Table 11.1: Mitigation measures

Location	Issue	Solution
Milton Park - general	Increased demand to access Milton Park.	Progress measures in the travel plan to increase the proportion of employees/users of the site by non-car means.
Didcot and surrounding area - general	Increased car demand at Milton Park associated with the LDO, displaces traffic in the Didcot area and increases the demand for public transport.	Measures to increase the attractiveness of public transport in the wider Didcot area
Milton Village	Change in the transport demand.	Discuss traffic management options with residents.
Sutton Courtenay Village		

Location	Issue	Solution
Milton Park/High Street junction (Milton Park West);	Change in the transport demand. The solution needs to have a minimal impediment to dominant traffic flow between Milton Interchange and Milton Park not increase traffic through Milton village.	Restriction of traffic movement through banning right-turn movements leaving Milton village. Right turn movement to be made by turning left and making a U-turn at the roundabout. If the scheme to restrict movements at the junction is not supported locally, consideration could be given to converting the junction to a SCJ to enable the demand to be managed. A roundabout solution would not be suitable as it would significantly impede traffic flows between Milton Park and Milton Interchange and it would attract more traffic through Milton village.
Milton Park/Sutton Courtenay Road/Milton Road junction (Milton Park East)	Milton Park traffic uses the junction and results in changes in demand for the traffic between Didcot and Milton Park.	A scheme is to be considered to increase the capacity at the junction by increasing the number of access lanes at the southern western approach arms. The engineering feasibility of this scheme is to be considered further.
Power Station roundabouts	Milton Park traffic uses the Basil Hill Roundabout and results in a change in demand. The junction has significant capacity issues in the Do Minimum scenario and that the LDO does not change this situation considerably. Milton Park traffic Mendip Height roundabout, and results in a change in demand. Minimal impact to the junction capacity.	A scheme for the junction is required to address to Do Minimum issues. This should be provided as part of the SVUK strategic infrastructure

Location	Issue	Solution
Steventon Signal Controlled Junction	Milton Park traffic uses junction, and results in a change in demand. The Milton Park LDO scenario reduces the practical reserve capacity of the junction by 3%.	A scheme for the junction is required to address to Do Minimum issues. This should be provided as part of the SVUK strategic infrastructure
Milton Interchange	This modelling work shows that the junction is at capacity in the Do Minimum scenario and the LDO scenario increases queue lengths (in particular the A34 southbound of slip and A4130 Didcot approach in the AM peak and the Milton Park arm in the PM peak).	The assessment work is showing a need for a scheme to address the issues at Milton Interchange under the Do Minimum scenario. This should be provided as part of the SVUK strategic infrastructure.
Accesses onto the A4130	Demand to access A4130 directly	Two new signal controlled junctions to be designed once layout of developments are known. These junctions' controls should be linked.

12 Conclusion

This report sets out the assessment of transport issues work undertaken for the Milton Park LDO development.

The assessment shows that the site is located near to parts of the highway network that currently experience congestion issues. These congestion issues are further exacerbated in the future year Do Minimum scenario.

The strategic assessment shows that LDO development will not have a significant traffic impact. The transport modelling work shows that the highway network responds to the LDO development by re-routeing trips, re-distributing trips and switching some trips to public transport.

Further assessment work was undertaken to assess the impacts of the LDO development at key junctions that would be used by Milton Park traffic. This analysis shows that the LDO traffic does not significantly increase the congestion issues in the Do Minimum scenarios.

Mitigation schemes have been identified along with the need to progress the measures identified in the travel plan to increase the use of sustainable modes of transport by existing Milton Park users, new Milton Park users and other travellers in the area.

The specific junction improvements at the Milton Park/High Street (western end of Milton Park) and Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park) junctions will need to be developed further with the County Council taking into account local opinion (in line with comments in Chapter 11). The resultant schemes need to be developed to a level such they can be costed.

The SVUK infrastructure strategy is to include schemes at Milton Interchange, Steventon signal controlled lights and the Power Station roundabouts.

Appendix A Milton Park Development Assumptions

Site Name	Area		Consented Development (Extant Permissions) - included in the Do Minimum Scenario		Potential LDO Development - included in the LDO Scenario		Site Ref
	ha	*Acres*	*sq m*	*sq ft*	*sq m*	*sq ft*	
Milton South	0.898	2.22	6,358	68,437			MP3
Milton Central	3.834	9.47	26,891	289,452			MP7
Site 182/185	3.356	8.29	-	-	16,725	180,026	MP6
Site 172	0.915	2.26	4,590	49,406			MP4
Milton Gateway	5.813	14.36	16,500	177,604			MP8
Kelaart Field	10.6	26.19	-	-	31,176	335,580	MP9
Land to rear of 154	0.447	1.10	-	-	2,235	24,057	MP1
Site 120's	0.481	1.19	2,274	24,480			MP2
Land to rear of Macdonalds	1.882	4.65	-	-	4,705	50,644	MP5
Total	28.226	69.75	56,613	609,380	54,841	590,308	

Assumptions on use classes in the LDO		Existing		Potential		
		%		%		Potential Floorspace sq m
	B1	39.44		60		221890.04
	B2	10.84		10		36981.67
	B8	48.01		25		92454.18
	Ancillary*	1.71		5		18490.84
		100.00		100		**369816.74**
*Ancillary will be defined in the LDO as uses other than employment generating uses						

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Appendix B Committed Development Assumptions

Location	Housing Number	Employment Area	Description/Comments
Residential and Employment Growth, Science Vale UK Area, Vale of White Horse and South Oxfordshire			
Milton Park (Consented development)		See Appendix A	
Completions between 2007 and 2011 including outstanding permissions at Didcot	321		
Harwell Oxford	400	6000	
Culham Science Centre		1000	
Didcot town centre	300	B1 – 0.65ha	
		Retail – 5.25	
Great Western Park Didcot (SODC)	2700		
Great Western Park Didcot (VALE)	600		
Ladygrove East, Didcot	642		
North East Didcot	2030		
Vauxhall Barracks, Didcot	300		
Valley Park	2150		
NE Wantage/Crab Hill	1500		
Wantage town centre		B8 – 1ha	
		Retail – 2.75ha	
St Mary's Road, Stirlings Road, Newbury Street, Limborough Road	202		
Permissions on small sites (Wantage)	459		
Grove Airfield	2500		
Chilton Fields Harwell	75		

Location	Housing Number	Employment Area	Description/Comments
Infrastructure, Science Vale UK Area, Vale of White Horse and South Oxfordshire			
Great Western Park Link Road			As included in SCOTS
Milton Interchange			Changes to junction made between 2007 and 2010
Milton Interchange slips lengthened			A34 southbound off-slip and northbound on-slip lengthened
Rowstock Roundabout improvements			As included in SCOTS
Harwell Strategic Link Road			As included in SCOTS
Harwell Field Link Road, including increased capacity roundabout at Harwell Oxford entrance			As tested in SCOTS
Rowstock Bypass (western section only)			As tested in SCOTS
Featherbed Lane improvements			As tested in SCOTS
Wantage Eastern Link Road			As tested in SCOTS
Mendip Heights Roundabout Improvements			As tested in SCOTS
Grove Northern Link Road			As tested in SCOTS
Didcot Northern Perimeter Road (NPR3)			As tested in SCOTS
Residential and Employment Growth, Witney, West Oxfordshire			
Completions between 2007 and 2011	901		
Woolgate extension		2,188sq m	A1 Retail Complete
Lidl, Ducklington Lane		800sq m	A1 Retail Complete
Marriot's Close	50	Cinema 1,924 sq m	
		A3/A4 787 sq m	
		14 retail units (A1) 8,835 sq m	

Location	Housing Number	Employment Area	Description/Comments
		B1a Offices 167 sq m	
Buttercross Works, North of Station Lane between Leys Recreation Ground and Gordon Way	50		
Extant permissions various	98		
Windrush Health Centre		1,573 D1	Floorspace extension to health centre
Windrush Park, East of Downs Road, between Range Road and Burford Road		21,139 sq m	B1
Plot 3 Windrush Park		3,058 sq m	B1
West of Downs Road		2.3ha	B1
East of Downs Road		1.4ha	B1
Banner Homes site Adjacent to North Curbridge	20		
North Curbridge	1000	10ha	
Cogges LP Proposal	46		
Additional homes on other sites and windfall	200		
Infrastructure, Witney, West Oxfordshire			
A415 Ducklington Lane/Station Lane junction improvement			Removal of existing signals at Ducklington Lane and installation of roundabout. Design as approved by County Council
Down's Road/A40 new junction			New all movement at grade roundabout as per design provided by County Council (from developers of site)
B4022 Oxford Hill/Jubilee Way junction improvement			Removal of existing signals and

Location	Housing Number	Employment Area	Description/Comments
			installation of roundabout. Design as approved by County Council
Re-designation of A4095			Re-route A4095 through Witney via Cogges Link Road. Down grade existing A4095 route to B class
Staple Hill A4095/B4022 existing double mini roundabout at top of Briddge Street			Assumed provision of traffic signals
A4095 Woodstock Road west of Jubilee Way junction			Link 'slowed down' to model chicane/gate feature to reflect route has been down graded from A4095 when Cogges Link Road is the main A4095 through route
Residential and Employment Growth, Carterton, West Oxfordshire			
Completions between 2007 and 2011	481		
Shilton Road LP	63		
Swinbrook Road LP	200		
Extant permissions	45		
RAF Brize Norton	400		
West Ox Business Park, South of Norton Way		2017 sq m	
Plots 1 and 2 Carterton South Industrial Estate, east of Black Bourton Road		1513 sq m	
Plot D Ventura Park, Broadshires Way		1410 sq m	
Plot J Ventura Park Broadshires Way		527 sq m	
Remainder of West Oxon Business Park and Ventura Park		5.4ha	
Aldi, Alvescot Road		1000 sq m	
East site, east of Monahan Way/North of Carterton Road	1000		

Location	Housing Number	Employment Area	Description/Comments
Other sites and windfall	300		
Residential and Employment Growth, Bicester, Cherwell			
South West Bicester Phase 1 and 2	2235	3.91ha	
Bicester Business Park		6ha	
Bicester Village Phase 4		0.43ha	Land vacated by existing Tesco Site
Town Centre Redevelopment		Food 0.74	
Town Centre Redevelopment		Non-Food 0.64	
Town Centre Redevelopment		Cinema	
Gavray Drive	500		
Heyford Park	761		
Heyford Park		B1 – 1.6ha	
Heyford Park		B2 – 1.8ha	
Heyford Park		B8 – 8.6ha	
NW Bicester	1794	3366 jobs on site	
Caversfield MOD Site	187		
Talisman Road	140		
Garden Centre area		6.7ha	
NE Bicester		0.10 hectares	
E Bicester		7.0 hectares	
Graven Hill	1900	2.50ha	

Location	Housing Number	Employment Area	Description/Comments
Infrastructure, Bicester, Cherwell			
East West Rail			Level-crossing on Charbridge Lane and London Road and associated road closures 4 times per hour as per Bicester Model. Two trains per hour between Milton Keynes and Oxford in both directions.
South West Bicester Link Road			New roundabouts at north and south ends of link, realignment of A4095, two signalised junctions on A41 and removal of slips at Chesterton
Town centre changes			Changes to Bure Place, two new roundabouts, and signalised entrance to the car park
Evergreen 3			Rail improvement scheme between Bicester and Oxford to provide a new service between Oxford and London Marylebone. The scheme will also include a new station, Water Eaton Parkway. 2 trains per hour between Marylebone and Oxford in both directions.
Bucknell Road/A4095 Howes Lane new mini roundabout			
Roman road widening			
B4030 Middleton Stoney Road Traffic Calming			
M40 J9 Phase 2			Widening the A34 northbound carriageway approach from 2 lanes to 3, then to 4 lanes at the roundabout. Introduction of traffic signals on the A34 northbound approach. Widening the A41

Location	Housing Number	Employment Area	Description/Comments
			northbound exit from 2 to 3 lanes. Extension of the A41 southbound 3 lane approach flare
Residential and Employment Growth, Oxford City			
West End		2 Ha Offices	
West End		0.53 ha Conference Centre	
West End		1.53 Hotel	
West End		1.3 ha Retail	
West End		0.06 ha A2	
West End		0.97 ha	
West End		0.07 ha Museums	
West End		0.1 ha Leisure	
West End		1.4 College research/training	
West End		0.7 ha Healthcare	
Barton inc Sandhills	284		
Barton inc Sandhills	850		
Blackbird Leys	316		
Blackbird Leys	100		
City Centre (inc West End)	156		
City Centre (inc West End)	543		
East Oxford	420		
Headington	125		
Hinksey Park	0		

Location	Housing Number	Employment Area	Description/Comments
Jericho and Osney	169		
Jericho and Osney	40		
Littlemore	313		
Lye Valley	53		
Marston	78		
Quarry and Risinghurst	17		
Rose Hill	124		
St Margarets	50		
Summertown	50		
Wolvercote	424		
Northern Gateway		3000 jobs	
Infrastructure, Oxford City			
Priority junction including bus only link over the A40 between new development at Barton and Headington			
Heyford Hill Junction			Sainsbury's and OCC's development related junction improvements, creation of a signalised hamburger roundabout. Avoider lanes for traffic on A4074 and A423
Kennington Roundabout Improvements			Implementation of improvements as per County Council Design
Botley Interchange and Westway A420 junction			Highways Agency junction improvement scheme, signalisation of roundabout.
Hinksey Hill			Avoider slip from A423 on to A34

Location	Housing Number	Employment Area	Description/Comments
			SB. County council junction improvement scheme
Frideswide Square			Junction improvement scheme at Frideswide Square. Design provided by County Council
Residential and Employment Growth, Thame			
Former Memec Site	40		
Corporation Yard	6		
Site F (West Thame north of Oxford Road)	530		
Thame		2 ha	
Residential and Employment Growth, Henley			
Henley		5.17 ha committed	
Henley	400		
Residential and Employment Growth, Wallingford			
Wallingford		5.81 ha	
Site B West Wallingford	250		
Site B West Wallingford	400		
Residential and Employment Growth, South Oxfordshire District			
Completions between 2007 and 2011 including outstanding permissions in Rest of District (exc Didcot)	1464		
Cholsey	353		
Crowmarsh Gifford	42		
Chinnor Former Cement Works	178		
Unallocated housing within the towns of	560		

Location	Housing Number	Employment Area	Description/Comments
Wallingford/Thame/Henley			
Unallocated housing within the larger villages	500		
Larger Villages		4.2 ha	
Residential and Employment Growth, Faringdon			
Park Road	18		
Lechlade Road	24		
Winslow and Coxwell	46		
Cricket and Former Nursery	341		
South of Park Road	400		
Residential and Employment Growth, Vale of White Horse Rest of District			
Abingdon	85		
Cumnor	191		
East Challow	14		
Sutton Courtenay	30		
Permissions on small sites	136		
Windfalls across the whole of VOWH District	1170		

Appendix C COTM Modelled Traffic Flow Data

Appendix D Fixed Trip Matrix Modelled Traffic Flow Data

Appendix E Modelled Traffic Flow Data for Milton Interchange

Appendix F Basil Hill Roundabout ARCADY analysis

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Appendix G Mendip Heights Bridge Roundabout ARCADY analysis

Appendix H Steventon signal controlled junction LINSIG analysis

Appendix I Milton Interchange TRANSYT analysis

Appendix J Milton Park/High Street (western end of Milton Park) scheme

Appendix K Milton Park/Milton Road/Sutton Courtenay Road (eastern end of Milton Park) scheme