REDDITCH BOROUGH COUNCIL

PROPOSED DIVERSIFICATION PARK DEVELOPMENT

LAND AT WINYATES GREEN TRIANGLE, REDDITCH

TRANSPORT ASSESSMENT

MT/NWK/VRG/835/HOC

NOVEMBER 2009

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1 INTRODUCTION

1.1 Morgan Tucker has been commissioned by Redditch Borough Council to investigate and advise on the transport and highways issues associated with a proposed diversification park on land sandwiched between the A4023 Coventry Highway and A435 Birmingham Road, and to produce a transport assessment which meets the requirements of both Worcestershire County Council and Warwickshire County Council.

1.2 The format and layout of this report take account of the latest transport assessment guidance, as issued by the Department for Transport in March 2007 and also Worcestershire and Warwickshire County Council's own policies and advice.

1.3 As recommended by national guidance, a scoping note was prepared in advance of the drafting of the full TA, in order to reach agreement with Worcestershire and Warwickshire County Councils, as highway authority for the town's internal road network, on the nature of the key issues to be examined in the report and various other technical parameters. The scoping note was mailed to Officers at both County Councils for comment.

1.4 Brian Sharp responded from Worcestershire County Council to confirm that the scoping note met his requirements and to draw our attention to Worcestershire County Council's TA Guidance Note. Warwickshire County Council failed to respond on the scoping note. A copy of the scoping note is included at **Appendix A.**

1.5 The transport assessment will provide supporting technical evidence to the overall planning appraisal process. Specifically, the report assesses the accessibility of the development site by a variety of modes of transport. The sustainability of the site is also considered with respect to relevant policy guidance and an assessment of the traffic impact of the proposal on the surrounding road network is provided and appropriate mitigation measures identified.

2 EXISTING SITE INFORMATION

2.1 Introduction

2.1.1 In order to assess the impact of the Diversification Park development proposal to be constructed on land at Winyates Green Triangle, Redditch, on the transport network surrounding the site, it has been necessary to establish the existing site conditions.

2.2 Site Location

2.2.1 A location plan (drawing number **JN835-NWK-001**) confirming the position of the development site within the context of the surrounding area is included in **Appendix B.**

2.2.2 The town of Redditch is situated approximately 15 miles south of Birmingham and is located on the northeastern boundary of Worcestershire. The town lies on the A435, which skirts to the east. The main route of access is the A441, which extends between Birmingham and Cookhill. The M42 motorway is a short drive away and it is linked by dual carriageways and A class roads to the surrounding towns of Bromsgrove and Evesham.

2.2.3 The town has a long history of successful manufacturing. In the 19th century, the town manufactured needles and diversified into fishing tackle, with other metal-based trades also growing in importance. Today 22.8% of jobs in Redditch are in the manufacturing sector, compared with 14% in the West Midlands and only 10.6% in Great Britain. The sector is crucial to the local economy.

2.2.4 Redditch was designated a New Town in 1964 and the population increased dramatically with the construction of housing developments such as Church Hill, Matchborough, Winyates, Lodge Park and Woodrow created to accommodated overspill from nearby areas such as Birmingham. Redditch was built as a flagship town using new methods and town planning, examples

of this innovation being that all the main roads are banked to reduce noise to the housing estates, with a network of footpaths and underpasses segregating pedestrians from primary routes.

2.2.5 According to the 2001 Census, Redditch has a population of approximately 78,800.

2.3 Existing Land Uses in the vicinity of the Development Site

2.3.1 The development site is situated on the Winyates Green Triangle on the northeastern boundary of Redditch, with a residential area to the west and south, the A435 Birmingham Road to the east, and the A4023 Coventry Highway to the north. **Plate 1** below highlights the proposed Diversification Park development in context.

Plate 1 – Proposed Development Context

2.4 Existing use of the Development Site

2.4.1 The site is currently agricultural / unused. **Plate 2** refers:

Plate 2 – Development Site

2.5 Air Quality

2.5.1 Under the Environment Act 1995**,** local authorities are responsible for ensuring that air quality standards are not exceeded within their area after 2005. The National Air Quality Strategy sets standards for the eight main air pollutants and objectives for the UK.

2.5.2 Managing local air quality requires local authorities to identify and take action to tackle any local air quality problems from these pollutants. If conclusions point to objectives being exceeded, an Air Quality Management Area (AQMA) must be declared covering the area affected. Action plans must then be drawn up, involving the many different stakeholders, setting out how further objectives are to be achieved.

2.5.3 As part of this process, the local authority reviews and assesses local air quality on an annual basis and submits a report of their findings to DEFRA. In 2007 Redditch Borough Council published the 2007 Progress Report which indicated that none of the tested locations would exceed acceptable levels for pollutants. An extended diffusion tube survey took place in 2008 to monitor NO2 levels and a further progress report was due in 2008 but is not on the website.

2.6 Abnormal Usage

2.6.1 The Construction and Use regulations provide the basic law by which normal motor vehicles and trailers (up to a maximum of 40 tonnes) are built and operate on the road. The movement of large or heavy loads and cranes (abnormal loads) that exceed dimensions set down by the regulations is permitted provide they follow the Special Types General Order (STGO) provided by the Department for Transport.

2.6.2 An abnormal load can potentially travel on any road provided the haulier complies with the law including weight limits; however, some roads are more suitable, such as A Class Roads. Before a haulier can move an abnormal load the Police must be notified. In addition if the gross weight or axle weights exceed those specified on the Construction and Use regulations the Highway Authority and bridge owners along the route must be informed e.g. Network Rail. The law requires a minimum of two days notice before moving the load.

2.6.3 At the present time no abnormal loads visit the site and this situation is unlikely to alter as a result of the development.

3 BASELINE TRANSPORT DATA

3.1 Introduction

3.1.1 This chapter firstly describes the character of the surrounding highway network and provides information on recent injury collisions recorded in the vicinity of the development site and baseline 2009 traffic flows from critical junctions in the town confirmed as being within the scope of the assessment.

3.2 Highway Network

3.2.1 The proposed development site is situated on land bounded by Far Moor Lane to the west, the A435 Birmingham Road to the east and the A4023 Coventry Highway to the north.

3.2.2 The A435 Birmingham Road is a de-trunked road, which links Birmingham and Cirencester. The section of the route to the east of the town is single lane carriageway with a 40 mph speed limit changing to a dual carriageway adjacent to the site and the junction with the A4023.

3.2.3 The A4023 Coventry Highway connects the eastern boundary of Redditch with the town centre where it forms the Redditch Ringway. The section of the route to the north of the development site is dual carriageway with a 70 mph speed limit. There is a well-used lay-by on this section of the road adjacent to the development site, along with a Route Information Point. **Plates 3** and **4** refer:

Plate 3 – Route Information Point adjacent to Development Site

Plate 4 – A4023 Coventry Highway adjacent to Development Site

3.2.4 Far Moor Lane runs between the A4023 Coventry Highway / Moons Moat North Industrial Estate roundabout and Alders Drive to the south. Far Moor Lane is a local distributor road with a 30 mph speed limit in place along its length. **Plate 5** refers:

Plate 5 – Far Moor Lane near to Development Site

3.3 Personal Injury Collision Statistics (PICS)

3.3.1 In order to confirm the safety record on the road network within the area of influence of the proposed development site, the personal injury collision statistics for the five year period from January 2004 to August 2009 have been obtained from Warwickshire and Worcestershire County Councils.

3.3.2 Analysis of the collision statistics confirms that since January 2004, there have been a total of 32 collisions within the search area surrounding the development site. **Tables 1** and **2** below identify the severity breakdown of these collisions and information on their locations on the road network.

Category	Number of Collisions between January 2004 – August 2009
Slight	29
Serious	2
Fatal	1

Table 1 - Collision Category

Location	Number of Collisions	Percentage (%)
Far Moor Lane	3	9.4%
A4189 Warwick Highway / Alders Drive Roundabout inc. all approaches	4	12.5%
A4023 Coventry Highway / Far Moor Lane Roundabout inc. all approaches	11	34.4%
A435 Birmingham Road / A4023 Coventry Highway Junction inc. all approaches	8	25%
A4189 Warwick Highway / A435 Birmingham Road Roundabout inc. all approaches	3	9.4%
A435 Birmingham Road between the junction with A4023 Coventry Highway & A4189 Warwick Highway	3	9.4%

Table 2 – Location of Collisions

3.3.3 **Tables 1** and **2** above demonstrate that the vast majority of collisions which have occurred since 2004 resulted in slight injury. They are grouped into 6

locations, with 34.4% occurring on the approaches to or on the A4023 Coventry Highway / Far Moor Lane roundabout and 25% occurring on the approaches to or on the A435 Birmingham Road / A4023 Coventry Highway grade-separated junction. The next highest location with 12.5% was the A4189 Warwick Highway / Alders Drive roundabout and its approaches. Further details regarding the causes of these collisions are provided in **Tables 3** – **8** below:

Collision Reference	Severity	Vehicles Involved	Cause
04DF39326	Serious	HGV	Loss of control due to slippery carriageway surface
06DF49456	Slight	Car v. Car	Foreign National driving on the wrong side of the carriageway
07DE86692	Slight	Car v. Car	Failure to look properly and turned in to the path of an oncoming car

Table 3 – Far Moor Lane

Collision Reference	Severity	Vehicles Involved	Cause
04DF40432	Slight	Car v. Pedal Cycle	Failure to look properly resulting in a car pulling in to the path of an oncoming pedal cyclist
04DF41651	Slight	Car v. Motorcycle	Car collided with the rear of a stationary motorcycle
06DE50316	Slight	Car v. Car	Car collided with the rear of a stationary car

09D900988	Slight	HGV v. Car	HGV collided with the rear of a stationary car

Table 4 – A4189 Warwick Highway / Alders Drive Roundabout inc. all approaches

Collision Reference	Severity	Vehicles Involved	Cause
04DF42068	Slight	Car v. Taxi	Failure to look properly and turned in to the path of an oncoming taxi
05DF48582	Slight	HGV v. Car	HGV collided with the rear of a stationary car
06DE49886	Slight	Car	Loses Control for unknown reason
06DE51627	Slight	Car	Intoxicated car driver loses control of vehicle
06DE52415	Slight	Car v. Car	Collided with the rear of a stationary car
06DE85255	Slight	Car v. Car	Collided with the rear of a stationary car
07DE86865	Slight	Car v. Car	Loses control of vehicle whilst braking suddenly
07DE87058	Slight	Car v. Car	Collided with the rear of a car changing lane
08DE88588	Slight	Car v. Car	Collided with the rear of a stationary car
09D903514	Slight	Motorcycle	Loss of control whilst negotiating bend

09D903977	Slight	Car v. Car	Driving on the wrong side of the carriageway

Table 5 – A4023 Coventry Highway / Far Moor Lane Roundabout inc. all approaches

Collision Reference	Severity	Vehicles Involved	Cause
S031868	Slight	Car	Loss of control whilst swerving to avoid another vehicle
S030658	Slight	Car	Loss of control whilst overtaking
S031137	Slight	Car v. Car	Intoxicated car driver loses control of vehicle
S031463	Slight	Car v. Car v. Car v. Car	Collided with the rear of a stationary car in queuing traffic
S030250	Slight	Car	Loses control whilst on slip road
S030603	Serious	Car	Loss of control due to wet carriageway and excessive speed
S031558	Slight	Motorcycle	Loss of control whilst overtaking
S031675	Slight	Car v. Car	Loss of control due to icy carriageway

Table 6 – A435 Birmingham Road /A4023 Coventry Highway Grade Separated Junction inc. all approaches

Collision Reference	Severity	Vehicles Involved	Cause
S032000	Slight	Car v. Agricultural Tractor	Car collides with the rear of broken down tractor
S030959	Slight	Car v. Car	Failure to look properly results in a car trying to overtake the other car turning right
S030834	Fatal	Car v. Car v. Car	Loses control after exiting roundabout

Table 7 – A4189 Warwick Highway / A435 Birmingham Road Roundabout inc. all approaches

Collision Reference	Severity	Vehicles Involved	Cause
S031383	Slight	Car v. Car v. Car	Car collides with the rear of a car attempting u-turn
S031767	Slight	Car v. Car	Car collides with rear of a car who has braked suddenly
S031707	Slight	Car v. LGV. Car	Car collides with rear of stationary car who was waiting to turn right

Table 8 – A435 Birmingham Road between A4023 Coventry Highway and A4189 Warwick Highway

3.3.4 Closer inspection of the interpreted listings reveals that the majority of collisions have occurred as a result of driver error for example, failing to look properly, following too closely and poor judgement. In addition, several of

these collisions occurred when the road conditions were wet/icy or there were objects in the carriageway.

3.3.5 One fatality occurred in the search area between 2004 and 2009, which occurred on 28 June 2008 at 1730 at the roundabout of A435 Birmingham Road and A4189 Warwick Highway. This occurred during the day, on a dry carriageway and in fine weather. The driver of the first car was travelling northwest bound on the A435 and exited the roundabout where they lost control, colliding with an oncoming southbound travelling car. A third car then collided with the rear of the second car as they were unable to stop in time. The driver of vehicle 1 aged 76 suffered fatal injuries.

3.3.6 Based on the information identified in the collision analysis, it is considered likely that the development proposals will not result in a statistically significant increase in the frequency or severity of collisions in the area surrounding the development site. The full listings from both authorities are contained in **Appendix C**.

3.4 Base Traffic Flows

3.4.1 In order to establish the 2009 base traffic flows on the A4023 Coventry Highway, a classified traffic survey was undertaken for the morning, afternoon and evening peak periods on the 8th September 2009. The data is contained in **Appendix D**.

3.4.2 In order to establish the 2009 base traffic flows on the A4189 Warwick Highway and Alders Drive / Far Moor Lane junction, a classified traffic survey was undertaken for the morning, afternoon and evening peak periods on the 9th September 2009.

3.4.3 In order to establish the 2009 base traffic flows on Far Moor Lane, an Automatic Traffic Counter (ATC) was laid between Wednesday the 9th September and Friday the 11th September 2009 between the junctions of Ilshaw Close and Hollyberry Close. **Plate 6** refers:

Plate 6 – Location of ATC on Far Moor Lane

3.4.4 Warwickshire County Council has provided ATC data for the A435 Birmingham Road (south of Gorcott Hill) from Monday the 1st June until Tuesday the 30th June 2009. This data includes vehicle count and speed survey information. **Plate 7** refers:

Plate 7 – Location of ATC on A435 Birmingham Road

3.4.5 The resulting 2009 peak hour base flows for the local road network are illustrated on the summary distribution diagram on drawing number **JN835-**

NWK-002 and the ATC data Speed Data for the A435 Birmingham Road and Far Moor Lane is contained in **Appendix D**.

3.5 Speed Data

3.5.1 In order to ascertain the speed of traffic travelling along Far Moor Lane, the A4023 Coventry Highway and the A435 Birmingham Road past the proposed development site, either a manual speed survey or ATC data was required. A manual speed survey was undertaken on the A4023 Coventry Highway on the 3rd September 2009, and the ATC data for Far Moor Lane and the A435 Birmingham Road was used to obtain speed survey information for those roads.

3.5.2 The 85th percentile speeds have been obtained in accordance with TA22/81 (Vehicle speed measurement on All Purpose Roads) of the Design Manual for Roads and Bridges.

3.5.3 With regards to the manual speed survey on the A4023 Coventry Highway, it was undertaken during neutral hours, i.e. non-peak hours, for a 2-hour period using a radar speed measurement gun. The enumerator was positioned in an unmarked car on the A4023 Coventry Highway so as not to affect traffic speeds and so that motorists were not aware of his presence. The weather was dry and sunny.

3.5.4 The speeds of 100 vehicles in a westbound direction were recorded in free flow conditions in order to obtain as accurate a sample as possible. The speeds were recorded as vehicles passed the speed survey point. As the sample size of the survey was less than 200 vehicles the standard deviation method of calculation was used to determine the 85th percentile speed.

3.5.5 The detailed survey results are attached at the rear of this report in **Appendix D** and the calculated 85th percentile speeds are confirmed in **Table 9 – 11** below:

Direction of Traffic Flow	Dry Weather 85th Percentile Speed	Wet Weather 85th Percentile Speed
Westbound towards the Moons Moat roundabout	63.09mph	58.12mph

Table 9 – Speed Survey Results – A4023 Coventry Highway

Direction of Traffic Flow	Dry Weather 85th Percentile Speed	Wet Weather 85th Percentile Speed
Northbound	44.73mph	42.23mph
Southbound	43.27mph	40.77mph

Table 10 – Speed Survey Results – Far Moor Lane

Direction of Traffic Flow	Dry Weather 85th Percentile Speed	Wet Weather 85th Percentile Speed
Northbound towards the junction with the A4023 Coventry Highway	44.6mph	42.1mph
Southbound towards the junction with the A4189 Warwick Highway	43.9mph	41.4mph

Table 11 – Speed Survey Results – A435 Birmingham Road

3.5.6 The speed survey results above show that vehicles in both directions are travelling in excess of the 30 mph speed limit along Far Moor Lane and in excess of the 40 mph speed limit along the A435 Birmingham Road. The higher speeds can be attributed to the inactive frontage on Far Moor Lane, lack of pedestrian activity or parked cars, and on the A435 Birmingham Road this can be attributed to the nature of the road and again its largely inactive frontage.

3.6 Existing Trip Generation

3.6.1 The site is currently agricultural / unused and is generating minimal trips.

4 SUSTAINABLE TRANSPORT MODES AND ACCESSIBILITY

4.1 Introduction

4.1.1 This chapter discuss in detail access to the development by sustainable modes of travel and how this could be improved through the use of a Travel Plan.

4.2 Pedestrian and Cycling Facilities

4.2.1 Walking and cycling have significant roles to play in delivering a more sustainable transport system. Nearly a quarter of all car driver trips are less than 2 miles and 56 per cent are less than 5 miles (DfT, 2008). For some of these journeys, walking and cycling can be a real alternative. Not only does this help reduce congestion and pollution, but it can also improve our health and wellbeing and reduce obesity.

4.2.2 PPG13 (paragraph 75) identifies walking as being “the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2 kilometres.”

4.2.3 The Institution of Highways and Transportation (IHT) publication ‘Guidelines for providing for journeys on foot’ (2000) provides guidance on how to encourage pedestrian travel. Within paragraph 3.3.1 it identifies the following factors as being the main influence on acceptable walking distances: -

- An individual’s fitness and physical ability
- Encumbrances, e.g. shopping pushchair
- Availability, cost and convenience
- Time savings
- Journey purpose
- Personal Motivation
- General deterrents to walking

4.2.4 The Guidelines also note that walking accounts for over a quarter of all journeys and four-fifths of journeys less than one mile, (1.6 kilometres). Furthermore, walking is also an essential part of much car and almost all public transport travel, as bus stops are usually accessed on foot. The promotion of sustainable, integrated transport therefore involves providing good pedestrian links to public transport facilities. A drawing is contained in **Appendix E** (**JN835-NWK-004**) which demonstrates the area accessible within a comfortable 2 kilometre walk distance of the site.

4.2.5 A footpath is adjacent to the development site on Far Moor Lane and forms a continuous wide path of approximately 2 metres behind a 9.5 metre wide highway verge. There is regular street lighting, along with interconnecting underpasses (approximately 3.8 metres wide) under Far Moor Lane into the neighbouring residential estate. **Plates 8** - **10** refer:

Plate 8 – Footpath on Far Moor Lane

Plate 9 – Typical underpass under Far Moor Lane

Plate 10 – Typical linkage into neighbouring residential estate

4.2.6 PPG13 (paragraph 78) identifies cycling as having "the potential to substitute for short car trips, particularly those under 5km, and to form part of a longer journey by public transport." A drawing is contained in **Appendix E** (**JN835-NWK-005**) which demonstrates the area accessible within a comfortable 5 kilometre cycle distance of the site.

4.2.7 Redditch's urban road infrastructure is conducive to cycling, with its network of residential roads and footpath/underpass connections bypassing busier

roads. However the area would benefit from pedestrian/cycle signage to encourage the use of these sustainable modes of travel.

4.2.8 Redditch is on the National Cycle Network Routes 5 and Regional Route 55. NCN5 is a long distance route which when compete will connect Reading and Holyhead via Oxford, Banbury, Stratford-upon-Avon, Redditch, Bromsgrove, Birmingham, Walsall, Stafford, Stoke-on-Trent, Chester, Colwyn Bay and Bangor. NCN55 is a regional route linking Redditch to Kings Norton in the West Midlands. **Plate 11**, courtesy of Worcestershire County Council's LTP2, refers:

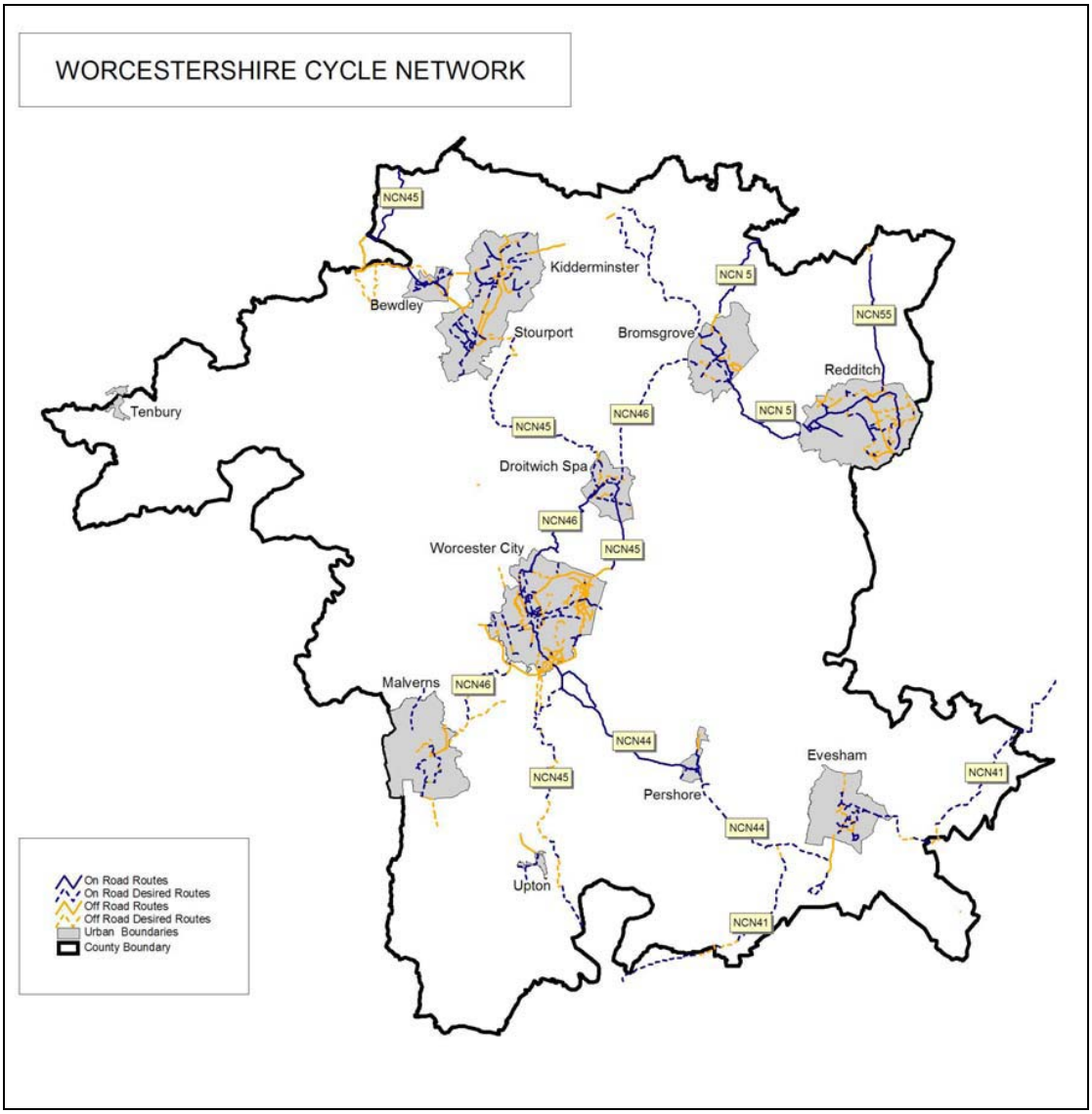

Plate 11 – Worcestershire Cycle Network

4.2.9 It is proposed that the development will provide undercover cycle parking to meet local standards.

4.3 Passenger Transport Facilities - Bus

4.3.1 An assessment of the existing bus facilities within the vicinity of the proposed development has been undertaken following a site visit on the 3rd September 2009.

4.3.2 The development site is well located for access to public transport with bus stops within comfortable walking distance of the proposed site access on Far Moor Lane. The nearest bus stops are near Illshaw Close and Furze Lane, which are located less then 20 metres from the potential vehicular access to the development site and approximately 200 metres apart from one another. A drawing (**JN835-NWK-006)** is contained in **Appendix E** which confirms the bus stop infrastructure within a 400-metre walk distance of the site.

4.3.3 The bus stops both consist of hard standing, a post, with a flag and timetable information attached. In addition, the Furze Lane stop is linked to the footpath adjacent to the development site by a further footpath. **Plates 12** and **13** refer:

Plate 12 – Near Illshaw Close, Far Moor Lane

Plate 13 – Near Furze Lane, Far Moor Lane

4.3.4 An assessment of the existing bus services within the vicinity of the proposed development has been undertaken, and route and timetable information has been obtained courtesy of the Worcestershire County Council website. All bus timetables and routes operating along Far Moor Lane e.g. within 400 metres of the development site are summarised in **Tables 9** - **10** below.

4.3.5 Services 52 and 53 are circular routes operating along Far Moor Lane, hourly Monday to Saturday.

	Direction/Route/Operator	Frequency of Service		
		Morning	Daytime	Evening
Monday- Saturday	Redditch - Church Hill - Matchborough East - Alexandra Hospital - Winyates West - Riverside - Redditch 52 First	0906	1006 1106 1206 1306 1406 1506	

Monday- Saturday	Redditch - Riverside - Winyates West - Alexandra Hospital - Matchborough East - Church Hill - Redditch 53 First		1004 1104 1204 1304 1404	

Table 9 – Services 52 and 53, Far Moor Lane

4.3.6 Service 61 is a circular route operating along Far Moor Lane, hourly Monday to Saturday.

		Frequency of Service		
	Direction / Route	**Morning**	**Daytime**	**Evening**
Monday - Saturday	Sainsbury's - Redditch - Winyates Green - Matchborough East (Circular) 61 Diamond	0804 0854	1014 1114 1214 1314 1414 1514 1614	1714 1804

Table 10 – Service 61, Far Moor Lane

4.3.7 The contents of the above tables were correct at the time of printing and clearly illustrate that there are already frequent opportunities for travel around Redditch by bus.

4.4 Travel Plan

4.4.1 A Travel Plan is a specific package of measures tailored to suit the needs of individual sites aimed at promoting greener, cleaner travel choices and reducing single occupancy car journeys.

4.4.2 The objectives for the Business Travel Plan would be to enable modal choice for visitors to the site and to reduce single occupancy car trips associated with the site. It would address commuter journeys and business journeys. For

example, measures could include an information pack for visitors with bus timetables.

4.4.3 The Travel Plan would include a range of mechanisms, initiatives, targets, indicators and associated monitoring/review procedures to reduce the impact of travel associated with the site on the environment. For example, it would be likely to include targets to encourage the use of local bus services.

5 PROPOSED DEVELOPMENT

5.1 Introduction

5.1.1 This chapter will discuss in detail the proposed development site and the impact of new trips generated by the development.

5.2 Proposed Development

5.2.1 The proposal is to create a Diversification Park to facilitate businesses in Redditch by manufacturing new products for growth sectors or finding alternative markets for their current products. The businesses themselves would not locate on the diversification park; rather they would use the facilities on the park to help develop their new products. The park should be a central facility for manufacturers to access support and services specifically designed to meet their needs. These could include:

- Manufacturing Advisory Service
- Other Business Link Services
- Proto-typing companies
- Solicitors specialising in patent and intellectual property rights
- Incubator units
- Market research companies
- CAD/CAM specialists

5.2.2 The Park would also be a host location for regular events such as:

- International trade events
- Meet the buyer events
- Meet your maker events

5.3 Proposed Parking

5.3.1 Car parking spaces will be provided in accordance with government guidance, and specific local guidance.

5.3.2 Cycle parking spaces will be provided in accordance with government guidance, and specific local guidance.

5.4 Trip Generation

Diversification Park / Business Innovation

5.4.1 In order to derive the potential level of new trips that would be generated by the proposed development, the TRICS 2009 database has been interrogated, however, in the absence of comparable survey sites, Morgan Tucker conducted our own multimodal transport survey at a local site which was considered to be comparable.

5.4.2 Newark Beacon is a state of the art business innovation centre approximately 2000 sqm, completed in 2007 to offer 27 office units, along with 4 light industrial units, additional support facilities, virtual office facilities, conference facilities, and a café. Although smaller then the proposed Diversification Park, the survey results were factored accordingly.

5.4.3 Full results of the survey of Newark Beacon are contained in **Appendix F**.

5.4.4 The resulting trip generations (factored up for a 10,000 sqm development) are in **Table 11** below:

Use	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)	
	Arrivals	Departures	Arrivals	Departures
Business Innovation Centre - Vehicles	205	20	25	160
Business Innovation Centre - Pedestrians	50	5	0	5
Business Innovation	15	0	5	5

Centre - Cyclists				

Table 11 – Proposed Trip Generations 10,000 sqm Business Innovation Centre

5.4.5 To summarise, the proposed development would generate a worst case of 225 2-way trips in the AM peak hour and 185 2-way trips in the PM peak hour for 10,000 sqm business innovation development.

5.4.6 The resulting trip generations (factored up for a 20,000 sqm development) are in **Table 12** below:

Use	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)	
	Arrivals	Departures	Arrivals	Departures
Business Innovation Centre - Vehicles	410	40	50	320
Business Innovation Centre - Pedestrians	100	10	0	10
Business Innovation Centre - Cyclists	30	0	10	10

Table 12 – Proposed Trip Generations 20,000 sqm Business Innovation Centre

5.4.7 To summarise, the proposed 20,000 sq.m business innovation development would generate a worst case of 450 two-way trips in the AM peak hour and 370 two-way trips in the PM peak hour.

Business Park

5.4.8 For a further comparison, the TRICS 2009 database has been interrogated for Business Parks to provide a statistically valid estimate of the likely rate of trip generation (full information contained in **Appendix F**). In addition, a

modal split pie chart is contained below to illustrate the division of trips via mode. **Plate 14** refers:

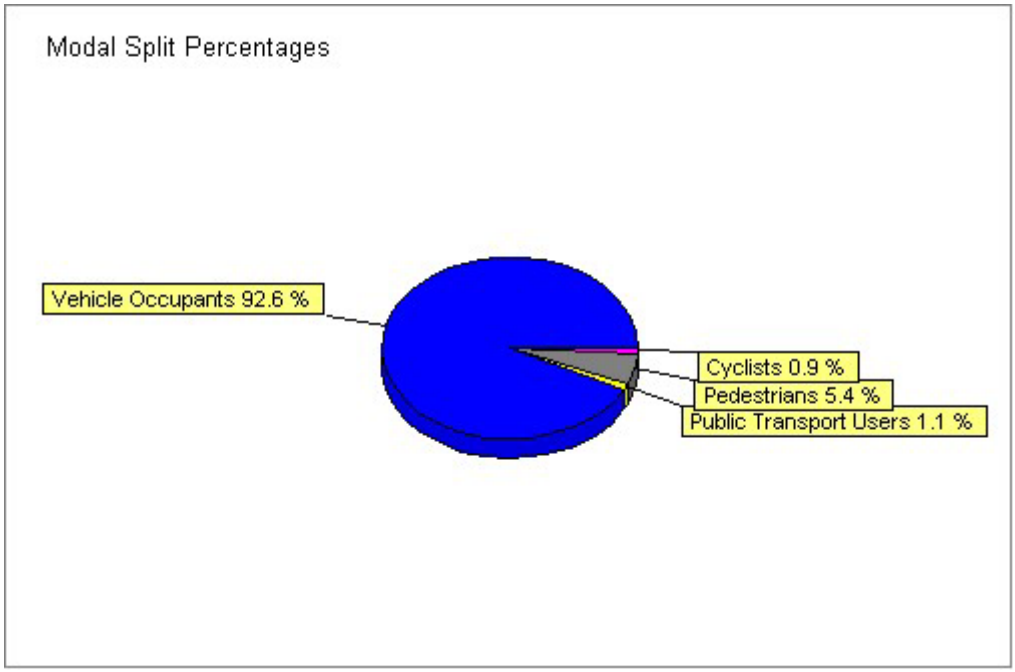

Plate 14 – Business Park

5.4.9 The resulting trip generations are displayed below in **Table 13**:

Use	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)	
	Arrivals	Departures	Arrivals	Departures
Per 100 sqm	1.364	0.286	0.235	1.186
Business Park – Vehicles	136	29	23	119
Business Park – Pedestrians	10	1	2	8
Business Park – Cyclists	2	0	0	1
Business Park – Public Transport Users	4	0	0	2

Table 13 – Proposed Trip Generations 10,000 sqm Business Park

5.4.10 To summarise, the proposed development would generate a worst case of 165 2-way trips in the AM peak hour and 142 2-way trips in the PM peak hour for 10,000 sqm business park development.

5.4.11 The resulting trip generations are displayed below in **Table 14**:

Use	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)	
	Arrivals	Departures	Arrivals	Departures
Per 100 sqm	1.364	0.286	0.235	1.186
Business Park – Vehicles	273	57	47	237
Business Park – Pedestrians	21	1	4	17
Business Park – Cyclists	5	0	0	3
Business Park – Public Transport Users	8	0	0	4

Table 14 – Proposed Trip Generations 20,000 sqm Business Park

5.4.12 To summarise, the proposed development would generate a worst case of 330 two-way trips in the AM peak hour and 284 two-way trips in the PM peak hour for 20,000 sqm business park development.

Residential Development

5.4.13 Lastly, in early 2000, the development site was investigated for a 300 house residential development. For accuracy, the TRICS 2009 database has been re-interrogated for Residential Development to provide an up-to-date estimate of the likely rate of trip generation (full information contained in **Appendix F**). In addition, a modal split pie chart is contained below to illustrate the division of trips via mode. **Plate 15** refers:

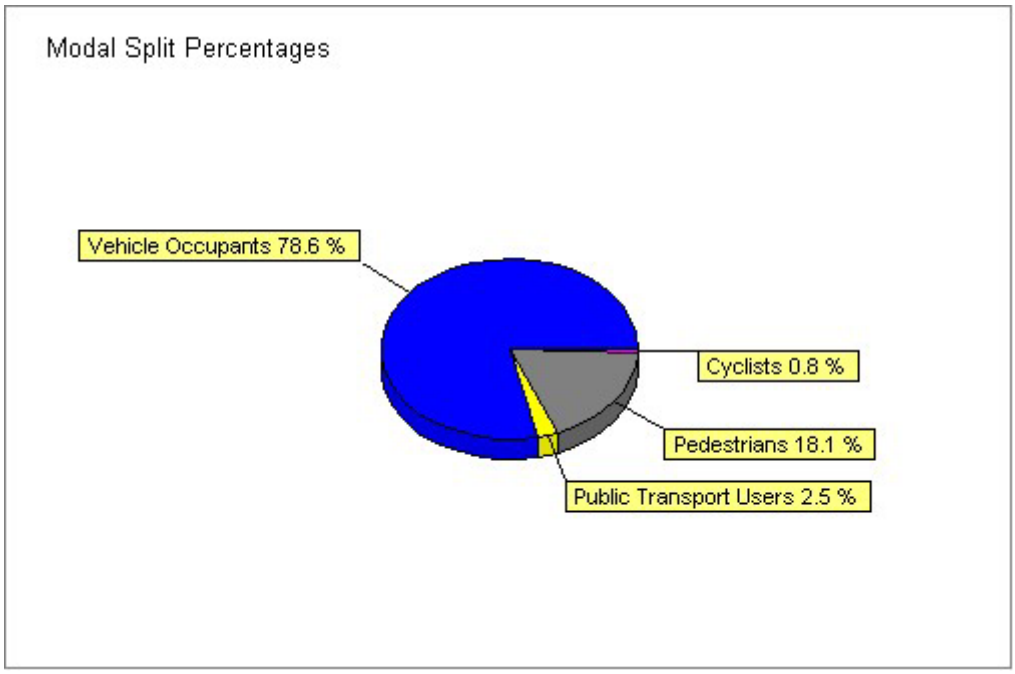

Plate 15 – Residential Development

5.4.14 The resulting trip generations are displayed below in **Table 15**:

Use	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (17:00 – 18:00)	
	Arrivals	Departures	Arrivals	Departures
Per Dwelling	0.223	0.469	0.439	0.309
300 Residential Dwellings – Vehicles	67	141	132	93
300 Residential Dwellings – Pedestrians	15	72	27	19
300 Residential Dwellings – Cyclists	3	2	0	1
300 Residential Dwellings – Public Transport Users	12	13	4	1

Table 15 – Proposed Trip Generations 300 Residential Dwellings

5.4.15 To summarise, the proposed 300 dwelling residential development would generate a worst case of 208 two-way trips in the AM peak hour and 225 two-way trips in the PM peak hour.

Conclusion

5.4.16 As demonstrated above, the worst case for trip generation is a business innovation use with 20,000 sqm generating 450 two-way trips in the AM peak hour and 370 two-way trips in the PM peak hour.

5.5 Census Data

5.5.1 The 2001 Census holds the most up-to-date source of data about the population of Redditch, which can be used to check that the trip generations and modal splits we are proposing for this development site are appropriate. The Redditch map is contained in **Plate 16** below:

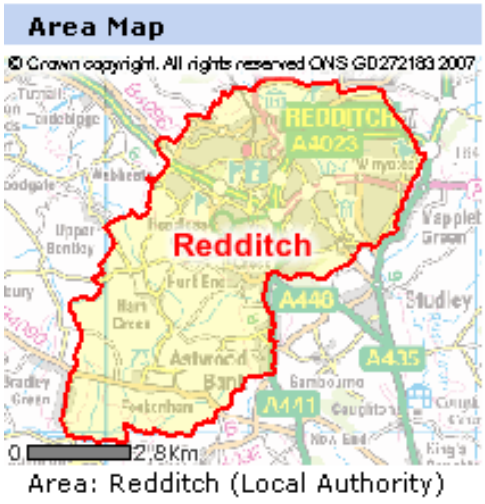

Plate 16 – Census Redditch Area

5.5.2 According to the 2001 Census Data, car ownership in Redditch is higher then in the West Midlands as a whole, with only 21% of households without a car compared to 27% for the West Midlands. 42% of households have 1 car in Redditch compared to 43% in West Midlands, and 37% have 2 or more cars compared to 30% in the West Midlands. **Plates 17** and **18** below illustrate:

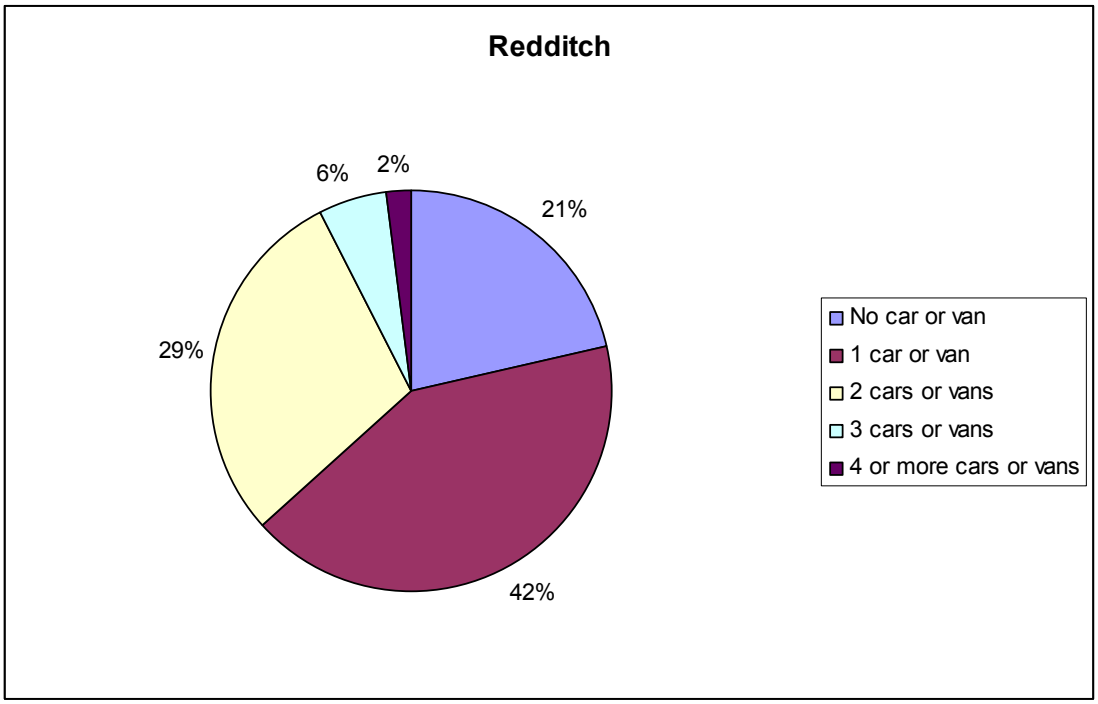

Plate 17 – Car ownership per household in Redditch (2001 Census)

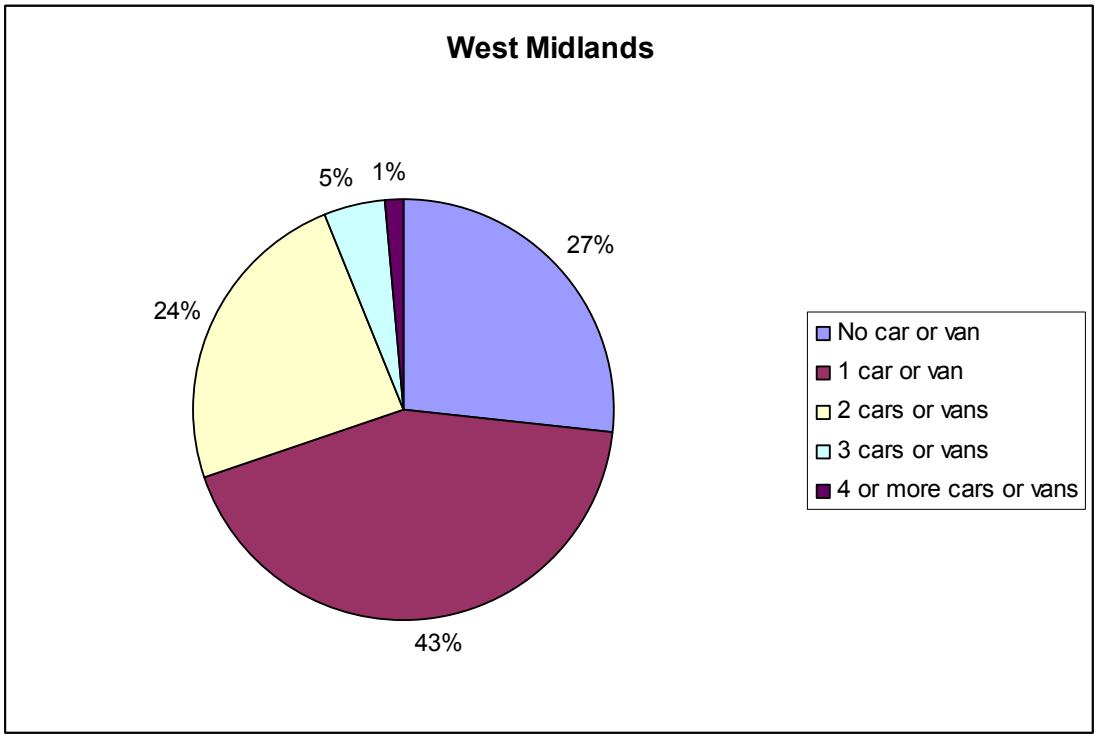

Plate 18 – Car ownership per household in the West Midlands (2001 Census)

5.5.3 The impact of car ownership in Redditch is illustrated in **Plate 19** below where car use is by far the most popular mode of travel, with 70% of journeys to

work made by people driving a car, and a further 8% as a passenger in a car, in employment in the Redditch area. The percentage of people who travel to work via a sustainable mode of transport such as walking, cycling, and public transport is 9%, 2% and 10% respectively, providing a total of 21% of all journeys.

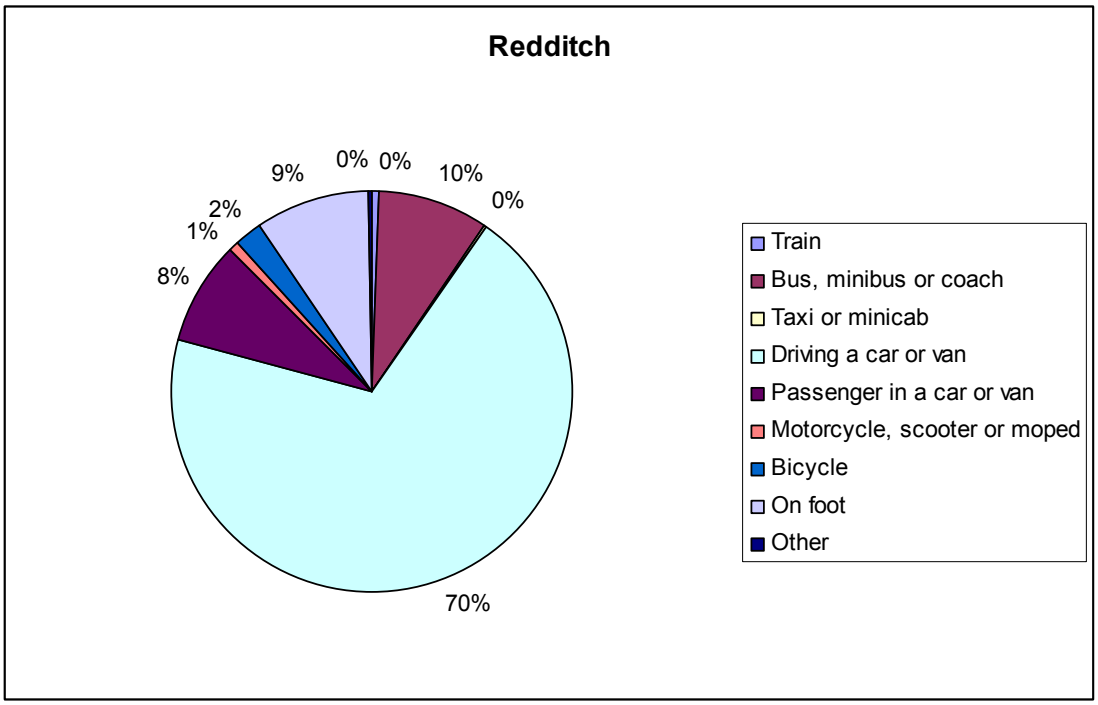

Plate 19 – Travel to Work by Mode in Redditch (2001 Census)

5.5.4 **Plate 20** below demonstrates that the car is slightly less dominant with 67% of people employed in the West Midlands travelling to work made by people driving a car, and a further 8% as a passenger in a car. In turn, the percentage of people who use sustainable travel modes has increased to 24% of the modal split (10% walking, 2% cycling, 12% public transport).

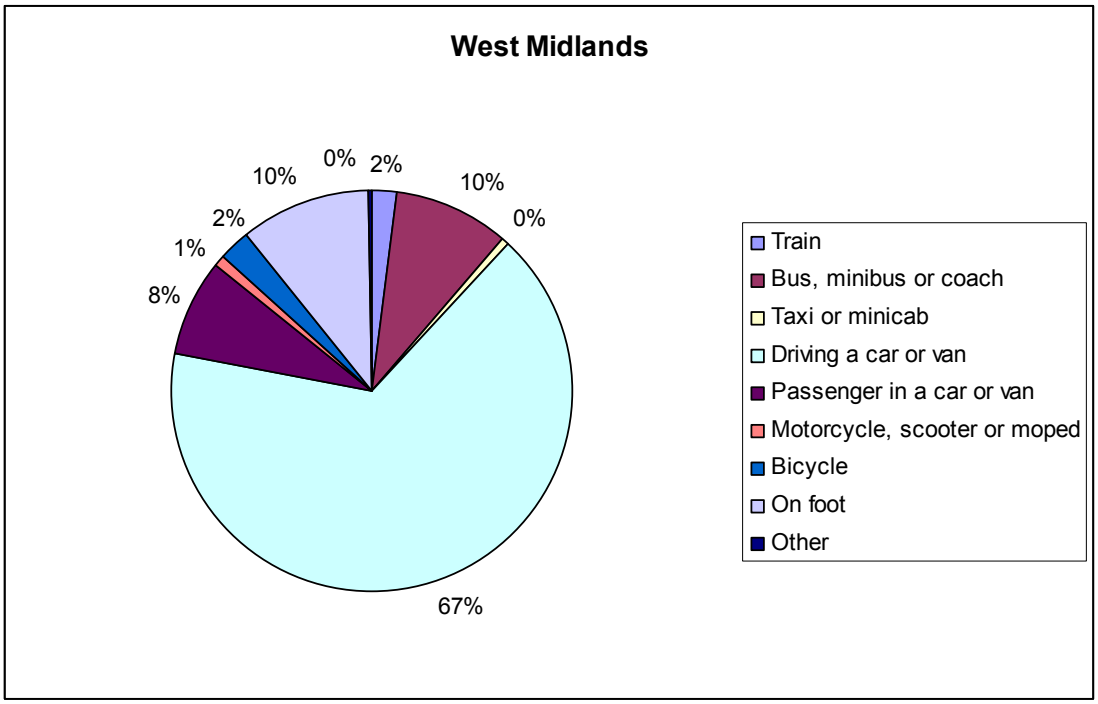

Plate 20 – Travel to Work by Mode in the West Midlands (2001 Census)

5.5.5 **Plate 21** below demonstrates that 28% of journeys to work in Redditch are less than 2 km, a comfortable walking distance, and 33% are between 2 and 5 km, so comfortable cycling or public transport distance.

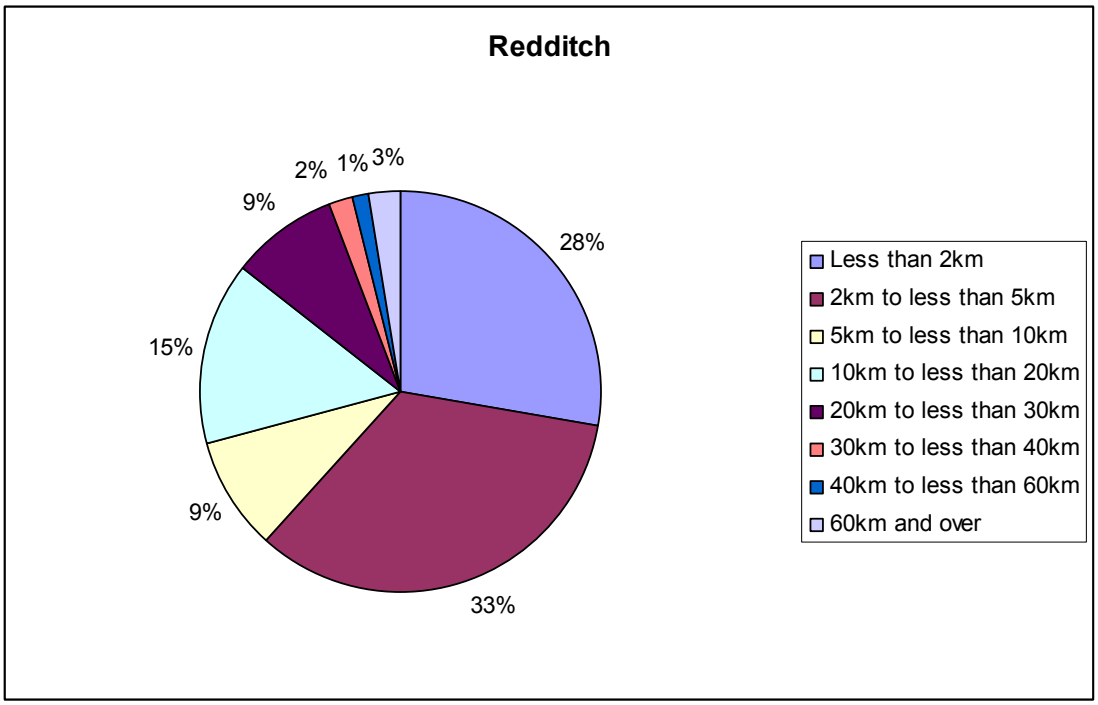

Plate 21 - Distance Travelled to Work in Redditch (2001 Census)

5.5.6 In comparison, **Plate 22** below demonstrates that 23% of journeys to work in the West Midlands are less than 2 km and 26% of journeys are between 2 and 5 km.

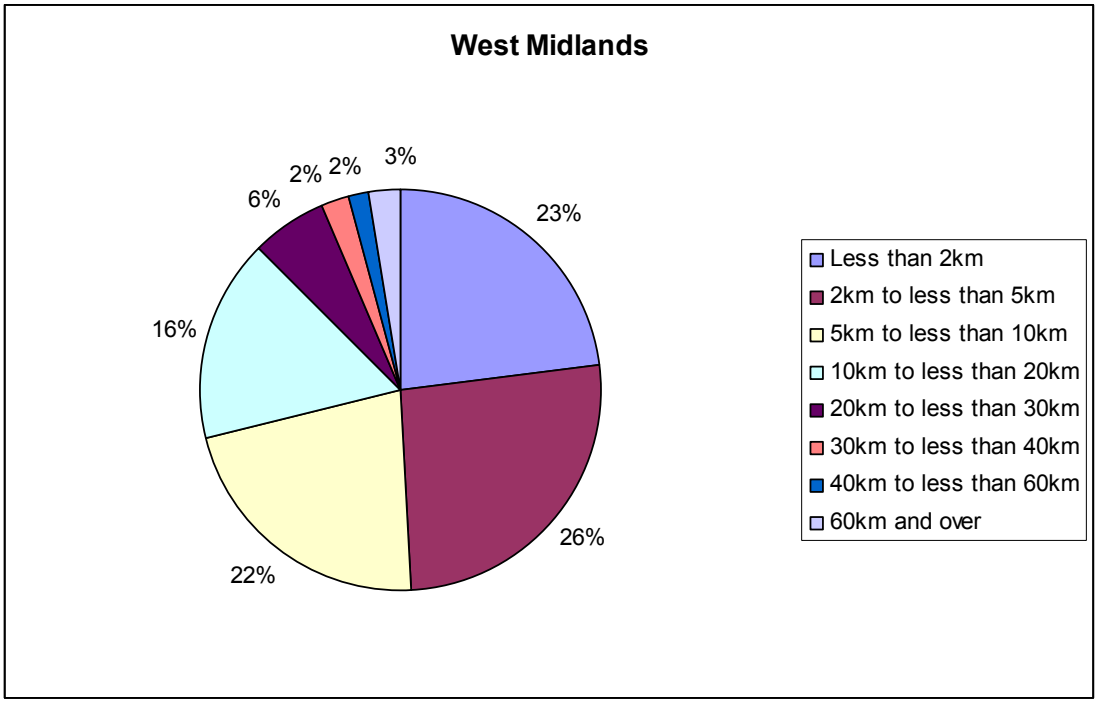

Plate 22 - Distance Travelled to Work in the West Midlands (2001 Census)

Conclusion

5.5.7 From the investigations above into the 2001 Census data for Redditch and the West Midlands, it is likely that approximately 75-78% of trips generated by the proposed development site will be by car with sustainable travel modes comprising the remaining 22-25%. This is a similar level to the results of the TRICS investigations, therefore it is acceptable to use these surveys for estimating the likely trip generations on the local highway network.

5.6 Trip Distribution

5.6.1 Following the investigation into the 2001 Census Data for Redditch, it is still not clear what the likely origin and destinations will be of the trips generated to/from the proposed development. Development trip distribution diagrams

(**JN835-NWK-006** – **JN835-NWK-008**) illustrating the likely assignment of the development traffic are attached at **Appendix F**.

6 IMPACT APPRAISAL

6.1 Introduction

6.1.1 This chapter will discuss in greater detail the likely impact of the proposed development site as measured against the government's five objectives for transport (outlined in A New Deal for Transport and A New Deal for Trunk Roads White Papers), applied through the New Approach to Appraisal (NATA).

6.2 Environment

6.2.1 In 2007 Redditch Borough Council published the 2007 Progress Report which indicated that none of the tested locations would exceed acceptable levels for pollutants. An extended diffusion tube survey took place in 2008 to monitor NO2 levels and a further progress report was due in 2008 but is not on the website.

6.2.2 In terms of environmental impact of the development, the proposal will result in the generation of motorised vehicle trips. However the subsequent improvement of accessibility through the use of an innovative travel plan and other necessary transport improvements to provide new linkages such as improvements to public transport, would mediate the impact.

6.3 Safety

6.3.1 In order to confirm the safety record on the road network within the area of influence of the proposed development site, the personal injury collision statistics for the five year period from January 2004 to August 2009 have been obtained from Warwickshire and Worcestershire County Councils.

6.3.2 Analysis of the collision statistics confirms that since January 2004, there have been a total of 32 collisions within the search area. Inspection of the interpreted listings reveals that the majority of collisions have occurred as a result of driver error for example, failing to look properly, following too closely and poor judgement. In addition, several of these collisions occurred when the road conditions were wet/icy or there were objects in the carriageway.

6.3.3 Based on the information identified in the collision analysis, it is considered likely that the development proposals will not result in a statistically significant increase in the frequency or severity of collisions in this area of Redditch.

6.4 Economy

6.4.1 One of the key roles of the planning system is to ensure that sufficient and attractive land is available for employment related development. The Borough Council has recently prepared a Draft Employment Land Review (October 2008) as part of its Local Development Framework that it is currently progressing. The purpose of the Review is to provide a context for the Local Development Framework by establishing future employment sites. The Review examines existing employment sites in terms of their fitness for future employment use, and identifies new sites for future use.

6.4.2 **Plate 23** below demonstrates that out of the people in Redditch who are of an economically active age; 65% are employed full-time, 17% part-time, 10% are self-employed, 3% are full-time students and 5% unemployed.

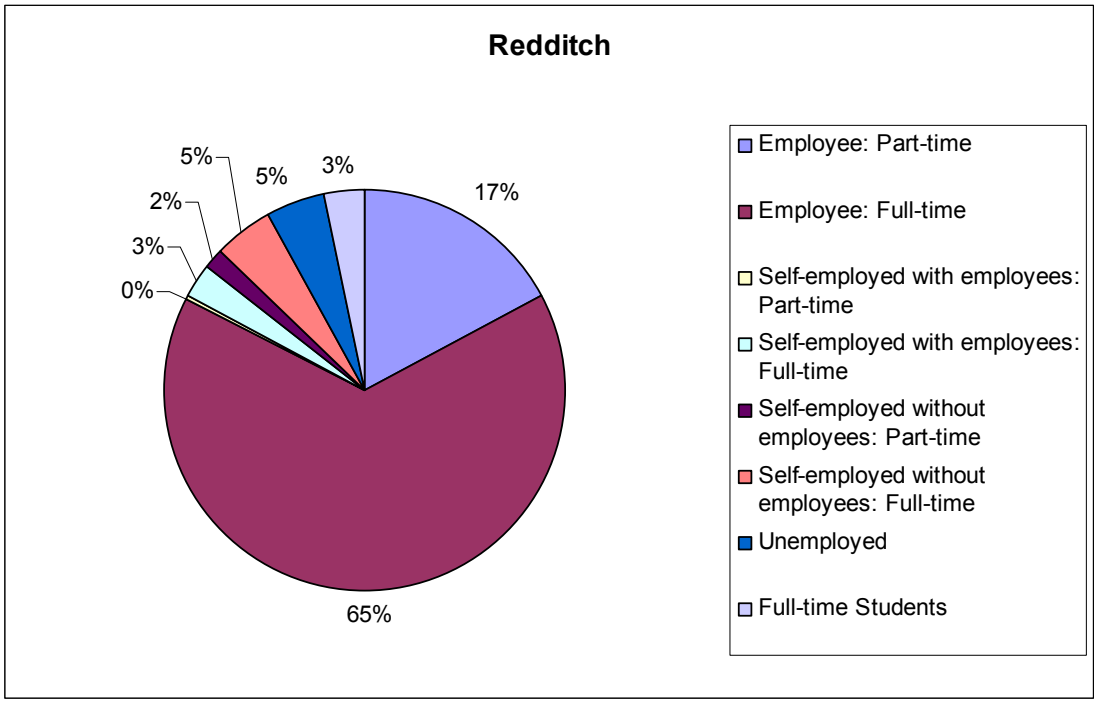

Plate 23 – Economic Activity in Redditch (2001 Census)

6.4.3 **Plate 24** demonstrates that the largest percentage of people (29%) work in manufacturing, followed by wholesale and retail trade / motor vehicles (19%), real estate (12%), health and social work (9%). Please note, there are very small percentages of people working in agriculture, hunting, forestry, fishing, mining and quarrying, electricity, gas, and water supply, which are not reflected on **Plate 24**.

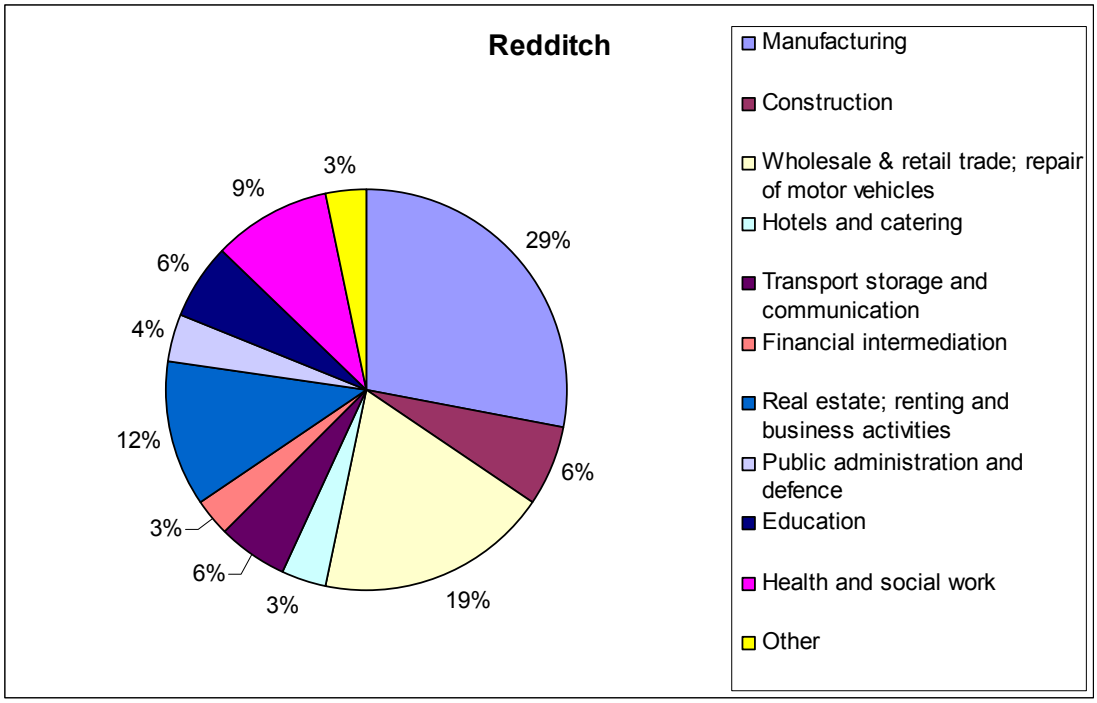

Plate 24 – Employment Industry in Redditch (2001 Census)

6.4.4 The results in **Plate 24** above for manufacturing concur with Redditch Borough Council's desire for a Diversification Park to support manufacturers and individuals, and the manufacturing industry in Redditch.

6.5 Accessibility

6.5.1 Worcestershire's second Local Transport Plan for 2006-11 (LTP2) was published in March 2006. The LTP2 outlines the transport strategy for Worcestershire for a five year period ending March 2011, and provides details of priority projects for the improvement of transport within Worcestershire. The overall vision of the LTP2 strategy is "To deliver a transport system within Worcestershire that is safe to use, and which allows people to easily access

the facilities that they need for their day-to-day life in a sustainable and healthy way."

6.5.2 The Worcestershire LTP2 has the following relevant transport strategies which have been developed following analysis of transport issues within the context of the wider priorities for the County and are underpinned by the four shared Priorities for Transport :

- To ensure that all residents, visitors and workers in Worcestershire can access the facilities they need to carry out day-to-day activities by the safest, most efficient and convenient mode of transport available to them.
- To minimise the impact of all modes of transport upon the local environment, and seek to reduce vehicle emissions arising from transport activity within Worcestershire.
- To ensure that traffic congestion within Worcestershire does not constrain economic activity within the County, reduce the impact of congestion upon local communities, and ensure that the environmental impact of congestion is minimised.
- To create a transport network within Worcestershire that is even safer for people to use.
- To ensure that land use decisions take full account of transport issues and that community facilities are located to minimise the need for travel for their users.

6.5.3 The Worcestershire LTP2 contains the Accessibility Strategy which covers a wide range of transport modes as well as the need to ensure the accessibility of facilities is considered when land use decisions are made. The vision for the accessibility strategy is "To ensure that people have access to key services at reasonable cost, in reasonable time, and with reasonable ease, and in a way that promotes better health for all." It is outlined within the plan that implementing the accessibility strategy will involve improving walking, cycling, passenger transport, and public rights of way facilities across the County and involve partnership working.

6.5.4 Warwickshire County Council developed a second Local Transport Plan, LTP, which sets out how the County Council plans to improve transport in

Warwickshire over the five year plan period. The plan was adopted in March 2006, following a review of the previous LTP 2001-06, and covers the five year period ending 31 March 2011. The plan provides the policy background and planning to how local transport services contribute towards improving peoples and lives and making Warwickshire 'the best place to live and work'.

6.5.5 The Warwickshire LTP2 has specific transport objectives which have been developed within the context of the wider priorities for the County and are underpinned by the four shared Priorities for Transport:

- Accessibility: to improve accessibility to health and educational facilities;
- Road Safety: to maintain a special focus on improving road safety for children, particularly in disadvantaged areas;
- Congestion: to discourage traffic growth during peak periods in urban areas; and
- Air Quality: to tackle the declared Air Quality Management Areas (AQMAs) and prevent any further areas being declared.

6.5.6 It is outlined within the LTP2 Warwickshire County Council's intentions to place the strongest emphasis on addressing issues of accessibility and continuing to make roads safer. It is also acknowledged as pressure on transport networks in the urban areas of Warwickshire increase the issues of air quality and congestion need to be addressed.

6.5.7 The Warwickshire LTP2 contains the Accessibility Strategy. The Accessibility Strategy has close links to national, regional and local policy frameworks. The vision for the accessibility strategy is 'to enable people to reach a range of education, training, employment, healthcare, shopping and leisure opportunities, with a particular focus on improving accessibility for disadvantaged groups and areas.' The Accessibility Strategy ensures that its action plans positively encourage sustainable travel patterns and opportunities available for walking cycling and passenger transport as priorities to maximize the ability to connect people to jobs, key services, and public transport.

6.6 Policy Integration

Planning Policy Statement 1

6.6.1 Planning Policy Statement 1: Delivering Sustainable Development (PPS1) states that 'Planning should facilitate and promote sustainable and inclusive patterns of urban and rural development'. It is thought that this proposal is in support of PPS1 as it supports the following aims:

- the promotion of urban and rural regeneration…and create new opportunities for the people living in those communities.
- bring forward sufficient land of a suitable quality in appropriate locations to meet the expected needs for housing, for industrial development, for retail and commercial development, and for leisure and recreation.
- provides improved access for all to jobs, health, education, shops, leisure and community facilities, open space, sport and recreation.

Planning Policy Guidance Note 13

6.6.2 The development proposal will also fully support the objectives of Planning Policy Guidance Note 13: Transport (PPG13) through the integration of planning land use and transport in order to help reduce the growth in the length and number of motorised journeys and encourage alternative modes of travel to the private motor vehicle. In particular, this will include the use of an innovative travel plan.

Regional Planning Guidance

6.6.3 The West Midlands Regional Spatial Strategy (RSS) Phase 2 Revision (Preferred Option) identifies Redditch as a Settlement of Significant Development. The level of housing growth for the period 2006-2026 is identified as 6,600 dwellings, 3,300 of which need to be accommodated on land within the adjoining authorities of Bromsgrove District Council and Stratford District Council, but adjacent to the boundary of Redditch. A related amount of employment land would also be required.

6.6.4 The Government Office for the West Midlands subsequently commissioned a study to identify further options for growth that could deliver higher housing numbers. This study has been recently published. It does not proposed higher housing growth for Redditch, but does suggest additional housing growth for Bromsgrove, some of which could be accommodated in proximity to Redditch.

6.6.5 Redditch Borough Council, Bromsgrove District Council and Stratford-on-Avon District Council have jointly commissioned two studies associated with the RSS. The first assessed the implications for Redditch of achieving the growth scenarios put forward in the RSS Phase 2 Revision. The second study examined how the proposed growth could best be distributed in Redditch, Bromsgrove and Stratford.

Local Planning Context

6.6.6 The Borough of Redditch Local Plan No 3 was adopted in May 2006 and forms part of the Development Plan for the Area. The Council is progressing its Core Strategy, which once adopted will, in part, replace Local Plan No 3. The consultation period on the Preferred Draft Core Strategy was from 31st October 2008 to 8th May 2009. The Borough Council is gathering evidence for the Core Strategy and has a DRAFT Employment Land Review (October 2008) and Sustainability Appraisal Scoping Report (October 2008).

6.6.7 The development site is in the administrative boundary of Stratford-upon-Avon District Council. Stratford-upon-Avon's District Local Plan Review was adopted in July 2006 and forms part of the Development Plan for the Area. Stratford is also preparing its Core Strategy and has made the following provision in Policy CS.6(a) – 'approximately 11.7 hectares of land at Winyates Green Triangle will be released for employment development to meet the needs of Redditch'.

6.6.8 Redditch Borough Council is currently preparing a Policy for the Diversification Park on this land and Stratford will be requested to incorporate the policy into their Core Strategy document in due course.

6.6.9 The following 'saved' policies (and excerpts from the policies) from the Redditch Local Plan No 3 are relevant to this development proposal:

- C(T).7 Public Transport Infrastructure – 'The Borough Council will support the appropriate expansion and enhancement of the network of Public Transport Routes in the Borough'…
- C(T).12 Parking Standards – 'New development will be expected to comply with the parking standards set out in Appendix H of this Plan [Local Plan No 3]. The Appendix sets out the maximum standards that the Council considers appropriate for any new development. The standards specifically for disabled parking bays and cycle parking are minimum standards and if the development warrants, may be increased. If the development requires parking facilities and these cannot be provided on site, the developer may be asked to contribute to transport related projects in the area'.

6.6.10 For example, for B1 business use class (over 2,500 sqm GFA) would require a maximum of

- 1 car space per 30 sqm GFA
- 1 disabled parking space per 20 car parking spaces
- 1 cycle parking space per 10 car parking spaces
- 1 motorcycle parking space per 20 car parking spaces
- 1 lorry parking space per 2,500 sqm GFA.

6.6.11 The following 'saved' policies (and excerpts from the policies) from the Stratford-upon-Avon's District Local Plan Review are relevant to this development proposal:

- Dev.4 Access – 'New or improved access arrangements to serve development will be treated as an integral part of the overall layout'…
- Dev.5 – Car Parking 'The provision of car parking associated with development proposals will be expected to comply with maximum parking standards of the District Council'…
- Dev.9 Access for People with Disabilities – 'Development to which members of the public would reasonably expect to have access will only be permitted if

provision is made in the design for safe and convenient access by people with disabilities'…

- Com.7 Bus Service Support – 'The District Planning Authority will work with bus operators, developers, the County Council and other interested parties to protect, improve and extend both conventional and non-conventional bus services to assist local people to gain access to work, shopping, health, leisure and other facilities'…
- Com.9 Walking and Cycling – 'The layout and design of development proposals will be expected to incorporate facilities for walking and cycling which are safe, convenient to use and well connected to other parts of the settlement'…
- Imp.5 Infrastructure Provision Transport – 'The District Planning Authority will assess each planning application to gauge the level and form of contribution towards transport-related facilities required as a result of the development'…
- Imp.6 Transport Assessments – 'Development proposals which generate significant traffic movements will be expected to be accompanied by a Transport Assessment'…
- Imp.7 Green Transport Plans – 'A Green Transport Plan will be required to be submitted as part of a planning application, or produced through the terms of a Section 106 Agreement, where a development proposal would…cause significant traffic impacts…generate a significant amount of car travel…be situated in an area where public transport facilities are limited'…

6.7 Highway Impact

6.7.1 In order to assess the impact of the proposed development on the local highway network, a range of opening year capacity assessments have been undertaken for 2012. Assessment of a 2017 future year has also been undertaken.

6.7.2 In order to derive the forecast base peak hour traffic flows for the assessment years confirmed above, the existing traffic movements as recorded in the traffic survey have been factored using 1997 NRTF central growth estimates adjusted by TEMPRO to tailor the forecast to local circumstances. The appropriate NRTF adjusted growth factors based on Redditch area are identified in **Tables 16** and **17** below:

	AM PEAK	PM PEAK
2009 – 2012 Opening Year	1.040	1.047
2009 – 2017 Design Year	1.122	1.132

Table 16 - Adjusted NRTF Growth Factors for Assessment Years – Far Moor Lane, Claybrook Drive and Alders Drive

	AM PEAK	PM PEAK
2009 – 2012 Opening Year	1.014	1.021
2009 – 2017 Design Year	1.055	1.064

Table 17 - Adjusted NRTF Growth Factors for Assessment Years – A4023 Coventry Highway, A4189 Warwick Highway and A435 Birmingham Road

6.7.3 The resulting 2012 and 2017 peak hour base (without development) traffic flows for the local road network are illustrated on the summary distribution diagrams on drawing numbers **JN835-NWK-009** and **JN835-NWK-010** in **Appendix G**.

6.8 Operational Assessment – Far Moor Lane / Alders Drive

6.8.1 Capacity testing of existing junctions considered to be within the influence of the development site has been confined to the junction of Far Moor Lane with Alders Drive. It was not thought necessary to undertake capacity assessments on any other junctions as they were observed (during the traffic survey work) to be operating well within capacity with little evidence of significant levels of congestion/queuing during the peak hours.

6.8.2 PICADY capacity tests for this junction (using the 20,000 sq.m. Business Innovation Centre trip generations) have been carried out for varying base and future years, as detailed below:

- 2009 Base Traffic Flows

- 2017 Without Development
- 2017 With Development

6.8.3 The full printed output information is contained in **Appendix H** at the rear of the report. The key results from the capacity tests are summarised in **Tables 18** to **20** below.

AM PEAK			PM PEAK		
Junction Arm	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**	**Junction Arm**	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**
Alders Lane North	0.109	0.12	Alders Lane North	0.086	0.09
Far Moor Lane	0.429	0.74	Far Moor Lane	0.249	0.33
Alders Lane South	0.214	0.27	Alders Lane South	0.534	1.12
Total Vehicle Demand / Hour – 672.6			Total Vehicle Demand / Hour – 1080		
Total Queuing Delay – 76.6			Total Queuing Delay – 98.5		

Table 18 - 2009 Base Traffic Flows
Far Moor Lane / Alders Drive Junction

6.8.4 The summary results of the PICADY outputs clearly illustrate that the Far Moor Lane / Alders Drive junction is currently operating within capacity in both peaks, with minimal queuing occurring e.g. maximum queue length of 1 vehicle on Alders Lane south in the PM peak. This means that the junction is well within capacity and therefore any congestion and queues formed are dispersed within a couple of minutes.

6.8.5 Site observations concluded that the junction is currently impeded by traffic queuing southbound on Alders Drive on the approach to the Warwick Highway roundabout. Traffic queuing southbound for the roundabout are blocking northbound traffic wishing to turn right into Far Moor Lane. This could be mediated by the introduction of a yellow box junction through the use of a Traffic Regulation Order (TRO).

6.8.6 Please note, PICADY does not have the ability to reflect the exact current situation with the queuing traffic from the nearby roundabout or the introduction of the yellow box junction, as it cannot model these parameters. However, it can safely be assumed that the introduction of a yellow box junction would provide results as on **Tables 19** – **20**.

AM PEAK			PM PEAK		
Junction Arm	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**	**Junction Arm**	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**
Alders Lane North	0.133	0.15	Alders Lane North	0.111	0.12
Far Moor Lane	0.483	0.92	Far Moor Lane	0.292	0.41
Alders Lane South	0.242	0.32	Alders Lane South	0.620	1.59
Total Vehicle Demand / Hour – 754.3			Total Vehicle Demand / Hour – 1223.2		
Total Queuing Delay – 91.8			Total Queuing Delay – 128.3		

Table 19 - 2017 'Without Development' Traffic Flows
Far Moor Lane / Alders Drive Junction

6.8.7 The summary results of the PICADY outputs clearly illustrate that the Far Moor Lane / Alders Drive junction will operate within capacity in both peaks in 2017, with minimal queuing occurring e.g. maximum queue length of 2 vehicles on Alders Lane south in the PM peak. This means that the junction is well within capacity and therefore any congestion and queues formed are dispersed within a couple of minutes.

AM PEAK			PM PEAK		
Junction Arm	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**	**Junction Arm**	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**
Alders Lane North	0.180	0.22	Alders Lane North	0.282	0.38
Far Moor	0.532	1.12	Far Moor	0.618	1.57

Lane			Lane		
Alders Lane South	0.663	1.90	Alders Lane South	0.678	2.02
Total Vehicle Demand / Hour – 960.7			Total Vehicle Demand / Hour – 1392.9		
Total Queuing Delay – 194.5			Total Queuing Delay – 222.6		

Table 20 - 2017 'With Development' Traffic Flows
Far Moor Lane / Alders Drive Junction

6.8.8 The summary results of the PICADY outputs clearly illustrate that the Far Moor Lane / Alders Drive junction will operate within capacity in both peaks in 2017 with a 20,000 sq.m Business Innovation Centre development. There would be minimal queuing e.g. a maximum queue length of 2 vehicles on Alders Lane south in the PM peak. This means that the junction is well within capacity and therefore any congestion and queues formed are dispersed within a couple of minutes.

6.9 Operational Assessment – Far Moor Lane / Development access.

6.9.1 ARCADY and PICADY capacity tests (using the 20,000 sqm Business Innovation Centre trip generations) for two alternative site access junction layouts i.e. a roundabout and a staggered crossroads, have been carried out for the future year scenario as detailed below:

- 2017 With Development

6.9.2 The full printed output information is contained in **Appendix H** at the rear of the report. The key results from the capacity tests are summarised in **Tables 21** to **22** below.

AM PEAK			PM PEAK		
Junction Arm	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**	**Junction Arm**	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**
Development Site – Far Moor Lane	0.037	0.04	Development Site – Far Moor Lane	0.348	0.53

South			South		
Development Site – Far Moor Lane North / Illshaw Close	0.061	0.06	Development Site – Far Moor Lane North / Illshaw Close	0.433	0.75
Illshaw Close – Far Moor Lane North	0.040	0.04	Illshaw Close – Far Moor Lane North	0.018	0.02
Illshaw Close – Development Site / Far Moor Lane South	0.057	0.06	Illshaw Close – Development Site / Far Moor Lane South	0.025	0.03
Far Moor Lane South – Development Site	0.318	0.46	Far Moor Lane South – Development Site	0.038	0.04
Far Moor Lane North – Illshaw Close	0.012	0.01	Far Moor Lane North – Illshaw Close	0.026	0.03
Total Vehicle Demand / Hour – 720.3			Total Vehicle Demand / Hour – 698.3		
Total Queuing Delay – 47.1			Total Queuing Delay – 90.0		

Table 21 - 2017 'With Development' Traffic Flows
Staggered / Right Turn Lane Site Access

6.9.3 The summary results of the PICADY outputs clearly illustrate that the staggered / right turn lane junction would operate well within capacity in both peaks in 2017 with a 20,000 sqm Business Innovation Centre development. This means that congestion and queues formed at the junction are dispersed within a couple of minutes.

AM PEAK			PM PEAK		
Junction Arm	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**	**Junction Arm**	**Maximum RFC Value**	**Maximum Queue (no. vehicles)**

Far Moor Lane North	0.309	0.4	Far Moor Lane North	0.242	0.3
Development Site	0.037	0	Development Site	0.315	0.5
Far Moor Lane South	0.359	0.6	Far Moor Lane South	0.154	0.2
Illshaw Close	0.069	0.1	Illshaw Close	0.027	0
Total Vehicle Demand / Hour – 717.6			Total Vehicle Demand / Hour – 695.7		
Total Queuing Delay – 77.2			Total Queuing Delay – 69.1		

Table 22 - 2017 'With Development' Traffic Flows
Roundabout Site Access

6.9.4 The summary results of the ARCADY outputs clearly illustrate that roundabout junction would operate within capacity in both peaks in 2017 with a 20,000 sqm Business Innovation Centre development. This means that any congestion and queues formed are dispersed within a couple of minutes.

6.10 Preferred Development Site Access Option – Far Moor Lane

6.10.1 The preferred development site access option is for a new roundabout junction on Far Moor Lane, which combines the development site traffic with Far Moor Lane and Illshaw Close flows (drawing number **JN835-NWK-011** in **Appendix H** refers). This site access arrangement is preferred, as it provides ample capacity for the development site in 2017, is relatively cheap to construct, addresses the speeding problem on Far Moor Lane by introducing a speed reduction feature that would alter the inactive frontage on this side of the road and serves to increase pedestrian, cyclist and road user safety.

6.11 Alternative Development Site Access Options

6.11.1 Alternative development site access options evaluated as part of this assessment process include:

- a traffic signal junction on the A435 Birmingham Road including pedestrian and cycle facilities as requested by Warwickshire County Council (drawing number **JN835-NWK-012B** in **Appendix H** refers)

- a roundabout junction on the A4023 Coventry Highway
- a traffic signal junction on the A4023 Coventry Highway (drawing number **JN835-NWK-013** in **Appendix H** refers)

6.12 Operational Assessment – A435 Birmingham Road

6.12.1 LinSig capacity tests (using the 20,000 sqm Business Innovation Centre trip generation rates) have been carried out for the future year scenario as detailed below:

- 2017 With Development

6.12.2 The full printed output information is contained in **Appendix H** at the rear of the report. The key results from the capacity tests are summarised in **Table 23** below.

AM Peak Hour (08:00-09:00)			**PM Peak Hour (17:00-18:00)**		
Link Name	**Degree of Saturation (%)**	**Mean Maximum Queue (PCU)**	**Link Name**	**Degree of Saturation (%)**	**Mean Maximum Queue (PCU)**
A435 Birmingham Road (North) Ahead.	84.4	29.7	A435 Birmingham Road (North) Ahead	103.9	74.2
A435 Birmingham Road (North) Right	97.6	12.8	A435 Birmingham Road (North) Right	21.7	1.0
A435 Birmingham Road (South) Left Ahead	103.9	79.0	A435 Birmingham Road (South) Left Ahead	98.2	48.9
New Development Road	21.5	1.4	New Development Road	87.4	13.4
Cycle Time – 120 Seconds			*Cycle Time – 120 Seconds*		

PRC –15.5%	*PRC – 15.4%*
Total Delay – 59.97 PCU/Hr	*Total Delay – 69.04 PCU/Hr*

Table 23 – 2017 'With Development' Traffic Flows

6.12.3 The summary Linsig results above have demonstrated that the proposed 'T' junction on Birmingham Road / New Development Road will operate over its capacity in both the AM and PM peaks with PRC values of -15.5% and -15.4% respectively. This means that queuing and delay at the junction, particularly on the A435 Birmingham Road approaches, will be significant during both peaks periods leading to unacceptable levels of congestion.

6.13 Operational Assessment - A4023 Coventry Highway

6.13.1 Capacity testing has been confined to the traffic signal junction arrangement. It was not considered necessary to undertake capacity assessments on the roundabout design as it is extremely unlikely to have a capacity issue in the future year of 2017.

6.13.2 LinSig capacity tests (using the 20,000 sqm Business Innovation Centre trip generations) have been carried out for the future year scenario, as detailed below:

- 2017 With Development

6.13.3 The full printed output information is contained in **Appendix H** at the rear of the report. The key results from the capacity tests are summarised in **Table 24** below.

AM Peak Hour (08:00-09:00)			PM Peak Hour (17:00-18:00)		
Link Name	**Degree of Saturation (%)**	**Maximum Queue (PCU)**	**Link Name**	**Degree of Saturation (%)**	**Maximum Queue (PCU)**

A4023 Coventry Highway (West) – Ahead, Right	77.9	28.6	Coventry Highway (West) – Ahead, Right	66.1	22.1
A4023 Coventry Highway (East) – Ahead, Left	78.3	27.4	Coventry Highway (East) – Ahead, Left	66.7	19.8
New Development Road (South)	12.5	0.9	New Development Road (South)	66.7	7.4
Cycle Time – 90 seconds			*Cycle Time – 90 seconds*		
PRC 14.9%			*PRC 34.9%*		
Total Delay 20.77PCU/h			*Total Delay 19.53PCU/h*		

Table 24 - 2017 'With Development' Traffic Flows

6.13.4 The summary LinSig results demonstrate that the proposed 'T' Junction of A4023 Coventry Highway / New Development Road will perform within capacity in both the AM and PM peaks with PRC values of 14.9% and 34.9%. This means that the junction is well within capacity and therefore congestion and queues formed are dispersed with a couple of cycles.

6.13.5 It should be noted that no information has been received for the new development to the north of the A4023 Coventry Highway, and no additional traffic from this development has been included in this set of LinSig results.

6.14 Development Access Solution – Summary Appraisal Table

6.14.1 **Table 25** below provides an overall comparative summary of the key appraisal parameters as they relate to each of the possible alternative access solutions to the proposed Diversification Park development, as assessed earlier. The Table highlights the principal benefits and disbenefits of each

option which underpin the decision to select the Far Moor Lane roundabout option as the preferred access solution to serve the Diversification Park.

	Economy	Efficiency	Safety	Environment	Other factors
Option 1 Preferred Solution Far Moor Lane Roundabout	Relatively cheap to construct. Estimated cost £400,000	Operates well within capacity in 2017 with development traffic. Has minimal impact on neighbouring junctions.	Will help to address the existing speeding problems on Far Moor Lane.	Will introduce some visual and noise impact to adjacent residents, particularly during construction. Access is required across wildlife corridor.	Potential of local opposition from residents on Far Moor Lane. Does not provide access option to other potential development land parcels in the area.
Option 2 Far Moor Lane Staggered Crossroads	Cheapest of all the options to construct. Estimated cost £250,000	Operates well within capacity in 2017 with development capacity. Similar performance and local impact to r'dbt option. May introduce delays to Ilshaw Close	Improves pedestrian / cyclist safety on Far Moor Lane but may encourage inappropriate overtaking.	Requires less land than r'dbt option but will have similar local amenity impacts as roundabout. Access is again required across wildlife corridor.	Likely to be the most acceptable solution on Far Moor Lane to local residents and local authorities. Minimal impact on strategic roads in the area. Only serves Diversification Park.
Option 3 A435 Birmingham Road Traffic Signals	Cheapest access option from A road network. Estimated cost £450-500,000	Over capacity in 2017 with development traffic. Not so convenient for local access as Far Moor Lane options.	Provides a safe means of access to development for vulnerable road users but may increase risk of shunt collisions.	Least intrusive of all the options in terms of impact on neighbouring residential areas. Minimal third party land required for construction.	Most convenient option for strategic access for vehicles from the east and south of Redditch. Unlikely to gain Warwickshire CC support due to inefficient operation.
Option 4 A4023 Coventry Highway Roundabout	Most expensive to construct. Estimated cost £5 million	Will be able to cater for the development traffic and many years of network traffic growth beyond 2017.	Large r'dbt poses significant risk to vulnerable road users and may confuse unfamiliar drivers.	Scale of roundabout will create significant visual and noise impact on adjacent properties. Likely to lead to poorer air quality. Large land take requirements.	Provides access solution to serve potential development land on north side of Coventry highway. May be difficult to construct due to level difference across site.
Option 5 A4023 Coventry Highway Traffic Signals	Cheaper than r'dbt but still significant cost to construct. Estimate - £3 million	Ample capacity for predicted 2017 traffic flows but introduces considerable delay to A4023 Redditch traffic.	Safer option to vulnerable road users than r'dbt on Coventry Highway but complex layout may increase risk of collision.	Although less intrusive than r'dbt option and requiring minimal third party land, delays to traffic will increase noise levels locally and air quality will	Offers similar access benefits as Option 4, but will have the greatest impact of all the options in terms of detriment to the efficiency of the highway network.

Table 25 – Access option summary appraisal table.

7 POTENTIAL MITIGATION MEASURES

7.1 Introduction

7.1.1 This chapter discusses various transport measures and initiatives, which could be introduced to mitigate the vehicular impact of the proposed development.

7.2 Bus Service Improvements

7.2.1 Bus service improvements could be made to increase the frequency of services on Far Moor Lane particularly in the peak hours e.g. improving the hourly service to half hourly into Redditch and connecting to the railway station. At a later stage of the development, bus services could divert into the development site if provided with adequate infrastructure.

7.3 Bus Stop Infrastructure

7.3.1 Bus Stop infrastructure in Redditch is currently to a varying standard dependent on the popularity of the stop. This development proposal is likely to increase bus patronage and will thus necessitate improvements to the nearest bus stops on Far Moor Lane e.g. provision of adequate shelters and easy access kerbing at the bus stop.

7.4 Cycle Parking Provision

7.4.1 The provision of good quality cycle parking is very important to complement car parking policies. The development will provide cycle parking provision in accordance with government guidance and local guidance.

7.5 Cycle Infrastructure

7.5.1 Redditch's urban road infrastructure is conducive to cycling, with its network of residential roads and footpath/underpass connections bypassing busier roads. The area would benefit from pedestrian/cycle signage to encourage the use of these sustainable modes of travel.

7.6 Travel Plan

7.6.1 A Travel Plan is a specific package of measures tailored to suit the needs of individual sites aimed at promoting greener, cleaner travel choices and reducing single occupancy car journeys.

7.6.2 The objectives for the Travel Plan would be to enable modal choice for employees of the site and to reduce single occupancy car trips associated with the site. It will address commuter journeys and business journeys. For example, measures could include an information pack for visitors with bus timetables.

7.6.3 The Travel Plan would include a range of mechanisms, initiatives, targets, indicators and associated monitoring/review procedures to reduce the impact of travel associated with the site on the environment. For example, it would be likely to include targets to encourage the use of local bus services.

7.7 Urban Design

7.7.1 Urban design considers the form and function of the urban areas surrounding individual buildings. Good urban design reconciles form and function, and can improve urban viability. Access, siting and design are inseparable.

7.7.2 Essential requirements for good urban design include:

- Permeability – so people can go where they want
- Legibility – so people can understand their surroundings
- Robustness and Richness – the space should be flexible and interesting

7.7.3 Measures for improving permeability and legibility for pedestrians could include more pedestrian crossings, more direct and convenient routes for walking, and decreased speed limits within the development site e.g. 20 mph zones to reduce car speeds and improve pedestrian and cyclist safety.

7.7.4 Measures for improving permeability and legibility for cyclists could include improving cycle safety, provision of parking for bicycles, and cycle priority at junctions or through purpose built cycleways throughout the development.

7.8 Speed Reduction on Far Moor Lane

7.8.1 It is proposed to provide a new roundabout to access the development off Far Moor Lane. This would be an effective speed reduction measure, as it would alter the inactive frontage on this side of the road. In addition, further traffic calming measures such as speed tables/cushions, and the introduction of a 7.5 tonne weight limit on Far Moor Lane would support these mitigation measures.

8 SUMMARY AND CONCLUSIONS

8.1 Morgan Tucker was commissioned by Redditch Borough Council to investigate and advice on the transport and highways issues associated with a proposed diversification park on land sandwiched between the A4023 Coventry Highway and A435 Birmingham Road, and to produce a transport assessment, which meets the requirements of both Worcestershire County Council and Warwickshire County Council.

8.2 The proposed development site is situated on land bounded by Far Moor Lane to the west, the A435 Birmingham Road to the east, and the A4023 Coventry Highway to the north.

8.3 The personal injury collision statistics for the five year period from January 2004 to August 2009 were obtained from Warwickshire and Worcestershire County Councils. Based on the information identified in the collision analysis, it is considered likely that the development proposals will not result in a statistically significant increase in the frequency or severity of collisions in the area surrounding the development site.

8.4 In order to ascertain the speed of traffic travelling along Far Moor Lane, the A4023 Coventry Highway and the A435 Birmingham Road past the proposed development site, a manual speed survey was undertaken on the A4023 Coventry Highway, and ATC data for Far Moor Lane and the A435 Birmingham Road was used to obtain speed survey information for those roads. The speed survey results showed that vehicles are travelling in excess of the 30 mph speed limit along Far Moor Lane and in excess of the 40 mph speed limit along the A435 Birmingham Road.

8.5 Analysis of the pedestrian and cycle infrastructure, and bus and rail services in the vicinity of the site confirms that there are realistic opportunities for future users of the development to adopt sustainable modes of travel to access the wider area.

8.6 Car and cycle parking spaces will be provided in accordance with government guidance, and specific local guidance.

8.7 It is proposed to create a Diversification Park to facilitate businesses in Redditch by manufacturing new products for growth sectors or finding alternative markets for their current products.

8.8 The proposed development would generate a worst case of 225 2-way trips in the AM peak hour and 185 2-way trips in the PM peak hour for 10,000 sqm business innovation development, and 450 2-way trips in the AM peak hour and 370 2-way trips in the PM peak hour for 20,000 sqm business innovation development.

8.9 Capacity testing has been undertaken on the two different potential site access junction arrangements (staggered / right turn lane and roundabout) on Far Moor Lane and the remote junction of Far Moor Lane with Alders Drive. The results demonstrate that the staggered / right turn lane junction and roundabout access solutions would operate within capacity in both peaks in 2017 with a 20,000 sqm Business Innovation Centre development. The Far Moor Lane / Alders Drive junction would also operate within capacity in both peaks in 2017 with a 20,000 sqm Business Innovation Centre development. There would be minimal queuing e.g. maximum queue length of 2 vehicles on Alders Lane south in the PM peak.

8.10 Capacity testing has been undertaken on two different potential site access junction arrangements (traffic signal junction) on the A435 Birmingham Road and the A4023 Coventry Highway. The results demonstrate that a traffic signal junction on the A435 Birmingham Road, designed to the requirements of Warwickshire County Council, would not perform adequately in either the AM or PM peaks in 2017. This means that the junction would become congested leading to long queue lengths and subsequently a long waiting time. Both a traffic signal solution and a roundabout option on the A4023 Coventry Highway would perform within capacity in both the AM and PM peaks. This means that the junction is well within capacity and therefore congestion and queues formed are dispersed with a couple of cycles.

8.11 Combining the results of the capacity testing exercise with an appraisal of economic, safety and environmental impacts as they apply to each access option, it has been concluded that a new roundabout junction on Far Moor

Lane will provide the best overall access solution to serve the Diversification Park.

8.12 Based on the findings of this assessment, it can be concluded that this proposal is a good example of sustainable development in accordance with the ethos of PPS1, PPG13, West Midlands RSS and local policies contained in both Worcestershire and Warwickshire's Local Plan / Development Frameworks.