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Post Opening Project Evaluation

M62 Junction 6 Improvement

Five Years After Study

August 2015

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Executive Summary

The M62 Junction 6 improvement scheme was implemented to address congestion and safety issues at the roundabout known locally as Tarbock Island. The roundabout is the junction of the M62 (east-west), M57 (north-south) and the local road network. The scheme aimed to address these issues by relieving the roundabout of traffic movements between the M57 north and M62 east. In order to do this two new links were provided to facilitate free-flow movements between the M57 north and the M62 east. The scheme opened in December 2008. The two new links are:

- Link A: links the M57 southbound to the M62 eastbound
- Link C: links the M62 westbound to the M57 northbound

Scheme Objectives

Scheme Objectives from Order Publication Report (OPR)	**Objective Achieved?**
Reduce peak congestion compatibly with transport policies	✓
Improve safety	✓
Improve facilities for non-motorised users	✓
Positively influence regeneration	✓
Ensure there is no worsening of environment	✓

Key Findings

Traffic Impact

- The average daily traffic flows on new links A and C are now 15,500 and 13,600. This is higher than forecast.
- The average daily number of vehicles using the roundabout has reduced by 23% from before the scheme opened (2007).
- The new Link A has resulted in a 71% reduction in traffic using the M57 southbound exit-slip, whilst traffic using the M62 westbound-exit slip has reduced by 38% as a result of new Link C.
- The scheme has resulted in improved journey times through the junction.

Safety

- The average annual collision rate has reduced from 23.4 collisions per year (Before) to 12.6 (FYA). This is a statistically significant decrease.
- The Severity Index has increased from 0.05 (Before) to 0.13 (FYA), this is due to two fatal collisions occurring since the scheme opened.
- The observed annual average collision saving (when adjusted for background reduction) of 5.4 is greater than the annual average saving of 0.8 that was forecast.

Environment

- Landscape planting is generally establishing well along embankments, mitigating the visual impact of the scheme.
- Link C wetland was establishing well, but the bluebell area of Windy Arbor Wood was significantly overgrown with brambles lessening its effectiveness as environmental mitigation.
- The Link C saturated embankment does not appear to have suffered from any slippage and embankment planting has become established (which is likely to reduce the chances of continued saturation due to increased root uptake of water).

Accessibility & Integration

- Severance at the roundabout has not necessarily been improved because traffic flows have not reduced to the forecast levels, and the configuration of the pedestrian crossing facilities is as per the pre-scheme arrangement.
- The extension to the Potters Pits Bridge was implemented to address severance issues, however the bridge remains closed. Discussions are ongoing regarding opening the bridge.
- The scheme aligns with land-use and regeneration policies.

Summary of Economic Impact

		Forecast	FYA Outturn
Present Value Costs (PVC)		£30.80m	£31.83m
Journey Time Benefits		£70.80m	£70.06m
Safety Benefits		£1.40m	£22.76m
Total Benefit (PVB)		£72.20m	£92.82m
Indirect Tax reduction impact		£0.2m	£0.2m
Indirect cost impact within costs	**PVC** (incl. indirect tax as increase)	£31.00m	£32.03m
	BCR	**2.33**	**2.90**
Indirect tax impact within benefit	**PVB** (incl. indirect tax as a reduction)	£72.00m	£92.62m
	BCR	**2.34**	**2.91**

- The outturn scheme cost at 2002 prices is £31.83 million, which is higher than the forecast cost of £30.8 million.
- The 60 year journey time benefits of the scheme are evaluated as £70.06 million, which is very similar to the forecast £70.8 million predicted. These benefits have increased since the OYA evaluation.
- The safety benefits of the scheme are evaluated at £22.76 million over the 60 year assessment period. This is significantly higher than the £1.4 million forecast and the £9.9million observed at OYA.
- The total evaluated PVB for the scheme is £92.82 million, which is higher than the forecast £72.20 million. Overall, the scheme represents high value for money with an outturn BCR evaluated as 2.91.

1. Introduction

Background

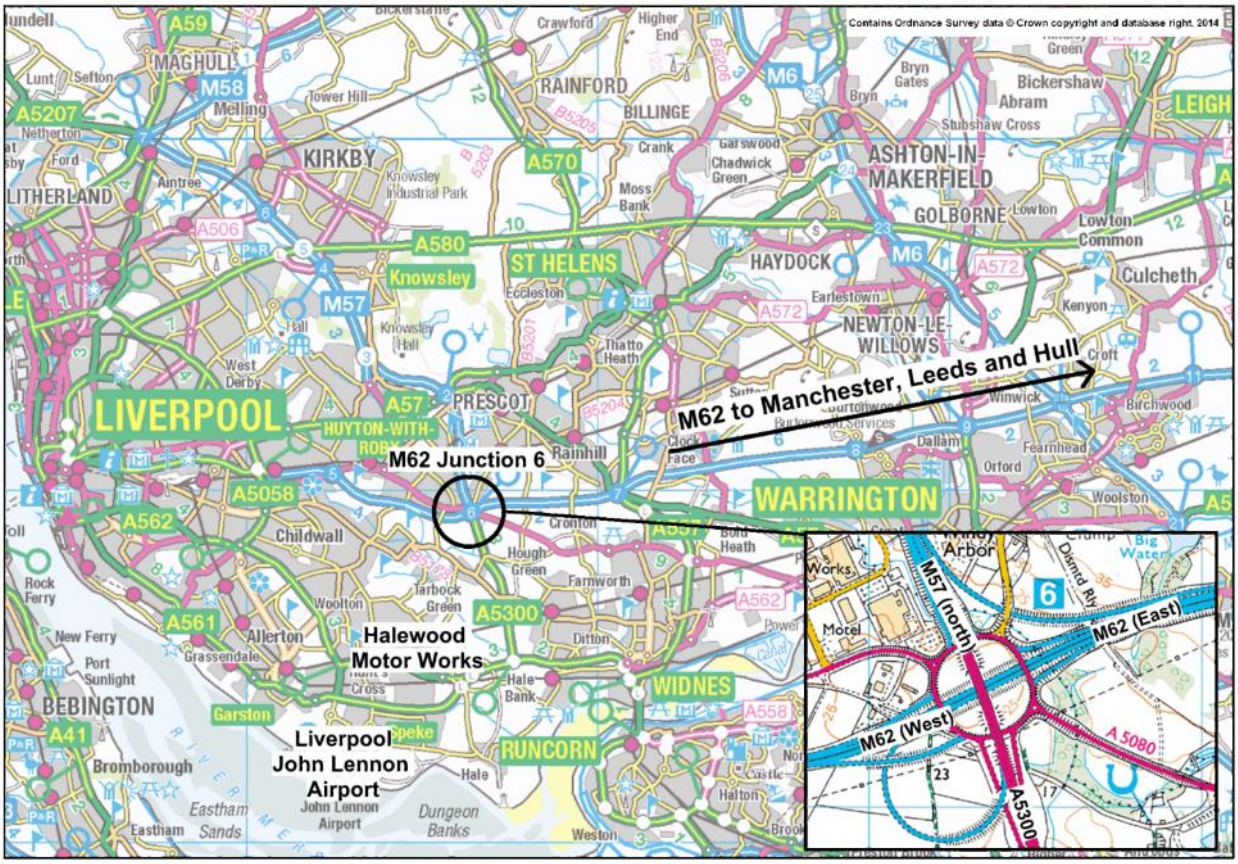
1.1 The M62 Junction 6 Improvement Scheme is a major Highways England (formally the Highways Agency (HA)) scheme which opened in December 2008. The scheme provided two dedicated slip roads enabling turning movements between the M62 east and the M57 north to avoid the roundabout at the junction, thereby reducing congestion. The scheme was primarily designed to benefit the following traffic movements:

- **M57 (north) to M62 (east) -** Relieving the M57 southbound exit-slip, and M62 eastbound entry-slip roads).
- **M62 (east) to M57 (north) –** Relieving the M62 westbound exit slip and the M57 northbound entry slip roads.

1.2 The scheme was implemented at the Tarbock Island (M62 junction 6) which is situated in Knowsley, to the east of Liverpool. A One Year After (OYA) study of the scheme impacts was completed in 2010, the findings of which are summarised later in this report. This report is the Five years after (FYA) evaluation of the scheme which assess the longer term impacts of the scheme, in particular journey time, safety and environmental aspects of the scheme.

1.3 The M62 is a part of the Trans European Road Network (TERN), and is an important east-west route in the north of England which links Liverpool, Manchester, Leeds, and Hull. The scheme is located at the western end of the M62, at the junction with the M57 and its southern extension, the A5300. The M57 is a north-south route forming an outer bypass to the City of Liverpool and it intersects a number of routes between Merseyside, the M6 motorway, and Greater Manchester. The M62 Junction 6 is used by traffic heading to Liverpool Docks in the west on the M62, to John Lennon Airport and Halewood motor works in the south on the A5300, It also provides a link to local industrial, employment and regeneration sites. The location of the scheme and its context in the road network is shown in ***Figure 1.1***.

Figure 1.1 – M6 Junction 6 Improvement Strategic Context



1.4 The M62 Junction 6 corresponds with Junction 1 of the M57. It is a grade-separated, three-level interchange. The M62 runs in an east-west direction in an underpass. The M57/A5300 traverses the junction in a north-south direction on an overpass. Linking these two routes at an intermediate level is a roundabout, known locally as Tarbock Island. The A5080 Cronton Road adjoins the roundabout to the northwest and southeast. A further minor road, Windy Arbor Road, is northeast of the roundabout. Including the one-way motorway slip roads the roundabout is an 11 arm junction. Prior to scheme implementation all turning movements had to use the junction.

1.5 Five of the seven entries to the junction are signalised:

- M62 westbound off slip
- M57 southbound off slip
- Cronton Rd (A5080) southbound
- M62 eastbound off slip
- A5300 northbound off slip

1.6 The Windy Arbor Road and Cronton Road (A5080) northbound entries to the junction are not signalised.

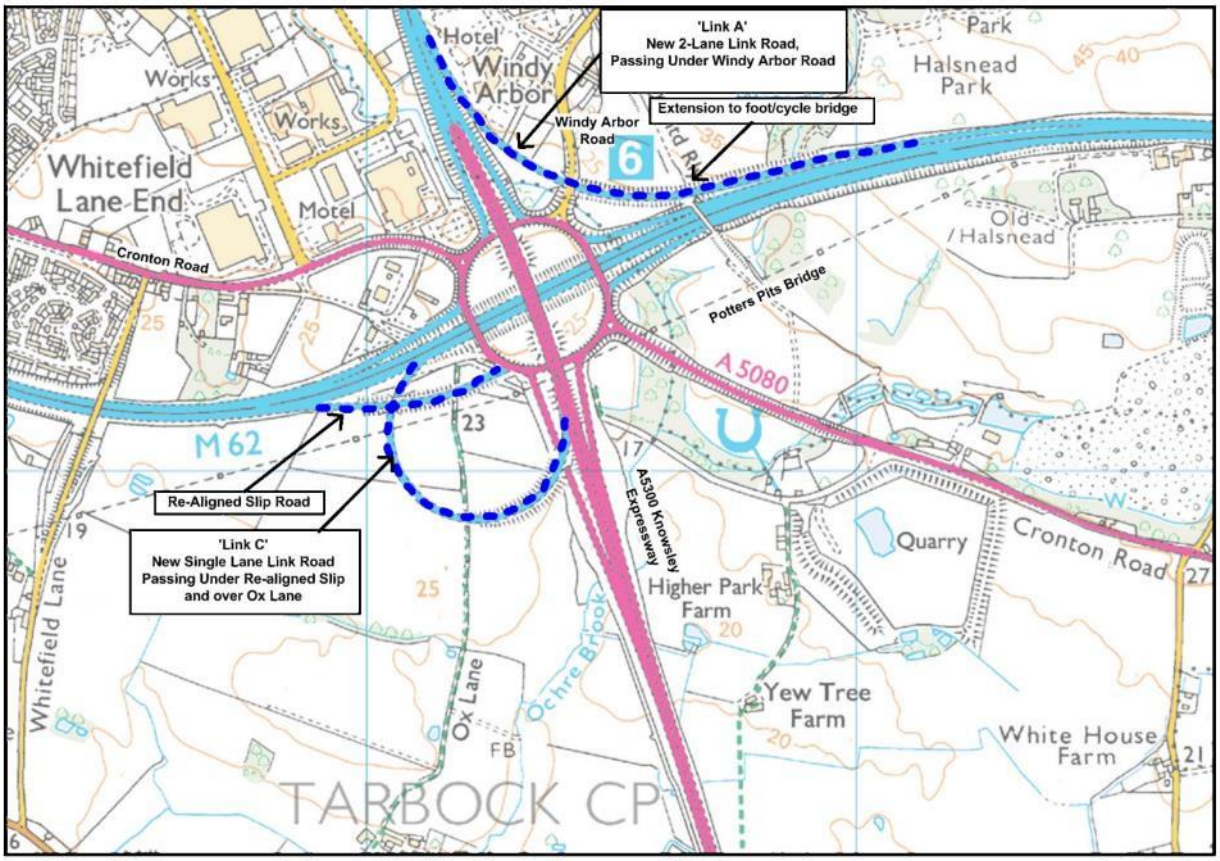
1.7 The scheme was designed to address peak-time congestion and queuing at this junction, in particular that experienced on the M62 westbound and M57 southbound slip roads, whilst benefitting other movements on the junction by removing traffic from the roundabout. The scheme was also designed to address collision problems identified at the junction.

Scheme Design

1.8 The delivered scheme was designed to address the identified congestion and safety issues at this junction. The scheme components as shown in Figures 1.2 and 1.3 are:

- Two new slip-roads which facilitate certain movements avoiding the junction:
  - Two lane slip linking the M57 southbound to the M62 eastbound, which passes beneath Windy Arbor Road. This is referred to as Link A;
  - One lane slip road linking the M62 westbound to the M57 northbound, which passes under the re-aligned M62 westbound entry-slip, and over the existing A5300 northbound exit-slip. This is referred to as Link C;
- Re-alignment of the existing M62 westbound on-slip which passes over the new Link C;
- Seven new variable-message sign gantries installed on the M62 and M57;
- Modification of three existing gantries on the M62 to include variable message signs;
- Extension of the existing Potters Pits bridge over Link A, which would enable the opening of a footpath and cycleway on the alignment of the former Knowsley Mineral Railway line; and
- An underpass for non-motorised users has been provided on Ox Lane which passes beneath Link C.

Figure 1.2 – Scheme Layout



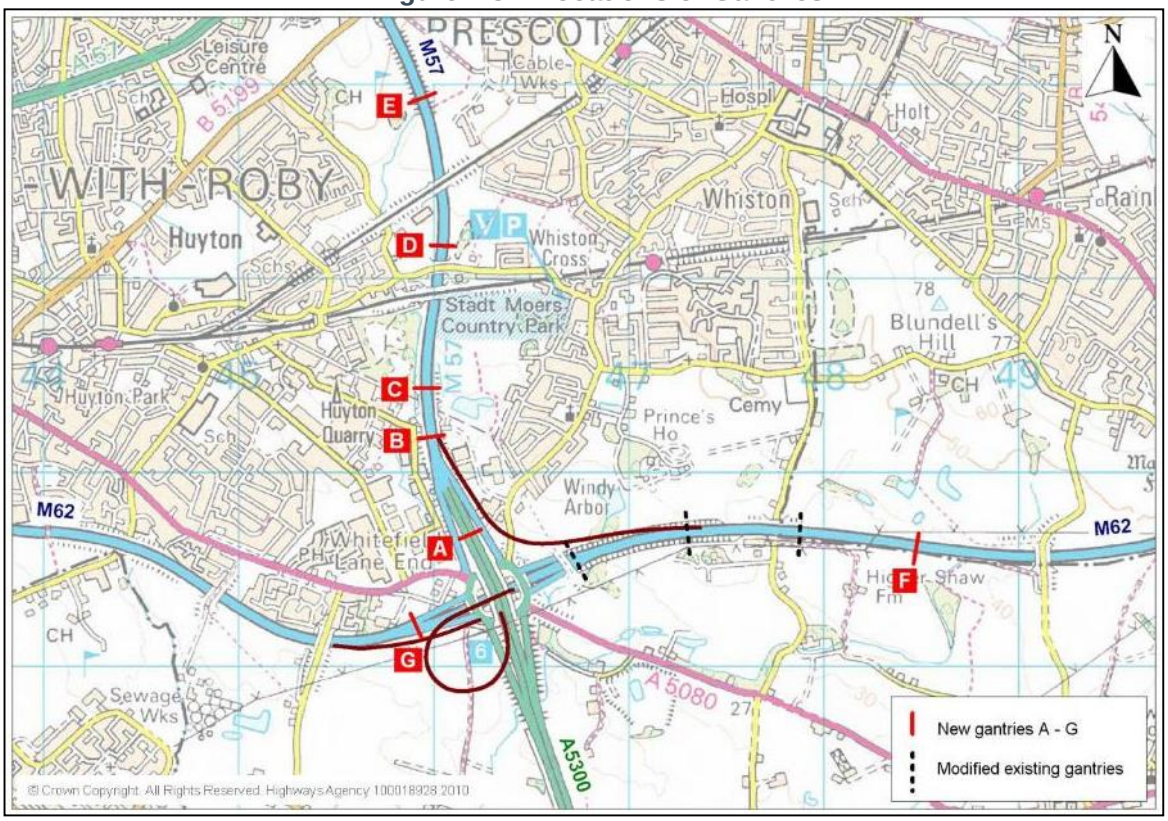
1.9 The scheme is shown on the latest OS 1:50,000 map, however it is noted that there were the following errors with the OS mapping:

- The extension to Potters Pits Bridge actually passes over new Link A, not under it as shown on the map; and
- Ox Lane has been diverted to join the roundabout east of the reconstructed M62 westbound entry-slip, it does not go beneath the re-aligned slip road in an underbridge as shown on the map.

1.10 Since 2008, 0.7 miles (1.25km) of the A5300 south of the junction, including the overbridge and two slip roads, have been transferred from local authority to Highways England control. This is not shown in the OS mapping.

1.11 The scheme components are illustrated in ***Figure 1.2*** and ***Figure 1.3*** below.

Figure 1.3 – Locations of Gantries



1.12 The photographs taken in September 2014 below show the roundabout and the key components of the scheme.

Figure 1.4 – New Link A and Extended Potters Pits Bridge – from M57 North to M62 East

Figure 1.5 – Re-aligned M62 Westbound Entry-Slip

Figure 1.6 – New Link C – M62 East to M57 North

History of the Scheme

1.13 The history of the scheme development and implementation is as follows:

- An assessment of the junction was conducted in 1990;
- Public consultation took place in 1991;
- The Preferred Route for an improvement was announced in 1992, comprising widening of the M62 between junctions 6 and 7, together with dedicated slip roads at junction 6. This scheme was withdrawn in 1994;
- Improvements were made to the roundabout in 1995, following the construction of the A5300 Knowsley Expressway as a southern continuation of the M57. Further improvement work took place in 2000;
- The M62 Junction 6 Major Scheme improvement was developed as plans for the regeneration of Merseyside progressed and traffic analysis forecast increased levels of congestion at the junction. The scheme entered the Targeted Programme of Improvements in 2001 (now known as the Major Schemes Programme);
- The Preferred Route was confirmed in 2003;
- The contract for scheme delivery was awarded under Early Contractor Involvement (ECI) in January 2005. This allowed detailed planning to be carried out while the scheme was being taken through statutory procedures;
- A public inquiry was held in October 2006;
- The decision to proceed was announced in January 2007.
- Construction began in April 2007; and
- The scheme was opened in December 2008.

1.14 Maintenance of the junction is the responsibility of Highways England, and is the duty of the Managing Agent Contractor (MAC) to deliver.

Scheme Objectives

1.15 The primary scheme objective was to provide free-flow links between the M62 to the east of junction 6, and the M57 to the north.

1.16 In addition to the objectives given in the Order Publication Report, further detail on the scheme objectives was outlined in the Environmental Statement (ES) as follows:

- ***Environment****:* ensure no significant worsening of sub-criteria assessment results contained in the scheme appraisal summary table (AST);
- ***Safety****:* improve safety by removing connecting traffic between the M62 westbound and the M57 northbound, and M57 southbound to M62 eastbound from the roundabout, and improve safety for NMUs;
- ***Accessibility****:* provide improved routes for NMUs at the roundabout;
- ***Integration****:* reduce peak time congestion on side road junctions and motorway slip roads at the all-purpose roundabout, in a way compatible with the transport proposals of both Highways England and local authorities; and

- ***Economy**:* be a positive influence with respect to the regeneration policies of the Merseyside Strategic Investment Area, in particular Huyton Strategic Investment Area, while reducing congestion delay and driver stress and improving the reliability of journey times.

Post Opening Project Evaluation

Highways England Evaluation Process

1.17 Highways England undertakes post-opening project evaluations (POPE) of its Major Schemes at one and five years after opening, to identify the extent to which the objectives and forecast benefits have been achieved.

1.18 This report represents the Five years after (FYA) report for the M62 Junction 6 Improvement scheme, and is prepared under the Post-Opening Project Evaluation (POPE) Commission.

OYA Key Findings

- Cost (PVC) and benefits (PVB) were accurately predicted.
- The traffic volume on Link C was about the same as predicted and the actual traffic on Link A is 17% higher than predicted.
- The total volume of turning traffic (including the new links) had risen by 3% probably due to reassignment from other roads. Traffic using the roundabout itself has fallen by 25%, as a result of diversion to the new link roads.
- The time savings and queue reductions were most pronounced for the movements directly relieved by the new links.
- The evaluated vehicle-time benefit was very similar to that predicted.
- The small reduction in collisions actually observed in the opening year was not statistically significant, but nevertheless it was much greater than the low number predicted.
- The predicted vehicle operating cost benefits were unusually large, particularly for goods vehicles. This surprising result appears to be related to how the traffic modelling program was used in scheme forecasting.
- Landscape planting was generally establishing satisfactorily, although some plants including standard size trees have failed and required replacement.
- Biodiversity mitigation had been implemented in line with proposals.
- Archaeological site investigation took place before construction and several important finds, including Stone Age settlements were found.
- NMU provision had been implemented as part of the scheme as expected but connection to the wider footpath network had yet to be implemented by others.
- Journey experience has improved with the provision of free-flow links and clear gantry-based signage.
- The study concluded that the scheme objectives had been met one year after opening.

Five years after Evaluation Study (FYA)

1.19 This report evaluates the scheme impacts five years post opening against a number of the key objectives set out in WebTAG. The key purpose of the five year study is to examine the longer term impacts of the scheme by analysing data from a longer time-period than considered in the OYA. The key elements of the FYA study are:

- Overview of the OYA report findings;

- Comparison of 'Before' and 'Five years after' (FYA) traffic volumes locally at the junction and strategically on adjacent roads, and a comparison with forecast;
- Comparison of 'Before' and 'Five years after' (FYA) journey times;
- Analysis of changes in collisions pre and post scheme implementation;
- Analysis of the FYA outturn economic benefits, based on the changes in traffic volumes, journey times, and collisions;
- Comparison of the outturn cost and forecast costs;
- Comparison of the environmental impacts with those forecast and identified in the OYA; and
- A review of the original Appraisal Summary Table (AST) in the form of a new Evaluation Summary Table (FYA EST).

Structure of the Report

1.20 The remainder of this report is structured as follows:

- **Section 2** :Traffic flows, journey times, and comparisons against forecasts and OYA;
- **Section 3** :Safety impacts, comparison against forecasts and OYA;
- **Section 4** : Economic benefits, comparison against forecasts and OYA;
- **Section 5** :Environmental evaluation;
- **Section 6** :Accessibility and integration;
- **Section 7** :Original Appraisal Summary Table (AST), OYA Evaluation Summary Table (OYA EST), and FYA evaluation (FYA EST), and;
- **Section 8:** Conclusions.

Sources

1.21 The following sources were used in compiling this report:

- M62 Junction One-Year After (OYA) POPE Study.
- Traffic data from the Highways England database (TRADS);
- Traffic survey data commissioned by Atkins specifically for this study;
- Journey time data from Satellite Navigation data
- Appraisal Summary Table (March 2006);
- Traffic and Collision Data Report (July 2005);
- Journey Time Report (May 2005);
- Traffic Forecasting Report (October 2005)
- Traffic and Economic Assessment Report (January 2006);
- Environmental Statement Volume 1 (December 2005);
- Environmental Statement, Volume 2 (March 2006);
- Environmental Statement Volume 3 (March 2006);
- Non-Technical Summary of Environmental Statement (March 2006); and
- Other environmental documents as detailed in the relevant section.

2. Traffic Impact

2.1 The traffic impact of the scheme is assessed in this section of the report. The traffic impact of the scheme in terms of traffic flows and journey times at the junction is assessed within the context of national, regional and local trends.

2.2 This assessment is conducted using data form the following sources:

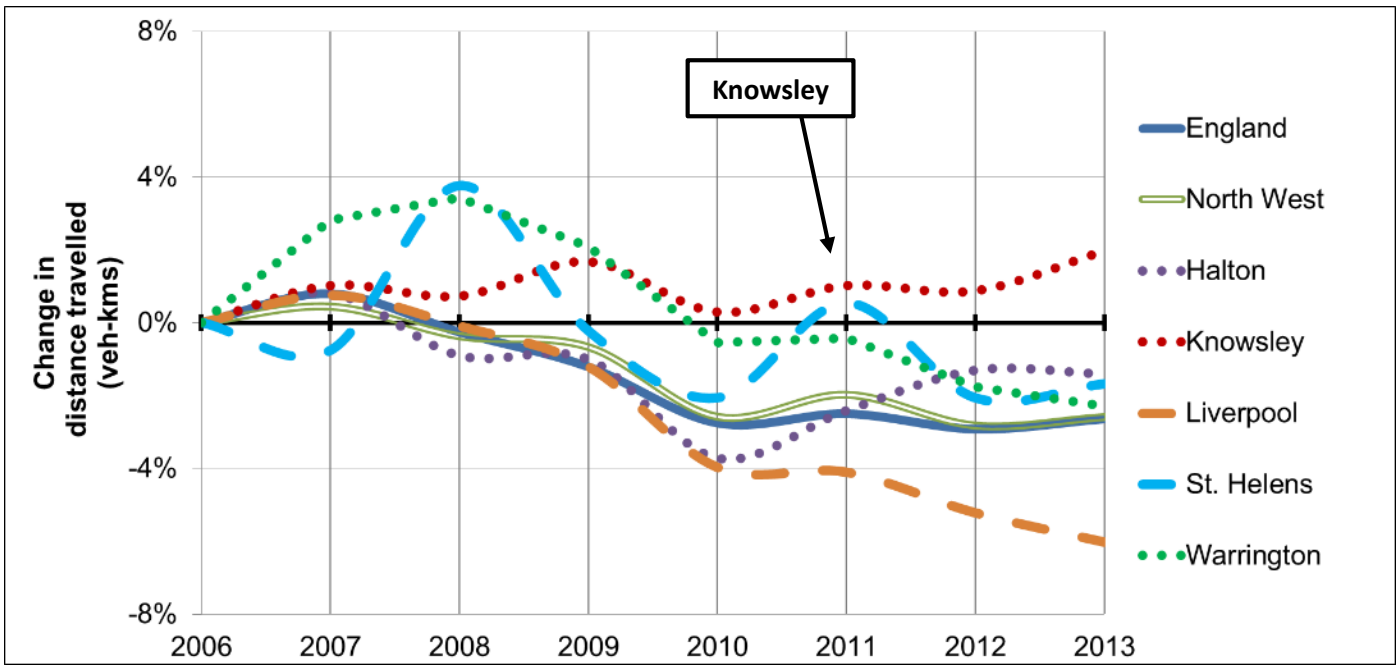
- Department for Transport (DfT) National Road Statistics (continuous);
- Highways England TRADS data: M62 and M57 (continuous);
- Classified Turning Count at the junction (June 2014);
- Traffic count on the new link roads (June 2014)
- TomTom Sat-Nav journey time database (data available 2008-2014).

Background Traffic Changes

2.3 The Before scheme opening, OYA and FYA traffic volumes reported in the next section need to be considered in the context of national and regional trends. Department for Transport (DfT) statistics on vehicle-kilometres travelled by road traffic provides this context. Data is available up to 2013 for national, regional and local authority areas[1]. The data for these areas is provided in Figure 2.1, which include local districts within Merseyside and the northwest which are relevant to the scheme, including Knowsley Borough in which the scheme is located.

2.4 ***Figure 2.1*** presents the percentage change in vehicle-kilometres travelled since 2006, which was when the final scheme was developed and appraised.

Figure 2.1 – Annual Traffic Change Trends: national, regional and district (million vehicle kilometres travelled) - % change against 2006



[1] DfT Road Statistics for Local Authorities 1993-2013 (www.gov.uk/government/organisations/department-for-transport/series/road-traffic-statistics)

2.5 The data shows that:

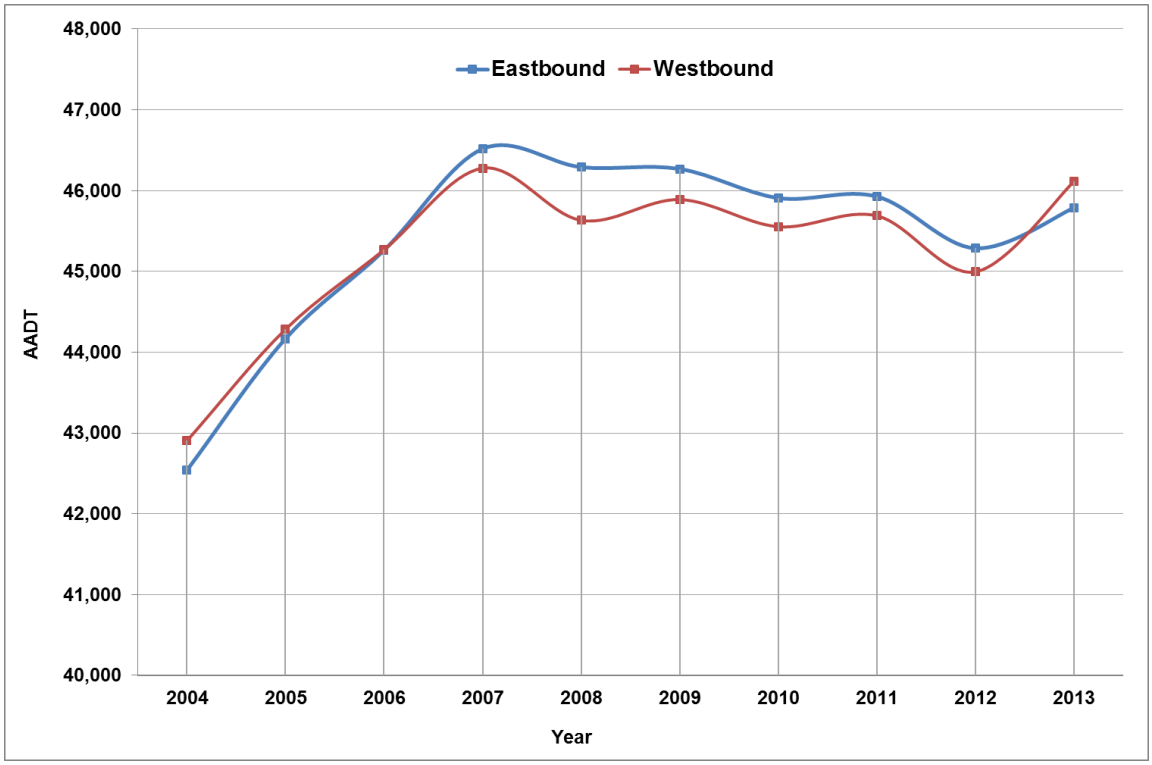
- Nationally and regionally the number of vehicle-kilometres travelled has reduced since 2006. The greatest reductions occurred between 2008 and 2009 which was the start of the national economic downturn. There has been a gradual reduction since, and in 2013 they remained below the 2006 levels;
- Data from the local districts is consistent with the national and regional trend with the exception of Warrington, Knowsley and St Helens where distance travelled increased in 2008 and 2009, and;
- Knowsley Borough is the only area in which the distance travelled in 2013 is higher than that in 2006, it has not decreased below 2006 levels over the past 7 years.

2.6 The national reductions in distance travelled could be a result of the economic downturn, whilst the localised increases could be a result of people travelling further for employment as a result of a fewer local employment opportunities in the local area because of the economic downturn.

Traffic Volumes

2.7 Long-term data for average daily traffic flows provides an indication of traffic trends in the local area. ***Figure 2.2*** presents average annual daily traffic (AADT) for the M62 between junctions 7 and 8 which is within St Helens.

Figure 2.2 – Long term trend in Average Daily Traffic (ADT) on M62 J7-8



2.8 Traffic flows on the M62 at this location increased steadily between 2004 to 2007.The data shows that:

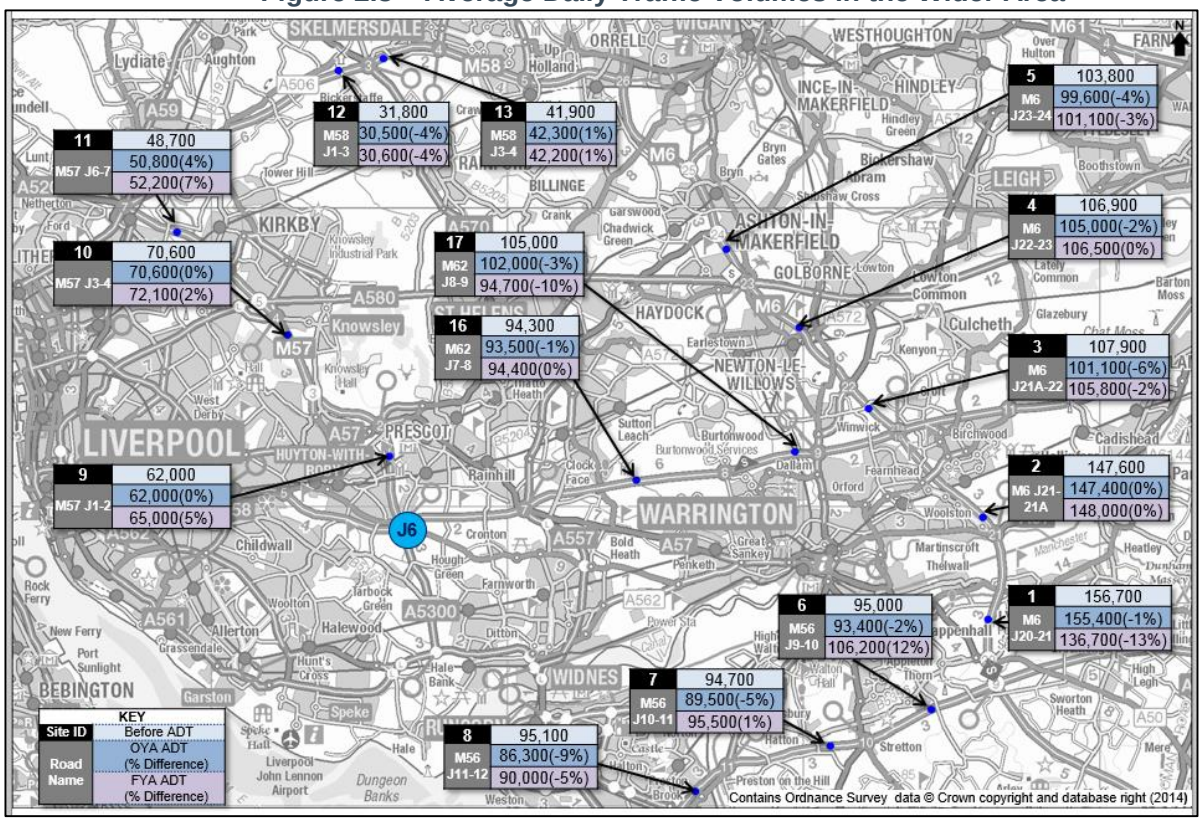
- East and westbound flows were comparable up to 2007;
- From 2007 to 2012 there has been a slight reduction flows, and;

- Since 2012 flows have increased by 1% although the 2013 flows were higher than 2007.

2.9 During scheme construction (April 2007-December 2008) westbound flows reduced which could be a result of the scheme works, however this reduction is not dissimilar to the variations shown in westbound flows in 2010 and 2012. There were no changes to the eastbound flows during construction which would also have been effected by scheme construction works.

2.10 The average daily traffic volumes across the wider area are presented in ***Figure 2.3***. This data has been sourced from the TRADS and Local Authorities.

Figure 2.3 – Average Daily Traffic Volumes in the Wider Area



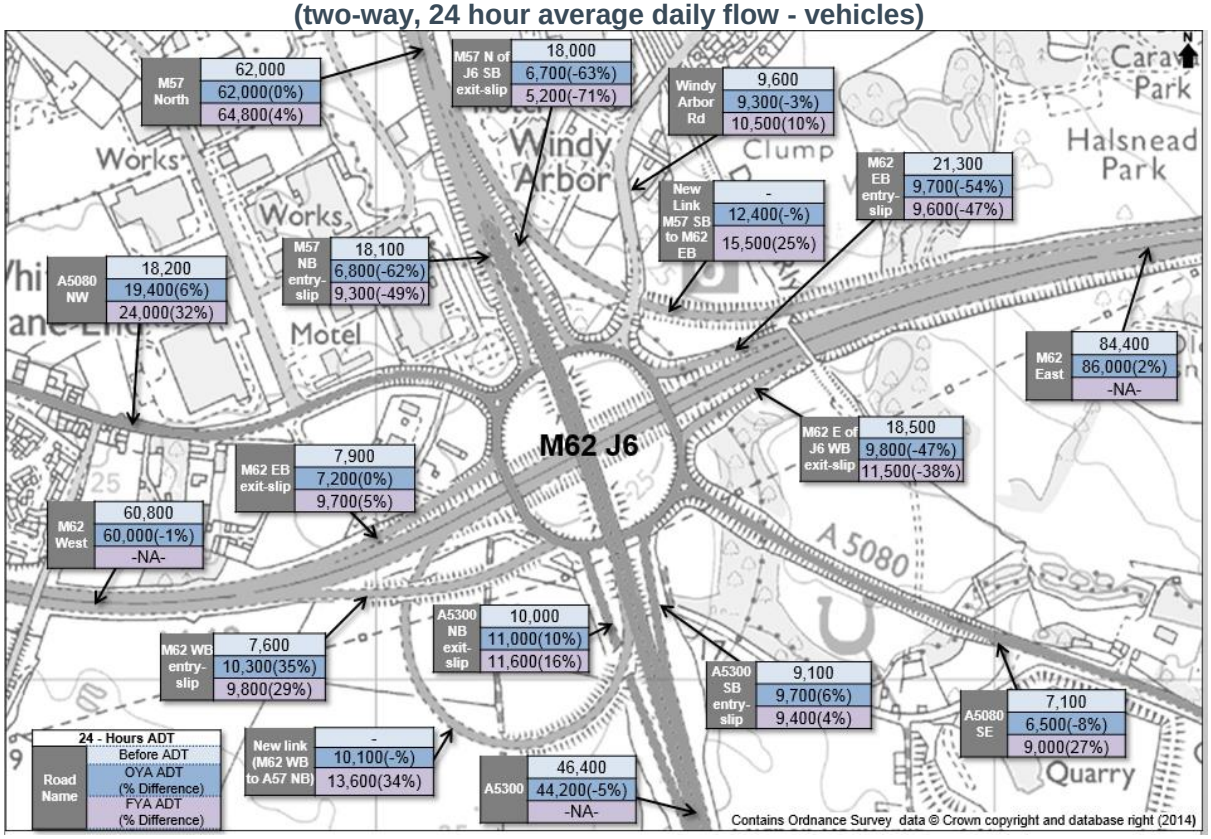
2.11 The data presented in ***Figure 2.3*** shows that there have been changes in traffic flows (increases and decreases) across the wider area. The most notable changes in traffic flows from before the scheme opened (2007 data) are:

- Increase in flows on the M57 north of junction 6
- No change in flows on the M62 east of the junction, between junctions 7 and 8
- Increases on the M56 between junctions 9-10
- Reductions on the M6 north and south of the junction with the M62 (M6 junction 21A), which is approximately 15 miles (24km) from M62 junction 6

2.12 The increases on the M57 north of the junction could be a result of the scheme due to the provision of free-flow links between the M57 north and the M62 east of the junction, which means that this route would now be quicker. However, this increase is unlikely to be a direct result of the scheme as there have been limited changes in the traffic flows on the M62 east of the junction. Therefore the increases to the M57 north of the junction are likely to be due to improved journey times at the junction. The changes on the M56 and M6 are unlikely to be a result of this scheme due to their distance from the M62 Junction 6.

2.13 Further analysis of the traffic volumes of the junction is required to understand the impact of the scheme on traffic flows on the M57 and M62. The average daily traffic flows on the roads at the junction are provided in ***Figure 2.4***. There are some locations which do not have data in 2014, this is either because a TRADS site is no longer in operation and data was not available from the local authority.

Figure 2.4 – Traffic Volumes (ADT) at the Junction: Before, OYA and FYA (two-way, 24 hour average daily flow - vehicles)



2.14 ***Figure 2.4*** above indicates that:

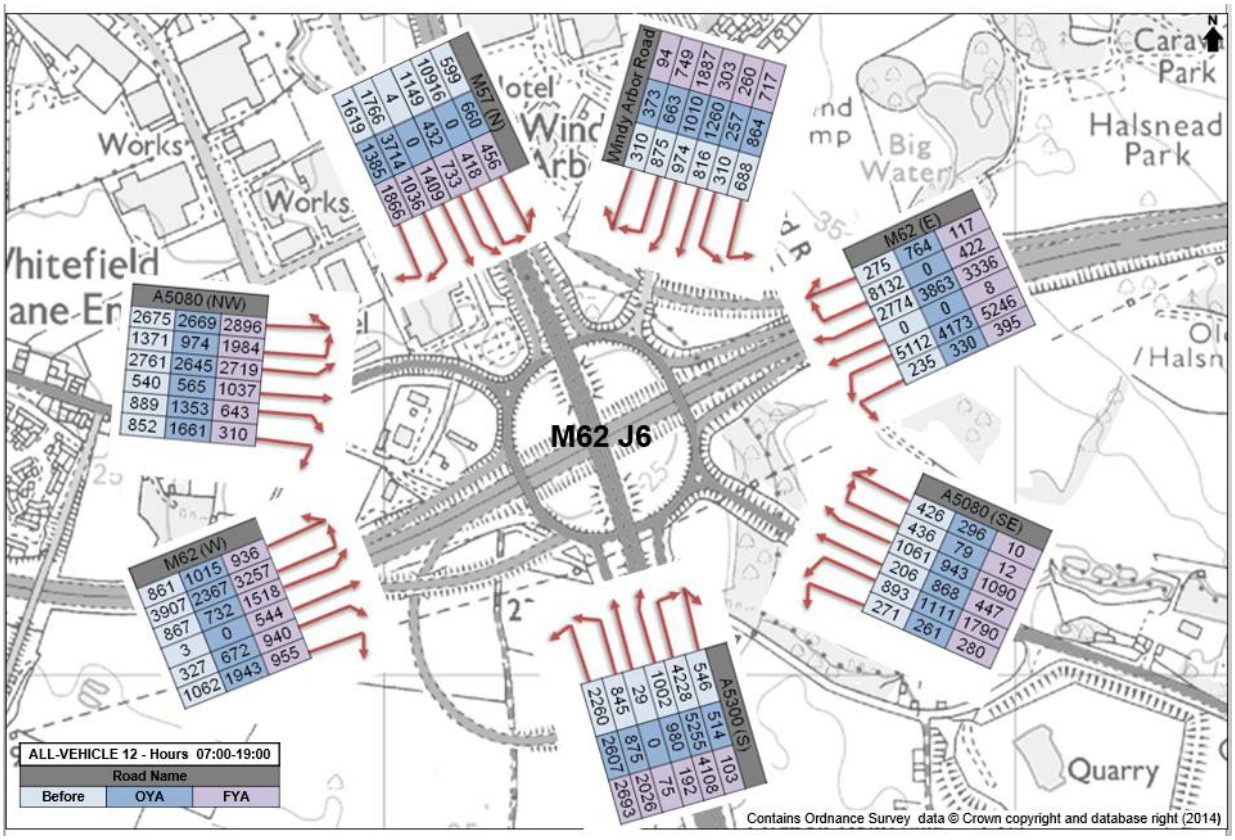
- Link A carries 15,500 vehicles per day, which is a 25% increase from the OYA;
- Link C carries 13,600 vehicles which is a 34% increase from OYA;
- This has resulted in a 71% reduction in vehicles using the M57 SB exit-slip north of the junction, and 38% reduction on the M62 westbound exit-slip to the east of the junction;
- There have also been reductions on the M62 eastbound entry-slip road (47%) and the M57 northbound entry-slip (49%), these have both been relieved by the scheme;
- Increase in flows since 2007 (Before) on the M57 north of the junction ;
- There have been increases from Before and OYA on the primary road network (PRN) which adjoins the junction, and;
- Volumes on the A5080 southeast and northwest and Windy Arbor Road have increased since 2007.

2.15 The data shows that volumes on the new links in 2014 are higher than those identified at the OYA, whilst volumes on the M57 north have increased. This increase is most likely a result of induced traffic at the roundabout because of the reduction in traffic flow and reduced congestion at the roundabout due to the provision of free-flow links for the M57 north to M62 east movements. Induced traffic is traffic that now uses the roundabout due to the benefits delivered by the scheme, whereas previously it wouldn't.

Vehicle Turning Count

2.16 Turning count data has been collected pre and post scheme opening. The FYA turning count surveys were undertaken in June 2014 at the roundabout. The Before, OYA and FYA 12 hour turning movements at the junction are presented in ***Figure 2.5*** below. The data presented here does not include the vehicles using the new links.

Figure 2.5 – Weekday Turning Count at the Junction: Before, OYA and FYA (Vehicles, 12 hours 0700-1900)



2.17 The total number of vehicles using the roundabout (excluding those using the new links), has reduced by 23% since before the scheme opened, from an average of 64,900 vehicles per day, to 50,000 in 2014. Since the OYA surveys, the number of vehicles using the roundabout at FYA has seen no real change.

2.18 The turning count data shows that:

- Since before scheme construction, demand on the M57 southbound exit-slip approach to the junction has reduced by 71%, whilst traffic from the M62 westbound exit-slip has reduced by 38%;
- Demand on the M62 eastbound exit-slip and A5080 south-east approaches to the junction has increased by 5 and 27% respectively;
- Movements between the M62 east and A5300 south are the highest flows on the roundabout; and,
- Traffic volumes using the roundabout during the AM, Inter-peak and PM peak have reduced since before the scheme by 18 %, 28% and 15% respectively. This is a direct result of the scheme, and provides benefits to all users in terms of reduced congestion.

2.19 The turning count data indicates that whilst the scheme has removed the specific M57 North-M62 East movements from the roundabout, this has benefitted other movements where an

increase in demand has been recorded. This is likely to be a result of previously suppressed trips, due to congestion at the roundabout, being released.

Traffic Volume Comparison with Forecast

2.20 The forecasts and observed average daily traffic flows are presented in Table 2.3. The traffic flows for the scheme were forecast in the 2005 Traffic Forecasting Report (TFR) and the 2006 Environmental Statements (ES). Forecasts were made for 2009 opening year, 2024 design year and 2031 projected growth year. This forecast data has interpolated to provide a 2014 forecast year against which the 2014 observed data can be compared.

2.21 Traffic growth used in the models cover the range of most likely, pessimistic and optimistic forecasts. This was based on predictions for:

- TEMPRO (Version 4.2.3). growth for cars taking into account local growth variations;
- National Road Traffic Forecasts (NRTF) growth for other vehicle types
- Strategic Investment Areas (SIA) development growth represented by the main areas in Merseyside; and
- Liverpool John Lennon Airport growth

2.22 SIA forecasting was based on forecasts for 2004 with regards to the extent of future development resulting from the Objective One Funding. Airport expansion was based on the 2003 white paper which forecast passenger numbers to increase two- or three-fold by 2030.

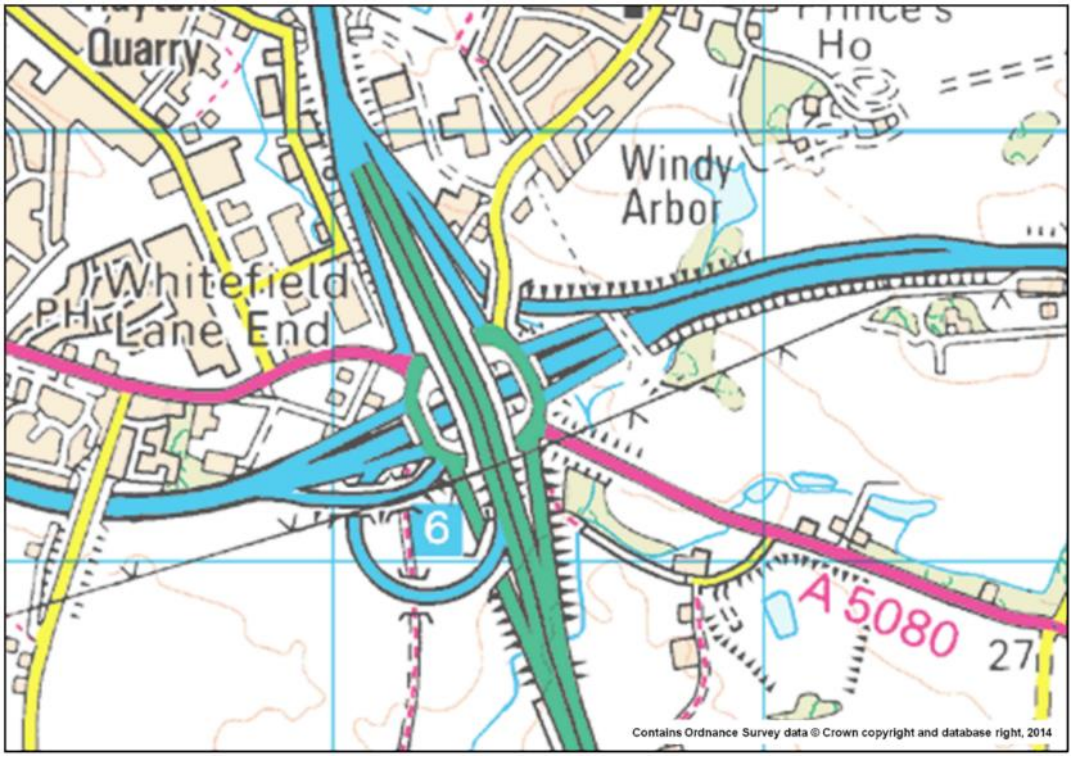
2.23 No highway works were included in this area in the Do Minimum model.

2.24 An Induced traffic appraisal was undertaken for the M62 Junction 6 Improvement scheme. The assessment utilised the SATURN model elastic assignments. This showed significant trip suppression in the Do Minimum scenario whereas Do Something scenario would release a proportion of this suppressed traffic. However, most traffic through the junction long distance hence relative importance of these benefits would be eroded by bottlenecks elsewhere on the motorway network. The extent of induced traffic, in this case largely suppressed demand, ranges from between 2% and 6% for the opening year (2009) and the horizon year (2031) respectively.

2.25 The traffic modelling undertaken to forecast the traffic impact of the scheme was conducted using PARAMICS and subsequently SATURN. The model network, as shown in ***Figure 2.6,*** encompassed the following links and junctions:

- M62 Junction 6
- A5300
- M57
- M62 east and west
- A5080 southeast
- A5080 northwest
- Windy Arbor Road

Figure 2.6 – Model Network Extent



2.26 The model base year was 2004, and forecasts were made for 2009 (opening year), 2024 (design year), and 2031 (last year of projected traffic growth). The Trip End Forecasts issued by the DfT (TEMPRO) were the basis for car trips. Other vehicles in the trip matrices were factored up in accordance with the DfT National Road Traffic Forecasts (NRTF97), modified for local variations by the use of TEMPRO. Additional traffic generated by the growth of John Lennon Airport was based on figures from the 2003 white paper 'The Future of Air Transport'.

2.27 The OYA study identified that there were inconsistencies in some of the forecasting, however the TFR and ES forecasts presented in Table 2.1 were adjusted to address these. The observed data has been sourced from traffic counts, TRADs and local authority data. Where there are gaps this is because a survey site is not active, or there has not been a survey undertaken which provides data up to 2014.

Table 2.1 – Forecast and Actual Average Daily Traffic Volumes

	Forecast TFR Do-Something		Observed			2014 Forecast vs Observed (% difference)
	2009	2014 Interpolated	Before (2007)	OYA (2010)	FYA (2014)	
M62 W of junction	60,700	64,300	60,800	60,000	-	-
M62 EB exit-slip	8,900	9,400	7,900	7,200	11,500	23%
M62 WB entry-slip	7,100	7,400	7,600	10,300	9,800	32%
M62 EB entry-slip	7,700	8,200	21,300	9,700	9,600	17%
M62 WB exit-slip	6,800	7,300	18,500	9,800	9,700	32%
M57 N of junction	62,100	61,500	62,000	62,000	64,800	5%
M57 through junction	26,600	32,300				
M57 NB entry-slip	8,300	8,700	18,100	6,800	9,300	7%
M57 SB exit-slip	6,500	6,800	18,000	6,700	5,200	-24%
A5300 S of junction	42,300	45,100	46,400	44,200	-	
A5300 NB exit-slip	8,300	8,900	10,000	11,000	11,600	30%
A5300 SB entry-slip	7,400	8,000	9,100	9,700	9,400	18%
A5080 NW of junction	16,200	17,100	18,200	19,400	24,000	40%
A5080 SE of junction	7,400	7,700	7,200	6,500	9,000	16%
Windy Arbor Rd	8,300	8,700	9,600	9,300	10,500	21%
New Link A	10,600	11,300	-	12,400	15,500	37%
New Link C	10,200	10,800	-	10,100	13,600	26%

2.28 The comparison of the 2014 forecast and observed data shows that:

- The forecasts were lower than observed for the majority of the links despite the reduction in observed traffic growth since 2007. The observed data demonstrates that all but one of the links have exceeded the forecast traffic flow
- The forecasts for demand on the new links were low, with the observed data on new links A and C showing traffic flows being 37 and 26% higher respectively.
- Forecasts for the M57 southbound exit-slip have not been met (24% lower than forecast)
- The observed flows on the M62 westbound exit-slip are 32% higher than forecast
- The most significant underestimated forecast is on the A5080 Cronton Road north west of the junction

2.29 The comparison provided above indicates that the traffic forecasts for the scheme underestimated the demand for the new links introduced as part of the scheme. The comparison above indicates that the scheme has performed better than expected with regards to removing traffic from the junction on the M57 southbound exit-slip (24% lower than forecast). Whilst the data shows that traffic flows on the M62 westbound exit-slip approach to the junction are 32% higher than forecast.

2.30 It remains unclear whether induced traffic was included in the forecasts, as discussed in the OYA study, the evidence provided here shows that traffic flows have increased on new link A and C. This would be a result of the journey time benefits provided by the free-flow links, whilst

traffic on the A5080 and A5300 approaches to roundabout have increased. This is most likely to be a result of the reduction in traffic on the roundabout due to the scheme.

Heavy Vehicle Proportion Comparison with Forecast

2.31 The forecasts proportions of heavy goods vehicles using the junction are contained within the ES for the Do-Minimum and Do-Something scenarios. These forecasts are provided in ***Table 2.2*** below alongside the observed data collected during the turning count surveys conducted Before, OYA and FYA. .

Table 2.2 – Forecast and Actual Heavy Vehicle Proportion of Average Daily Traffic (weekday)

Link	Heavy Vehicle Proportion of Total Traffic Volume				
	Forecast		Observed		
	DM	DS	Before	OYA	FYA
M62 EB exit-slip	5%	5%	7%	3%	6%
M62 WB entry-slip	5%	5%	7%	4%	5%
M62 EB entry-slip	-	10%	18%	12%	13%
M62 WB exit-slip	-	9%	19%	11%	14%
M57 NB entry-slip	11%	5%	16%	4%	7%
M57 SB exit-slip	13%	5%	17%	5%	6%
A5300 NB exit-slip	-	10%	13%	9%	11%
A5300 SB entry-slip	-	8%	13%	5%	14%
A5080 NW of junction	8%	8%	12%	9%	9%
A5080 SE of junction	-	5%	5%	2%	3%
Windy Arbor Rd	4%	4%	6%	3%	3%
New Link A	N/A	17%	N/A	16%	18%
New Link C	N/A	14%	N/A	17%	17%

2.32 The forecast and observed heavy vehicle analysis shows that:

- The proportion of HGVs using the new links is higher than forecast but is consistent with the OYA observed.
- The proportion of HGVs using the M57 southbound exit-slip is broadly consistent with forecast whilst on the M62 westbound exit-slip they are higher than forecast.
- On the M62 eastbound entry-slip and the A5300 entry and exit slips HGV proportions are higher than forecast.

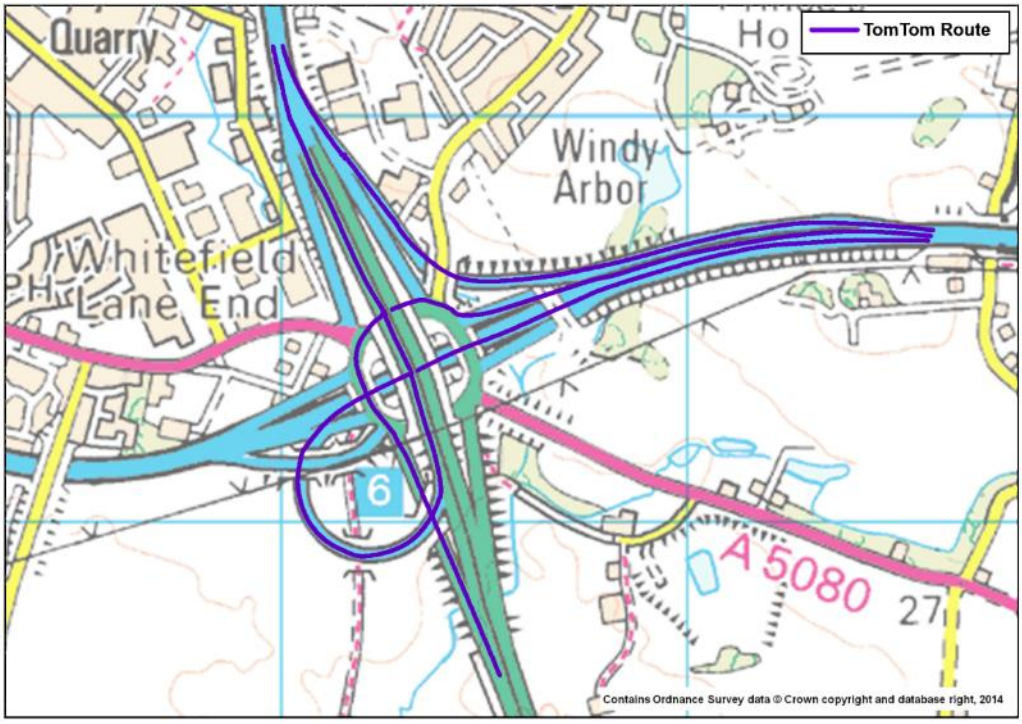
2.33 The data indicates that the HGV proportions forecasts were optimistic for the majority of the links when compared to the observed data. Comparison of the before and FYA observed data shows that overall there has been a reduction in HGVs as a proportion of all traffic. The proportion of HGVs using the new links is higher than forecast, whilst the observed data shows that the M62 westbound exit-slip carries more HGVs than forecast. This indicates that as a result of the scheme the A5300 and A5080 are more attractive routes for HGVs in respect of journey times. These roads also provide access to local businesses.

Journey Times

2.34 Journey time surveys were undertaken at the junction in March 2007 (Before) and in March 2010 (One Year After) using the moving observer method. FYA journey times have been extracted from a Satellite Navigation (Sat Nav) database. This provides journey time data from some motorists who use satellite navigation devices and allow their data to be used anonymously for the purpose of generating travel statistics. The FYA data was obtained for a 12 month period: 01/07/2013 to 30/06/2014 and for the route shown in ***Figure 2.7*** below. This route was identified to assess the journey time impact on the movements most directly affected by the scheme as identified in the OYA which are:

- M57 north to M62 east (M57 southbound to M62 eastbound)
- M62 east to M57 north (M62 westbound to M57 northbound)

Figure 2.7 – FYA Journey Time Route – M62 east, M57 north and A5300



2.35 The pre scheme and post scheme journey times for the movements which are directly relieved by the scheme are provided in Table 2.3 below.

Table 2-3 - Average Journey Times (min: sec) for Movements Directly Relieved by New Links

Turning Movement	Before (via roundabout)			One Year After (via new links)			Five Year After (via new links)			Journey time difference (FYA - Before) (via new links)		
	AM Peak	Inter Peak	PM Peak	AM Peak	Inter Peak	PM Peak	AM Peak	Inter Peak	PM Peak	AM Peak	Inter Peak	PM Peak
M57N to M62E	03:18	01:55	03:04	01:54	01:56	01:55	00:54	01:31	00:54	**-02:38**	**-00:14**	**-02:30**
M62E to M57N	05:15	03:03	05:26	03:08	02:58	03:26	01:54	01:50	01:52	**-03:36**	**-01:31**	**-03:44**

2.36 The journey time data shows further savings in journey times have been recorded at FYA since OYA. Journey time savings have improved by up to 1 minute 44 seconds from OYA to FYA. The journey times for the two movements have also significantly improved since Before the scheme was implemented with journey time savings of up to 3 minutes 44 seconds recorded. The scheme has therefore been successful in improving journey times for network users.

2.37 The significant journey time savings from OYA to FYA could be a result of the different datasets used, or that queuing back from the junction has reduced and thus improved journey times for these movements. In particular the greatest benefit is for the M62 east to M57 north movement, and during the AM and PM when the volume of traffic at the junction is highest. The difference in journey times between the inter-peak and the peak hours has also reduced as a result of the scheme.

FYA Journey Time Comparison with Forecasts

2.38 Forecast journey times were not provided in the Traffic Forecasting Report or the Traffic and Economic Assessment Report. The Appraisal Summary Table (AST) states that Business Users and Consumer Users will experience reduced journey times due to a reduction in congestion at the roundabout. The greatest journey time savings as identified in the OYA were for the movements bypassing the roundabout on links A and C. This reduction in journey times was identified OYA and FYA as shown in

2.39 ***Table*** 2-3 above. The forecast as described in the AST is therefore correct.

Journey Time Reliability

2.40 The scheme AST assessed the scheme as having a beneficial impact on journey time reliability for 20,000 vehicles per day using the new freeflow links. The 2014 traffic data identified that an average of 29,100 vehicles use new links A and C, therefore the scheme will benefit a great number of vehicles. The AST assessment of the scheme having a beneficial impact on journey time reliability can therefore be concluded as being appropriate.

Traffic Conclusions

- The average daily traffic flows on new links A and C are now 15,500 and 13,600. This is higher than forecast and higher than the OYA flows.
- The traffic flow forecasts were pessimistic in their estimation of the number of vehicles using new links and A and C, where the observed flows have been 37% and 26% respectively higher than forecast.
- The implementation of link A has resulted in a 71% reduction in traffic using the M57 southbound exit-slip, whilst traffic using the M62 westbound-exit slip has reduced by 38%.
- There has been no significant change in the number of vehicles using the roundabout. However there have been increases on the M62 eastbound exit-slip and A5080 south-east approaches.
- The proportions of HGVs using the new links is higher than forecast.
- The scheme has resulted in improved journey times, and five years after opening these improvements are greater than identified in the OYA.
- Journey time savings are greatest in the AM and PM peaks, whilst there is also a reduction in the difference between peak hour and inter-peak journey times. This shows an improvement in journey time reliability.

3. Safety

Introduction

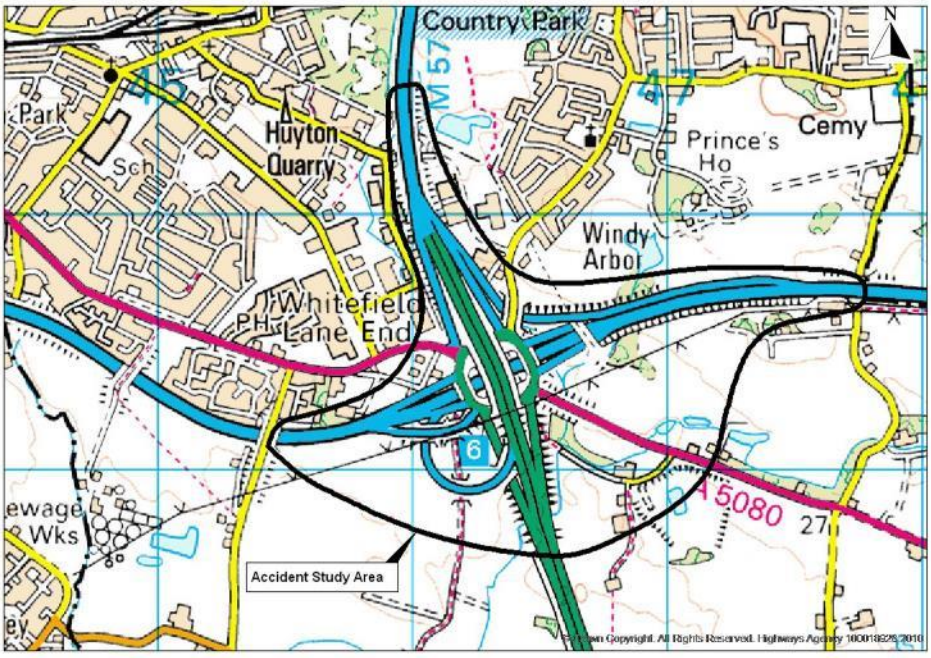
3.1 In conjunction with reducing journey time and improving reliability for users the scheme also had the objective of reducing the occurrence of collisions at the junction. This section evaluates the collision data for five years prior to the commencement of scheme construction (April 2002 to March 2007), and five years after the scheme opened (January 2009 to December 2013). The five year data has been analysed as recommended within the OYA study, in order to enable more detailed analysis of the impact that the scheme has had on collisions.

3.2 This data can be used to evaluate how the scheme has performed against the WebTAG Safety objective.

Sources

3.3 The collision and casualty data has been extracted from the dataset based on police reports called STATS19 for a specific area which covers the junctions and the approach roads. The data in this report is validated by the DfT. The study area corresponds with the extent of the COBA network used for the forecasting of safety benefits and the OYA safety analysis. The COBA forecasting used data provided by Knowsley Metropolitan Borough Council. The collision data search area is outlined in ***Figure 3.1***.

Figure 3.1 – Collision Study Area



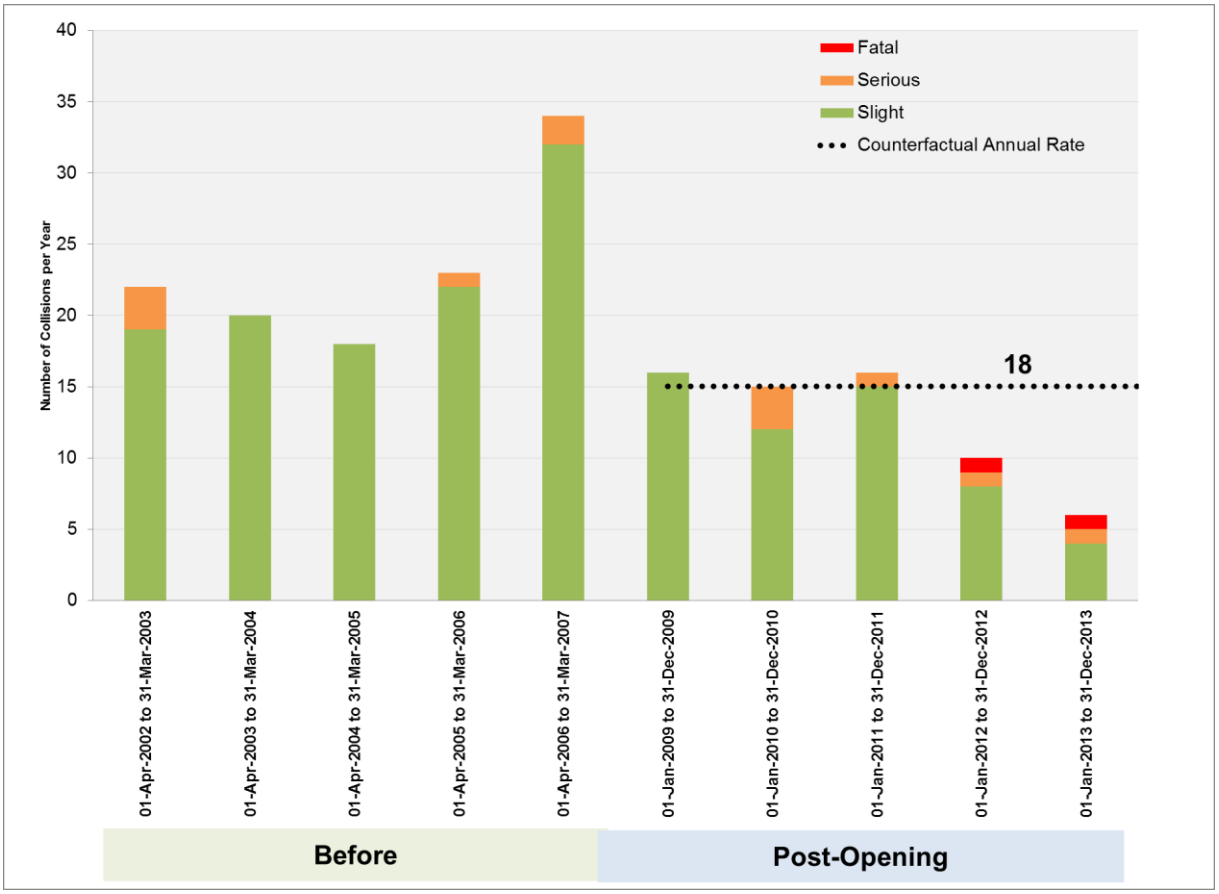
Personal Injury Collisions

3.4 The personal injury collision data relates to specific collisions which have occurred within the study area and the Before and After years. The data is presented in Figure 3.2. This data takes account of the background reduction in collisions.

3.5 It is now widely recognised that there has been a year-on-year reduction in the number of personal injury collisions on UK roads over the past decade. This is in the context of the trend of increasing traffic volumes during much of that period, therefore traffic volumes have been increasing but the number of personal injury collisions has been decreasing. This reduction is due to a number of factors including improved safety measures in vehicles and reduced numbers of younger drivers.

3.6 This background trend needs to be considered when assessing the number of collisions in the study area. If the scheme had not been built, collision numbers in the area would still be influenced by this national longer term trend. In the context of post opening evaluation, we refer to this as the counterfactual annual rate. As shown in ***Figure 3.2*** this rate has been calculated as 18 collisions per year, which could have occurred had the scheme not been constructed.

Figure 3.2– Personal Injury Collisions per year: before and post opening



3.7 The data presented in ***Figure 3.2*** shows that:

- Since the scheme has opened there has been an overall reduction in the number of collisions occurring within the study area;
- Prior to scheme construction there were no fatal collisions within the study area, however in 2012 and 2013 there were incidences of fatal collisions, and;
- The number of collisions occurring in the area post-scheme opening has not increased above the pre-scheme levels.

The data indicates that there has been a reduction in the number of collisions occurring at the junction, however the severity of collisions has increased. This is discussed further in the next section.

Numbers of Collisions and Casualties

3.8 The numbers and severity of collisions and casualties within the study area are provided in ***Table 3-1*** and ***Table 3-2*** below.

Table 3-1 – Before & After Collisions

Period	Time Period		Number of Collisions by Severity			Total Collisions		Annual Average Accidents
	From	To	Fatal	Serious	Slight	(year)	Period	
Before	Apr 2002	Mar 2003	0	3	19	22	117	23.40
	Apr 2003	Mar 2004	0	0	20	20		
	Apr 2004	Mar 2005	0	0	18	18		
	Apr 2005	Mar 2006	0	1	22	23		
	Apr 2006	Mar 2007	0	2	32	34		
Post Opening	Jan 2009	Dec 2009	0	0	16	16	63	12.60
	Jan 2010	Dec 2010	0	3	12	15		
	Jan 2011	Dec 2011	0	1	15	16		
	Jan 2012	Dec 2012	1	1	8	10		
	Jan 2013	Dec 2013	1	1	4	6		
Counterfactual								18.01
Saving (adjusted for counterfactual)								5.41

3.9 The collision data shows that:

- The total number of collisions prior to scheme construction was 117. In the 5 years since the scheme was opened (2009-2013) there has been a total of 63 collisions;
- The annual collision rate reduced from 23.4 collisions per year before the scheme to a FYA rate of 12.6;
- There has been a saving 2.41 accidents when taking into account the counterfactual measure, and;
- The scheme has been identified as being statistically significant in this accident saving, as discussed later in the report.

3.10 Collisions can involve multiple casualties therefore the casualty data has also been analysed, this is presented in ***Table 3-2*** below.

Table 3-2 – Before and After Casualties and Killed Serious Injured Index (KSI)

Period	Time Period		Number of Casualties by Severity			Total Casualties	(KSI)	
							Annual	Average (period)
	From	To	Fatal	Serious	Slight			
Before	Apr 2002	Mar 2003	0	3	31	34	0.09	0.04
	Apr 2003	Mar 2004	0	1	25	26	0.04	
	Apr 2004	Mar 2005	0	0	35	35	0.00	
	Apr 2005	Mar 2006	0	1	30	31	0.03	
	Apr 2006	Mar 2007	0	2	61	63	0.03	
Post-Opening	Jan 2009	Dec 2009	0	0	25	25	0.00	0.08
	Jan 2010	Dec 2010	0	3	19	22	0.14	
	Jan 2011	Dec 2011	0	1	27	28	0.04	
	Jan 2012	Dec 2012	1	1	18	20	0.10	
	Jan 2013	Dec 2013	1	1	7	9	0.22	
Counterfactual								17.11
Saving (adjusted for counterfactual)								70

3.11 The casualty data provided in ***Table 3-2*** indicates that:

- The total number of casualties reduced FYA the scheme; a reduction from 189 Before to 104 FYA;
- The casualty rate has reduced from 37.8 per year in the five years prior to scheme construction, and 20.8 in the five years post opening;
- This compares to a national reduction in casualties of 17.1% from 2005 to 2011
- The severity of casualties has increased, with 50% increase in the KSI. This is due to the increase in fatal casualties, whilst FYA Slight and Serious casualties have reduced.

3.12 The statistical significance of the changes in the number of collisions has been analysed and is discussed below.

Test of Statistical Significance of Results

3.13 A chi-squared test [2] is undertaken to assess the statistical significance of changes in collisions numbers to establish whether the change is significant or likely to have occurred by chance.

3.14 It was reported in the OYA study that there was no statistically significant change, however analysis undertaken with five year post-opening collision data has identified that there has been a statistically significant reduction in collisions. This takes in to account the background reduction in collisions recorded nationally. This means that the collision reductions are more likely to be a result of the scheme, rather than having occurred by chance, therefore the scheme has provided safety benefits.

Comparison with Forecast

3.15 The five year data enables a more robust comparison against the forecast changes in collisions as a result of the scheme. The comparison of the forecast and observed collision saving is presented in ***Table 3-3*** below. The before observed data has been adjusted to account for the national trend of collision reductions by applying the index of change to the observed data.

Table 3-3 – Forecast and Observed Annual Average Collisions

Forecast		Observed	
Collisions DM (2009)	23.40	**Collisions Before (2002-2007)**	23.40
Collisions DS (2009)	22.60	**Collisions After (2009-2013)**	12.60
		Collisions Before - adjusted by national reduction. All roads to give counterfactual	18.01
Forecast Net saving	0.80	**Observed (adjusted) net saving**	5.41

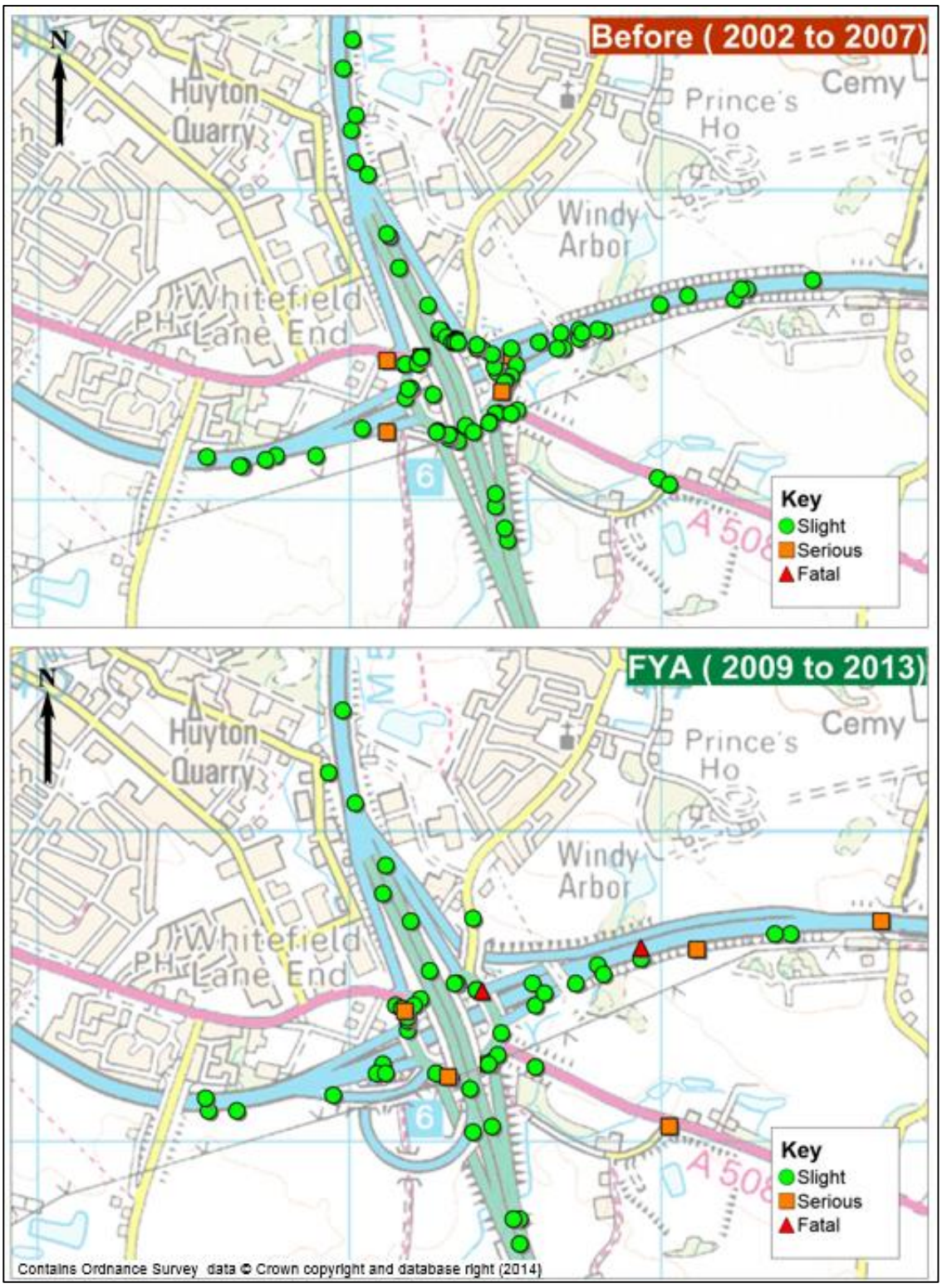
3.16 The comparison shows that the forecast net saving was conservative in estimating a saving of 0.8 collisions, whilst the observed data shows that the scheme has resulted in a 5.4 collision reduction in the average annual occurrence of collisions in the first 5 years

[2] This statistical test uses the 95% significance level

Collision Locations Before and After Opening

3.17 The collision data has been analysed to understand the geographical distribution of collisions within the study area before and after scheme opening. This is shown in Figure 3.3.

Figure 3.3 – Locations of Collisions Five Years Before and Five Years After Scheme Construction



3.18 The Before and After data shows that the highest concentration of collisions is on the roundabout and the approaches to it. As shown in ***Figure 3.2*** the number of collisions in the study area has reduced since scheme opening, this is illustrated in ***Figure 3.3***. It can be seen that the number of collisions on the M57 southbound and the M62 westbound exit-slip roads and the junctions with the roundabout has reduced. The data also indicates that there has been a reduction in the cluster of collisions on the southern section of the roundabout circulatory. There have been no accidents on the new links.

3.19 The statistical assessment of collisions has demonstrated that the scheme has contributed to the reduction in collisions, which can be seen in ***Figure 3.3*** because there has been a reduction in collisions at locations where traffic has been removed from the roundabout and transferred to the new links.

Personal Security

3.20 The scheme's AST assessed the forecast impact of the scheme on personal security as 'moderate beneficial'. This assessment was based on the impact the scheme would have on non-motorised users (NMU), rather than for vehicle users as outlined in the WebTAG criteria. WebTAG 3.4.2 states 'road users are more vulnerable to crime at locations where they are required to stop their vehicles or travel at slow speeds, such as at the approaches to signals or in congested conditions'. The AST assessed the moderate beneficial impact for NMU on the basis of the following scheme components:

- Re-open Ellis Ashton Street temporarily for traffic during construction (2007-2009) and permanently for pedestrian access;
- An underpass for the public right of way along Ox Lane underneath Link C. This would be illuminated and have through visibility; and
- A new pedestrian / cycleway at Potters Pits Bridge.

3.21 The OYA evaluation of the AST assessment of these components is outlined below:

- *The Ellis Ashton Street underbridge (under the M57) is shown as an 'existing footway' in the ES, but it is also noted that traffic has been excluded because of a history of unsocial behaviour. During the POPE site visit, it was noted that the approach to the underbridge was obscured (see Figure 3.4) which is an indicator of poor security. The bridge's opening or re-opening to pedestrians does not feature on drawings or in descriptions of the scheme, and it is doubtful whether it was legitimate to include the measure in the AST;*
- *It is confirmed that the Ox Lane bridge is illuminated with through visibility. However, there was no bridge in this location before – the track was open and was not crossed by a link road. So it is hard to justify this as an improvement to security; and*
- *The Potters Pits Bridge has been constructed, but not opened for use. Opening will depend upon the local authority (refer to Chapter 6).*

3.22 For this five year post opening study the site visit in 2014 confirmed the following points regarding security:

- Ellis Ashton Street underbridge: the use of this route as a footpath is unattractive due to poor lighting, and the obscured approach as mentioned in the OYA. There is also no natural surveillance of the route with high and dense vegetation on either side.
- The Ox Lane underpass is open and there is evidence of use by pedestrians and cyclists. There is provision for lighting however it is now in dis-repair, whilst the pathway is clear

under the bridge it does narrow to the north due to vegetation. The underpass is shown in ***Figure 3.4***

- The Potters Pits Bridge remains closed for use. It has been identified in consultation with Knowsley Metropolitan Borough Council in 2014 that there are still plans to re-open it and link the bridge in to the existing network for use by pedestrians, cyclist and equestrians. Discussions about opening this are on-going and funding is required to undertake the necessary works to re-open it.

Figure 3.4 – Ox Lane Underpass

Figure 3.5 – Potters Pits Bridge

3.23 The five years after assessment of personal security has identified that there has been no substantial change in the provision of these components for non-motorised users. Maintenance of the Ox Lane underpass could be improved. Therefore, as identified in the OYA, the impact on non-motorised users is considered neutral.

3.24 The traffic data has identified that the scheme has reduced the number of vehicles needing to stop at signals or wait at the roundabout from the M57 southbound and the M62 westbound exit-slip roads, where drivers were potentially vulnerable to crime. The impact of the scheme

on vehicle users was identified as ‘slight beneficial’, no evidence has been identified in this study to revise this assessment.

Safety Conclusions

- The average annual collision rate has reduced from 23.4 collisions per year (Before) to 12.6 five years after.
- A saving of 5.4 collisions average per year adjusted to account for background reduction.
- The number of collisions has reduced by 46% (117 collisions Before, 63 FYA).
- The KSI has increased from 0.05 (Before) to 0.13 (FYA), this is due to two Fatal collisions.
- The number of casualties has decreased by 45% (189 Before, 104 FYA), however the KSI has increased.
- The collision saving at the junction is statistically significant.
- There has been little change to the impact of the scheme on Personal Security, with only a slight improvement for vehicle users.

4. Economy

Introduction

4.1 The forecast economic benefits of the scheme were outlined in the 2006 Traffic and Economic Assessment Report (TEAR). The forecasting of the economic benefits for journey times and vehicle operating costs were calculated using PEARS (Programme for Economic Assessment of Road Scheme), which uses the micro-simulation model PARAMICs to calculate the impact of the scheme on modelled vehicles on the network. The forecast collision benefits were assessed using COBA.

4.2 Unless otherwise stated the scheme costs and benefits presented are discounted to 2002 to enable a comparison of scheme costs against future scheme benefits. The 2002 discounting converts scheme costs and benefits to 2002 prices and provides a Present Value of Costs (PVC) and Present Value of Benefits (PVB). This enables the scheme costs to be compared to the scheme benefits.

Sources

4.3 The forecast and observed scheme benefits have been derived from the following sources:

- Traffic and Economic Assessment Report (TEAR), January 2006;
- PEARS;
- COBA;
- Outturn costs provided by Highways Agency (at time of request) Regional Finance Manager (2014); and
- Traffic and safety data analysis provided in Section 2 and 3 of this report

Forecast Scheme Benefits

4.4 The forecast economic benefits are presented in ***Table 4-1*** and are forecast over a 60-year appraisal period. They are calculated by subtracting the benefits of a Do-Something scenario (scheme implemented) from the benefit of the Do-Minimum (without the scheme). The forecast Do-Something scenario used in this analysis is the Most Likely Growth scenario outlined in the TEAR. The total economic benefits of the scheme in terms of present value were forecast as £426.3 million.

Table 4-1 – Forecast Scheme Economic Benefits (£ million) 2002 prices and values

Forecast Benefit		Vehicle Category			Total
		Car	Goods	Bus	
Vehicle Journey Time Benefit	Consumer	35.5	0	1.2	36.7
	Business	21.5	12.2	0.3	34.1
	Total	**57.0**	**12.4**	**1.5**	**70.8**
Vehicle Operating Cost Benefit	Consumer	-1.4	0	0	-1.4
	Business	48.7	297.5	9.3	355.5
	Total	**47.3**	**297.5**	**9.3**	**354.1**
Safety Benefit		1.4			
Total Benefit (£ millions)		**104.3**	**309.7**	**10.8**	**426.3**

Vehicle Operating Costs (VOC)

4.5 ***Table 4-1*** shows that VOC benefit of goods vehicles formed the largest element of the forecast benefit. Over 80% of VOC benefit is attributed to goods vehicles as outlined in the TEAR – Transport Economy Efficiency table (TEE).

4.6 The high benefit for goods vehicles is unusual in contrast to other highway improvement schemes where VOC changes, whether positive or negative, are usually comparatively small, and the impacts on business and consumer users is similar. The forecast VOC benefits provided in ***Table 4-1*** were calculated in PEARS. The OYA study of this scheme identified that there were issues with the PEARS forecasts and therefore the results were not included in the assessment of scheme benefits one year after opening.

4.7 At the OYA stage, the PEARS models was examined in order to try to identify the reasons for the unexpected distribution of the benefit forecasts. The reasons identified are:

- Examination of the PARAMICS input to PEARS showed that the number of vehicles making the zone-to-zone trips was higher without the scheme than with it, despite the demand being identical. PEARS is a fixed trip methodology. This means that there must be the same number of trips for the modelled scenarios with and without the scheme; and,
- Results from PARAMICS micro-simulation vary from run-to-run. It is normal practice to account for this variation by running the model a number of times using different 'seed' values, and then averaging the results for use in economic assessment. It appears that, it may have been the case that only one run for each scenario was undertaken.

Thus it was decided that the VOC result was a result of how PEARS had been used. The POPE evaluation of VOC at the FYA stage does not include this VOC value due to the issues with the PEARS results and because the observed journey time data is not split by vehicle class.

Evaluation of Monetary Benefits

Journey Times

4.8 The journey time benefit of the scheme is re-evaluated by taking the before and after opening traffic flows and journey times on routes through the junction to calculate the annual vehicle

hours travelled. For the purpose of this five year study the journey times were analysed for the routes outlined in Section 2 of this report.

4.9 The monetary benefit of journey time changes is calculated by multiplying the standard value-of-time (£12.86) by the observed annual vehicle hours saved. The calculation of the vehicle-time savings for the OYA and outturn FYA evaluation is provided in ***Table 4-2*** for the 60 year scheme life period.

Table 4-2 – Journey Time Saving and Monetary Benefit – OYA and Outturn

Re-forecast Journey Time Benefits	OYA (2010)	FYA (2014)
Vehicle Hours Saved in Opening Year	150,441	150,811
Value Of Time per hour in evaluation year at 2002 prices	£12.86	£12.86
Annual Time Saving in evaluation year at 2002 prices	£1,934,665	£1,939,431
60-Year Capitalisation Factor	45.96	45.96
60-Year Time Saving	£88,913,987	£89,133,013
Discount factor	0.786	0.786
Time Savings in Opening Year discounted to 2002	£1,520,647	£1,524,393
Value of Time Benefits discounted to 2002	**£69,886,394**	**£70,058,548**

4.10 The re-forecast journey time benefits based on observed traffic flows and journey times show that the scheme provides journey time benefits of £70 million over the scheme life.

4.11 The FYA outturn assessment indicates that the journey time benefits of the scheme are similar to that observed in the OYA. The FYA observed journey time benefits of the scheme are consistent with the forecast shown in ***Table 4-2***.

Safety Benefit

4.12 The COBA model forecast that the scheme would save 0.8 collisions in the opening year (2009). This has been compared to the observed annual saving in the first five years (2009-2013). The analysis of the collisions data has identified that the saving is statistically significant therefore it can be inferred that the scheme has directly contributed to this saving. (This is discussed in Section 3).

4.13 The POPE methodology for the evaluation of the outturn of the economic value of benefits arising from safety improvements is based on the comparison of observed and forecast collision changes at the POPE evaluation stage (in this case five years after opening, and using the pre scheme counterfactual scenario to take background decline in collisions into account). This is then combined with the assumption that the observed safety impact at this stage can be taken as indicative of that over the whole 60 year appraisal period.

4.14 The methodology for calculating benefits is based on the presumption that the forecast ratio of the number of collisions saved in the first year to the forecast 60 year benefits can be used to generate a reforecast economic benefit based on the observed saving in collisions reported in Chapter 3 of this report.

4.15 The monetisation of these long term collision savings is shown in ***Table 4-3***.

Table 4-3 – Collision Saving and Monetary Benefit (2002 prices)

Period	Collision Saving	60 Year Monetary Benefit (£m)
Forecast opening year	0.8	£1.4m
Observed five years after	5.41	£22.76m

Scheme Costs

4.16 The forecast and outturn investment cost and Present Value of Cost (PVC) are presented in ***Table 4-4***. The FYA outturn costs were provided by the Highways Agency (as in operation at the time of request) in May 2014. Indirect tax revenue is deducted from the costs because tax revenue is generated because vehicles travelling further and at a higher speed will consume more fuel[3]. The outturn PVC becomes £31.5 million. Scheme costs include works, preparation, supervision, and land. The forecast and FYA outturn costs are provided in ***Table 4-4***.

Table 4-4 – Forecast and Actual Costs (£ million)

	Forecast	FYA Outturn
Investment Costs: 2002 prices	31.1	31.3
Indirect tax revenue impact	-0.2	-0.2
Present Value of Cost (PVC) (discounted to 2002 prices, and converted to market prices, indirect tax excluded)	31.0	32.0
Present Value of Cost (PVC) (indirect tax impact included)	30.8	31.8

4.17 ***Table 4-4*** shows that the outturn scheme costs are 3% higher than the forecast scheme costs.

Benefit Cost Ratio (BCR)

4.18 The benefit cost ratio is a comparative measure of the scheme costs (PVC) and monetary benefits (PVB) of the scheme over the 60 year scheme assessment period expressed in present values. The outturn BCR is re-forecast based on observed data. The forecast and outturn PVC, PVB and BCR are provided in ***Table 4.5***. This includes VOC, the outturn VOC is assumed as forecast as outlined in Section 4.5.

[3] Guidance at the time this scheme was assessed stated that indirect tax revenue should deducted from the cost.

Table 4.5 - Scheme Costs and Benefits (£m, 2002 Present Value Year)

		Forecast	FYA Outturn
Present Value Costs (PVC)		£30.80m	£31.83m
Journey Time Benefits		£70.80m	£70.06m
Safety Benefits		£1.40m	£22.76m
Vehicle Operating Costs (VOC)		-	-
Future Maintenance Impacts		-	-
Total Benefit (PVB)		£72.20m	£92.82m
Indirect Tax reduction impact		£0.2m	£0.2m
Indirect cost impact within costs	**PVC** (incl. indirect tax as increase)	£31.00m	£32.03m
	BCR	**2.33**	**2.90**
Indirect tax impact within benefit	**PVB** (incl indirect tax as a reduction)	£72.00m	£92.62m
	BCR	**2.34**	**2.91**

4.19 ***Table 4.5*** shows that the forecast and outturn BCR's are very similar to forecast. The outturn BCR shows that the scheme represents High Value for Money.

4.20 It should be noted that the BCR ignores non-monetised impacts. In the former NATA assessment and its replacement, the Transport Business Case, the impacts on wider objectives must be assessed but are not monetised. The evaluation of the environmental, accessibility and integration objectives is covered in subsequent sections of this report.

Wider Economic Impacts

4.21 The AST stated that the scheme would have a positive effect on regional regeneration strategies, and would generate between 731 and 914 jobs. The scheme was assessed as being beneficial for wider economic impacts.

4.22 The scheme has resulted in improved journey times therefore it is likely to have had a positive impact in terms of reduced travel costs for personal and business users of the junction. Further evaluation on the impact of the scheme on land-use and regeneration is provided in Chapter 6.

Economy Conclusions

- The 60 year journey time benefits of the scheme are evaluated as £70.06m, which is lower than the forecast £70.8 million.
- Journey time benefits have increased since the OYA evaluation.
- The 60-year safety benefits are evaluated as £22.76 million, compared with £1.4 million predicted.
- This safety benefits are better than forecast, even taking background reductions in collisions in to account.
- The total evaluated PVB for the scheme is £92.62 million, which is higher than the forecast £72 million. This difference is due to the higher than forecast safety benefits
- The outturn scheme cost at 2002 prices is £31.3 million, which is higher than forecast.
- Overall, the scheme represents High Value for Money with an outturn BCR evaluated as 2.91.

5. Environmental Impacts

Introduction

Scheme Objective: Ensure no significant worsening of sub-criteria assessment results contained in the scheme Appraisal Summary Table.

5.1 The identified environmental scheme objective was to "ensure no significant worsening of sub-criteria assessment results contained in the scheme appraisal summary table (AST)", with the Order Publication Report environment objective being noted as "ensure there is no worsening of the environment".

5.2 The Environmental Statement (ES) stated that:

'the scheme is considered to offer a superior balance of delivered improvements whilst minimising the effect upon the environment and where such effects are unavoidable, mitigation measures will be provided to reduce impacts. The proposed scheme will provide enhanced facilities for non-motorised users, in particular pedestrians and cyclists'.

5.3 This FYA report evaluates the effectiveness of the scheme five years after opening against the sub-objectives contained in the AST, specifically:

- Noise
- Air Quality
- Landscape & Townscape
- Biodiversity
- Heritage
- Water
- Physical Fitness
- Journey Ambience

5.4 For each of these environmental sub-objectives, the evaluation in this section assesses the environmental impacts predicted in the scheme's AST and ES against those observed five years after opening. This section is based upon the findings from the OYA evaluation and new evidence obtained at FYA where available, and includes:

- An evaluation of the ongoing effectiveness of the mitigation measures implemented as part of the scheme;
- An updated summary of key impacts against all of the nine environment WebTAG sub-objectives, with particular focus on assessment of sub-objectives where it was too early to conclude at the OYA evaluation stage; and
- Additional analysis relevant to close out issues/ areas for further study as identified at the OYA stage for consideration at the FYA stage.

Summary of OYA Evaluation

5.5 The OYA identified a number of areas where further investigation was required at FYA to confirm the longer term impacts of the scheme on the environment, which are summarised as follows:

Summary of OYA Evaluation

Landscape

Mitigation measures had generally been provided in line with proposals and the planting was generally establishing satisfactorily although some plants including standard size trees had failed and required replacement. It was considered too soon to evaluate the effectiveness of the new planting for screening and ongoing establishment should be reviewed at FYA.

Biodiversity

The extent of habitat retention and new planting, seeding and translocation was undertaken in line with proposals. At OYA monitoring reports indicated that the wetland area within Link C may not be establishing as expected and was of low value for Great Crested Newts. Ox Lane underpass has been lit and this may be the reason why bats were currently not using it. It was deemed too soon to fully evaluate the effectiveness of mitigation measures and biodiversity should be reconsidered at FYA when it was expected that the Handover Environmental Management Plan and further monitoring information should be available for both habitats and species.

Heritage

With regard to archaeology it was noted at OYA that the Academic Report was due for publication in late 2010 and the archive, including photographic records, was to be stored with the National Museum Liverpool. The Academic Report and the progress of the archive should be considered as part of the FYA.

Water

It was suggested that water issues are reconsidered at FYA when further information may be available, including the outcomes of the review of any required rectification strategy for the saturation of the Link C embankment and the establishment of wetland vegetation.

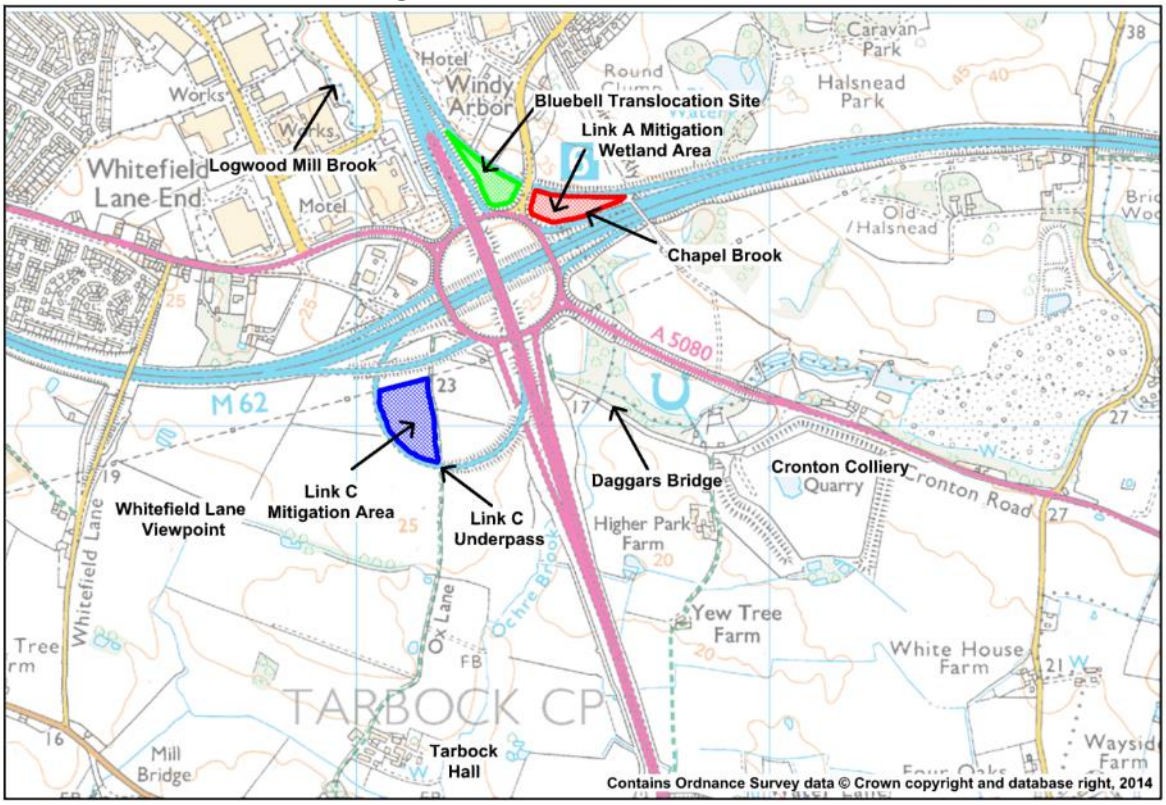
Physical Fitness

The scheme had enhanced Non-Motorised User (NMU) facility provision as expected, although the connection of the Potters Pits Bridge footpath to the wider NMU network was yet to be implemented by others and it was suggested that the status of NMU facilities should be reconsidered at FYA.

Site Overview

5.6 ***Figure 5.1*** shows the study area.

Figure 5.1 – Site overview



Evaluation Methodology

5.7 The environmental assessment focuses on those aspects that were unable to be fully appraised at OYA, or where OYA made recommendations for further study. Any issues that have arisen since OYA have been incorporated in this report. The detail of the OYA is not repeated, and reference should be made to the OYA report where required, although key points are incorporated into the FYA where appropriate to provide context.

5.8 No new modelling or survey work has been undertaken for this FYA environmental evaluation.

Data Collection

5.9 The following documents have been used when compiling this section of the report:

- Appraisal Summary Table (March 2006).
- M62 Junction 6 Improvements: Environmental Statement (ES) and Non-Technical Summary (March 2006).
- Addendum to the ES (July 2006).
- M62 Junction 6 Improvements Scheme: Archaeological Post Excavation Assessment Report on Excavations in 2007 (April 2009).
- M62 Junction 6 Improvements Huyton, Merseyside: Bat Monitoring Survey 2010 (February 2010).
- M62 Junction 6 Improvement: Non-Motorised User Final Audit Report (Revision 0, July 2009).

- M62 Junction 6 Improvements Huyton, Merseyside: Wetland Vegetation Monitoring (February 2010).
- M62 Junction 6 Improvements Construction Environment Management Plan (M62/00026, January 2007).
- A Journey into the Past – Archaeology at Junction 6, Tarbock Roundabout M62 (2012).

5.10 A full list of the background information requested and received is included in Appendix D.

Site Inspection

5.11 A site visit was undertaken in September 2014; access was limited to safe, publicly accessible areas and included taking photographs which are used to illustrate the report where appropriate. Selected pictures are reproduced in Appendix C with OYA or ES pictures as appropriate to provide comparison.

Consultation

5.12 ***Table 5.1*** lists the organisations contacted during consultation and summarises their responses. Further detail is included in the relevant topic sections where appropriate.

Table 5.1 – Summary of Environmental Consultation Responses

Organisation	Topic	OYA Comments	FYA Comments
Natural England (NE)	Biodiversity and Landscape	Landscape: NE stated that it was consulted on biodiversity and landscape at OYA and had no concerns at the time and did not need to follow up mitigation requirements, therefore had no comment to make. Biodiversity: A copy of the Great Crested Newt (GCN) Licence Return Form was provided by NE.	NE noted that from the information provided it did not fall within the scope of consultation that they would routinely comment on. It was noted that the scheme was unlikely to have significant impacts on statutory designated sites or landscapes.
English Heritage (EH)	Heritage	EH felt unable to comment and suggested contacting the local authority.	EH were satisfied with the approach followed regarding heritage, and did not wish to make any further comments.
Environment Agency (EA)	Water	EA does not undertake post-project appraisal work and were unable to provide any comments.	EA provided some local water quality and water invertebrate data for information.
Knowsley Metropolitan Borough Council	General	No responses received.	Responded confirming status of Potters Pit Bridge (still not available for use).
Lancashire Wildlife Trust	Biodiversity	-	No responses received

Organisation	Topic	OYA Comments	FYA Comments
Whiston Town Council (WTC)	General	-	WTC stated that the "extension to J6 has been excellent and works well", although it was noted the roundabout needs "investment into cleaning and maintaining it".
Ramblers Association	Public rights of way	-	No responses received.

5.13 Animal mortality data for the wider area was supplied by the MAC. The data provided covered all of 2010, the first four months of 2011 and first eight months of 2012, however, the only animal mortality that occurred at the junction was a bird in July 2010, on the new Link A road.

5.14 The OYA referred to the need to review the number of Part 1 claims at FYA; note that Part 1 claims are no longer considered as part of POPE.

Changes to the Proposed Scheme since the ES of March 2006

5.15 At the time of the ES and NMU report, the disused Cronton Colliery was designated for commercial / industrial development. It is understood that there have been some changes outside the scheme extents at Cronton Colliery since the preparation of the ES and that the current proposals for the Cronton Colliery site is for restoration for community and leisure use.

ES Addendum July 2006

5.16 Minor changes were made which increased the separation between the Link A eastern fence line and the wall of a nearby warehouse (Batleys Cash and Carry, off Fallows Way), primarily by replacement of the earthworks embankment with a small retaining wall.

Traffic Forecast Evaluation

5.17 Three of the environmental sub-objectives – noise, air quality and greenhouse gases are directly related to traffic flows. No new noise or air quality surveys are undertaken for POPE, and an assumption is made that the level of traffic and the level of traffic noise and local air quality are related.

5.18 The ES traffic assessment noted that for 2003 (the baseline year) AADT flows for the existing roundabout were approximately 57,000 vehicles of which 13% were HGVs. In the absence of the scheme it was forecast that AADT flows would rise to be in the region of 63,500 vehicles by 2009 and 65,000 by 2024. In fact, by 2007 traffic flows on the roundabout had reached 72,800.

5.19 With the scheme in place it was expected that the introduction of Links A and C would remove all traffic between the M57 north and the M62 east from the roundabout, reducing the AADT traffic flows on the roundabout to approximately 47,000 vehicles in 2009 and 55,000 vehicles in 2024. At the opening of the scheme (2009) it was predicted that AADT flows would be 10,000 vehicles on Link C, 10,500 vehicles on Link A, and 7,000 vehicles on the re-constructed M62 westbound on-slip road. By 2024, AADT flows were predicted to increase to 13,000 vehicles on Link A and 12,000 vehicles on Link C with 8,000 vehicles using the slip road.

5.20 The ES expected that the implementation of the scheme would immediately remove over 30% of all traffic from the existing roundabout. Traffic at the roundabout has fallen from 72,800 before the scheme in 2007 to 53,400, representing a 25% reduction in traffic using the roundabout.

5.21 ***Table 5.2*** shows the predicted traffic volumes and the actual traffic volumes measured at FYA. The predicted volumes were linearly interpolated from the predictions made in the ES for 2009 and 2024 in order to provide a prediction for the FYA year specifically. The original traffic assessment noted that HGVs comprised 13% of traffic using the roundabout.

5.22 The HGV data presented in chapter 2 (***Table 2.2***) indicates that the HGV forecasts were optimistic for the majority of the links when compared to the observed data. Comparison of the before and FYA observed data demonstrates that overall there has been a reduction in HGVs as a proportion of all traffic, although due to the increase in overall traffic, the absolute number of HGVs has increased.

Table 5.2 – Forecast vs Actual Traffic Volumes (AADT)

Location		Actual Traffic 2007 (before scheme)	ES Interpolated Traffic Forecast (2014)	Actual Traffic FYA	% Difference on Forecast
M62 WB	Off slip	18,500	7,300	9,700	32%
	On slip	7,600	7,400	9,800	32%
M62 EB	Off slip	7,900	9,400	11,500	23%
	On slip	21,300	8,200	9,600	17%
M57	SB off slip	18,000	6,800	5,200	-24%
	NB on slip	18,100	8,700	9,300	7%
A5300	NB off slip	10,000	8,900	11,600	30%
	SB on slip	9,100	8,000	9,400	18%
A5080	NW junction	18,200	17,100	24,000	40%
	SE junction	7,200	7,700	9,000	16%
Link A	-	N/A	11,300	15,500	37%
Link C	-	N/A	10,800	13,600	26%

Noise

Forecast

AST

5.23 The AST stated that nine additional people would experience noise levels above 64 dB(A). Two of these people would have levels between 70 and 74 dB(A). The quantitative assessment stated that the estimated population annoyed (EPA) in the study area was as follows:

- Do Minimum = 169
- Do Something = 171.

5.24 Overall the estimated extra population annoyed by traffic would be 2 as a result of the scheme.

Environmental Statement

5.25 The calculations made as part of the ES indicated that no residential properties would meet the requirement for the provision of noise insulation as a result of the scheme.

5.26 The ES stated that a pervious surface would be used which would produce less noise than the existing impervious surface. It was not considered that any noise impact of the scheme warranted the provision of noise barriers.

5.27 The ES stated that the proposed scheme would cause no perceptible change to most of the properties in the study area. There would be no noticeable change for commercial properties. A slight increase in noise levels (<3dB(A)) might just be noticeable at 57 (approximately 9%) of the residential properties. Fifty industrial properties within the study area would experience no change (band from -1 to +1 dB(A)) in noise levels due to the scheme. However, a total of 22 industrial properties would experience a very slight noticeable increase (band from +1 to +3 dB(A)) in noise levels. No industrial properties would experience a noticeable reduction in noise level.

5.28 Other noise sensitive locations were assessed, including schools and places of leisure. The largest predicted increase due to the scheme was identified at the Village Hotel where calculated noise levels were predicted to increase by a just noticeable amount (1.2 dB(A)). All other noise sensitive locations assessed fell into the 'no change' category.

5.29 The overall noise and vibration impact of the scheme was assessed as 'very low'.

OYA

Conclusions

5.30 A low noise surface was used throughout the scheme as expected. No post-opening noise surveys were undertaken and it was understood that no properties were eligible for insulation against traffic noise.

5.31 The ES stated that noise fences were not required and none were erected as part of the scheme.

5.32 The scheme resulted in a significant reduction of traffic on the roundabout of 25% although this was slightly less than the 30% forecast.

EST

5.33 The OYA EST noted that overall traffic had reduced on the roundabout by 25% and based on traffic flows on the new link roads it was likely that the predicted changes in the noise environment were generally as expected. However in 5 locations traffic flows were >25% higher than predicted and in 2 locations >20% less than predicted. Noise was assessed likely to be **as expected** for the new Link roads, with some locations **worse and some better than expected**.

FYA Consultation

5.34 No consultation responses were received regarding noise, although the response from Whiston Town Council noted that they "have not been made aware of any problems and believe the

extension to junction 6 has been excellent and works well" – a lack of comment on this matter implies (but does not prove) that noise from the junction is not considered problematic locally.

FYA Evaluation

5.35 It was confirmed at OYA that a low noise surface was used for the scheme. The Road Surface Index (RSI) value of the surface used has not been provided to POPE which would confirm the noise reduction properties

5.36 Noise measurements are not taken at OYA or FYA; instead the approach is to determine if traffic levels are significantly different (25% higher or 20% less) than what was expected. If traffic levels are significantly lower, it is assumed that noise effects will be better than expected i.e. quieter. Similarly, significantly higher levels imply that noise levels will be worse than expected i.e. higher.

5.37 Based on ***Table 5.2*** traffic on the two new link roads carried significantly more traffic than expected, 37% for Link A and 26% for Link C. Four locations – the M62 westbound on and off slips, the A5300 northbound off slip, and the A5080 north-west of the junction – have observed traffic levels between 30% and 40% higher than expected and therefore the noise levels are assumed to be worse than expected. The M57 south-bound off slip had observed traffic levels 24% below what was predicted which suggests noise levels better than expected from this particular source.

5.38 The addition of the two new link roads are the key change in the scheme, and these carry more traffic than expected. The other traffic flows relate to pre-existing road links and the balance of these is that the local noise climate is likely to be **worse than expected.**

Table 5.3 – Evaluation Summary: Noise

Sub Objective	AST	FYA
Noise	Increase of 2 people estimate to be annoyed by traffic noise.	New link roads and existing slip roads worse than expected overall

Air Quality

Forecast

AST

5.39 The AST stated that the scheme would result in a slight deterioration to the air quality levels around the junction, however there would be an improvement over the existing situation. It was reported that the Link A bridge would bring 6 additional properties within 200 m of the scheme.

Environmental Statement

5.40 The ES indicated that the air quality in the vicinity of the roundabout would experience an overall improvement in the DS scenario (2009) compared to the existing situation. However, the assessment indicated that 50 properties would experience a slight deterioration, 11 properties a slight improvement and 9 properties no change in the opening year (2009) as a result of the junction improvements.

5.41 It was predicted that 2 properties (the factory to the north east of Junction 6 and the Village Hotel), would however experience an increase in particulate matter (PM_{10}) of greater than 1µg/m^3 and an increase in nitrogen dioxide (NO_2) of greater than 2µg/m^3.

5.42 In the scheme opening year the concentrations of NO_2 and PM_{10} were predicted to be below the objectives defined within the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) both with and without the scheme.

5.43 The assessment stated that there were no declared Air Quality Management Areas (AQMAs) within the study area. The scheme was expected to have an overall neutral impact. It was stated that the appraisal of the main communities adjoining the junction would suggest that extensive mitigation measures would not be necessary.

OYA

Conclusions

5.44 It was stated in the ES that mitigation measures would not be necessary for the operational scheme. It was confirmed at OYA that none have been included as part of the scheme.

5.45 Analysis of the forecast and observed traffic data showed that there was no requirement to undertake any further air quality assessment. Where observed traffic flows on roads differed from the OYA forecast data by more than 10%, the majority of these roads either have no properties within 200m and/or showed a decrease in traffic with the scheme. Differences in traffic on the remaining roads were considered unlikely to significantly affect air quality at the nearest properties, which are located over 100m from these roads.

EST

5.46 Air quality was likely to be as expected.

FYA Consultation

5.47 No consultation responses were received regarding air quality, although Whiston Town Council noted that they “have not been made aware of any problems and believe the extension to Junction 6 has been excellent and works well”. As with noise, this can imply that air quality has not been a sufficient issue such that it has been raised with the town council.

FYA Evaluation

5.48 Air quality measurements are not taken at OYA or FYA; instead the approach is to determine if traffic levels are significantly different (a change of +/-1000 AADT, +/-200 HGV or +/-10 km/hr average speed) than what was expected. If traffic levels are significantly lower, it is assumed that air quality will be better than expected. Similarly, significantly higher levels imply that air quality will be worse than expected.

5.49 The observed traffic flows are significantly higher than those forecast in all cases where data is available except for the M57 northbound and southbound slip roads. In addition, the observed number of HGVs is significantly higher than forecast at a number of road links. This means that properties in Windy Arbor could be affected by the increases in traffic observed on Windy Arbor Road and new Link A. In addition, properties close to A5080 north west of the junction could also be affected by the increase in observed traffic flows and HGVs on this road compared to those forecast. There are also properties near the M62 west of the junction although there is no observed data for this section. However, it is thought that traffic would be in line with forecasts along this section, so should not affect the properties in this area.

5.50 There is no monitoring data available for this area to see if pollutant concentrations have changed since the scheme was implemented, however, Knowsley Metropolitan Council have not declared any AQMAs indicating that pollutant concentrations are still below the air quality criteria, indicating relatively good air quality.

Table 5.4 – Evaluation Summary: Air Quality

Sub Objective	AST	FYA
Air Quality	Properties worse off – 50 Properties better off – 11 No change – 9 Aggregate NO_2: -137.92 Aggregate PM_{10}:97.69	Likely to be worse than expected at properties in the Windy Arbor area and near the A5080, as a result of higher observed traffic flows than forecast.

Greenhouse Gases

Forecast

5.51 The carbon dioxide emissions were forecast in the Environmental Statement (ES) using COBA, which input the flows from the Traffic Forecasting Report (TFR).

5.52 In the ES it was forecast that carbon dioxide emissions would increase by 0.4% due to increases in vehicle-kilometres driven as a result of the scheme. The net increase of carbon emissions was forecast to be less than 0.5% of the DM emissions, for this reasons an assessment of neutral impact was given.

Evaluation

5.53 The evaluation of outturn carbon impacts is usually carried out using one of these two methodologies:

- COBA 11 (used to forecast emissions in the ES)
- Design Manual for Roads and Bridges (DMRB) regional emissions worksheet.

5.54 The OYA study assessed that there was a net 1% increase in carbon emissions in the study area. The format of the journey time data collected in POPE for this scheme is not sufficiently detailed to be able to replicate this level of precision where the net change is less than 1% i.e. the margin of error would be too high in any approximation to be able to assess whether emissions were higher or lower than expected. Therefore in the case of this five years after assessment no evaluation has been undertaken for greenhouse gases.

Landscape and Townscape

Forecast

AST

5.55 The AST stated that the visual impact of Link A would be negligible to the wider landscape given its location within Link C and the re-alignment of M62 Westbound entry slip road would introduce visually prominent embankments into an open landscape. It stated that mitigation planting would help reduce this impact over time. The overall impact was assessed as slight adverse.

5.56 In terms of townscape, the AST stated that the proposals would reduce the gap between urban edges and major road corridors; however, alleviation of congestion would benefit the wider urban environment. The overall impact was assessed as neutral.

Environmental Statement

Link A

5.57 Key landscape elements predicted to be impacted upon included the fragmentation and loss of areas of mature woodland (Windy Arbor Wood), highway vegetation and the enlargement of an existing junction which would narrow the gap between the road corridor and the urban edge of Whiston. The long term landscape impacts of Link A would be reduced over time by mitigation to slight adverse.

5.58 It was stated that the majority of Link A would be sited in a cutting and screened by areas of existing vegetation, proposed screen planting and existing urban form. Link A would have no substantial visual impact. A small number of receptors, (including the Village Hotel) might experience a slight adverse impact once mitigation measures were in place, reducing eventually to negligible in the long term when mitigation planting matured.

Link C

5.59 The scheme proposals for Link C would involve significant earthworks. Key landscape elements predicted to be impacted included the fragmentation and loss of areas of mature hedgerow, the diversion of the end of a public right of way and enlargement of an existing junction which would encroach into the existing rural setting of the area and extend the junction southwest. The junction would in effect sever an island of land from the wider landscape to the southwest. The long term landscape impact for Link C was assessed to be slight to moderate adverse.

5.60 Link C would have moderate adverse visual impacts on a small number of properties. The level of visual impact for the majority of properties was predicted to be negligible in the long term due to intervening vegetation, landform and distance from the junction.

5.61 A significant change in visual amenity was predicted to be experienced by users of footpath Tarbock No. 8 (Ox Lane) which would require diversion at its northern end where it would coincide with the realigned slip road adjacent to the junction. Link C would not affect the alignment of the footpath as it would bridge over it but the proposals would change the experience of users of this public right of way. A moderate adverse impact was predicted on opening and mitigation planting would help reduce the impact of these changes in view to slight adverse over time.

Lighting and Gantries

5.62 The existing junction and approach roads were lit, and lighting of the Knowsley Expressway (A5300) ended approximately 800 metres south of the junction. The junction lies adjacent to residential and industrial areas which have a significant amount of lighting and as a result the effect of new lighting was assessed to be limited particularly as cut off lighting was proposed to be used.

5.63 Seven new overhead sign gantries were proposed. Gantries A, B, C and G would be visible from areas within Huyton Business Park and from Windy Arbor. Gantry F, to be located approximately 2 kilometres east of Junction 6 would potentially have a slight to moderate adverse visual impact in the short term on one residential property, Higher Shaw Farm.

Planting and Mitigation

5.64 In addition to the optimising of the vertical and horizontal alignments, the following mitigation was proposed:

- 33,500m^2 tree and shrub planting including a significant amount of new woodland planting around Link C;

- 600 linear metres of hedgerow planted as double row of transplants, with occasional feathered trees;
- creation of wildflower grass swards;
- use of lighting designed to reduce the amount of light 'spilling' out into the area;
- retention of existing vegetation; and
- the creation of wildlife habitats.

5.65 It was stated that the assessment was based on no off-site planting being included as part of the scheme

OYA

Conclusions

5.66 The extent of vegetation removal appeared to have been undertaken in line with the ES. It was confirmed that Link C had been constructed as proposed including the extent of earthworks and its elevated position and that Windy Arbor Wood has been severed by Link A. Vegetation within both parcels of the woodland, including the bluebells, appeared to be recovering from any effects of the severance. The establishment of the hedgerow to the north of Link A, on the boundary with the woodland, could provide additional protection of the woodland edge in this location.

5.67 It was confirmed that landscape mitigation measures have generally been implemented in line with the proposals. In addition planting has been undertaken at several locations:

- adjacent to the Warehouse off Fallows Way;
- on the boundary between Link A and the Village Hotel including screen fencing;
- to the boundary of Windy Arbor Wood; and
- on the embankment of the eastbound carriageway between a location to the south of Lake View to Fox's Bank underbridge.

5.68 In general plants appeared to be establishing satisfactorily although it was noted that some whips and standard trees appeared to be dead or dying potentially as a result of wind damage. The wildflower areas in Link C were not yet established and the ground was compacted. It was too soon to evaluate the effectiveness of the planting and seeding mitigation measures and this was noted as requiring consideration at FYA.

5.69 The diversion route, width of path and fencing to Tarbock Lane No. 8 (Ox Lane) had been implemented as expected. The retention of existing vegetation helped soften views of the scheme for users of this footpath, as did the new planting to the southern bank of Link C.

5.70 The LEMP noted that there was a 3 year maintenance / defects period which ended in March 2011. It stated that maintenance includes grass cutting and weed control in woodland areas and hedges and that any dead or dying plant material is to be replaced each year for 3 years.

5.71 It was noted that individual plant shelters were generally free from weed growth and weed control spraying around the planting had been undertaken, however the extent of herbicide treatment around the whips and transplants has resulted in large areas void of grass. Noxious weed was evident in some areas of planting and seeding.

5.72 As anticipated in the ES, the lighting erected as part of the scheme was visible from some locations nearby.

EST Landscape

5.73 Mitigation measures have generally been provided in line with proposals and the planting is generally establishing satisfactorily although some plants including standard size trees have failed and require replacement. It is considered too soon to evaluate the establishment of new planting and its effectiveness for screening, which should be reviewed as part of the FYA report. Likely to be as expected, **slight adverse**.

EST Townscape

5.74 Alignment of scheme implemented as proposed and reduction in congestion and traffic flows generally as expected, **neutral.**

FYA Consultation

5.75 Natural England was consulted at FYA. They noted that the scheme did not "appear to fall within the scope of the consultations that Natural England would routinely comment on"; although they did observe that the scheme "is not likely to result in significant impacts on statutory designated sites or landscapes".

FYA Evaluation

5.76 During the site visit key areas of planting were visited and photographed to determine how they were establishing. No dead or dying trees were noted during the site visit, so these may have either been replaced or obscured by surrounding growth. ***Figure 5.2*** shows that the planting alongside Link A has developed considerably since OYA, when photos showed minimal growth. This figure is compared with the comparable OYA picture in Appendix C. It is also clear that some maintenance is being undertaken given the tidy nature of the bottom of the embankment. As is clear, the planting is relatively continuous and generally developing as expected (after 5 years a height of 1.5 to 3 m might be expected, and this has generally been achieved), and as it develops further will provide a good visual barrier to this link road.

Figure 5.2 – Link A Roadside Planting, looking east from Windy Arbor Road

5.77 Screening planting was also developing along the new slip road, in particular along Ox Lane; whilst most of this planting was establishing well there was one area where this was not the

case, as shown in ***Figure 5.3*** and ***Figure 5.4*** respectively. The section of poor planting was only 2-3 m long so whilst it is very noticeable from the immediate location on Ox Lane it does not affect the overall efficacy of the planting in that area. The OYA noted that a three year period of maintenance was specified in the Landscape and Ecological Management Plan (in the CEMP) would expire in 2011, so defects noted at this stage would not automatically be made good.

Figure 5.3 - Slip Road Planting, from Ox Lane

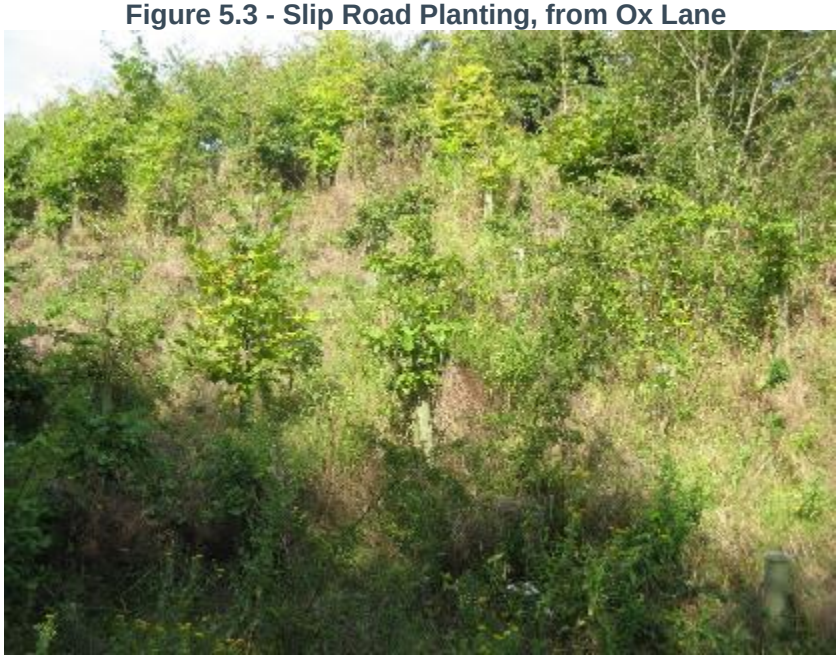


Figure 5.4 - Slip Road Planting Failure, from Ox Lane

5.78 Embankment planting was also seen to be establishing well along Link C, as shown in ***Figure 5.5***

Figure 5.5 - Link C Planting, from Ox Lane underpass

5.79 Longer views of looking north along Ox Lane indicate that the scheme is softened by both new and existing planting retained as part of the scheme (***Figure 5-6***).

Figure 5-6 - View from Ox Lane looking north with scheme in middle-distance

5.80 Note that Windy Arbor Wood is dealt with in the biodiversity section below.

5.81 No mitigation planting was used to screen the newly installed gantries. To the north of the roundabout a lot of the motorway corridor already has mature vegetation on either side which provides some degree of screening; one gantry is immediately adjacent to a warehouse so the immediate environment is not significantly affected by the new structure. The most sensitively located gantry is to the east of the roundabout, noted in the ES as likely to have a slight to moderate short term impact on Higher Shaw Farm. The existing vegetation in the golf course and surrounding areas was noted as reducing the potential visual impact of the gantry; this vegetation is still apparent so the effect is no worse than expected.

5.82 For the most part, landscape planting has established well and is successfully screening views of the new link roads. As such the landscape is deemed as expected, "**slight adverse**".

5.83 The scheme entailed some encroachment of the road corridors toward the urban edge, specifically Link A, although as the AST noted this would be counteracted by reduced congestion. The scheme was implemented as expected and congestion has reduced so the overall impact is **"neutral**", as expected.

Table 5.5 – Evaluation Summary: Landscape and Townscape

Sub Objective	AST	FYA
Landscape	Slight adverse	As expected
Townscape	Neutral	As expected

Biodiversity

Forecast

AST

5.84 The AST predicted that the loss of the mature broadleaved woodland due to Link A and the loss/severance of the mature species-rich hedgerow along Ox Lane due to Link C would affect great crested newt terrestrial habitat, bat and barn owl foraging and commuting routes. Habitat disturbance would be offset in the short to medium term (dependant on habitat) by recreating woodland, hedgerows, wetland and wildflower grassland, and by appropriate landscaping south of Link C, combined with an underpass at Ox Lane designed to redirect protected species away from the carriageway. The quantitative assessment stated that approximately 0.2 hectares (ha) of mature broadleaved woodland would be lost and approximately 3.5 ha woodland created; less than 0.1 ha of species rich grassland would be lost and 1.7 ha created; and 270 metres of hedgerow lost and more than 600 metres of hedgerow to be planted.

5.85 The overall impact was assessed as **slight adverse**.

Environmental Statement

5.86 The ES noted that there were no Sites of Special Scientific Interest (SSSI) within the survey area. There were eleven non-statutory, Sites of Biological Importance (SBIs) identified within the survey area and no direct impacts were anticipated.

5.87 Two main features of ecological value would be affected by the scheme – a broadleaved bluebell woodland at Windy Arbor Wood (Local BAP habitat), and the hedgerow network at Ox Lane. Associated with these habitats were a range of important flora and fauna, including great crested newt, bats, barn owl and a suite of birds of conservation importance. A moderate adverse impact was expected for both barn owl and bats that foraged along the hedgerow network and within Windy Arbor Wood.

5.88 The desk study identified the presence of water vole along the Logwood Mill Brook, west of the A5300. However the ES recorded that no water vole or otter were identified during the field survey.

5.89 Badgers were not recorded in the survey area.

5.90 It was stated within the ES that the impacts upon the identified habitats (and associated species) would be ameliorated through appropriate mitigation, which would aim to retain them

or recreate habitat to offset any losses. In addition supplementary features of ecological value would be gained as part of the scheme, including a large wetland complex within Link C, the translocation of bluebells and monoliths (mature dead tress moved as standing deadwood) and a wetland area at Link A, which would provide valuable habitat for a range of flora and fauna, including bats, birds and invertebrates. It was noted in the ES that the mitigation would require ongoing maintenance to retain the proposed habitats in a favourable condition. As part of the mitigation for bats it was stated that the underpass at Ox Lane would not be lit.

5.91 The summary ecology and nature conservation assessment was recorded as the scheme resulting in an overall neutral to slight adverse impact.

OYA

Conclusions

5.92 It appeared that the ecological mitigation measures have generally been implemented in line with the proposals.

Habitats

5.93 The extent of habitat retention and new planting had been undertaken in line with that proposed, including 200 m of mature hedgerow removed and replanted to the south of Link C.

Translocation Site at Link A

5.94 The translocation site for bluebells and monoliths at Link A appeared to be generally establishing satisfactorily. Tree planting failure rates were low although some of the larger tree species appeared to be struggling. Bluebells were establishing within the receptor site and colonising the verge areas.

5.95 It was recorded in the July 2010 monitoring report that one large pit planted oak has died and should be replaced. It also recommended that the failed translocated tree species and coppice stools should be replaced and that in the longer term (5-10 years) hazel coppicing should be undertaken; this was noted as requiring consideration at FYA.

5.96 The wetland area at Link A appeared to be establishing satisfactorily and it was noted that it was wet during the site visit and that marginal vegetation was establishing.

Invasive Species

5.97 Japanese knotweed (to the east of Windy Arbor Wood to the north of Link A) and Spanish bluebells (to the east of Windy Arbor Wood to the south of the link) were recorded within the Monoliths and Bluebells monitoring report (February 2010), with treatment recommended to control both species. Within the monitoring report (July 2010) Japanese knotweed was not recorded and it was advised that the future treatment of Spanish bluebells be included within the Handover Environmental Management Plan (HEMP). In the July 2010 monitoring report, Himalayan balsam was recorded within Windy Arbor Wood, outside of the receptor site location. The monitoring report recommended that the landowner of Windy Arbor Wood be contacted regarding treatment of this invasive species. Invasive species were noted as requiring consideration at FYA.

Great Crested Newts and Wetland and Wildflower Area (Link C)

5.98 The Wetland Vegetation Monitoring Report (February 2010) stated that the wetland and wildflower areas were not establishing as expected and further planting works and monitoring was recommended. The monitoring report concluded that the wetland areas are currently considered to be of low habitat value. The establishment of the wetland areas should be considered at FYA and any further scheme monitoring reports should be made available.

Bats

5.99 For health and safety reasons the underpass at Ox Lane had to be lit. The bat monitoring report concluded that bats were commuting and foraging within the Link A and Link C areas. However, no bats were recorded commuting in the new Ox Lane underpass and it was reported that bats are unlikely to use the underpass because it contains artificial lighting, although the report also noted that as this was based on one monitoring survey and further surveys in 2010 and 2011 were recommended to confirm use of the area by bats. It was stated that the FYA report should consider additional monitoring information that may be available at that date. Based on the information available at OYA it appeared that the impact on bats was worse than expected.

EST

5.100 The extent of habitat retention and new planting (3 ha of native broadleaved woodland, 2.5 ha of wildflower meadow and 600 m of native species hedgerow) has been undertaken in line with that proposed, including 200 m of mature hedgerow which was removed and replanted to the south of Link C. Monitoring reports have indicated that the wetland area with Link C may not be establishing as expected at this stage and is of low habitat value for GCN. Ox Lane underpass has been lit and this may be the reason why bats are currently not using it. It is too soon to evaluate the effectiveness of the mitigation measures and biodiversity should be reconsidered as part of the FYA report when further monitoring information will be available for both habitats and species. Likely to be worse than expected.

FYA Consultation

5.101 Natural England was consulted at FYA and they noted that the scheme did not “appear to fall within the scope of the consultations that Natural England would routinely comment on”; although they did observe that the scheme “is not likely to result in significant impacts on statutory designated sites or landscapes”.

5.102 The Environment Agency provided invertebrate data for two nearby sites on Ditton Brook – Carr Lane, 3.2 km upstream of the site and Daggars Bridge, 0.2 km downstream of the site. It was noted that there was a “need to exercise caution in interpreting these data, particularly those from Carr Lane, as there are other potential stressors in addition to the motorway junction that may be affecting the invertebrate community”.

FYA Evaluation

5.103 No further monitoring reports were available subsequent to those available at OYA.

5.104 The Environment Agency provided Biological Monitoring Working Party (BMWP) and the similar Average Scope Per Taxon (ASPT) indices of water quality as derived from the types of invertebrate species present for two sites on Ditton Brook. Both sites had monitoring data covering the period 2000 to 2013, so covering both before and after construction. Indices for the downstream site were lower than those for the upstream site thereby indicating poorer water quality, although as the Environment Agency noted this is not necessarily due to motorway runoff. The indices for the downstream site did not exhibit an obvious trend or step change throughout the period in which data were available, which suggests that the scheme did not affect the water quality or invertebrate taxa of Ditton Brook. Aquatic life was not explicitly mentioned as a factor in the biodiversity AST score which suggests that no improvement or decline was anticipated. Given the data suggest that no change took place this would imply that effects were “as expected” for this aspect.

5.105 The OYA report referred to the need to consider at FYA whether hazel coppicing was undertaken; the need to contact the owner of Windy Arbor Wood regarding invasive species management; the need for further monitoring of great crested newts and the wetland; and further monitoring of bats. No documentary evidence was made available at FYA to assess whether or not these recommended works had taken place.

Windy Arbor Wood

5.106 The OYA recommended that hazel coppicing be undertaken over the next 5-10 years; no reports were made available to suggest that this has or is going to happen.

5.107 It was observed during the site visit that the translocation site for Link A at Windy Arbor Wood was overgrown with impenetrable brambles (***Figure 5-7***), to the point that planted whips were covered ***(Figure 5-9).*** It was clear that newly planted trees had not achieved enough height to break through the bramble layer, and the contrast between the previously existing areas of Windy Arbor Wood and the new area was clear (see Appendix C). The site visit was not at the time of year when bluebells would be in flower, but such a density of understorey scrub is likely to inhibit bluebell growth.

5.108 It seems clear that a three year maintenance programme as specified in the CEMP (assuming this was undertaken as stated) was not sufficient to allow this area of woodland replanting to establish itself, specifically for trees to reach a height where they will not be submerged in understorey plants such as brambles. Hopefully in time the new trees will reach sufficient height, but it appears that a three year period of maintenance (assuming the recommended period was undertaken) is not sufficient to allow this process to complete, or at least reach the point where it will complete without assistance from ongoing maintenance.

5.109 No Japanese knotweed was noted during the site visit.

Figure 5-7 - Windy Arbor Wood Translocation Site

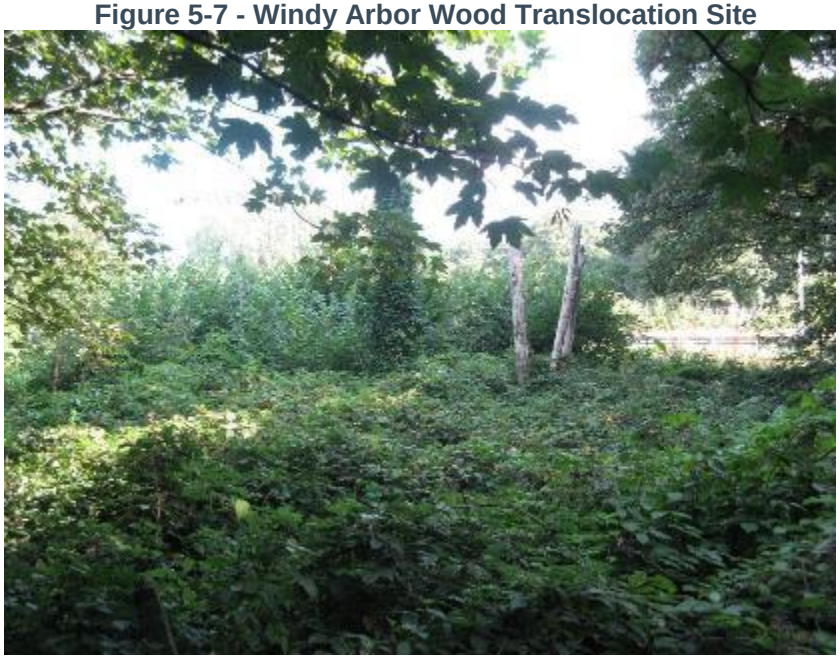


Figure 5-8 - Whips covered by brambles at Windy Arbor Wood

Link A Wetland

5.110 Safe access was not available to this area during the site visit, although from Windy Arbor Road it appeared that there was plenty of marginal vegetation establishing, as can be seen in ***Figure 5-9***.

Figure 5-9 - Link A Wetland Mitigation Area

Link C Mitigation Area

5.111 The OYA noted the need for further consideration at FYA; however no further monitoring reports were made available beyond those seen at OYA.

5.112 Pictures in the OYA show that the Link C wetland was largely devoid of marginal vegetation, although by FYA this was clearly not the case, with reeds having grown up around the open water significantly (***Figure 5-10***). Appendix C provides a comparison.

Figure 5-10 - Link C Wetland Area

Bats

5.113 It was noted in the OYA that bats were not using the Ox Lane underpass, possibly due to it being lit. It was noted during the FYA site visit that the lights have been vandalised so this may have the side effect of making the underpass more conducive to bats (although it does detract from its use as a public right of way).

Animal Mortality

5.114 Only one animal death was recorded in the incomplete dataset made available (24 months of data were provided for the period 2010-12); of a bird (unspecified) on the new Link A road. Whilst the data are incomplete, this suggests that there is not a significant problem with animal mortality as a result of the scheme.

5.115 Whilst both the wetland areas appeared to be establishing successfully, the Windy Arbor Wood area was not establishing in the way that was expected in the ES, as such the evaluation could be considered worse than expected because the expectation would be that mitigation would be successful. As such the evaluation considers biodiversity to be worse than expected, although it remains "**slight adverse**". It was not considered that the shortfall in the mitigation was sufficient to merit a change to moderate adverse.

Table 5.6 – Evaluation Summary: Biodiversity

Sub Objective	AST	FYA
Biodiversity	Slight adverse	Worse than expected, although assessment remains "slight adverse"

Heritage

Forecast

AST

5.116 The AST stated that based on the current information, the scheme would have a direct impact on six archaeological sites; three of local and three of district importance. The majority of Link

A had no archaeological potential, but there was some potential in Link C, especially to the east of Ox Lane. No Scheduled Monuments within the vicinity of the scheme, and no listed buildings would be directly affected. Overall the impact was assessed as slight adverse.

Environmental Statement

5.117 The ES noted that Cultural Heritage sites would be affected by the scheme and that the impacts could be mitigated by an appropriate level of recording prior to, or during, construction. The alignment of Link A had only limited archaeological potential. The area of the proposed Link C had more potential, especially to the east of Ox Lane, but the majority of this area would not be affected and any below ground deposits beneath the road corridor here would be preserved *in situ*.

5.118 Other areas of potential, for example to the west of Ox Lane, would be assessed by additional investigative works prior to construction and a final mitigation strategy would be presented in an addendum to the ES (see below).

5.119 Six of the identified Cultural Heritage sites would be directly affected by the scheme. The impacts were predicted to be slight adverse.

5.120 No Listed Buildings would be directly affected by the proposals. One section of a substantial boundary wall (noted as being important at the "district" level in the Scheduled Monument Record) which runs along the west side of Windy Arbor Wood and represented one of the boundaries of Halsnead Park would be directly affected.

5.121 Mitigation was proposed through a series of further evaluations during spring 2006 and detailed recording.

ES Addendum (July 2006)

5.122 Excavation at 19 trenches was undertaken during the period of May to June 2006. The impacts of the construction works associated with Link A remained unchanged from that assessed in the ES. The ES noted that the impacts of the proposed borrow pit and balancing pond within Link C to the west of Ox Lane and the area to the east of Ox Lane were then unknown. After the further investigation the overall impacts were considered to be slight adverse on Site 25 (Ox Lane). The second phase of archaeological investigations confirmed that this area of proposed borrow pit and balancing pond contained little of archaeological interest.

5.123 The 2006 trenches established that the archaeological importance or potential of the majority of the Link C alignment to the east of Ox Lane was low. However, the eastern end of this part of the corridor, close to the A5300 Knowsley Expressway (Site 26), coincided with a natural slope and soil movement over several centuries had preserved important archaeological deposits. Information obtained from the 2006 investigations meant that the grade of importance of this site was increased from District to Regional, and that the scale of impact was increased from small-scale to significant, with a corresponding increase in overall adverse impact from "slight" to "moderate".

5.124 Phase 2 recording brief in advance of construction, followed by an appropriate level of Phase 4 and 5 works was proposed at the following sites:

- Site 21 (Norwood Farm, angle of Ox Lane and Dagger's Bridge);
- Site 22 (Terrace of cottages and enclosures, either side of Dagger's bridge Lane);
- Site 25 (Ox Lane, south of Motorway)
- Site 26 (Prehistoric and Romano-British activity (finds), west side of A5300)

5.125 The Halsnead Park (Site 43) boundary wall in this area would also be subject to a Phase 2 photographic survey prior to its partial demolition, as would the remains of the Cronton Colliery mineral railway (Site 41).

5.126 A Phase 3 watching brief, followed by an appropriate level of Phase 4 and 5 works would be undertaken at the Link C alignment drainage works, east of Ox Lane,

5.127 The additional evaluations and investigations carried out during 2006 and reported in the ES Addendum July 2006 did not reveal any issues likely to have a major effect upon the proposed scheme design.

OYA

Conclusions

5.128 Prior to the commencement of construction work a four month programme of archaeological investigation took place in 2007 at the sites of interest identified within the ES and subsequent addendum. During the investigations there were several important finds, the most significant was found in an area within the Link C zone near to the existing A5300, where evidence of 7,000 year old Stone Age settlements was found. This is recorded as the earliest record of human activity within the local area. At Link A, investigations found the remnants of a small clay structure and one of the best collections of late medieval pottery and metalwork from the county.

5.129 On Friday 1st and Saturday 2nd February 2008 open days were held to exhibit the archaeological finds to the public and stakeholders which it is understood was well attended. In addition to the exhibition an interactive website was set up.

5.130 It was confirmed to POPE that a photographic record of both the wall at Halsnead Park (ES Site 43) and Cronton Railway (ES Site 41) was undertaken in June 2006. During the site visit it was noted that, in the location to the south of the Link A carriageway, a concrete capping appears to have been used where the wall has been rebuilt.

5.131 It was understood that an Academic Report was to be published for the scheme. This was to be considered as part of the FYA report.

5.132 It was understood that all archaeological archives, including the photographic records, in connection with the investigations will be held in one depository with the National Museum Liverpool. It was understood that this is still being compiled and the progress of this should be confirmed as part of the FYA evaluation.

5.133 The setting of Listed Buildings was not considered as part of the Cultural Heritage assessment. However Hillside, Carr Cottages, Carr House, Carr Lodge and Tarbock Hall (Listed Buildings) were identified as visual receptors within the Landscape and Visual Assessment. Long term negligible visual impacts were assessed for all these properties, with the exception of Tarbock Hall, where a long term negligible-slight adverse visual impact was predicted. It is anticipated that these visual impacts are likely to be as predicted once mitigation planting has established.

EST

5.134 Mitigation measures have generally been provided in line with proposals and the planting is establishing satisfactorily. It is considered too soon to evaluate the establishment of new planting and its effectiveness for screening, which should be reviewed as part of the FYA report. Likely to be as expected, slight adverse.

FYA Consultation

5.135 English Heritage were consulted at FYA. They confirmed that they were satisfied with the approach followed regarding heritage, and did not wish to make any further comments.

5.136 Liverpool Museums confirmed the situation with the archives and photographic records of the scheme, and also the academic report. Specifically, it was noted that the archive was completed with the completion of the final report and that is held at the Museum of Liverpool. Regarding the technical report which was submitted to the HA (at time of submission) in early 2012, it was noted that this had not been made available either on the Highways England website or to Liverpool Museums for them to post a copy on their website. They noted that "it is a primary requisite of archaeologists to make their work public" and so this mitigation cannot be considered to be complete at this stage.

FYA Evaluation

5.137 During the site visit it was noted that the scheme was entirely obscured from view from the point where Ox Lane passes Tarbock Hall. The scheme may be more visible from the private land itself (this could not be assessed) but it was clear from traversing Ox Lane that both the existing and mitigation planting contributed a significant depth of vegetation that would at the least significantly soften views of the scheme, if not entirely obscure it.

5.138 Whilst the technical report has been completed and submitted to the HA (as in operation at the time), it does not appear to be available to any interested parties. Ron Cowell of Liverpool Museums noted that he had repeatedly tried to contact the HA but only received automated responses or was referred to the National Archives, where the report is also not available. Making the technical report publicly available should be considered a "quick win" and pursued as a matter of urgency in order to close out this aspect of the mitigation.

5.139 The archive of the archaeological works (except for the technical report) is complete and this is being held by the Museum of Liverpool, as confirmed by Ron Cowell.

5.140 Given the unavailability of the technical report it should be concluded that heritage is "**worse than expected**". However given the easy manner in which this can be rectified it is not considered that this merits changing "slight adverse" to "moderate adverse".

Table 5.7 – Evaluation Summary: Heritage

Sub Objective	AST	FYA
Heritage	Slight adverse	Worse than expected, but still considered "slight adverse"

Water

Forecast

AST

5.141 The AST stated that there would be a minor increase of approximately 450 litres/second in run-off volumes but no mitigation was required by the Environment Agency. The scheme was not predicted to affect flood risk or groundwater. Mitigation would include oil interceptors on both links and a balancing pond/wetland feature with reed beds on Link C. Overall the impact was assessed as neutral.

Environmental Statement

5.142 The ES (NTS) stated that the main watercourse in the locality is Logwood Mill Brook; also known locally as Ochre Brook and Chapel Brook. Drainage before the junction improvements was into Logwood Mill Brook through a number of outfalls. It was proposed that these drainage discharge points would be used as part of the improvement scheme drainage.

5.143 The water environment in the vicinity of the junction was generally poor with no safeguards to protect the brook from a spillage on the road or from general pollution. Any further degradation of the water environment was said to be unacceptable to the Environment Agency.

5.144 The scheme was expected to have an insignificant impact on the water quality of the stream. There would be no discharge to groundwater as a result of the proposed scheme.

5.145 It is understood from the ES that during consultations the Environment Agency stated that it was unlikely there would be any increase in flood risk downstream due to the development and that a flood risk assessment was not necessary. The EA also confirmed that flow attenuation and flood mitigation measures would not be required for the scheme. However the inclusion of a balancing pond / wetland feature in the area enclosed by Link C required for engineering and environmental reasons would provide attenuation of drainage run off. There would also be petrol interceptors and other measures to prevent pollution spills entering local watercourses (Logwood Mill Brook/Chapel/Ochre Brook).

OYA

Conclusions

5.146 A wetland attenuation area, with reedbeds at Link C and three oil interceptors was included within the scheme as proposed. No information on pollution incidents was made available.

5.147 During the OYA site visit it was confirmed that the attenuation area at Link C was holding water and French drains were present and the existing road drainage was retained as expected.

5.148 The surface of the embankment to the south of Link C, near to the A5300, appeared to be saturated and as *Juncus* sp. was growing at the toe of the slope this was taken as an indication that the area has been wet for some time. It was understood that this saturated area was to be reviewed onsite with a rectification strategy to be established if required. The area would be revisited at FYA.

EST

5.149 The attenuation area (Link C) has been implemented and is holding water. Oil interceptors have been included as part of the scheme. No information has been made available which would indicate that the scheme is not performing other than as intended. It is suggested that water issues are reconsidered as part of the FYA study when further information may be available, including the outcomes of the review of and any required rectification strategy for the saturation of the Link C embankment, and the establishment of wetland vegetation could be reviewed. Likely to be as expected, neutral.

FYA Consultation

5.150 The Environment Agency provided water quality data between 2000 and 2014 for two locations – Prescot Brook / Logmill Brook where this crosses Wood Lane north of the site (this location is upstream), and Prescot Brook at Daggers Bridge (on Dacre's Bridge Lane, downstream of the site).

FYA Evaluation

5.151 No further monitoring reports or strategies were available at FYA beyond what was available at OYA.

Water Quality

5.152 Water quality data from the EA was reviewed to determine if it was useful for the purposes of POPE. Data for both locations were provided for 2000-2006 and 2013-2014, and for a range of determinands (concentration of compounds, elements or other factors e.g. pH that are measured). Data availability was not consistent, so some determinands had usable data sets at one location but not the other, or had only a handful of data points insufficient to discern a pattern. The extent of the usable data was reviewed for POPE and it was concluded that sufficient data was not available to determine if there was any apparent effect of the scheme. In particular, no or insufficient data were available for typical road runoff contaminants such as nickel, copper, zinc, cadmium, lead and polycyclic aromatic hydrocarbons (PAHs).

Saturated Area

5.153 It was observed during the site visit that the saturated area to the south of Link C had changed significantly. Firstly, the embankment mitigation planting has become well established (***Figure 5-11***, see for comparison Appendix C), which is likely to reduce saturation due to greater root uptake of water. However, reeds were apparent in the area (***Figure 5-12***) which suggests some degree of saturation still. Also, the French drain in this area appeared to extend further than could be seen in the OYA photo, so this may have been extended after the OYA report was completed (note that no As Built drawings for drainage have been made available to POPE).

5.154 There was no visible saturation during the site visit; however this may be due to the greater vegetation cover obscuring any evidence. Also, the weather prior to the site visit had been quite dry, whereas the weather on the OYA site visit day appeared to be very wet, so it is difficult to compare the two.

Figure 5-11 - Saturated Area Developed Embankment Planting

Figure 5-12 – Wetland Vegetation at Saturated Area

5.155 Overall, the water environment is considered to be "**neutral**", as expected. There is no conclusive data regarding the effects of the scheme on water quality; and whilst the saturated area may still get quite wet it appears that the extra vegetation will mitigate this and that the area has drainage. No slope slippage was apparent on the embankment.

Table 5.8 – Evaluation Summary: Water

Sub Objective	AST	FYA
Water	Neutral	As expected

Physical Fitness

Forecast

AST

5.156 The AST stated that the number of pedestrian/cycling journeys may increase with the provision of a new NMU crossing at Potters Pits Bridge with an overall slight benefit anticipated.

Environmental Statement

5.157 The scheme was expected to enhance the existing facilities for NMUs, particularly pedestrians and cyclists. The scheme proposed to upgrade and enhance NMU facilities including:

- carry out minor upgrades which would introduce improved pedestrian facilities at Ellis Ashton Street Bridge and Logwood Bridge;
- reduction of traffic flows on the roundabout;
- retention of Tarbock No. 8 (Ox Lane) as a footpath route with inclusion of an illuminated, straight, level underpass, under Link C; and
- extend the Potters Pits Bridge.

5.158 Knowsley Metropolitan Borough Council would be responsible for the provision of some of the connecting routes and the ongoing maintenance of the footpath routes.

5.159 At the time of the ES and the NMU Context Report, the disused Cronton Colliery was designated for commercial/industrial development.

OYA

Conclusions

5.160 It was understood that there had been some changes outside the scheme at Cronton Colliery since the preparation of the ES and the NMU Context Report that were expected to change the future NMU activity in the local area. The NMU Final Report noted that the current proposals for the Cronton Colliery site is for it to be restored for community/leisure use which would increase the number of people wanting to cross the M62 via the extended Potters Pits Bridge to link with the wider NMU network.

Potters Pits Bridge

5.161 A single span bridge had been constructed across Link A, which joins the existing Potters Pits Railway Bridge converted to provide provision for a future footpath, improving the provision of facilities in the locality. The bridge was fenced off at both ends with public access restricted and it was understood that the footpath was planned by the Land Restoration Trust as part of their renovation of the former Cronton Colliery. Until the link to the wider NMU network is provided an increase in NMU journeys will not occur as a result of the new facility provided as part of the scheme. It was suggested that this link to the wider NMU network is considered as part of the FYA report.

Ellis Ashton Street Bridge and Logwood Bridge

5.162 It was understood that minor upgrades at Ellis Ashton Street Bridge and Logwood Bridge have been undertaken. It was also confirmed that pedestrian access under the M57 (Ellis Aston Street Bridge) is possible.

Traffic Flows on the Roundabout

5.163 Traffic on the roundabout had reduced significantly (by 25%) as a result of the scheme and the reduction to one lane of traffic onto the M62 Eastbound and Westbound, had also improved NMU crossing in this location making it easier and safer for NMUs to cross carriageways.

Footpath Tarbock No. 8, Ox Lane

5.164 Ox Lane (Tarbock No. 8) underpass had been provided as expected; it was lit and the approaching the underpass is straight providing clear views through. Evidence of vandalism along and within the vicinity of this footpath, including graffiti in the underpass and some damage to the footpath fence was noted during the site visit.

5.165 No new NMU surveys were carried out specifically for POPE and the NMU context report did not include numbers of people using local footpaths so it was not possible to confirm whether the number of cycle/pedestrian journeys had changed as a result of the scheme, however the expected benefits of the Potters Pits Bridge link were yet to be realised. It was suggested that the status of NMU provision should be reconsidered at FYA including consultation.

EST

5.166 The scheme has enhanced NMU facility provision as expected although the connection of the Potters Pits Bridge footpath to the wider NMU network has yet to be implemented by others. The status of NMU provision should be reconsidered at FYA.

FYA Consultation

5.167 The Ramblers Association were contacted with regards to their views on the scheme; no response was received. Knowsley Metropolitan Borough Council's highways and transportation group provided an update on the current status of Potters Pit Bridge:

'In summary the bridge has recently been the subject of various communications between the lands trust [Land Restoration Trust], Highways Agency and ourselves. Whilst the bridge still remains inaccessible the aspiration still remains to open to users (pedestrians, cyclists and equestrians) however there are various agreements and funding which need to be resolved to realise this. On a positive note this does potentially seem to be achievable, but will need some further investment of raising the bridge parapets to raise their height'.

FYA Evaluation

5.168 No NMU surveys were undertaken prior to FYA giving rights of way usage.

5.169 Reinforcing the response from Knowsley Metropolitan Borough Council quoted above, the Land Restoration Trust who hope to open the site of the former Cronton colliery (to which the Potters Pit bridge would provide a link to) note on their website that:

'Access to the site will be improved with a network of footpaths, cycleways and bridleways, including a link to Whiston and Huyton along the disused mineral railway line [which crosses Potters Pit Bridge][4]*.*

5.170 During the site visit no pedestrians were noted using the footpaths around the roundabout. Ox Lane was generally clear and appeared to be reasonably well trodden, two other people were noted using it during the site visit.

5.171 It was observed during the site visit that the Ox Lane underpass had graffiti and the lights had been vandalised (both shown in ***Figure 5-13***). This will reduce the attractiveness of using Ox Lane to walkers.

[4] http://www.landrestorationtrust.org.uk/business/sites.html?SID=cronton

Figure 5-13 - Vandalised Lights and Graffiti in Ox Lane Underpass

5.172 Given the slight detriment to Ox Lane users of the vandalised underpass, and the continued inaccessibility of Potters Pit Bridge, it must be concluded that physical fitness is worse than expected at FYA, in this case "**neutral**" as opposed to the AST assessment of slight beneficial.

Table 5.9 – Evaluation Summary: Physical Fitness

Sub Objective	AST	FYA
Physical Fitness	Slight beneficial	Worse than expected, neutral

Journey Ambience

Forecast

AST

5.173 The AST stated that improvements as a result of the scheme would lead to reduced congestion and delay, thus reducing driver stress. Overall the impact was assessed as moderate beneficial.

Environmental Statement

5.174 The effects of the scheme were expected to be as follows;

Traveller Views

5.175 The NTS stated that the proposed planting would create a more attractive view from the junction for vehicle travellers. Moving traffic from the existing elevated section of the M57 and roundabout into the cutting section of the proposed Link A would restrict driver views for about 1km causing a slight deterioration. Link C would rise to join the higher level bridges of the existing interchange with their open views which together with the proposed planting would enhance traveller views from Link C.

Driver Stress

5.176 The ES (NTS) stated that the level of congestion experienced at Junction 6 was considered to cause driver frustration due to delays and the unreliability of journey times. The addition of two new links would reduce congestion and time delays for motorists and journey times would become more reliable. There was no evidence to show that route uncertainty was a factor at the existing junction. The proposals included the provision for several new overhead gantry signs to aid driver navigation and minimise uncertainty. Driver fear was not considered a major concern within the ES. Both Link A and Link C were expected to reduce driver stress.

Traveller Care

5.177 Traveller care was not specifically mentioned in the ES section on vehicle travellers.

OYA

Conclusions

Travellers' Views

5.178 Although Link A has been located within cutting there are views of Windy Arbor Wood (including in the spring Bluebells) (***Figure 5-7***) and the new bridge which carries Windy Arbor Road over the link has been faced with brickwork.

5.179 Views in connection with Link C are considered to be as expected with some open views to the surrounding area and of the planting undertaken as part of the scheme.

Driver Stress

5.180 The main benefit of the scheme has been for traffic which now uses the new free flow Links providing direct access between the motorways. The scheme has also reduced traffic on the roundabout and reduced congestion.

5.181 In terms of route certainty the gantries and signage provide drivers with information as expected.

Traveller Care

5.182 Emergency telephones were noted during the OYA site visit on the new Links and on the 'As Built' information.

EST

5.183 The new links have provided direct access between the motorways and have also resulted in reduced traffic on the roundabout and improved congestion. The gantries and signage provide drivers with clear information which helps reduce route uncertainty. As expected, moderate beneficial.

FYA Consultation

5.184 In response to consultation Whiston Town Council noted the following:

'I was involved in the public consultation and the opening ceremony and since completion I have not been made aware of any problems and believe the extension to junction 6 has been excellent and works well.

I have on a number of occasions had cause to contact the highways agency regarding signage for Whiston and believe that some investment should be allocated to cleaning up and making the large roundabout more appealing, I have never really been successful as

funding has not been available, so yes the extension to the motorway is working very well but the large roundabout really does need some investment into cleaning and maintaining it'

FYA Evaluation

5.185 The consultation response from Whiston Town Council indicates that the works have clearly benefitted the junction, but that there may have been some missed opportunities with regards to signage and landscaping and enhancement of the roundabout itself. However these two items were not an intended part of the scheme so this does not affect the evaluation. Nevertheless it is a clear indication that local stakeholders would like to see some additional works to the junction which should be considered by Highways England.

5.186 Traffic flows on the roundabout are 23% lower than before the scheme opened due to the diversion of traffic onto Links A and C. This will have led to reduced driver stress as was predicted.

5.187 ***Table 5.10*** summarises the evaluation of the various elements of journey ambience and the scheme's impact on this sub-objective. Overall the scheme impact is "**moderate beneficial**" as expected.

Table 5.10 – Journey Ambience

Traveller Factor	Score	FYA evaluation
Views	Moderate beneficial	As expected, landscape planting established
Driver Stress	Moderate beneficial	As expected due to new link roads successfully providing connections that avoid roundabout, and signage reducing route uncertainty. The scheme has significantly reduced the number of collisions at the junction
Care	Moderate beneficial	Emergency telephones present
Summary Score	**Moderate Beneficial**	**As expected**

Environment Conclusions

- **Noise** is likely to be worse than expected overall given that actual traffic flows are generally higher than expected.
- **Air quality** is likely to be worse than expected overall given that actual traffic flows are generally higher than expected.
- **Greenhouse Gases** – a five year assessment of greenhouse gases was not undertaken as the OYA identified a net change is less than 1%, this means that the margin of error would be too high to assess whether emissions were higher or lower than expected.
- **Landscape** planting is generally establishing itself satisfactorily so providing mitigation against the visual impact of the scheme. One isolated area on Ox Lane has clearly not established but this is only 2-3 m long and does not affect the overall integrity of the mitigation. Landscape impacts are 'slight adverse', which is as expected.
- **Townscape** - The scheme entailed some encroachment of roads towards the urban edge, specifically Link A. This is however counteracted by reduced congestion and therefore the overall impact is neutral, as expected.
- **Biodiversity** – Link C wetland habitat appears to be flourishing, although the mitigation area at Windy Arbor Wood has become overgrown with brambles meaning that the translocated bluebells will have difficulty flowering. Three years of maintenance was specified but it appears that this is not sufficient to allow the habitat to establish. It is likely that this is because it is not sufficient time for a tree canopy to develop that would shade out understory plants like brambles. Overall, biodiversity was slightly worse than expected although the category is still assessed as 'slight adverse'.
- **Heritage** mitigation in the form of archaeological reporting is partially complete; the photographic archive is complete and available at Liverpool Museums, but the final technical report has not been made available which renders this documentary mitigation less effective. The results indicate that the scheme's impact on heritage is worse than expected although the category remains 'slight adverse'.
- **Water** - Environment Agency water monitoring data was made available but it does not provide sufficient information on which to judge the scheme. The saturated embankment has not suffered any slippage and vegetation growth may mean that increased plant uptake reduces the risk of saturation in future. As expected, the impact on water is 'neutral'.
- **Physical fitness** – Potters Pit Bridge is not yet open to the public although this is in the hands of the Land Restoration Trust rather than Highways England. The lights in the Link C underpass have been vandalised and graffiti means that some people may be deterred from using that part of Ox Lane. The scheme's impact on physical fitness has been assessed as worse than expected and receives a 'neutral' score.
- **Journey ambience** – more freely flowing traffic on the roundabout and link roads to avoid it in two directions mean that congestion is reduced. The rate of collisions are also significantly lower following the implementation of the scheme. Overall, the impact on journey ambience is 'moderate beneficial', as expected.

6. Accessibility and Integration

Accessibility

Option Values

6.1 Option Values are the different options that are available for making a journey, including the ability to change to a different means of transport if the regular mode is temporarily unavailable. The AST stated this was 'not applicable' and gave a neutral assessment.

6.2 The scheme only facilitates for turning movements by motor vehicles at the junction, this evaluation confirms that there has been no change to Option Values.

Severance

6.3 The AST assessed the scheme impact on severance as being 'slight beneficial', this is based on the following:

- A forecast 30% reduction in traffic using the roundabout would benefit non-motorised users of the footway which encircles the roundabout by making it easier to cross the entry and exit approaches at the roundabout; and
- The provision of the Potters Pits Bridge footbridge and cycleway which would provide access over the M62 east of the junction for non-motorised users.

6.4 The FYA observed traffic data shows that there has been a 23% reduction in traffic using the roundabout since before the scheme opened, this is less than the forecast reduction of 30%. The scheme has reduced traffic flows on specific arms of the roundabout, and thus the benefit of this reduction for pedestrians crossing the roundabout would only occur on these arms. There has also been an increase in traffic flows on the A5080 approaches to the roundabout. The benefit of reduced traffic flows would only occur for pedestrians crossing the roundabout exit arms because the entry approaches to the roundabout were already signalised, however these signals do not include a pedestrian phase and there is no controlled pedestrian crossing.

6.5 It is also likely that the reduction in traffic flows would not necessarily benefit pedestrians throughout the day because the vehicle speed and gap between vehicles would vary depending on traffic conditions. Considering these factors, it is unlikely that there has been an improvement for non-motorised users of the roundabout as a result of the scheme.

6.6 The scheme included the construction of a pedestrian cycle bridge over the new Link A, this is an extension to the existing Potters Pits Bridge over the M62 mainline. The bridge has remained closed since the Knowsley Mineral Railway Line ceased operation.

6.7 The maintenance of the new footpath and cycle route over the two sections of bridge is the responsibility of Knowsley Metropolitan Borough Council. For this evaluation the Borough Council were consulted on the current status of the bridge as it was identified in the OYA as being closed for access. The bridge remains closed for access, however it remains an aspiration of all parties including the Knowsley Borough Council, The Land Trust, Highways England and Sustrans to open the bridge for access to pedestrians, cyclists and equestrians. It is understood that discussions are ongoing.

6.8 The scheme was identified as having the potential to reduce severance in the OYA study, this remains the case however the achievement of this requires further work. Therefore the assessment of the impact of the scheme on severance is considered Neutral.

Figure 6.1 – Dropped kerb crossing on the signalised M57 southbound exit-slip approach to the roundabout

Figure 6.2 – Dropped kerb pedestrian crossing on the A5080 Cronton Road South exit from the roundabout

Access to the Transport System

6.9 The AST stated that the scheme would not have an impact on access to the public transport system, and assessed the impact as Neutral. The five years after evaluation confirms this. However, the site visit identified that the junction is used by local bus services, and therefore

the reduction in traffic at the junction could be beneficial to bus journey times and reliability. The assessment remains Neutral.

Figure 6.3 – Local Bus using M62 Junction 6 Tarbock Island roundabout

Integration

Transport Interchange

6.10 The AST stated that there would be no additional public transport provision or freight interchange facilities, and gave a neutral assessment. This five years after evaluation confirms this as the scheme did not include any Transport Interchange components.

Land Use Policy

6.11 The AST stated that the scheme was consistent with national, regional, and local policy and assessed the impact of the scheme on Land Use policy as being Neutral.

6.12 The land use planning system changed during scheme preparation, development and construction. During scheme preparation land-use planning was governed by the Knowsley Unitary Development Plan (UDP). Post-scheme opening there have been two changes to the planning system. In September 2008 regional planning policy was adopted in the Northwest of England Regional Spatial Strategy. This was revoked in 2013. Local planning policy also changed in 2009 when the UDP was updated under the Local Development Framework (LDF) system. The current adopted plan for Knowsley is the Replacement Unitary Development Plan (adopted in 2006); this will remain in place until the formal adoption of the emerging Local Plan.

6.13 The UDP policies are of relevant to this scheme as they were in place during scheme development and construction. National planning policy has also changed and is now directed by the National Planning Policy Framework (NPPF) which was adopted in March 2012.

6.14 This scheme was listed amongst other transport schemes in the UDP and was identified as supporting Policy T1, "An Integrated Transport System. The scheme was included in Policy T4, "Major Highway Schemes" and also cited as supporting the regeneration objectives of the UDP.

6.15 The land-use policies were supported by local transport policies, which at the time of scheme preparation and construction, were outlined in the Merseyside Local Transport Plan 2006-2011 (LTP). The LTP refers to the scheme benefits: "as well as reducing congestion with consequent economic and environmental benefits, it will improve road safety …..(and) improve access to the port and airport from the M62".

6.16 The Potters Pits Bridge component of the scheme, although not currently open, has the potential to provide access for non-motorised users to the urban extensions 8 and 9 reserved in the emerging Local Plan. Consultation with Knowsley Borough Council has confirmed that major residential allocations have planning permission in the area, as outlined in the UDP the scheme would have a positive impact on future development in the area.

6.17 The scheme was supported by land use planning policies and by the Local Transport Plan, therefore the impact of the scheme on land-use policy has been assessed as 'Beneficial'.

Other Government Policies

6.18 The AST states that the scheme would be beneficial to a range of government policies for transport, economic regeneration, and growth in an EU Objective 1 Area. Additionally both the RSS and UDP supported the scheme. The impact of the scheme on Other Government Policies was assessed as 'Beneficial'.

6.19 In 2006 Merseyside qualified for European Regional Development Fund Objective 1 status. This scheme was not constructed with ERDF funding however the scheme is located within the Objective 1 and helps to improve accessibility within it.

6.20 The AST did not refer to the schemes positive effect on the Merseyside and Huyton Strategic Investment Areas (SIAs) identified in the OPR. The scheme was within the Huyton and Prescot SIA in which ERDF funding was targeted. The aim of the SIA was to create 7,600 new jobs. The scheme improves the accessibility of the area, as identified in the journey time analysis, for existing businesses and potential development sites. Therefore the scheme could be supportive and beneficial to the ERDF programme.

Accessibility and Integration Conclusions

- The scheme has had no impact on Option Values and Access to the Transport System, this is because of the nature of the scheme.
- Severance problems at the roundabout have not necessarily been improved because traffic flows have not reduced to the forecast levels, and the configuration of the pedestrian crossing facilities is as per the pre-scheme arrangement.
- The Potters Pits Bridge remains closed, however the extension of the bridge over link A providing a route across the motorway means that the scheme has the potential to improve Severance for non-motorised users. Discussions on opening the bridge are on-going.
- Transport Interchange has not been affected by the scheme.
- The scheme supports Land Use Policy and Other Government Policies.

7. Appraisal and Evaluation Summary Tables

7.1 An Appraisal Summary Table (AST) is a one-page summary of the predicted economic, environmental, and social impacts of a major road scheme. The AST for this scheme, dated March 2006, is reproduced in Table 7.1.

7.2 The Evaluation Summary Table (EST) has been devised for the POPE process to record a summary of the actual scheme impacts. Where possible the EST mirrors the appearance and process of the AST, to permit comparison between the two. The Five Years After Study AST is provided in Table 7.2.

Table 7-1 – Appraisal Summary Table

Option: Preferred route		**Description:** Addition of free flow link from M57 southbound to M62 eastbound (link A) and M62 westbound to M57 A5300 northbound (link C) to the existing grade separated junction	**Problems:** Peak time congestion at roundabout and queuing on slip roads	Present value of costs to public accounts: £30.5m
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	9 additional people will experience noise levels above 64dB(A). 2 of these will have levels between 70-74 dB(A)	Estimated population annoyed (EPA) in the study area: Do minimum = 169. Do something =171	Estimated population annoyed by traffic =+2
	Local Air Quality	Proposed scheme results in a slight deterioration to the air quality levels around the junction. However there will be an improvement over the existing situation. Link A brings 6 additional people within 200m of the scheme	No. properties worse off=50 No. properties better off=11 No. properties no change = 9	Aggregate PM_{10}=97.69 Aggregate NO_2=137.92
	Greenhouse Gases	Scheme would result in an increase of <0.5% (84,380 tonnes) in CO_2 in opening year 2009 compared with the do-minimum scenario*	19,309,238 tonnes of CO_2 with Do Minimum 19,393,609 tonnes of CO_2 with Do Something	Net increase of 84,380 tonnes of CO_2
	Landscape	Visual impact of Link A negligible to wider landscape given in cutting. Link C and re-aligned M62 westbound entry slip introduce visually prominent embankments into an open landscape; mitigation planting will help reduce impact over time.	Not applicable	Slight adverse
	Townscape	Proposals reduce gap between urban edges and major road corridors; however alleviation of congestion will benefit the wider urban environment	Not applicable	Neutral
	Heritage of Historic Resources	Based on current information, scheme will have a direct impact on six archaeological sites, three of Local and three of District importance. All six impacts are slight adverse. Majority of Link A has no archaeological; potential, but some potential in Link C, especially east of Ox Lane. No Scheduled Monuments within vicinity of scheme, and no Listed Buildings are directly affected.	Not applicable	Slight adverse
	Biodiversity	The loss of the mature broadleaf woodland due to Link A, and the loss severance of the mature species-rich hedgerow along Ox Lane due to Link C would affect great crested newt terrestrial habitat, bat and barn owl foraging and commuting routes. Habitat disturbance would be offset in the short to medium term (dependent on habitat) by recreating woodland, hedgerows, wetland, and wildflower grassland, and by appropriate landscaping south of Link C, combined with an underpass at Ox Lane designed to redirect protected species away from the carriageway.	Approx 0.2 ha mature broadleaved woodland lost approx 3.5 ha woodland created. <0.1 ha species-rich grassland lost approx 1.7 species-rich grassland created. 270 metres hedgerow lost >600 metres hedgerow planted	Slight adverse
	Water Environment	Minor increase of approx 450l sec in run-off volumes, but no mitigation required by Environment Agency. No predicted impacts on flood risk or groundwater. Mitigation provided includes oil interceptors on both links and balancing wetland feature with reed beds on Link C.		Neutral
	Physical Fitness	Number of pedestrian cycling journeys may increase with provision of new NMU crossing at Potters Pits bridge.		Slight beneficial
	Journey Ambience	Improvements will lead to reduced congestion and delay thus reducing driver stress.		Moderate beneficial
SAFETY	**Collisions**	Savings in personal injury collisions over a 60 year assessment period.	Most likely- 45 PIAs with casualties of 0 Fatal, 5 Serious, 58 slight	PVB 1.455m
	Security	Ellis Ashton Street bridge will be re-opened temporarily for traffic during construction, and permanently for pedestrian access. The underpass along Ox Lane is on-line and illuminated with through visibility. A new pedestrian cycleway crossing is proposed at Potters Pits bridge.		Moderately beneficial
ECONOMY	**Public Accounts**		Central govt PVC £30.05m. Local govt OVC £nil	PVC £30.50m
	Business Users & Providers	Reduced journey times and vehicle operating costs by reducing congestion at Junction 6 roundabout.	Users PVB £387.88m; Providers PVB £0, Other PVB £0	PVB £387.88m
	Consumer Users	Reduced journey times and vehicle operating costs by reducing congestion at Junction 6 roundabout.		PVB £33.71m
	Reliability	Reduction in peak time congestion will improve journey time reliability for over 20,000 vehicles per day.		Beneficial
	Wider Economic Impacts	The scheme will have a positive effect on regional regeneration strategies	Estimated that the scheme will generate 731 and 914 jobs	Beneficial
ACCESSIBILITY	**Option Values**	Not applicable		Neutral
	Severance	Reduces severance experienced with reduction of approx 30% traffic at existing roundabout. Introduction of Potters Pits footbridge cycleway provides grade separation over M62 without need to use roundabout.	2 walking group including 'Walking for Health' plus cyclists will have grade separated access across M62. All users will benefit from reduced flows at roundabout.	Slight positive
	Access to the Transport System	Will not have an impact on access to the transport system		Neutral
INTEGRATION	**Transport Interchange**	Scheme does not include any additional public transport provision or freight interchange facilities	Not applicable	Neutral
	Land Use Policy	Scheme is consistent with National, Regional, and Local policy	Not applicable	Neutral
	Other Government Policies	Scheme is beneficial to a range of government policies for transport, economic regeneration, and growth in EU Objective 1 area. Both Regional Spatial Strategy and Knowsley UDP support scheme.	Not applicable	Beneficial

*POPE Note - there was an error in the original air quality calculations so all the CO_2 figures here are out by a factor of 1,000

Table 7.3 – FYA Evaluation Summary Table

Option: Preferred route		**Description:** Addition of free flow link from M57 southbound to M62 eastbound (link A) and M62 westbound to M57 A5300 northbound (link C) to the existing grade separated junction	**Problems:** Peak time congestion at roundabout and	Present value of costs to public accounts: £31.5m
OBJECTIVE	**SUB-**	**QUALITATIVE IMPACTS**	**QUANTITATIVE**	**ASSESSMENT**
ENVIRONMENT	**Noise**	Traffic on the two new link roads carried significantly more traffic than expected, 37% for Link A and 26% for Link C. Four locations – the M62 westbound on and off slips, the A5300 northbound off slip, and the A5080 north-west of the junction – have observed traffic levels between 30% and 40% higher than expected so the noise levels are assumed to be worse than expected. The M57 south-bound off slip had observed traffic levels 24% below what was predicted which suggests noise levels better than expected from this particular source.	-	Likely to be worse than expected
	Local Air Quality	The observed traffic flows are significantly higher than those forecast in all cases where data is available except for the M57 northbound and southbound slip roads. In addition, the observed number of HDVs is significantly higher than forecast at a number of road links. This means that properties in Windy Arbor could be affected by the increases in traffic observed on Windy Arbor Road and New Link A. In addition, properties close to A5080 north west of the junction could also be affected by the increase in observed traffic flows and HDVs on this road compared to those forecast. There are also properties near the M62 west of the junction although there is no observed data for this section. However, it is thought that traffic would be in line with forecasts along this section, so should not affect the properties in this area.	-	Likely to be worse than expected
	Greenhouse Gases	Not assessed	-	-
	Landscape	Mitigation measures have been provided in line with proposals and the planting is generally establishing satisfactorily with the exception of a short section on Ox Lane, although this does not affect the overall integrity of the mitigation.	-	Likely to be as expected (slight adverse)
	Townscape	Alignment of scheme implemented as proposed and reduction in congestion and traffic flows generally as anticipated.	-	As expected (neutral)
	Heritage of Historic Resources	The photographic archive is complete and available at Liverpool Museums. The archaeological technical report is not yet available and this reduces the value of this documentary mitigation.		Likely to be as expected (slight adverse)
	Biodiversity	The bluebell translocation site at Windy Arbor Wood has become overgrown with brambles and so is reducing the value of the habitat for bluebells. The Link C wetland is well established now.	-	Likely to be worse than expected
	Water Environment	Environment Agency water monitoring data was made available but it does not provide sufficient information on which to judge the scheme. The saturated embankment has not suffered any slippage and vegetation growth may mean that increased plant uptake reduces the risk of saturation in future.	-	Likely to be as expected (neutral)
	Physical Fitness	Potters Pit Bridge is not yet open to the public although this is in the hands of the Land Restoration Trust rather than Highways England. The lights in the Link C underpass have been vandalised and graffiti means that some people may be deterred from using that part of Ox Lane	-	Worse than expected (Likely to be neutral)
	Journey Ambience	More freely flowing traffic on the roundabout and link roads to avoid it in two directions mean that congestion is reduced. The rate of collisions are also significantly lower following the implementation of the scheme	-	As expected (moderate beneficial)
SAFETY	**Collisions**	The number of collisions in the first five years is 5.41 lower, when taking background reduction in collisions in to account, than the annual average in the five years before the start of construction. This change has been assessed as statistically significant.	Saving of 5.41 accidents per year.	Safety PVB £22.76m (better than expected)
	Security	Ellis Ashton Street has limited surveillance and does not feel safe. The underpass along Ox Lane has been constructed and has been illuminated however lighting is poorly maintained. The planned pedestrian cycleway crossing over the M62 on Potters Pits bridge has still not opened, discussions are on-going.	-	Neutral
ECONOMY	**Public Accounts**			PVC £31.8m (slightly higher than expected)
	Business and Consumer Users	Reduced journey times by reducing congestion at Junction 6 roundabout.	-	Journey time PVB £70.01m (slightly lower as expected), VOC as
	Reliability	Reduction in variability between peak and inter-peak journey times, whilst traffic diverted to the new freeflow links no longer experiences delays on the roundabout.		Beneficial, as expected
	WEI	Provides improved access to businesses and employment opportunities in the area, and support the Strategic Investment Areas (supported by European Regional Development Funding (ERDF).	-	Beneficial, as expected
ACCESSIBILITY	**Option Values**	Not applicable		Neutral, as expected
	Severance	There has been a 25% traffic reduction at roundabout. The benefits to pedestrians are limited by signal timings. Introduction of Potters Pits footbridge cycleway would provide grade separation over M62 without need to use roundabout, if opened for use.	-	Neutral, worse than expected
	Access to the Transport System	Reduced congestion at the junction has a positive impact on local bus services using the roundabout by improving journey times and reliability,	-	Neutral, as expected
INTEGRATION	**Transport Interchange**	Scheme does not include any additional public transport provision or freight interchange facilities	-	Neutral, as expected
	Land Use Policy	Scheme is consistent with National, Regional, and Local transport policy. The extension of the Potters Pits Bridge can provide sustainable access to development sites identified in the Local Plan. Conflicts with green belt and environmental policies are reduced by mitigation measures.	-	Beneficial, better than expected
	Other Gov't Policies	Scheme supports a range of government policies for transport, economic regeneration, and growth in EU Objective 1 area.	-	Beneficial, as expected

8. Conclusions

8.1 The M62 Junction 6 Improvement Scheme provided two free-flow link roads between the M57 north and M62 east. This enabled traffic making these movements to by-pass the M62 Junction 6 roundabout (Tarbock Island) which was identified as having congestion and safety issues.

Traffic Impact

8.2 The average daily number of vehicles using the roundabout has reduced by 23% from before the scheme opened (2007). The average daily traffic flows on new links A and C are now 15,500 and 13,600. This is higher than forecast and higher than the OYA flows. The new link A has resulted in a 71% reduction in traffic using the M57 southbound exit-slip, whilst traffic using the M62 westbound-exit slip has reduced by 38% as a result of new link C.

8.3 The scheme has resulted in improved journey times, and five years after opening these improvements are greater than identified in the OYA. Journey time benefits are greatest in the AM and PM peaks, whilst there is also a reduction in the difference between peak hour and inter-peak journey times.

Safety

8.4 The average annual collision rate has reduced from 23.4 collisions per year (Before) to 12.6 (FYA), however the Severity Index has increased from 0.05 (Before) to 0.13 (FYA), this is due to two Fatal collisions occurring since the scheme opened.

8.5 The scheme has been identified as being statically significant in contributing to the reduction in collisions at the junction.

Economy

8.6 The outturn scheme cost at 2002 prices is £31.3 million, which is slightly higher than the forecast cost of £30.8 million.

8.7 The 60 year journey time benefits of the scheme are evaluated as £70.06m, which is slightly lower than the forecast £70.8 million predicted. These benefits have increased since the OYA evaluation. The safety benefits of the scheme are evaluated at £22.76 million over the 60 year assessment period. This is compared with £1.4 million forecast. This is significantly higher than the OYA evaluation.

8.8 The total evaluated PVB for the scheme is £92.8 million, which is higher than the forecast £72 million. Overall, the scheme represents High Value for Money with an outturn BCR evaluated as 2.91.

Environment

8.9 Landscape planting was generally establishing well along embankments, mitigating the visual impact of the scheme.

8.10 Link C wetland was establishing well, but the bluebell area of Windy Arbor Wood was overgrown with brambles lessening its effectiveness as environmental mitigation.

8.11 The final archaeology report has not been made publicly available meaning that its value as mitigation is diminished.

8.12 The saturated embankment does not appear to have suffered from any slippage and embankment planting has become established (which is likely to reduce the chances of continued saturation due to increased root uptake of water).

Accessibility & Integration

8.13 Severance at the roundabout has not necessarily been improved because traffic flows have not reduced to the forecast levels, and the configuration of the pedestrian crossing facilities is as per the pre-scheme arrangement. Whilst the scheme delivered the extension to the Potters Pits Bridge to address severance issues, the bridge remains closed. However discussions about opening the bridge are on-going.

Success against Objectives

Table 8-1 – FYA Assessment of the Scheme Achievement of Objectives

Scheme Objectives from Order Publication Report (OPR)	**Objective Achieved?**
Reduce peak congestion compatibly with transport policies	✓
Improve safety	✓
Improve facilities for non-motorised users	✓
Positively influence regeneration	✓
Ensure there is no worsening of environment	✓

Appendix A – Turning Counts at M62 J6

Key

Movement uses new link A after scheme

Movement uses new link C after scheme

Table A.1 – 'Before' Turning Movements 07:00 – 19:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	599	10,916	1,149	4	1,766	1,619	**16,053**
Windy Arbor	310	0	688	310	816	974	875	**3,973**
M62 (E)	8,132	275	0	235	5,112	0	2,774	**16,528**
A5080 (SE)	1,061	436	426	0	271	893	206	**3,293**
A5300 (S)	29	1,002	4,228	546	0	2,260	845	**8,910**
M62 (W)	3,907	867	3	327	1,062	0	861	**7,027**
A5080 (NW)	2,675	1,371	2,761	540	889	852	0	**9,088**
Total	**16,114**	**4,550**	**19,022**	**3,107**	**8,154**	**6,745**	**7,180**	**64,872**

Table A.2 – OYA Turning Movements 07:00 – 19:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	660	11,534	432	0	3,714	1,385	17,725
Windy Arbor	373	0	864	257	1,260	1,010	663	4,427
M62 (E)	9,378	764	0	330	4,173	0	3,863	18,508
A5080 (SE)	943	79	269	0	261	1,111	868	3,531
A5300 (S)	0	980	5,255	514	0	2,607	875	10,231
M62 (W)	2,367	732	0	672	1,943	0	1,015	6,729
A5080 (NW)	2,669	974	2,645	565	1,353	1,161	0	9,367
Total	15,730	4,189	20,567	2,770	8,990	9,603	8,669	70,518

Table A.2 – FYA' Turning Movements 07:00 – 19:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	2	456	12205	733	1409	1036	1866	17707
Windy Arbor	94	1	717	260	303	1887	749	4011
M62 (E)	10711	117	0	395	5246	8	3336	19813
A5080 (SE)	1090	12	10	0	280	1790	447	3629
A5300 (S)	75	192	4108	103	0	2693	2026	9197
M62 (W)	3257	1518	544	940	955	0	936	8150
A5080 (NW)	2896	1984	2719	1037	643	310	1	9590
Total	18125	4280	20303	3468	8836	7724	9361	72097

Table A.3 – 'Before' Turning Movements 08:00 – 09:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	74	1,180	89	0	169	144	1,656
Windy Arbor	46	0	55	24	90	107	58	380
M62 (E)	1,034	16	0	12	525	0	111	1,698
A5080 (SE)	186	68	50	0	23	114	25	466
A5300 (S)	2	97	357	54	0	185	36	731
M62 (W)	378	33	0	33	29	0	82	555
A5080 (NW)	293	164	226	52	57	41	0	833
Total	1,939	452	1,868	264	724	616	456	6,319

Table A.4 – OYA Turning Movements 08:00 – 09:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	110	1,334	53	0	346	133	1,976
Windy Arbor	36	0	98	20	119	73	49	395
M62 (E)	1,130	44	0	22	424	0	483	2,103
A5080 (SE)	105	11	48	0	36	171	105	476
A5300 (S)	0	62	615	62	0	245	23	1,007
M62 (W)	545	102	0	103	180	0	135	1,065
A5080 (NW)	280	72	192	37	115	101	0	797
Total	2,096	401	2,287	297	874	936	928	7,819

Table A.5 – FYA Turning Movements 08:00 – 09:00

To From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	63	1380	49	129	126	205	1952
Windy Arbor	17	0	87	12	28	148	114	406
M62 (E)	1133	10	0	23	558	0	282	2006
A5080 (SE)	206	0	0	0	39	253	72	570
A5300 (S)	0	14	314	5	0	263	178	774
M62 (W)	449	183	63	105	28	0	78	906
A5080 (NW)	392	131	278	120	49	16	0	986
Total	2197	401	2122	314	831	806	929	7600

Table A.6 – 'Before' Turning Movements 11:00 – 12:00

To From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	26	776	72	0	118	124	1,116
Windy Arbor	26	0	66	11	64	85	66	318
M62 (E)	530	16	0	20	365	0	220	1,151
A5080 (SE)	56	19	19	0	22	41	6	163
A5300 (S)	5	68	301	37	0	128	85	624
M62 (W)	227	66	0	17	70	0	74	454
A5080 (NW)	179	106	254	35	69	57	0	700
Total	1,023	301	1,416	192	590	429	575	4,526

Table A.7 – OYA Turning Movements 11:00 – 12:00

To From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	26	758	27	0	185	102	1,098
Windy Arbor	24	0	58	51	84	62	59	338
M62 (E)	500	96	0	22	287	0	221	1,126
A5080 (SE)	100	4	13	0	16	69	85	287
A5300 (S)	0	53	348	50	0	163	55	669
M62 (W)	174	55	0	43	247	0	72	591
A5080 (NW)	172	70	210	56	117	73	0	698
Total	970	304	1,387	249	751	552	594	4,807

Table A.8 – FYA Turning Movements 11:00 – 12:00

To From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	2	18	780	10	72	84	125	**1091**
Windy Arbor	7	0	70	41	31	88	39	**276**
M62 (E)	628	15	0	27	353	2	204	**1229**
A5080 (SE)	82	1	4	0	22	92	27	**228**
A5300 (S)	5	10	312	9	0	171	143	**650**
M62 (W)	174	115	23	44	85	0	65	**506**
A5080 (NW)	176	158	166	53	58	20	0	**631**
Total	1074	317	1355	184	621	457	603	**4611**

Table A.9 – 'Before' Turning Movements 17:00 – 18:00

To From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	70	1,137	222	0	171	112	**1,712**
Windy Arbor	17	0	50	40	50	77	75	**309**
M62 (E)	679	27	0	37	296	0	322	**1,361**
A5080 (SE)	80	25	34	0	29	77	20	**265**
A5300 (S)	1	121	407	65	0	251	101	**946**
M62 (W)	455	105	0	26	120	0	78	**784**
A5080 (NW)	272	100	185	77	50	145	0	**829**
Total	**1,504**	**448**	**1,813**	**467**	**545**	**721**	**708**	**6,206**

Table A.10 – OYA Turning Movements 17:00 – 18:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	75	1,206	40	0	642	151	**2,114**
Windy Arbor	25	0	110	14	128	121	51	**449**
M62 (E)	1,224	33	0	47	332	0	428	**2,064**
A5080 (SE)	61	3	9	0	23	98	73	**267**
A5300 (S)	0	157	472	19	0	299	126	**1,073**
M62 (W)	74	54	0	45	80	0	79	**332**
A5080 (NW)	265	72	265	53	71	155	0	**881**
Total	**1,649**	**394**	**2,062**	**218**	**634**	**1,315**	**908**	**7,180**

Table A.11 – FYA Turning Movements 17:00 – 18:00

To / From	M57 (N)	Windy Arbor Rd	M62 (E)	A5080 (SE)	A5300 (S)	M62 (W)	A5080 (NW)	TOTAL
M57 (N)	0	70	1278	178	201	144	246	**2117**
Windy Arbor	3	0	52	32	13	208	46	**354**
M62 (E)	1359	14	0	81	426	0	385	**2265**
A5080 (SE)	46	0	0	0	21	188	26	**281**
A5300 (S)	0	15	463	0	0	311	195	**984**
M62 (W)	349	153	59	162	67	0	83	**873**
A5080 (NW)	284	223	271	112	24	35	0	**949**
Total	2041	475	2123	565	752	886	981	**7823**

Appendix B - Environment Information

Table B.1 - Environment Related Information Requested and Response

Environment Specific Requirements	Response
Environment Statement (ES) or if not a scheme requirement the latest Scheme Assessment Report (SAR).	Environmental Statement Vol 1, 1a and 2 (March 2006) Appraisal Summary Table (March 2006)
Any amendments, updates or addendums to the ES SAR or any relevant further studies or reports. Any significant changes to the scheme since the ES.	Addendum to ES (July 2006)
As built drawings for landscape biodiversity environmental mitigation measures drainage fencing earthworks etc.	Link A and Link C as built drawings (2009)
Construction Environment Management Plan (CEMP)	Construction Environmental Management Plan (January 2007)
Landscape and Ecology Aftercare Plan (LEAP).	LEAP included as appendix to CEMP (January 2007)
H& S File – environment information	Not received
Handover Environmental Management Plan (HEMP).	Not received
Relevant Contact Names for: • the Statutory Consultees (EA, EH and NE); • the local authorities (at county and district level); • the Parish or Town Councils; • Employer's Agent and Designers or environmental coordinators for scheme; • the MAC; and • Other relevant specialist consultees.	Knowsley MBC and Area 10 MAC contacts supplied to POPE. EA, EH and NE contacted via central enquiry contacts; details for other organisations found online
Archaeological Reports (popular and academic).	Popular – now archived at http://webarchive.nationalarchives.gov.uk/20120810121037/http://www.highways.gov.uk/knowledge/m62flash/index.html#) Academic Reports: • M62 Junction 6 Tarbock Island, Merseyside Archaeological Post-excavation Assessment Report on Excavations in 2007, September 2008;

Environment Specific Requirements	Response
The Road Surface Influence (RSI) value of any low noise surface installed	Not received
The insulation performance properties of any noise barriers installed (The BS EN 1794-2 result provided by the noise barrier manufacturer)	n/a
List of properties eligible for noise insulation.	No properties were eligible for noise insulation.
Reports for any pre post opening survey and monitoring work e.g. for noise, biodiversity, water quality).	Following documents available to POPE: M62 Junction 6 Improvements, Huyton, Merseyside, Bat Monitoring Survey 2010, February 2010; M62 Junction 6 Improvements, Huyton, Merseyside, Great Crested Newt Monitoring, February 2010; M62 Junction 6 Improvements, Huyton, Merseyside, Monitoring of the Translocation of Monoliths and Bluebells from Windy Arbor Wood, February 2010; M62 Junction 6 Improvements, Huyton, Merseyside, Monitoring of the Translocation of Monoliths and Bluebells from Windy Arbor Wood, July 2010 M62 Junction 6 Improvements, Huyton, Merseyside, Wetland Vegetation Monitoring, February 2010;
Animal mortality data	Animal Carcass Data (2010, Jan-Apr 2011, Jan-Aug 2012) provided by MAC
Post opening Non-motorised User (NMU) Audit or Vulnerable User Survey	M62 Junction 6 Improvements. Non Motorised User Final Audit Report (Revision 0), July 2009;
Any information regarding environmental enhancements to streetscape townscape for bypassed settlements.	N A
Employers Requirements Works Information – environment section	Not received
Scheme Newsletters or publicity material for the scheme.	Not received

Appendix C - Comparison of selected OYA and FYA pictures

Link A Landscape Planting

OYA

FYA

Windy Arbor Wood Mitigation

Note that the pictures are taken from different locations but the dead trees clearly identify the site as the same in each instance.

OYA

FYA

Link C Mitigation Area

OYA

FYA

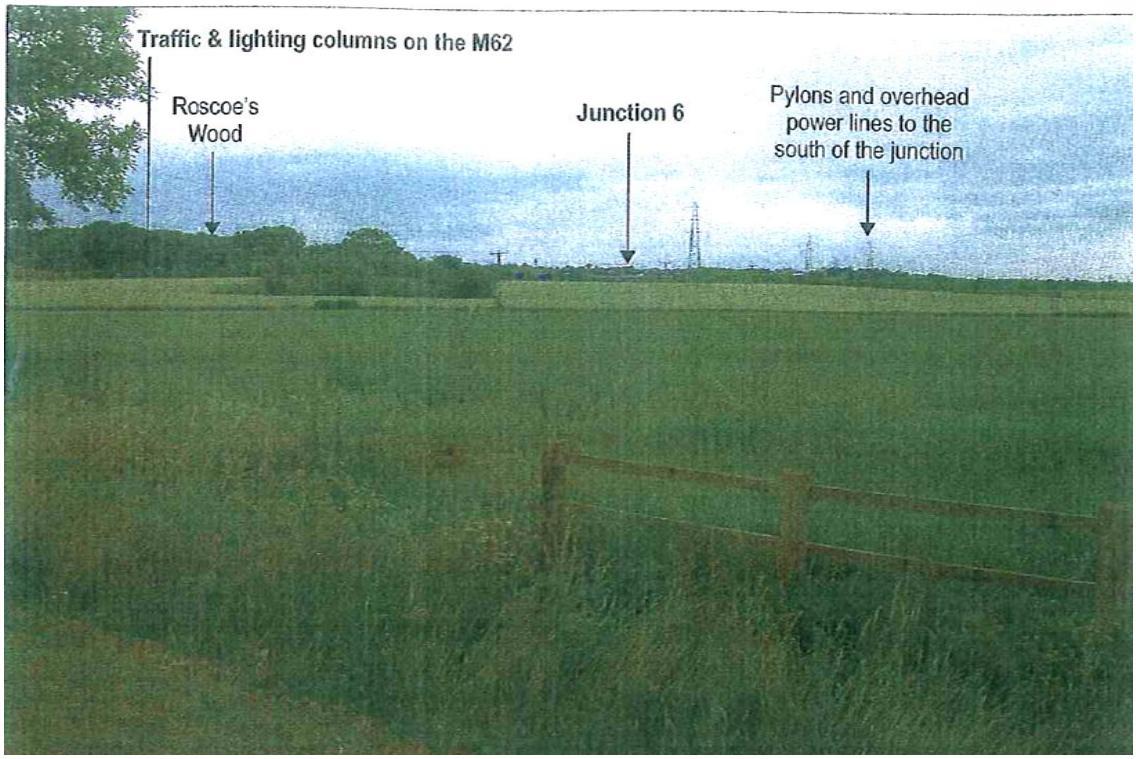
Saturated Embankment

OYA

FYA

View From Whitefield Road Visual Receptors

ES



OYA

FYA

Note that despite the difference in zoom compared to previous pictures the FYA picture clearly shows that the scheme is not immediately obvious from these receptors, confirming that the scheme is no worse than expected from a visual perspective.

Appendix D - Summary of Predicted Biodiversity Effects, Proposed Mitigation and Evaluation of Impacts

Table F.1 - Summary of predicted biodiversity effects, proposed mitigation and evaluation of impacts

Aspect	Predicted Impact	Mitigation Measures	Evaluation
Vegetation and Habitats	The most significant impacts upon habitats were predicted to be those likely to affect broadleaved woodland habitat at Windy Arbor Wood (local Biodiversity Action Plan, BAP habitat and TPO). A moderate adverse impact on this was expected, through fragmentation and subsequent isolation of the southern part of the woodland. A total of 1,700m2 of Windy Arbor Wood would be lost.	Creation of grassland and woodland habitats would aim to recreate a similar composition to that which is already naturally occurring across the survey area. Therefore, a woodland community (W10 designation) would be replicated in areas near to Windy Arbor Wood, and where possible natural regeneration would be encouraged, augmented with translocated bluebell bulbs. To mitigate losses of hedgerow, new hedgerow sections would be created, particularly to the north of the M62, and parts of hedgerow to be removed would be translocated within the scheme (south embankment of Link C) to provide immediate habitat structure where this is necessary. A total of 600 linear metres of hedgerow would be planted. Species rich grassland would be established by creating a sward with an even mix of monocotyledons (grasses) and dicotyledons (flowering plants).	It is understood that in terms of habitat quantities; • 200 metres of mature hedgerow was removed and replanted; • 600 metres of native species hedgerow has been planted; • 3 hectares of native broadleaved woodland; and • 2.5 hectares of wildflower planting. It is understood that in May 2009, a vegetation and habitat health survey together with photographic monitoring was undertaken (as reported in the Monitoring of the Translocation of Monoliths and Bluebells from Windy Arbor Wood, February 2010). The report noted that tree planting and relocation, including hazel stools, in the receptor site was generally high (90%). It was recommended that failed tree species be replaced. Ongoing monitoring was also recommended. Monitoring Report (July 2010) recommended that one large pit planted oak and failed translocated species be replaced during October to February. It was also stated in this report that future monitoring should continue during future management operations by on-site personnel. It was confirmed during the site visit that the proposed Translocation area has been implemented to the west of Windy Arbor Wood. Bluebells were noted to be establishing within the translocation area and also within the verges adjacent to the woodland. It is suggested that the area is re-considered for the FYA report. Establishment of the habitats is reported within the Wetland Monitoring Report (February 2010) which reports the results of monitoring surveys undertaken in September 2009 at the wetland areas created at both Link A and Link C. It was reported that in both locations wetland plants and their abundance was lower than expected. Overall the wetland area in Link C was reported as being in poor condition. Within the Link C Monitoring Report it was recommended that replanting and re-seeding takes place and also that the ditches and planting wetland areas are monitored during 2010. No visible signs of replanting re-seeding were noted during the site visit. During the site visit it was noted that species were establishing within the area at Link A, however some noxious weeds were present. It was also noted that whilst tree species were establishing in the attenuation area in Link C, it appeared as though the wildflower grassland areas were not flourishing. The translocation hedgerow appeared to be re-establishing The presence of hedgerow planting was confirmed during the site visit. Generally the double staggered planting hedgerows were noted to be establishing satisfactorily. Establishment of the habitats should be considered as part of the FYA report.
	It was predicted that a small stretch of species rich hedgerow (UK and Local BAP habitat) adjoining the woodland to the west would also be lost. Moderate adverse impacts would be incurred at the species rich hedgerow along Ox Lane, through the severance of the main hedgerow that runs parallel with the Lane and further dissections of ancillary hedges that run at right angles to this.		
	Two grassland (local BAP habitat) patches along the embankment west of the M57 and A5300 (near to the roundabout) were recorded has being of greater consideration, due to their higher ecological value attributed to greater species richness.		
	Two small grassland patches within the plantation south west of Junction 6 were noted for their diverse flora. It was assessed that these grassland areas would be lost to the development, resulting in a slight adverse impact.		

Aspect	Predicted Impact	Mitigation Measures	Evaluation
Birds	Breeding birds of conservation importance, including yellowhammer, linnet, reed bunting, song thrush, willow warbler and bullfinch were predicted to be affected by the road construction (through noise disturbance), although clearance of nesting habitat prior to the breeding bird season would offset any adverse impact.	All affected vegetation would be removed after the bird breeding season – between mid August and late February and maintained in an unfavourable state for birds until construction starts. Two wetland areas would be created as part of the mitigation – a large wetland within Link C, approximately 0.7 hectares in surface area with a maximum depth of 1.7 metres and extensive shallows and a smaller series of 'scrapes' alongside Link A. It was reported that this habitat would provide opportunities for breeding birds.	It is understood that vegetation clearance was undertaken outside the bird breeding season or under the supervision of an ecologist. The wetland areas have been created as proposed, and during the site visit a pair of breeding Canada Geese was noted. A series of bird boxes were also noted during the site visit within Link C, near to Dacre's Bridge Lane.
Bats	No bat roosts were identified during the ES. Several trees along Ox Lane, and a stone wall at Windy Arbor Wood were however assessed as having high roosting potential. It was predicted that Bats (local BAP species), which forage within the woodland and the adjoining hedgerow and connected fields, would be affected by the construction of Link A, resulting in a moderate adverse impact. Severance of commuting routes and destruction of foraging habitat was assessed as the main influencing factors. Species rich hedgerow along Ox Lane, through the severance of the main hedgerow that ran parallel with the Lane and further dissections of ancillary hedges that run at right angles to this. The damage to this habitat, caused by the creation of Link C, was assessed as also impacting upon protected species as Bats were recorded as using the hedgerow network for commuting.	Demolition of the dry stone wall at Windy Arbor Woods would be undertaken by hand with a suitably qualified bat worker present and be carried out between September and October. A replacement stone wall should be constructed with the material from that of the dismantled wall. Culverts and bridges, where constructed or modified, would be adapted to have suitable crevices for roosting bats. To encourage bats to pass safely between Link C and the surrounding land, a strategy that encourages bats to use the underpass along Ox Lane was necessary, achieved through sensitive landscaping that leads the bats through the underpass and also the appropriate use of lighting. Translocated trees (monoliths) made safe by the removal of side branches and deep anchorage, would be positioned away from the carriageway and in areas close to existing bat activity.	It is understood that stone walls were demolished under supervision. At the time of writing it has not been established whether the bridges and culverts were constructed with suitable crevices for bat roosting potential. Planting has generally been undertaken in line with that proposed in the ES, including to the south of Link C. Translocated trees (monoliths) were noted in several locations during the POPE site visit. It is understood that the monitoring of Bats commenced in summer 2009, during the surveys a significant level of common Pipistrelle bat commuting and foraging was recorded within the dissected section of Windy Arbor Wood and foraging within the Link C area. It was reported that no bat roosts were identified within Link C and therefore it is likely that bats are safely commuting across the new slip road to forage. No bats were recorded commuting in the new Ox Lane underpass. It was reported that bats are unlikely to use the underpass because it contains artificial lighting. It was confirmed that the lighting was included due to health and safety requirements. Further monitoring is recommended within the monitoring report. These should be made available for the FYA report.
Barn Owl	Moderate adverse impacts were anticipated at the species rich hedgerow along Ox Lane, through the severance of the main hedgerow that runs parallel with the Lane and further dissections of ancillary hedges. The damage to this habitat, caused by the creation of Link C, would also impact upon protected species, including Barn owls which were recorded as using the hedge for foraging.	To discourage Barn owls foraging near to the carriageway of Link C and divert them away from Link C. Planting of shrubs on the embankments and the retention of existing vegetation immediately south of the southern embankment of Link C.	Planting has generally been undertaken in line with that proposed within the ES. It was noted during the site visit that substantial areas of vegetation to the south of Link C have been retained and hedgerow planting was noted to the south of Link C. Woodland edge species have been planted on the southern embankment of Link C. No barn owl casualties have been recorded by the MAC post opening.

Aspect	Predicted Impact	Mitigation Measures	Evaluation
Great Crested Newts (and other amphibia)	Great crested newts were identified at a pond to the south of Ox Lane, which was assessed as having terrestrial habitat that extended into the area of the development footprint of Link C. A slight adverse impact was anticipated as a result of disturbance to this terrestrial habitat. It was reported that most of the other ponds, although not supporting great crested newt, did support populations of toad, common frog and smooth newt.	Great crested newt mitigation would be subject to a method statement that involved the trapping and exclusion within 500m of Pond 5 from Link C during the construction, and the subsequent provision of refugia and enhancement of terrestrial habitat for the species. Replacement shrub planting on the southern embankment of the link, together with the enhancement of the rough grassland and hedge banks either side of the link. A DEFRA Licence would be sought. As part of this the extent of any further mitigation should be agreed.	On the GCN Licence Return Form (dated 13th November 2008) it was confirmed that great crested newt exclusion fencing was installed in Spring 2007 and that 4 ha of potential terrestrial habitat was destroyed and 3.6 ha restored. It was reported in the Wetland Monitoring Report (February 2010) with regards to Link C, Ditch 4, which was constructed as part of the GCN DEFRA Licence method statement as a seasonal ditch to direct newts to the Ox Lane underpass that it was in a barren state and of severely limited value as a wildlife corridor. It was recommended within the report that monitoring of Ditches 2 and 4 should be undertaken during April 2010. During the site visit it was noted that this ditch was not wet but was vegetated.
Water Vole and Otter	None recorded during survey.	A pre-construction survey would be necessary to ensure that riparian mammals have not spread into the catchment covered by the study area. All culverts must include mammal ledges for their safe passage during flood conditions. Where this was not feasible, an underpass would be constructed on dry land adjacent to the culvert with appropriate landscaping to guide the mammals to the entrance hole.	POPE is not aware whether a Riparian mammal survey was undertaken prior to the commencement of construction. It is understood that no culverts were constructed as part of the scheme.
Invasive Species	No specific impact identified as part of the ES.	A method statement for the treatment of Japanese knotweed was to be drawn up.	It is understood that Japanese knotweed was demarcated during construction and a relevant method statement, including Tool Box Talks, were in place. Japanese knotweed was confirmed to be present, near Windy Arbor Road, within the Translocation of Monolith and Bluebells Monitoring Report (February 2010). No Japanese knotweed was noted during the Monitoring report (July 2010) for this area. It is advised in the Translocation of Monoliths and bluebells monitoring report July 2010 that the future management of Spanish bluebells be included within the HEMP. Also within the July 2010 monitoring report it is advised that the landowner of Windy Arbor Wood be contacted in relation to Himalayan balsam, which is located within the wood, outside the Receptor site.
Reptiles	No specific impact identified as part of the ES.	A pre-construction survey conducted between March and May would be necessary.	POPE is not aware whether a reptile survey was undertaken prior to the commencement of construction.

Appendix E - Glossary

The following table details the acronyms and specialist terms used within the context of this report

Term	Definition
AADT	Annual Average Daily Traffic. Average of 24 hour flows, seven days a week, for all days within the year.
Accessibility	Accessibility can be defined as 'ease of reaching'. The accessibility objective is concerned with increasing the ability with which people in different locations, and with differing availability of transport, can reach different types of facility.
AM	denoting the morning peak period
AQS	Air Quality Strategy for England, Scotland, Wales and Northern Ireland
AST	Appraisal Summary Table. This records the impacts of the scheme according to the Government's five key objects for transport, as defined in DfT guidance contained on its Transport Analysis Guidance web pages, WebTAG
AWT	Average Weekday Traffic. Average of Monday to Friday 24 hour flows.
BAP	Biodiversity Action Plan. An action plan for declining and endangered species and habitats and targets for recovery.
BCR	Benefit Cost Ratio. The ratio between the monetised benefits and costs of a scheme, used as a measure of High Value for Money in economic terms
CEMP	Construction Environment Management Plan
COBA	COst Benefit Analysis – a computer program traditionally used to compare scheme costs with the monetary benefits of savings in time, vehicle operating costs and collisions. COBA may also be used to calculate safety benefits only, if time and operating cost benefits are assessed by other means.
DfT	Department for Transport. A Government department.
Discounting	Discounting is a technique used to compare costs and benefits that occur in different time periods and is the process of adjusting future cash flows to their present values to reflect the time value of money. A standard base year needs to be used, which is 2002 for POPE.
ECI	Early Contractor Involvement, in which the contractor leads a design team in the early stage of the design process.
EST	Evaluation Summary Table. In POPE studies, this is a summary of the evaluations of the TAG objectives using a similar format to the forecasts in the AST.
GCN	Great Crested Newt
HATRIS	Highways England Traffic Information System

Heavy Vehicle	In this study, those goods vehicles identified by survey enumerators as having four or more axles, or two axles with twin rear wheels, together with buses and coaches.
HEMP	Handover Environmental Management Plan
Highways Agency	An Executive Agency of the Department for Transport, responsible for operating, maintaining and improving the strategic road network in England. Known as Highways England from April 2015.
IP	Inter Peak, the time between the AM and PM peaks
Light vehicle	In this report, all vehicles other than those defined as heavy.
LEAP	Landscape and Ecology Aftercare Plan
LEMP	Landscape and Ecology Management Plan
MAC	Managing Agent Contractor. A company appointed by Highways England to maintain trunk roads in a defined area.
NATA	New Approach to Transport Appraisal. Used since 1998.
NMU	Non-Motorised User. Pedestrians, cyclists and equestrians.
NRTF	National Road Traffic Forecasts. NRTF97 refers to the forecasts made in 1997.
NTS	Non Technical Summary. A brief report summarising the principle sections of the Environmental Statement in non-technical language.
Objective 1 Area	An area designated for the receipt of maximum assistance from the European Regional Development Fund, from 1999 to 2006.
OPR	Order Publication Report
PAR	Project Appraisal Report. A PAR is prepared for schemes costing less than £ million.
PARAMICS	Transport modelling software based on microsimulation, that is the representation of individual vehicle movements through a network.
PEARS	Program for the Economic Assessment of Road Schemes. An economic assessment package that has been specifically designed for use with the output from traffic microsimulation models. Maintained by Transport Scotland.
PIA	Personal Injury Collision. A road traffic collision in which at least one person required medical treatment.
PIA/mvkm	PIA/mvkm is the number of PIAs per million vehicle kilometres where 'vehicle kilometres' are the number of vehicles using a section of the road multiplied by the length of the road.
PM	evening peak period
POPE	Post Opening Project Evaluation, before & after monitoring of all major highway schemes in England.

PROW	Public Right of Way
PBV	Present Value of Benefits. The value of future monetary benefits, typically over a 60-year period, discounted to a designated present-value year (e.g.2002).
PVC	Present Value of Costs. Costs discounted to a designated present-value year (e.g. 2002).
RTF08	The DfT Road Traffic Forecasts 2008, from the National Transport Model.
Rule of Half	A technique for calculating time benefit where a scheme results in extra traffic, in which benefits to additional trips are averaged, by assuming each receives half the benefit per trip for existing trips.
SBI	Sites of Biological Importance. Sites complying with local authority selection criteria, for inclusion as non-statutory sites for nature conservation.
Screenline	An imaginary line drawn across a transport corridor used to determine flows between areas on either side. Each road crossed by the screenline is monitored by a traffic count (ATC).
Severance	Community severance is the separation of adjacent areas by road or heavy traffic, causing negative impact on non-motorised users, particularly pedestrians.
SMR	Sites and Monuments Record. The SMR contains information on sites and finds of archaeological interest.
SSSI	Site of Special Scientific Interest. Designated for biological or geological importance.
STATS19	A database of injury collision statistics recorded by police officers attending collisions
TEMPRO	Trip End Model forecasts issued by the DfT.
TERN	Trans-European Road Network, designated by the European Union as being important for the movement of long-distance traffic.
TRADS	Traffic Information Database
Vehicle hours	Vehicle hours refers to the total time spent by all vehicles using a road and is expressed normally as a yearly value. For example, if 10,000 vehicles a day used a route with a 6 minute journey time, then the route's vehicle hours for the year would be 365,000.
VOC	Vehicle Operating Costs. These include fuel and other items such as oil, tyres, maintenance and depreciation.
vpd	Vehicles Per Day
VOT	Value Of Time
webTAG	Department for Transport's website for guidance on the conduct of transport studies at http://www.webtag.org.uk/