

Bedale, Aiskew and Leeming Bar Bypass

Monitoring and Evaluation Plan Final

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1 Introduction

1.1 Background

The Department for Transport (DfT) is responsible for demonstrating that the funding it provides to local-level investment represents value for money for the taxpayer. It must also ensure that lessons learnt from this evidence are used to inform future decision making. The DfT approach to achieving this varies to reflect the nature and scale of the programme under consideration.

The funding of Local Authority Major Schemes constitutes a substantial investment for government. Evaluating the investment must satisfy the following objectives:

- *Provide accountability for the investment;*
- *Evidence future spending decisions;*
- *Learn about which schemes deliver cost-effective transport solutions;*
- *Enhance the operational effectiveness of existing schemes or future schemes;*
- *Improve future initiatives based on learning.*

The recent National Audit Office (NAO) report on Local Authority Major Schemes highlighted the importance of evaluation for ensuring transparent and accountable decision making. The report concluded that whilst the DfT has made advances in this area, there is still scope for improvement in the coverage, quality and resourcing of evaluations.

In September 2012, the DfT released an updated framework to meet responsibilities for the evaluation of Local Authority Major Schemes, entitled “Monitoring and Evaluation Framework for Local Authority Major Schemes” (to be known as “the DfT’s guidance” throughout the remainder of this report).

The DfT’s guidance is designed to make the process as consistent and proportionate as possible. It also aims to be complementary with the devolution of decision making, developing a consistent evidence base to enable a clear demonstration that intended outcomes and impacts have been delivered effectively, and assess whether scheme objectives have been achieved. This will provide valuable evidence to support future funding of such investment streams.

A consistent monitoring approach across all Local Authority Major Schemes will also facilitate programme level analysis to be carried out by the DfT on a regular basis, enabling dissemination of good practice and lessons learnt across the investment programme.

The framework sets out:

- *The expectations for the monitoring and evaluation of Local Authority Major Schemes and engagement with DfT*
- *Standard Monitoring requirements*
- *Enhanced Monitoring requirements*
- *Fuller Evaluation requirements*
- *The schemes selected for Fuller Evaluation*
- *Monitoring and Evaluation Plan requirements*

1.2 Report Purpose

This report sets out the Monitoring and Evaluation Plan for the proposed Bedale, Aiskew and Leeming Bar Bypass (referenced throughout the remainder of this report as “the Scheme”).

1.3 Sources of Information

The following documents have been consulted as part of the development of the Monitoring and Evaluation Strategy:

- *Bedale, Aiskew and Leeming Bar Bypass (BALB) - Major Scheme Business Case;*
- *Monitoring and Evaluation Framework for Local Authority Major Schemes (DfT, September 2012);*
- *Best Practice Guidance for Planning the Fuller Evaluations of Local Authority Major Schemes (Rev0) (DfT, 2013);*
- *HMT Magenta Book; and*
- *Logic Mapping Hints and Tips (Tavistock Institute, October 2010)*

1.4 Report Structure

The remainder of this document is structured as follows:

- *Chapter 2: Proposed Scheme;*
- *Chapter 3: Monitoring and Evaluation Requirements;*
- *Chapter 4: Logic Mapping;*
- *Chapter 5: Standard Monitoring Approach;*
- *Chapter 6: Data Collection; and*
- *Chapter 7: Governance*

2 Proposed Scheme

2.1 Proposed Scheme

The proposed scheme consists of a 4.8 km single carriageway (7.3m wide) link from the A684, north of Bedale, to the A684, east of Leeming Bar. The scheme crosses the A1(M) at approximately the midpoint of the bypass, where it will connect to a new grade separated interchange at Junction 51 which has recently been constructed as part of the A1 upgrade to motorway scheme.

The western section of the proposed scheme ties into the existing A684 adjacent to Bedale Golf Club, immediately north of Bedale, with a 3-arm roundabout forming the junction with the existing network. The scheme then heads east, rising and falling via approach embankments and a multi-span bridge to cross Bedale Beck and the Wensleydale Railway. The route follows a near straight alignment at ground level intersecting a track at Sand Hill Farm, before a large reverse curve on the approach to the western roundabout of the A1 (M) Leeming junction.

The central section is formed by the A1(M) underpass and the link road from the A1(M) to Leases Road. Essentially the road remains in a cutting to the east of the A1(M) and meets a new roundabout at Leases Road before passing onto a low embankment at Low Street.

It is proposed to stop-up Low Street, to the south of the bypass, using a turning head adjacent to Ashville; Low Street would be diverted to tie in to the northern spur of the Leases Road roundabout. This produces a much improved arrangement in terms of the access to Low Street North.

From Low Street the bypass remains on a low embankment to its second crossing over the Wensleydale Railway where it rises and falls using structures and approach embankments. The road returns to ground level where a 3-arm roundabout forms the connection to the existing A684.

As part of the scheme, provisions for non-motorised users (NMUs) are being included on the eastern section of the bypass. The shared NMU route along the scheme will link to, and provide a continuation of, route 71 of the National Cycle Network.

The scheme location is shown in **Figure 2-A**.

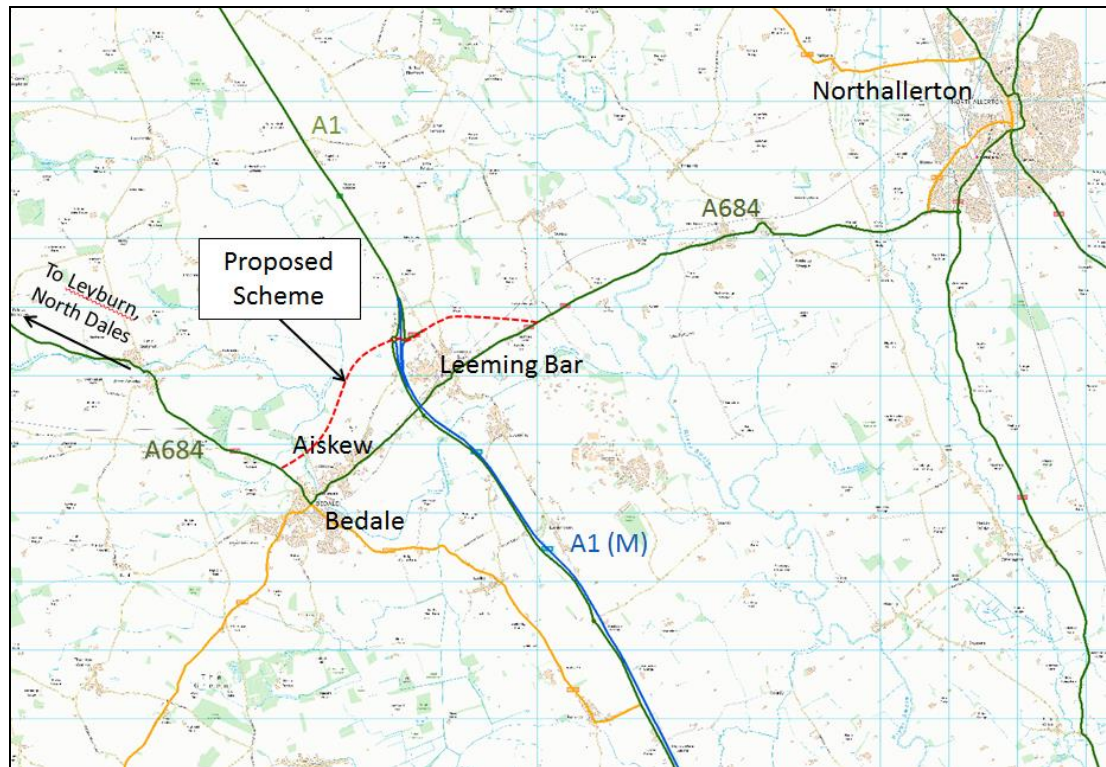


Figure 2-A: Scheme Location

2.2 Scheme Objectives

The published objectives of the proposed scheme are as follows:

- To reduce traffic congestion in the communities bypassed by the proposed scheme;
- To provide stimulus for diversification and regeneration of the rural economy, particularly in relation to tourism;
- To reduce environmental and road safety problems in and on the approaches to the communities of Bedale, Aiskew and Leeming Bar;
- To improve access to Leeming Bar Industrial Estate; and
- To improve access from the A1(M) to communities and areas west of the A1 (North Dales), and to the east of the A1, including the county town of Northallerton.

3 Monitoring and Evaluation Requirements

3.1 Introduction

The DfT Monitoring and Evaluation Framework guidance sets out three tiers of Monitoring and Evaluation:

- *Standard Monitoring*
- *Enhanced Monitoring*
- *Fuller Evaluation*

All Local Authority Major Schemes approved for funding as part of the 'Supported Pool' in 2010, or as part of the 'Development Pool' process in late 2011 / early 2012, are required to undertake Standard Monitoring.

Those schemes that cost more than £50m, or which are anticipated to have significant impact upon particular indicators (e.g. local air quality), are required to undertake Enhanced Monitoring.

Selected schemes, as identified by the DfT, are also required to undertake a Fuller Evaluation. This consists of assessments of the delivery process, outcomes and impacts, and value for money. These schemes have been selected based on the scale of investment, the nature of the scheme and the benefits to be gained from the evaluation evidence generated.

This scheme only requires Standard Monitoring and Evaluation. The requirements for this tier are summarised below. Full details of the proposals to satisfy those requirements are set out in Chapter 5.

3.2 Inputs, Outputs, Outcomes and Impacts

Before outlining the requirements for Monitoring and Evaluation, it is worth explaining four terms that are used, namely Inputs, Outputs, Outcomes and Impacts, as described below:

- **Inputs:** What is being invested in terms of resources, equipment, skills and activities undertaken;
- **Outputs:** What has been delivered and how it is being used, such as roads built, bus services delivered;
- **Outcomes:** Short-term intermediate effects, such as changes in traffic flows, modal shifts; and
- **Impacts:** Longer-term effects on wider social and economic outcomes, such as supporting economic growth.

3.3 Standard Monitoring

Table 3-A summarises the DfT's Standard Monitoring requirements for all Local Authority Major Schemes.

Item	Stage	Data Collection Timing
Scheme Build	Input	During delivery
Delivered Scheme	Output	During delivery / post opening
Costs	Input	During delivery / post opening
Scheme Objectives	Output / Outcome / Impact	Pre or during delivery / post opening (up to 5 years)
Travel Demand	Outcome	Pre or during delivery / post opening (up to 5 years)
Travel Times and Reliability	Outcome	Pre or during delivery / post opening (up to 5 years)
Impact on the Economy	Impact	Pre or during delivery / post opening (up to 5 years)
Carbon	Impact	Pre or during delivery / post opening (up to 5 years)
Stage Inputs: What is being invested in terms of resources, equipment, skills and activities undertaken Outputs: What has been delivered and how it is being used, such as roads built, bus services delivered. Outcomes: Intermediate effects, such as changes in traffic flows, modal shifts. Impacts: Longer-term effects on wider social and economic outcomes, such as supporting economic growth).		
	Reported within 'One year after Report' (released 1 – 2 years post scheme implementation)	
	Reported within both the 'One year after Report' and 'Final Report' (~5 years after scheme implementation).	

Table 3-A: Standard Monitoring Requirements

Noise, local air quality and accidents are covered by enhanced monitoring and evaluation. Other aspects, such as travel behaviour, impacts on the economy and impacts on carbon, are covered in detail by fuller monitoring and evaluation.

4 Logic Mapping

4.1 Introduction

In order to support the monitoring and evaluation process, scheme promoters need to clearly articulate the assumptions which underpin how the scheme will deliver the intended outcomes and impacts. The DfT Monitoring Framework guidance recommends logic mapping is undertaken by scheme promoters to present their scheme's causal pathways, whereby the chain of connections showing how a scheme is expected to achieve desired results and anticipated benefits is illustrated.

4.2 Method

Logic mapping is a systematic and visual way of presenting the key steps required in order to turn a set of resources or inputs into activities and outputs, which are, in turn, designed to lead to a specific set of changes or outcomes / impacts. The aim is to articulate the underlying causal theory based on the assumptions and evidence underpinning the rationale for the scheme.

Causality is central to logic maps, as events are ordered in such a way that the presence of one event or action leads to, or causes, a subsequent event or action. Logic maps should seek to:

- *Articulate what needs to happen in order for the anticipated outcomes and impacts to be achieved;*
- *Provide a clear line of sight between the inputs and the anticipated impacts;*
- *Visualise unintended effects;*
- *Highlight gaps in the evidence base and therefore help to focus evaluation effort accordingly;*
- *Outline the stages between the inputs and the desired impacts, which provides a transparent assessment framework within which existing evidence and evaluation results can be combined to provide answers to the evaluation questions; and*
- *Point to where the links between the inputs, outputs, outcomes and impacts are unclear, which aids delivery as well as evaluation design.*

4.3 Logic Map

The logic map for the Bedale, Aiskew and Leeming Bar Bypass is provided as **Figure 4-A** and will be used to aid the development of the Monitoring and Evaluation strategy for the scheme.

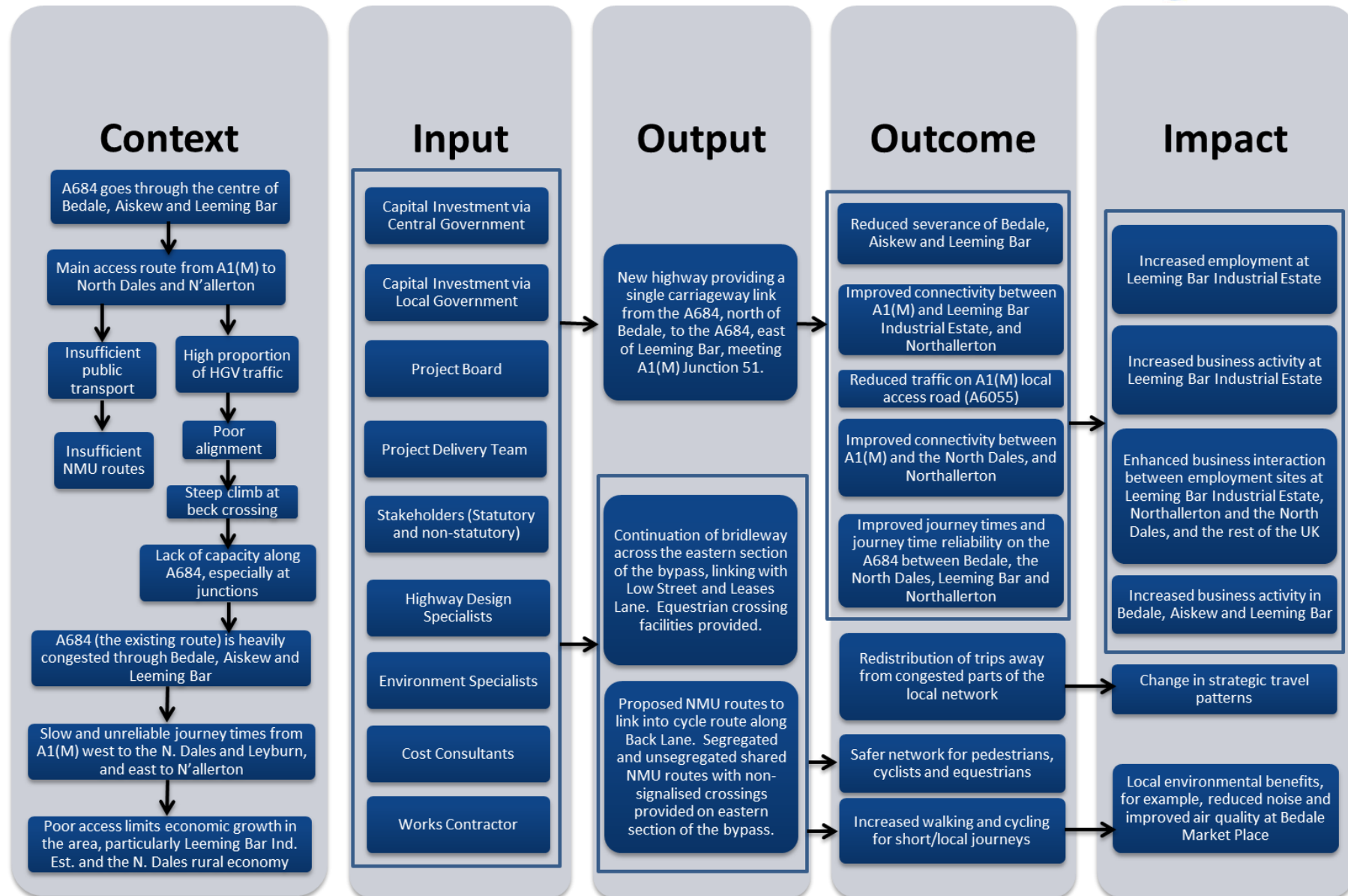


Figure 4-A: Logic Map

5 Standard Monitoring Approach

5.1 Introduction

This chapter details the proposed methodology and the reporting mechanisms to be adopted for Standard Monitoring. Data collection requirements and programme are discussed in Chapter 6.

The Standard Monitoring approach is discussed under the following headings:

- *Scheme Build*
- *Delivered Scheme*
- *Scheme Costs*
- *Scheme Objectives*
- *Travel Demand*
- *Travel Times and Reliability*
- *Impact upon the Economy*
- *Carbon*

The Evaluation Manager will be responsible for the overall coordination and management of the Monitoring and Evaluation process. They will not be involved in the day to day scheme delivery, but will be a visible member of the team who is able to objectively assess the various elements of the Monitoring and Evaluation metrics. Further details of the Evaluation Manager's role are discussed in section 7.3.

5.2 Scheme Build

Monitoring of the Scheme Build process will form a key component of the ongoing delivery of the Scheme. The evaluation of the Scheme Build will be published within the 'One Year After' Report.

Key information and evidence to support a transparent evaluation of the Scheme Build process will be collected throughout the delivery process.

Table 5-A provides a summary of the key items that will be included within the evaluation of Scheme Build. Information will be documented as part of regular progress meetings (monthly), Project Board meetings (every two to three months), Cabinet papers and Gateway Reviews at key milestones.

The Project Manager will be responsible for ensuring details are readily available and clearly documented for supply to the Evaluation Manager.

Metric	Details
Programme	<p>The scheme delivery process will be monitored against the proposed delivery programme put forward as part of the Best and Final Funding Bid / confirmation of funding.</p> <p>Key milestones in the delivery process will be used to understand whether the Scheme Build has met expectations and details of any variances will be documented and discussed.</p>
Stakeholder management	<p>The evaluation of Stakeholder management will focus upon the effectiveness of engagement. Both statutory bodies and non-statutory stakeholders, such as the public and local employers, will be asked for their views on whether the engagement was thorough, open, at the right times etc..</p> <p>Details of Stakeholder engagement undertaken during the delivery process will be published along with key findings. This will be used to inform potential lessons learned from effective consultation and to clearly demonstrate its value.</p>
Risk management	<p>The effectiveness of the risk management process will be evaluated at key stages in the delivery process e.g. planning application / consent, funding / business case submissions, Gateway Reviews and during construction.</p> <p>It will consider the following:</p> <ul style="list-style-type: none"> • Were all risks identified in the early stages of scheme development? • If new risks became apparent during the course of scheme development or delivery, could they have been reasonably foreseen? • How were risks managed during scheme development and delivery? Were actions clearly recorded? Were actions taken by the nominated person responsible? • Was the reporting of risks open and transparent? • What worked well and what are the lessons learnt for other schemes? <p>This will be used to inform the overall impact of risk upon the delivery process, the appropriateness of risk assumptions within the scheme cost estimates and use of Optimism Bias uplift within the scheme appraisal.</p>
Scheme benefits	<p>A comparison will be made between the scheme, as it was originally proposed at Programme Entry, versus that which evolved during the Scheme Build process. This will identify whether, for example, de-scoping has occurred to keep within budgets, resulting in some beneficiaries losing out.</p>

Table 5-A: Standard Monitoring - Scheme Build

5.3 Delivered Scheme

Details of the delivered scheme will be provided within the 'One Year After' Report. This will provide a detailed comparison of the proposed scheme at funding approval, detailed design and the delivered scheme.

The design team will work alongside the construction team to identify and document the outturn deliverables against the planned deliverables.

The Project Manager will be responsible for ensuring details are readily available and clearly documented for supply to the Evaluation Manager.

Table 5-B provides a summary of the key items that will be included within the evaluation of the Delivered Scheme.

Metric	Details
Implemented scheme	The following information will be documented: <ul style="list-style-type: none"> • Full description of implemented scheme • Plans of the delivered scheme • Plans of individual elements as required
Changes	Identification of any changes to the scheme since funding approval. For example, changes to route and/or design of the scheme and details of the reasons for any such changes.
Intended beneficiaries	A qualitative assessment of whether the scheme has reached the intended beneficiaries e.g. road users, pedestrians, cyclists, and both developers and residents in Bedale, Aiskew and Leeming Bar.
Mitigation	Identification of changes to mitigation measures (e.g. on landscape, noise mitigation etc.) with a clear description of the changes and the reasons for implementation (or non-implementation).

Table 5-B: Standard Monitoring - Delivered Scheme

5.4 Scheme Costs

A detailed account of the scheme costs will be provided within the 'One Year After' Report and Final Report. This will provide a detailed comparison of the cost estimates at funding approval, the detailed design, the outturn values upon delivery of the scheme, and of maintenance costs, 4-5 years after scheme opening.

The design team and the cost consultants will work alongside the construction team to identify and document the outturn costs against the cost estimates.

The Project Manager will be responsible for ensuring details are readily available and clearly documented for supply to the Evaluation Manager.

Table 5-C provides a summary of the key items that will be included within the evaluation of the Scheme Costs.

Metric	Details
Outturn costs	Outturn investment costs broken down into key elements as put forward for the Major Scheme funding bid.
Risk	Details of the manifestation of identified risks within each element of the scheme cost estimate.
Savings	Identification of those cost elements with savings, and identification of the reasons for those cost savings.
Overruns	Analysis of those cost elements with overruns, and identification of the reasons for those cost overruns.
Maintenance costs	Comparison of outturn maintenance or other capital costs with those forecast, analysis of any variations from forecast and any unanticipated costs identified.

Table 5-C: Standard Monitoring - Scheme Costs

5.5 Scheme Objectives

DfT guidance suggests that up to three main objectives of the scheme should be evaluated against appropriate metrics to enable an assessment to be made of how scheme objectives have been realised.

The scheme objectives to be evaluated are;

- Objective 1** To reduce traffic congestion in the communities bypassed by the proposed scheme;
- Objective 2** To reduce environmental and road safety problems in and on the approaches to the communities of Bedale, Aiskew and Leeming Bar;
- Objective 3** To improve access from the A1(M) to communities and areas west of the A1 (North Dales), and to the east of the A1, including the county town of Northallerton.

The recommended evaluation approach for each of the scheme objectives are outlined below.

The Project Manager will be responsible for ensuring details are readily available and clearly documented for supply to the Evaluation Manager.

The evaluation of the objectives will be presented within both the 'One Year After' Report and the Final Report.

5.5.1 Objective 1: Reduce congestion in Bedale, Aiskew and Leeming Bar

Traffic exiting the A1(M) at junction 51 bound for Leyburn, Hawes and the North Dales must use a local access road from the junction and then the A684 through the centres of Aiskew and Bedale. Likewise, traffic from the A1(M) heading east towards Northallerton currently has to travel either along the local access road linking to the A684, or along Leases Road. Both routes to Northallerton go through the centre of Leeming Bar. At present, this is the most direct access route between Northallerton and the A1(M).

The proposed scheme will remove such traffic from the A684 in Bedale, Aiskew and Leeming Bar, linking with the A684 at new roundabouts to the east of Leeming Bar and to the north of Bedale. In order to ascertain if the scheme has been effective in this regard, and thus reduced congestion in these communities, a series of traffic counts and journey time surveys are proposed.

Three screen-lines of traffic counts are proposed so that, by undertaking counts both pre-construction and after opening, the scheme can be assessed to quantify three potential changes in traffic once the scheme is open:

- a) The volume of traffic on the scheme;
- b) Traffic relief on the A684 and other nearby roads; and
- c) Whether there has been any change in total traffic between the A1(M) and Northallerton, and the A1(M) and the North Dales.

Existing permanent Automatic Traffic Counters (ATCs) will be used in conjunction with temporary ATCs installed for a neutral month, to derive weekday AM (0700-1000hrs), PM (1600-1900hrs) and 12hr flows, as well as 12hr flows on a Saturday. As mentioned above, surveys will be undertaken pre-construction to establish the baseline conditions, within 12 months of the scheme opening and 4 to 5 years after the scheme has opened. The positions of the traffic counters are shown in **Figure 5-A**.

Journey times and journey time reliability will be analysed using data obtained from TrafficMaster plc. Data will be collected in the same neutral month as the Travel Demand data. Analysis will be undertaken for weekday peak hours i.e. 0800-0900hrs and 1700-1800hrs. Analysis will also be undertaken on a typical Saturday within the same neutral month for 1100-1200hrs.

Analysis will be undertaken pre-construction, within 1 year after opening and 4 to 5 years after opening.

The Team Leader for the Journey Times Data Collection will be responsible for ensuring the above data is readily available and clearly documented for supply to the Evaluation Manager.

The evaluation of the Travel Time and Reliability metrics will be provided within both the 'One Year After' Report and the Final Report.

5.5.2 Objective 2: Reduce environmental and road safety problems

The two main environmental problems caused by the high volume traffic flow through Bedale, Aiskew and Leeming Bar, and subsequently congestion, are noise and air quality.

The Environmental Statement (ES) written for the scheme identifies PM₁₀, NO_x and NO₂ as being the most significant pollutants to be considered. The UK Air Quality Archive presents background concentration maps for the years 2006 to 2020 for these three pollutants. The baseline used for the Environmental Statement was derived in 2008, and an addendum to the ES was produced as a result of the updated traffic model in August 2011. The addendum to the ES states that the significance levels of the impacts of the scheme, with regards to noise and air quality, remain as per the ES. Therefore, the pollutant concentration modelling already undertaken for the ES provides a valid baseline for monitoring and evaluation purposes.

The model uses AADT flows and speeds, the proportion of heavy duty vehicles, road type and background pollutant concentrations to predict pollutant levels. Traffic data from the ATCs will be analysed 1 year and 4-5 years after scheme opening, so a comparison can be made between outturn flows and modelled flows, and thus changes in air quality inferred.

Similarly, models to predict noise levels use traffic data. Traffic speeds, the proportion of heavy duty vehicles and the typical traffic volume between 6am and midnight are needed for the calculations. This information will be obtained from the ATC data.

Analysis of noise levels will be undertaken pre-construction, within 1 year after opening and 4 to 5 years after opening.

The evaluation of the Environment metrics will be provided within both the 'One Year After' Report and the Final Report.

Road safety will be monitored using the personal injury accident data logged, and provided by North Yorkshire County Council (NYCC). This data for the existing route along the A684 will be analysed within the 12 months prior to construction commencing to provide a baseline, and 1 year and 4-5 years after the scheme opens, with findings to be reported in the 'One Year After' Report and Final Report.

5.5.3 Objective 3: Improve access

At present, traffic travelling from the A1(M) to Leyburn and the North Dales has to go through Aiskew and the centre of Bedale. Improving access can be evaluated quantitatively through the analysis of journey time surveys. The Scheme is intended to reduce journey times for through traffic from the A1(M) and upgrade the access route to Leeming Bar Industrial Estate via Leases Lane.

Table 5-D provides a summary of the metrics that will be considered.

<i>Metric</i>	<i>Details</i>
Journey Times	In line with the journey time analysis detailed in the Transport Assessment (TA) travel time savings along the scheme between junction 51 of the A1(M) and Bedale Athletic Club, and between junction 51 and the Leeming Bar roundabout will be evaluated using TrafficMaster data. Data will be collected pre-construction and post-scheme opening (both within 1 year and 4 to 5 years after opening). This will demonstrate the improved conditions for through traffic.
Journey Time Reliability	
Traffic Volumes	<p>Traffic volumes will be monitored using the ATCs on the new scheme and on the current road network.</p> <p>This data will be collected as part of the Travel Demand metric.</p>

Table 5-D: Standard Monitoring - Objective 3

5.6 Travel Demand

Travel demand information will be collected on key corridors of travel that are affected by the scheme, i.e. on the A684 and the bypass. This data will be used to inform an assessment of the impact upon travel patterns within the area.

The evaluation of the travel demand metrics will be provided within both the 'One Year After' Report and the Final Report.

Table 5-E provides a summary of the metrics that will be considered to evaluate changes in Travel Demand as a result of the scheme. The locations of the surveys are shown in **Figure 5-C** and **Figure 5-D** at the end of this chapter, and detailed in **Appendix A**.

Daily weekday traffic flows (AM (0700-1000), PM (1600-1900) and 12-hour flows) for a neutral month (April, May, June, September, October or November) for all locations will be monitored using permanent Automatic Traffic Counters (ATCs) and approximately 8 temporary ATCs. Weekend 12-hour flows will also be monitored for Saturdays and Sundays for the same neutral month.

Data will be collected for the baseline conditions (pre-opening), the settling down period post-construction (within 1 year of opening) and the longer-term impact (4 to 5 years after opening).

Pedestrian and cycle counts will also be undertaken on the eastern section of the bypass, on the cycle route to the west of the A1(M), in Aiskew and at Leeming Bar crossways, for a typical weekday within the same survey month as the ATCs and for the same time periods i.e. AM (0700-1000), PM (1600-1900) and 12-hours. Counts will also be undertaken on a typical Saturday within the same neutral month. Count sites are located at all junctions along the shared NMU route.

The Team Leader for the Travel Demand Data Collection will be responsible for ensuring the above data is readily available and clearly documented for supply to the Evaluation Manager.

Metric	Details
Traffic Flows	<p>Traffic volumes will be monitored using permanent ATCs that are already in place, those which will be installed on the bypass and additional temporary ATCs on the existing route (A684), as illustrated in Figure 5-C and detailed in Appendix A. The locations of the ATCs form a screenline on either side of the scheme and A684.</p> <p>Data will be collated for the baseline conditions pre-opening, the settling down period post-construction (up to 12 months) and the longer term impact (4 to 5 years after opening).</p> <p>Data will be analysed for Weekday AM/ PM/12hr and Saturday 12hr to determine changes in traffic patterns as a result of the scheme.</p>
Pedestrian and Cycle counts	<p>Although the scheme is primarily a highway scheme, it will include segregated and non-segregated shared NMU routes to improve safety for pedestrians and cyclists.</p> <p>Pedestrian and cycle counts will be undertaken on a number of key corridors of travel, as shown in Figure 5-D, and detailed in Appendix A. The counts would be undertaken on a weekday and a Saturday.</p> <p>Data will be collated for the baseline conditions pre-opening, the settling down period post-construction (up to 12 months) and the longer term impact (4 to 5 years after opening).</p> <p>Data will be analysed for Weekday AM/ PM/12hr and Saturday 12hr to determine changes in pedestrian and cycle patterns as a result of the scheme.</p>

Table 5-E: Standard Monitoring - Travel Demand

5.7 Travel Time and Reliability

Travel times and reliability will form a key measure of the success of the scheme in relieving existing routes and improving access from the A1(M) to Leyburn, Hawes, the North Dales and Northallerton.

Journey times and journey time reliability will be analysed using data obtained from TrafficMaster plc. Data will be collected in both directions for key routes, as listed below and as shown in **Figure 5-B** at the end of this chapter:

- Leeming Bar Roundabout along the A684, through Aiskew and Bedale to the White Bear junction, and on to Bedale Athletic Club, both with and without the scheme in place;
- Leeming Bar Roundabout to Junction 51 of the A1(M) along the bypass, continuing on to the Bedale Roundabout, and along the A684 to Bedale Athletic Club.

Data will be collected in the same neutral month as the Travel Demand data. Analysis will be undertaken for weekday peak hours i.e. 0800-0900hrs and 1700-1800hrs. Analysis will also be undertaken on a typical Saturday within the same neutral month for 1100-1200hrs.

Analysis will be undertaken pre-construction, within 1 year after opening and 4 to 5 years after opening.

The Team Leader for the Journey Times Data Collection will be responsible for ensuring the above data is readily available and clearly documented for supply to the Evaluation Manager.

The evaluation of the travel time and reliability metrics will be provided within both the 'One Year After' Report and the Final Report.

Table 5-F summarises the proposed methodology to be adopted.

Metric	Details
Travel times	Changes in journey times and journey time reliability on key corridors of interest will be measured using TrafficMaster data. Data will be collected pre-construction and post-scheme opening (both within 1 year and 4 to 5 years after opening).
Travel time reliability	<p>Analysis of the data will be used to demonstrate that the scheme has reduced travel times from the A1(M) to the A684 north of Bedale, in both directions, from the A1(M) to Northallerton, in both directions, and on the existing A684 through Bedale, Aiskew and Leeming Bar.</p> <p>The following routes will form the focus of the travel time analysis (as shown in Figure 5-B at the end of this chapter):</p> <ul style="list-style-type: none"> Leeming Bar Roundabout along the A684, through Aiskew and Bedale to the White Bear junction, and on to Bedale Athletic Club, both with and without the scheme in place; and Leeming Bar Roundabout to Junction 51 of the A1(M) along the bypass, continuing on to the Bedale roundabout, and along the A684 to Bedale Athletic Club.

Table 5-F: Standard Monitoring - Travel Time and Reliability

5.8 Impact on the Economy

Scheme promoters are required to monitor and report information which shows how the scheme is contributing to economic growth.

5.8.1 Reduced travel times

Within standard economic analysis, travel times are converted to monetary values through the application of Values of Time. By assessing journey time savings, journey purpose and the total number of journeys made, total journey time savings can be converted into monetary values which represent benefits to the economy. The cumulative annual travel time savings, expressed as monetary values, can then be compared to the cost of the scheme and the expected monetised benefits for Economic Efficiency as given in the Best and Final Funding Bid (BAFFB) Economic Case.

Travel time savings will be monitored using data from TrafficMaster plc, as discussed in more detail in section 5.7 above. Traffic flows will be monitored using count data as described in section 5.6 above. By comparing the forecasts prior to the opening of the scheme with data collected after opening, a high-level assessment can be made to determine whether the overall benefits of the scheme are as expected.

5.8.2 Access to employment

Improved access to development sites can benefit the economy by accelerating and stimulating their development, thereby creating employment at those sites.

The introduction of the Scheme will significantly improve access from the strategic highway network to a number of key areas that are important to the local economy. Growth of the rural economy through increased tourism, and of the industrial economy through the development of Leeming Bar Industrial Estate, where there is potential for expansion, and thus increased employment, is expected to result from the Scheme.

The evaluation metrics that will be employed to understand potential impacts upon economic growth are summarised in **Table 5-G**.

Metric	Details
Implemented Scheme	Qualitative assessment of how the scheme has improved access to development sites.
Travel times	Changes in journey times will be evaluated using TrafficMaster data on various key routes for the Travel Times and Reliability metric, as detailed in section 5.7 above. Data will be collected pre-construction and post-scheme opening (both within 1 year and 4 to 5 years after opening). The analysis will show which routes have seen reductions in travel times and improvements in travel time reliability.
Accessibility	Accessibility plots, in the form of 20 minute isochrones, will be derived in GIS for cars for the situations with and without the scheme.
Employment levels	The impact of the scheme upon employment levels at key development and regeneration sites will be monitored by North Yorkshire County Council. This will identify any changes in employment at the development sites closest to the scheme.

Table 5-G: Standard Monitoring – Impacts on the economy

Evaluation of the impact on the economy will be provided within both the One Year After Report and the Final Report.

5.9 Carbon Impacts

Scheme promoters are required to monitor and report information which shows how the scheme has affected carbon emissions. The evaluation of the impact on Carbon will be provided within both the 'One Year After' Report and the Final Report.

Changes in the volume of traffic and their speeds affect carbon emissions. An analysis will be undertaken to identify any significant differences between outturn flows and/or speeds compared to those forecast for the scheme.

The evaluation metrics that will be employed to understand the impact of the scheme on carbon emissions are summarised in **Table 5-H**.

The Team Leader for Travel Demand Data Collection will be responsible for ensuring details are readily available and clearly documented for supply to the Evaluation Manager.

Metric	Details
Traffic Volumes	Traffic volumes will be monitored using the screenlines of ATCs for the Travel Demand metric, as detailed in section 5.6 above. Data will be collected pre-construction and post-scheme opening (both within 1 year and 4 to 5 years after opening). The data will be used to determine changes in traffic patterns as a result of the scheme.
Traffic speeds	Changes in journey times will be evaluated using TrafficMaster data on the bypass and A684 for the Travel Times and Reliability metric, as detailed in section 5.7 above. From this, the ratio of peak hour to free-flow speeds can be derived. Data will be collected pre-construction and post-scheme opening (both within 1 year and 4 to 5 years after opening). The analysis will show which routes and sections have seen changes in speeds.

Table 5-H: Standard Monitoring – Carbon

5.10 Summary of Standard Monitoring

Table 5-I below summarises the Standard Monitoring to be undertaken for this scheme;

Standard / Enhanced / Fuller	Item	Stage (Inputs / Outputs / Outcomes / Impacts)	Sub-Item
Standard	Scheme Build	Inputs	Programme
			Stakeholder management
			Risk management
			Scheme completeness
	Costs	Inputs	Outturn construction costs
			Risks
			Cost savings
			Cost over-runs
			Outturn maintenance costs
			Unanticipated costs
	Delivered Scheme	Outputs	Changes to scheme
	Travel Demand	Outcomes	Intended beneficiaries
			Changes to mitigation
	Scheme Objectives	Outcomes	Traffic volumes (screenlines)
			Pedestrians and cyclist counts
			Employment levels
			Accessibility
			Congestion
			Noise
	Travel Times and Reliability	Outcomes	Air quality
			Accidents
	Economy	Impacts	Journey times surveys
			Variability of journey times
	Carbon	Impacts	Travel times
			Accessibility
			Employment levels
			Traffic volumes
			Traffic speeds

Table 5-I: Standard Monitoring – Summary



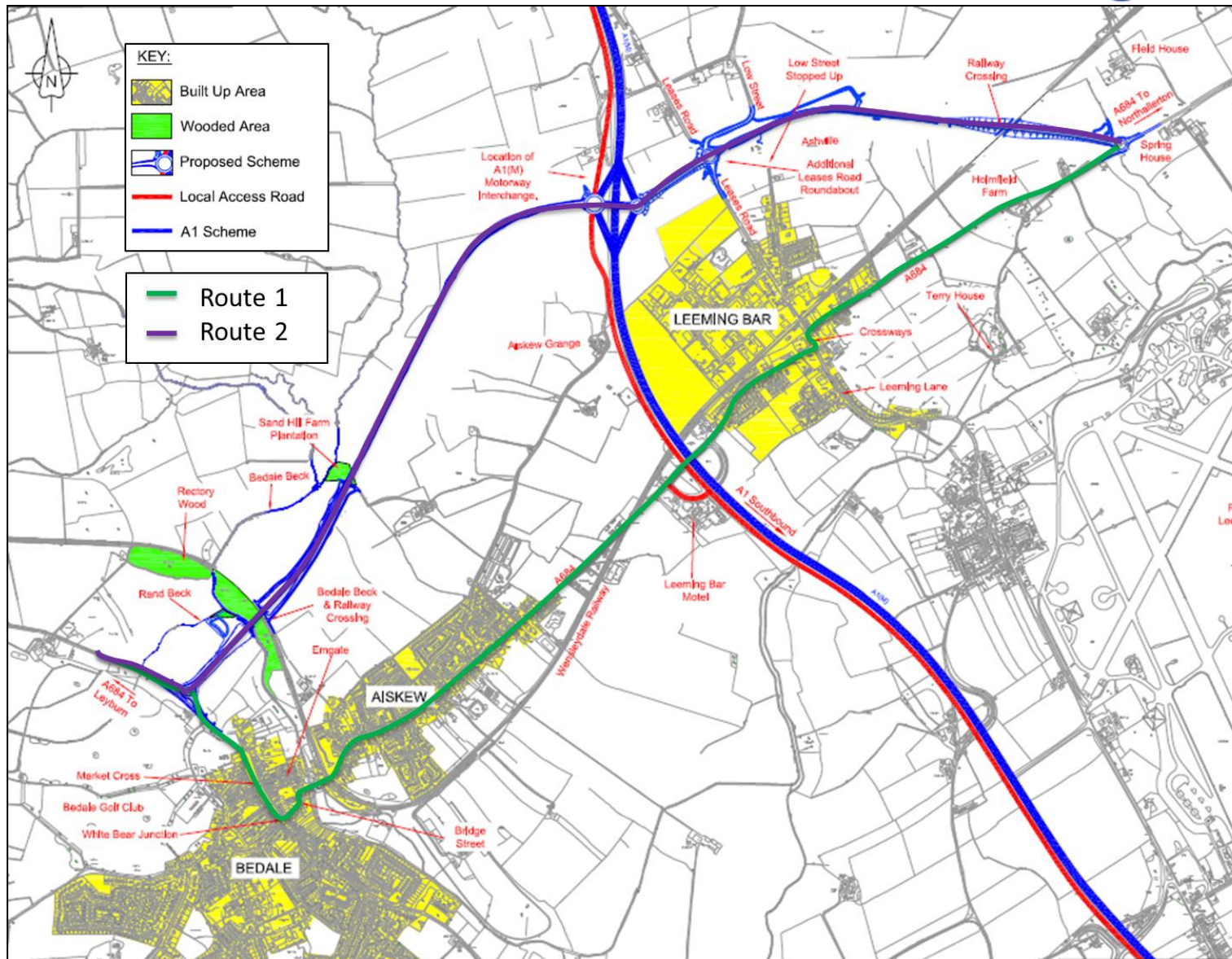


Figure 5-B: Journey Time Survey Routes

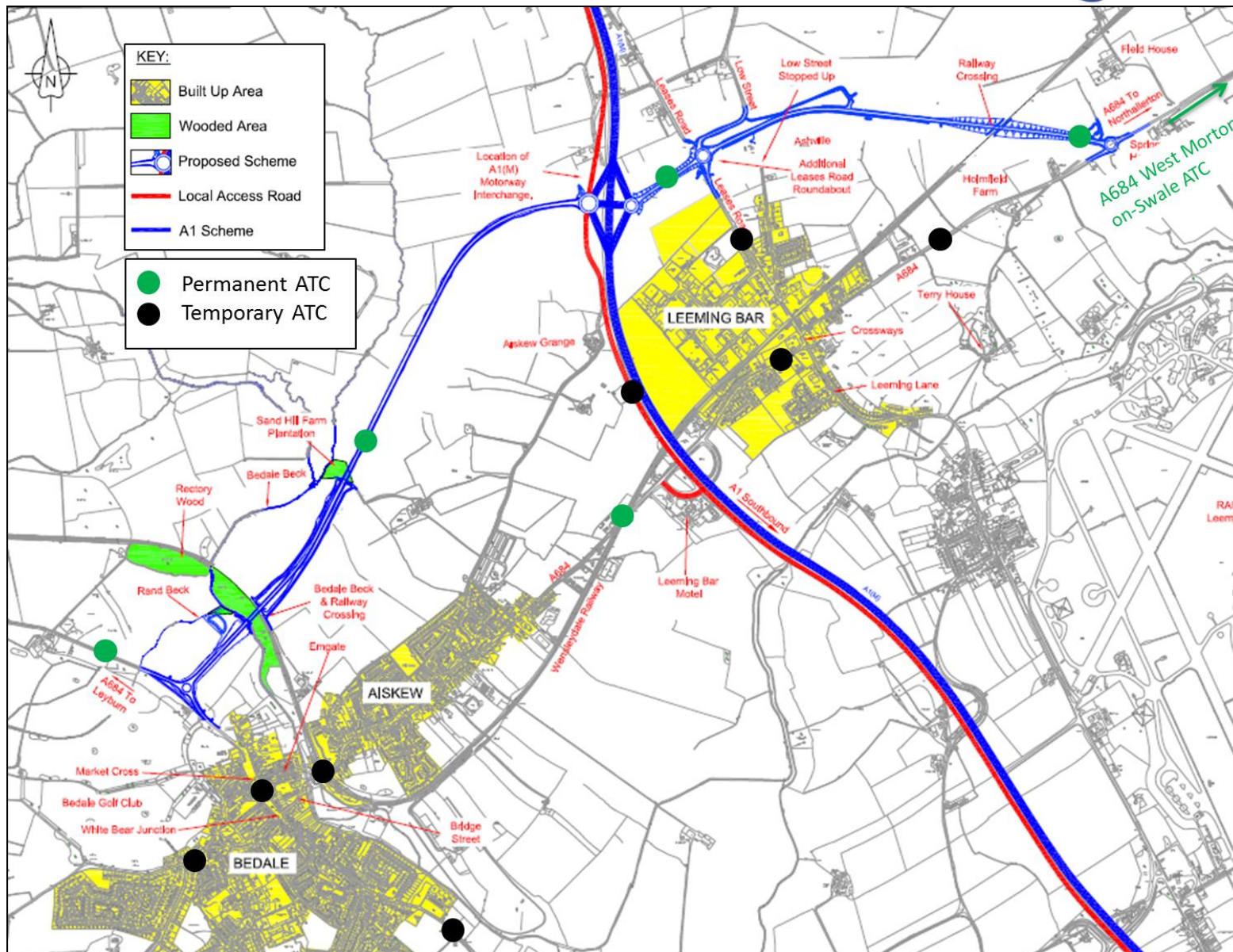


Figure 5-C: Traffic Count Sites



6

Data Collection

6.1 Introduction

This chapter of the report sets out the data collection requirements, timescales and budgetary estimates associated with each of the evaluation metrics for the Standard Monitoring.

6.2 Data Collection Requirements

Table 6-A provides a summary of the data collection requirements for each of the evaluation metrics outlined within this document, together with an indication of when the data collection would be required within the monitoring and evaluation period. The indicative timescales are based upon the current programmed opening of the scheme in Autumn 2016 i.e. 1 year after surveys would be undertaken in neutral months (September/October) in Autumn 2017, with the 4 to 5 years after surveys in Autumn 2021 in the same neutral months.

6.3 Budgetary Estimates

Table 6-B provides a summary of the budgetary estimates for the completion of the Monitoring and Evaluation of the scheme.

Metric / Data Collection	Timescale			
	Baseline	Construction	~1 yr after Spring 2017	4-5 yrs after Spring 2021
Standard Monitoring				
1. Scheme Build	✓	✓	✓	
2. Scheme Costs	✓	✓	✓	✓(A)
3. Delivered Scheme	✓	✓	✓	
4. Travel Demand				
a) Traffic counts (screenlines and cordons)	✓		✓	✓
b) Pedestrian and cycle counts	✓		✓	✓
5. Scheme Objectives				
i) Reduce congestion				
a) Traffic counts (screenlines and cordons)	(✓)		(✓)	(✓)
b) Journey time surveys	✓		✓	✓
c) Journey time reliability	✓		✓	✓
ii) Reduce environmental and road safety problems				
a) Traffic counts (air quality)	(✓)		(✓)	(✓)
b) Personal Injury Accident Data	✓(B)		✓	✓
iii) Improve access				
a) Traffic counts (screenlines and cordons)	(✓)		(✓)	(✓)
6. Travel Time and Reliability				
a) Journey time surveys	(✓)		(✓)	(✓)
b) Journey time reliability	(✓)		(✓)	(✓)
7. Impact on the Economy				
a) Employment levels	✓		✓	✓
b) Journey time surveys	(✓)		(✓)	(✓)
c) Property rental values	✓		✓	✓
8. Carbon				
a) Traffic counts (screenlines and cordons)	(✓)		(✓)	(✓)

A = maintenance costs only

B = already obtained for accident analysis

(✓) = uses survey data collected for other metrics

Table 6-A: Data Collection Requirements

Metric / Data Collection	Indicative Costs				
	Baseline	Construction	~1 yr after	4-5 yrs after	TOTAL
Standard Monitoring	£25,680	£6,000	£16,180	£15,680	£63,540
Reporting	N/A	N/A	£20,000	£15,000	£35,000
Project Management Coordination	£3,000	£900	£1,575	£1,500	£6,975
Evaluation Manager	N/A	N/A	£10,000	£5,000	£15,000
TOTALS	£28,680	£6,900	£47,755	£37,180	£120,515

Table 6-B: Monitoring and Evaluation Budgetary Estimates

7 Governance

7.1 Introduction

This chapter sets out the proposed Governance arrangements to be adopted as part of the Monitoring and Evaluation strategy. It provides details of the key personnel responsible for each aspect of the scheme evaluation, the reporting lines and information dissemination.

7.2 Governance Structure

The proposed management structure for the coordination and delivery of the scheme evaluation is summarised in **Figure 7-A** with key roles discussed in more detail within the following paragraphs.

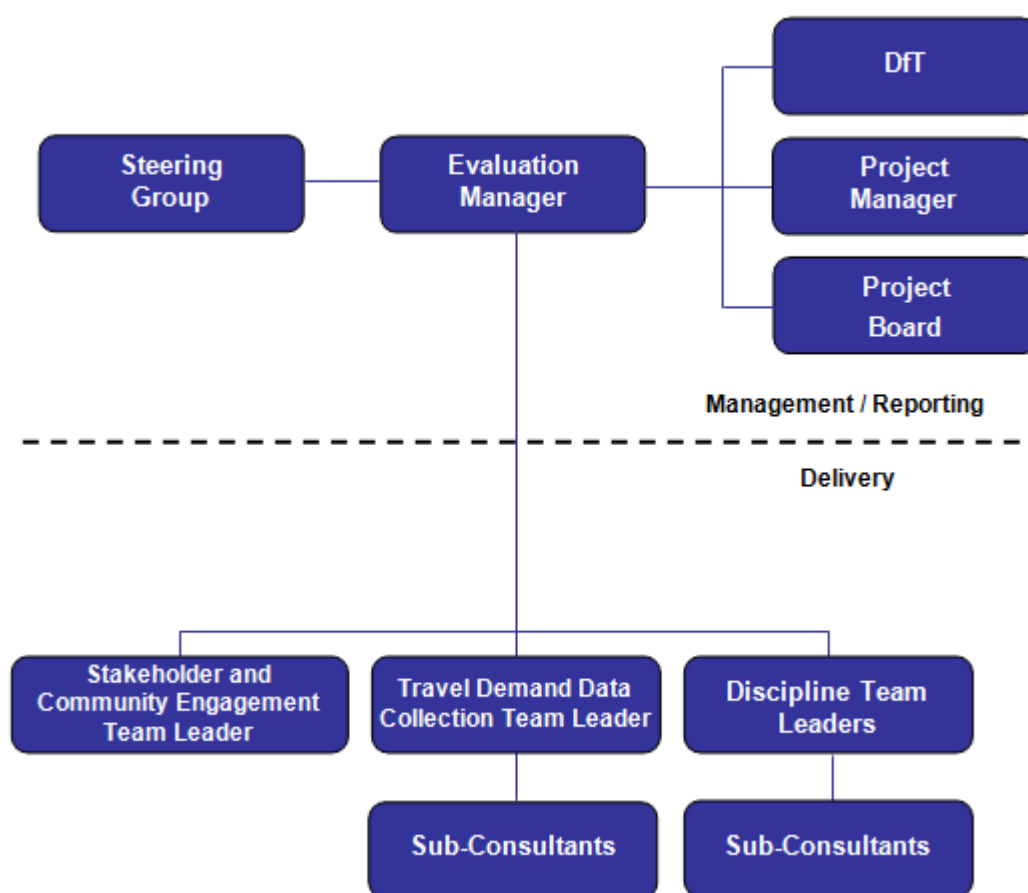


Figure 7-A: Governance

7.3 Key Personnel

7.3.1 Evaluation Manager

The Evaluation Manager will be responsible for the overall coordination and management of the Monitoring and Evaluation process and the production of relevant Evaluation Reports. The Evaluation Manager will be of an appropriate

position and hold the relevant skills to be able to directly influence resources and drive the process forward. The Evaluation Manager will have knowledge of the scheme but will not be heavily involved in the process. This will ensure the avoidance of bias within the reporting procedure. In addition, they will have knowledge and appropriate experience of the appraisal and review process to ensure that the overall objectives are met.

The Evaluation Manager will also be responsible for the dissemination of the Monitoring and Evaluation information to the Project Board, the DfT and key stakeholders. Further details are discussed in Section 7.7 below.

7.3.2 Steering Group

The Steering Group for Monitoring and Evaluation will be made up of key officers within NYCC, members of the project team and external consultants employed to help deliver the scheme. Additional stakeholders who have a vested interest in the scheme may also be represented within the steering group. External stakeholders are likely to include representatives from the DfT as well as members / officers from other agencies or organisations.

The steering group will undertake an advisory role to the evaluation team to ensure that best use is made of local knowledge, experience and skills as part of the evaluation process. This will ensure that the evaluation is effectively managed and driven forward with consideration of a range of views.

The steering group will also advise on the commissioning of any sub consultants required to undertake specific elements of the evaluation such as data collection/analysis.

Upon completion, the results of the evaluation will be presented to the steering group. A review will be undertaken to establish whether the evaluation has fully captured the resultant impacts of the scheme.

7.3.3 Delivery Team

Below the Steering group will be the delivery teams, each managed and led by a discipline Team Leader.

Each team leader will be directly responsible for ensuring that work is completed in line with the Evaluation Plan and will report directly to the Evaluation Manager. Team Leaders will be responsible for identifying and reporting potential issues at an early stage to ensure resources are appropriately allocated in order to limit risks.

7.4 Quality Assurance

In order that the monitoring and evaluation exercise is a productive endeavour, the findings must be accurate, reliable and uncompromised. The evaluation must be independent, inclusive, robust and transparent.

There may be pressures on the evaluation project timescales and/or resources. Should such a situation occur, it is preferable to reduce the scope of the evaluation rather than compromise the quality of the evaluation.

The Evaluation Manager will ensure consistency in data collection, the methodology used, reporting and the interpreting of findings. The Evaluation Manager will be

independent of the project team, providing impartiality to the evaluation. More information regarding the role of the Evaluation Manager is given in section 7.3.1 above.

Quality control is the responsibility of the Evaluation Manager. Quality assurance procedures will be implemented throughout the evaluation programme, enabling an early response to any problems encountered.

7.5 Management of Risk

It is important to consider potential risks to the Monitoring and Evaluation programme during the planning stage, so that mitigation measures can be identified and put in place should action be necessary. **Table 7-A** gives details of potential risks and measures to be taken to mitigate these risks.

Risk	Mitigation measures
Evaluation fails to fully address objectives	The approach to evaluation is to be agreed with NYCC, DfT and the Steering Group before construction begins. It will be the responsibility of the independent Evaluation Manager to ensure the agreed approach is adhered to.
Failure to agree the purpose of evaluation	The Monitoring and Evaluation Plan is to be disseminated to the Steering Group to set out the purpose of evaluation so any areas of concern can be addressed.
Baseline data compromised by construction works starting	The data collection period is planned to take place in advance of the current expected start date for construction. The scheme promoter is aware of the importance of the baseline data collection taking place before the start of construction.
Outcome/impact evaluation being carried out too early	Data collection will take place one year and 4-5 years after scheme completion, as recommended by the DfT, in order to capture the outcomes and impacts respectively, allowing sufficient time for the scheme benefits to take effect.
Failure to understand the limitations of the data	Section 5 of this report gives details of the data to be collected and the conclusions that can be inferred from the findings. The methods of data collection have been designed to provide suitably detailed data for the evaluation requirements of the scheme and will be agreed with the DfT.
Evaluation design failing to provide robust data	Industry-standard forms of data collection are being employed and the evaluation has been designed to give thorough coverage of the area surrounding the bypass. The evaluation design will be agreed with the DfT.
Failure to foresee future analytical or data requirements	NYCC are aware of the permanent count sites and employment data needed to complete each stage of the evaluation. Forward planning is needed so that temporary traffic counts can be commissioned to replace any non-operational permanent traffic counts, and to ensure employment data is being collected periodically throughout the evaluation process. Data collection and analysis procedures will be agreed with the DfT.
Failure to gather sufficient, good quality data	There will be comprehensive coverage of the Bedale, Aiskew and Leeming Bar area by traffic counts that can be in place for longer if the data collected is not sufficient. Journey time surveys and employment data are more routine, non-project specific forms of data, which are less susceptible to technical problems. The evaluation design will be agreed with the DfT to ensure sufficient data is collected.

Risk	Mitigation measures
Producing evaluation findings that are not actionable or that do not have clear implications	The One Year After Report and Final Report will summarise findings in terms of lessons learned and improvements to scheme planning and delivery that could have brought about greater benefits. This information can then be used to inform proposals and decision making for similar schemes and to ensure good practice is replicated.
Poor or disrupted planning as a result of insufficient time, resources or management priority	The evaluation programme follows DfT guidance and will be agreed with the DfT. A suitably experienced independent Evaluation Manager will be appointed by NYCC, who will be responsible for the delivery of the evaluation programme.
Failure to account for other outcome/impact influencing factors, and so not being able to directly attribute outcomes/impacts to this scheme	The Monitoring and Evaluation Plan will have to be assessed on an ongoing basis for its suitability, and amended as necessary to take account of any factors that may arise during the Monitoring and Evaluation programme.

Table 7-A: Mitigation measures for evaluation risks

7.6 Timescales for Reporting

Monitoring and Evaluation progress will be reported within the Quarterly Reports issued to the DfT during scheme construction.

Post-implementation, based on the expected data collection programme given in section 6.2, the One Year After Report is expected to be issued to the DfT in March/April 2018, followed by the Final Report in March/April 2022. This timeframe allows a six month window for data to be collated, analysed and the findings to be reported.

7.7 Dissemination Plan

As mentioned above, the One Year After and the Final Monitoring and Evaluation reports will be disseminated to the Project Board, the DfT and key stakeholders by the Evaluation Manager.

Briefings will be held with the Monitoring and Evaluation Steering Group, which includes local Members, the Local Enterprise Partnership, local Chamber of Commerce, Highways Agency and Local Access Forum.

Once those briefings have been held, the main method of disseminating the Monitoring and Evaluation reports will be via the North Yorkshire County Council website. This will be managed by NYCC's communications department. Local press releases will be issued as appropriate.

Appendix A Travel Demand – Survey Locations

The locations of Automatic Traffic Counts (ATCs) required to collect the relevant data are given in the table below and illustrated in **Figures 5-B to 5-D**.

	Location	Permanent / Temporary ATC
Existing road network	A684 Outside Athletic Club	Permanent
	Masham Rd, Bedale, between Burrill Rd and The Wynd	Temporary
	B6285, south of Brookside Ave	Temporary
	A684 Aiskew level crossing	Permanent
	A684 Northallerton Road, west of Holmfield Farm	Temporary
	Market Place, Bedale	Temporary
	Eastern approach to Bedale Beck bridge, A684 Bedale Rd	Temporary
	A6055 between railway crossing and Back Ln	Temporary
	Leases Rd, between Conygarth Way and Portland Way	Temporary
	A684 Bedale Rd on approach to Leeming Bar, outside the White Rose	Temporary
	A684 West Morton-on-Swale	Permanent
Proposed scheme	Eastern section of the bypass near Leeming Bar Roundabout (near balancing pond)	Permanent
	Mid-way along the western section of bypass (near access to balancing pond)	Permanent
	Eastern section of the bypass between A1(M) J51 and Leases Rd Roundabout	Permanent

Table A-1: Automatic Traffic Count Locations

	Route	Details
Existing road network	1	Along A684 from Holmfield Farm to Bedale Athletic Club via the White Bear junction
Proposed scheme	2	From Bedale Athletic Club to the Bedale Roundabout, along the western section of the new scheme to the A1(M) junction and along the eastern section of the new scheme to Leeming Bar Roundabout

Table A-2: Journey Time Survey Routes

	Location
Existing road network	Leeming Bar crossways
	Junction of Back Ln and Sandhill Ln
	Junction of A684 Bedale Rd and Sandhill Ln
	Eastern approach to Bedale Beck bridge, A684 Bedale Rd
Proposed scheme	Leeming Bar Roundabout
	Low St NMU non-signalised crossing
	Leases Road Roundabout
	NMU connection to scheme at Low St stop-up

Table A-3: Locations of Pedestrian and Cycle Counts

Appendix B Evaluation Budgetary Estimates

Metric / Data Collection	Indicative Costs														Comments
	Baseline				Construction			~1 year after			4 to 5 years after			TOTAL	
Standard Monitoring	Survey Design / Prep.	Surveys	Analysis & Reporting	Sub-Total	Surveys	Analysis & Reporting	Sub-Total	Surveys	Analysis & Reporting	Sub-Total	Surveys	Analysis & Reporting	Sub-Total		
1. Scheme Build	N/A	N/A	£1,000	£1,000	N/A	£6,000	£6,000	N/A	£1,000	£1,000	N/A	£1,000	£1,000	£9,000	Assumption = analysis & reporting by NYCC as part of regular monthly progress meetings i.e. only small additional costs but over a large number of months. Also, only maintenance costs to be assessed 4-5 years after opening.
2. Scheme Costs															
3. Delivered Scheme															
4. Travel Demand															
a) Traffic volumes (screenlines and cordons)	£4,000	£4,000	£3,000	£11,000	N/A	N/A	N/A	£4,000	£2,000	£6,000	£4,000	£1,500	£5,500	£22,500	Typical survey costs per site based on a similar scheme Assumption = temporary ATCs used at 8 new sites at £126.65 each per week, in place for 4 weeks Assumption = no monitoring during construction (use NYCC's permanent ATCs instead).
b) Pedestrian and cycle counts	£3,000	£1,680	£2,000	£6,680	N/A	N/A	N/A	£1,680	£1,500	£3,180	£1,680	£1,500	£3,180	£13,040	Assumption = enumerators at £120 per day for approx. 7 manual pedestrian & cycle surveys (plus an allowance for training) for 1 weekday and 1 Saturday for each year.
5. Scheme Objectives	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	£1,000	£1,000	N/A	£1,000	£1,000	£2,000	Further traffic data analysis required for noise / air quality
6. Travel Time and Reliability															
a) Journey time surveys	£0	£0	£6,000	£6,000	N/A	N/A	N/A	£0	£3,000	£3,000	£0	£3,000	£3,000	£12,000	Assumption: a) Surveys = use TrafficMaster data i.e. free b) £1,500 for journey time survey analysis first time around, then £1000 c) £3,000 for NYCC to develop algorithms first time around for journey time variability, then £1000.
b) Journey time reliability															
7. Impact on the Economy															
a) Employment levels	N/A	N/A	£1,000	£1,000	N/A	N/A	N/A	N/A	£1,000	£1,000	N/A	£1,000	£1,000	£3,000	Assumption = analysis & reporting of employment levels undertaken by NYCC routinely anyway.
8. Carbon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	£1,000	£1,000	N/A	£1,000	£1,000	£2,000	Some analysis of carbon reductions from traffic data is needed, subsequent reporting
SUB-TOTAL FOR STANDARD MONITORING	£7,000	£5,680	£13,000	£25,680	£0	£6,000	£6,000	£5,680	£10,500	£16,180	£5,680	£10,000	£15,680	£63,540	
SUB-TOTAL FOR DATA COLLECTION	£7,000	£5,680	£13,000	£25,680	£0	£6,000	£6,000	£5,680	£10,500	£16,180	£5,680	£10,000	£15,680	£63,540	
One Year After Report	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	£20,000	£20,000	N/A	N/A	N/A	£20,000	
Final Report	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	£15,000	£15,000	£15,000	
Project Management	£1,050	N/A	£1,950	£3,000	N/A	£900	£900	N/A	£1,575	£1,575	N/A	£1,500	£1,500	£6,975	15% of survey design & analysis/reporting costs
Evaluation Manager	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	£10,000	£10,000	N/A	£5,000	£5,000	£15,000	
TOTAL	£8,050	£5,680	£14,950	£28,680	£0	£6,900	£6,900	£5,680	£42,075	£47,755	£5,680	£31,500	£37,180	£120,515	