stakeholder engagement, and the responses to issue raised can be found in the Management Case and Consultation Report (Appendix C).

Following the planning consent and conditional approval of the business case by LEP in January 2018 LCC started a process of acquiring land for the construction of the scheme and improvement of existing highways in the vicinity of the PWD though Compulsory Purchase Order (CPO). The order was made under Sections 239, 240, 246, 250 and 250 of the Highways Act 1980 and all other enabling powers.

Following publication of the CPO a total of thirty-four letters of objection were received from statutory objectors. The main issues raised within these objections include:

- *The impact on individual properties and businesses;*
- *Certain access provisions;*
- *The level of consideration of possible alternative routes;*
- *Access over land outside new highway boundary;*
- *The effect of the construction period;*
- *The closure of Darkinson Lane and Sandyforth Lane to vehicles;*
- *The severance of land;*
- *The extent of land for habitat and landscape mitigation;*
- *The effect of the scheme on existing habitat;*
- *The adequacy of information concerning the detail and financing of the scheme;*
- *The scheme being of false value in trying to reduce congestion;*
- *The effect on existing covenants and planning permissions and future planning permissions.*

In response to these objections, the following evidence was prepared for the public inquiry:

- *A description of the operation of the current highway network*
- *A justification of the need to address the current highway inadequacies*
- *The effect on planning applications*
- *The examination of alternatives to the underlying scheme*
- *The environmental impact of the underlying scheme on properties and businesses*
- *The mitigation of the scheme impacts*
- *Ability to implement and finance the scheme*
- *Analysis of impacts upon individual properties and land by noise, visually, air quality or other impact including access issues*
- *Human Rights considerations*
- *Consequences were the scheme not to be proceeded with.*

In promoting and progressing the CPO, Lancashire County Council has complied with all relevant legislation and regulations that provide an opportunity for those affected to object to the Orders and have their representations considered at a Public Inquiry. The land to be acquired that is the subject of the CPO has been kept to the minimum necessary to facilitate the construction of the road and associated mitigation measures.

Many of the above objections were withdrawn before reaching a public inquiry following agreements between the objectors and Lancashire County Council. However, a number of the objections were not settled ahead of the public inquiry which took place from November to December 2018.

During the public inquiry the remaining issues relating to the above objections were either withdrawn or satisfactorily addressed by the acquiring authority. The planning inspector formally closed the public inquiry on 19th of December 2018 and submitted his recommendation to the Secretary of State for the final approval which was granted in April 2019. The Secretary of State Decision letter is provided in Appendix D.

3.10 Internal and External Business Drivers

As is recognised in the Strategic Economic Plan, Lancashire has failed to secure the necessary investment in critical local transport infrastructure over recent decades.

"The failure to deliver the transport infrastructure needed to support sustained business success, it is estimated, accounts for one-quarter of Lancashire's current economic performance gap with the rest of the UK" (Lancashire Strategic Economic Plan, March 2014).

Preston, South Ribble and Lancashire City Deal represents, and agrees, shared objectives with government to seek to close this gap and achieve a once-in-a-lifetime transformation of the area, creating thousands of jobs and homes.

PWD is one of four transport schemes required to support the scale of such ambitious development in the City Deal area. It is expected to address a key barrier to growth in the area - lack of network capacity - and attract a transport investment commensurate with Lancashire's economic and housing growth opportunities and challenges.

North West Preston was identified in the Central Lancashire Core Strategy as a strategic location capable of making a particularly large contribution to meeting Preston's future housing needs and is central to the economic growth objectives in Lancashire. The PWD will support the delivery of the North West Preston by providing a good access for the local traffic to the strategic road network and deterring it from using the congested routes to the east.

PWD will also provide a better access to education and employment by relieving congestion on routes linking education and employment sites, particularly in Preston city centre, the Strategic Road Network and the Lancashire Enterprise Zone at Warton. The LEP has ambitions to establish the Zone as a world-class location for advanced engineering and manufacturing, creating a hub of expertise in a sector that is already one of Lancashire's greatest economic strengths. The Zone has the potential to create between 4,000 and 6,000 high value jobs in the longer term.

3.11 Synergy

One of the key strategic benefits of the PWD scheme is the synergy and compatibility with other transport interventions aimed to support the continued effective operation of Central Lancashire strategic and local transport network.

The PWD is one of four major new road schemes to the North, South and West of Preston aimed at opening up new opportunities to create housing and employment. The four schemes which include the PWD, Broughton Bypass, A582 South Ribble Western Distributor, and Penwortham Bypass, have been presented in the Masterplan and are planned to be delivered in the period to 2026 and each integral to

the long term vision of the Central Lancashire. Delivery of these schemes will ensure the planned new developments can go ahead and allow significant complimentary improvements to sustainable transport provision.

The Broughton Bypass has since been constructed and the Penwortham Bypass is being constructed now.

As previously stated, a proposed new 'Parkway' rail station in the Cottam area will serve the North West Preston strategic housing location. The station will best be accessed from the PWD rather than the existing rural road network to provide rail-based Park and Ride opportunities to Preston/Manchester/Liverpool and Blackpool.

As stated in Section 3.3.3, the Cottam Parkway station is dependent upon the scheme's ability to unlock the housing development and provide station road access. Similarly, the reduction in traffic in other areas of Preston will help facilitate bus lanes and public realm improvements to encourage other forms of sustainable travel.

The CLHTM set out a network of public transport priority corridors that will link Preston, Leyland and Chorley to the main housing and employment areas including the routes between Warton EZ and Samlesbury EZ via Preston and between North West Preston/Cottam and Preston City Centre. Both of these routes will greatly benefit from the implementation of the PWD scheme through journey time and reliability reductions on these routes.

Moreover, the importance of the PWD beyond 2026 is likely to be even more significant. The potential construction of the new crossing of the River Ribble will complete the linking of the two Western Distributor Road in Preston and South Ribble between the M55 near Bartle and the M65 at Cuerden and will provide substantial relief to Preston's road network in and around Riversway.

The PWD and access to/from Cottam also represents a core part of enhancing rail access to/from Preston HS2 station, and in terms of ensuring and enhanced and efficient transport network to/from Preston City centre itself, that is a core and strong objective of HS2 and growth-related objectives associated with HS2's arrival in the City.

3.12 Conclusion

The provision of a new road to the West of Preston has been considered for half a century.

The proposed scheme has exceptionally strong underpinning in national, sub-regional and local policy, as a scheme designed to promote economic growth, whilst simultaneously delivering transport user and business competitive advantage.

Existing evidence, drawn from a variety of sources, demonstrates that there are wide-ranging and interlinked transport related problems identified from the evidence base in and around Preston in the current situation. These include: widespread issues with congestion and delay on each radial and orbital route to/from the City; poor journey time reliability- on both road and public transport networks in peak periods; associated issues with air quality and noise; and higher than national average levels of accidents.

The underlying cause of all of the identified problems is that the transport network in Preston is already at critical point and will not be able to cope with an increase in demand for travel as a result of viable economic growth now being delivered, and new developments in the area as part of the City Deal agreed with government.

Without an intervention, evidence from each of the sources identified above indicates that all the identified problems will be exacerbated in the future and will be constraining investment and growth in Central Lancashire.

Based on the current evidence and approved future year plans, a strategic transport intervention is required which would be capable of supporting the following outputs and benefits:

- *5,000+ new dwellings in the North West Preston strategic housing location- a nationally significant level;*

- *Significantly improved access to/from the core centre of advanced manufacturing and fast-growing Enterprise Zone at Warton, as well as to support its continued future growth;*

- *Reduced congestion on radial and arterial routes to and from Preston;*

- *Facilitate the provision of a new 'parkway' railway station at Cottam on the soon to be electrified Preston to Blackpool North railway line to enhance local rail connectivity; and to*

- *Facilitate the provision of bus improvements and environmental and public realm improvements within and on routes to/from Preston.*

Following the identification and appraisal of a range of over twenty alternative options, covering all modes of transport, and based on the scoring against the set of consistent primary and supporting objectives, a Dual Carriageway PWD emerged as the Preferred Option that will address existing unacceptable situation in terms of congestion and will provide essential infrastructure to enable the delivery of much needed market and affordable housing.

The PWD aligns well with National, Sub-national and local planning policies.

It has a strong fit with the national priority for house building and economic growth as set out within the Treasury, DCLG, DfT and Highways England objectives. The PWD also has strong local political support and is identified as the key project in the City Deal, Strategic Economic Plan, CLHTM, Lancashire Local Transport Plan, and Preston Local Plan.

The scheme is driven by the ambitious plans set out in the Lancashire City Deal, now being realised, to transform the area and create thousands of new jobs and new homes.

It is one of the four transport schemes agreed as part of the City Deal with Government to address the key barriers to growth in the area – a lack of network capacity and the lack of connectivity from North West Preston and Warton to/from the strategic road network - and attract a transport investment commensurate with Lancashire's economic and housing growth opportunities and challenges.

One of the key strategic benefits of the PWD scheme is the synergy and compatibility with other transport interventions within a larger, approved and confirmed Transport Masterplan, aimed to support the continued effective operation of Central Lancashire strategic and local transport network; both now and in a future world of sustained economic growth promoted by the Northern Powerhouse, and the arrival of HS2.

4. The Economic Case

4.1 Introduction

The Economic Case identifies and assesses all the impacts of the proposed scheme, and the resulting value for money, to fulfil HM Treasury's requirements for appraisal and demonstrate value for money in the use of taxpayers' money.

In line with HM Treasury's appraisal requirements, the impacts considered are not limited to those directly impacting on the measured economy, nor to those which can be monetised. The economic, environmental, social and distributional impacts of a proposal are all examined, using qualitative, quantitative and monetised information. In assessing value for money, all of these are consolidated to determine the extent to which a proposal's benefits outweigh its costs.

The economic appraisal has been tailored to reflect the needs of the PWD Full Business Case and is discussed under the following headings:

- *Methodology*
- *Assumptions*
- *Scheme Cost for Economic Appraisal*
- *Transport Economic Efficiency*
- *Reliability*
- *Changes in Indirect Tax*
- *Safety Benefits*
- *Environmental and Social Impacts*
- *Distributional Impacts*
- *Wider Economic Benefits*
- *Sensitivity Tests*
- *Appraisal Summary Table (AST)*
- *Value for Money Statement*

4.2 Methodology

4.2.1 Overview

Figure 4-A shows the diagram which provides details of the methodology for the Value for Money assessment of the PWD scheme.

The Value for Money assessment is a staged process which includes appraisal of the scheme's economic, environmental, social, distributional and fiscal impacts using qualitative, quantitative and monetised information.

Some methods for identifying these impacts, and estimating their monetary values, are more widely-accepted than others because they are well-researched, tried-and-tested, and therefore considered more robust.

As a result, the DfT Value for Money Framework (July 2017) distinguishes between three 'types' of monetised impacts: established, evolving, and indicative monetised impacts. These are treated differently in the value for money assessment and presented separately in Value for Money Statements.

Value for Money assessment starts with analysis of costs and established monetised benefits and calculation of the **Initial Benefit Cost Ratio** of the Scheme. The next stage is to capture and analyse evolving monetised impacts, which will be subsequently added to the original assessment to generate an **Adjusted Benefit Cost Ratio.**

The third stage involves capturing indicative monetised impacts and non-monetised impacts (i.e. impacts that cannot be monetised but can be presented as qualitative information). The methodologies to analyse and monetise indicative impacts are generally developing and have a high degree of uncertainty in the magnitude of the impact exists. Therefore, they are not considered in the BCR calculation, rather they are used solely to support the Value for Money conclusions of the scheme, as reported in the Economic Case.

Finally, the assessment looks at how the impacts of the scheme are distributed across different social groups as informed by the Distributional Impacts Analysis.

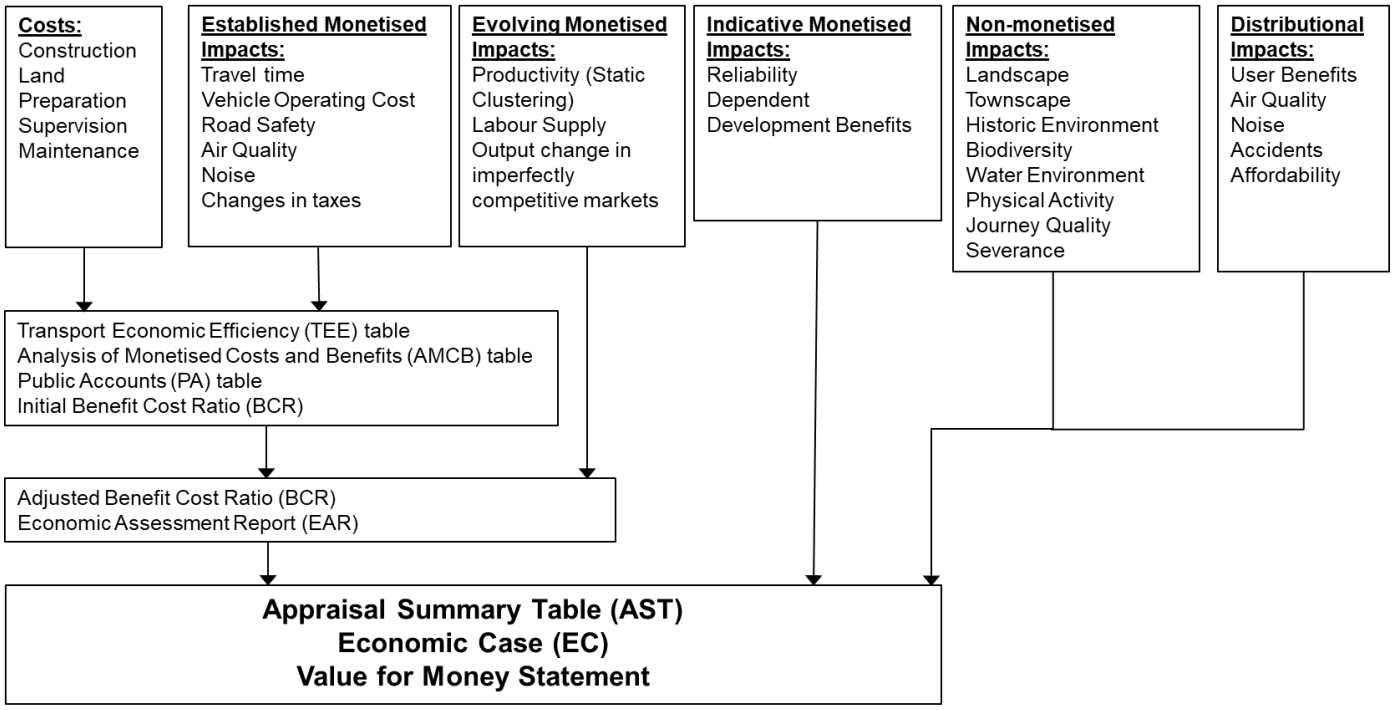

Figure 4-A: Value for Money Assessment Process

4.2.2 Analysis of Monetised Impacts and Costs

As discussed above, Value for Money assessment starts with the calculation of impacts that can be expressed in monetary terms. These monetised impacts are summed to construct a Benefit Cost Ratio (BCR) – that is the amount of benefit being bought for every £1.00 of cost.

The summary of the established monetised impacts used to calculate the Initial BCR is presented in the standard **Analysis of Monetised Costs and Benefits (AMCB)** table appended to the Economic Assessment Report (EAR) (January 2019).

The appraisal of wider economic impacts of the PWD is undertaken based on TAG Unit A2-1 (May 2018) and reported in the Economic Impact Report (EIR). In line with the guidance, some of wider economic benefits, which are classified as evolving impacts, can be included in the Adjusted BCR of the scheme; while others, known as indicative impacts, are monetised only to support the Value for Money assessment of the scheme.

Other indicative impact assessed as part of this study is journey time reliability. It can be monetised, but there is less certainty about the robustness of their results. Therefore, this impact contributes to the Value for Money of the scheme but is not part of the Initial or Adjusted BCR.

In line with WebTAG all impacts are reported in the **Appraisal Summary Table (AST)** (April 2019) and the EAR. The EAR and AST are attached to this document as Appendix E and Appendix F.

The DfT Value for Money Framework (July 2017) suggests a flexible approach to economic appraisal to ensure time and resources spent on the development of a business case are proportionate to the size of the investment.

Having considered the nature and objectives of the scheme and its potential impacts on the economy, environment, and social well-being it was agreed in consultation with the LEP Independent Assurer and DfT that the focus of economic appraisal would be on capturing both traditional sources of scheme benefits, alongside wider economic benefits. Calculation of benefits is based on the output from the Central Lancashire Highway Transport Model (CLHTM) which was developed specifically for the purpose of supporting the PWD Business Case. It should be noted that after the approval of the PWD OBC, CLTHM model was revalidated to the same base year with the latest WebTAG values of time and used the latest TEMPRO 7.2 growth factors to estimate future year traffic demand.

Full details of the CLHTM model can be found in the Local Model Validation Report (LMVR) (December 2018) and Traffic Forecasting Report (TFR) (December 2018) attached to this document as Appendix G and Appendix H respectively.

The following monetised impacts have been included in the economic assessment:

- *Travel time*
- *Vehicle operating cost*
- *Accidents*
- *Journey Time Reliability*
- *Greenhouse gases emission*
- *Air Quality and Noise*
- *Changes in Indirect Taxes*
- *Wider Economic Impacts*

Along with the estimation of benefits, the costs are also required for the economic assessment of the scheme.

Costs can be defined as the total amount of money spent on constructing and maintaining the scheme. The costs are therefore referred to as Scheme costs and Maintenance costs:

- *Scheme costs are construction costs, land costs, preparation costs (planning and designing the scheme) and supervision costs during the scheme construction.*

- *Maintenance costs are the cost of people, machinery and materials required to maintain the highway network. These costs are also known as the Capital Costs of Maintenance.*

Base costs for construction, land / property, preparation / administration and supervision, including adjustment for risk are based on the detailed design of the scheme. The maintenance cost estimate has been produced using the typical maintenance profiles, costs, durations and timings for new roads as per the DfT QUADRO manual 2017 (DMRB Volume 14 Sec 1 Part 2 Chapter 4).

In addition, Optimism Bias adjustments have been made. Optimism Bias is the tendency for scheme appraisers to be overly optimistic about key parameters, including scheme costs. As risk analysis improves during the development of the scheme, the level of Optimism Bias adjustment will decrease. Given the final scheme cost will not be known until the construction contract is awarded later in 2019, for the purposes of this economic assessment the 3% Optimism Bias adjustment was applied to the scheme cost as recommended by WebTAG for the final stage of scheme appraisal (TAG Unit A1.2: Table 8). This has only been used for the economic assessment and has not been applied to the scheme costs set out in the financial case and the funding profile.

It should be noted that costs and benefits occur in different years throughout the assessment period, e.g. the construction costs occur before the scheme opens, whilst the benefits occur over the DfT standard appraisal period of 60 years. Therefore, the costs used in scheme appraisal differ from the outturn costs used for funding decisions. The appraisal costs are discounted and converted to the DfT's standard present value year for appraisal (2010) to allow direct comparison with the monetised benefits.

The combination of having costs and benefits in a standard price base and discounted to a common year means that all costs and benefits in this Economic Case are in 2010 prices, discounted to 2010 (unless explicitly stated).

4.2.3 Analysis of Non-monetised Impacts

The second stage of a Value for Money assessment builds on the initial monetised costs and benefits and considers qualitative and quantitative information on those impacts which cannot be monetised and how these contribute to the Value for Money of the scheme.

The impacts which are difficult to monetise but which have nevertheless been appraised using qualitative and quantitative information and given an overall qualitative assessment score are listed below:

- *Impacts on Landscape;*

- *Impacts on Townscape;*

- *Impacts on Historic Environment;*

- *Impacts on Biodiversity;*

- *Impacts on Water Environment;*

- *Impacts on Physical Activity;*

- *Impacts on Journey Quality;*
- *Impacts on Severance.*

The analysis of non-monetised impacts has been undertaken in accordance with the methodology recommended within the relevant WebTAG units and the results have been summarised within the AST (Appendix F) and section 4.9 of this chapter.

4.2.4 Analysis of Distributional Impacts

Finally, to understand the impacts of the scheme on different social groups, including those which are potentially more vulnerable to the effects of transport the Distributional Impacts (DI) appraisal has been undertaken. The DI appraisal is a mandatory requirement of WebTAG and it included the analysis of the following five impacts:

- *User Benefits;*
- *Noise;*
- *Air Quality;*
- *Accidents; and*
- *Personal Affordability.*

Full details of the methodology and results for each DI impact are given within the Distributional Impact Report (January 2019) and included as Appendix I. The results of the DI Appraisal are also reported within the AST and section 4.10 of this chapter.

4.2.5 Assessment Tools

The assessment methodology requires a use of appropriate tools and procedures in quantification and monetisation of the scheme impacts. Below is the list of appraisal tools recommended by DfT which were used to estimate the PWD benefits as part of the value for money assessment:

- *Transport User Benefit Appraisal (TUBA) - version 1.9.11 (June 2018) has been used to derive travel time benefits, VOC and indirect tax benefits of the scheme, as well as the impacts on the transport network of unlocking new development.*
- *COst and Benefit to Accidents – Light Touch (COBA-LT) - version 2013.2 with parameter file 2018.1 (May 2018) has been used to derive the expected change in number of accidents and their associated cost to the economy.*
- *QUeues And Delays at ROadworks (QUADRO) – version 4R13.0 has been used to derive the cost of delay due to construction and maintenance works.*
- *Wider Impacts in Transport Appraisal (WITA) version 1.2. Be has been used for analysis of productivity improvements and labour supply impacts.*
- *Jacobs bespoke Spreadsheets Analysis Tool has been used to determine and monetise urban roads journey time reliability impacts of the scheme.*

The use of assessment tools in economic appraisal is further discussed for each element of the assessment in the subsequent sections.

4.2.6 Uncertainty and Sensitivity Tests

The Value for Money assessment of the PWD scheme has been based on the 'most likely' traffic forecast scenario known as Core Scenario. It has been produced in line with WebTAG guidance and does not include trips associated with the scheme dependent development, to meet guidance in the context of schemes delivering housing growth.

To take into account the uncertainty regarding future traffic growth and to demonstrate the impact on the Value for Money with the Cuerden Strategic Sites included in the forecast scenario, a series of sensitivity tests were also undertaken.

Low Growth and High Growth forecast scenarios have been developed to take into account uncertainty regarding forecasts of population, households, employment, GDP growth and fuel price trends and their impact on future traffic growth.

The Low and High Growth sensitivity tests have been undertaken to investigate what effect the use of the low and high growth traffic forecasts would have on the BCR and the value for money.

A further sensitivity scenario, referred to as Core+ scenario, has been developed which includes the traffic demand generated by the committed Cuerden Strategic site that had to be excluded from the Core scenario to ensure the traffic growth was constrained to TEMPRO. The test aims to assure the robustness of BCR to such potential changes.

It should be noted that to ensure a proportionate approach the assessment for each sensitivity test has been undertaken in TUBA only. All other assessment results (such as accidents and environmental benefits) in the calculation of the BCR figures were assumed to be consistent between the Core and the sensitivity test scenarios.

Full details of the developing the sensitivity tests and the results are reported in the TFR and the EAR.

4.3 Assumptions

4.3.1 Overview

This section summarises the key assumptions supporting the Value for Money analysis. This includes the assumptions set out in WebTAG as well as further assumptions specific to the PWD scheme.

4.3.2 Transport Model, Time Periods and User Classes

The impacts of the proposed scheme are based on the differences between forecasts of the without-scheme and with-scheme scenarios. These forecasts have been developed within the Central Lancashire Highway Transport Model (CLHTM).

The CLHTM SATURN highway assignment model for the proposed scheme was developed for the Base year, 2014, validated to 2013 traffic counts, based on the latest WebTAG values of time.

To ensure that the analysis of traffic conditions and the subsequent development of proposal for the PWD was informed by contemporary data, a comprehensive programme of traffic surveys was undertaken, that included:

- *Road side interview surveys;*
- *Automated and manual traffic counts; and*
- *Journey time data;*

Most of the data on the baseline traffic conditions was collected in 2013 and 2014 as part of the development of the CLHTM model and PWD Outline Business Case (OBC). This was supplemented by other available data (2012) to ensure a more comprehensive analysis of the baseline conditions.

Future traffic growth for the development of model forecasting scenarios was based on planning data from the relevant planning authorities together with national data from NTEM v7.2, as the latest nationally adopted version, and RTF15 for LGV and HGV traffic.

Model development and traffic forecasting have been carried out in line with WebTAG units for the modelling practitioner (Units M1-1, M1-2, M3-1 and M4). Full details of modelling and forecasting can be found in the Local Model Validation Report (December 2018) and the Traffic Forecasting Report (December 2018) appended to this Business Case.

A Variable Demand Model (VDM) has been developed for the PWD scheme using DIADEM 5.0 software, in accordance with the scope and specifications outlined in a technical note produced by Jacobs (April 2018), and agreed with the DfT. The demand model was calibrated for car trips in line with the methodology laid out in WebTAG Unit M2. The responses included in VDM are trips frequency, trip distribution and cost damping. Additional details on the VDM parameters and realism tests are included within the LMVR (December 2018).

Subsequently, the VDM model was used to create forecast demands for the proposed scheme covering the peak and inter-peak traffic periods and conditions. The following time periods have been modelled:

- *Morning (AM) weekday peak hour between 08:00 and 09:00;*
- *An inter-peak weekday hour representing an average hour between 10:00 and 16:00; and*
- *Evening (PM) weekday peak hour between 17:00 and 18:00.*

Weekday night-times, Weekends (day-times and night-times) and Bank Holidays (day-times and night-times) were not modelled as the benefits generated in these time periods are unlikely to be significant due to lower levels of traffic.

The model used for forecasting splits the travel demand into different vehicle categories and different journey purposes. As a result, the following user classes are represented in the assignment model:

- *Cars – commuting;*
- *Cars – employer's business;*
- *Cars – other;*
- *Light goods vehicles (LGV); and,*
- *Heavy goods vehicles (HGV).*

4.3.3 Appraisal Period

In line with WebTAG guidance, the impacts of the scheme have been assessed over the 60 year period after the scheme opens, capturing the planned period of scheme development and implementation.

The transport model provides estimates for three forecast years: the opening year (2022), 15 years after opening, known as the design year (2037) and for 2042. The 60-year appraisal period for the PWD scheme is 2022-2081.

The results of the model have been interpolated and extrapolated to cover the whole appraisal period of 60 years.

4.3.4 Benefits Capture and Annualisation

The benefits and disbenefits captured in the assessment are not limited to those on the scheme itself. They are based on changes in levels of congestion, accidents, noise, air pollution, and greenhouse gas emissions on both the new road and existing roads across the study area.

The study area for each element of the appraisal has been identified individually based on the area of impact. For example, the study area for the TUBA analysis is consistent with the traffic model area of coverage and covers all Britain. The study area for the COBA-LT analysis only includes links and junctions with the change in traffic flow of more than 10% between with and without the scheme scenarios in the design year. More detail on the area of impact for each element of the appraisal can be found in the EAR.

In accordance with the guidance travel time and vehicle operating cost benefits generated in the modelled time periods have been extended using annualisation factors. The annualisation factors are defined as a number of times each time period occurs over a full year.

The annualisation factors have been calculated based on the standard procedures outlined in the TUBA manual and were derived using permanent Automatic Traffic Count (ATC) data for the A6 Garstang Rd (South of Beech Drive) and A583 (West of Riversway) as representative roads carrying the traffic which will be expected to benefit from the scheme.

The modelled peak periods (AM and PM) have been extended to include any adjacent periods where there is no significant change in traffic volume (<10%) and multiplied by a number of working days per year.

The weekday off-peak (19:00-07:00), weekends and Bank Holidays have been excluded from TUBA analysis. This is consistent with TAG guidance, which recommends not including benefits from non-modelled time periods.

4.3.5 Discounting and Units of Accounts

Costs and benefits occur in different years throughout the assessment period, e.g. the construction costs occur before the scheme opens, whilst the benefits occur in the 60 years afterwards. Also, it is considered that benefits that accrue now are considered to be more valuable than those that accrue further into the future.

Given the above, in order to compare benefits and costs it is essential that they are all converted to a common base and a common value (known as the Present Value Year).

The process used is called discounting and the Present Value Year is currently 2010.

Discounting is undertaken internally within the assessment tools mentioned above, using the standard DfT discount rates of 3.5% per year for the first 30 years of appraisal and 3.0% per year thereafter.

The unit of account must also be consistent between costs and benefits in order to allow comparison between the two. There are two different units of accounts:

- Market price unit of account – this refers to the prices paid by consumers for goods and services and therefore includes indirect taxation (e.g. VAT); and
- Factor cost unit of account – this excludes indirect taxation. Prices paid by Government bodies are usually quoted in the factor cost unit of account as any tax paid is recovered by the Government and is therefore ignored.

While scheme benefits are calculated in market prices, scheme costs are usually quoted as factor costs.

The scheme costs must therefore be adjusted to market prices for economic assessment purposes – this is done within economic assessment software.

4.3.6 Inflation

Costs can also be in different price bases. In order to enable comparisons to be made between such costs and to take account of the effect of inflation all monetary values in the calculation of costs and benefits are adjusted so that they are all in a common price base.

To ensure that the scheme costs account for real changes above and below general inflation in the economics modelling, a further adjustment was applied based on the conservative assumption of 5.5% per annum for construction related cost and 2.5% per annum for land, preparation and supervision cost.

4.4 Scheme Cost for Economic Appraisal

The costs used in the scheme appraisal and how they were derived are discussed in the Financial Case (Chapter 5). It should be noted that costs for scheme appraisal are adjusted to the DfT standard present value year (2010) to allow direct comparison with the monetised benefits and are in calendar years.

	Discounted Costs (£m)
Scheme Costs	£130.90m
Additional Costs of Maintenance	£2.73m
Total PVC	**£133.63m**

Table 4-A: Present Value of Costs (2010 prices, discounted to 2010)

4.5 Transport Economic Efficiency

4.5.1 Introduction

The Transport Economic Efficiency (TEE) benefits consist of three key components, set out below:

- *Travel time and Vehicle Operating Costs (VOC) benefits as a result of the scheme;*
- *Travel time and Vehicle Operating Costs (VOC) disbenefits as a result of construction activities; and*
- *Travel time and Vehicle Operating Costs (VOC) disbenefits as a result of maintenance activities.*

Travel time and VOC benefits as a result of the scheme are calculated with the use of TUBA software and normally constitute by far the largest proportion of the scheme benefits used in BCR calculation. TEE benefits/disbenefits as a result of construction and maintenance activities are calculated with the use of QUADRO software. Their proportion in the total amount of benefits is usually quite small compared to other impacts.

4.5.2 TEE Benefits as a Result of the Scheme

TUBA is the industry-standard software used to derive the travel time, VOC and Indirect Taxes benefits/ disbenefits of a scheme. It considers the Business and Consumer Traveller Impacts, the Private Sector Provider Revenues and Costs, and the Indirect Taxes elements of the WebTAG requirements.

TUBA requires input from the transport model in the form of trip, time and distance matrices by year, time period and user class as well as scheme specific information such as years of appraisal, time slices, costs etc.

TUBA assesses travel time savings over the entire modelled area and then applies monetary values (known as Values of Time (VOT)) to derive the monetary benefits of those time savings.

TUBA also calculates Vehicle Operating Cost (VOC) changes which occur due to changes in costs associated with such items as fuel, maintenance, and wear and tear. These occur due to changes in

speed and distance when the scheme is implemented and can include both positive and negative values depending upon the scheme's impact upon traffic flows and routing.

The diagram in Figure 4-B shows the process of the derivation of the TUBA benefits.

The full details of TUBA analysis for the PWD can be found in the EAR.

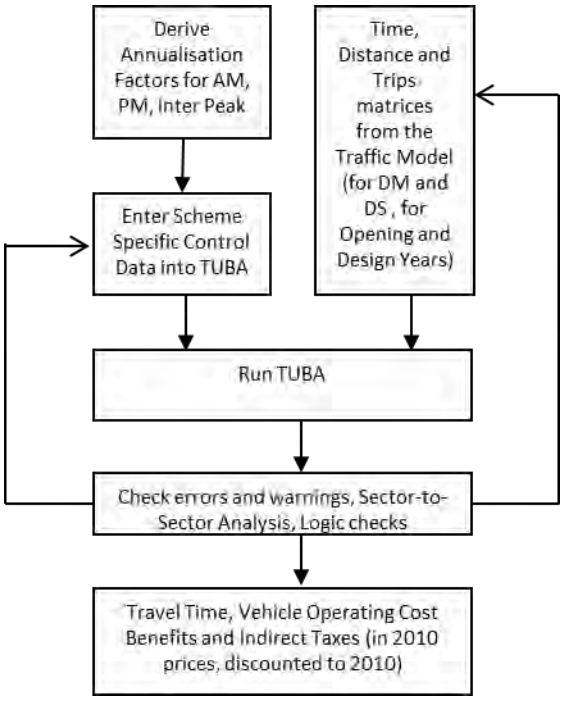

Figure 4-B: TUBA Analysis

The results of the TUBA assessment show that the PWD will deliver significant benefits from journey time savings, amounting to £279.7m.

The scheme also produces a net disbenefit of -£15.9m from an increase in VOC. The VOC disbenefit is logical as the total travel distance across the network is higher with the scheme than without the scheme.

The TUBA benefits are reported in a standard table known as the TEE table. The completed TEE table is included in the EAR.

It can be seen from the TEE table that 31% of travel time benefits are associated with Business trips and 69% with non-business trips.

The journey time benefits have also been assessed against the level of time saved, as shown in Table 4-B.

Net journey time changes (£m)	0 to 2 mins	2 to 5 mins	More than 5 mins
Business	£14.1m	£22.0m	£49.2m
Commuting	£30.7m	£30.9m	£34.3m
Other	£38.3m	£30.5m	£29.6m
Total	**£83.1m**	**£83.4m**	**£113.1m**

Table 4-B: Monetised Time Benefits by Size of Time Saving (2010 prices, discounted to 2010)

The table shows that time benefits are evenly spread between the levels of time savings, with 40% of the total travel time benefits being more than 5 minutes. In general, the smaller time savings are due to a reduction in congestion in Preston and the arterial roads accessing it, while larger time savings will be experienced by vehicles using the scheme.

The sector-to-sector analysis of TUBA benefits demonstrates that the results are logical in terms of how the benefits are spread across different geographical areas. As expected, the largest benefits occur between the sectors which will experience reductions in travel time as a result of the scheme.

The trips which account for the largest proportions of travel time benefits are listed below:

- *Trips within Preston and between Preston and areas in the north, east and south-east of Lancashire. These trips will benefit from the scheme due to a reduction in congestion on roads accessing or going through Preston, mainly the A6 and the A5085 Blackpool Road. While the unitary benefits per trip are moderate, the high trip demand between these areas relevantly scales the total amount of benefits.*

- *Trips between Preston and Blackpool, that can use PWD instead of travelling longer journeys through M55 junction 1 or leaving the M55 at junction 3 and accessing Preston through Kirkham and local roads.*

- *Trips between the Warton Enterprise Zone site and East Lancashire, South-East Lancashire/Bolton and GB south. With the scheme, vehicles can access Warton through M6, M55 and PWD, instead of going through Preston or using local roads.*

The sector-to-sector analysis also shows that there could be dis-benefits for some movements mainly those affected by a slight increase in journey time on the strategic road network. The highest disbenefits are expected for trips between Blackpool and east Lancashire, the south-east of Lancashire/Bolton and GB south. While unitary dis-benefits per trip are insignificant, high demand scales up the impact on total benefits.

4.5.3 TEE Disbenefits as a Result of Construction Activities

The PWD scheme is partly being constructed on-line (at junctions with the M55 and A583 / A5085) and during the construction delays will be experienced by road users. These delays will be kept to a minimum through the use of effective traffic management but are unlikely to be removed altogether. This will result in travel time and VOC dis-benefits on the existing network that have been considered as part of the TEE assessment.

QUADRO is the industry-standard software used to derive the construction and maintenance delay elements of the TEE benefits of a scheme.

The methodology for QUADRO construction delays assessment is shown in Figure 4-C.

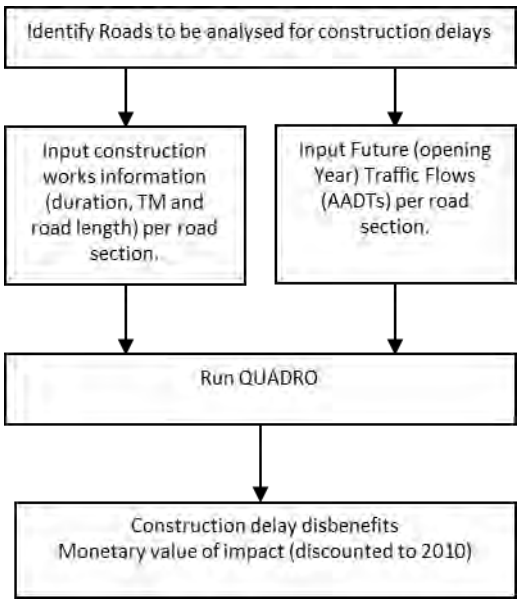

Figure 4-C: QUADRO for Construction Delays Analysis

The total dis-benefit due to construction of the PWD, calculated in QUADRO is -£2.04m (in 2010 prices, discounted to 2010).

More detail on the methodology and results of QUADRO analysis for construction delays disbenefits can be found in the EAR.

4.5.4 TEE Disbenefits as a Result of Maintenance Activities

Delays will be experienced by road users during periods of maintenance in the future both with and without the scheme. These delays and their associated cost have been estimated in QUADRO over the 60 year appraisal period. The process is schematically demonstrated in Figure 4-D.

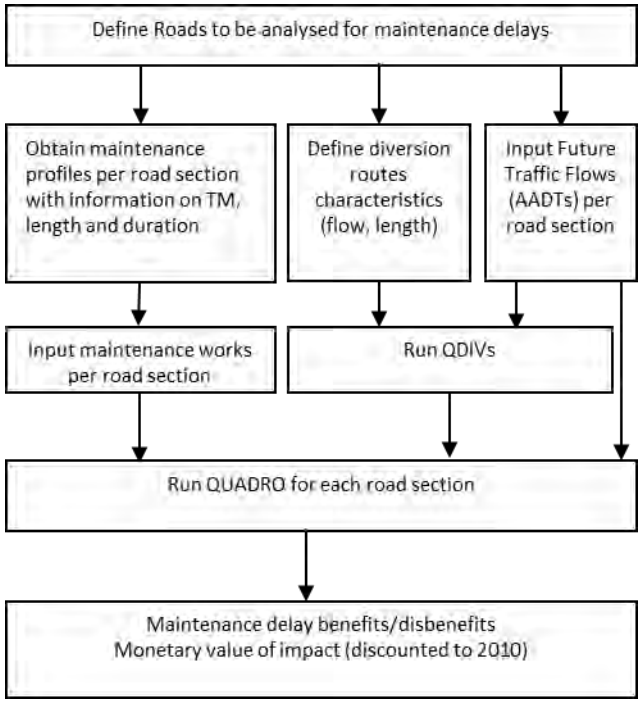

Figure 4-D: QUADRO for Maintenance Delays Analysis

With the transfer of traffic from Preston urban roads to the PWD fewer trips will be affected by the delays due to maintenance, particularly on the A6. However, the new road will also need to be maintained,

and over the 60-year period the overall impact on travel time as a result of maintenance activities is expected to be negative, with a net disbenefit of -£0.69m.

More detail on the methodology and results of QUADRO analysis for maintenance delays disbenefits can be found in the EAR.

4.6 Reliability

The term reliability is referred as a variation in journey times that individuals are unable to predict. Such variation could come from recurring congestion at the same period each day (day-to-day variability, or DTDV) or from non-recurring events, such as incident. It excludes predictable variation relating to varying levels of demand by time of day, day of week, and seasonal effects which travellers are assumed to be aware of.

WebTAG provides guidance for modelling and monetisation of changes in journey time reliability for motorway and urban road users. However, there is no WebTAG methodology for modelling reliability on schemes, such as the PWD. This means that PWD reliability impacts are treated as indicative impacts and therefore, cannot be captured in the BCR but reliability valuations can be approximated and monetised to support the overall Value for Money assessment.

Monetised impacts of the PWD on journey time reliability have been calculated for trips starting and ending within Preston and north of South Ribble urban area only. The methodology is based on the model that calculates journey time reliability as a function of the standard deviation of travel time. In turn, standard deviation is established based on the changes in journey time and distance due to the scheme.

As a result of the reduction in congestion and accidents in the urban area of Preston, the scheme is estimated to provide £5.0m of journey time reliability benefits (2010 prices, discounted to 2010).

Given that the journey time reliability analysis was limited to the urban area and there is an uncertainty regarding the impact of the scheme on reliability across the wider network and in line with WebTAG guidance this element of economic appraisal has not been considered within the AMCB and therefore not been included in the calculation of the BCR.

4.7 Changes in Indirect Tax

Indirect taxes relate to the taxation levied on goods and services and therefore include excises, duties and VAT. TUBA calculates the changes in Indirect Taxes as a result of changes in speed and distance. These changes affect the amount of fuel being used and therefore affect the amount of taxes the Government receives.

According to the TAG guidance changes in indirect tax revenues are included as part of the Present Value of Benefits (PVB). Therefore, change in Indirect Taxes, as a monetary value in 2010 prices discounted to 2010, is included within the AMCB and PA tables and form part of the BCR.

The results output from TUBA for the entire study area predict an increase in indirect tax revenues of £8.2m. This is added to the benefits, as shown in the AMCB table.

4.8 Safety Benefits

One of the supporting objectives of the scheme, as noted in the Strategic Case is to improve road safety particularly within Preston, and that presently have accident rates above the national average.

When the scheme is built the traffic is expected to transfer from local roads with accident rates higher than national average to a modern standard dual carriageway road, thus providing significant accident savings.

In line with WebTAG, the DfT COBA-LT software was used to derive accident benefits of the scheme. COBA-LT compares the predicted numbers of accidents with and without the scheme and converts them into monetary values by multiplying the numbers of accidents by their monetised costs.

The diagram in Figure 4-E shows schematically the methodology for COBA-LT analysis.

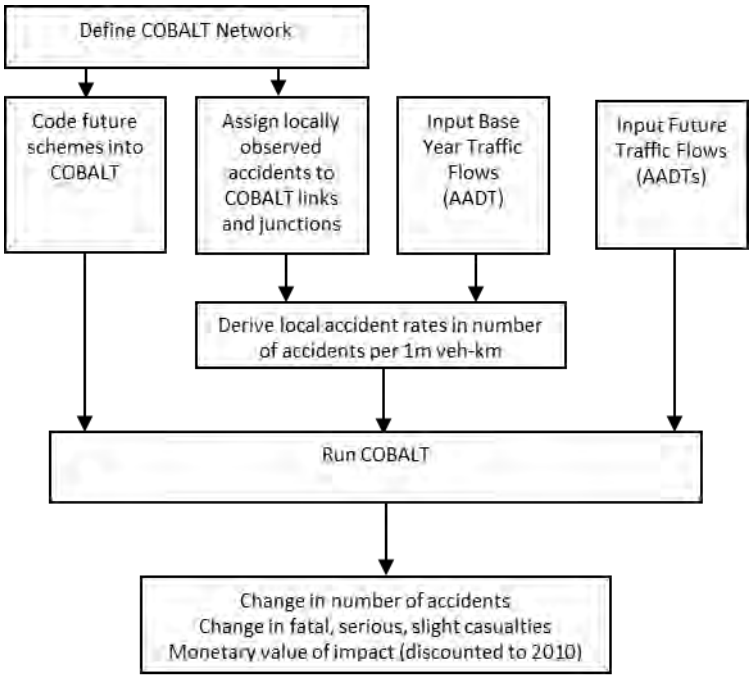

Figure 4-E: COBA-LT Analysis

The extent of the COBA-LT network is demonstrated in Figure 4-F.

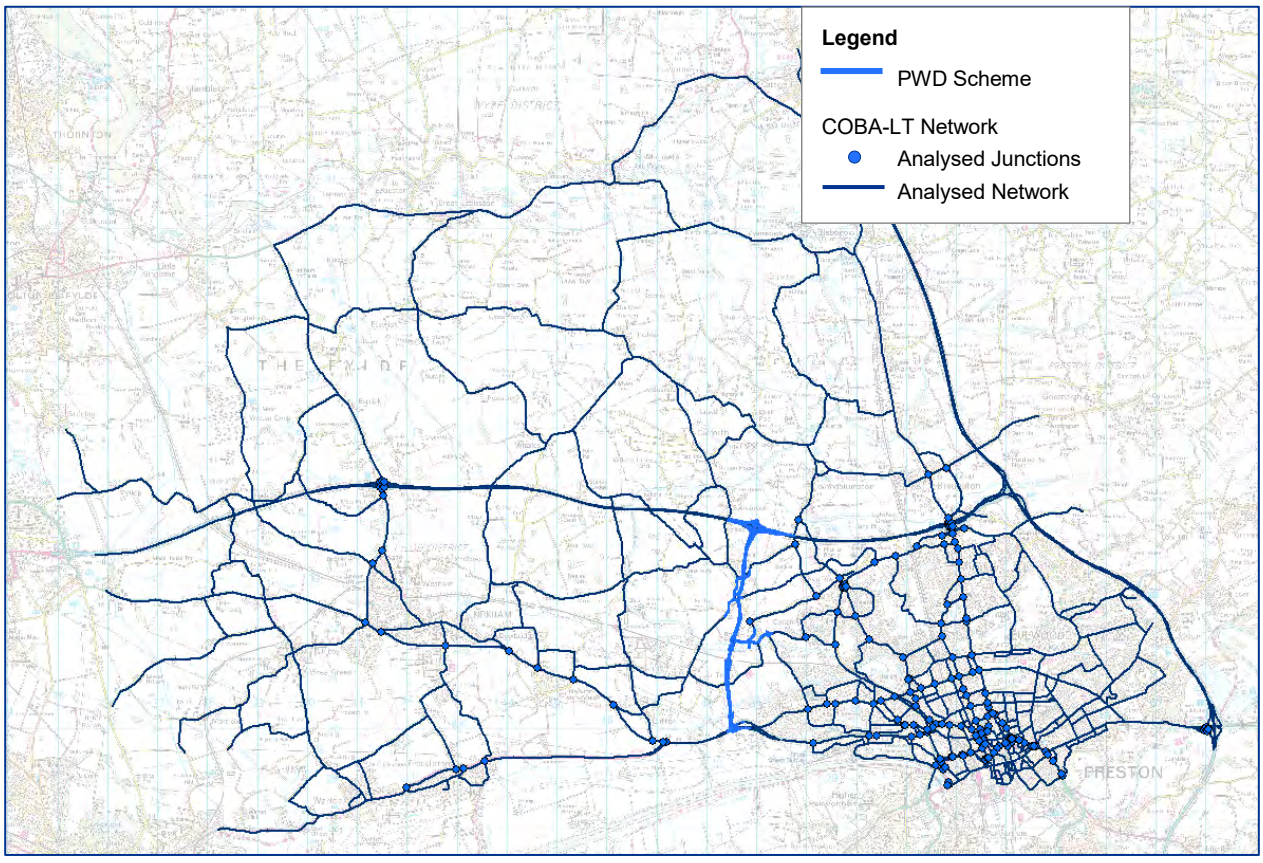

Figure 4-F: COBA-LT Network

Table 4-C summarises the results of the PWD COBA-LT analysis.

It shows that over the 60-year period the scheme will reduce the total number of accidents by 632, including 8 fatal casualties and 100 serious casualties.

The monetary value of the overall change in accidents would be a benefit of £33.7m (2010 prices, discounted to 2010).

	Total
Reduction in number of accidents	**632**
Reduction in number of casualties	
Fatal	8
Serious	100
Slight	732
Total	**840**

Table 4-C: Predicted Accident Reductions as a Result of PWD

The full details of COBA-LT analysis for the PWD can be found in the EAR.

4.9 Environmental and Social Impacts

4.9.1 Overview

This section summarises the impacts of the scheme on the environment, as well as the social impacts. The environmental impacts include monetised impacts (Noise, Air Quality and Greenhouse gases) and non-monetised impacts (Landscape, Townscape, Historic Environment, Biodiversity and Water Environment). The social impacts described in this section are not typically monetised and have therefore been assessed using quantitative and qualitative information. They include Physical Activity, Journey Quality, and Severance.

4.9.2 Environmental – Air Quality

The likely effects on air quality once the scheme is in place relate predominantly to the changes in traffic emissions for vehicles travelling along affected roads in the study area. The standard Air Quality Worksheet from WebTAG Unit A3 has been used to calculate the impact of the scheme on local air quality, regional air quality and the economic valuation of air pollution for the 60 years after the scheme opening.

The results of the local air quality assessment are detailed in **Appendix J.1.** The scheme will result in a net reduction (benefit) in local air quality concentrations overall in the opening and design years. However, concentrations are likely to increase near to the scheme and on nearby motorways/main roads (M55, M6, New Preston Road) due to the attraction of extra traffic onto the road network, while roads farther from the scheme will benefit from an improvement in air quality due to attraction of traffic away from these areas.

The total value of the change in Air Quality is a benefit of £0.58m.

4.9.3 Environmental – Noise

Changes in traffic flows can also result in changes in noise, depending on whether properties are located adjacent to affected roads or not. The standard Noise Worksheet from WebTAG Unit A3 has been used to calculate the change in noise levels during the life of the scheme, the change in number of people ‘annoyed’ and the monetary value of those changes (PVB).

The results output from the Noise spreadsheet presented in **Appendix J.2** show that there is predicted to be a benefit from changes in noise levels, equating to £6.22m over the 60 year appraisal period. The number of households expected to experience a decrease in noise exceeds considerably the number of households expected to experience an increase in noise levels once the scheme is implemented.

One of the supporting objectives of the scheme as set out in the Strategic Case is to *Improve air quality and reduce noise pollution.*

This objective is likely to be achieved based on the results of environmental assessment for Local Air Quality and Noise impacts.

4.9.4 Environmental – Greenhouse Gases

Changes in greenhouse gas emissions from the vehicles depend on changes in flows, speeds and distance travelled. The standard Greenhouse Gases Worksheet from WebTAG Unit A3 has been used to calculate the total carbon dioxide emissions for the life of the scheme. This can be seen in **Appendix J.3.** The spreadsheet outputs information on carbon dioxide emissions per year. Benefits are output in tonnes and as a monetary value.

The results output from the Greenhouse Gases Worksheet predict an increase in carbon emissions of 393,094 tonnes over the 60 year appraisal period. These changes are due to an increase in distance travelled once the scheme is in place despite there being a decrease in overall travel times. There is no change in traded carbon dioxide emissions as a result of the scheme. The monetary value of the increase is a disbenefit of -£17.6m.

The monetary values of Air Quality, Noise and Greenhouse Gases impacts have been added to the PVB and included in the calculation of the scheme initial BCR.

4.9.5 Environmental – Landscape

The impact assessment on landscape was undertaken using the standard Landscape Worksheet from WebTAG Unit A3. The output of the assessment was that the scheme would adversely affect the landscape and result in a loss of vegetation, topographical changes, a reduction in tranquillity and visual amenity, and the interruption of field pattern.

Mitigation vegetation would serve to help integrate the road into the surrounding landscape, enhance and link vegetation and restore field boundaries. However, traffic on the new road would continue to reduce tranquillity; thus, making the overall impact of the scheme on landscape **slight adverse.**

The Landscape impact assessment worksheet is presented in **Appendix J.4.**

4.9.6 Environmental – Townscape

Townscape covers the physical and social characteristics of the built and non-built urban environment and the way in which people perceive those characteristics. The methodology used for appraising the impact of the scheme on townscape is based on a qualitative approach and uses the standard Townscape Worksheet from WebTAG Unit A3.

The results of the Townscape impact assessment presented in **Appendix J.5** show that as the PWD largely runs through a rural area there will be no impact on the local townscape character, and therefore the overall effect for Townscape is **neutral.**

4.9.7 Environmental – Historic Environment

The Historic Environment comprises buildings and sites of architectural and historic significance. The impact of the scheme on historic environment has been appraised qualitatively using the standard WebTAG Worksheet.

A total of 110 heritage assets have been identified, of which only 56 appear to be impacted by the scheme. After mitigation, residual impact is assessed as moderate adverse on two assets and slight adverse for seven assets, with the remainder being neutral. The potential for as-yet unknown archaeological remains is considered to be low.

The overall result for historic environment as detailed the Worksheet is **slight adverse**. This can be seen on **Appendix J.6.**

4.9.8 Environmental – Biodiversity

In common with the other non-monetised environmental impacts, Biodiversity has been assessed using the qualitative and quantitative techniques set out within the WebTAG and by completing the standard TAG Worksheet presented in **Appendix J.7.**

Although the impacts on the majority of the identified biodiversity features at 15 years operation are assessed as Neutral, a major negative impact is anticipated for veteran trees. Due to the timescale needed for trees to establish veteran status, new planting cannot adequately compensate for the loss of eight veteran trees due to the scheme. This would represent an overall assessment score of **moderate adverse** impact for biodiversity.

4.9.9 Environmental – Water Environment

The Water Environment Appraisal Worksheet (see **Appendix J.8)** has been completed to assess the potential impact of the scheme for different water environment features.

The results show that impacts of the scheme on water environment would range in magnitude from negligible to large adverse. However, most of the impacts on the identified water environment attributes would be insignificant or have low significance. The only potentially significant impact identified is the biodiversity of ponds adjacent to the scheme.

Potential impacts were identified prior to the application of any mitigation measures. However, impacts from construction runoff, routine road runoff and spillages will be mitigated through a drainage system designed to attenuate flows and treat pollutants. Culverts and watercourse diversions will be designed with sufficient capacity to convey anticipated flows and to minimise erosion.

As a result a **slight adverse** score has been awarded for Water Environment.

4.9.10 Social – Physical Activity

According to WebTAG the latest research shows a correlation between physical inactivity and the risk of all-cause mortality. A qualitative and quantitative assessment has been undertaken for the scheme in line with the WebTAG guidance (Unit A4.1) which is summarised Physical Activity assessment worksheet (**Appendix J.9**).

It is concluded that overall non-motorised users (NMU) would experience a **slight beneficial** impact with regard to physical activity due to the new facilities provided and slightly increased journey times for users of some of the Public Rights of Way.

4.9.11 Social – Journey Quality

Journey Quality depends on a number of factors all of which have been qualitatively assessed in line with WebTAG, with and without the scheme to make a judgement on the impact of the PWD on journey quality. These factors include traveller care, traveller views, traveller stress as well as additional sub-factors.

It is concluded that as a result of the scheme, there would be a significant beneficial effect on travellers' views from the proposed distributor road due to the good quality views across the countryside along the new route, particularly across the two proposed viaducts. There would also be an improvement in

traveller stress due to a reduction in driver frustration, fear of accidents and journey uncertainty as well as the improvement in NMU facilities. In addition, a beneficial impact on traveller care would be experienced through improving the environmental factors of the journey. As the number of travellers affected exceeds 10,000, the impact is likely to be **large beneficial**.

The Journey Quality appraisal worksheet is presented in **Appendix J.10**.

4.9.12 Social – Severance

Severance is defined within WebTAG as the separation of residents from community facilities and services caused by substantial changes in transport infrastructure or by changes in traffic flows. To understand the impact of the PWD on severance, the difference in the levels of severance in the with-scheme and without-scheme cases have been examined as demonstrated in the WebTAG worksheet (**Appendix J.11**).

Overall, the scheme is considered to have a **slight beneficial** impact on severance especially to the communities adjacent to the scheme such as Lea Town and Cottam. The new facilities provided along the distributor road would provide increased access for NMUs.

4.10 Distributional Impacts

The assessment of Distributional Impacts (DIs) is designed to help understand the impacts of transport interventions on different groups of people, including those potentially more vulnerable to the effects of transport. Consideration of the DIs of transport schemes is a mandatory requirement of WebTAG. As per TAG Unit A4.2, the DI Appraisal requires the consideration of the following eight DI Indicators:

- *Noise;*
- *Air Quality;*
- *Accessibility;*
- *Security;*
- *Severance;*
- *User Benefits (journey times and vehicle operating costs);*
- *Affordability; and*
- *Accidents*

The full appraisal process is based on a three step approach:

- *Step 1 – Screening Process*
- *Step 2 – Assessment*
- *Step 3 – Appraisal of Impacts*

Five of the DI indicators were found to fulfil the criteria to be taken to Step 2 of the PWD DI Appraisal: User Benefits, Affordability, Accidents, Noise and Air Quality.

The results of the DI appraisal demonstrated that not all those impacts are distributed evenly among different social groups. This is summarised in the DI Appraisal Matrix included in the Distributional Impacts Appraisal Report (January 2019) (**Appendix I**).

DI assessment for different income groups showed some income groups will experience more significant benefits/disbenefits than the others. For User Benefits income group 4 will receive a large positive impact, whilst income groups 2,3 and 5 will a receive moderate beneficial impact and income group 1 receives a slight beneficial score.

For Air Quality NO2, income group 1 receives a moderate adverse score and income group 3 receives slight adverse benefits from the scheme. Income groups 2 and 5 will receive a large beneficial impact and income group 4 will receive a moderate benefit. For Air Quality PM10 all income groups receive a positive impact but income groups 4 and 5 will benefit the most.

All income groups will receive a negative impact regarding personal affordability, with income groups 1 and 2 receiving a slight adverse score, income groups 3 and 4 scoring large adverse, and income group 5 gaining a large adverse score.

On the other hand, all income quintiles except income quintile 1, which receives a large adverse score will benefit from a decrease in noise levels with the scheme in place. Income group 5 receives a large beneficial impact, income groups 2 and 4 receive a slight beneficial score, and income group 3 receives moderate beneficial.

DI assessment for vulnerable groups showed that children, older people, pedestrians and cyclists will overall be positively affected by the scheme.

Children are expected to receive a slight beneficial effect from change in noise levels as well as from a reduction in accidents, while there is expected to be a neutral impact on air quality.

Older people, pedestrians and cyclists are expected to benefit from accident impact as there will be a reduction in numbers of casualties among representatives of these two groups when the scheme is in built. Older people are also expected to experience a reduction in noise resulting from the scheme. Yet they have scored slight adverse for air quality.

4.11 Wider Economic Benefits

4.11.1 Introduction

The appraisal of wider economic impacts of the PWD has been undertaken based on TAG Unit A2-1 (May 2018) and reported in the Economic Impact Report (EIR). In line with WebTAG, methods available to capture the wider economic impacts are not as robust as the traditional transport user benefits (established monetised benefits). Therefore, only some of the wider economic impacts (evolving monetised benefits) can be included within the scheme's adjusted BCR. These benefits include productivity, labour supply, and output change in imperfectly competitive markets.

Other wider economic benefits, such as Dependent Development benefits, known as indicative impacts, are monetised only to support the Value for Money assessment of the scheme. Given the nature and objectives of the PWD it was critical that the economic appraisal would capture these impacts to demonstrate that the strategic objectives will be met.

4.11.2 Productivity Impacts

Given that increasing productivity is a national priority and that the PWD scheme is expected to reduce travel costs, the impact of the scheme on productivity has been considered in the economic appraisal. It is expected that the proposed scheme will provide productivity benefits through an increase in agglomeration, as a reduction in travel costs effectively brings businesses and employees closer together. This assessment is defined in TAG as 'static clustering'.

Agglomeration impacts are likely to be greater from transport improvements near already densely clustered urban centres. TAG Unit A2 identifies a number of 'Functional Urban Regions': schemes that fall within or nearby these areas are more likely to receive agglomeration benefits. The PWD scheme lies within the Preston Functional Urban Region.

The assessment of the PWD impacts on productivity has been undertaken using WITA v1.2 (the latest available version at the time of analysis) and TUBA.

The results of the assessment show that the scheme will provide £45.5m of agglomeration benefits, extracted for a 'core area' around Preston, over a 60 year appraisal period in 2010 prices discounted to 2010. A report issued by Highways England's Chief Analyst's Division ('Economic Growth Technical Annex, February 2018') states that WITA benefits – primarily agglomeration benefits from static clustering – typically represent between 20% and 107% of business user benefits. In the case of this appraisal, the agglomeration benefits are 55% of the standard Business User benefits from the TEE table.

4.11.3 Labour Supply Impacts

TAG Unit A2.3 identifies labour supply impacts as being likely to occur when transport is a barrier to employment. This can occur when an area has poor connections to employment centres and / or high transport costs relative to incomes. As described in the Strategic Case, poor transport links and increasing congestion has been identified as a barrier to employment growth in the area. Key employment sites such as Lancashire Enterprise Zone have described a difficulty in attracting skilled labour due to the problems of commuting.

As commuting costs fall following the introduction of the PWD, some people who had been priced out of the labour market by high commuting costs would now be able to seek employment. The additional employment generated would add value to the scheme.

As with the productivity benefits described above, labour supply impacts were calculated using the DfT's WITA software. The impacts were calculated in the same WITA run as the productivity impacts.

The labour supply results over a 60 year appraisal period in 2010 prices discounted to 2010 are £1.8m.

4.11.4 Induced Investment – Output Change in Imperfectly Competitive Markets

Output change in imperfectly competitive markets refers to changes in the level of economic activity as a result of transport investment. A reduction in generalised travel costs will induce investment and hence output. However, in an imperfectly competitive market, the value of the output is greater than the costs of production. The value of the resulting increased output is therefore not fully captured by the magnitude of the change in travel costs. Business user benefits therefore fail to capture the total value of the output change.

TAG Unit A2.2 provides examples of 'market failures', the presence of which would indicate an imperfectly competitive market. These include

- Imperfect Competition (Product markets): e.g. when markets are dominated by a small number of business.
- Tax Distortions: e.g. when companies adjust efficiency to adjust taxes payable.
- Imperfect Competition (Land markets) e.g. when land is owned by a small number of land owners.
- Co-ordination Failure: e.g. when multiple developers each under-invest in local transport improvements.
- Land Rationing: e.g. when policies (public or private) artificially limit the area of land available for development.

In the context of the Preston Western Distributor scheme, a significant proportion of the business user benefits accrue to freight. Within this market, a small number of large companies appear to have a significant proportion of the market. It is therefore likely that the scheme will result in output change that should be captured above the standard business user benefits. Output change in imperfectly competitive markets have been therefore assessed.

As per TAG Unit A2.2 (paragraph) 4.3.1, the additional welfare effects are estimated by applying a 10% uplift factor to the business and freight user benefits. The result of this is £8.14m, over a 60 year appraisal period in 2010 prices discounted to 2010.

4.11.5 Dependent Development Benefits

As discussed in the Strategic Case the scheme is driven by the ambitious plans set out in the Lancashire City Deal to transform the area and create thousands of new jobs and new homes. The scheme is expected to unlock the North West Preston strategic housing location (referred to as MD2 in local planning documents and accounting for 5,320 dwellings) and provide direct links into Cottam development areas and Cottam Parkway Rail Station.

WebTAG categorises new development that is dependent on the provision of a transport scheme as Dependent Development. In the case of the PWD scheme, dependency refers to land use development that cannot be realised without the introduction of the PWD.

Given that the dependent development is conditional to the provision of the scheme and to ensure a fair comparison between With and Without Scheme scenarios, WebTAG suggests that the dependent development should not be included into the Core demand matrices.

Instead, a separate assessment has been made to estimate the benefits of the PWD that are attributed to unlocking housing development, following the three-step approach in line with WebTAG:

Step 1: Determine the quantity of new development in the North West Preston area that should be regarded as dependent on the PWD scheme.

Step 2: Assess the transport user benefits of the transport scheme in isolation (that is, in the absence of the dependent housing development). This has been undertaken using TUBA for the Core Scenario as described above; and

Step 3: Assess the benefits of the dependent housing development with the PWD in place. This involves a comparison of the Core Scenario and a scenario with the dependent development assigned on the With Scheme network.

Step 1 of the process was undertaken by means of a dependency test in line with WebTAG guidance, as detailed in the Dependency Test note (November 2015) as part of the scheme Outline Business Case. The test concluded that with the exception of 450 dwellings at Haydock Grange site, NWP was dependent on the PWD and therefore not included in the core traffic modelling assumptions.

Subsequently, a review of existing planning data identified 5 sites within the NWP development to already have planning permission, either without conditions for developer contributions to the PWD or with no time threshold on such contributions. The 5 sites awarded conditional approvals are:

- Redrow, 330 dwellings;
- Connemara, 125 dwellings;
- Wainhomes Developments, 350 dwellings;
- Hollins Strategic Land Development, 140 dwellings; and
- CEG Development, 350 dwellings.

These 5 sites, comprising 1,295 dwellings, and the 450 dwellings at Haydock Grange were therefore not considered to be dependent developments on the PWD.

The remaining 3,575 dwellings at the NWP residential development are considered to be dependent on the PWD scheme. Benefits from these developments have been captured within this Wider Economic Impact assessment reported in the EIR.

Assessment of the dependent development benefits of the PWD scheme (Step 3) considered the following elements:

- Planning gain arising from dependent new homes
- Transport external costs; and
- Loss of amenities

The results are presented in Table 4-D below.

Dependent Development Impacts Stream	Benefits (£m)
Planning Gain (Land Value Uplift)	£188.6m
Loss of Amenity Value	-£7.4m
Transport External Cost (impact of new congestion on existing road users)	-£126.5m
Total Dependent Development Benefits	**£54.7m**

Table 4-D: Monetised Dependent Development Impacts

With the use of the WebTAG 'Valuing Housing Impacts' spreadsheet model the overall uplift in land value arising from the planning permission for this area has been estimated and amounted to £188.6m.

The loss in amenity value of the agricultural land was estimated to be –£7.4m which represents the non-transport external costs from the dependent development.

Finally, transport external costs in the form of travel time disbenefits to road users as a result of additional traffic generated by dependent housing development have been estimated to be -£126.5m based on a TUBA run comparing scenarios with and without the dependent development trips.

Thus, the benefits of the North West Preston dependent development are estimated to be £54.7m.

In line with WebTAG guidance, this element is not considered within the Analysis of Monetised Costs and Benefits (AMCB) and therefore has not been included in the calculation of the Benefit to Cost Ratio (BCR). It is however reported in the AST table and Value for Money statement of the scheme.

4.11.6 GDP Impacts of Unlocked Development

The results described in this Economic Case are calculated using a welfare-based approach, as required by WebTAG guidance to support the value for money assessment of a scheme. However, to assess how well the scheme addresses local economic objectives – which is reported in the strategic case – non-welfare impacts such as the impact on GDP can be useful metrics.

One objective of the Preston Western Distributor is to *"support local economic growth by unlocking housing development in North West Preston"*. While the Economic Case measures the extent to which this objective is achieved in terms of welfare at a national level, its success can also be considered at a local level, in terms of the change in local GDP (known as Gross Value Added or GVA).

The Economic Impact Report appended to this EAR describes the scheme's impact on GVA. Based on the assumption that each new home will indirectly support 0.15 jobs in the local economy, the housing at NWP would result in 536 jobs overall. Each job is assumed to have a 'persistence' in the economy of 10 years, i.e. the GVA benefit for each job is accrued for 10 years.

The estimated number of new jobs in each year is multiplied by typical 'GVA per job' figures for the local area. This resulted in a total GVA benefit of £108m (in 2010 prices, discounted to 2010).

This figure is used to support the scheme's Strategic Case. It is simply an alternative way of assessing the benefits captured within the Economic Case at a local level, and should not be added to the total benefits already described in this Economic Case. Further details on the methodology used in the GDP assessment, and how it links to the welfare assessment described in the Economic Case, is provided in the Economic Impact Report.

4.11.7 Summary of Wider Economic Benefits Results

A summary of the results of wider economic impacts, is provided in Table 4-E.

Evolving Monetised Impacts (for inclusion in adjusted BCR)	Benefits (£m, 2010 prices discounted to 2010)
Labour supply impacts	£1.8m
Productivity: Static Clustering	£45.5m
Output change in imperfectly competitive markets	£8.1m
TOTAL	**£55.4m**
Indicative Monetised Impacts (not for inclusion in adjusted BCR)	Benefits (£m, 2010 prices discounted to 2010)
Dependent Developments Benefits	£54.7m

Table 4-E: Summary of Wider Economic Impacts

4.12 Sensitivity Test Results

As discussed in section 4.2.6, a series of sensitivity tests has been undertaken to investigate the effect on the scheme BCR of travel demand variation, and to demonstrate the impact on the Value for Money with the Cuerden Strategic Sites included in the forecast scenario.

The sensitivity tests have been limited to TUBA analysis only. All other assessment results were assumed to be consistent between the Core and the sensitivity test scenarios.

The results of the sensitivity test are provided in Table 4-F, together with the results for the Core scenario for comparison purposes.

	Core Scenario	**Low Growth Scenario**	**High Growth Scenario**	**Core + Scenario**
TUBA Benefits (Travel Time, VOC and impacts on taxation)	£272.0m	£205.5m	£327.6m	£275.6m
Total PVB	£292.1m	£225.6m	£347.7m	£295.8
Total PVC	£133.63m	£133.63m	£133.63m	£133.63m
NPV	**£158.47m**	**£91.97m**	**£214.07m**	**£162.07m**
Initial Benefit to Cost Ratio (BCR)	**2.19**	**1.69**	**2.60**	**2.21**
Total PVB including £55.4m of Wider Economic Impact	£347.5m	£281.0m	£403.1m	£351.2m
Adjusted Benefit to Cost Ratio (BCR)	**2.60**	**2.10**	**3.02**	**2.63**

Table 4-F: Sensitivity Tests Results

As expected, the Low Growth scenario predicts moderately lower TUBA benefits than the Core Scenario, while the High Growth scenario predicts moderately higher benefits. The Low Growth scenario resulted in an initial BCR of 1.69 which represents medium Value for Money, while the High Growth and Core scenarios resulted in a high value for money initial BCR of 2.60 and 2.19, respectively. When considering the wider economic benefits, the proposed scheme presents high Value for Money in all scenarios.

Traffic to and from Cuerden will also receive benefits from improved journey times due to the PWD and therefore the impact of the inclusion of the Cuerden development site on the VfM is positive. However, despite the size of the development (4,000 jobs) the change from the Core forecast results is relatively minor which may be explained by the fact that the site is located far from the scheme.

4.13 Appraisal Summary Tables

The AST presents evidence from the analysis that that is undertaken to inform the Economic Case of an intervention. Applying the principles of HM Treasury Green Book, the AST has been designed to record all impacts - Economic, Environmental, Social, Public Accounts and Distributional.

The Scheme AST is included in **Appendix F.**

4.14 Value for Money Statement

The Value for Money assessment of the PWD scheme has been undertaken in line with the latest WebTAG guidance to support the Full Business Case of the scheme.

As part of the assessment the economic, environmental, social, distributional and fiscal impacts of the proposed scheme have been appraised using qualitative, quantitative and monetised information.

WebTAG guidance recommends Initial and Adjusted Benefit Cost Ratio (BCR) metrics to define the Value for Money category of a scheme. The categories include:

- *Poor VfM* *if BCR is below 1.0*
- *Low VfM* *if the BCR is between 1.0 and 1.5*
- *Medium VfM* *if the BCR is between 1.5 and 2.0*
- *High VfM* *if the BCR is between 2.0 and 4.0*
- *Very High VfM* *if the BCR is greater than 4.0*

The BCR represents the amount of benefits of the scheme being bought for every £1.00 of cost and is calculated by dividing the Present Value of Benefits (PVB) by the Present Value of Cost (PVC).

Based on the Analysis of Monetised Costs and Benefits (AMCB) the total monetised benefits (PVB) of the scheme, £292.1m, will exceed the scheme cost (PVC) of £133.63m, by £158.47m (NPV) (2010 prices, discounted to 2010).

The Initial BCR of the scheme is 2.19.

The scheme also delivers wider economic benefits from labour supply, productivity and output change in imperfectly competitive markets, which equate to £55.4m (2010 prices, discounted to 2010) and results in adjusted BCR of 2.60.

Any BCR between 2 and 4 indicates the scheme offers High Value for Money based on DfT guidance criteria and when set against the criteria of the TfL Assurance Framework.

Other impacts which have been monetised but not included in the BCR calculations are journey time reliability (£5m; 2010 prices, discounted to 2010) and dependent development benefits (£55m; 2010 prices, discounted to 2010).

As expected the majority of the benefits generated by the scheme are associated with travel time savings for business and non-business road users. Improvement in Safety, Noise and Air Quality also contribute to the total monetised benefits of the scheme. In addition, there will be an increase in indirect tax paid to the Exchequer which was also reflected in the total value of benefits.

On the other hand, negative benefits are expected from greenhouse gases emissions and increase in vehicle operating costs.

The non-monetised impacts of the scheme have also been considered as part of the Value for Money assessment.

The scheme it is expected to:

- largely benefit journey quality due to reduction in driver frustration, fear of accidents and journey uncertainty as well as the improvement in Non-Motorised User (NMU) facilities;
- have a slight beneficial impact on physical activity resulting from the provision of new facilities and slightly longer journeys;
- have a slight beneficial impact on severance due to the provision of new facilities maintaining connectivity between communities;
- have a slight adverse effect on the local landscape, historic environment and water environment and a moderate adverse impact on biodiversity;
- have neutral effect on townscape.

5. Financial Case

5.1 Introduction

The Financial Case concentrates on the affordability of the proposal, its funding arrangements and technical accounting issues (value for money is scrutinised in the Economic Case).

The Financial Case is discussed under the following headings:

- *Methodology*
- *Assumptions*
- *Base Costs*
- *Sunk Costs*
- *Inflation*
- *Maintenance Costs*
- *Quantified Risk Assessment (QRA)*
- *Optimism Bias*
- *Expenditure Profile*
- *Preferred Funding Arrangements*
- *Alternative Funding Arrangements*
- *Conclusion*

5.2 Methodology

The Financial Case for the PWD has been updated from the OBC stage based on further scheme development and latest costing of the preferred alignment.

Planning consent has been achieved and the Compulsory Purchase Procedure to assemble the necessary land was concluded on 1st April 2019 by the Secretary of State for Transport confirming Compulsory Purchase and Side Road Orders. The scheme is now unfettered by Planning and Land Assembly matters. The Decision Notice is attached as Appendix D.

The current cost estimate has been produced by Lancashire County Council's Early Contractor Involvement (ECI) contractor and is based on the scheme design at its present status. It remains a live document and is amended as the detailed design progresses.

The cost estimate is based on the following:

- Finalised highways design and structures detailed drawings, informed by a ground investigation, detailed consultation with interfacing third parties (Network Rail, Canals and Rivers Trust and Highways England;
- New Roads and Street Works Act 1992 Code of Practice Clause C3 Estimates received from statutory authorities;
- Future Preparation, Admin and Supervision costs developed by Lancashire County Council;
- Land acquisition and compensation costs including compensation payable under Part 1 of the Land Compensation Act 1973, estimated in February 2019;
- Quantified Risk Assessment dated March 2019.

Scheme delivery arrangements and commercial terms have been taken into account as has the determination of base costs and risk.

The Conditions of Contract to be adopted for the scheme's construction is an NEC Option C Activity Schedule supported Target Price. As the scheme is being developed under Early Contractor Involvement the development of the Target Cost is a joint exercise between designer/client and contractor leading to greater cost certainty and risk responsibility.

In developing the scheme, the engagement of an ECI contractor and availability of our framework consultant offered an excellent opportunity to value engineer the scheme during development. This included seeking out the most economic designs, materials and construction methodology. Additionally, it offered the opportunity to professionally challenge on the widest scale the concept and methods of achieving the aims of the scheme. This provides confidence that the final designed scheme is best and lowest cost option.

To provide additional surety of the Cost Estimate was independently verified by Corderoy in January 2017 and by Ridge and Partners Ltd in December 2017 (Appendix K). The verification reports helped refine the cost and adjust the methodology for inflation calculation. The inflation methodology has continued in further cost plans.

A final cost verification exercise will be commissioned prior to contract award to provide DfT, the City deal and the county council with confidence in the submitted Target Cost.

5.3 Assumptions

The key assumptions used in deriving the scheme cost estimates are outlined below:

- *Cost estimated in 2019 prices*
- *Construction period commencing Q3 19/20 with the scheme opening Q4 22/23;*
- *The rates used reflect construction projects of a similar size and nature and are provided by Costain Ltd, LCC's ECI contractor, who have access to current market rates which will be utilised in the Target Cost anticipated to be agreed in July 2019 for contract award in September 2019;*
- *The cost estimate has been prepared from the detail design information available at this stage of the project, which is 95% complete with the landscaping details the most significant outstanding scope. However, due to the detail needed for the successful planning application sufficient information is available for robust estimate to be produced.*
- *Construction Works to generally be undertaken during normal working hours save for the out of hours requirements associated with specific tasks relating to work near the M55 motorway and the Preston to Blackpool railway line;*
- *Access to the site is unrestricted except in relation to areas associated with the M55 motorway and the Preston to Blackpool railway line;*
- *Estimate only covers those works within the "red line" planning permission boundary;*
- *Allowance has been made for Utility services alterations which are based upon C3 Budget estimates which will be converted to C4 Detailed estimates prior to construction commencement;*
- *Part 1 Claims and Property estimates comprising the land costs have been developed by LCC valuers experienced in Lancashire property matters;*
- *Future Preparation and Admin costs have been calculated based upon the known staff requirements within the dedicated LCC team to complete the project to works commencement and the overhead cost attached by the staff;*
- *Site Supervision costs have been calculated by determining the required supervision team for the project. With this information and understanding the hourly rates and overheads and the contract length a calculation has been undertaken to evaluate the cost forecast.*

The works consist of:

- *New Dual and Single carriageways;*
- *One new grade separated motorway junction;*
- *Three new traffic signal controlled roundabout junctions;*
- *250m viaduct crossing the Millennium Ribble Link and flood plain;*
- *250m viaduct joint crossing of the railway and canal;*
- *Single span bridge crossing of the M55 motorway;*
- *Bridge crossing of existing lane over the scheme;*
- *Two subway access for agricultural public right of way and ecological mitigation purposes;*
- *Site clearance;*
- *Drainage works;*
- *Earthworks;*
- *Fencing;*
- *Shared use footway cycle tracks;*
- *Street lighting;*
- *Works for and liaison with Statutory Undertakers.*

5.4 Base Costs

The base cost of the scheme is shown in Table 5-A. As per the assumptions the cost estimates are in 2019 prices.

Category	**Estimate (£000's, 2019** prices)
Construction	£137,074
Land and Property	£13,215
Preparation and Administration	£11,558
Supervision and Testing	£2,230
TOTAL	**£164,076**

Table 5-A: Base Costs

The construction cost of PWD is estimated to be £137,073,589.70 (exclusive of risk and inflation) and the breakdown is presented in Appendix L**.**

The land and property valuation was last reviewed in February 2019 by LCC and is considered to be robust. The estimates were performed by local authority valuers experienced in Lancashire property and Part 1 Claim values. The total valuation takes into account the following elements:

- *The acquisition of interests in land estimated at £11,902m including fees. This includes a property which has been purchased already at a significantly lower value than could be expected due to the circumstances of the vendor. This offered a significant long term saving to the scheme*
- *Compensation under Part 1 of the Land Compensation Act 1973 at £1,313m including fees.*

The basis of the valuation is Agricultural Land valued at £8,500 per acre up to Development Land at £250,000 per acre. The valuation will remain under review as the scheme progresses through to statutory procedures if necessary for acquisition. Changes to the estimated land and property costs will be reported to the LEP and included in the Final Business Case. The changes will be met by the City Deal.

With a dedicated in-house design team supported by the County Council's framework consultants and an ECI contractor a scheme delivery team has been assembled with known and forecastable costs enabling preparation costs to be included in the scheme estimate.

5.5 Maintenance Costs

The PWD scheme will require maintenance work which will create costs that would not be present if the scheme was not built.

Maintenance costs for the PWD have been estimated based on the capital cost (e.g. people and machinery) of maintenance. The cost has been estimated using the typical maintenance profiles provided in the QUADRO manual 2017 (DMRB Volume 14 Sec 1 Part 2 Chapter 4), based on the road's length, flow and carriageway standard.

Table 5-B below shows the costs of maintaining the PWD, once constructed. The cost has been estimated for the 60-year appraisal period in 2010 prices and includes 3% contingency but does not include an allowance for inflation.

Section	Estimate (£000's, 2010 prices)
Maintenance cost	£9,809

Table 5-B: Maintenance Costs

The maintenance cost of the PWD may be partially off-set by a reduction in the maintenance cost required on the existing routes due to a reduction in traffic (e.g. A6 and A583). However, to ensure a conservative estimate was derived, this partial saving has not been quantified.

5.6 Sunk Costs

As has been outlined in the Economic Case and in line with guidance set out within WebTAG Unit A1.2 'sunk' costs, which represent expenditure incurred prior to the scheme appraisal and which cannot be retrieved should not be considered in the appraisal and decision to go ahead.

As of 1st March 2019, a total of £10.791 of project development costs have been incurred by LCC, including £500,000 of Land and Property cost and £10.291m of Preparation Cost. These costs are considered sunk and have subsequently been excluded from both the economic and financial cases. The scheme costs after excluding sunk cost are shown in Table 5-C.

Category	Estimate (£000's, 2019 prices)
Construction	£137,074
Land and Property	£12,715
Preparation and Administration	£1,267
Supervision and Testing	£2,230
TOTAL	**£153,285**

Table 5-C: Scheme costs excluding sunk costs

5.7 Inflation

The outturn costs, which include inflation, but do not include risk or optimism bias, are shown in Table 5-D below. In line with WebTAG and to ensure the scheme costs account for real changes above and below general inflation in the economics modelling the conservative inflation rate of 5.5% per annum after the current year was applied to the construction cost. Land, Preparation and Supervision cost inflation was assumed to be 2.5% per annum after the current year.

Category	Estimate (£000's, outturn prices)
Construction	£153,212
Land and Property	£12,874
Preparation and Administration	£1,267
Supervision and Testing	£2,346
TOTAL	**£169,699**

Table 5-D: Outturn Costs (excluding QRA)

5.8 Quantified Risk Assessment

A quantified risk assessment (QRA) for the PWD has been undertaken by LCC and Costain in order to determine the amount of risk to be applied to the base costs.

The QRA is a live document and gets updated regularly. It is based on industry knowledge and experience from other schemes which have been constructed.

The latest version of QRA updated on 1st March 2019 is included as Appendix M. It identifies 306 risks attributed to client or contractor. The risks have been assessed and where possible addressed introducing mitigation measures leaving 130 currently active and quantified.

Following mitigation, 15 risks remain with a high value in the most probable category. The high value risks are set out in Appendix N.

The risks have been subject to a Monte Carlo Risk Analysis the summary of the analysis of the client risks are attached as Appendix O.

The analysis provides a normal bell curve output with the levels of probability for the pre-mitigated risk value shown in Table 5-E.

Probability	Pre Mitigated Value	Post Mitigated Value
Maximum	£24,778,250.13	£6,528,588.40
Median	£15,595,720.16	£5,807,418.15
Least	£3,367,298.54	£527,052.36

Table 5-E: QRA Probability Results

The results for median pre-mitigated risk values are taken forward to the scheme cost estimate (Table 5-F).

Category	Estimate (£000's, outturn prices)
Base cost	£169,699
QRA	£15,596
TOTAL	**£185,295**

Table 5-F: Outturn Cost including QRA

5.9 Optimism Bias

As outlined in the Economic Case (Chapter 4), for the purpose of the economic appraisal which has been undertaken, the base costs (including risk) have been further uplifted to include optimism bias at a rate of 3% as suggested in WebTAG Unit A1.2.

For the purpose of the Financial Case, optimism bias has not been included.

5.10 Expenditure Profile

Expenditure profile (excluding Part 1 claims) is shown in Figure 5-A.

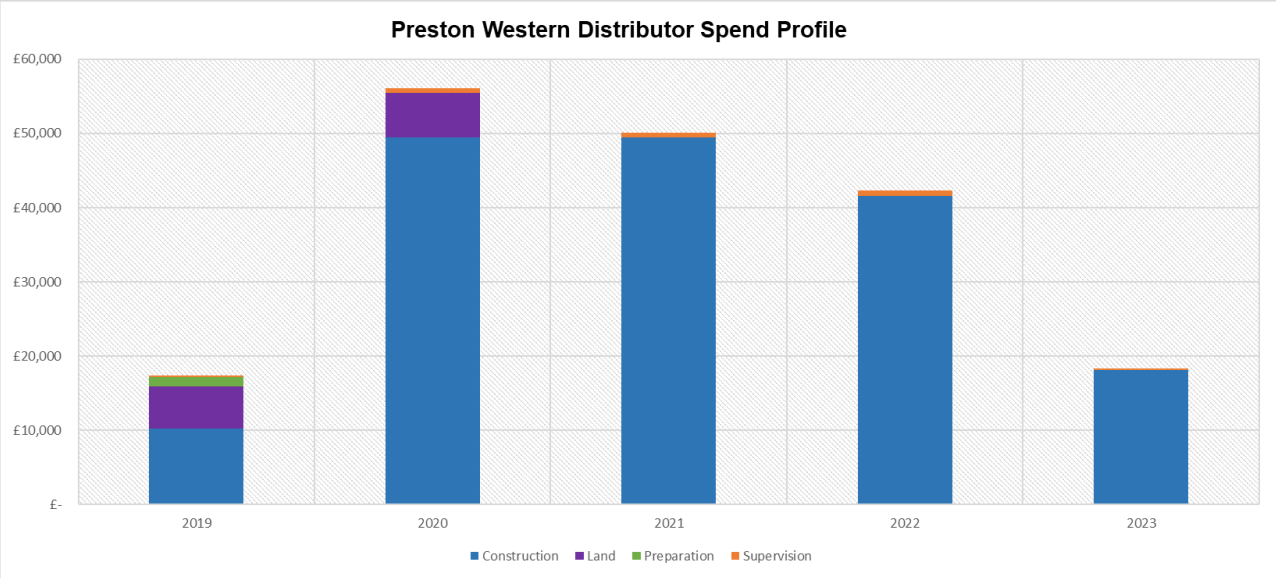

Figure 5-A: Expenditure profile (in outturn costs, £000s)

More detail is available in Appendix P. It has been confirmed that the funding will be released for the City Deal commensurate with the spending.

5.11 Preferred Funding Arrangements

Table 5-G below outlines the intended funding arrangements for the scheme.

Funding Source	Sum **(£000's)**
Local Growth Fund (LGF)	£58,000
Highways England Pinch-point Scheme	£25,000
City Deal Infrastructure Delivery Fund (CDIDF)	£102,295
Total	**£185,295**

Table 5-G: Funding Sources

Preston Western Distributor has a £58m allocation through the Government's Local Growth Fund which is accessed through the Growth Deals agreed with the Lancashire Local Enterprise Partnership (LEP).

The £58m available from the Government via LGF is subject to the scheme having a strong Business Case and a high value for money.

The £25m allocation for the M55 Junction 2 is available through Highways England Road Investment Strategy as evidenced in the letter in Appendix Q.

The remainder of the funding is available through the City Deal Infrastructure Delivery Fund as evidenced in the resolution in paragraph 13 of the minutes of the meeting of the City Deal Executive on 5th February 2019 as Appendix R.

PWD is one of four major highway schemes planned to be delivered within the Preston, South Ribble and Lancashire City Deal agreed between the local authorities and Government in Autumn 2013.

The delivery of the City Deal is supported by a City Deal Infrastructure Delivery Fund (CDIDF) totalling £383m.

The release of City Deal Funds does not require receipt of confirmed funding from developers in advance of major road infrastructure provision. LCC has agreed to underwrite the impact of any timing differences in relation to receipt of funding for schemes delivered within the City Deal framework. In addition, LCC confirms that any scheme cost increase will be covered by LCC and this has been underwritten by the Section 151 officer Appendix S.

The East West Link Road is a key component of the provision of the new highways in the North West Preston and in achieving the outcomes for Preston Western Distributor Road. It is therefore essential that it is constructed at the same time as PWD. To this end EWLR is included in the single construction contract with PWD.

Additionally, the City Deal has approved funding for EWLR. This is recorded in the City Deal Funding Confirmation (Appendix R -Paragraph 13 (iii)) in that the local funding contribution is confirmed at £103.44m - £124.47m which added to the £83m Local Growth Fund and HE funding equated to the estimated cost range of PWD and EWLR inclusive of risk and inflation. Additionally, the S151 Officer Letter (Appendix S) confirms that costs over and above the estimates will be met by the accountable body - LCC.

Figure 5-B shows the breakdown of funding by year excluding Part 1 claims. It is acknowledged that the LGF and HE RIS funding is only available to cover cost of construction.

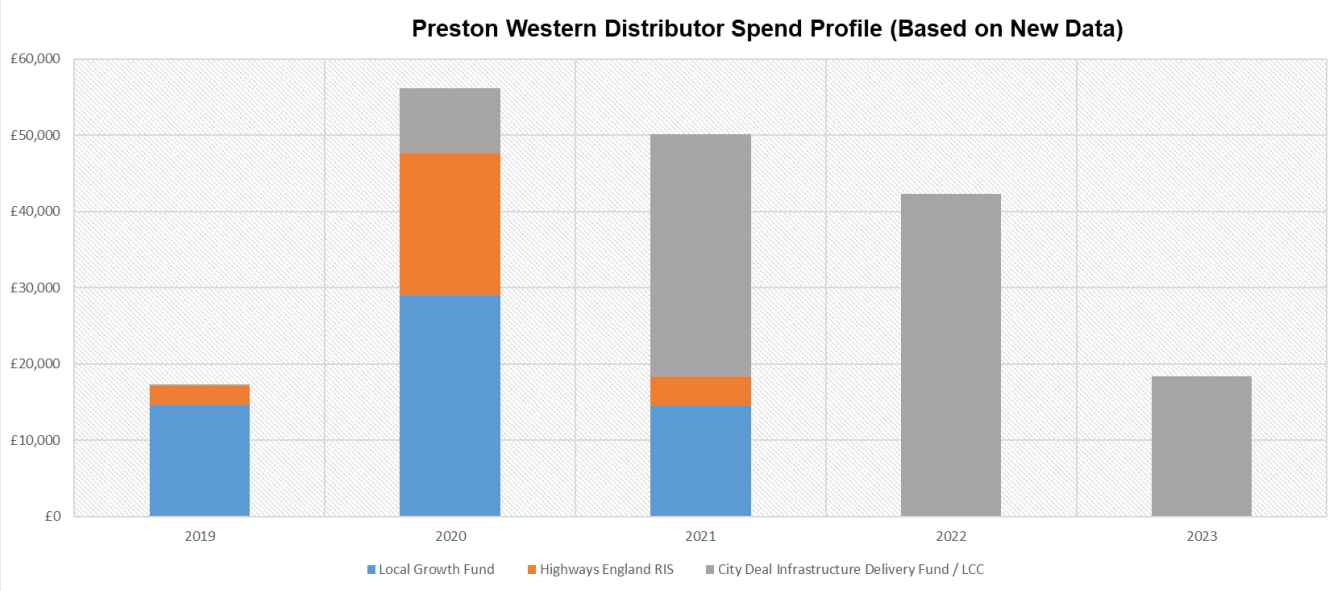

Figure 5-B: PWD Funding Profile ((in outturn costs, £000s)

LCC will be responsible for paying any Part 1 Claim compensation costs made as a result of the PWD. The compensations costs (Part 1 Claims) can only be claimed from one year after the opening of the road to traffic and claims have to be made within the 6 years following the first claim day.

The highway authorities will be responsible for the ongoing maintenance of the completed works, LCC in respect to the PWD and Highways England with respect to the M55 Junction 2 and slip roads. Letters confirming the commitment to this funding are provided as Appendix T.

5.12 Alternative Funding Arrangements

There are no other identified funding strategy options at this stage.

5.13 Conclusion

The PWD scheme is estimated to cost approximately £185.3m in outturn prices including risk adjustments and Part 1 claims and excluding sunk costs.

The capital maintenance costs of the scheme are estimated to be £9.8m (in 2010 prices) over a 60-year period.

The scheme will be funded through a combination of Local Growth Fund (LGF) funding, Highways England RIS funding and the City Deal Infrastructure Delivery Fund.

Lancashire County Council has approved the underwriting of any necessary gap funding required to deliver the scheme.

6. Commercial Case

6.1 Introduction

The Commercial Case provides evidence on the commercial viability of a proposal and the procurement strategy that will be used to engage the market. It presents evidence on risk allocation and transfer, contract timescales and implementation timescale as well as details of the capability and skills of the team delivering the project and any personnel implications arising from the proposal.

The scheme has developed from the Outline Business Case, but the commercial case remains intrinsically the same although with some development included under the appropriate headings.

The Commercial Case is discussed under the following headings:

- *Procurement Method*
- *Contract Options*
- *Contract Development and Progression*
- *Procurement Programme*
- *Payment Mechanisms*
- *Pricing Framework*
- *Contract Length*
- *Contract Management*
- *Risk Allocation*
- *Conclusion*

6.2 Procurement Method

6.2.1 Early Contractor Involvement

LCC chose to procure using what is known as Early Contractor Involvement (ECI) to provide construction intelligence support to the scheme development process and for the construction of the works.

ECI was chosen as opposed to the 'traditional method' of detailed design, tender and construction due to the industry recognised benefits of the more modern approach. These include:

- *Early creation of integrated teams.*
- *Collaborative, longer-term and non-confrontational relationships.*
- *Fair allocation of risk.*
- *Incentivised delivery.*
- *Selection of suppliers based on best value.*
- *Measure performance / continuous improvement.*
- *Shared ownership.*
- *Longer term understanding of scheme by contractor including its issues, challenges position in the locality and function.*
- *More scope for innovation and buildability*
- *Skills of the supply chain input earlier*
- *Better skills and resource planning*

- *Improved H&S planning & risk management*
- *Earlier relationships with stakeholders*
- *Better cost estimating & budgeting*
- *Faster delivery of projects*
- *Developed contractor understanding of the ecological, environmental and social responsibilities associated with the project.*

In addition, ECI has become widely recognised by many public and private sector bodies as a delivery mechanism for major civil engineering projects. These include:

- *Highways England*
- *Crossrail*
- *Thames Tideway Tunnels*
- *HS2*
- *TfL - London Underground Network Rail*
- *Water Companies*
- *Northern Ireland Roads Service*
- *Welsh Government*

6.2.2 Securing services of Contractor

In November 2015, a report was presented to Lancashire County Council Cabinet Member for Highways and Transport outlining the advantages of the Early Contractor Involvement Process with particular reference to Preston Western Distributor Road. Approval was given to undertake the process. The recommendation report is attached as Appendix U.

A procurement exercise was undertaken in compliance with Public Contracts Regulations 2006 in the form of an open bid process requiring submission based upon 26 questions arranged under the following relevant headings:

1. *Partnering*
2. *Management of Information*
3. *Performance Indicators*
4. *Financial Control*
5. *Risk Management*
6. *Public relations*
7. *Quality of Staff*
8. *Management*
9. *Specific Experience*
10. *Environmental Management*
11. *Safety*
12. *Social Value*

A total of seven bids were received several of high quality. A robust marking process resulted in LCC engaging Costain Ltd on an ECI basis. The appointment was on a 3-phase basis:

- *Phase 1 Support up to granting of planning consent;*

- *Phase 2 Development of Target Cost;*
- *Phase 3 Construction*

The contract was structured so that it can be terminated without penalty by either party between phases should the arrangement be deemed not to be delivering the benefits of ECI and to ensure that value for money is obtained at all times. This is referred to in the S151 Officer Letter (Appendix S) by advising that the county council will seek the Most Economically Advantageous Tender (MEAT) procedure and could under the contract terms move to other contract and tendering opportunities.

6.3 Contract Options

6.3.1 Contract Strategy

The Engineering and Construction Contract (ECC), part of the New Engineering Contract (NEC3) family of contract documents, is used as the standard form of construction contract in the UK and across Europe. The county council has also adopted it as standard for this type of contract.

6.3.2 Phases 1 and 2 Professional Services Contract

The contract with the ECI contractor for phases 1 and 2 was established under the NEC3 Engineering Construction Contract Professional Services Contract. This contract allows the contractor acting more in a consultant role to provide professional expertise in the areas identified in 6.2.2 on a payment process directly related to the resources utilised on the project at any one time. It covers the contractor costs as per the tender but also affords the flexibility that only the specific skill set in employed at any time on a demand basis. This is an important efficiency during the process which can extend over several years on projects of this scale. The tender evaluation process ensured the contractor had at their disposal the necessary appropriate resource.

6.3.3 Phase 3 Construction Contract

6.3.3.1 Construction Contract Options

Phase 3 will be undertaken under the Engineering Construction Contract which has six main options:

- *A: Priced contract with Activity Schedule*
- *B: Priced contract with Bill of Quantities*
- *C: Target contract with Activity Schedule*
- *D: Target contract with Bill of Quantities*
- *E: Cost reimbursable contract*
- *F: Management Contract*

The NEC/ECC is published in the form of a set of core clauses with a range of main and secondary option clauses enabling scheme specific contracts to be produced depending on individual requirements. The choice of option is a balance between risk, apportionment of risk and certainty of cost. The contract options legally define the responsibilities and duties of Employers (who commission work) and Contractors (who carry out work) in the Works Information.

Option A (Priced Contract with Activity Schedule)

This option is only viable if the design is fully designed at the time of tender and or design liability is placed with the contractor when it provides the greatest degree of cost certainty of any of the NEC options. This form of contract is attractive because it provides relative cost certainty. The contract is awarded as a lump sum based on the activity schedule and can be awarded on the lowest price or a quality/price ratio. The contractor is paid a lump sum for each activity.

Option B (Priced Contract with Bill of Quantities)

By utilising a Bill of Quantities (BoQ), the quantification of risk lies with the Employer so the design may be less complete at the time of tender. The contract is awarded based on the tendered total of BoQ prices. There is still an option of awarding on the lowest price or a quality/price ratio. The successful contractor is paid for the actual quantities of work undertaken at the rates in the BoQ, provided changes in quantity don't exceed a defined limit. Changes in quantity which exceed the defined limit are treated as compensation events which are assessed and paid on an actual cost reimbursable basis unless the contractor and Employer both agree to use the BoQ as the basis of assessment. Option B is not suitable for use where the intention is to transfer major elements of design liability to the contractor. The opportunity for placing risk with the contractor is limited and cost certainty is consequently reduced from that achievable with Option A.

Option C (Target Contract with Activity Schedule)

Option C is a target cost contract with an activity schedule where the out-turn financial risks are shared between the client and the contractor in an agreed proportion. In this option the Contractor tenders (or negotiates) a target price using an activity schedule. Each activity is priced as a lump sum and a Fee is also tendered as a percentage for subcontract work and for the Contractor's own direct work. The initial target price is the sum of the activity prices and the fee. During the course of the contract, the target price is adjusted to cater for compensation events that are set out in the contract. Payment is made on the basis of actual costs with an incentive mechanism for the Contractor to minimise costs via a pain/gain mechanism based on actual cost vs Target Price. Savings and over-runs are shared between the parties. The sharing of risk in the target cost approach is likely to reduce the occurrence of disputes. Additionally, is the situation where there is early contractor involvement throughout the scheme development the understanding of the risks is shared between the Client and the contractor leading to a more certain Target Cost

Option D (Target Contract with Bill of Quantities)

In common with Option C, the contractor is paid their actual costs. The BoQ is used to derive the Target and adjust the Target if quantities vary within an agreed range. The Employer therefore takes a quantification risk.

Option E (Cost Reimbursable Contract)

Option E is a cost reimbursable contract where the financial risk is taken largely by the Employer and the contractor is paid their actual costs plus the Fee with only a small number of constraints to protect the Employer from inefficient working or incompetence. It is normally used when the scope of works cannot be defined at the outset, for example with emergency work.

Option F (Management Contract)

Option F is suitable for management contracts in which most of the work is done by sub-contractors and the Contractor manages the procurement and the work undertaken by the sub-contractors. The Contractor receives the payment for the cost of the sub-contracts plus their management fee. The Employer carries most of the risk.

6.3.3.2 Construction Contract Choice

At the outset of the delivery process and particularly the ECI engagement it was proposed that **Option C** would be used for the construction contract. The construction of highways carries a high level of risk due to the significant amount of earthworks, the interaction with live railways, motorways and waterways and weather dependency. As the contractor and the designer are currently following the ECI procedure the joint understanding of the project and the risks promote the value of sharing the risk and encouragement of the pain/gain mechanism to innovate and seek economic resolution.

6.4 Contract Development and Progression

6.4.1 Progress to date

The project has evolved over more than two years since the inception of the ECI. It has demonstrated the delivery of its aspirations with the following areas provided as examples:

- *Early creation of integrated teams.*

Costain Ltd staff have been embedded with the LCC City Deal Delivery Team for 3 years and are co-located in Lancashire County Council offices. The number of members of the joint team has increased over that period commensurate with the work load demands and the specialisms required to achieve the stages of the development delivery of the project. The team is further externally supported from the county council's framework consultant Jacobs in areas including structural design, business case development, ecological and environmental advice. In addition, the county council has further resources within the organisation which has provided support in the form of further structural and landscape design. A team has been created which provides the necessary wide range of experienced professional expertise necessary to deliver project of the scale of PWD Road. The joint team structure is illustrated as Appendix V.

- *Construction methodology*

Early understanding of the construction methodology has supported the project delivery from its early stages. It has enabled construction methods to be evolved which provide a balance between efficiency and cost efficacy with the constraints of both the planning and compulsory purchase process. This has supported robust and successful submissions to both the processes.

- *Fair allocation of risk.*

As both parties are involved in the emergence of risks and the understanding thereof, the consideration of apportionment and responsibility can commence at an early stage ensuring a fairer allocation at final contract agreement. The QRA at Appendix M illustrates the how risks have been identified and either removed or if not possible, mitigation determined and finally allocated and quantified. An ECI contractor offers the immediacy and insight into the costs of risks

- *Selection of suppliers based on best value.*

As a national company with current live construction projects their supply chain is continually revaluated on a wide base of parameters best value included. Consequently 'live' costings have been available for PWD from this chain. Costain have as the scheme developed in detail gone 'to the market' of its supply chain with appropriate packages of works ensuring the cost plan remains up to date.

- *More scope for innovation and buildability*

Designs have been tested at early stages in their development for buildability resulting in early review and revision of concepts and preliminary designs.

This has been particularly relevant to PWD as challenging ground conditions have been encountered around the major structures. The opportunity of designers, specialist contractors and estimating professionals to engage and determine at a pace the solutions and costings available for immediate decisions on the final scheme.

With immediate access to the market immediate resource has been available to new innovative products as well as the range of existing solutions to design and constructions issues.

- *Better cost estimating & budgeting*

Costain have provided a commercial resource with access to the market and the supply chain provides reliable current costing opportunities and the ability to maintain a live cost plan for budgeting purposes.

- *Development of Understanding of Economic, Environmental and Social Value*

The inclusion within the procurement process of a requirement to demonstrate an understanding of these requirements and how they can be delivered ensured that as the scheme developed a valid input from Costain was assured and delivered. This has provided reassurance that this can continue into the construction phase

6.4.2 Strategy to Works commencement

On the basis of the success to date of the ECI and the approach to Option C Target Cost the City Deal Executive confirmed on 15th November 2018 that the contract process should continue into Phase 3 Construction Contract with Costain Ltd on an Option C Target Cost Basis subject to satisfactory agreement of the Target Cost.

6.5 Programme

LCC in particular, the established City Deal Delivery Team and its support will continue to work with the ECI contractor to progress the scheme to the construction phase. The procurement programme milestones to commencement of works both achieved and forecast are shown in Table 6-A.

Stage	Timeline	
	Achieved	**Forecast**
Outline Business Case to TfL	10th January 2018	
Outline Business Case to LEP	30th January 2018	
CPO to Lancashire CC Cabinet	1st February 2018	
Secretary of Stage decision on Public Inquiry	April 2018	
Public Inquiry	20th November 2018	
Current Target Cost to LCC	February 2019	
City Deal Approval of Current Target Cost	February 2019	
151 Officer/Cabinet Approval of Current Target Cost	February 2019	
Full Business Case to TfL		5th June 2019
Full Business Case to LEP Board		26th June 2019
CPO confirmed		April 2019
GVD Notice Issued		May 2019
Land Accessed		September 2019
Full Business Case Final DfT Approval		September 2019
Possible Advance Works		September 2019
LCC award of construction contract		September 2019
Contract Works Commence		November 2019
Work Complete Scheme open		March 2023

Table 6-A: Procurement Milestones

6.6 Payment Mechanism

The scheme will be let under NEC Engineering Construction Contract Option C Target Cost with Activity Schedule. The payment principles of this type of contract are well defined within the contract as identified in Core Clause 5 Payment. In summary the Project Manager is responsible for assessing the amount due to the contract at the Assessment Date. The Assessment Dates will be defined in the contract and will be at calendar month intervals. The Project Manager is required to certify the payment within one week of the Assessment Date. The payment as defined in the contract is composed of:

- The Price of Works Done to Date
- Plus other amounts to be paid to the contractor
- Less amounts to be paid by or retained from the contractor

The contract will have an experienced supervisory staff responsible for measuring and assessing the works done to date.

The Project Manager will be required to report payment progress to the Project Board on a monthly basis.

6.7 Pricing Framework

Under the currently preferred NEC Option C procurement approach the Contractor will provide the Preston Western Distributor construction works described in the contract for a Target Cost (TC). The contract provides for adjustments to the TC if compensation events occur. Due to the use of an Option C Contract with TC approach, there is incentive for cost reductions and mitigations to costs of unforeseen issues once the project has been procured.

6.8 Contract Length

At this stage in the programme it is anticipated that the construction contract length will be 41 months. This is predicated on an Autumn 2019 commencement of works. There are ecological and environmental mitigation measures required to be undertaken, the commencement of which is seasonally dependant. Consequently, there is potential for the contract length to be influenced by the actual commencement on site. The CPO Inquiry decision affords the opportunity of accessing the land early to potentially undertake the ecology and environmental mitigation works. This will require early serving of the GVD but the county council has resourced to enable this to opportunity to be realised and significantly reduce the risk of contract length extension.

6.9 Contract Management

The contract management arrangements during the implementation stage will be administered by an ECC Project Manager and Supervisor and a support team applicable to stage of the works at any one time. The ECC Project Manager and Supervisor will also provide a site presence to deal with all contract variations/issues and early warnings/compensation events. The roles for the project will otherwise be as set out in the detail within the Project Governance section of the Management Case. This approach will also ensure that the construction contract is programmed and coordinated.

6.10 Risk Allocation

Risks and associated cost estimates are included in the Risk Register (Appendix M) and will be specifically assessed and assigned depending on which partner is best placed to manage them. The register is a live document which was initially drafted following a risk workshop involving multidisciplinary professions covering all aspects of delivering a scheme of this scale and adjustments to risks, costs and responsibilities are amended as the detail design progresses. By having a joint register and ownership under ECI, the management of risk is assessed and controlled from both perspectives affording the opportunity to drive down the risk and associated cost.

6.11 Conclusion

The ECI procurement route with an NEC3 Option C Target Contract with Activity Schedule has been chosen as opposed to traditional method of detailed design, tender and construction. ECI would provide additional programme and price certainty, as the design and construction programme are better developed and there is opportunity to reduce risk prior to starting on site.

The skill set held within LCC supported by the framework consultants and ECI contractor provides for a team who can manage the scheme through the detailed design and contractual phases in addition to the legal and property requirements needed to enable the scheme to be built. LCC also has the Statutory Authority necessary to undertake this process.

The latest scheme programme forecasts that the main construction works will take approximately 41 months, from November 2019 to March 2023.

7. Management Case

7.1 Introduction

The Management Case assesses whether a proposal is deliverable. It tests the project planning, governance structure, risk management, assurance, communications and stakeholder management, and plans for monitoring and evaluation.

There should be a clear and agreed understanding of what needs to be done, why, when and how, with measures in place to identify and manage any risks. The Management Case sets out a plan to ensure that the benefits set out in the Economic Case are realised and will include measures to assess and evaluate this.

The Management Case is discussed under the following headings:

- *Governance*
- *Evidence of Successful Project Delivery*
- *Assurance*
- *Delivery Programme*
- *Risk Management*
- *Communications and Stakeholder Management*
- *Monitoring and Evaluation*
- *Benefits Realisation Plan*
- *Conclusion*

7.2 Governance

7.2.1 High Level and Steering Governance

The management of the delivery of the Preston Western Distributor Road is fully encompassed within the overall accountabilities of the Lancashire Enterprise Partnership in its governance responsibilities of the Preston South Ribble and Lancashire City Deal.

The City Deal has been in place since 2013 and has evolved in its structure since its inception and also since its structure was reported in the Outline Business Case. The governance is best demonstrated by the chart provided as Appendix W. This explains how through the boards and teams with clear terms of reference the infrastructure projects within the City Deal are managed. The composition of the boards and teams are indicated and illustrate the distribution of responsibility across the members.

The structure particularly identifies the significance of the major infrastructure projects in providing individual boards for the 2 major schemes, Preston Western Distributor and A582 dualling.

In addition, the terms of reference are extended by the City Deal Strategic and Operational Governance framework in Appendix X.

7.2.2 Delivery Team Structure

Underlying the above structure is the Delivery Team, the direct connection to the governance structure by means of the Project Manager reporting to the project Board and above if necessary. The Delivery Team and its operational links are shown in Appendix V.

7.2.2.1 Scheme development stage

Lancashire County Council provided a core to the City Deal Delivery Team but due to the varying nature and demands on delivering a scheme of the nature of PWD a variety of professional support is required during the development period. This is as wide ranging as from legal resource to environmental specialists.

Lancashire has in house a range of professionals which can be called to provide the support but there are a range of specialisms which either due to capacity or absence requires external procurement.

To fill this gap Lancashire County Council has a framework consultant(s) in place to readily call upon as needs arise. The consultants are procured following an open tender process in accordance with the relevant regulations and selected on an 80/20 quality/price basis. The heavy reliance on quality ensured the level of the delivered products is of the highest excellence. During the life of the project the framework has been retendered. From 2103 – 2017 the service was provided by a single consultant Jacobs Ltd and from 2017 to date two consultants have provided the service, Jacobs Ltd and Atkins Ltd the former taking all commissions below a predetermined finical level with higher value commissions being subject to a bidding process.

The organogram shown in Appendix V illustrates how the scheme has been delivered. Table 7-A indicates the distribution of the workload.

Work Package	Delivery Organization
Highway design	City Deal Delivery Team
Structural design Co-ordination	City Deal Delivery Team
Structural Design and Checks	Jacobs
Structural Design and Checks	LCC in House Structures Group
Structural Design Checks	Atkins
Landscape Design	LCC Landscape Group
Ecology and Environmental Support	LCC Landscape Group
Planning Application Preparation and Co-ordination	City Deal Delivery Team
Planning Application Preparation	Jacobs
Planning Application Surveys	Jacobs
Transport Modelling Co-ordination	City Deal Delivery Team
Transport Model Development	Jacobs
Business Case Preparation	Jacobs
CPO legal support	LCC in House Legal team
CPO legal support	Kings Chambers Manchester
CPO Estates Surveying Support	LCC in House Estates Team
Land Assembly	LCC in House Estates Team
Construction Methodology	Costain

Commercial Support (cost estimation)	Costain
Market Access	Costain
Risk Assessment	Costain

Table 7-A: Delivery Team Roles Distribution

7.2.2.2 Strategy During Construction and Beyond

The development of a team which understands the project whilst offering the wide range of professional support is intended to continue into construction phase and beyond. The appointment of Costain (subject to acceptable Target Cost agreement) has been made. The other support services remain available under the LCC professional services delivery framework.

7.2.3 Forward Delivery Structure

Subject to successfully accomplishing the stages highlighted in the Delivery Programme (Section 7.5) and further defined in Section 6.5 of the Commercial Case, works will commence on site in November 2019.

In preparation and to ensure smooth transition from the design and preparation phases in to contract and construction appropriate personnel have been appointed to key contractual roles for the county council who as accountable body will be entering into the construction contract with Costain Ltd.

In line with NEC Option C Contract the key roles are *Project Manager* and *Supervisor*. The *Project Manager* appointed is the current Project Manager of the City Deal Delivery Team P Wilson. This accords with the NEC Guidance which suggests that in appointing to this role continuance is an essential criteria. Additionally the appointee brings to the role over 35years of highways design and construction experience in all forms of contract but latterly, in line with county council policy, the NEC contracts.

Further to this two *Supervisors* have been appointed a highway specialist and a structures specialist both from the City Deal Delivery Team who will be bringing a depth of design and contractual supervision experience to the roles. The supervising team will be expanded commensurate with the Employer's responsibilities on a project of this scale.

7.3 Evidence of Successful Project Delivery

LCC has a strong track record of project delivery. Recent major transport projects demonstrating successful delivery include:

- Heysham to M6 Link Road, the £130m scheme completed in 2017
- Broughton Bypass, the £32m relief road completed in 2017.
- Penwortham Bypass, the £20m scheme currently under construction and due for completion in January 2020
- A582 Dualling and Junction Improvements, the £21m improvements on existing single carriageway

The Heysham scheme is similar in length and design standard to the PWD. It completes the long awaited connection from the Heysham and Morecambe peninsula to Junction 34 of the M6 and is a 4.8km two lane dual carriageway with a footpath and cycle way along the entire route.

Broughton Bypass is the first of the four schemes delivered through the City Deal Infrastructure Delivery Programme and largely followed the same project delivery governance structure as the PWD.

Penwortham Bypass is the second of the City Deal Schemes to reach the construction stage and is directly under the governance structure of the City Deal and by the City Deal Delivery Team. It has been designed form concept and taken through the planning process. The land was assembled by agreement without recourse to CPO. The scheme is currently on programme and on budget for completion in January 2020.

The improvements to the A582 are early wins by the City Deal Delivery Team to ease immediate congestion and facilitate access to housing sites and business opportunities in Preston and South Ribble as a precursor to the full dualling of the A582 from Cuerden to Preston. This has been achieved under the current City Deal governance.

The lessons learnt from delivery of the above projects both external and within the City Deal Team are shared across the team to ensure the widespread learning for other projects particularly the PWD.

7.4 Assurance

7.4.1 TfL Assurance Framework

As the Accountable Body, LCC has put in place arrangements for independent local audits carried out in line with DfT requirements as set out in the TfL Assurance Framework approved by DfT.

TfL has a dedicated web page hosted by the Lancashire Enterprise Partnership. This will be used to publish agendas, minutes, the business cases, evaluation and appraisal reports and supporting technical material, and regular programme updates on delivery and spend against budget.

As per the LEP Assurance Framework, LCC will submit a quarterly monitoring report (QMR) to TfL, setting out progress on scheme preparation and delivery. This will include a regularly updated quantified risk assessment.

The officer with overall responsibility for business case scrutiny and for making recommendations to Transport for Lancashire (TfL) is Stephen Young, LCC Executive Director of Growth, Environment, Transport & Community Services.

In order to secure the required expertise for business case assurance, TfL has established a consultant panel with a minimum of two independent specialist consultants appointed to a Business Case Scrutiny framework for a set period of three years. This ensures separation between scheme promoters and their own framework consultants and the appraisal team and decision makers.

As the Accountable Body, LCC ensures that officers from the three local transport authorities with appropriate technical experience of this type of work oversee the selection process.

The LEP Board Director for Strategic Transport will have an advisory role in supporting scheme assessment and approval arrangements. Consultants appointed to the Business Case Scrutiny framework will provide TfL with a formal report on each submitted local major transport scheme business case specifying the outcome of their assessment against a standard set of key criteria.

7.4.2 Approval Process

TfL has adopted a three stage approval process which requires business case submissions to meet DfT Business Case guidance including:

Programme Entry: Programme Entry indicates the LEP's intention to provide funding to a scheme or package following acceptance of a Strategic Outline Business Case and its inclusion in the Strategic Economic Plan. Programme Entry is not an absolute commitment, but intended to provide sufficient assurance for the promoting authority to embark on Outline Business Case development.

Conditional Approval: Conditional Approval indicates the LEPs acceptance of an Outline Business Case demonstrating high value for money. It is intended to provide the expectation of funding necessary

for the promoting authority to apply for any statutory powers that may be required such as Transport and Works Act powers, highways orders, planning consents, compulsory purchase orders etc. The LEP will only grant Conditional Approval on the basis that there will be no material changes to the scheme's scope, cost, design, expected benefits and value for money. The granting of Conditional Approval may be subject to a small and limited number of conditions. This is the stage that Preston Western Distributor Road is currently applying for through this Outline Business Case

Full Approval: occurs once procurement has taken place and a preferred bidder and final price obtained and once granted, enables the PWD scheme to commence construction and draw down grant funds. Full Approval indicates the LEPs acceptance of a Full Transport Business Case and approval to proceed to implementation. It occurs when all necessary statutory powers are in place and any necessary conditions specified at Conditional Approval have been satisfied. Scheme promoters can only apply for Full Approval once procurement has taken place and a preferred bidder with firm and final prices selected. Once granted, Full Approval enables the scheme promoter to commence construction and draw down grant funds.

7.4.3 Retained Scheme

When Local Growth Deal funding was announced, the DfT reported that larger Growth Deal transport projects would be 'retained' by the DfT, and final funding decision will be taken by Ministers.

Due to the amount of Local Growth Deal funding being sought, the PWD scheme was subsequently identified as a DfT 'retained' scheme.

In November 2015 the DfT issued guidance on its expectations for these retained schemes, which are now considered to be part of the major schemes portfolio.

The guidance confirmed that the level of detail of the Business Case for DfT approval should be no different to that which would have been required by the LEP under the terms of the LEP assurance framework were it to be approving the scheme.

The LEP/Promoter will need to provide the DfT with proportionate value for money and business case information either as one final business case or separate documents. The LEP does not need to formally approve business case information before submission to DfT. However, prior to signing off funding approval DfT will wish to ensure that the LEP is content with the basis on which the approval is proposed.

It has also been confirmed that no DfT approval of the OBC is required at the Conditional Approval stage. However, the scheme promoter and its consultant work closely with the DfT to ensure the Business Case for PWD meets DfT requirements, and particularly with regards to the modelling and economic appraisal underpinning the VfM assessment.

7.4.4 Funding Guarantees

It is noted that TfL requires scheme promoters to provide an absolute minimum 10% contribution towards total scheme construction cost and 100% of any increase in cost once TfL has granted a scheme Provisional Approval. As set out in the Financial Case Lancashire's Section 151 officer has under-written the authority's ability to fund the local contribution to PWD and any subsequent cost increases post the granting of remaining funding approval. The release of City Deal Funds does not require receipt of confirmed funding from developers in advance of major road infrastructure provision. Furthermore, the LCC agreed to underwrite the impact of any timing difference in relation to receipt of funding for scheme delivered within the City Deal framework.

7.4.5 External Views on Business Case

TfL will publish the PWD major scheme business case on its website to ensure transparency. LCC will do likewise and will publicise through the regular communications channels. The Full Business Case

and its supporting documentation will be made available for inspection and independent assurance by TfL's Independent Assurance team appointed to review PWD.

7.4.6 Value for Money

The LEP will only approve schemes demonstrating high value for money, with a benefit to cost ratio (BCR) of greater than 2. As part of the independent scrutiny of a scheme's transport business case, TfL will require the consultant responsible to confirm that the Value for Money assessment aligns with DfT's Advice Note for Local Transport Decision Makers published in December 2013. Neil Kissock, Director of Financial Resources, will sign off all Value for Money assessments as true and accurate. The Director of Financial Resources is not involved with scheme development and promotion at LCC, thus avoiding any potential conflict of interest with regard to schemes promoted by the County Council.

A scheme must satisfy the Lancashire Enterprise Partnership's value for money requirements at both Conditional and Full Approval stages. Where a scheme fails to deliver a minimum benefit to cost ratio of greater than 2, the Lancashire Enterprise Partnership will seek independent professional advice on the magnitude of the stated additional benefits prior to determining whether these benefits are sufficient to offset this requirement.

A Value for Money (VfM) statement for PWD has been produced which summarises the Economic Case for the scheme and the BCR. The Initial and Adjusted BCR of the PWD scheme have been assessed as being 2.19 and 2.60, respectively, including 3% Optimism Bias on costs. This represents High VfM.

7.4.7 Monthly Update to Project Board

Monthly update reports are being provided by the PWD Project Manager to the City Deal Infrastructure Steering Group, now the PWD Project Board in the evolved governance structure, and will continue through the delivery of the scheme. The reports currently cover scheme design, CPO Process, Funding, Land and Planning. When funding is secured and contracts are let, the reports will also cover adherence to programme and budget, issues and decisions made within the tolerances granted and exceptions.

7.5 Delivery Programme

The delivery programme for the scheme is owned by the Project Manager. The programme is reviewed and updated as necessary prior to formal progress meetings.

Changes to the project programme that could impact upon key milestones within the development and delivery of the scheme are communicated to the Project Board.

Key milestones for the project are also set out in the City Deal Infrastructure Delivery Plan. The City Deal Infrastructure Delivery Plan sets out the major activity for the next 36 months. The Key Milestones for the PWD are shown in Table 7-B.

Delivery Stage	OBC Forecast	Current position
Planning Consent	Q3 17/18	Achieved Q3 17/18
OBC Approval	Q4 17/18	Achieved Q4 17/18
CPO Published	Q4 17/18	Achieved Q4 17/18
CPO Inquiry Procedure	*Q4 17/18 – Q2 19/20*	Public Inquiry Held Q3 18/19 Decision Received Q1 19/20
FBC	Q2 19/20	Target Q1 19/20
FBC Approval LEP		Target Q1 19/20 (26/06/2019)

FBC Approval DfT		Target Q2 19/20
Works Commence		Target Q3 19/20

Table 7-B: Key Programme Milestones

The current detailed scheme programme is shown Appendix Y.

7.6 Risk Management

7.6.1 Risk Management Strategy

Risks associated with delivery of the LEP investment programme are managed according to the overall monitoring responsibilities set out in the LEP's Accountability Framework. This Framework requires risk registers to be produced and maintained for individual schemes once approved.

The Steering Group has overall responsibility for governance and risk associated with the delivery of the PWD scheme. It is responsible for managing and overseeing the risk management strategy and where appropriate agreeing and undertaking actions to mitigate key risks. The Project Manager is responsible for maintaining and updating a Quantified Risk Register and planning for mitigating any risks which do not require escalation. The project and City Deal programme governance structures outlined earlier in this chapter show the arrangements for decision making and approvals including the responsibilities regarding risk on PWD are clearly defined.

7.6.2 PWD Risk Register

A quantified risk assessment (QRA) for the PWD has been undertaken by LCC and Costain in order to determine the amount of risk to be applied to the base costs. The Risk register is owned by Project Manager and a live document and gets updated regularly. It is based on industry knowledge and experience from other schemes which have been constructed.

The latest version of QRA updated on 1st March 2019 is included as Appendix M. It identifies 306 risks attributed to client or contractor. The risks have been assessed and where possible addressed introducing mitigation measures leaving 130 currently active and quantified.

The QRA includes all types of risk which could affect the cost of the scheme such as planning delay, political decisions, land acquisition issues, legislative delays etc.

The detail regarding risk values and probability and impact on the scheme cost is provided in the Financial Case.

7.7 Communications and Stakeholder Management

7.7.1 City Deal Communications and Marketing Strategy

The communications strategy for the project is framed within the wider communications strategy for the City Deal. The City Deal Communications and Marketing Strategy have been developed to:

- *Ensure a consistent approach to all external communications activities relating to the City Deal;*
- *Effectively engage with appropriate stakeholder groups; and*
- *Raise the profile of the City Deal area, and its impact on the Lancashire economy, on a local, regional and national level.*

The proposed overarching approach and activities have been identified by communications staff from Lancashire County Council, Preston City Council, South Ribble Borough Council and the HCA. They are intended to establish foundations for successful communication of the implementation phase and

have been directly influenced by the schedule of work outlined in the Infrastructure Delivery Plan (including Preston Western Distributor).

7.7.2 Approach

A partnership approach to communications activity during the lifetime of the City Deal requires a close working relationship on communications between the three councils with input from the HCA, LEP, government departments and other partners where appropriate, reflecting the arrangements for delivering the programme overall. The activities within the plan are led by the three councils with the support of the City Deal Delivery Team. These activities will be reviewed annually throughout the City Deal lifetime.

In keeping with best practice communications and value for money principles, the overall approach will have a clear focus on achieving measurable results. Detailed proactive planning ensures that objectives and targets are set and regularly measured against. Updates and reports against these objectives are provided back to the City Deal Delivery Team, Programme Board, Executive and Stewardship Board.

The scheme has reached a specific stage as it progresses rapidly towards construction. The county councils communications team in association with the partner's communications officers and the contractor is developing the strategy to construction commencing and throughout the construction period.

7.7.3 Audiences

Communications key audience groups consist of:

- *Business and business groups - both existing and future;*
- *Residents and wider public;*
- *Councillors;*
- *Campaign groups;*
- *Statutory groups;*
- *Government - at local and central level;*
- *Developers, house-builders and land owners;*
- *Investors;*
- *Partners, e.g. Lancashire Enterprise Partnership, HCA, Highways England, other Councils, and Media.*

7.8 Monitoring and Evaluation

The Monitoring and Evaluation plan has been produced and is contained in Appendix Z.

The Monitoring and Evaluation proposals set out in the plan are based on a ‘Fuller’ monitoring and evaluation approach and are drawn from the guidance outlined in the Monitoring and Evaluation Framework for Local Authority Major Schemes issued by the DfT (September 2012) and the Growth Deal Monitoring & Evaluation Framework issued by the LEP. As such, the plan will include the following:

Process Evaluation

- *Scheme Delivery Process;*
- *Delivered Scheme; and,*
- *Outturn Costs.*

Impact Evaluation

- *Scheme Objectives;*
- *Travel Demand;*
- *Travel Times & Reliability;*
- *Impacts on the Economy;*

- *Impacts on Carbon;*
- *Impacts on Noise;*
- *Impacts on Local Air Quality; and,*
- *Impacts on Accidents*

Economic Evaluation

- *Outturn Appraisal Assumptions*

In addition to the above as part of LEP's requirement, Gross Value Added (GVA) impacts associated with the Northwest Preston development (dependent on the PWD) will be calculated using the assumptions and methodology outlined in the Economic Impact Report (EIR, Jan. 2019).

The Monitoring and Evaluation plan outlines the data collection that will be required to inform each of the evaluation metrics, together with an indication of when the data collection would be required within the monitoring and evaluation period.

The indicative timescales for monitoring and evaluation are based upon the current programmed opening of the scheme in early 2023. Therefore, 1 year after surveys would be undertaken in neutral months in late 2024, with the 4 to 5 years after surveys in late 2028 in the same neutral months.

The Monitoring and Evaluation plan also 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.

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

7.9 Benefit Realisation Plan

A Benefits Realisation Plan (BRP) has been developed for the PWD scheme.

The purpose of a BRP is to enable the benefits that are expected to be derived by a project to be identified, tracked and compared to those that were predicted. A BRP details the key activities that are required to manage the successful realisation of the benefits (i.e. what needs to be done, when and by whom).

The BRP is consistent with the Monitoring and Evaluation Plan and is shown diagrammatically in Table 7-C.

Scheme Objectives	Infrastructure to Deliver the Objective	Indicator for Measuring Success	When will it be measured?	Qualitative / Quantitative	Data Collection Requirements	Key Risks to achieving Scheme Objective
Support local economic growth by unlocking housing development in North West Preston;	Preston Western Distributor	Build Out rates, number of planning consent granted, and GVA impacts for Northwest Preston development and responses from developers on their views about the role of the scheme in building the houses	Within one year and 4 to 5 years after scheme opening	Quantitative/Qualitative	Number of planning permissions and build out rate information from development site, and a survey with developers	Socio-economic downturn leading to a lower level of investment than expected
Improve access of the Warton Enterprise Zone to strategic road network and wider labour market catchment		Improved journey times and journey time relaibility for trips between M55 junction 1 and Warton Enterprise and responses from business owners and employess at Warton Enterprise Zone on their views about the role of the PWD in improving access to Warton.	Within one year and 4 to 5 years after scheme opening	Quantitative/Qualitative	Journey time data from TrafficMaster and employer and employee surveys at Warton Enterprise Zone	Lower volume of traffic from Warton switching to use the PWD than forecast.
Reduce congestion and associated delays on the arterial and radial routes within the Preston urban area		Improved journey times and journey time relaibility for on key routes within Preston, and feedbac from road users and local residents on congestion relief as a result of the PWD	Within one year and 4 to 5 years after scheme opening	Quantitative/Qualitative	Journey time data from TrafficMaster and surveys with road users and local residents	Lower volume of traffic switching to use the PWD than forecast.
						Higher levels of traffic growth than forecast resulting in ongoing congestion in Preston urban areas.
Improve road safety		Reduction in number of accident and casualty rates	Within 4 to 5 years after scheme opening (for each year)	Quantitative	STATS 19 accident database	Lower volume of traffic switching to use the PWD than forecast.
Improve air quality and reduce noise pollution		NOx, CO2 and PM10 emissions and noise level calculated from changes in traffic and speed	Within one year and 4 to 5 years after scheme opening	Quantitative	Traffic Flow Data from ATCs and MCCs, and speed data from TrafficMaster	Lower volume of traffic switching to use the PWD than forecast.

Scheme Objectives	Infrastructure to Deliver the Objective	Indicator for Measuring Success	When will it be measured?	Qualitative / Quantitative	Data Collection Requirements	Key Risks to achieving Scheme Objective
						Higher levels of traffic growth than forecast resulting in ongoing congestion in Preston urban areas; therefore higher emissions.
Facilitate the provision of enhanced walking and cycling networks		Walking and cycling increase in Central Preston and along the new PWD route	Within one year and 4 to 5 years after scheme opening	Quantitative	Pedestrians and cycle counts	High dependency on car use and increased car ownership in the area
Facilitate access to the proposed Cottam Parkway rail station		Provision of direct Link road from the PWD to the proposed Cottam Parkway rail station.	Within one year after scheme opening	Qualitative	Delivered Scheme	Socio-economic downturn leading to the proposed station not coming forward

Table 7-C: Benefits Realisation Plan

7.10 Conclusion

The Management Case for PWD scheme demonstrates that robust project governance and assurance frameworks have been established.

A detailed scheme delivery programme has been produced and will be owned by the Project Manager.

A risk register has been developed which has a ‘risk owner’ allocated to each risk.

Lancashire County has successfully delivered four major schemes recently, and has a proven record in delivering them on time and within budget.

The communications strategy for the project is framed within the wider communications strategy for the City Deal and the scheme has its own page on the LCC website. Significant stakeholder and public consultation has already been undertaken related to identification of the Preferred Route, the planning permission and land acquisition. During construction, the successful contractor will be expected to engage with stakeholders and the community affected and their plans for doing so will be specified in their tender documentation.

A Monitoring and Evaluation Plan has been produced in line with DfT’s Local Authority Major Schemes Monitoring and Evaluation Framework and Lancashire LEP Growth Deal Monitoring and Evaluation guidance.

8. Summary and Conclusions

8.1 Summary

This report documents the Full Business Case for the Preston Western Distributor Road. It has been developed in line with the structure mandated by the Department for Transport's Business Case guidance.

PWD has a strong strategic and economic fit with the aspirations of the City Deal and the commercial, management and financial cases demonstrate the scheme progressing towards successful delivery.

The Area of North West Preston is allocated for up to 5,500 new homes, over 1,500 of which have planning consent and construction has commenced. The provision of PWD is essential to allow the successful delivery of these new homes and avoid the congested highway network that will ensue. It will also offer a new strategic link to the north and west of Preston improving links to the existing strategic highway network which assists in the City Deal aims to promote jobs and housing.

The scheme is consequently a strategic priority within the Central Lancashire Highways and Transportation Masterplan, the Preston City Local Plan, the City Deal and the Lancashire LEP Growth Deal, as well as being in alignment with the principles of the National Planning Policy Framework. Implementation of the scheme is vital to facilitate sustainable development and ease local congestion and air quality problems which will be forthcoming as the area of North West Preston develops. The scheme is included in the City Deal Infrastructure Delivery Programme, a programme which aims to enable the delivery of critical infrastructure and allow the full development of strategically significant commercial development and housing schemes.

Cost-benefit analysis of PWD concluded that the scheme offers High Value for Money.

The Preferred option can potentially generate additional GVA benefits of £108m over the 60 year appraisal period through unlocked development, employment and productivity impacts which have not been included in the calculation of the BCR. This is a net GVA figure and demonstrates the scheme would strongly support local economic activity.

Preston Western Distributor has £58m committed LGF funding and £25m Regional Investment Strategy funding. The remainder will be covered through City Deal funding.

The LEP's governance arrangements combined with LCC's internal project governance will provide a robust legal structure to oversee the delivery of this City Deal priority scheme.

The proposed form of contract used will be the Engineering and Construction Contract (ECC), part of the New Engineering Contract (NEC3) family of contract documents, the standard form of construction contract in the UK. Use of Option C (Target Price with Activity Schedule) will provide the highest degree of cost certainty and risk transfer. Procurement activity for Early Contractor Involvement (ECI) commenced in November 2015 and resulted in the engagement of Costain Group as contractor.

8.2 Conclusions

In conclusion, PWD, a strategic priority for the City Deal, is proposed by LCC to relieve traffic from North West Preston and significantly enhance labour connectivity to and from Preston. It is a highly deliverable scheme which will support economic development of the area and specifically the Warton Enterprise Zone.

- *The **Strategic Case** demonstrates that the scheme is supported by a robust case for change that fits with wider policy objectives;*

- *The **Economic Case** demonstrates that with an Initial BCR of 2.19 and an Adjusted BCR of 2.60, the preferred option is forecast to represent high Value for Money based on DfT and Lancashire LEP guidance;*

- *The **Financial Case** demonstrates that the scheme is financially affordable and the funding arrangements are clearly defined;*

- *The **Commercial Case** demonstrates that the scheme is commercially viable and that the chosen procurement strategy provides additional price and programme certainty;*

- *The **Management Case** shows that the scheme is deliverable and that robust project governance, assurance and monitoring frameworks are already established.*

Appendix A. Scheme Drawings

Appendix B. Options Assessment Report

Appendix C. Preston Western Distributor, East-West Link Road and Cottam Link Road Consultation Report (Oct 2014)

Appendix D. CPO/SRO Decision Letter

Appendix E. Economic Assessment Report

Appendix F. Appraisal Summary Table

Appendix G. Local Model Validation Report

Appendix H. Traffic Forecasting Report

Appendix I. Distributional Impacts Appraisal Report

Appendix J. WebTAG Worksheets

Appendix K. Cost Verification Reports

Appendix L. Cost Breakdown

Appendix M. Risk Register

Appendix N. Residual High Value Risks

Appendix O. Monte Carlo Analysis

Appendix P. Spending Profile

Appendix Q. Highways England Funding Letter

Appendix R. City Deal Funding Confirmation

Appendix S. Section 151 Officer Letter

Appendix T. Maintenance Funding Letter

Appendix U. ECI Recommendation Report

Appendix V. Delivery Team Organogram

Appendix W. City Deal Governance Structure

Appendix X. City Deal - Strategic and Operational Governance

Appendix Y. Programme

Appendix Z. Monitoring and Evaluation Plan