

Burnley / Pendle Growth Corridor

Lancashire County Council

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Appendix A. BCR Assessment Outputs

Appendix B. Development Potential



1. Introduction

1.1 Background

This technical note documents the methodology and findings of the economic assessment undertaken for the Burnley / Pendle Growth Corridor schemes.

Jacobs were commissioned by Lancashire County Council LCC to undertake an economic and strategic assessment of the Burnley / Pendle Growth Corridor Improvements Scheme in support of the formulation of a Strategic Outline Business Case (SOBC).

Jacobs undertook a Benefit Cost Appraisal (BCR) of the proposed schemes in order to quantify the potential economic benefits that could be generated as a result of the improvements. Additionally, a previously undertaken Gross Value Added (GVA) assessment was reviewed for validity.

Whilst BCR is the traditional approach to assessing the merit of transport schemes, GVA analysis seeks to complement standard transport appraisals where these have already been produced. The wider economic impacts of the proposed transport schemes are particularly important to understand in terms of the potential benefits for the locality, and in the context of supporting the funding bid for the scheme as well as the Government's economic growth agenda.

1.2 Overview of Scheme

The Burnley / Pendle Growth Corridor Strategy (Jacobs, June 2014) identified a number of potential options which were expected to deliver benefits to the Burnley / Pendle Growth Corridor. In order to deliver these options LCC identified a number schemes across the corridor incorporating highway improvements and rail station facility improvements.

Of the junctions identified for improvement, a number of these have been grouped into packages based on operational practicalities and the interdependencies of signal timings in order to deliver a more efficient network. Figure 1-A illustrates the location of each of the schemes, as well as highlighting the package improvement, if any.



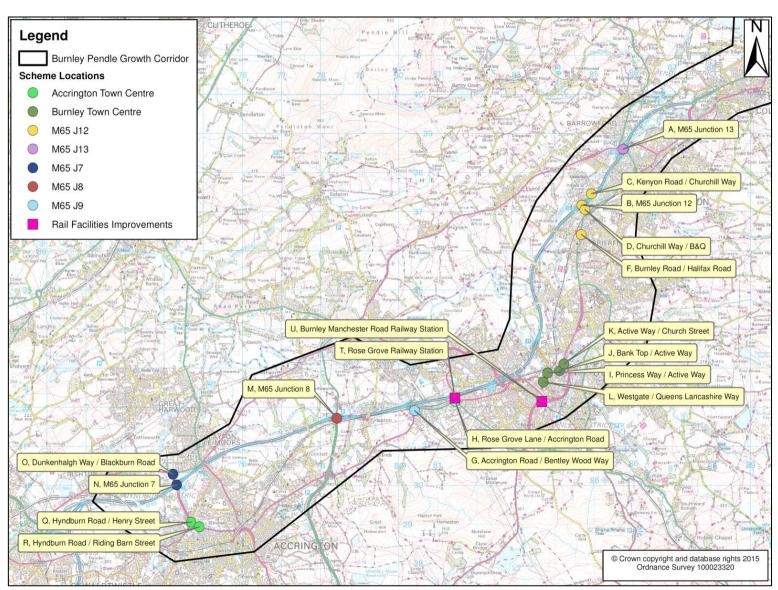


Figure 1-A: Scheme Locations



Detail on the improvements proposed by each scheme is shown in Table 1-A.

Reference	Scheme	Intervention/Benefits Stream	Package name
Α	M65 Junction 13	Signalisation of roundabout.	M65 Junction 13
В	M65 Junction 12	Signalisation of roundabout.	
С	Kenyon Road/Churchill Way	Signalisation of T junction.	
D	Churchill Way / B&Q	Alteration of junction layout.	M65 Junction 12
F	Burnley Road / Halifax Road	Signal technology upgrade include improvements for pedestrians.	
G	Accrington Road / Bentley Wood Way	Alteration of junction layout.	
н	Rose Grove Lane / Accrington Road	Alteration of junction layout and signal technology upgrade. Provision of a 48 space car park adjacent to Rose Grove station.	M65 Junction 9
Т	Rose Grove Railway Station	Passenger facilities improvements.	
ı	Princess Way / Active Way	Signalisation of roundabout.	
J	Bank Top / Active Way	Signal technology upgrade.	
К	Active Way / Church Street	Alteration of junction layout & signal technology upgrade.	Burnley Town Centre
L	Westgate / Queens Lancashire Way	Signalisation of roundabout.	
М	M65 Junction 8	Signalisation of roundabout.	M65 Junction 8
N	M65 Junction 7	Signalisation of roundabout.	
О	Dunkenhalgh Way / Blackburn Road	Alteration of junction layout & signal equipment.	M65 Junction 7
Q	Hyndburn Road / Henry Street	Alteration of junction layout & signal equipment.	Accrington Town Centre
R	Hyndburn Road / Riding Barn Street	Signal technology upgrade.	Accomplish Town Centre
U	Manchester Road Railway Station	Increase in station car park capacity.	Rail Facilities Improvements

Table 1-A: Scheme Details

1.3 Overview of Approach

A BCR assessment has been undertaken to assess the transport user costs and benefits of each scheme. In order to assess each scheme appropriately, two methodologies were identified, namely:

- Quantification of highway scheme benefits; and
- Quantification of rail scheme benefits.

Each methodology is detailed in Chapter 3. The methodology for appraising potential highway scheme benefits was applied to those schemes where junction improvements were proposed, with the rail scheme benefits methodology applied to schemes within the Rail Facilities Improvements package.

A review of the previously undertaken GVA assessment was undertaken in order to verify its validity. The methodology is detailed in Chapter 4. The GVA analysis assesses the potential wider economic benefits that the transport scheme could generate based on the proposed development that the scheme supports. The GVA analysis accords with both HM Treasury Green Book guidance, and the principles and procedures adopted in WebTAG, in line with a traditional BCR approach.

All GVA values presented are net figures (inclusive of locally orientated deadweight, displacement, leakage and substitution factors), and are considered in the context of regeneration phasing and profiles of development build-out. This ensures that GVA values presented comply with national best practice, only present the additional benefits thereby derived for UK Plc, and thus also focus on the net change in overall economic welfare at the national level.

This is critical for incorporating a GVA value within an overall compliant WebTAG appraisal and the economic case (BCR) for progression of a transport scheme.

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All values, whilst presented annually have also been presented in 2010 prices and values, discounted in line with Treasury and WebTAG standards.

1.4 Report Contents

This remainder of this report is structured as follows:

- Cost Estimate;
- BCR Methodology;
- GVA Methodology;
- Results; and
- Summary and Conclusion.



2. Cost Estimates

2.1 Introduction

This section of the report outlines the input preliminary cost estimates included in the assessment provided by LCC

2.2 Cost Estimates

Scheme cost estimates were provided by Lancashire County Council in July 2015 and are summarised in Table 2-A. In line with WebTAG requirements, a 15% allowance for risk has been included in the base scheme costs by LCC. All costs presented in Table 2-A are in 2015 resource prices and no allowance for optimism bias has been included at this stage.

Scheme cost estimates for all schemes have been included in the economic assessment in order to provide a true reflection of the overall package BCR.

It should be noted that this specifically also includes scheme X, the sustainable transport scheme. This scheme has not yet been developed in sufficient detail to allow an assessment of the potential economic benefits, and therefore the BCR cannot be quantified, however costs have been included in the overall scheme PVC and resultant BCR for appraisal purposes.

Key	Scheme	Preparation Cost (£)	Supervision Cost (£)	Construction Cost (£)	Annual maintenance Cost (£)	Total Cost (Design, Supervision & Construction) (£)
Α	M65 Junction 13	£80,000	£20,000	£1,400,000	£3,000	£1,500,000
В	M65 Junction 12	£60,000	£15,000	£925,000	£1,000	£1,000,000
С	Kenyon Road/Churchill Way	£15,000	£5,000	£130,000	£1,000	£150,000
D	Churchill Way / B&Q	£13,000	£4,000	£133,000	£1,000	£150,000
F	Burnley Road / Halifax Road	£18,000	£2,000	£80,000	£500	£100,000
G	Accrington Road / Bentley Wood Way	£5,000	£5,000	£190,000	£500	£200,000
Н	Rose Grove Lane / Accrington Road	£75,000	£25,000	£2,700,000	£1,000	£2,800,000
I	Princess Way / Active Way	£40,000	£10,000	£750,000	£1,000	£800,000
J	Bank Top / Active Way	£8,000	£2,000	£90,000	£500	£100,000
K	Active Way / Church Street	£8,000	£2,000	£90,000	£500	£100,000
L	Westgate / Queens Lancashire Way	£50,000	£20,000	£680,000	£1,000	£750,000
М	M65 Junction 8	£50,000	£15,000	£345,000	£2,000	£410,000
N	M65 Junction 7	£40,000	£15,000	£745,000	£2,000	£800,000
0	Dunkenhalgh Way / Blackburn Road	£20,000	£5,000	£775,000	£1,000	£800,000
Q	Hyndburn Road / Henry Street	£15,000	£5,000	£400,000	£500	£420,000
R	Hyndburn Road / Riding Barn Street	£5,000	£2,000	£73,000	£500	£80,000
Т	Rose Grove Railway Station	£3,000	£2,000	£155,000	£0	£160,000
U	Manchester Road Railway Station	£15,000	£5,000	£730,000	£0	£750,000
Х	Sustainable Transport Scheme/s	£25,000	£15,000	£460,000	£2,000	£500,000
					Total	£11,570,000



Table 2-A: Base Scheme Cost Estimates

Based upon the stage of development of each scheme and the detail level of the cost estimates, appropriate levels of optimism bias (44%, 15% or 3%) were selected for each scheme in line with WebTAG Unit A1-2 'Scheme Costs' section 3.5, 'Optimism Bias'. The levels of optimism bias applied to each scheme are set out in Table 2-B.

All scheme costs are expected to occur in the year of construction and it was acknowledged that the cost of civil engineering projects rises faster than the rate of inflation. To address this, a 2.5% uplift per year in real terms has been applied to scheme costs where the construction year is later than 2015. LCC have provided a construction programme detailing the construction year of each scheme.

To allow for comparative assessment, costs have been deflated from 2015 to the DfT's base year, 2010, using the GDP deflator contained within the WebTAG Databook (DfT, November 2014).

In line with WebTAG Unit A1-1 'Cost Benefit Appraisal' section 2.1, 'Present Values and Discounting' all scheme costs have been discounted to the DfT's base year 2010, using WebTAG Databook values. This has been applied across the full appraisal period for each scheme due to the associated maintenance costs recurring each year.

To convert from resource price to market prices, an indirect tax correction factor of 1.190 has been applied, in accordance with WebTAG unit A1-2 Section 6.1.

The final scheme costs for input into the appraisal, along with relevant optimism bias levels and scheme opening years, is shown in Table 2-B.

Key	Scheme	Total Cost (Design, Supervision & Construction) (2015 Resource Prices)	Construction Year	Optimism Bias (%)	Annual maintenance cost	Total Cost (Design, Supervision & Construction) (2010 Market Prices)
Α	M65 Junction 13	£2,500,000	2015	3%	£3,000	£1,447,006
В	M65 Junction 12	£1,000,000	2015	3%	£1,000	£1,133,391
С	Kenyon Road/Churchill Way	£150,000	2015	3%	£1,000	£178,981
D	Churchill Way / B&Q	£50,000	2015	3%	£500	£178,981
F	Burnley Road / Halifax Road	£100,000	2018	3%	£500	£113,821
G	Accrington Road / Bentley Wood Way	£200,000	2017	44%	£500	£312,847
Н	Rose Grove Lane / Accrington Road	£2,800,000	2017	44%	£1,000	£4,320,736
ı	Princess Way / Active Way	£900,000	2016	44%	£1,000	£1,253,896
J	Bank Top / Active Way	£100,000	2016	15%	£500	£129,253
K	Active Way / Church Street	£100,000	2016	15%	£500	£125,253
L	Westgate / Queens Lancashire Way	£750,000	2017	44%	£1,000	£1,164,555
M	M65 Junction 8	£410,000	2017	44%	£2,000	£650,945
N	M65 Junction 7	£800,000	2016	44%	£2,000	£1,264,095
0	Dunkenhalgh Way / Blackburn Road	£800,000	2016	44%	£1,000	£1,253,896
Q	Hyndburn Road / Henry Street	£420,000	2017	44%	£500	£651,559
R	Hyndburn Road / Riding Barn Street	£70,000	2018	15%	£500	£102,173
Т	Rose Grove Railway Station	£160,000	2015	3%	£0	£150,969
U	Manchester Road Railway Station	£750,000	2017	3%	£0	£660,616
х	Sustainable transport Scheme	£500,000	2017	44%	£2,000	£594,899

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Table 2-B: Final Scheme Costs for Appraisal.



3. BCR Methodology

3.1 Introduction

This section of the report outlines the methodology for quantifying transport user benefits arising from the proposed improvements across the Burnley / Pendle Growth Corridor.

3.2 Value for Money

BCR is the traditional approach to quantifying the costs or benefits of a transport intervention. The output Benefit Cost Ratio (BCR) from the assessment is therefore a key input into how a scheme intervention is appraised as part of the Business Case submission and supporting documentation.

A Benefit Cost Ratio (BCR) will be produced for each junction as well as a combined BCR for the package of improvements as a whole.

Figure 3-A illustrates how the outputs from the BCR feed into the appraisal process and 'Value for Money (VfM)' categories.

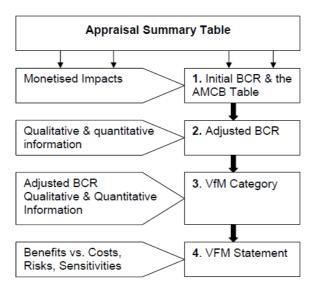


Figure 3-A: Benefits Cost Analysis & VfM¹

Costs of the scheme have been provided by Lancashire County Council (the Client), as outlined in the previous section.

As per Department for Transport (DfT) guidance, the output BCR from the BCR determines the VfM category the scheme falls within, as defined below:

- Poor VfM if the BCR is less than 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; or
- Very high VfM if the BCR is greater than 4.0.

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¹ DfT (Dec 2013) Value for Money Assessment: Advice Note for Local Transport Decision Makers.



Sections 3.3 and 3.4 detail the methodology that has been applied to assess the transport user costs and benefits of each scheme.

3.3 Quantification of Highway Scheme Benefits

For the junction assessments, scheme benefits have been calculated based upon through journey time savings as a result of the junctions operating more efficiently.

The journey time benefits have been derived from analysis of the reduction in delay between the current situation and proposed future situation. The delay quantification has been undertaken by Lancashire County Council using industry standard software, Linsig and Arcady, to model the scenarios. The models produced reflect the peak hour during the AM and PM peak period and the average hour during the IP period.

The modelling of the IP hour was undertaken for selected junctions in order to reflect the disbenefits associated with the signalisation of previously uncontrolled junctions. Eight junctions were identified for IP modelling as they are currently uncontrolled and the proposed scheme is to install signals, thereby potentially introducing disbenefits in the IP, off-peak and weekend periods. Further detail on the annualisation process and quantification of off peak disbenefits is provided in section 3.3.5.

As the local junction models do not allow for vehicle re-routing or the quantification of travel distance changes the quantification of other potential highway related benefits has not been undertaken, for example noise, air quality and greenhouse gas reductions.

The junction modelling has been undertaken by Lancashire County Council for the AM and PM peak hours at all junctions and the average IP hour for selected junctions, using industry standard junction modelling software Arcady & Linsig.

The methodology for quantifying scheme benefits will be informed by WebTAG Unit A1-1: 'Cost-Benefit Analysis' and WebTAG Unit A1-3: 'User and Provider Impacts'. The approach to calculating scheme Journey Time Benefits is outlined below:

- Quantification of transport demand in the opening year (2015), and forecast transport demand in the design year (2030);
- Quantification of overall travel time savings in the DN and DS scenarios (derived from the local junction modelling outputs) in opening year and the design year;
- Derivation of local percentage vehicle splits at each junction;
- Monetise the travel time savings;
- Calculation of annual transport benefits;
- Forecast monetised benefits over 15 year appraisal period; and
- Discount benefits to 2010 in line with WebTAG recommendations and standard values.

Further detail on the steps undertaken above is given in sections 3.3.1 to 0.

3.3.1 Quantification of Transport Demand

The quantification of transport demand in the opening year has been undertaken by LCC using classified vehicle and counts carried out in March and June 2014. The data collected is considered to be 'neutral', or representative, avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic.

It is acknowledged that one MCC site was undertaken in December for the Burnley Road / Halifax Road junction. Whilst not considered 'neutral' by WebTAG, this data has been deemed appropriate for use based on local knowledge of the area. It is also acknowledged that the proposed interventions at this junction are

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relatively minor, with only a signal technology upgrade proposed, and therefore the data is appropriate for this application.

LCC has forecast transport user demand in the design year using time period specific NTEM v6.2 growth factors, applied to the opening year observed demand.

These have been applied to each turning movement, for each time period and modelled year. The only change between the do-minimum and the do-something scenario is the scheme itself.

It is important to note that there are a large number of developments in the vicinity of many of the schemes. This introduces the potential for development dependency within the forecasts.

As a result, and to ensure that the analysis remained suitably conservative for individual junction assessments, no site specific developments have been included within the benefit calculations. This has ensured that traffic growth remains consistent with NTEM v6.2 that the potential transport benefits are not inflated and also removes and potential uncertainty regarding the phasing or timing of developments within any of the analysis.

3.3.2 Quantification of Travel Time Savings

LCC have modelled each junction in the opening year and design year for the Do Nothing and Do Something scenarios in both the AM and PM peak hour at all junctions and the average IP hour for selected junctions.

The AM and PM peak hours have been defined at each junction based on the observed peak hour flow across the period (07:00 – 10:00 and 16:00 – 19:00 respectively). The average IP hour has been calculated across the entire IP period (10:00 – 16:00). All factors have been derived from local traffic counts undertaken in June 2014.

The travel time savings are defined as the change in total delay between the DN and DS scenario, at each junction, or local grouped network level, where junctions are linked.

The outputs of this process have adopted a standard unit of pcuHrs per modelled hour, and have been treated accordingly in terms of conversion to vehicles, and overall monetary values on an annual basis.

It is acknowledged that the effects of upgrading a signalised junction from a Fixed Time program to MOVA operated control are inherently difficult to model using local junction modelling software. As such, the approach adopted has been to exclude from the economic assessment the potential benefits associated with upgrading to MOVA control, when other geometric or substantial changes are being implemented.

However, a number of situations existed where no further changes were proposed in excess of upgrading the signal controls to MOVA. In these instances, and in agreement with the independent assurer, the DS model was constructed by applying a 2.78% increase in the saturation capacity to each of the approach lanes. This saturation capacity increase is supported by the "Modelling MOVA Control" (tec, September 2003) technical note.

3.3.3 Derivation of Vehicle Type Splits

Percentage vehicle type splits have been calculated for each junction based on classified vehicle counts for the AM and PM peak hours, carried out in June 2014 and provided to Jacobs by LCC.

The user classes included in the analysis are:

- Car;
- LGV;
- OGV 1;
- OGV 2; and
- PSV.

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For the purposes of applying Values of Time, sourced from the WebTAG Databook (DfT, November 2014) Table A1.3.2, default journey purpose splits were applied to each user class and sourced from the WebTAG Databook (DfT, November 2014) Table A1.3.4. The resultant vehicle splits input into the appraisal were:

- Car Employers Business;
- Car Commute;
- Car Other:
- LGV Employers Business;
- LGV Commute;
- LGV Other;
- OGV 1;
- OGV 2; and
- PSV.

3.3.4 Monetisation of Travel Time Savings

Values of time for each user class, journey purpose and appraisal year have been sourced from the WebTAG Databook (DfT, November 2014, Table A1.3.2).

3.3.5 Calculation of Annual Transport Benefits

Annual transport benefits were derived through the application of a peak hour to peak period factor (or average hour to peak period factor, where appropriate) and a working day to working year factor in line with WebTAG Unit A1-3 'User and Provider Impacts' section 9, 'Annualisation'.

The peak hour to peak period factors have been calculated based on observed data at a selection of count locations across the Burnley / Pendle Growth Corridor. It was acknowledged that there were two distinct types of junctions being modelled:

- Junctions carrying strategic motorway traffic; and
- Junctions carrying local traffic.

As the nature of traffic flow between each type was expected to vary, the traffic count sites selected for analysis are representative of both junction types. Figure 3-B shows the location of each site.



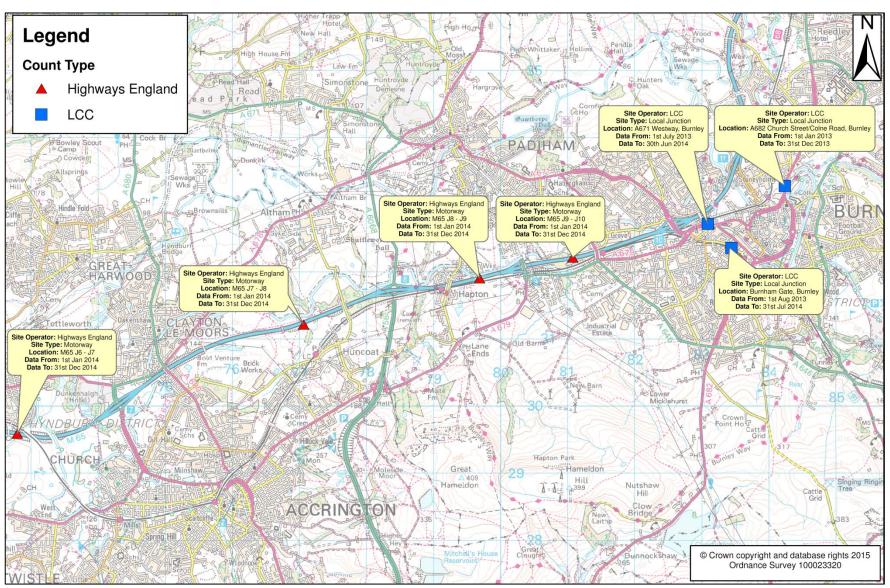


Figure 3-B: Count Locations



A peak hour to peak period factor was calculated at each junction, the results are summarised in and is summarised in Table 3-A.

Location	Туре	AM Peak Hour	AM Peak hour to AM Period Factor	PM Peak Hour	PM Peak hour to PM Period Factor
M65 J6 – J7	Motorway	07:30 - 08:30	2.36	16:45 – 17:45	2.49
M65 J7 – J8	Motorway	07:30 - 08:30	2.35	16:45 – 17:45	2.48
M65 J8 – J9	Motorway	07:30 - 08:30	2.44	16:30 – 17:30	2.50
M65 J9 – J10	Motorway	07:30 - 08:30	2.43	16:45 – 17:45	2.49
Burnham Gate, Burnley	Local	08:00 - 09:00	2.67	16:00 – 17:00	2.86
A671 Westway, Burnley	Local	08:00 - 09:00	2.66	16:00 – 17:00	2.76
A682 Church Street/Colne Road, Burnley	Local	08:00 - 09:00	2.64	16:00 – 17:00	2.74

Table 3-A: Peak Hour to Period Factors (Individual Count Sites)

It is clear from the results that the variation of factors of the same location type is low. It was therefore deemed appropriate to average the AM and PM peak hour to period factors for each type to derive common factors which would be applied to the appropriate junctions when calculating the annual transport benefits.

The factors to be used when calculating the annual transport benefits for the Burnley / Pendle Growth Corridor, and the junctions to which they apply, are summarised in Table 3-B.

Location	AM Peak Hour to AM Period	Average IP Hour to IP Period	PM Peak Hour to PM Period	Schemes to which factors apply
Motorway	2.40	6.00	2.49	A, B, C, D, E, G, M, N, O and P
Local	2.66	6.00	2.79	F, H, I, J, K, L, Q and R

Table 3-B: Peak Hour to Period Factors (Burnley / Pendle Growth Corridor)

It is acknowledged that where disbenefits are observed during the IP period it is likely these are also likely to apply to the off peak and weekend periods.

Where the IP hour was explicitly modelled for a junction, the off peak disbenefits have also been calculated. This has been undertaken by identifying an associated 24 hour traffic count for each junction (or where a 24 hour count was not available on any of the approach arms, a representative count site was selected, giving consideration to the road type, typical volume of vehicles and nature of the surrounding area (i.e. rural or urban)). A factor was then calculated to convert from average IP hour to average OP hour and this was then incorporated into the annualisation factors for the IP period.

Following examination of the traffic count data, it was not deemed appropriate to incorporate weekend disbenefits within the economic assessment. This was due to the traffic volumes observed on the weekend being significantly lower than those during the weekday IP period. The data was therefore considered unrepresentative and for this reason, weekend disbenefits have been excluded from the economic assessment.

The working day to working year factor applied is 253.

3.3.6 Forecasting Benefits over the Appraisal Period

The annual transport benefits for each scheme have been interpolated and projected over a 15-year appraisal period as illustrated in Figure 3-C. Appropriate growth in the value of time for each year of the appraisal has been sourced from the WebTAG Databook (DfT, November 2014) and applied to each appraisal year. In line with WebTAG guidance, no further growth was applied after the last modelled year.



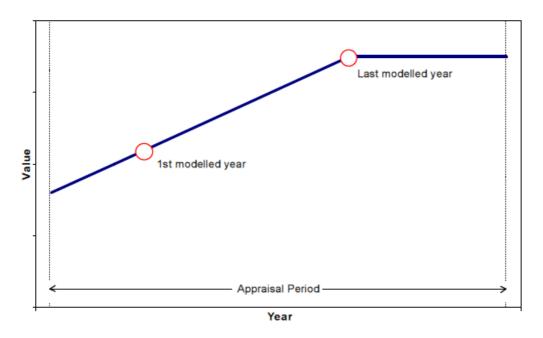


Figure 3-C: Interpolation and projection of benefits

Benefits were then discounted to 2010 values, with a 3.5% rate applied for the duration of the appraisal period. The cost of the scheme was then compared with the projected benefits over 15 years to produce the overall BCR.

3.4 Quantification of Rail Scheme Benefits

The proposed rail station improvement schemes include station facility improvements at Rose Grove station, in line with the Rail North Station Quality Standard (SQS) and provision of additional car parking at Burnley Manchester Road station.

The methodology for undertaking the rail station facilities benefit analysis has been informed by WebTAG Unit A5-3: 'Rail Appraisal'. The approach to calculating the Rail Station Facilities Improvements Benefits is outlined below:

- Quantification of existing station usage;
- Quantification of annual Generalise Journey Time (GJT) and demand uplift benefits from station improvements; using Passenger Demand Forecasting handbook (PDFH) and Rail North values for individual improvements, with an overall package cap to ensure no double counting of benefits;
- Quantification of additional demand, revenue, and non-user benefits (Marginal External Costs) resulting from the increased rail demand;
- Interpolation of monetised benefits over 60 year appraisal period; and
- Discount benefits to 2010.

This methodology has been informed by the processes undertaken as part of the East Lancashire Rail Connectivity Study recently completed by Jacobs and approved by Network Rail, using a similar approach and existing data where possible. The previously calculated average trip lengths and average fares, derived from the MOIRA rail demand forecasting software as part of the East Lancashire Rail Connectivity Study have been used. Where appropriate previously reviewed and audited spreadsheet approaches have been employed in order to ensure consistency of approach in respect of other similar studies.

The Marginal External Cost (MECs) approach considered air quality, noise, congestion, infrastructure and accident costs as a result of a change in vehicle kilometres on the highway network. The increase in demand on the rail network will be driven by a proportion of people transferring from car to rail and as such an associated



reduction in vehicle kilometres can be measured. The methodology is outlined in WebTAG Unit A5.4 'Marginal External Costs', and will be based on PDFH recommended diversion factors to ensure robustness.

3.5 Assumptions

Key assumptions required to undertake the analysis are detailed below:

- For highway improvement schemes the scheme opening year was provided by LCC and the scheme design year was assumed to be 15 years post opening based upon the design life of the signal infrastructure:
- Highway improvement schemes were appraised over a 15 year appraisal period based upon the design life
 of the signal infrastructure;
- Based on local Automatic Traffic Count (ATC) count data the following factors have been determined and applied to the analysis:

	Motorway Junction	Local Junction
AM Peak Hour to Period	2.40	2.66
Average IP hour to IP Period	6.00	6.00
PM Peak hour to Period	2.49	2.79

- Rail station facilities upgrades were appraised over a 60 year appraisal period;
- Based upon empirical evidence and previous studies, the package cap to ensure no double counting of benefits for rail station facility improvements was assumed to be 8%;
- Rail patronage growth was assumed to be 27% by 2023 and 67% by 2043, based on a medium growth
 scenario contained within "Regional Urban Market Study" (Network Rail, October 2013) and in line with the
 methodology applied to previous studies, namely the "East Lancashire Rail Connectivity Study" (Jacobs,
 December 2014);
- Rail patronage growth was capped after 20 years, based on PDFH and WebTAG guidance; and
- The factors applied to obtain forecast highway traffic growth levels have been obtained from TEMPRO software, using the NTEM v6.2 dataset.

3.6 Modelled Time Periods

The modelled time periods for each junction will be the AM peak hour (peak hour between 0700 and 1000) and the PM peak hour (peak hour between 1600 and 1900).

Following liaison with the Independent Assurer, it has been agreed that the Interpeak hour (average hour between 100 and 1600) should be modelled in scenarios where there is potential to introduce disbenefits during this period. There is potential for this to occur at junctions where the current junction configuration is a roundabout and the proposed intervention is signalisation.

For this reason it has been agreed that the Interpeak hour will be modelled at Junctions A, B, C, I, L, M and N.

A full summary of the scenarios and time periods modelled is tabulated later in this note.

3.7 Intermediate Year Modelling

In liaison with the independent assurer, it was determined that intermediate year modelling was required for junctions where either of the following criteria apply:

- · Opening year benefits are negative and design year benefits are positive; or
- Where the change in delay is positive in both opening and design years, but the delay per vehicle increases significantly.



Following agreement with the independent assurer, a significant increase in delay per vehicle has been defined as 2.5 minutes per vehicle for any time period. This is considered a reasonable build-up of queued time, such that alternative routes and responses may be considered.

The delay per vehicle analysis was undertaken based on the DN scenario for each junction. For this reason it has been agreed that the Intermediate year will be modelled at Junctions B, C, H, L, M, N and Q.

A full summary of the scenarios and time periods modelled is tabulated later in this note.

This intermediate year models were produced for 2024 and developed using the same approach as applied to the design year models. The results of the intermediate year models have been incorporated within benefit calculations of the core scenario.

3.8 Sensitivity Testing

In order to provide a proportionate approach to sensitivity testing, low growth models have been developed for those junctions which generate the most significant levels of delay.

This has been undertaken following the process below:

- Identify the junctions for which sensitivity testing is required. These were identified through examination
 of the results of the economic analysis for the core scenario and identifying those which generate the
 most significant level of delay and using the
- 2. Determine the traffic demand for the low growth scenario, for both forecast years, in line with WebTAG Unit M4, Forecasting and Uncertainty. The low growth scenario was calculated by subtracting a proportion of the base traffic from the core scenario. The level of base demand to be subtracted from the core demand is calculated by:

$$2.5\% \times \sqrt{n_1-n_2}$$

Where n_1 = Forecast Year and n_2 = Base Year

- 3. Assign low growth forecasts to Linsig and Arcady models.
- 4. Calculate economic benefits for low growth scenario. Benefits were quantified as per the core scenario and detailed in the "*Proposed Benefits Cost Analysis Methodology*" (Jacobs, March 2015).

Based upon the outputs of the core scenario modelling it was determined that sensitivity testing should be carried out on junctions C, D, J, K, Q and R.

A full summary of the scenarios and time periods modelled is tabulated later in this note.

3.9 Summary of Assignments

A complete summary of the junction models assigned is shown in Table 3-C.

		Core Scenario	Additional Testing		
Junction	AM	IP	PM	Low Growth	Intermediate Year
Α	✓	✓	✓		
В	✓	✓	✓		✓
С	✓	✓	✓	✓	✓
D	✓		✓	✓	
F	✓		✓		
G	✓		✓		
Н	√		✓		√



I	✓	✓	✓		
J&K	✓		✓	✓	
L	✓	✓	✓		✓
M	✓	✓	✓		✓
N	✓	✓	✓		✓
0	✓		✓		
Q	✓		✓	✓	✓
R	√		√	√	

Table 3-C: Junction Assignments



4. GVA Methodology

4.1 Introduction

This section of the report outlines the methodology used to quantify the potential GVA benefits associated with the scheme.

4.2 Methodology

The analysis of potential GVA benefits has been undertaken in the following stages, as summarised in Figure 4-A below.

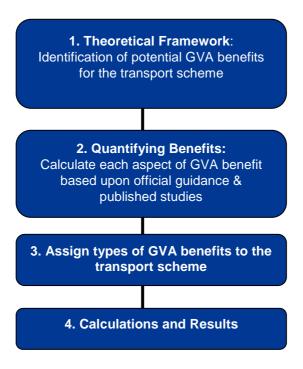


Figure 4-A: Theoretical GVA Framework

4.3 Theoretical Framework

The GVA analysis seeks to complement standard transport appraisals. The wider economic impacts of the proposed transport schemes are particularly important to understand in terms of the potential benefits for the locality and the Government's economic growth agenda.

GVA measures the total value of goods and services; i.e. economic activity. In its simplest terms, it is therefore GDP at a local/regional level, minus indirect taxation.

There are three key mechanisms by which transport schemes produce GVA benefits; the number of new jobs created, the enhanced productivity of existing jobs and the direct cost savings brought about by a transport scheme, as summarised below:

1. More jobs = Additional wages = Greater GVA

2. Higher productivity = Higher profits = Greater GVA

3. Direct cost savings = Greater GVA



4.4 GVA Benefit Quantification

Unlike standard transport appraisals, there is not a single methodology for estimating the impacts of a scheme on GVA, employment, or similar measures of the performance of the real economy. Methodologies often vary considerably across studies.

Almost all methods reviewed have particular strengths and weaknesses, and thus there is no single definition of what GVA is or how it should be quantified in the context of transport appraisal.

In this context, a bespoke methodology has been developed based on the above definition and consistent theoretical framework for assessing additional economic benefits. This ensures that the scheme is subject to a standard process and quantification of benefits; albeit using local variations in GVA per job, and local transport capacity constraints overcome.

Not all elements of GVA benefits are applicable for every type of scheme. The change as a result of unlocked development from increased capacity was considered appropriate for the Burnley / Pendle Growth Corridor and has subsequently been assessed.

Benefits generated by unlocked development and employment, is quantified by multiplying the number of jobs expected to be generated by GVA per employee (by district area, and employment sector, using standard industrial categories).

The number of jobs generated by future employment opportunities has been referred to as direct employment and is obtained directly from business survey and direct empirical sources that estimate how much employment will be generated from local businesses. In this case, the Ekosgen 2014 report has been used as a robust measure of these, and which, accounting for deadweight, displacement and leakage, provides realistic and market-assessed level of net employment creation for each key development site in the County.

The annual benefits obtained in the GVA analysis have been forecast over a 15 year period to be consistent with the rest of the appraisal, and to ensure consistency with the BCR outputs derived for the highway improvements schemes, and which already incorporate user benefits of the scheme.

A 2% per annum GVA growth rate has been applied up to 2030 (the end of the appraisal period). This is in line with the WebTAG databook (DfT, November 2014) guidance on forecast real increases in productivity over time and is applicable to years 1 - 30 where appropriate.

The benefits over the 15 year period have then been discounted using a 3.5% discount rate as defined in WebTAG. This is in line with Treasury Green Book guidance and is applicable to years 1 – 30 where appropriate.



5. Results

5.1 Introduction

This section presents the results from the BCR and GVA analysis.

The BCR results have been presented by package, as identified in the Strategic Outline Business Case as well as for the overall Burnley / Pendle Growth Corridor Improvements Scheme.

5.2 BCR Results

5.2.1 Package Results

The results of the BCR assessment for each package of schemes is shown in the table below, displaying the Present Value of Benefits (PVB), the Present Value of Costs (PVC) and Benefit Cost Ratios (BCR). The PVB quoted does not incorporate the potential GVA benefits associated with the scheme and are considered WebTAG standard BCR's for each package.

Scheme	Package	PVB	PVC	BCR		
M65 Junction 13	M65 Junction 13	£10,982,675	£1,447,006	7.6		
M65 Junction 12		C17 120 F47				
Kenyon Road / Churchill Way	M65 Junction 12		£1,605,174	10.7		
Churchill Way / B&Q	IVIOS JUIICUOTI 12	£17,128,547	11,003,174	10.7		
Burnley Road / Halifax Road						
Accrington Road / Bentley Wood						
Way						
Rose Grove Lane / Accrington	M65 Junction 9	£17,492,300	£4,784,552	3.7		
Road						
Rose Grove Railway Station						
Princess Way / Active Way						
Bank Top / Active Way	Burnley Town	£1,115,764	£2,676,957			
Active Way / Church Street	Centre			0.4		
Westgate / Queens Lancashire	Centre					
Way						
M65 Junction 8	M65 Junction 8	£1,524,313	£650,945	2.3		
M65 Junction 7						
Dunkenhalgh Way / Blackburn	M65 Junction 7	£4,275,523	£2,517,991	1.7		
Road						
Hyndburn Road / Henry Street	Accrington Town	C40 C00 40F	6752 722	C4.C		
Hyndburn Road / Riding Barn	Centre	£48,699,495	£753,733	64.6		
Street	Dail Facilities					
Manchester Road Railway Station	Rail Facilities Improvements	£5,022,778	£660,616	7.6		
Sustainable Transport Scheme/s	N/A	N/A	£594,899	N/A		
Total		£106,241,396	£15,691,872	6.8		
Note: All monetary values quoted are in 2010 Market Prices, discounted to 2010.						

Table 5-A: Scheme Benefits by Package

With the exception of the Burnley Town Centre package and the M65 Junction 7 package, all package improvements have a traditional BCR of greater than 2.0, which is the threshold for the LEP to consider a scheme for funding, as set out in the "LEP Accountability Framework" (Lancashire Enterprise Partnership, September 2014).



However, it should be noted that the inclusion of the Burnley Town Centre Package is imperative in order to realise the benefits at surrounding junctions and support economic growth in the area. In addition to this, when considered in conjunction with the potential GVA benefits (discussed in section 5.3) the package is expected to deliver value for money to the taxpayer.

When considered in isolation from the Burnley Town Centre Package, it is notable that the Westgate / Queen Lancashire Way junction has significant disbenefits over the appraisal period. When the Burnley Town Centre package of improvements is evaluated excluding the Westgate / Queens Lancashire Way junction, the PVB rises to £13.7m with a PVC of £1.5m and resultant BCR of 9.1.

This demonstrates that the cause of the low BCR for this package of improvements is due to the economic assessment of the Westgate / Queens Lancashire Way junction.

As highlighted in the "Model Validation and Forecasting Note" (Jacobs, October 2015) the modelling at this junction in the DN scenario is considered to be under representing the level of delay and thus resulting in a disbenefit in the economic analysis. In order to demonstrate the strategic need for this scheme further analysis has been undertaken on the network management, highway safety, bus routing and pedestrian and cyclist provision as a result of the proposed scheme. This analysis is presented in section 5.3.

It is acknowledged that there are significant levels of benefits attributed to the Accrington Town Centre and M65 Junction 12 packages (£48.7m and £17.1m respectively, accounting for 62% of the total PVB). Further investigation was undertaken into the validity of the models and the high levels of benefits can be attributed to the fact that congestion at these junctions is already very high and the forecast traffic growth will increase this congestion significantly.

As a sensitivity test to evidence that the Burnley / Pendle Growth Corridor Strategy BCR is not being inflated significantly as a result of these two packages a separate BCR has been calculated for the remaining 6 packages. This produced a PVB of £40.4m, PVC of £13.3m and resultant BCR of 3.0. Thus the BCR is well within the LEP threshold for consideration of a scheme for funding (which must be at least 2.0).

5.2.2 Sensitivity Testing

In order to provide a proportionate approach to sensitivity testing, a low growth scenario was produced for a selected number of junctions, in agreement with the independent assurer. These were identified based upon those junctions which generated the most significant levels of delay in the base and future years and in agreement with the independent assurer.

A low growth scenario was produced for six junctions and a comparison of the Core and Low PVB's, PVC and BCR's is presented in Table 5-B.

Scheme	Core PVB	Low PVB	PVC	Core BCR	Low BCR
Kenyon Road / Churchill Way	£12,292,342	£8426,836	£178,981	68.7	47.1
Churchill Way / B&Q	£6,188,703	£6,181,758	£178,981	34.6	34.5
Bank Top / Active Way	(42 422 270	62 024 220	C2E0 E07	46.0	44.7
Active Way / Church Street	£12,132,379	£3,024,328	£258,507	46.9	11.7
Hyndburn Road / Henry Street	£47,663,864	£45,580,407	£651,559	73.2	70.0
Hyndburn Road / Riding Barn Street	£1,035,631	£394,791	£102,173	10.1	3.9

Table 5-B: Low Growth Scenarios versus Core Growth Scenario

The table above highlights that both the Bank Top / Active Way junction and the Hyndburn Road / Riding Barn Street junction are particularly sensitive to a change in traffic volume, as shown by the change in benefits, and resultant BCR, between the Core and Low scenarios. However both junctions maintain a BCR greater than 2.0 in the low growth sensitivity test, therefore if the additional growth does not materialise as per the core forecasts these junctions will still meet LEP criteria to be considered for funding.



The comparison between core and low PVB & BCRs demonstrates that all schemes still maintain a BCR greater than 2.0 in the low growth scenario, which is the threshold for the LEP to consider a scheme for funding, as set out in the "LEP Accountability Framework" (Lancashire Enterprise Partnership, September 2014).

5.2.3 AMCB Table

The AMCB (Analysis of Monetised Costs and Benefits) table is an industry standard table published by the DfT for the presentation of all monetised impacts of a scheme considered sufficiently robust for inclusion in the Net Present Value (NPV) and Benefit Cost ratio (BCR).

The overall results of this BCR assessment for the Burnley / Pendle Growth Corridor Improvements Scheme as a whole are summarised in the AMCB table below.

Table 5-A outlines the outputs of the Benefit Cost Analysis for the scheme.

Noise	-
Air Quality	-
Greenhouse Gases	-
Journey Quality (Congestion)	-
Physical Activity	-
Infrastructure Maintenance	-
Accidents	-
Economic Efficiency: Consumer Users	£70,593,221
(Commuting & Other)	110,393,221
Economic Efficiency: Business Users and Providers	£35,648,174
Wider Public Finances (Indirect Taxation	
Revenues)	-
Present Value of Benefits (PVB)	£106,241,396
Present Value of Costs (PVC)	£15,691,872
Net Present Value (NPV)	£90,144,185
Benefit to Cost Ratio (BCR)	6.8

Table 5-C: AMCB Table

The Burnley / Pendle Growth Corridor Improvements Scheme is expected to deliver £106.2m of benefits (2010 prices, discounted to 2010). The scheme is expected to cost £15.7m (2010 prices, discounted to 2010) and therefore has a BCR of 6.8 and is expected to deliver 'Very High' Value for Money, as outlined in DfT guidance.

Outputs from the BCR assessment are included in Appendix A.

5.3 Westgate / Queen Lancashire Way

The Westgate / Queen Lancashire Way junction has been identified as the cause of the low BCR for the Burnley town Centre package of improvements. Whilst a disbenefit has been calculated as a result of the network changes to this junction, it is proposed that the changes are delivered as part of the BPGC Junction Improvements Scheme in order to realise potential benefits from a number of alternative streams which have not been monetised as part of the economic assessment.

This section demonstrates the strategic need for this scheme from a network management, highway safety, bus routing and pedestrian and cyclist perspective.

5.3.1 Network Management

In recent years a number of junction improvements have been delivered in Burnley including the signalisation of the M65 junction 10 (Gannow Top and Barracks roundabouts with MOVA), the Mitre junction (MOVA and



pedestrian/cycle improvements) and Finsley Gate/Manchester Road (MOVA and pedestrian improvements). The Barracks roundabout also included a signalised bus gate to assist bus journey times between the centre of Burnley traveling along Westgate and beyond. The location of the proposed junction improvements at the Westgate / Queens Lancashire Way Junction, with respect to those improvements identified above, is shown in Figure 5-A.

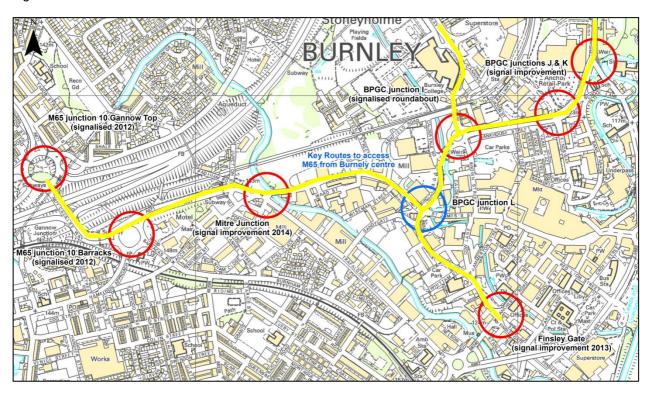


Figure 5-A: Strategic Context of Westgate / Queens Lancashire Way Junction

The BPGC improvements have been designed to complement this recent investment by undertaking further junction improvements on the Westgate/Active Way corridor. The Westgate / Queens Lancashire Way junction is at the centre of this strategic route and is also important for the better management of the network from the perspective of Urban Traffic Management and Control (UTMC) systems. Modern UTMC systems based on UG405 technology allow for the flexibility of linked control between nearby signal junctions that can be based upon various control strategies deemed best to deal with particular traffic flow patterns or events and incidents.

The benefits of signalising junction L then allow for this junction to be incorporated into the UTMC strategic network for overall better network management.

The benefits associated with improved network management have not been quantified as part of the economic assessment.

5.3.2 Highway Safety

Analysis of the STATS19 database has shown that over the last 5 years there have been 8 accidents at the junction resulting in 13 causalities. Although this is not considered a severe accident record, it is anticipated that a signalised junction improvement would reduce this accident rate.

The benefits associated with improved highway safety have not been quantified as part of the economic assessment.

5.3.3 Bus Routing

The route from St James Street to Westgate caters for frequent bus movements for a number of services. The current junction is on a significant east west gradient where buses exiting St James Street are stopped at the give way line uphill. With short gaps bus drivers often have difficulty in entering the junction. The proposed



signalled improvement will ease this difficulty and bus priority technology built into the signal infrastructure will further assist.

The benefits associated with improved bus routing have not been quantified as part of the economic assessment.

5.3.4 Pedestrians and Cyclists

It is considered that the current configuration of the junction does not adequately serve pedestrian and cyclists. The Westgate / Queens Lancashire Way junction is a key gateway to the centre of town and the Weaver's triangle development site. This junction also serves as an access for pedestrians and cyclists to Burnley College and the Knowledge Park development site on Princess Way.

It is acknowledged that a new Toucan crossing was provided on Queen Lancashire Way near the junction, however this is somewhat away from the pedestrian desire lines with many pedestrians often choosing not to use it. The local context of the junction and observed pedestrian desire lines is shown in Figure 5-B.

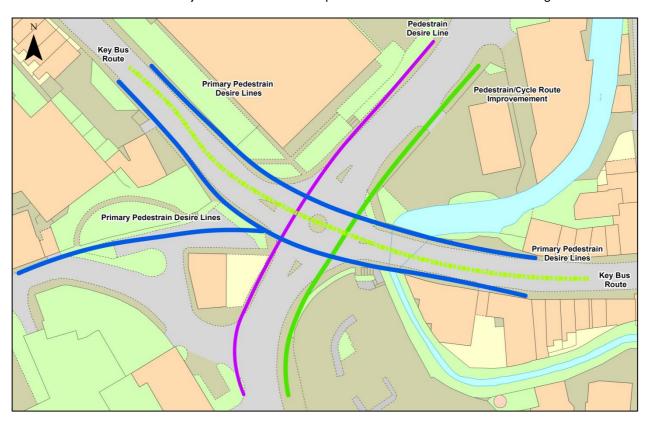


Figure 5-B: Local Context of Westgate / Queens Lancashire Way Junction

The benefits associated with improved pedestrian and cyclist provision have not been quantified as part of the economic assessment.

5.3.5 Summary

It is considered that the large negative BCR shown in this report is a result of the Arcady local junction model underestimating delay, resulting in a disbenefit being calculated as part of the economic assessment.

A number of wider scheme benefits (specifically network management, highway safety, bus routing and pedestrian and cyclist provision) have been identified, however these were not incorporated into the economic analysis.

For the reason set out above it is considered that the scheme should remain within the delivery programme for the BPGC junction improvements scheme.



5.4 GVA Results

The results of the GVA assessment undertaken produce various GVA measures which are defined in Table 5-D. The preferred and most useful measure is likely to be the discounted, average annual GVA benefits for the locality, so as it is presented in a similar way to GDP.

GVA measure	Explanation
Total GVA benefits over 15 years (undiscounted)	15-year values are provided over the lifetime of the scheme and which align with the same period of analysis associated with traditional transport appraisals. This figure shows the total 15 year GVA benefits undiscounted in 2010 prices.
Annual GVA benefits averaged over 15 years (undiscounted)	An annual GVA benefit averaged over 15 years is also presented. This is presented in 2010 prices and is undiscounted.
Total GVA benefits over 15 years (discounted)	This figure shows total benefits discounted over 15 years in 2010 prices. Discounting takes into account the effect of inflation at 3.5% for the duration of the appraisal period.
Annual GVA benefits averaged over 15 years (discounted)	An annual GVA benefit averaged over 15 years is also presented. This is presented in 2010 prices and is discounted.

Table 5-D: GVA Measures

The results of the GVA analysis are presented in Table 5-E. It should be noted that the preferred annual measure GVA is in the final column.

Undiscounted total GVA	Average GVA per annum	Discounted total GVA	Average GVA per annum
(15 years, 2010 Prices)	(2010 prices undiscounted)	(15 years, 2010 prices)	(2010 prices discounted)
£300,531,471	£20,035,431	£187,009,941	£12,467,329

Table 5-E: GVA Analysis Results

Given an investment of £12.9m, this would be returned in just over 1 year of the scheme opening, based on an average return of £12,467,329 in GVA uplift per annum in discounted 2010 costs. However, this figure represents an average over the appraisal period of the scheme and given the profiling of benefits, may not be recouped for several years.

These benefits have not been incorporated within the published BCR's set out in section 5.2, but it should be noted that the majority of improvements proposed meet the criteria for investment as set out by the LEP, without GVA addition to the case.

As noted previously this figure is represented as Net GVA. Net GVA reflects the fact that the current highway capacity can accommodate only a proportion of the forecast development. In addition to this it also takes into account locally orientated deadweight, displacement, leakage and substitution factors.

5.5 Unlocked Jobs

The GVA analysis detailed above was based upon a number of net additional jobs estimated by Ekosgen in April 2014 and net additional dwellings were estimated by the LCC development controls team.

In total, Ekosgen estimated the net additional jobs which had the potential to be delivered in the BPGC at approximately 4,700. This figure was constrained for the GVA analysis as it is acknowledged that transport improvements are not the only mechanism for unlocking development. The number of net additional jobs used for the GVA analysis has been constrained to 15%, with the remaining 85% expected to be delivered via alternative mechanisms.

Benefit Cost Ratio Technical Note



Therefore, the results of the GVA analysis, as set out in section 5.4, are based on a total 723 net additional jobs and 200 net additional dwellings being unlocked by the junction improvements.

In order to demonstrate that the level of potential jobs which can be unlocked as a result of the improvements proposed as part of the BPGC junction improvements scheme, the LCC Development Control team have undertaken an analysis of the development potential at, or close to, the junctions identified for improvements. The analysis is included in full in Appendix B and summarised in Table 5-F.

This analysis demonstrates the level of net additional jobs likely to be delivered in the corridor and thus that the GVA figures associated with the transport improvements are considered to be robust.

It should be noted that if further detail is required in terms of quantifying the number of jobs which could be unlocked at each site, a detailed assessment would be required.

Site Name	Impact (Gross Jobs)	Detail
Junction 7 Clayton-le-Moors	1,684	This site is accessed directly through the Dunkenhalgh Way / Blackburn Road junction. It is considered that the current configuration does not have adequate provision for pedestrians and cyclists and it is also operating at capacity at peak times. It is anticipated that very little development could come forward at this site without the junction improvements proposed.
Huncoat	433	The M65 junction 8 is likely to be on the main routing to and from this site which has capacity for a small increase in traffic in the short term. There is therefore only limited capacity available to support the development at this site, without junction improvements.
Burnley Bridge Business Park	1,473	The Accrington Road / Bentley Wood Way junction and the Rosegrove Lane / Accrington Road junction are currently limiting the level of development above current permissions. Any later phases of development would require the junction improvements proposed.
Weaver's Triangle	Various	As noted in section 5.3, the Westgate / Queens Lancashire Way junction is a key gateway to this site. The proposed changes to this junction will greatly enhance the sustainable transport connectivity which will be key in further developing this site.
North light / Brierfield Mill	392	Planning permission has been approved, however traffic impact mitigation relies on improvements at the M65 junction 12, the Churchill Way / B&Q junction and the Burnley Road / Halifax Road junction.
Shuttleworth Mead	1,569	The M65 junction 8 is likely to be on the main routing to and from this site which has capacity for a small increase in traffic in the short term. There is therefore only limited capacity available to support the development at this site, without junction improvements.
Empire Business Park	280	This development is in the vicinity of the Rosegrove Lane / Accrington Road junction and the development opportunities are constrained without any improvements to this junction.
Rossendale Road Industrial Estate	Unknown	Improvements to both the Accrington Road / Bentley Wood Way junction and the Rosegrove Lane / Accrington Road junction would be required before development commenced at this site.
Lomeshaye	1,210	Currently accessed through the M65 junction 12 and the Kenyon Road / Churchill Way junction only very limited development in the short term can be supported without the proposed junction improvements.
Barrowford Business Park	Unknown	Further development on this site will be dependent on improvements to the M65 junction 13.

Table 5-F: Unlocked Jobs

It is clear from Table 5-F that whilst significant development in terms of net additional jobs is proposed across the BPGC, a significant proportion of this is reliant upon the BPGC junction improvements scheme being delivered. These schemes will therefore directly assist in unlocking the full potential of these sites.

Benefit Cost Ratio Technical Note



This evidence above also supports the approach to the GVA assessment and the use of a constrained number of jobs in order to produce a conservative estimate. The constrained figure is considered reflective of the level of jobs that the BPGC junction improvements could realistically unlock as it is acknowledged that other mechanisms will be required to unlock the full potential of these sites.

The potential benefits associated with unlocking these jobs have not been incorporated within the published BCR's set out in section 5.2, but it should be noted that the majority of improvements proposed meet the criteria for investment as set out by the LEP, without GVA addition to the case.



6. Summary & Conclusion

6.1 Summary

This report presents the results of the BCR and GVA analysis undertaken for the Burnley / Pendle Growth Corridor Improvements Scheme.

Standard WebTAG and Treasury Green Book approaches have been used to undertake an assessment of the benefit cost ratios for the schemes. All benefits quoted are in 2010 prices, discounted to 2010, over a 15 year appraisal period for junction signalisation schemes and a 60 year period for rail station improvement schemes.

The BCR analysis has shown that the scheme would provide benefits to existing transport users, reducing journey times and where applicable, marginal external cost savings.

In the absence of a singly recognised and adopted methodology for estimating potential GVA benefits, the GVA analysis has been undertaken using an evidence-led, theoretically consistent framework approach, based on available studies and parameters, as well as collaborative working with the client.

The analysis has quantified the potential GVA benefits that would be generated by the scheme. The results from the analysis, presented in this report, indicate that the scheme will have a positive impact on the local economy

6.2 Conclusion

The Burnley / Pendle Growth Corridor Improvements Scheme appraisal demonstrates 'very high' value for money, based on a traditional transport BCR of 6.8 for the BPGC scheme as a whole.

Individual junction improvements were grouped into packages based on operational practicalities and the interdependencies of signal timings in order to deliver a more efficient network. Individual BCR's for each package were produced with one package, the Burnley Town Centre package, highlighted due to its low BCR.

The low BCR of the Burnley Town Centre package was attributed to the improvements at the Westgate / Queens Lancashire Way junction. Following further analysis it is recommended that the proposed improvements at this junction are retained within the BPGC scheme in order to realise potential benefit from alternative streams. These alternative streams considered improved network management, highway safety, bus routing and pedestrian and cyclist facilities however were not incorporated within the economic quantified as part of the economic assessment.

The scheme will also generate additional GVA benefits for the local economy.

A net GVA benefit over the appraisal period of approximately £12.5m per annum averaged over a 15-year appraisal period has been calculated based on locally adjusted GVA values (in 2010 discounted prices). The net GVA benefit has been calculated based upon the delivery of 723 net additional jobs and 200 net additional dwellings. There is potential for further net additional jobs to be delivered via alternative mechanisms towards the total estimated by Ekosgen (approximately 4,700).

Over the full 15 year assessment period, the total 2010 discounted benefits amount to £187.0m.



Appendix A. BCR Assessment Outputs



Appendix B. Development Potential

							Opening Ye	ar			Intermediate Year							Design Year								sheet Inputs						
						1	Total Delay			Opening Year			To	otal Delay			Intermediate		Total Delay (pcuHr) Design Year Total								Intermediate Year			Packaged Outputs		
				Year						Total Time	Year						Year Total Time							Time Savings	Time Period		Total Time Savings	Design Year Total Time Savings (Hr)				
Lookup_ID	Scheme	Scheme	Appraisal Period (Years)		Time Period	DN	DN Units		DS Units	Savings (pcuHr)		Time Period	DN	DN Units		DS Units	Savings (pcuHr)		Time Period	DN	DN Units	DS	DS Units	(pcuHr)			(Hr)		PVB	PVC	NPV	BCR
					AM	53.9		29.4		24.5		AM							AM	278.4		56.0		222.5	AM	24.3		220.8				
Junction A	А	M65 Junction 13	15	2014	IP PM	6.6 18.5	pcuHrs	14.0 26.8	pcuHrs	-7.4 -8.3	- 1	IP PM			\vdash			2030	IP PM	10.3 134.5	4	18.0 64.3	pcuHrs	-7.8 70.2	IP DAA	-7.4 -8.2		-7.7 69.7	£10,982,675	£1,447,006	£9,535,669	7.6
					AM	6.4		20.8		-8.3 -15.8		AM	12.0		35.9		-23.8	8	AM	134.5		36.9		70.2	PM AM	-8.2 -15.6	-23.5					
Junction B	В	M65 Junction 12	15	2015	IP	2.4		16.6	pcuHrs	-14.2	2024	IP	2.9	pcuHrs	14.3		-11.4				pcuHrs	16.9	pcuHrs	-13.1	IP	-14.0	-11.4					
					PM	10.8		31.3		-20.5		PM	28.7		36.2		-7.5		PM	179.4		47.0		132.4	PM	-20.3	-7.5					
		Kenyon Road / Churchill			AM	93.8		4.5		92.6		AM	125.5		5.5		124.5	-	AM	207.4	1	6.5		208.2		91.0	122.2					
Junction C	С	Way	15	2014	IP PM	1.5 14.2	VehHrs	3.5 7.4	pcuHrs	-2.0 7.3	2024	IP PM	1.8 9.1	VehHrs	4.1 8.7	pcuHrs	-2.2	-	IP PM	2.0 61.0		9.7	pcuHrs	-2.3 53.4	IP PM	-1.9 7.2	-2.2 0.8					
					AM	9.8		3.3		6.6		AM	5.1		0.7		0.0		AM	111.8		11.9		101.6	AM	6.6	0.0	100.7	£17,128,547	£1,605,174	£15,523,374	10.7
Junction D	D	Churchill Way / B&Q	15	2015	IP		VehHrs		VehHrs	0.0	į	IP						2030	IP		VehHrs		VehHrs	0.0	IP	0.0		0.0				
					PM	6.0		2.8		3.3		PM							PM	34.3		5.2		29.6	PM	3.2		29.4				
Junction F	F	Burnley Road / Halifax	15	2015	AM IP	16.0	and ten	14.8		1.2 0.0	ŀ	AM IP	_		\vdash			2030	AM IP	70.2	1	54.9		15.3 0.0	AM IP	1.2 0.0		15.2				
Junction F	'	Road	15	2015	PM	11.0	pcuHrs	10.6	pcuHrs	0.0		PM			\vdash			2030	PM	15.2	pcuHrs	14.3	pcuHrs	0.0		0.0		0.0				
					AM	3.4		2.8		0.4		AM							AM	7.2		5.0		2.3	AM	0.6		2.2				
Junction G	G	Accrington Road / Bentley Wood Way	15	2015	IP		VehHrs		VehHrs	0.0		IP						2030	IP		VehHrs		VehHrs	0.0	IP	0.0		0.0				
		Boniady Wood Way			PM	2.4		2.2		0.2		PM							PM	3.6		3.3		0.4	PM	0.2		0.4				
	l	Rose Grove Lane /	45	2045	AM IP	45.5		33.1		12.4 0.0	2024	AM	89.3		38.0		51.3		AM	169.6		43.7		125.9 0.0	AM	12.2	50.4		£17,492,300	£4,784,552	£12,302,410	3.7
Junction H	Н	Accrington Road	15	2015	PM	58.8	pcuHrs	35.4	pcuHrs	23.4	2024	IP PM	124.1	pcuHrs	43.8	pcuHrs	0.0 80.3	-	IP PM	252.8	pcuHrs	57.8	pcuHrs	195.0	IP PM	0.0 23.0	0.0 80.3		£17,492,300	£4,784,552	£12,302,410	3.7
					1 101	30.0		33.4		25.4		1 101	124.1		45.0		00.5	3	1100	232.0		37.0		155.0	1 141	23.0	80.5	131.3				
Scheme T	Т	Rose Grove Railway	60														N/A															
		Gidion																														
Junction I	1	Princess Way / Active	15	2014	AM IP	12.2 4.9	VehHrs	21.0 14.4	pcuHrs	-8.6 -9.4	H	AM IP	-		\vdash			2030	AM IP	95.4 10.8	VehHrs	23.5 18.1	pcuHrs	73.2 -7.1	AM IP	-8.5 -9.3		72.7 -7.1				
		Way			PM	10.3		22.5		-12.1		PM							PM	67.9		28.7		40.2	PM	-12.0		39.9				
	١.,	Bank Top / Active Way			AM	67.2		54.6		12.6		AM							AM	116.5		58.8		57.7	AM	12.5		57.3				
	,	Dalik Top/ Active way								0.0	ŀ	IP						1	ID.					2.0	ID.	0.0		2.0				
Junction J & K		Active Way / Church	15	2014	IP		pcuHrs		pcuHrs	0.0		IP						2030	IP		pcuHrs		pcuHrs	0.0	IP	0.0		0.0	£1,115,764	£2,676,957	-£1,561,193	0.4
	К	Street			PM	120.3		72.1		48.2		PM							PM	236.1		110.3		125.8	PM	47.9		124.9				
					AM	5.9		25.7		-19.8		AM	9.8		29.9		-20.0	0	AM	25.1		25.5		-10.1	AM	-19.6	-19.8	-10.0				
Junction L	L	Westgate / Queens Lancashire Way	15	2014	IP	3.6	VehHrs	23.0	pcuHrs	-19.3	2024	IP	4.7	VehHrs	28.4	pcuHrs	-23.7	7 2030	IP	6.0	VehHrs	33.9	pcuHrs	-27.9	IP	-19.2	-23.7	-27.7				
		Zanodoriii o Tray			PM AM	4.0 21.8		23.4 43.1		-19.3 -21.4		PM AM	5.2 100.4		27.3 46.6		-21.9 53.8		PM AM	7.2 277.3		32.5 57.1			PM AM	-19.1 -20.7	-21.9 52.1					
Junction M	М	M65 Junction 8	15	2014	IP	4.4		23.9	pcuHrs	-19.6	2024	IP	5.5	pcuHrs	30.8	pcuHrs	-25.3	3 2030	IP	7.1	pcuHrs	32.1	pcuHrs	-25.0	IP	-19.0	-25.3	-24.2	£1,524,313	£650,945	£873,369	2.3
					PM AM	18.6 15.0		35.5 33.5		-16.9 -18.5		PM AM	59.4 56.7		40.0 42.5		19.3 14.2		PM AM	133.7 173.0		47.2 52.2			PM AM	-16.4 -18.2	19.3 14.0					
Junction N	N	M65 Junction 7	15	2014	IP	4.0	pcuHrs	22.5	pcuHrs	-18.5	2024	IP	5.1	pcuHrs	24.4	pcuHrs	-19.3	3 2030	IP	6.8	pcuHrs	27.7	pcuHrs	-21.0	IP	-18.2	-19.3	-20.6				
					PM AM	9.7 37.3		31.0 22.8		-21.3 14.6		PM AM	18.2		42.6		-24.4	4	PM AM	97.7 175.1		49.1 63.7		48.6 111.4		-21.0 14.3	-24.4	47.8 109.5	£4,275,523	£2,517,991	£1,757,532	1.7
Junction O	0	Dunkenhalgh Way / Blackburn Road	15	2015	IP		pcuHrs		pcuHrs	0.0	į	IP						2030	IP		pcuHrs		pcuHrs	0.0	IP	0.0		0.0				
					PM AM	32.1 148.8		17.8 40.0		14.4 108.7		PM AM	347.5		50.5		297.0	0	PM AM	73.4 467.0		34.1 68.0			PM AM	14.1 107.4	293.5	38.6 394.3				
Junction Q	Q	Hyndburn Road / Henry Street	15	2015	IP		pcuHrs		pcuHrs	0.0	2024	IP		pcuHrs	50.5	pcuHrs	0.0	0 2030	IP		pcuHrs		pcuHrs	0.0	IP	0.0	0.0	0.0				
					PM AM	108.5		36.8 8.0		71.7		PM AM	259.1		45.6		213.5	5	PM AM	395.6 14.5		55.9 12.0		339.7 1.6	PM AM	70.8 1.6	213.5	335.7	£48,699,495	£753,733	£47,945,762	64.6
Junction R	R	Hyndburn Road / Riding Barn Street	15	2015	IP	5.0	pcuHrs	8.0	pcuHrs	0.0	į	IP						2030	IP	14.5	pcuHrs	12.3	pcuHrs	0.0	IP	0.0		0.0				
					PM	10.8		8.5		2.3		PM							PM	29.4		14.2		15.3	PM	2.3		15.1				
C.I.		Burnley Manchester															p. 44												£0			
Scheme T	U	Road Railway Station	60														N/A												£2,859,303 £2,163,475	£660,616	£4,362,161	7.6
Sustainable Transport												N/A	£594,899	-£594,899	N/A																	
Scheme																																
																												Total	£106,241,396	£15,691,872	£90,144,185	6.8
																													15,212,330	.,,	,2,2,3	

Burnley Pendle Growth Corridor

Employment Sites

E2 Junction 7 (Clayton-le-Moors)

Goldtique Employment site – redevelopment

Area: 67,601 m2 (equal split B1a, B2 and B8)

Employment increase (net): 1,684
GVA increase (net): £107.8m
Estimates by 2026: 1,263 (75%)
GVA increase (net): £80.9m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Impact

This site access is directly from junction O. The current junction is old, having inadequate pedestrian and cycle facilities and is at capacity at peak times. Very little development could come forward without a junction improvement in line with the proposed junction O changes.

E3 Huncoats

Area: 62,000 m2 (all B8)

Employment increase (net): 433
GVA increase (net): £16.7m
Estimates by 2026: 43 (10%)
GVA increase (net): £1.7m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Impact

Junction M would likely be on the main routing to and from the development, which could cater for a small increase in traffic in the short term. Potential for some development say (25%) could come forward without junction M improvement but all subject to detail assessment.

E4 Burnley Bridge Business Park

Area: Initial phase 60,000m2 10% B1a, 45% B2 and 45%B8

Later phase 20,000m2, split as above

Employment increase (net): 1,473
GVA increase (net): £80.6m
Estimates by 2026: 1,326 (90%)
GVA increase (net): £72.6m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Impact

Junction H along with the associated junction G capacity is the current bottle neck in releasing further development above the current permissions. All subject to detail analysis but suggest that the later phase would require the junction improvement planned as part of BPGC.

E5 Weavers' Triangle

Taken from Local Plan policy the Council will permit heritage led regeneration within the Weavers' Triangle for the following uses:

- a. leisure;
- b. tourism;
- c. industrial;
- d. commercial; and
- e. residential.

The following sites are identified for the uses specified:

• BTC6/1 – Victoria Mill (0.34ha.)

This Listed Building is considered suitable for a range of uses including general industrial (B2), business (B1), canal related leisure and tourism uses and residential. A suitable mix of these uses may also be acceptable. See also General Policy proposal GP4/3, Economy and Work proposal EW1/12, and Housing and Local Neighbourhood proposal H1/6.

- BTC6/2 Sandygate Mill (0.39ha.)This site is considered suitable for a range of uses including residential, general industrial (B2), business (B1) and canal related leisure and tourism uses. A suitable mix of these uses may also be acceptable. See also General Policy proposal GP4/4, Economy and Work proposal EW1/13 and Housing and Local Neighbourhood proposal H1/7.
- BTC6/3 Clock Tower Mill (0.28ha.)This site of the former Listed Building within the Weaver's Triangle is considered suitable for a range of uses including general industrial (B2), business (B1), canal related leisure and tourism uses and residential. A suitable mix of these uses may also be acceptable. See also General Policy proposal GP4/5, Economy and Work proposal EW1/14, and Housing and Local Neighbourhood proposal H1/8.
- BTC6/4 Wiseman Street (0.38ha.)ThIs site is considered suitable for a range of uses including residential, general industrial (B2), business (B1) and canal related leisure and tourism uses. A suitable mix of these uses may also be acceptable. See also General Policy proposal GP4/6, Economy and Work proposal EW1/15 and Housing and Local Neighbourhood Proposal H1/9.
- BTC6/5 Slater's Terrace (0.ha.)This Listed Building is considered suitable for a canal related leisure use.

Junction L is a key gateway to the Weavers Triangle development with the proposed changes to improve sustainable connectivity important to seeing further development of this site.

E6 Knowledge Park

Area: 3,000m2, split 50/50 B1b and B2

Employment increase (net): 84

GVA increase (net): £5.6m

Estimates by 2026: 84 (100%)

GVA increase (net): £5.6m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Junction Impact

Junction I, J, K and L are on key routing to and from the development, but likely all development to come forward in any case.

E7 North Light/Brierfield Mill

Area: 45,000 sq ft managed workspace, 71 apartments, 78 bed hotel,

leisure/retail uses

Employment increase: 392 direct/indirect jobs (gross)/302 direct/indirect jobs (net)

GVA increase (net): £13.5m annual GVA (gross)/£10.4m annual GVA (net)

Source: Growth Deal Business Case (initial proposition)

Impact

Planning permission now approved but traffic impact mitigation relies on the junction B, D and F improvement.

E8 Altham Business Park

Area, including boundary extension

http://www.hyndburnbc.gov.uk/downloads/Proposals Map Altham Extract.pdf

Impact

Detail not currently available but traffic impacts on junction M

E9 Shuttleworth Mead

Extension

Area: 29ha equal split B2 and B8

Employment increase (net): 1,569
GVA increase (net): £74.7m
Estimates by 2026: 1,177(75%)
GVA increase (net): £56.0m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Impact

Junction M would likely be on the main routing to and from the development, which could cater for a small increase in traffic in the short term. Longer term would require the junction M improvement.

E10 Empire Business Park

Estimated that there is vacant/undeveloped land of around 15,000 sq m for industrial units which would generate around 280 jobs.

Junction Impact

This development is close to junction H with only a small development opportunity without the improvements at this junction.

E11 Network 65 (Junction 9)

Impact

Improvement to both junctions G and H would release further development at this site.

E12 Rossendale Road Industrial Estate

Impact

Improvement to both junctions G and H would be required before development commenced at this large site.

E13 Heasandford Industrial Estate/Innovation Drive

Innovation Drive:

Area: 33,000m2 split 50/50 B1c and B8

Employment increase: 370
GVA increase (net): £18.8m
Estimates by 2026: 370 (100%)
GVA increase (net): £18.8m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Impact

Although some distance from the M65 motorway routes to and from the site go through junctions B, D, F, K,J, I, L.

E14 Lomeshaye

'Pendle Gateway' extension:

Area: 64,000m2 all assumed to be B2

Employment increase: 1,210
GVA increase (net): £62.9m
Estimates by 2026: 484 (40%)
GVA increase (net): £25.2m

Source: Economic Impact Forecasts for Lancashire Strategic Sites, 2014

Impact

Current access through junction C and B, future also through junction A. Only limited developed in sort term without these junction improvements, say 10%.

E15 Barrowford Business Park

http://www.pendle.gov.uk/download/downloads/id/8260/cd0413_land_west_of_barrowford_development_framework.pdf

Taken from a Development Framework;

- **2.3** The site has planning permission for around 27,000 sq m (300,000 sq ft) of office accommodation, a hotel, pub/restaurant and day nursery.
- **4.1** The proposed Strategic Site comprises c.25.7 hectares (63.5 acres) of land situated to the west of Barrowford to the north of Barrowford Road (A6068) and west of junction 13 of the M65.
- **6.1** The proposed Strategic Site is capable of accommodating up to 18,210 sq m (gross external floor area) of reconfigured commercial floorspace at Riverside Business Park. The business park will continue to provide high quality office accommodation set within an attractive and green landscaped environment. The layout and design of the accommodation will be similar to that already approved for the site. This reconfiguration of permitted floorspace is required in order to facilitate an appropriate access to the housing development. As such, 8,087 sq m of commercial floorspace will be removed and up to 2,800 sqm will be reconfigured to form a new plot on the eastern side of the site adjacent to and overlooking Pendle Water.
- **6.2** In addition to Riverside Business Park, the Strategic Site would be capable of accommodating new residential development of up to 500 dwellings (at a gross density of approximately 40 dwellings per hectare). These high quality, family homes would range in size from 2 to 5 bedrooms and would incorporate a proportion of affordable units.

Impact

Further development on this site will require junction A improvement.