



East Lancashire Rail Connectivity Study

Stage 3: Conditional Output Statement









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		Origin	ated by		Checked by	Reviewe	ed by
ORIGINAL Ste		NAME			NAME	NAME	
		Steve W	Steve Webb		Peter Hibbert	Leighton Cardwell	
Approved by Mike Cam		NAME			As Project Manager I confirm that the abov document(s) have been subjected to Jacob		INITIALS
		Mike Ca	Cammock		Check and Review procedure and the them for issue	at I approve	MC
		Document sta	atus: V	Vorking Draft (not for circulation	n)		

REVISI	ON	NAME		NAME	NAME	
1 Steve		Steve Webb		Peter Hibbert	Leighton Cardwell	
Approved by		NAME		As Project Manager I confirm that the above document(s) have been subjected to Jacobs'		INITIALS
Peter		Peter Hi	bbert	Check and Review procedure and that them for issue	at I approve	PH
DATE 18.02.15		Document status: F	inal		•	

REVISI	REVISION		NAME	NAME		
2 Steve W		/ebb	Peter Hibbert	Leighton C	Cardwell	
		NAME		As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue		INITIALS
		Peter Hibbert				PH
DATE	DATE 26.03.15		Document status: Final			

REVISI	ON	NAME		NAME	NAME	
3		Steve W	/ebb	Peter Hibbert	Leighton (Cardwell
Approved by		NAME		As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue		INITIALS
Ре		Peter Hi	bbert			РН
DATE	DATE 15.04.15 Document status: Fi		Final			

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Executive Summary

The need for the East Lancashire Rail Connectivity Study was identified in the East Lancashire Highways and Transport Masterplan published for consultation by Lancashire County Council in October 2013 and subsequently adopted in February 2014. A key challenge for the Masterplan is to establish the optimum balance between outward connectivity and internal accessibility to jobs, education and training.

There is a strong perception locally that East Lancashire is poorly connected, with both road and rail networks hindering the efficient movement of people and goods, and that this relative isolation is having a negative impact on economic development and impeding regeneration.

A key focus for the Lancashire Enterprise Partnership is to ensure that Lancashire's major transport projects fully align with the delivery of key economic priorities. The principal objective of the Rail Connectivity Study is to develop a 'Conditional Output Statement' setting out what East Lancashire requires of the rail industry in support of growing its economy.

In order to answer this question, a three stage methodology has been adopted.

- Stage 1: Data Collection and Problem Identification;
- Stage 2: Conditional Output Development; and
- Stage 3: Conditional Output Statement.

The Stage 1: Data Collection and Problem Identification Report (Jacobs, December 2014) helped to identify the existing constraints within East Lancashire's Rail Network. A summary of the key issues is provided below:

- Service frequency is low. The majority of stations within the core study area are only served by an hourly service frequency, with only Preston, Blackburn and Accrington having a half hourly service.
- **Journey times are slow.** Car journey times are quicker than the generalised journey times by rail for all trips within the core study area.
- **Connectivity is constrained.** An interchange at Blackburn is required to link services on the (north-south) Clitheroe to Manchester line with services on the (east-west) Calder valley line. Furthermore, Preston is the only station in the core study area served by a direct train service to Manchester Airport.
- Service reliability is poor. The public performance measure of all three services operating within the core study area is lower than the Northern Rail average.
- **Rail usage is comparatively low.** The percentage of individuals travelling to work by train is lower in all ten Local Authority areas in the study area than the average for both the North West and England and Wales. In addition, a number of stations in the core study area have a low number of users and are therefore potentially being underutilised.
- **Passenger facilities are lacking.** An audit of existing facilities in the core study area revealed that many stations failed to meet Rail North's Station Quality Standards (SQS).





- **Network constraints exist.** The majority of the core study area's rail network is double track however two large sections of single track remain which consequently limit service frequency and impact reliability. In addition the permissible line speed varies significantly across the core study area's rail network.
- Rolling stock quality is poor. The National Rail Passenger Survey showed that passenger satisfaction with Northern Rail rolling stock is lower than the average for all regional services.
- **Rail demand growth.** The increase in station usage over the past 8 years has been relatively high for both the East Lancashire line (41.8%) and the Clitheroe Line (44.7%). Using a medium and high growth scenario contained within Network Rail's Regional Urban Market Study would result in further rail demand growth of between +24% to +43% over the next 10years.

The data collection and problem identification exercise undertaken has supported the local perception that East Lancashire's rail network is relatively constrained in terms of rail connectivity, capacity, performance, journey quality, journey times and passenger facilities. This is likely to have a negative impact on future economic growth.

The current deficiencies in East Lancashire's rail network can make it an unattractive mode of travel. Subsequently the current rail usage within East Lancashire is relatively low compared to neighbouring areas, with the percentage of individuals travelling to work by train being lower in all ten Local Authority areas in the study area than the average for both the North West and England and Wales. In addition, the current rail demand between East Lancashire and neighbouring City Regions is relatively low.

Furthermore, given the forecast national growth in rail demand, significant investment will be required in East Lancashire's rail network in order to improve its performance and attractiveness.

The Stage 2: Conditional Outputs - Benefits Appraisal Report (Jacobs, December 2014) defines the Conditional Outputs which have been adopted for East Lancashire based upon the findings from the Data Collection and Problem Identification stage.

Bespoke analysis of the potential economic benefits associated with delivering each of the identified Conditional Outputs was subsequently undertaken. It is accepted that realisation of each output will be subject to an affordable and value for money solution being identified, but the Conditional Outputs should nevertheless assist the rail industry and its partners in establishing proposals that best release the identified potential.

The adopted Conditional Outputs for East Lancashire's rail network and the potential transport benefits associated with the delivery of each output is shown in Table 1-A overleaf.



Objective	Ref	Conditional Outputs	Poter Trans Benefits* year ap	ntial port (£m) (60 praisal
		Improve the function of the Displaced Couth, Color	perio	0d) £164.9
	1	service.	+ 1tph + 2tph	£266.2
	2	Improve the frequency of the Clitheroe to Manchester	+ 1tph	£56.5
Connectivity	3	Improve the frequency of the Blackpool North to York	+ 1tph	£103.8
	4	Improve the frequency of the Blackburn to Manchester (via	+ 2tpn + 1tph	£608.3 £19.1
	5	Relieve overcrowding in peak hours between Clitheroe and Manchester	+ 21pn £67	.1
Capacity	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.	£83	8.8
	7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£56	6.5
Performance	8	Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£52	2.9
	9	Improve the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£158.3	
Journey Quality	10	Improve the quality of rolling stock on the Blackpool South to Colne service.	£12	2.8
	11	Improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.	£29	0.6
	12	Improve the quality of rolling stock on the Blackpool North to York service.	£61	.3
	13	Reduce rail journey times between Preston and Colne to under an hour (currently 71 minutes).	£31	.9
	14	Reduce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).	£62	2.0
	15	Reduce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.	£264	4.9
Journey	16	Reduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.	£379	9.5
Times	17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey time.	£174	4.6
	18	Reduce rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.	£38	9.0
	19	Reduce rail journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey time.	N//	A
Passenger Facilities	20	Improve station facilities within the core study area.	£11	.8

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Table 1-A: Adopted Conditional Outputs and Potential Transport Benefits.





The benefits appraisal revealed that delivery of the adopted Conditional Outputs had significant potential transport benefits. In particular improving the rail service frequency and journey times within the study would deliver the greatest level of benefit. If all of the Conditional Outputs are delivered there will be significant benefits to UK plc.

If no improvements are made to improve the frequency and journey times of rail services operating in East Lancashire it is likely that the perception of East Lancashire being poorly connected will grow stronger. This perception is likely to be further exacerbated by recent announcements proposing rail network improvements in the North of England which have the potential to increase the connectivity gap between East Lancashire and economic centres in the North, in particular Manchester and Leeds.

Consequently, the connectivity gap between East Lancashire and major settlements in the North of England could widen in the future without investment in East Lancashire's rail network. This would have a negative impact on the economy of East Lancashire as people and business would be less likely to locate here.

In addition, if the current rolling stock in East Lancashire is not improved or replaced then the quality of the trains will deteriorate over time, resulting in the passenger experience being negatively impacted both in terms of journey quality, capacity and performance. Consequently, this could result in existing rail passengers seeking to use alternative modes of transport which would place additional pressure on an already congested highway network.

The Conditional Outputs were defined as being conditional as achieving each Output is conditional upon affordable and economically viable options being identified. Consequently, the Conditional Output Statement stage (Stage 3) has undertaken an option appraisal exercise in order to identify options which would make the most significant contribution towards delivering the potential transport benefits associated with the delivery of the adopted Conditional Outputs.

Туре	Shortlisted Options
Facility Improvements	Improve station facilities across the study area to meet Rail North's SQS criteria which cover access facilities, information provision and passenger facilities.
	Electrification of the line between Clitheroe and Bolton.
Infrastructure	Electrification of the line between Preston and Colne / Leeds (including the newly reinstated Todmorden Curve).
improvements	Journey time improvements on the Copy Pit line (the section between Todmorden and Burnley).
	Improve the quality of Rolling Stock operating on services in the core study area so that it is comparable with similar regional services in other parts of the country (for example, the rolling stock currently operating on the TransPennine Express services between Manchester and Leeds).
Improvements	Improve service frequency between East Lancashire and Central Manchester.
	Add additional carriages to the existing peak services between Clitheroe and Manchester to increase capacity.
	Improve service frequency between East Lancashire and Leeds.

The eight options which have been shortlisted are shown in Table 1-B.

Table 1-B: Shortlisted Options.





The Report of the North of England Electrification Task Force (Northern Sparks, March 2015) scored the 32 non-electrified lines in the North of England. The Clitheroe to Bolton line and the full Calder Valley line between Leeds and Manchester (via Bradford and Brighouse) and Preston were both prioritised for electrification as a Tier 1 scheme. Tier 1 schemes have been identified based primarily on the scale of economic impact they will bring. The Northern Sparks report recommends that more detailed business cases are developed for Tier 1 schemes with a view to including them in the work programme for Control Period 6 (2019 - 2024).

It is recommended that further analysis is undertaken on each of the shortlisted options in order to assess their feasibility and economic viability.





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1



Introduction

1.1 Background

East Lancashire comprises the boroughs of Burnley, Hyndburn, Pendle, Rossendale and Ribble Valley together with the unitary authority of Blackburn with Darwen Borough Council. It is an area that has seen significant economic decline over a sustained period of time. The decline of industry and the resultant erosion of the local economic base have led to significant economic and social deprivation, high levels of unemployment and a relatively poor skills base. Labour markets tend to be relatively self-contained or with adjacent districts, where residents with low wages, poor skills and low aspirations will only travel limited distances for employment opportunities.

The five shire districts between them nevertheless provide employment for over 136,000 people, with almost a quarter of all employment in manufacturing. In addition, East Lancashire has a growing portfolio of higher value industries, with aerospace, advanced manufacturing, advanced flexible materials, digital and creative industries all featuring strongly. The Enterprise Zone at Samlesbury lies on the boundary with Central Lancashire and the launch of the Lancashire Advanced Engineering and Manufacturing Zone in April 2012 has focussed attention on the area's transport links and wider connectivity. Other priorities for the Lancashire Enterprise Partnership include a Local Growth Accelerator Strategy for East Lancashire, focused on delivering economic change but also supporting innovative ways of tackling deprivation and economic inactivity, in particular, enabling residents from deprived communities to access new jobs or enterprise opportunities.

There is a strong perception locally that East Lancashire is poorly connected, with both road and rail networks hindering the efficient movement of people and goods, and that this relative isolation is having a negative impact on economic development and impeding regeneration. A key challenge for the East Lancashire Highways and Transport Masterplan is establishing the optimum balance between outward connectivity and internal accessibility to jobs, education and training.

Apart from the M65 and M66/A56, roads tend to follow historic routes dictated by the topography rather than travel demand; consequently, most are poorly aligned and unsuitable for carrying high volumes of traffic, particularly heavy goods vehicles. Main line rail links are likewise constrained by topography, with resulting low line speeds having a significant impact on journey times, or as is the case with Rossendale, no longer exist. Although both road and rail routes continue eastward across the Pennines into Yorkshire, they are of a much lower quality than those further south that link Liverpool and Manchester with Leeds, Sheffield and the Humber ports.

1.2 Rationale for Study

The Rail Connectivity Study is one of five components that make up the East Lancashire Connectivity Study (ELCS). The ELCS was identified in the East Lancashire Highways and Transport Masterplan, which was published for consultation by Lancashire County Council and Blackburn with Darwen Borough Council in October 2013 and subsequently adopted in February 2014.





The principal objective of the Rail Connectivity Study has been to develop a Conditional Output Statement setting out what East Lancashire requires of the rail industry in support of growing its economy.

Conditional Outputs need to reflect established evidence and be complemented by bespoke analysis of the associated potential transport benefits. It is accepted that realisation of each Conditional Output will be subject to an affordable and value for money solution being available, but they should nevertheless assist the rail industry and its partners in establishing proposals that best release the identified potential.

The Rail Connectivity Study has identified existing constraints in East Lancashire's rail network that the rail industry, working with local partners, will need to address in order to facilitate the realisation of the identified potential transport benefits.

The study and its outputs will support the case for future investment in East Lancashire's rail network through the next rail industry investment period between 2019 and 2024 (known as 'Control Period 6') and future franchise specifications.

1.3 Outline Methodology

The Rail Connectivity Study has followed the methodology outlined in Figure 1-A.



Figure 1-A: Rail Connectivity Study Outline Methodology.





1.4 Report Purpose

The purpose of the Conditional Output Statement is to provide a robust evidence base to support the case for future investment in East Lancashire's rail network in support of growing its economy.

The Outputs are conditional as achieving each Output is conditional upon affordable and economically viable options being identified. For this reason, the Conditional Output Statement reports the results of an Option Appraisal exercise. The Option Appraisal has been undertaken in order to identify those options likely to make the most significant contribution to delivering the potential transport benefits calculated in Stage 2 of the study.

This report will also include a summary of the Data Collection and Problem Identification Stage (Stage 1) and the Conditional Output Development Stage (Stage 2) of the East Lancashire Rail Connectivity Study.

1.5 Sources of Information

For full details on either the Data Collection and Problem Identification Stage (Stage 1) or the Conditional Output Development Stage (Stage 2) please consult the following reports which are available upon request from the County Council:

- Rail Connectivity Study Stage 1: Data Collection and Problem Identification Report (Jacobs, December 2014); and
- Rail Connectivity Study Stage 2: Conditional Outputs Benefits Appraisal Report (Jacobs, December 2014).

1.6 Report Structure

The remainder of this report is structured as follows:

- Chapter 2: Study Area;
- Chapter 3: Data Collection Findings;
- Chapter 4: Conditional Outputs;
- Chapter 5: Potential Transport Benefits;
- Chapter 6: Potential Options; and
- Chapter 7: Conclusions.





2 Study Area

2.1 Introduction

This chapter of the report sets out the extent of the study area considered as part of the Rail Connectivity Study.

2.2 Study Area

The Rail Connectivity Study considered the following rail corridors:

- Preston to Burnley Manchester Road and onward connectivity to Leeds via Bradford and Manchester via Rochdale;
- Preston to Colne; and
 - Clitheroe to Bolton and onward connectivity to Manchester.

However, the focus of the study is on the East Lancashire rail network as a whole, rather than individual rail corridors. For this reason a core study area focussing solely on East Lancashire has been defined, as well as a buffer study area showing rail connectivity with major settlements further afield.

Figure 2-A shows the extent of the core study area.



Figure 2-A: Core Study Area.







Figure 2-B shows the extent of the buffer study area.

Figure 2-B: Buffer Study Area.





3 Data Collection Findings

3.1 Introduction

This chapter of the report provides a summary of the data collection findings as reported in the *Rail Connectivity Study Stage 1: Data Collection and Problem Identification Report (Jacobs, December 2014).*

In order to gain a greater understanding of the perceived problems in the study area and potential options, a workshop was held which was attended by a number of key local stakeholders from relevant Councils, Network Rail, Train Operating Companies and various rail industry organisations.

3.2 Document Review

The report includes a comprehensive document review including consideration of previous studies, local, sub national and national policies as well as technical guidance and information.

The National Rail Passenger Survey (January 2014) indicates that only 78% of Northern Rail passengers were satisfied with their journey overall, which is below the national average of 83%.

A number of local policies cite issues with the rail network across East Lancashire and a need for investment in both infrastructure and services in order to continue passenger growth in this area.

3.3 Review of Proposed and Committed Schemes

A review of proposed and committed rail schemes that would impact on East Lancashire's rail network has been undertaken. Two committed schemes, which will have a significant impact upon rail travel within East Lancashire, were identified. These are:

- Additional Blackburn to Manchester (via Burnley) Hourly Service; and
- Blackburn to Bolton Rail Corridor Improvements Scheme.

It is expected the additional Blackburn to Manchester (via Burnley) hourly service will come into operation in May 2015.

The timetable and service changes associated with the Blackburn to Bolton Rail Corridor Improvements Scheme are due to be introduced in December 2016.

Longer term, the construction of High Speed 2 could have a significant impact upon rail connectivity within the UK. HS2 proposals currently terminate in Manchester upon completion of Phase 2 in 2032/33. Proposals for a Preston Station / HS2 Interchange scheme are included in Lancashire's Strategic Economic Plan (SEP). The scheme would include enhancements at Preston station to improve the interchange between local and national services.





3.4 Development Proposals Review

A review of existing and proposed future developments in the study area has been undertaken in liaison with Lancashire County Council's Economic Development service.

The review revealed that there is a significant amount of future development proposed within the study area. Furthermore, a number of the key development sites are located in close proximity to the three rail corridors that are being investigated as part of the Rail Connectivity Study.

3.5 Socio-Economic Analysis

A comprehensive analysis of the demographics of East Lancashire's population has been undertaken using 2011 census data. The key finding from the socio economic analysis are as follows:

- The percentage of individuals travelling to work by train is lower in all Local Authority areas in the study area than the average for both the North West and England and Wales;
- The total number of rail trips originating from East Lancashire (2,056 daily trips) is significantly lower than in West Yorkshire (32,635 daily trips) and Greater Manchester (28,065 daily trips);
- The total number of rail trips between East Lancashire and West Yorkshire is very low (217 daily trips);
- The majority of Local Authority areas in the Rail Connectivity Study area have average household and personal incomes lower than the Lancashire and North West averages; and
- Average house prices throughout the Core Study area remain well below the national average. Average house prices in the Core Study area Local Authority areas have generally been decreasing since 2010.

3.6 Connectivity Analysis

The connectivity analysis undertook an assessment of the existing rail connectivity between key population centres within the study area, including a comparison of rail travel against other travel modes. The analysis considered:

- Rail service frequency;
- Journey times and interchanges;
- Generalised Journey Times;
- Fares;
- Service Reliability;
- A comparison of rail travel compared to car and bus travel;
- Access to Manchester Airport;
- Access between Ribble Valley and Preston; and
- HS2 Connectivity.

The analysis identified that the rail service frequency in the study area is poor, with the majority of stations being served by an hourly service (only Preston, Blackburn and Accrington have a half hourly service frequency).

Rail journey times between East Lancashire and destinations further afield are relatively long compared to the equivalent car journey times.





Connectivity between the rail lines in the core study is poor, meaning that direct access from the core study area to Manchester Airport is limited. Preston is the only core study area station to have a direct service to Manchester Airport.

In addition, the analysis found service reliability to be poor. The performance of all three services operating within the core study area is lower than the Northern Rail average.

3.7 Station Usage

Station usage data was collated and analysed in order to gain an understanding of demand for rail travel in the study area. The analysis considered station usage along the three rail corridors within the core study area and the historic station usage from 1997/98 to 2013/14.

The station usage figures show that since the economic downturn in 2008, the rate of growth of station usage figures has generally increased. However, a number of stations in the core study area have a low number of users and could therefore potentially be underutilised.

3.8 Station Facilities

It is understood that the quality of passenger facilities present at a railway station impacts on people's perception of rail travel and their ability to access the rail network. An audit of the station facilities at each station in the core study area compared to Rail North's Station Quality Standard has revealed that a number of stations fail to meet the Standard.

3.9 Network Constraints

Constraints on the rail network affect the operation of rail services in the study area and could potentially impact on opportunities to implement future network upgrades. The network constraints analysis considered:

- Track Constraints; and
- Rolling Stock.

The analysis identified that there are two long sections of single track rail line in the core study area which consequently limit service frequency and impact on reliability. In addition, the permissible line speed varies significantly across the core study area's rail network. The quality of rolling stock operating within the core study area is poor and the National Rail Passenger Survey shows that passenger satisfaction with Northern Rail rolling stock is lower than the average for all regional services.

3.10 Rail Demand

Consideration of rail demand has been used to highlight key transport movements by rail within the study area using MOIRA, the industry standard rail demand forecasting software. A matrix has been created illustrating rail demand within the core study area and to strategic locations such as Manchester and Leeds.

The matrix identifies that the largest trip movements on Northern Rail operated services are between station pairs with an origin or destination at Preston, Blackburn, Bolton, Manchester (Group) or Leeds.





4 Conditional Outputs

4.1 Introduction

This chapter presents the adopted Conditional Outputs for the study and summarises how they were identified.

4.2 Conditional Outputs

The Conditional Outputs were identified based upon the findings of the data collection exercise (see *Rail Connectivity Study Stage 1: Data Collection and Problem Identification Report*) and through discussions with the study's project management group.

Six objectives were identified which covered the key issues with East Lancashire's rail network. The six objectives are:

- *Connectivity;*
- *Capacity*;
- Performance;
- Journey Quality;
- Journey Times; and
- Passenger Facilities.

Conditional Outputs were then developed to address each of the six objectives. The East Lancashire Rail Connectivity Study subsequently identified twenty Conditional Outputs, as presented in Table 4-A.

The Conditional Outputs were agreed at a meeting with the study's project management group held in County Hall, Preston on the 5th August 2014.





Objective	Ref	Conditional Outputs			
	1	Improve the frequency of the Blackpool South to Colne service.			
	2	Improve the frequency of the Clitheroe to Manchester service.			
Connectivity	3	Improve the frequency of the Blackpool North to York service.			
	4	Improve the frequency of the Blackburn to Manchester (via Burnley) service.			
Capacity	5	Relieve overcrowding in peak hours between Clitheroe and Manchester.			
	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.			
Performance	7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.			
	8	Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.			
	9	Improve the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.			
Journey Quality	10	Improve the quality of rolling stock on the Blackpool South to Colne service.			
	11	Improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.			
	12	Improve the quality of rolling stock on the Blackpool North to York service.			
	13	Reduce rail journey times between Preston and Colne to under an hour (currently 71 minutes).			
	14	Reduce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).			
	15	Reduce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.			
Journey	16	Reduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.			
Times	17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey time.			
	18	Reduce rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.			
	19	Reduce rail journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey time.			
Passenger Facilities	20	Improve station facilities within the core study area.			

Table 4-A: Conditional Outputs.





5 Potential Transport Benefits

5.1 Introduction

The potential transport benefits associated with each of the Conditional Outputs have been appraised as part of the Conditional Output Development Stage (Stage 2).

This chapter of the report provides a summary of the appraisal methodology and results.

5.2 Appraisal Methodology

Following identification of the Conditional Outputs, an appraisal methodology note was drafted and circulated to the project management group. This document outlined the proposed methodology for appraising the benefits of each Conditional Output and subsequently formed the basis of the *Stage 2: Conditional Outputs - Benefits Appraisal Report (Jacobs, December 2014).*

The appraisal methodology is based on Department for Transport (DfT) Transport Analysis Guidance (TAG) and the rail Passenger Demand Forecasting Handbook (PDFH) guidance as appropriate.

In accordance with DfT TAG guidance, the benefits associated with each Conditional Output have been calculated, annualised and appraised over a standard 60 year period, discounted to 2010 prices and values.

In order to capture all of the potential transport benefits, three benefit streams were identified:

- Rail User Benefits associated with a change in Generalised Journey Time (GJT);
- Train Operating Company (TOC) Benefits associated with an increase in revenue; and
- Non-Rail User Benefits associated with a reduction in total vehicle kilometres and subsequent savings from a reduction in:
 - Congestion;
 - Infrastructure costs;
 - Accidents;
 - Air Pollution;
 - Noise;
 - Greenhouse Gases; and
 - Indirect Taxation.

The appraisal methodology for each objective is outlined in brief in the following sections of this chapter. For further detail please consult the *Stage 2: Conditional Outputs - Benefits Appraisal Note (Jacobs, December 2014).*





5.2.1 Connectivity Conditional Outputs

In order to measure the benefits associated with improved connectivity, the railway industry standard demand forecasting software MOIRA was used to forecast the impact of service frequency improvements.

Two scenarios were considered for each Conditional Output. They are:

- Scenario 1 forecast the effect of an additional one train per hour; and
- Scenario 2 forecast the effect of an additional two trains per hour.

The additional services assumed similar stopping patterns and journey times as per the existing services.

5.2.2 Capacity Conditional Outputs

This analysis focused on the Clitheroe to Manchester Line as discussions with stakeholders identified that this line currently suffers from capacity issues in the peak hours.

The current rail service between Blackburn and Manchester Victoria is hourly, with additional services during peak periods. The Blackburn to Bolton Rail Corridor Improvements Scheme will enable an all-day half hourly service to operate between Blackburn and Manchester Victoria from December 2016. However, as the scheme will only provide additional services in the off peak period, it is expected that its impact on relieving overcrowding on peak services will be negligible.

The potential transport benefits from reduced overcrowding were calculated using Value of Time Multipliers (dependent on the level of overcrowding) sourced from the Passenger Demand Forecasting Handbook (PDFH).

In order to calculate the potential transport benefits associated with forecast rail passenger growth, growth factors were applied to the passenger counts for 10 years, based upon forecasts contained within Network Rail's Regional Urban Market Study.

5.2.3 Performance Conditional Outputs

The performance Conditional Outputs were specifically related to the reliability of trains compared to the published timetable. The potential transport benefits of the performance Conditional Outputs were calculated by examining the impact of a reduction in the standard deviation of actual train arrival times.

Northern Rail provided a dataset of actual train arrival times between January 2013 and January 2014 for all three services operating within the core study area. The potential transport benefits associated with improving the Public Performance Measure (PPM) to Network Rail's target of 92.5% were then calculated.





5.2.4 Journey Quality Conditional Outputs

The journey quality Conditional Outputs were specifically related to the 'on-train' experience of passengers. The current level of passenger satisfaction was determined using the Passenger Focus National Rail Passenger Survey (NRPS). Four areas of journey quality were considered:

- Train Environment;
- Passenger Security;
- Train Cleanliness; and
- Availability of Information.

The potential transport benefits from improved journey quality were calculated using Incremental Value of Time Multipliers (dependent on the level of current and expected future satisfaction) sourced from the PDFH.

5.2.5 Journey Times Conditional Outputs

In order to measure the benefits associated with improved journey times, the railway industry standard demand forecasting software MOIRA was used to forecast the impact of timetable changes.

Target rail journey times were set using the average off peak car journey time between two stations (sourced from Google Maps). The analysis considered a number of key core study area stations, shown in Table 5-A.

Tier	Station
	Preston
Primary	Burnley
	Blackburn
	Clitheroe
	Accrington
Secondary	Nelson
	Rose Grove
	Darwen

Table 5-A: Key Core Study Area Stations.

5.2.6 Passenger Facilities Conditional Outputs

The passenger facilities Conditional Outputs were specifically related to the facilities available to passengers at stations.

The potential transport benefits were calculated by identifying the facilities required at each station to meet Rail North's Station Quality Standard (SQS) criteria and applying a value per facility improvement, sourced from the PDFH and previous studies.

The value per facility was then multiplied by the relevant station demand to calculate the potential transport benefits.





5.3 Appraisal Results

Table 5-B at the end of this chapter summarises the total potential transport benefits for all Conditional Outputs. It shows that the potential transport benefits associated with the Conditional Outputs vary significantly.

The connectivity and journey time Conditional Outputs provide the largest level of potential transport benefits. The capacity, performance and journey quality Conditional Outputs provide comparable levels of potential transport benefits and the passenger facilities Conditional Output provides the lowest level of potential transport benefits.

It is important to note that the costs associated with delivering a scheme that could achieve each of the Conditional Outputs will also vary significantly and thus affect value for money.

Improvements to the Blackpool North to York service provide the greatest level of potential transport benefits for the connectivity, performance, journey quality and journey time Conditional Outputs. However, a significant proportion of these benefits will be realised outside of the core study area.

Connectivity

Improving the service frequency of the Blackpool North to York service generates the highest level of overall potential transport benefits across the UK rail network (up to £608.3m).

However, of all the Conditional Outputs investigated, a service frequency improvement of an additional two trains per hour on the Blackpool South to Colne service would provide the largest increase in passenger journeys within the core study area.

Improving access to Manchester and Leeds through improved service frequencies provides a comparable level of increased passenger journeys in the core study area.

Capacity

Analysis of passenger counts shows that that there is significant overcrowding on the morning peak services on the Clitheroe to Manchester line.

Improving train capacity on the Clitheroe to Manchester line to relieve current overcrowding and accommodate potential future growth in demand would generate significant benefits to the study area (up to £83.8m).

Performance

Improving the performance of all three services currently operating in the study area would generate significant potential transport benefits, with the load factors on three morning services all exceeding 138% from Blackburn to Manchester.

The Blackpool South to Colne service currently has the lowest PPM statistic. However, improving the current performance of the Blackpool North to York service to meet the target PPM figure of 92.5% would generate the highest level of potential transport benefits (£158.3m) due to the demand on this service being higher.





Journey Quality

Improvements to journey quality relate to the physical environment of the train, cleanliness, security and available information. Improving the quality of the rolling stock on all three services operating in the study area would generate significant journey quality benefits (between $\pounds12.8 - \pounds61.3m$). Improving the quality of rolling stock would also contribute to achieving a number of the other Conditional Outputs.

Journey Times

Improving journey times between the core study area and Leeds generates the highest level of potential transport benefits across the UK rail network (£389m).

However, improving journey times between key core study area stations and Manchester would result in the largest increase in passenger journeys within the core study area.

Passenger Facilities

The appearance of railway stations and the facilities provided greatly impact on people's perception of the quality of the rail network.

Although the potential transport benefits associated with the delivery of the passenger facilities Conditional Output (£11.8m) are lower than the benefits associated with other Conditional Outputs, it is likely that the cost of achieving this Conditional Output would be significantly lower.

The Impact of Doing Nothing

A qualitative assessment on the impact of doing nothing has also been undertaken for each objective (detailed in section 4.2), considering what the impact on East Lancashire's rail network would be if no investment occurred.

If no improvements are made to improve the frequency and journey times of rail services operating in East Lancashire it is likely that the perception of East Lancashire being poorly connected will grow stronger. This perception is likely to be further exacerbated by recent announcements proposing rail network improvements across the North of England, which have the potential to increase the connectivity gap between East Lancashire and economic centres in the North, in particular Manchester and Leeds.

Consequently, the connectivity gap between East Lancashire and major settlements in the North of England could widen in the future without investment in East Lancashire's rail network. This could have a negative impact on the economy of East Lancashire as people and business would be less likely to locate here.

In addition, if the current rolling stock in East Lancashire is not improved or replaced then the quality of the trains will deteriorate over time, resulting in the passenger experience being negatively impacted both in terms of journey quality, capacity and performance. Consequently, this could result in existing rail passengers seeking to use alternative modes of transport, which would place additional pressure on an already congested highway network.



				Potential Transport Benefits [*] (£m) (60 year appraisal period)				
Vision	Objective	Reference	Conditional Outputs	Rail User Benefits	TOC Benefits	Non Rail User Benefits (MEC's)	Total Benefits	
		1	Improve the frequency of the Blackpool South - Colne service.	+ 1tph £118.9 + 2tph £187.8	£34.4 £56.3	£11.6 £22.2	£164.9 £266.2	
		2	Improve the frequency of the Clitheroe to Manchester service.	+ 1tph £40.5 + 2tph £113.4	£10.0 £32.5	£6.0 £19.9	£56.5 £165.8	
	Connectivity	3	Improve the frequency of the Blackpool North to York service.	+ 1tph £185.8 + 2tph £400.0	£53.9 £115.4	£33.2 £92.8	£272.9 £608.3	
		4	Improve the frequency of the Blackburn to Manchester (via Burnley) service.	+ 1tph £12.3 + 2tph £73.8	£4.3 £27.5	£2.4 £16.5	£19.1 £117.8	
	Canacity	5	Relieve overcrowding in peak hours between Clitheroe and Manchester.	£60.9	£3.7	£2.5	£67.1	
	Capacity	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.	£76.1	£4.6	£3.1	£83.8	
	Performance	7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£52.5	£2.5	£1.4	£56.5	
		8	Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£48.5 £2.6		£1.8	£52.9	
Improve rail		9	Improve the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£148.8	£5.2	£4.3	£158.3	
in order to		- 1						
facilitate future	Journey Quality	10	Improve the quality of rolling stock on the Blackpool South to Colne service.	£10.5	£1.5	£0.9	£12.8	
economic growth within Fast		11	Improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.	£24.7	£2.9	£2.0	£29.6	
Lancashire.		12	Improve the quality of rolling stock on the Blackpool North to York service.	£52.0	£5.1	£4.2	£61.3	
		13	Reduce rail journey times between Preston and Colne to under an hour (currently 71 minutes).	£23.7	£6.5	£1.7	£31.9	
		14	Reduce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).	£43.6	£13.1	£5.3	£62.0	
		15	Reduce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.	£172.3	£57.2	£35.4	£264.9	
	Journey Times	16	Reduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.	£245.5	£86.4	£47.6	£379.5	
		17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey time.	£126.8	£32.4	£15.4	£174.6	
		18	Reduce rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.	£278.6	£71.3	£39.1	£389.0	
		19	Reduce rail journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey time.		Ν	I/A		
	Passenger Facilities	20	Improve station facilities within the core study area.	£9.0	£1.7	£1.1	£11.8	

Table 5-B: Potential Transport Benefits Summary.

N.B. All benefits quoted are for a 60 year appraisal period in 2010 prices, discounted to 2010.







6 Potential Options

6.1 Introduction

This chapter of the report presents the potential options considered as part of the Conditional Output Statement Stage (Stage 3) of the Rail Connectivity Study and how they have been appraised.

It also presents the shortlisted options and contains a summary of the potential transport benefits and deliverability issues associated with each shortlisted option.

6.2 Identification of Potential Options

A number of sources were used in order to identify a long list of potential options.

As noted in chapter 3, a problems and options workshop was held as part of Stage 1 of the Rail Connectivity Study. The workshop was attended by a number of key local stakeholders from relevant Councils, Network Rail, Train Operating Companies and various rail industry organisations. The workshop offered an opportunity to utilise the local knowledge and experience of the key stakeholders to gather their thoughts on the key issues affecting the study area and the potential options that may alleviate the identified issues.

The findings of the *Rail Connectivity Study Stage 1: Data Collection and Problem Identification Report (Jacobs, December 2014)* were also used to identify any further potential options for inclusion in the study.

Ongoing liaison with the project management group throughout the project provided further potential options for inclusion in the long list of options.

A total of thirty six potential options were subsequently compiled, as shown in Table 6-A. The options were then categorised under the following headings:

- Facility Improvements;
- Infrastructure Improvements; and
- Service Improvements.





Туре	Potential Option
	Station improvements at Rose Grove (to make it an interchange).
	Park & Ride at Colne rail station.
	Park & Ride on the Clitheroe to Bolton line.
	Introduction of CCTV at stations to encourage use of isolated stations.
	Introduce ticket machines and increase the monitoring of fare collection by
	guards to improve revenue collection.
	Introduce new ticketing options.
Facility	Introduce Real Time Passenger Information at stations within the core study
Improvements	area.
	Additional car parking at stations within the core study area.
	Improved walking and cycling links to stations.
	Improved bus/rail interchange at Colne.
	Improved bus/rail interchange at Burnley.
	Improve station facilities across the study area to meet Rail North's SQS
	criteria which cover access facilities, information provision and passenger
	Introduce new signalling technology to provide journey time improvements.
	Electrification of the line between Clitheroe and Bolton.
	Electrification of the Calder Valley line.
	Add loops to single track line to improve service frequency and reliability.
	Reinstate Skipton - Come line.
Infractructure	Electrification of the line between Preston and Coine / Leeds (including the
Improvemente	Lipgrade to a double track line between Rese Grove and Colne in order to
improvements	facilitate a more frequent service (between Risknool South & Colne)
	Close stations with low footfall
	Bemove line speed restrictions (e.g. Farington Curve (30mph), Hall I' th'
	Wood – Bolton (20mph) and North of Darwen (30mph))
	Journey time improvements on the Copy Pit line (the section between
	Todmorden and Burnley).
	Alter stopping patterns in the core study area in order to deliver journey time
	savings.
	Tailor timetables to fit in with Burnley College, a large potential source of rail
	users.
	Extend the new Manchester to Blackburn service to Preston; review calling
	pattern west of Accrington and link to a review of the calling pattern of the
	Colne service west of Rose Grove.
	Improve marketing of stations, lines, potential destinations and fares, along
	with how this information is communicated.
	Introduce a direct service between Clitheroe and Preston/Colne.
	Improve the quality of Rolling Stock operating on services in the core study
Service	area so that it is comparable with similar regional services in other parts of
Improvements	the country (for example, the rolling stock currently operating on the
	Inansperime Express Services between Manchester and Leeds).
	Interconnected Urban Matrix
	Restructure fares
	Improve service frequency between East Lancashire & Manchester Airport
	Improve service frequency between East Lancashire & Central Manchester
	Add additional carriages to the existing peak services between Clitheroe and
	Manchester to increase capacity.
	Improve service frequency between Burnley & Colne.
	Improve service frequency between East Lancashire & Leeds.
	Introduce a regular service between Clitheroe and Hellifield (currently a
	Sunday service).

Table 6-A: Potential Options.





6.3 Option Appraisal

A qualitative option appraisal exercise has been undertaken in order to identify the extent to which each option is likely to contribute to the potential transport benefits associated with each of the Conditional Outputs.

The option appraisal process is outlined below:

- 1. Each option was assessed independently and a decision was made as to whether each option would be expected to contribute to the potential transport benefits of each Conditional Output.
- 2. Consideration was given to the likely contribution of each option towards the issues which underpinned the development of each Conditional Output, based on evidence gathered as part of Stage 1 of the study.
- 3. Options were scored on a three-point scale (Slight, Moderate or Significant) dependent on their expected contribution to the potential transport benefits of each Conditional Output. Options which were not expected to contribute towards the potential transport benefits of a Conditional Output were scored N/A.
- 4. To ensure consistency, scores were benchmarked for each conditional output in turn by comparing the scores of all options.

Following the option appraisal process, a high level capital cost estimate was assigned to each option based upon the following ranges:

- < £5 million;
- £5 million to £50 million; and
- > £50 million.

It was noted that some service improvement options would not be subject to any capital costs; however operational costs would exist which would need to be considered if the option were to be developed further.

Appendix A includes the option appraisal matrix showing the scores of each individual option against the Conditional Outputs.

6.4 Option Sift

The option sift process identified eight options which are likely to contribute most significantly to the potential transport benefits associated with delivery of the Conditional Outputs.

These eight shortlisted options will require further investigation in order to assess their feasibility and economic viability.





The eight shortlisted options are shown in Table 6-B.

Туре	Shortlisted Options
Facility Improvements	Improve station facilities across the study area to meet Rail North's SQS criteria which cover access facilities, information provision and passenger facilities.
	Electrification of the line between Clitheroe and Bolton.
Infrastructure	Electrification of the line between Preston and Colne / Leeds (including the newly reinstated Todmorden Curve).
improvements	Journey time improvements on the Copy Pit line (the section between Todmorden and Burnley).
Quarter	Improve the quality of Rolling Stock operating on services in the core study area so that it is comparable with similar regional services in other parts of the country (for example, the rolling stock currently operating on the TransPennine Express Services between Manchester and Leeds).
Improvements	Improve service frequency between East Lancashire and Central Manchester.
	Add additional carriages to the existing peak services between Clitheroe and Manchester to increase capacity.
	Improve service frequency between East Lancashire and Leeds.

Table 6-B: Shortlisted Options.

Table 6-C shows the option appraisal matrix containing only the shortlisted options. The table shows that the shortlisted options contribute to a number of Conditional Outputs. Consequently, if all shortlisted options are delivered, each Conditional Output would be achieved to some extent.



East Lancashire Rail Connectivity Study Shortlisted Options

Objective

Connectivity

Capacity

Performance

Journey Quality

Journey Times

Passenger Facilities

Improve rail connectivity in order to facilitate future economic growth within East Lancashire.

9

10

11

12

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rove the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.

duce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.

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e rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.

duce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey

ney times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey t

ove the quality of rolling stock on the Blackpool South to Colne service

rove the quality of rolling stock on the Blackpool North to York service.

nprove station facilities within the core study area.

rove the quality of rolling stock on the Clitheroe to Manchester Victoria service.

uce rail journey times between Preston and Colne to under an hour (currently 71 minutes).

duce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).

low v	vere discusse	d and agreed at a meeting held at County Hall on 5th August 2014.			Improve s the stuc North's SC access fa provis	tation facilities by area to meet Sy area to meet Sy criteria while Si criteria while Si criteria while facilities.	Electrification of the lif ween Clitheroe and Bo across Rail across ger	e Jou Iton. the second	ine topy Pit line (the set copy Pit line (the set between Todmorden Burnley).	nprov occion and nprov occk o e core com gional the co ling st n the rrvices
	Reference	Conditional Outputs		Potential Transport Benefits* (£m) (60 year appraisal period)						
	1	Improve the frequency of the Blackpool South to Colne service.	+ 1tph	£164.9		N/A	N/A	Significant	N/A	
			+ 2tph	£266.2		N/A	N/A	Significant	N/A	-
	2	Improve the frequency of the Clitheroe to Manchester service.	+ 1tph	156.5		N/A	Significant	N/A	N/A	-
			+ 1tph	£272.9		N/A	N/A	Significant	N/A	-
	3	Improve the frequency of the Blackpool North to York service.	+ 2tph	£608.3		N/A	N/A	Significant	N/A	
			+ 1tph	£19.1		N/A	N/A	N/A	N/A	+
	4	Improve the frequency of the Blackburn to Manchester (via Burnley) service.	+ 2tph	£117.8		N/A	N/A	N/A	N/A	
	5	Relieve overcrowding in peak hours between Clitheroe and Manchester.		£67.1		N/A	Significant	N/A	N/A	
	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.		£83.8		N/A	Significant	N/A	N/A	
	7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CPS.		£56.5		N/A	N/A	Significant	N/A	
	8	Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.		£52.9		N/A	Significant	N/A	N/A	

The Conditional Outputs recorded below

Table 6-C: Option	Appraisal Matrix for Sl	hortlisted Options.
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N/A Significant N/A N/A N/A Significant Slight Significant N/A N/A N/A Significant N/A Significant N/A N/A Significan N/A N/A Significant N/A N/A N/A N/A N/A Significant Significant N/A N/A Significant N/A Moderate N/A N/A N/A N/A Significant N/A Moderate N/A Moderate N/A Significant Slight Moderate N/A Slight Moderate Moderate N/A Significant N/A N/A Moderate N/A Significant Significant N/A N/A Significant Moderate N/A Significant N/A N/A N/A N/A N/A N/A Significant N/A N/A N/A N/A N/A £5m - £50m > £50m > £50m £5m - £50m N/A * N/A *

Shortlisted options

Improve the quality of Rolling Stock operating on services in the core study area so that it is comparable with similar regional services in other parts of the country (for example, the rolling stock currently operating on the TransPennine Express services between Manchester and Leedy

and Leeds).

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

Moderate

Moderate

Significant

Significar

Significan

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N/A

Improve service fre between East Lanca Central Manches

High Level Capital Cost Estimate (£m)

£158.3

£12.8

£29.6

£61.3

£31.9

£62.0

£264.9

£379.5

£174.6

£389.0

N/A

£11.8



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	N/A	Moderate								
	N/A	Moderate								
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	N/A	Significant								
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	N/A	N/A								
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_	N/A	N/A								
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	N/A	N/A								
	N/A	N/A								
	N/A *	N/A *								





6.5 Shortlisted Options

The main benefits and any major deliverability issues associated with each of the shortlisted options are summarised below.

(a) Improve station facilities across the study area to meet Rail North's SQS criteria which cover access facilities, information provision and passenger facilities.

Improved station facilities directly benefit rail passengers at the origin and interchange stations of their journeys. The potential transport benefits calculated as part of the Passengers Facilities Conditional output relate to improving facilities to meet Rail North's Station Quality Standard (SQS).

The appearance of railway stations and the facilities provided greatly impact people's perception of the quality of the rail network. If no investment is made to improve the level of facilities offered at railway stations in East Lancashire then the rail network is less likely to be able to attract new demand. Furthermore, if the quality of passenger facilities at stations deteriorates over time then existing rail passengers may look to alternative modes of transport in order to undertake their journey.

This option has been shortlisted as it is the only option to score significantly against the passenger facilities Conditional Output.

It is not anticipated that there would be any major deliverability issues associated with this option.

All stations within the core study require some level of intervention in order to meet Rail North's Station Quality Standard. The upgrades required are predominantly related to 'Access' facilities (e.g. car parking, cycle parking and step free access to all platforms) and 'Information' facilities (e.g. customer information screens, help points and bus information posters). In general, stations in the core study area with low usage require the most significant level of intervention.

The capital cost of implementing this option is likely to be between \$5 million - \$50 million.

(b) Electrification of the line between Clitheroe and Bolton.

Electrification of rail lines allows the introduction of electric powered rolling stock on the rail network. Electric powered rolling stock has the potential to offer reduced journey times, reduced noise and air pollution, improved journey quality, more reliable journey times and additional seating capacity. Other benefits can also be realised such as reduced operational, energy and maintenance costs. The introduction of new rolling stock also offers the industry an opportunity to review the infrastructure capability, such as permissible line speeds.

The electrification of the rail line between Clitheroe and Bolton will allow for services operating between Clitheroe and Manchester and between Blackburn and Manchester to utilise modern rolling stock powered by overhead electric lines.

This option has been shortlisted as it scored significantly against all objectives, with the exception of the passenger facilities objectives.





The Stage 1 Report identified reliability of rail services within the study area as an issue and although the Clitheroe to Manchester service offered the highest Public Performance Measure (PPM) in the core study area, at 89.4% between January 2013 and January 2014, it still fell short of Network Rail's target of 92.5%.

Additional seating capacity provided by electric rolling stock could contribute significantly to the potential transport benefits of the capacity Conditional Outputs by relieving overcrowding, which was also identified in the Stage 1 Report as an issue between Blackburn and Manchester Victoria.

There is also potential for significant journey time savings to be realised between key core study area stations and Manchester, through the introduction of electric rolling stock. These journey time savings could in turn generate additional demand for the rail network due to the increasing competitiveness of rail travel compared with alternative modes of transport.

There are significant deliverability issues associated with rail electrification schemes, in particular there are significant engineering constraints to be overcome in terms of track layout, topography and overhead structures. There is also likely to be significant disruption to rail passengers as a result of the engineering works.

Since the commencement of the Rail Connectivity Study, the Report of the North of England Electrification Task Force (Northern Sparks, March 2015) scored the 32 non-electrified lines in the North of England and prioritised the Clitheroe to Bolton line for electrification as a Tier 1 scheme. Tier 1 schemes have been identified based primarily on the scale of economic impact they will bring. The Northern Sparks report recommends that more detailed business cases are developed for Tier 1 schemes with a view to including them in the work programme for Control Period 6 (2019 - 2024).

The capital cost of implementing this option is likely to be greater than £50 million.

Figure 6-A illustrates the location of the shortlisted option as well as existing rail electrification schemes.

(c) Electrification of the line between Preston and Colne / Leeds (including the newly reinstated Todmorden Curve).

As discussed previously there are significant benefits from the electrification of rail lines.

The electrification of the rail line between Preston and Colne / Leeds would be delivered in conjunction with the North's wider rail electrification programme and enable the following services to utilise modern rolling stock powered by overhead electric lines:

- Blackpool North York;
- Preston Colne; and
- Blackburn Manchester (via the Todmorden Curve).

This option has been shortlisted as it scored significantly against all objectives, with the exception of the passenger facilities and capacity objectives. This option scored particularly well in the option appraisal as it directly benefits two train services operating through the core study area, namely the Blackpool South to Colne service and the Blackpool North to York service.





The Stage 1 Report identified reliability of services within the study area as an issue. The Blackpool South to Colne service offered the lowest PPM in the core study area, at 82.9% between January 2013 and January 2014, and the Blackpool North to York service offered the second lowest PPM, at 85.3% between January 2013 and January 2014. Both services were significantly below Network Rail's target of 92.5%.

There is also potential for significant journey time savings to be realised between key core study area stations and Colne / Leeds through the introduction of electric rolling stock. These journey time savings will in turn generate additional demand for the rail network due to the increasing competitiveness of rail travel compared with alternative modes of transport.

There are significant deliverability issues associated with rail electrification schemes, in particular there are significant engineering constraints to be overcome in terms of track layout, topography and overhead structures. There is also likely to be significant disruption to rail passengers as a result of the engineering works.

The Report of the North of England Electrification Task Force (Northern Sparks, March 2015) also prioritised the full Calder Valley line between Leeds and Manchester (via Bradford and Brighouse) and Preston as the highest scoring Tier 1 scheme. The Northern Sparks report recommends that more detailed business cases are developed for Tier 1 schemes with a view to including them in the work programme for Control Period 6 (2019 - 2024).

It should be noted that the branch line between Burnley and Colne has been identified as a Tier 2 scheme and as such it is expected this scheme would be developed for funding post Control Period 6 (2024).

The capital cost of implementing the option is likely to be greater than £50 million.

Figure 6-A illustrates the location of the shortlisted option as well as existing rail electrification schemes.

(d) Journey time improvements on the Copy Pit line (the section between Todmorden and Burnley).

Journey time improvements on the rail network can be realised through a range of interventions, for example removing line speed restrictions, improving signalling technology or reducing the number of stops required on a service.

Journey time improvements on the Copy Pit line between Todmorden and Burnley Manchester Road will benefit the Blackpool North to York service. It will also benefit the new Blackburn to Manchester (via Burnley) service which is due to come into operation in May 2015.

This option has been shortlisted as it has scored well against the journey times Conditional Outputs. Journey time improvements to the Copy Pit line will allow the reduction of journey times between key core study area stations and Central Manchester, Halifax, Bradford and Leeds.

It is also expected that there would be slight improvements to the performance of the services operating on the Copy Pit line.





There are significant deliverability issues associated with this option, in particular there are significant engineering constraints to be overcome in terms of track layout, topography and overhead structures. There is also likely to be significant disruption to rail passengers as a result of the engineering works. Recent improvement works undertaken on this section of the line (to the Holme Tunnel) required complete closure of the section between Todmorden and Burnley and a bus replacement service to be put into operation.

The capital cost of implementing this option is likely to be between \$5 million and \$50 million.

Figure 6-A illustrates the location of the shortlisted option.

(e) Improve the quality of Rolling Stock operating on services in the core study area so that it is comparable with similar regional services in other parts of the country (for example, the rolling stock currently operating on the TransPennine Express Services between Manchester and Leeds).

Improving the quality of rolling stock has a wide range of benefits to both rail passengers and the train operating company. Similar to the electrification benefits, upgraded rolling stock has the potential to reduce operational, energy and maintenance costs. The benefits to the rail passengers include increased comfort, improved environment, improved security and improved journey time reliability.

If combined with an electrification scheme, there are significant benefits to be realised through upgrading the rolling stock in the study area.

This option has been shortlisted as it has scored well against all objectives with the exception of connectivity and passenger facilities.

There are significant deliverability issues associated with this option, in particular the availability of rolling stock. Currently the rail lines in the core study area can only operate diesel powered rolling stock, of which there is currently a limited supply. In the short term diesel powered units could be sourced through a cascade system where diesel rolling stock becomes surplus to requirements after electrification. Longer term, electric powered rolling stock could be sourced in tandem with electrification of the rail lines through East Lancashire.

There are not expected to be any capital costs associated with the implementation of this option due to the current procurement methods employed by the UK rail industry whereby rolling stock is leased from Rolling Stock Operating Companies (ROSCOs). The costs of this option would therefore be attributed to the annual operational costs of the TOC rather than capital costs.

(f) Improve service frequency between East Lancashire and Central Manchester.

Improving the rail service frequency has a wide range of benefits to both the TOC's and rail passengers. An increased service frequency will reduce rail passengers GJT and improve rail passenger's perception of the connectivity between areas. As a result of improved connectivity and reduced GJT an increase in demand, and subsequent increase in TOC revenue, can be expected.

This option has been shortlisted as it has scored well against all of the connectivity Conditional Outputs and both capacity Conditional Outputs.





There are significant deliverability issues associated with this option, in particular the availability of rolling stock. As identified previously there is a limited supply of diesel powered rolling stock. In the short term, diesel powered units could be sourced through a cascade system. Longer term, electric powered rolling stock could be sourced in tandem with the electrification of the rail lines through East Lancashire.

There are not expected to be any capital costs associated with the implementation of this option as additional rolling stock would be leased from ROSCOS, as such the costs of this option would be attributed to the annual operational costs of the TOC rather than capital costs.

(g) Add additional carriages to the existing peak services between Clitheroe and Manchester to increase capacity.

The addition of carriages to existing peak services between Clitheroe and Manchester would provide benefits to rail passengers in terms of reduced overcrowding and to the TOC in terms of additional revenue from an increase in demand.

The addition of carriages to existing peak services between Clitheroe and Manchester will address overcrowding issues identified between Blackburn and Manchester Victoria.

It is expected this option would realise significant benefits from the capacity Conditional Outputs. This option has been shortlisted as it is anticipated it would be relatively low cost to implement and the benefits from reducing overcrowding on this line have been shown to be significant.

There are significant deliverability issues associated with this option, in particular the availability of rolling stock. As identified previously there is a limited supply of diesel powered rolling stock. In the short term, diesel powered units could be sourced through a cascade system. Longer term, electric powered rolling stock could be sourced in tandem with the electrification of the rail lines through East Lancashire.

There are not expected to be any capital costs associated with the implementation of this option as additional rolling stock would be leased from ROSCOS, as such the costs of this option would be attributed to the annual operational costs of the TOC rather than capital costs.

Figure 6-A illustrates the location of the shortlisted option.

(h) Improve service frequency between East Lancashire and Leeds.

As outlined previously, improving the rail service frequency has a wide range of potential transport benefits to both rail passengers and the TOC's.

This option has been shortlisted as it has scored well against all of the connectivity Conditional Outputs and consequently there are significant levels of potential transport benefits to be realised from its implementation.

There are significant deliverability issues associated with this option, in particular the availability of rolling stock. As identified previously there is a limited supply of diesel powered rolling stock. In the short term, diesel powered units could be sourced through a cascade system. Longer term, electric powered rolling stock could be sourced in tandem with electrification of the rail lines in East Lancashire.





There are not expected to be any capital costs associated with the implementation of this option as additional rolling stock would be leased from ROSCOS, as such the costs of this option would be attributed to the annual operational costs of the TOC rather than capital costs.

In order to achieve the Conditional Outputs that would enhance connectivity between East Lancashire and Leeds, service frequency on the existing Calder Valley line needs to be improved.

If future economic circumstances dictate that connectivity between East Lancashire and Leeds should be further enhanced to the point where capacity on the Calder Valley line becomes a constraining factor, consideration of alternative options between Burnley and Leeds may become necessary. Any alternative options would need to demonstrate that they would deliver value for money.





Figure 6-A: Shortlisted Options







7 Conclusions

The data collection and problem identification exercise undertaken has supported the local perception that East Lancashire's rail network is relatively constrained in terms of rail connectivity, capacity, performance, journey quality, journey times and passenger facilities. If no investment is secured to improve East Lancashire's rail network it is likely to have a negative impact on future economic growth.

The current deficiencies in East Lancashire's rail network can make it an unattractive mode of travel. Subsequently the current rail usage within East Lancashire is relatively low compared to neighbouring areas, with the percentage of individuals travelling to work by train being lower in all Local Authority areas in the core study area than the average for both the North West and England and Wales. In addition, the current rail demand between East Lancashire and neighbouring City Regions is relatively low.

Given the forecast national growth in rail demand the *Stage 1: Data Collection and Problem Identification Report (Jacobs, December 2014)*, concluded that significant investment is required in East Lancashire's rail network in order to improve its performance and attractiveness.

The Stage 2: Conditional Outputs - Benefits Appraisal Report (Jacobs, December 2014) defines the Conditional Outputs which have been adopted for East Lancashire based upon the findings from the Data Collection and Problem Identification stage.

Bespoke analysis of the potential economic benefits associated with delivering each of the identified Conditional Outputs was subsequently undertaken. It is accepted that realisation of each output will be subject to an affordable and value for money solution, but the Conditional Outputs should nevertheless assist the rail industry and its partners in establishing proposals that best release the identified potential.

The agreed Conditional Outputs for East Lancashire's rail network and the potential transport benefits associated with the delivery of each output is shown in Table 7-A.



Objective	Ref	Conditional Outputs	Poter Trans Benefits* year apj perio	ntial port (£m) (60 praisal pd)
	1	Improve the frequency of the Blackpool South - Colne	+ 1tph	£164.9
		Improve the frequency of the Clitheroe to Manchester	+ 2tpn + 1tph	£266.2 £56.5
Connectivity	2	service.	+ 2tph	£165.8
	3	Improve the frequency of the Blackpool North to York service.	+ 1tph + 2tph	£272.9 £608.3
	4	Improve the frequency of the Blackburn to Manchester (via Burnley) service.	+ 1tph + 2tph	£19.1 £117.8
	5	Relieve overcrowding in peak hours between Clitheroe and Manchester.	£67	.1
Capacity	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.	£83	.8
	7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£56	.5
Performance	8	Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£52	9
	9	Improve the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£158	3.3
	10	Improve the quality of rolling stock on the Blackpool South to Colne service.	£12.8	
Journey Quality	11	Improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.	£29	.6
	12	Improve the quality of rolling stock on the Blackpool North to York service.	£61	.3
	13	Reduce rail journey times between Preston and Colne to under an hour (currently 71 minutes).	£31	.9
	14	Reduce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).	£62	2.0
	15	Reduce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.	£264	4.9
Journey	16	Reduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.	£379	9.5
Times	17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey time.	£174	4.6
	18	Reduce rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.	£389	Э.О
	19	Reduce rail journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey time.	N//	4
Passenger Facilities	20	Improve station facilities within the core study area.	£11	.8

Table 7-A: Adopted Conditional Outputs and Potential Transport Benefits.

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The benefits appraisal revealed that delivery of the identified Conditional Outputs could deliver significant transport benefits. In particular improving the rail service frequency and journey times within the study would deliver the greatest level of benefit. If all of the Conditional Outputs are delivered there will be significant benefits to UK plc.

If no improvements are made to the frequency and journey times of rail services operating in East Lancashire it is likely that the perception of East Lancashire being poorly connected will grow stronger. This perception is likely to be further exacerbated by recent announcements proposing rail network improvements across the North of England which have the potential to increase the connectivity gap between East Lancashire and economic centres in the North, in particular Manchester and Leeds.

Consequently, the connectivity gap between East Lancashire and major settlements in the North of England could widen in the future without investment in East Lancashire's rail network. This could have a negative impact on the economy of East Lancashire as people and business would be less likely to locate here.

In addition, if the current rolling stock in East Lancashire is not improved or replaced then the quality of the trains will deteriorate over time, resulting in the passenger experience being negatively impacted both in terms of journey quality, capacity and performance. Consequently, this could result in existing rail passengers seeking to use alternative modes of transport, which would place additional pressure on an already congested highway network.

The Conditional Outputs were defined as being conditional as achieving each Output is conditional upon affordable and economically viable options being identified. Consequently, the Conditional Output Statement stage (Stage 3) has undertaken an option appraisal exercise in order to identify options which would make the most significant contribution towards delivering the potential transport benefits associated with the delivery of the adopted Conditional Outputs.

The results of the option appraisal have been presented in this report and the eight options that are likely to make the most significant contribution to delivering the potential transport benefits are presented in Table 7-B.

Туре	Shortlisted Options
Facility Improvements	Improve station facilities across the study area to meet Rail North's SQS criteria which cover access facilities, information provision and passenger facilities.
	Electrification of the line between Clitheroe and Bolton.
Infrastructure	Electrification of the line between Preston and Colne / Leeds (including the newly reinstated Todmorden Curve).
improvements	Journey time improvements on the Copy Pit line (the section between Todmorden and Burnley).
Coming	Improve the quality of Rolling Stock operating on services in the core study area so that it is comparable with similar regional services in other parts of the country (for example, the rolling stock currently operating on the TransPennine Express Services between Manchester and Leeds).
Improvements	Improve service frequency between East Lancashire and Central Manchester.
	Add additional carriages to the existing peak services between Clitheroe and Manchester to increase capacity.
	Improve service frequency between East Lancashire and Leeds.

Table 7-B: Shortlisted Options.

The Report of the North of England Electrification Task Force (Northern Sparks, March 2015) scored the 32 non-electrified lines in the North of England. The





Clitheroe to Bolton line and the full Calder Valley line between Leeds and Manchester (via Bradford and Brighouse) and Preston were both prioritised for electrification as a Tier 1 scheme. Tier 1 schemes have been identified based primarily on the scale of economic impact they will bring. The Northern Sparks report recommends that more detailed business cases are developed for Tier 1 schemes with a view to including them in the work programme for Control Period 6 (2019 - 2024).

It is recommended that further analysis is undertaken on each of the shortlisted options in order to assess their feasibility and economic viability.

In conclusion, the Rail Connectivity Study has identified the deficiencies within East Lancashire's rail network. The study has identified a series of Conditional Outputs which set out what East Lancashire requires from the rail industry in support of growing its economy. The study has shown there are significant potential transport benefits to be realised from improvements to the rail network and a shortlist of options which are likely to make the most significant contribution to delivering the potential transport benefits has been identified.





Appendix A Option Appraisal

The Conditional Outputs recorded below were discussed and agreed at a meeting held at County Hall on 5th August 2014.

Vision	Objective	Reference	Conditional Outputs	Potential Transport Benefits* (£m) (60 year appraisal period)							
		1	Improve the frequency of the Blackpool South to Colne service.	£164.9							
			+ 2tp	£266.2							
		2	Improve the frequency of the Clitheroe to Manchester service.	£56.5							
	Connectivity		+ 11ph								
		3	Improve the nequency of the blackpool worth to York service. + 2tph								
		4	+ 1tp	£19.1							
		-	+ 2tp	£117.8							
	Canacity	5	Relieve overcrowding in peak hours between Clitheroe and Manchester.	£67.1							
	Capacity	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.	£83.8							
		7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.	£56.5							
	Performance	8	Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CPS.								
		9	Improve the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CPS.	£158.3							
Improve rail connectivity in order to facilitate		10	Improve the quality of rolling stock on the Blackpool South to Colne service.	£12.8							
future economic growth within East Lancashire.	Journey Quality	11	Improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.	£29.6							
		12	Improve the quality of rolling stock on the Blackpool North to York service.	£61.3							
		13	Reduce rail journey times between Preston and Colne to under an hour (currently 71 minutes).	£31.9							
		14	Reduce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).	£62.0							
		15	Reduce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.	£264.9							
	Journey Times	16	Reduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.	£379.5							
		17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey time.	£174.6							
		18 Reduce rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.									
		19	Reduce rail journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey time.	N/A							
	Passenger Facilities	20	Improve station facilities within the core study area.	£11.8							
*All benefits quoted	are for a 60 year appraisal perio	nd in 2010 prices	discounted to 2010								

						Facility Imp	provements					
	Stati	on improvements at Grove (to make it an interchange).	Rose Park	& Ride on the Clitherc Bolton line.	pe to incre coller	oduce ticket machines ase the monitoring of ction by guards to imp revenue collection.	and Intra fare Info prove Info	oduce Real Time Passer rmation at stations wit the core study area.	iger Imp	proved walking and cyc links to stations.	ling Imp	oved bus/rail interchang at Burnley.
Impi th Nort acc i	rove station facilities at e study area to meet R h's SQS criteria which hes control of the set of the set of the provision and passenge facilities.	rross ail over r	ark & Ride at Colne ra station.	il Intro	duction of CCTV at sta neourage use of isola stations.	tions ted	ntroduce new ticketin options.	ng Ad	Iditional car parking ons within the core s area.	at tudy	oved bus/rail interch at Colne.	Inge
	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Significant	Slight	Slight	Slight	N/A	Moderate	N/A	Moderate	Slight	Slight	N/A	N/A
	f5m - f50m	c #5m	< f 5m	c f5m	< f 5m	< 65 m	< 65 m	< 65m	< 45m	< 65 m	< 45m	< f5m
	* Delivery of this sche	< LJIII	t to any canital costs	however operational	costs will exist	< LOUI	N LOIN	< LJIII	< LJIII	< LJIII	< LJIII	< LOIII

High Level Capital Cos Estimate (£m) The Conditional Outputs recorded below were discussed and agreed at a meeting held at County Hall on 5th August 2014.

Vision	Objective	Reference	Conditional Outputs		Potential Transport Benefits* (£m) (60 year appraisal period)					
		1	Improve the frequency of the Blackpool South to Colne service.	+ 1tph	£164.9					
				+ 2tph	£266.2					
		2	Improve the frequency of the Clitheroe to Manchester service.	+ 1tph	£56.5					
	Connectivity			£272.9						
		3	Improve the frequency of the Blackpool North to York service.	+ 2tph	£608.3					
			Improve the frequency of the Disckhure to Manchester (vis Purpley) require	£19.1						
		*	improve the nequency of the blackburn to manchester (via burnley) service.	+ 2tph	£117.8					
	Constitu	5	Relieve overcrowding in peak hours between Clitheroe and Manchester.		£67.1					
	Сарасну	6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.		£83.8					
		7	Improve the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.		£56.5					
	Performance	8	8 Improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.							
		9	Improve the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.		£158.3					
Improve rail connectivity in order to facilitate	Journey Quality	10	Improve the quality of rolling stock on the Blackpool South to Colne service.		£12.8					
future economic growth within East Lancashire.		11	Improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.		£29.6					
		12	Improve the quality of rolling stock on the Blackpool North to York service.		£61.3					
		13	Reduce rail journey times between Preston and Colne to under an hour (currently 71 minutes).		£31.9					
		14	Reduce rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).		£62.0					
		15	Reduce rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.		£264.9					
	Journey Times	16	Reduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.		£379.5					
		17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period journey time.	car	£174.6					
		18	Reduce rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.		£389.0					
		19	Reduce rail journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey	/ time.	N/A					
	Passenger Facilities	20	Improve station facilities within the core study area.		£11.8					
*All benefits quoter	are for a 60 year appraisal peri	od in 2010 prices	discounted to 2010							

				minastructure	improvements				
E betv	lectrification of the lin veen Clitheroe and Bol	e Add I Iton. impr	loops to single track li rove service frequency reliability.	ne to y and Cr net	Electrification of the lii between Preston and oine/Leeds (including: wly reinstated Todmor Curve).	ne Li Inte Close Iden	stations with low foo	Jour tfall. b	ney time improve : Copy Pit line (th etween Todmord Burnley).
troduce new signalin nology to provide jou time improvements.	ng rrney	ctrification of the Calc	der Reir	istate Skipton - Colne	line.	rade to a double track reen Rose Grove and (order to facilitate a m equent service (betwe lackpool South & Coln	: line coine ore H en e).	ove line speed restric Farington Curve (30r all ' th' Wood – Bolt (30mph)).	tions nph), on rwen
N/A	N/A	N/A	Moderate	N/A	Significant	Moderate	N/A	N/A	N/A
N/A	N/A	N/A	Moderate	N/A	Significant	Moderate	N/A N/A	N/A	N/A
N/A	Significant	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Significant	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A
N/A N/A	N/A N/A	Slight	N/A N/A	Slight	Significant	N/A N/A	N/A N/A	N/A N/A	N/A N/A
N/A	N/A	Slight	N/A	Slight	N/A	N/A	N/A	N/A	N/A
N/A	N/A	Slight	N/A	Slight	N/A	N/A	N/A	N/A	N/A
N/A	Significant	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A
N/A	Significant	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A
Moderate	N/A	N/A	Moderate	N/A	Significant	Moderate	N/A	Slight	N/A
Moderate	Significant	N/A	Moderate	N/A	N/A	N/A	N/A	Slight	N/A
Moderate	N/A	Moderate	N/A	N/A	Significant	N/A	N/A	Slight	Slight
N/A	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A
N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A
Slight	N/A	N/A	N/A	N/A	Significant	N/A	N/A	Slight	N/A
Slight	Significant	N/A	N/A	N/A	N/A	N/A	N/A	Slight	N/A
Slight	Significant	Slight	N/A	N/A	Slight	N/A	N/A	Slight	Moderate
Slight	Significant	Slight	N/A	N/A	Slight	N/A	N/A	Slight	Moderate
Slight	N/A	Significant	N/A	Slight	Significant	N/A	N/A	Slight	Significant
Slight	N/A	Significant	N/A	Slight	Significant	N/A	N/A	Slight	Significant
NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
					L	1			

High Level Capital Cos Estimate (£m)

East Lancashire Rail Connectivity Study **Option Sifting Matrix**

			Tailor timetables to f Burnley College, a potential source of ri	it in with lines large fi ail users. info	rove marketing of st , potential destinatio rres, along with how rrmation is communi	ations, the store and regist this of th cated. rollin ser	Improve the quality of Rolling Stock operating on services in the core study area so that it is comparable with similar regional services in other parts of the country (for example, the rolling stock currently operating on the TransFernine Express services between Manchester and Leeds).					Improve service frequency between East Lancashire & Central Manchester.			Introduce a regular service between Clitheroe and Hellifield (currently a Sunday service).	
		Alter stopping patte core study area in o deliver journey time	rns in the order to savings.	Extend the new Manches Blackburn service to Pre review calling pattern w Accrington and link to a r of the calling pattern of Colne service west of f Grove.	ter to ston; exiew the ose	Introduce a direct sen- between Clitheroe au Preston/Colne.	vice Im ocre Not	prove service frequen study area in line wit th's Interconnected L Matrix.	cy in In h Rail Irban br	nprove service freque etween East Lancashin Manchester Airport	ncy Add re & Cit	additional carriages ting peak services be theroe and Manches increase capacity.	to the internet to the internet to the internet to be	nprove service freque tween East Lancashir Leeds.	ncy e &	
	Potential Transport Benefits* (£m) (60 year appraisal period)															
+ 1tph	£164.9	N/A N/A	N/A N/A	Slight	N/A N/A	Slight	N/A N/A	Significant	N/A N/A	Moderate	Moderate	N/A N/A	Slight	Moderate Moderate	N/A	
+ 2tph + 1tph	£56.5	N/A	N/A	N/A	N/A	Slight	N/A	Significant	N/A N/A	Significant	Significant	N/A	N/A	Moderate	N/A	
+ 2tph	£165.8	N/A	N/A	N/A	N/A	Slight	N/A	Significant	N/A	Significant	Significant	N/A	N/A	Moderate	N/A	
+ 1tph + 2tph	£272.9 £608.3	N/A N/A	N/A N/A	Slight	N/A N/A	N/A N/A	N/A N/A	Significant	N/A N/A	Moderate	Moderate	N/A N/A	N/A N/A	Significant	N/A N/A	
+ 1tph	£19.1	N/A	N/A	N/A	N/A	N/A	N/A	Significant	N/A	Moderate	Moderate	N/A	N/A	Moderate	N/A	
+ 2tph	£117.8	N/A	N/A	N/A	N/A	N/A	N/A	Significant	N/A	Moderate	Moderate	N/A	N/A	Moderate	N/A	
	£67.1	N/A	N/A	N/A	Slight	Slight	Moderate	Significant	Slight	Significant	Significant	Significant	N/A	N/A	N/A	
	£83.8	N/A	N/A	N/A	Slight	Slight	Moderate	Significant	Slight	Significant	Significant	Significant	N/A	N/A	N/A	
	£56.5	Slight	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£52.9	Slight	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A	Slight	N/A	N/A	N/A	
	£158.3	Slight	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£12.8	N/A	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£29.6	N/A	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£61.3	N/A	N/A	N/A	N/A	N/A	Significant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£31.9	Moderate	N/A	N/A	N/A	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£62.0	Moderate	N/A	N/A	N/A	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
urney time.	£264.9	Slight	N/A	N/A	N/A	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
urney time.	£379.5	Slight	N/A	N/A	N/A	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
peak period car	£174.6	Slight	N/A	N/A	N/A	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Slight	
	£389.0	Slight	N/A	N/A	N/A	N/A	Moderate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Slight	
d car journey	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	£11.8	N/A	N/A	N/A	Slight	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	High Level Capital Cost Estimate (£m)	N/A	N/A	N/A *	< £5m	N/A *	N/A *	N/A *	N/A	N/A *	N/A *	N/A *	N/A *	N/A *	N/A *	
		* Delivery of thi	is scheme will not be s	ubject to any capital cost	s, however operatio	nal costs will exist.							1		I	

The Conditional Outputs recorded below were discussed and agreed at a meeting held at County Hall on 5th August 2014.

Vision	Objective	Reference	Conditional Outputs		Potential Transport Benefits* (£m) (60 year appraisal period)
Improve rail connectivity in order to facilitate future connection growth within East Lancashire.	Connectivity	1	Improve the frequency of the Blackpool South to Colne service.	1tph	£164.9
			+ 2tph		£266.2
		2	Improve the frequency of the Clitheroe to Manchester service. +	2tph	£165.8
		3	Improve the frequency of the Blackpool North to York service.	£272.9	
				£608.3	
		4	Improve the frequency of the Blackburn to Manchester (via Burnley) service.	1tph	£19.1
			+ 2tph		£117.8
	Capacity	5	leve overcrowding in peak hours between Clitheroe and Manchester.		£67.1
		6	Ensure sufficient capacity to meet forecast rail passenger growth between Clitheroe and Manchester in the next 10 years.		£83.8
	Performance	7	prove the Blackpool South to Colne service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.		£56.5
		8	improve the Clitheroe to Manchester Victoria service PPM to an overall level of at least 92.5% moving annual average by the end of CPS.		£52.9
		9	mprove the Blackpool North to York service PPM to an overall level of at least 92.5% moving annual average by the end of CP5.		£158.3
	Journey Quality	10	nprove the quality of rolling stock on the Blackpool South to Colne service.		£12.8
		11	improve the quality of rolling stock on the Clitheroe to Manchester Victoria service.		£29.6
		12	mprove the quality of rolling stock on the Blackpool North to York service.		£61.3
	Journey Times	13	educe rail journey times between Preston and Colne to under an hour (currently 71 minutes).		£31.9
		14	educe rail journey times between Clitheroe and Manchester to under an hour (currently 74 minutes).		£62.0
		15	educe rail journey times between key core study area stations and Central Manchester to the equivalent or better than the average off peak period car journey time.		£264.9
		16	Aduce rail journey times between key core study area stations and Manchester Airport to the equivalent or better than the average off peak period car journey time.		£379.5
		17	Reduce rail journey times between key core study area stations and West Yorkshire (Halifax and Bradford) to the equivalent or better than the average off peak period car journey time.		£174.6
		18	educe rail journey times between key core study area stations and Leeds to the equivalent or better than the average off peak period car journey time.		£389.0
		19	duce rall journey times between key core study area stations and National Economic Centres to the equivalent or better than the average off peak period car journey ne.		N/A
	Passenger Facilities	20	Improve station facilities within the core study area.		
*All benefits quoted are for a 60 year appraisal period in 2010 prices, discounted to 2010.					
High Level Capital Cost					