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M65 to Yorkshire Corridor Study

Stage 3: Review of Major Highway Proposals Report

September 2013

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	Originated by	Checked by	Reviewed by
ORIGINAL	NAME **P Hibbert**	NAME **D Brown**	NAME **P Kirk**
Approved by	NAME **M Cammock**	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 **MC**
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REVISION	NAME	NAME	NAME
1	**P Hibbert**	**D Brown**	**P Kirk**
Approved by	NAME **M Cammock**	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 **MC**
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REVISION	NAME	NAME	NAME
2	**P Hibbert**	**D Brown**	**P Kirk**
Approved by	NAME **M Cammock**	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 **MC**
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REVISION	NAME	NAME	NAME
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
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Executive summary

The County Council has a longstanding proposal to construct a new, modern standard single carriageway road between the M65 terminus in Colne and the Lancashire / North Yorkshire boundary north of Earby. This would remove a significant volume of through traffic from Colne and the villages of Foulridge, Kelbrook and Earby. However, traffic movements between the M65 and West Yorkshire via the A6068 would continue to use the existing route through the North Valley area of Colne. Historically, it was anticipated that the A56 Villages Bypass scheme would benefit the local communities in terms of improved road safety, reduced noise, improved air quality and reduced severance, and would enable the introduction of priority measures for public transport along the old road, together with improved facilities for cyclists.

Much of the work previously undertaken started from the premise that a bypass of Colne and the villages of Foulridge, Kelbrook and Earby was the most appropriate solution. The need for the M65 to Yorkshire Corridor Study has been identified in Lancashire County Council's Local Transport Plan (LTP) Implementation Plan 2012/13 - 2014/15.

The rationale for the M65 to Yorkshire Corridor Study is twofold:

(i) Identify and assess whether there are smaller scale interventions that the County Council and other agencies could introduce to mitigate traffic and environmental problems in Colne that are affordable and deliverable in advance of any bypass or if a bypass in this corridor does not emerge as a priority for major scheme funding, and

(ii) Undertake a desk based review of the existing proposals for an A56 Villages Bypass scheme and potential alternative options and alignments, including an assessment of engineering and environmental constraints and the provision of cost estimates using appropriate assumptions and sources of information.

Any recommended bypass scheme should not prejudice the potential future reinstatement of the Colne to Skipton railway line.

This Stage 3 Report summarises the findings of the review of the major highway proposals undertaken as part of the M65 to Yorkshire Corridor Study.

The shortlisted bypass options, split into southern section and northern section options, are summarised in the table below.

Section	Option	Description
Southern	Red	Based upon the remitted scheme between Vivary Way and the A56 north of Foulridge, following the track bed of the former Colne to Skipton railway line.
	Brown	As the Red Option, but in order to avoid conflict with the railway track bed at Vivary Way, the Brown Option would start from a new junction on the M65 motorway (between the existing Junctions 13 and 14).
	Blue	An offline route between a new junction on the M65 motorway (between the existing Junctions 13 and 14) and the A56 north of Foulridge, which completely avoids the track bed of the former Colne to Skipton railway line.
Northern	Pink	Based upon the northern section of the remitted scheme, this option would start north of Foulridge and tie back in with the A56 to the north of Earby, at the bottom of the Wyswick.
	Purple	As the Pink Option, but with a wider arc around the west side of Earby to a junction with the A56 at the top of the Wyswick.
	Green	An East-West Bypass to the north of Colne which would link up with the A56 and the A6068, and in conjunction with a southern section bypass option would therefore provide a bypass of Colne for traffic using either of these routes.

It is highly unlikely that the Colne to Skipton railway could be reinstated whilst retaining the current protected route of the A56 Villages Bypass (remitted scheme). It is therefore recommended that the current protected route is amended.

A southern section bypass option is likely to provide the majority of the traffic relief and associated journey time savings. If the Red Option were delivered it would preclude the potential future reinstatement of the Colne to Skipton railway along the existing disused track bed.

It is therefore recommended that the Brown Option and the Blue Option be considered for possible major scheme development.

The potential value for money of the northern section bypass options is likely to be less than the southern section bypass options.

The Green Option is unlikely to be viable due to its environmental impact, topographical constraints and resultant high costs.

If the County Council decides to undertake further development work on a bypass, it is recommended that this include traffic, economic and environmental assessments of the Brown, Blue, Pink and Purple Options. This approach will enable the economic and environmental impacts of these options to be assessed in more detail, prior to any potential public consultation exercise.

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1 Introduction

1.1 Background

The County Council has a longstanding proposal to construct a new, modern standard single carriageway road between the M65 terminus in Colne and the Lancashire / North Yorkshire boundary north of Earby, which bypasses the villages on the A56. This would remove a significant volume of through traffic from Colne and the villages of Foulridge, Kelbrook and Earby. However, traffic movements between the M65 and West Yorkshire via the A6068 would continue to use the existing route through the North Valley area of Colne.

Historically, it was anticipated that the A56 Villages Bypass scheme would benefit the local communities in terms of improved road safety, reduced noise, improved air quality and reduced severance, and would enable the introduction of priority measures for public transport along the old road, together with improved facilities for cyclists.

The existing proposals for an A56 Villages Bypass scheme are shown in Figure 1-A.

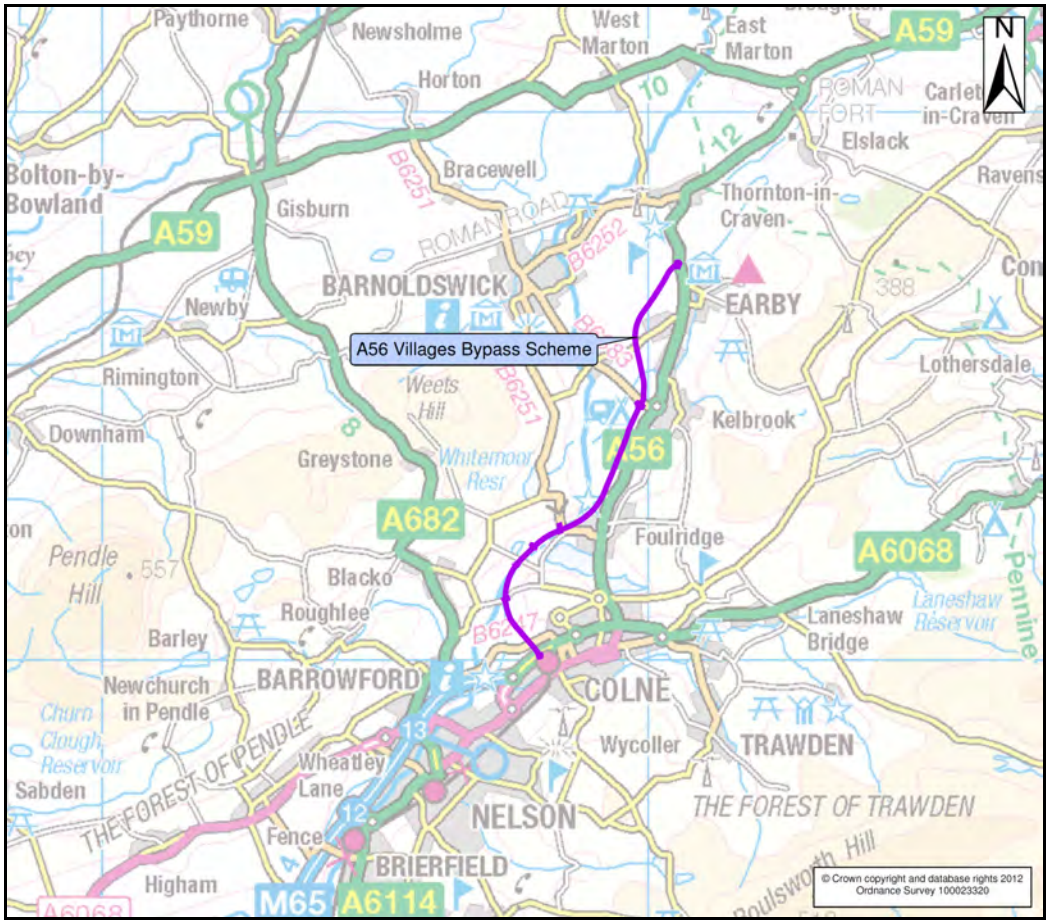

Figure 1-A: Route of Existing Proposals for an A56 Villages Bypass Scheme

The proposed scheme did not emerge as a priority through the work undertaken to inform the Regional Funding Allocations (RFA) advice submitted to the previous Government by the North West region in January 2006. The Coalition Government has subsequently developed an alternative local major transport scheme funding

framework for introduction from 2015/16. This is focused around the creation of Local Transport Bodies contiguous with Local Enterprise Partnership (LEP) areas and the introduction of a Single Local Growth Fund accessed through Growth Deals negotiated between Government and LEPs and based on an assessment of Strategic Economic Plans. All local major transport scheme funding is to be included in the Single Local Growth Fund from 2015/16, with Local Transport Bodies allocated a guaranteed minimum amount of funding on a per capita basis. Guaranteed minima are now confirmed at a level one third below the indicative allocations announced by the Department for Transport in January 2013.

1.2 Rationale for Study

The need for this study has been identified in Lancashire County Council's Local Transport Plan (LTP) Implementation Plan 2012/13 - 2014/15.

Much of the work previously undertaken started from the premise that a bypass of Colne and the A56 villages of Foulridge, Kelbrook and Earby was the most appropriate solution. The rationale for this study is twofold:

(i) Identify and assess whether there are smaller scale interventions that the County Council and other agencies could introduce to mitigate traffic and environmental problems in Colne that are affordable and deliverable in advance of any bypass or if a bypass in this corridor does not emerge as a priority for major scheme funding, and

(ii) Undertake a desk based review of the existing proposals for an A56 Villages Bypass scheme and potential alternative options and alignments, including an assessment of engineering and environmental constraints and the provision of cost estimates using appropriate assumptions and sources of information.

The study should advise whether a package of smaller scale interventions could collectively remove the need for the bypass or reduce the scale of the existing proposals. If the study concludes that new road construction is still necessary, the study will provide an initial recommendation on the optimum solutions to take forward for possible major scheme development. Any new or revised highway proposals should not prejudice the potential future reinstatement of the Colne to Skipton railway line.

1.3 Study Area

The study will focus primarily on the key issues affecting Colne and the villages of Foulridge, Kelbrook and Earby. However, to ensure that the strategic issues between the M65 and Yorkshire are fully understood and that appropriate solutions are identified, the surrounding strategic highway network will also be considered.

The study area includes the length of the M65 motorway from Preston to Colne and also extends eastward to the county boundary with North Yorkshire. The extent of the study area is illustrated in Figure 1-B.

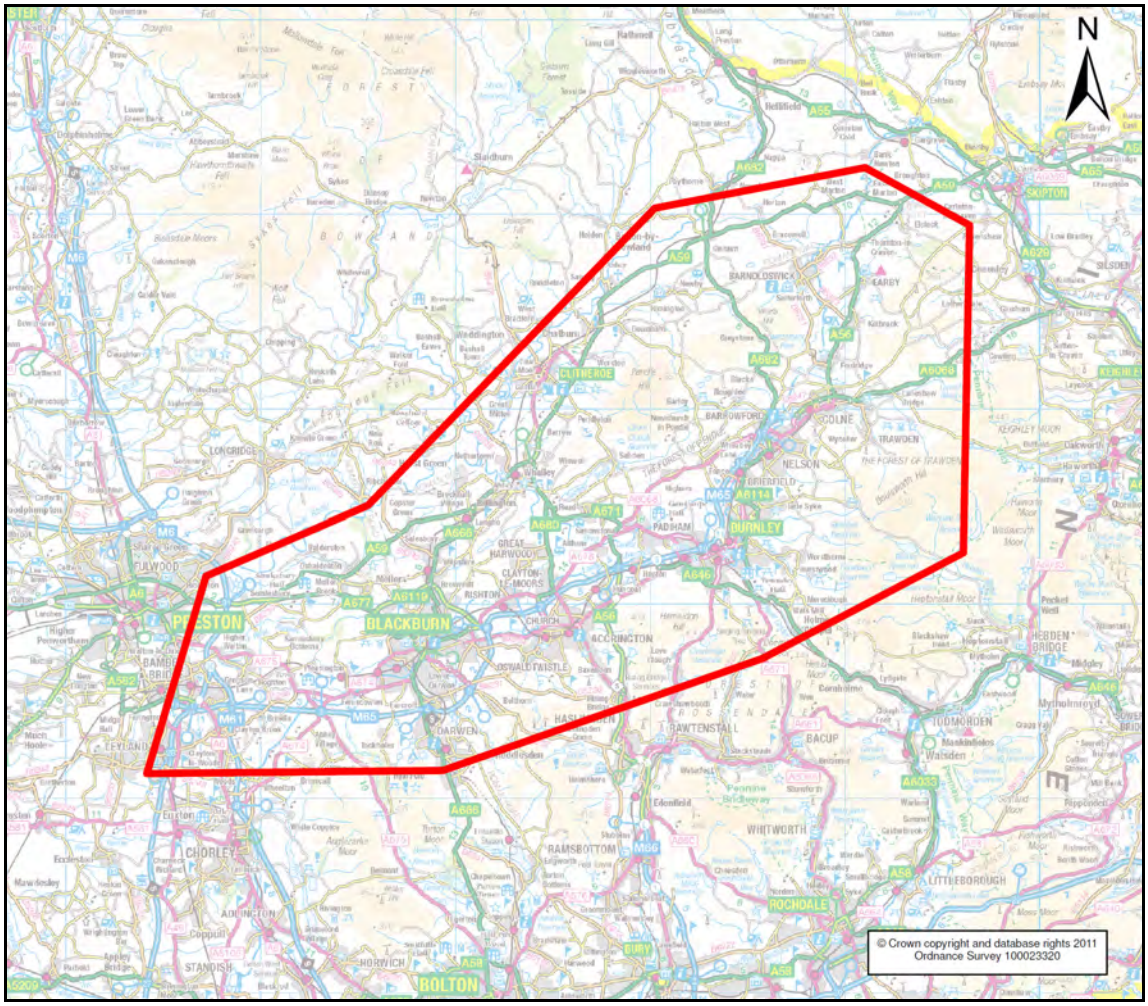

Figure 1-B: Study Area

1.4 Sources of Information

The following sources of information were used to inform this study:

- *Local Transport Plan 2011 - 2021: A Strategy for Lancashire (May 2011)*
- *Lancashire LTP: Implementation Plan 2012/13 - 2014/15 (July 2012)*

1.5 Methodology

The key stages adopted as part of the development of the M65 to Yorkshire Corridor Study are summarised in Figure 1-C.

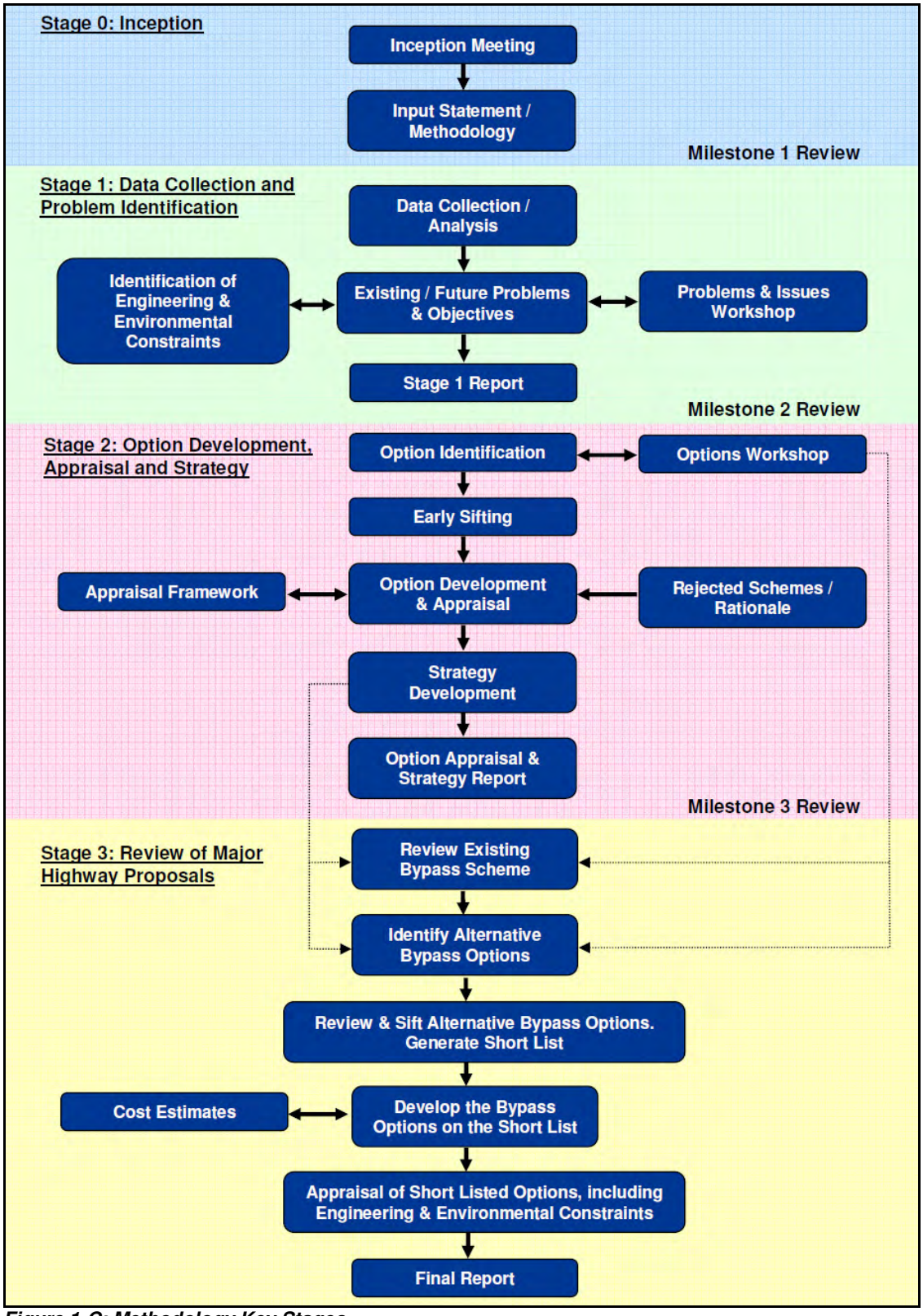

Figure 1-C: Methodology Key Stages

1.5.1 Stage 1

The *Data Collection and Problem Identification stage* (Stage 1) of the M65 to Yorkshire Corridor Study identified the key problems in the study area through analysing a wide range of different types of data and consultation with stakeholders. This process resulted in the identification of a set of five study objectives.

The Stage 1 Report described how a number of strategic routes converge in Colne, resulting in congestion, particularly during peak periods. Currently vehicles travelling between the M65 and Yorkshire experience congestion and consequently unreliable journey times. Evidence confirmed that the A6068 North Valley Road / Vivary Way has the highest traffic flows in Colne and suffers the worst congestion.

1.5.2 Stage 2

The *Option Development, Appraisal and Strategy stage* (Stage 2) of the M65 to Yorkshire Corridor Study resulted in the development of an alternative strategy which consisted of a range of traffic management measures.

The Stage 2 Report concluded that the alternative strategy which has been developed could help to mitigate some of the existing problems and issues experienced on the M65 to Yorkshire corridor. However, in comparison to a Colne bypass, the benefits of the alternative strategy are likely to be limited.

1.5.3 Stage 3

Subsequently a range of different bypass options for Colne have been identified and developed as part of the *Review of Major Highway Proposals stage* (Stage 3) of the M65 to Yorkshire Corridor Study.

The purpose of this Stage 3 Report is to summarise and evaluate the range of bypass options which have been developed.

1.6 Structure

The remainder of this report is structured as follows:

- *Chapter 2: Stage 3 Methodology*
- *Chapter 3: Review of the A56 Villages Bypass (remitted scheme)*
- *Chapter 4: Alternative Bypass Options*
- *Chapter 5: Bypass Options Workshop*
- *Chapter 6: Bypass Options Shortlist*
- *Chapter 7: Development of the Shortlisted Bypass Options*
- *Chapter 8: Appraisal of the Short Listed Bypass Options*
- *Chapter 9: Impact of Railway Reinstatement on Vivary Way*
- *Chapter 10: Summary, Conclusions and Recommendations*

2 Stage 3 Methodology

2.1 Introduction

The *Review of Major Highway Proposals stage* (Stage 3) forms the final phase in the development of the M65 to Yorkshire Corridor Study. It includes the identification of potential major highway proposals aimed at alleviating the underlying problems and issues in the study area.

The key elements of the adopted methodology are shown in Figure 2-A and discussed below.

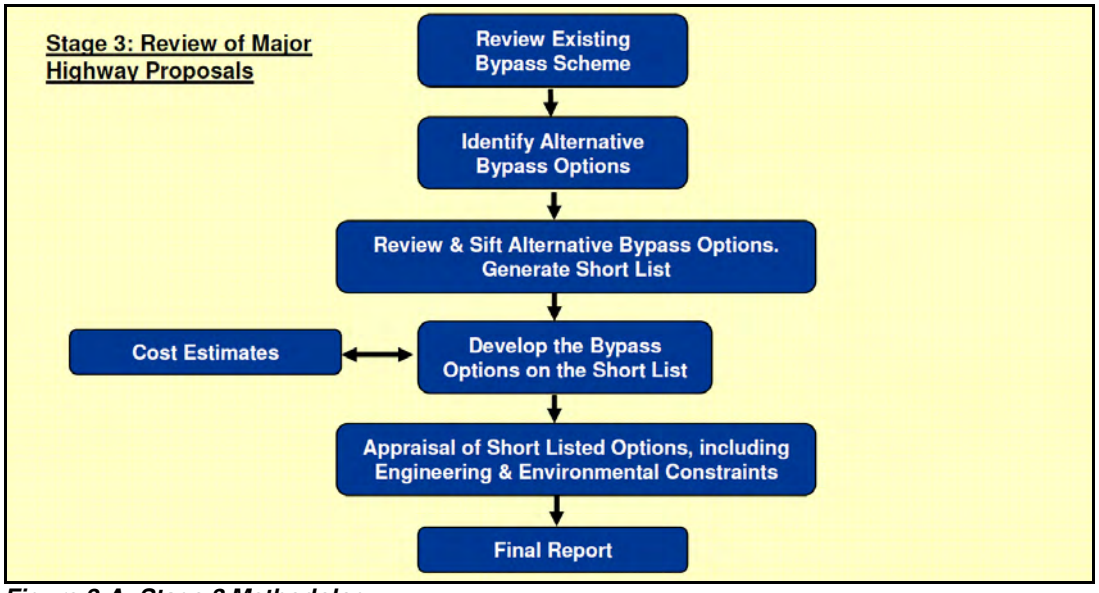

Figure 2-A: Stage 3 Methodology

2.2 Review Existing Bypass Scheme

The existing A56 Villages Bypass (remitted scheme) has been reviewed against the following criteria:

- *Problems & objectives in the study area*
- *Engineering constraints*
- *Environmental constraints*
- *Cost*
- *Impact upon the potential reinstatement of the Colne to Skipton railway*
- *LTP objectives*
- *Study objectives*
- *SWOT analysis*

The findings of the review are presented in Chapter 3.

2.3 Identify Alternative Bypass Options

Following the review of the existing A56 Villages Bypass (remitted scheme), alternative bypass options have been identified. This task was informed by:

- *The data collection and analysis undertaken in Stage 1 of the study*

- *Stakeholder engagement undertaken as part of the study*
- *Historic proposals (including options listed in the historic Public Consultation document)*

The alternative bypass options that have been identified are discussed in Chapter 4.

2.4 Review & Sift Alternative Bypass Options. Generate Short List

In order to identify the most appropriate bypass options, all of the alternative bypass options have been reviewed against the following criteria:

- *Problems & objectives in the study area*
- *Engineering constraints*
- *Environmental constraints*
- *Cost*
- *Impact upon the potential reinstatement of the Colne to Skipton railway*
- *LTP objectives*
- *Study objectives*
- *SWOT analysis*

The alternative bypass options were considered as concepts only at this stage.

A sifting process, informed by highway design engineers at a Bypass Options Workshop, was undertaken in order to generate a short list of alternative bypass options.

The review of the alternative bypass options and the sifting process undertaken is discussed in Chapter 5. The shortlisted bypass options are presented in Chapter 6.

2.5 Develop the Bypass Options on the Short List

Each of the short listed bypass options have been developed to an appropriate level of detail (conceptual design) to allow a more detailed appraisal of each of the options. The development of the short listed bypass options included consideration of:

- *Design standards - what is achievable given any physical constraints*
- *Alignment*
- *Junctions Strategy*
- *Structures*
- *Impact on Colne to Skipton railway line reinstatement*
- *Environmental Constraints*
- *Costs*

Indicative cost estimates for the shortlisted options have been derived based upon previous experience, appropriate assumptions and relevant sources of information. The cost estimates include consideration of any significant structures and earthworks that would be required but exclude land costs. Appropriate assumptions regarding optimism bias have also been included, as per DfT Transport Analysis Guidance (TAG Unit 3.5.9).

Full details relating to the development of the each of the short listed bypass options are included in Chapter 7.

2.6 Appraisal of Short Listed Options, including Engineering & Environmental Constraints

A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the short listed options has been undertaken to allow a clear comparison of the options and thus facilitate the decision making process on which major highway proposal should be considered by the County Council.

The SWOT analysis includes an analysis of the engineering and preliminary environmental constraints applicable to each of the short listed options.

The SWOT analysis is described in detail in Chapter 8.

2.7 Final Report

This Stage 3 Report represents the culmination of the M65 to Yorkshire Corridor Study.

The report presents the findings of the review of the major highway proposals and includes a recommendation on the optimum solutions to take forward if new road construction in the corridor is taken forward as a priority by the County Council.

3 Review of the A56 Villages Bypass (remitted scheme)

3.1 Introduction

Prior to investigating alternative bypass options, a review of the existing A56 Villages Bypass (remitted scheme) was undertaken.

This chapter presents the findings of the review of the existing A56 Villages Bypass (remitted scheme). A SWOT analysis has been undertaken in order to summarise the remitted scheme's strengths, weaknesses, opportunities and threats.

This remainder of this chapter is structured as followed:

- *Scheme History*
- *Scheme Description*
- *SWOT Analysis*

3.2 Scheme History

In February 2000, Lancashire County Council, in association with North Yorkshire County Council, conducted a public consultation exercise in order to gauge opinion on measures to ease traffic congestion along the A56 corridor.

The public consultation results indicated that an overall 58% of respondents were in favour of constructing the A56 Villages Bypass. However, the percentage of responses in favour of the bypass varied significantly depending upon area. For example, 96% of respondents from the North West area of Colne (the area which would derive most benefit) were in favour of a bypass.

Although the County Council continues to protect the line of the A56 Villages Bypass (remitted scheme) it has not been developed in detail.

3.3 Scheme Description

The A56 Villages Bypass (remitted scheme) bypasses Colne and the villages of Foulridge, Kelbrook and Earby. The remitted scheme starts on Vivary Way in Colne and follows the Skipton to Colne railway track bed for the majority of its length. The remitted scheme would utilise almost half of the 11.25miles of railway track bed between Skipton and Colne.

Figure 3-A shows the route of the A56 Villages Bypass (remitted scheme) as well as the Skipton to Colne rail track bed.

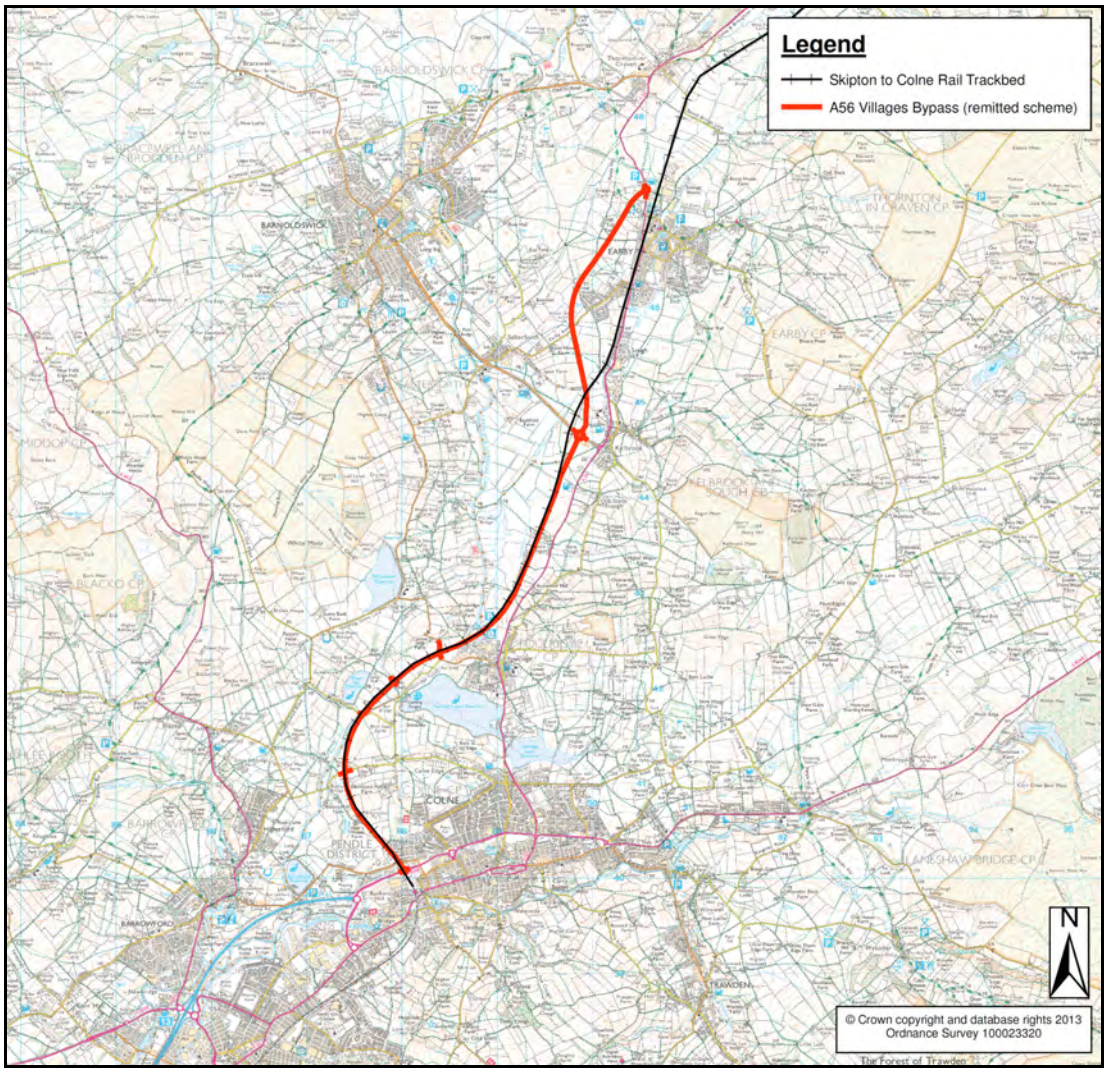

Figure 3-A: A56 Villages Bypass (remitted scheme)

3.4 SWOT Analysis (remitted scheme)

As part of the *Stage 2: Option Development, Appraisal and Strategy Report*, a SWOT analysis was undertaken on the concept of a Colne Bypass Strategy.

Table 3-A below summarises the relevant strengths, weaknesses, opportunities and threats that are specific to the A56 Villages Bypass (remitted scheme) against the following criteria:

- *Problems & objectives in the study area*
- *Engineering constraints*
- *Environmental constraints*
- *Cost*
- *Impact upon the potential reinstatement of the Colne to Skipton railway*
- *LTP objectives*
- *Study objectives*
- *SWOT analysis*

The engineering and environmental constraints associated with the A56 Villages Bypass (remitted scheme) are discussed in more detail in Chapter 7 of this report.

Strengths	Weaknesses
• The remitted scheme scores strongly against the study objectives. • The remitted scheme could reduce congestion in Colne town centre. • The remitted scheme could remove through traffic from the villages of Foulridge, Kelbrook, Earby and Thornton-in-Craven. • The remitted scheme could improve access between the M65 and Yorkshire / Leeds city region.	• Other options considered as part of the M65 to Yorkshire Corridor Study scored higher against the LTP transport priorities than the remitted scheme. • Maintains conflict between local and strategic traffic on Vivary Way. • The remitted scheme would have an adverse impact on the Biological Heritage Site that runs along part of the existing track bed.
Opportunities	**Threats**
• The remitted scheme may help facilitate economic growth in the study area through improving accessibility to and from the strategic road network and within the study area. • Potential to reallocate road space and improve the public realm with Colne town centre.	• The remitted scheme impacts upon the reinstatement of the Colne to Skipton railway line and therefore objections would be likely. • Alternative bypass options may provide better value for money than the remitted scheme. • Compulsory Purchase Orders. • Side Road Orders. • Statutory Bodies. • Funding availability. • Political acceptability • Planning Inquiry

Table 3-A: SWOT Analysis of the A56 Villages Bypass (remitted scheme)

4 Alternative Bypass Options

4.1 Introduction

Following the review of the A56 Villages Bypass (remitted scheme), the next stage in the process was to identify a range of alternative bypass options which could be feasible from an engineering perspective and deliver the key benefits of a bypass scheme.

The purpose of this chapter is to outline the methodology adopted to identify the alternative bypass options and to present the alternative bypass options that have been identified.

The remainder of this chapter is structured as follows:

- *Identification of Alternative Bypass Options*
- *Alternative Bypass Options*

4.2 Identification of Alternative Bypass Options

The following sources were used to identify potential alternative bypass options to be considered as part of the study:

- *Options discussed at the following events which have been organised as part of the M65 to Yorkshire Corridor Study:*

  - *Problems & Issues Workshop (29/11/12)*
  - *Options Workshop (20/02/13)*

- *Options discussed in previous studies. This was important to ensure that this study takes account of the findings of previous studies which have been undertaken.*

- *New options which have emerged as a result of the findings of the data collection and problem identification stage of the M65 to Yorkshire Corridor Study.*

- *Expertise of highways engineers working on the M65 to Yorkshire Corridor Study.*

This process resulted in the identification of nine alternative bypass options.

Identification and preliminary assessment of a range of alternative bypass options has enabled the M65 to Yorkshire Corridor study to provide an initial recommendation on the optimum solutions to take forward for possible major scheme development.

4.3 Alternative Bypass Options

Table 4-A lists the nine alternative bypass options which were identified. At this stage in the process, the alternative options were considered as concepts only. Detailed investigations into the exact scope and locations were not undertaken.

An audit trail spreadsheet was developed to record all of the potential alternative bypass options that have been identified for further consideration. A copy of the alternative bypass options audit trail is included as **Appendix A**.

Option	Name
Alternative Option 1	Colne to Foulridge Bypass
Alternative Option 2	East-West Bypass (to the north of Colne)
Alternative Option 3	East-West Bypass (to the south of Colne)
Alternative Option 4	A56 Villages Bypass (remitted scheme) but starting from M65 J14
Alternative Option 5	A56 Villages Bypass (remitted scheme) but starting from a new junction on the M65 motorway (between the existing Junctions 13 and 14)
Alternative Option 6	Individual Bypasses of the A56 Villages
Alternative Option 7	Upgrade A682 / Barnoldswick Road / B6251 route to form a bypass of Colne
Alternative Option 8	Remitted scheme but with a wider arc around the west side of Earby to cross the A56 at the top of the Wyswick
Alternative Option 9	A new offline highways route starting from a new junction on the M65 motorway (between the existing Junctions 13 and 14) which completely avoids the alignment of the disused Skipton to Colne railway track bed.

Table 4-A: Alternative Bypass Options

Figure 4-A provides an indicative location of the potential route of all the alternative bypass options contained within Table 4-A.

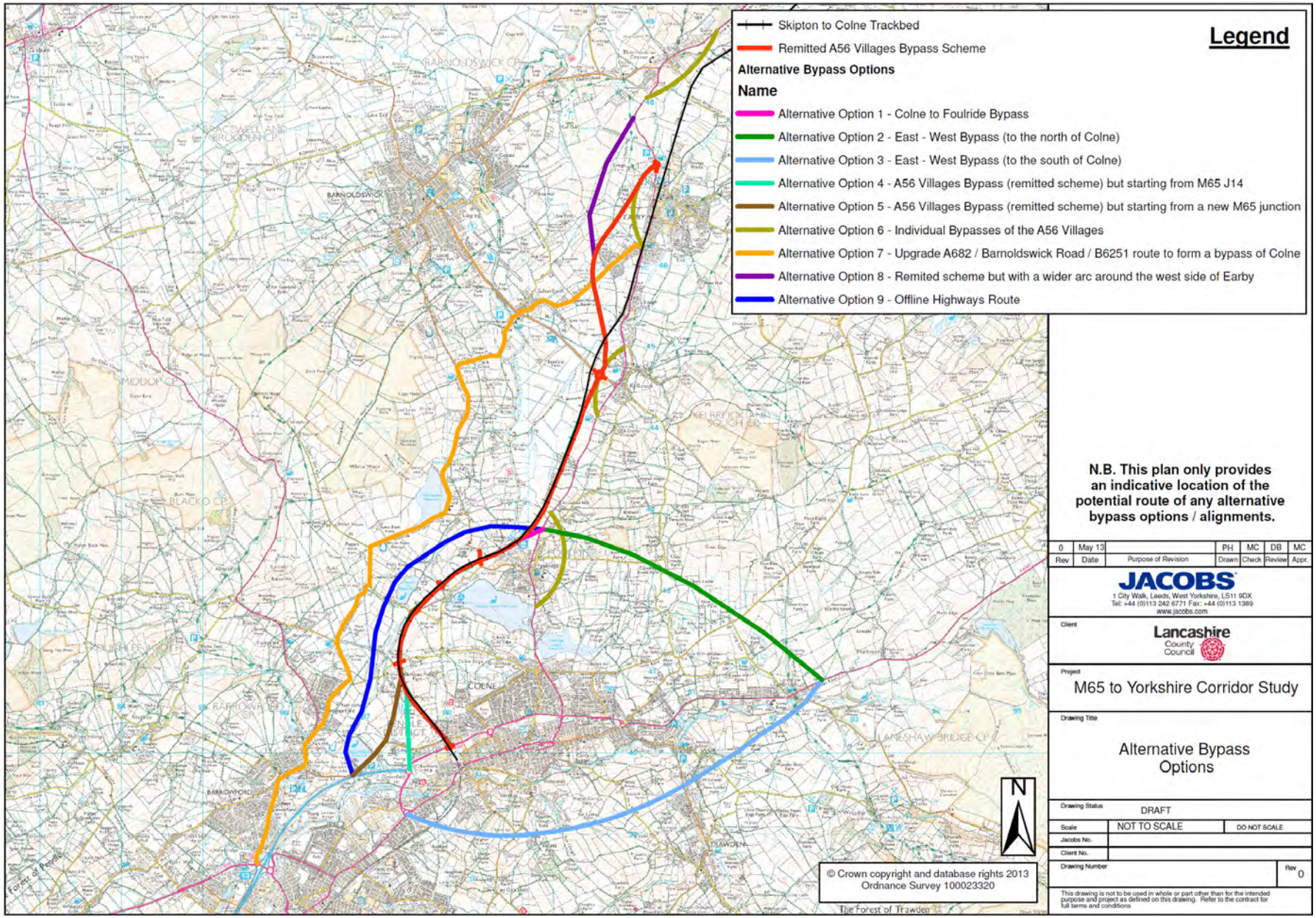

Figure 4-A: Alternative Bypass Options

5 Bypass Options Workshop

5.1 Introduction

Each of the nine alternative bypass options were discussed in detail at a Bypass Options Workshop held at County Hall on Friday 10th May 2013.

The purpose of the workshop was to outline the scope of each of the options, discuss potential challenges to deliverability, potential transport benefits and agree on a short list of options to be taken forward for further consideration.

The Bypass Options Workshop is discussed under the following headings:

- *Attendees*
- *Agenda*
- *Bypass Options*
- *Potential Employment Sites*

5.2 Attendees

The Bypass Options Workshop was facilitated by Jacobs's staff and attended by Officers from Lancashire County Council (LCC) and Pendle Borough Council. A list of attendees is provided below:

- *Mike Cammock* *(Jacobs Project Manager)*
- *Peter Hibbert* *(Jacobs Assistant Project Manager)*
- *Dave Colbert* *(LCC: Project Sponsor)*
- *Peter Kirk* *(Jacobs Highways Director)*
- *Debbie Brown* *(Jacobs Highways PM)*
- *Peter Atkinson* *(Pendle Borough Council)*
- *Neil Watson* *(Pendle Borough Council)*

5.3 Agenda

The agenda used to structure discussions at the Options Workshop was as follows:

1. Project Overview
2. Bypass Options
   - Existing A56 Villages Bypass Scheme
   - Alternative Bypass Options / Alignments
3. Agreement of bypass options short list
4. Next Steps
5. Any Other Business

The majority of the Bypass Options Workshop was used to discuss the viability of the potential alternative options which Jacobs had identified prior to the workshop (based upon the findings of the problem identification and data collection stage).

5.4 Bypass Options

Table 5-A below summarises the bypass options which were discussed at the workshop and the decision which was reached as to whether or not each option should be taken forward for further consideration.

The Bypass Options Workshop minutes contained in **Appendix B** of this report provide a record of the discussions which took place and the justification for the decision reached.

Option	Name	Decision
Remitted Scheme	A56 Villages Bypass (remitted scheme)	Although there are significant engineering and environmental constraints associated with the A56 Villages Bypass (remitted scheme), this option has been retained for further investigation in order to allow comparisons with alternative options.
Alternative Option 1	Colne to Foulridge Bypass	This option provides a variation to the northern section of the remitted scheme and has been retained for further investigation.
Alternative Option 2	East-West Bypass (to the north of Colne)	This option provides a variation to the northern section of the remitted scheme and has been retained for further investigation.
Alternative Option 3	East-West Bypass (to the south of Colne)	This option would not be used by traffic heading north / south on the A56 and is therefore unlikely to alleviate congestion issues in Colne. In addition, significant engineering constraints exist to the south of Colne due to the local topography and the presence of a railway viaduct. This option has therefore been discounted.
Alternative Option 4	A56 Villages Bypass (remitted scheme) but starting from M65 J14	This option would require an additional arm to be added to the existing Junction 14 roundabout at the end of the M65 motorway. This would be difficult to accommodate due to the topography and location of existing properties and developments. Congestion on the M65 motorway on the approach to the Junction 14 roundabout is already an issue. This option has therefore been discounted.
Alternative Option 5	A56 Villages Bypass (remitted scheme) but starting from a new junction on the M65 motorway (between the existing Junctions 13 and 14)	This option provides a variation to the southern section of the remitted scheme and has been retained for further investigation.
Alternative Option 6	Individual Bypasses of the A56 Villages	This option would not bypass Colne and therefore not alleviate the congestion issues in Colne. This option has therefore been discounted.
Alternative Option 7	Upgrade A682 / Barnoldswick Road / B6251 route to form a bypass of Colne	This route would require a significant upgrade to improve capacity and alignment sufficiently to enable it to become the main route. In addition, this route wouldn't help journeys starting / finishing in Colne. This option has therefore been discounted.
Alternative Option 8	Remitted scheme but with a wider arc around the west side of Earby to cross the A56 at the top of the Wyswick	This option provides a variation to the northern section of the remitted scheme and has been retained for further investigation.
Alternative Option 9	Offline Highways Route	This option provides an alternative bypass alignment to the remitted scheme and has been retained for further investigation.

Table 5-A: Bypass Options

The bypass options which have been retained for further investigation have formed the Bypass Options Short List and are discussed in more detail in Chapter 6.

5.5 Potential Employment Sites

It was noted at the Bypass Options Workshop that there are two potential employment sites in Pendle in close proximity to Colne. A potential bypass of Colne could therefore significantly improve access to the two potential employment sites.

Pendle Borough Council has undertaken a preliminary study to investigate potential employment targets for these two employment sites. The findings of the study are summarised in Table 5-B.

Potential Employment Site	Area	Potential Employment
Land North of Foulridge Wharf	25ha	2,977 jobs
Barrowford Road, Colne	22.8ha	2,144 jobs

(Source: Pendle Borough Council)

Table 5-B: Potential Employment Sites

Figure 5-A shows the location of the two potential employment sites.

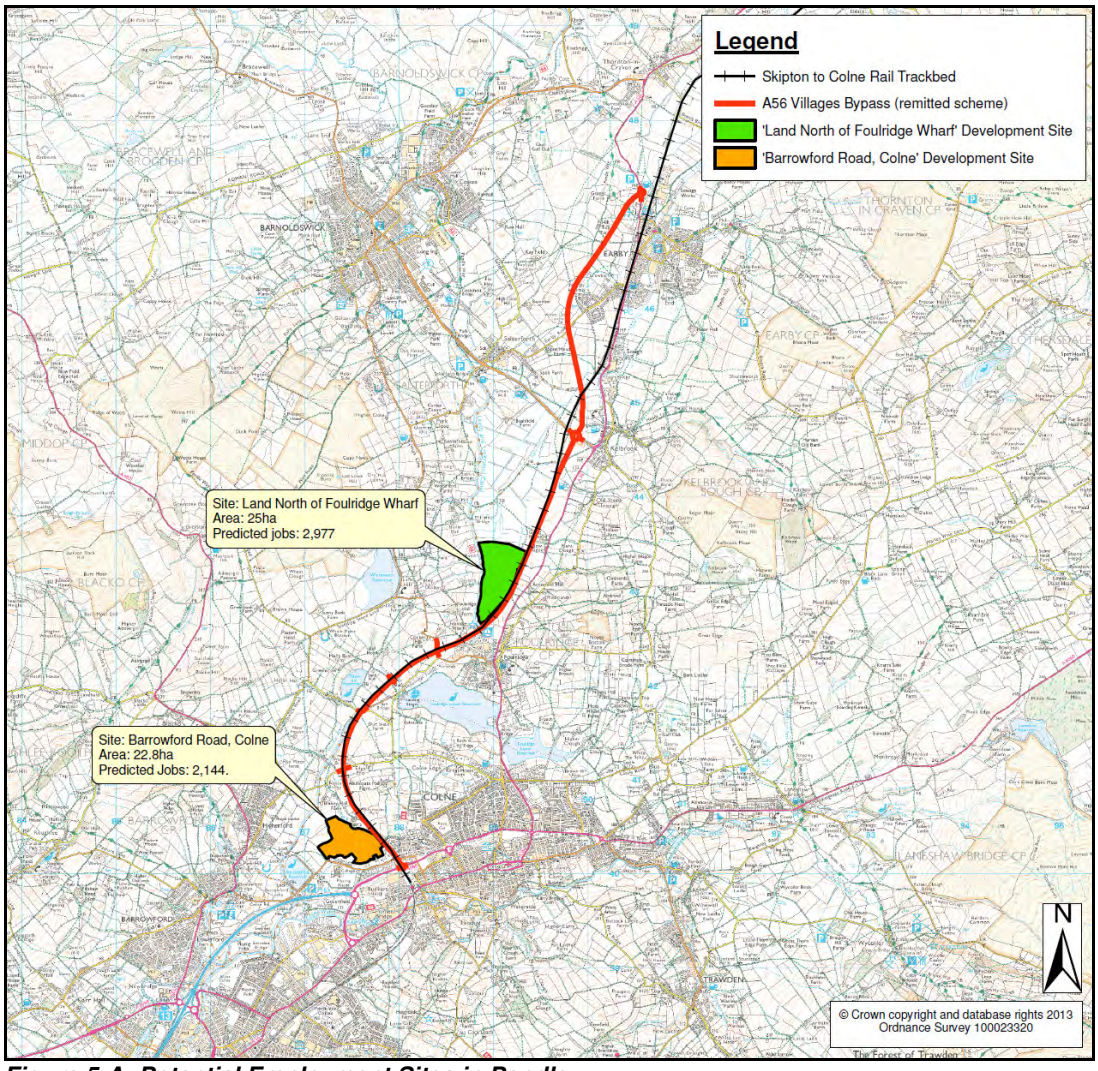

Figure 5-A: Potential Employment Sites in Pendle

6 Bypass Options Shortlist

6.1 Introduction

Following the Bypass Options Workshop, the six shortlisted bypass options to be taken forward for further consideration were grouped into southern section options and northern section options as summarised in Table 6-A:

Section	Option	Description
Southern	Red	Based upon the remitted scheme between Vivary Way and the A56 north of Foulridge, following the track bed of the former Colne to Skipton railway line.
	Brown	As the Red Option, but in order to avoid conflict with the railway track bed at Vivary Way, the Brown Option would start from a new junction on the M65 motorway (between the existing Junctions 13 and 14).
	Blue	An offline route between a new junction on the M65 motorway (between the existing Junctions 13 and 14) and the A56 north of Foulridge, which completely avoids the track bed of the former Colne to Skipton railway line.
Northern	Pink	Based upon the northern section of the remitted scheme, this option would start north of Foulridge and tie back in with the A56 to the north of Earby, at the bottom of the Wyswick.
	Purple	As the Pink Option, but with a wider arc around the west side of Earby to a junction with the A56 at the top of the Wyswick.
	Green	An East-West Bypass to the north of Colne which would link up with the A56 and the A6068, and in conjunction with a southern section bypass option would therefore provide a bypass of Colne for traffic using either of these routes.

Table 6-A: Bypass Options Shortlist

An Audit Trail of all six shortlisted bypass options, grouped under the updated option names used in Table 6-A is included in **Appendix C**. The Audit Trail compares each option against the following criteria:

- *Engineering Constraints*
- *Environmental Constraints*
- *Impacts upon the Colne to Skipton railway track bed*
- *SWOT Analysis*
- *Transport Impacts*

Figure 6-A shows all six of the bypass options which have formed the Bypass Options Shortlist on the one plan for comparative purposes.

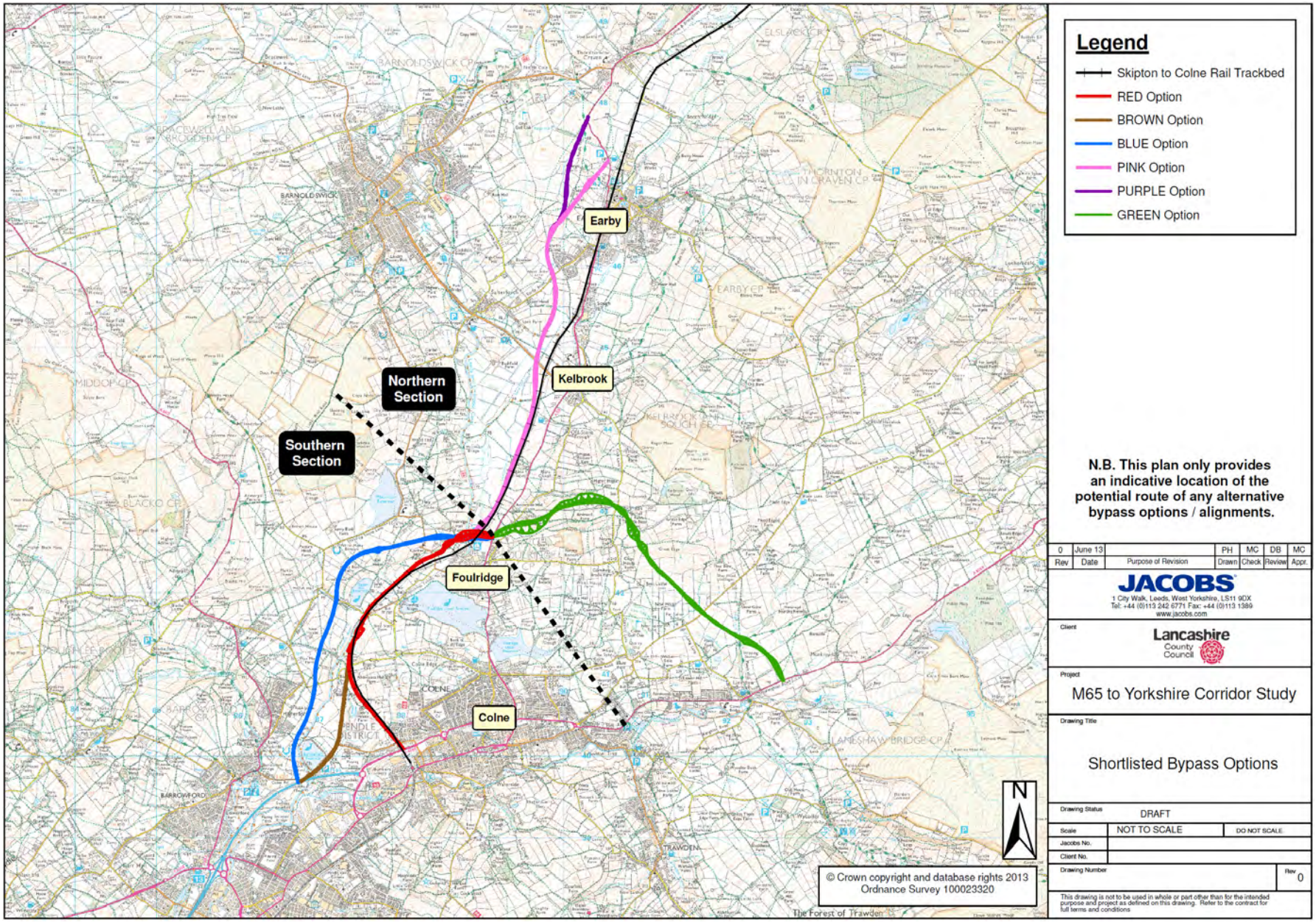

Figure 6-A: Short listed Bypass Options Plan

The remainder of this chapter presents each of the six shortlisted bypass options individually and is structured as follows:

- *Southern Section*
- *Northern Section*

6.2 Southern Section

6.2.1 Red Option

Description: Based upon the remitted scheme between Vivary Way and the A56 north of Foulridge, following the track bed of the former Colne to Skipton railway line.

The indicative route of the Red Option is illustrated in Figure 6-B and described in detail in Chapter 7.

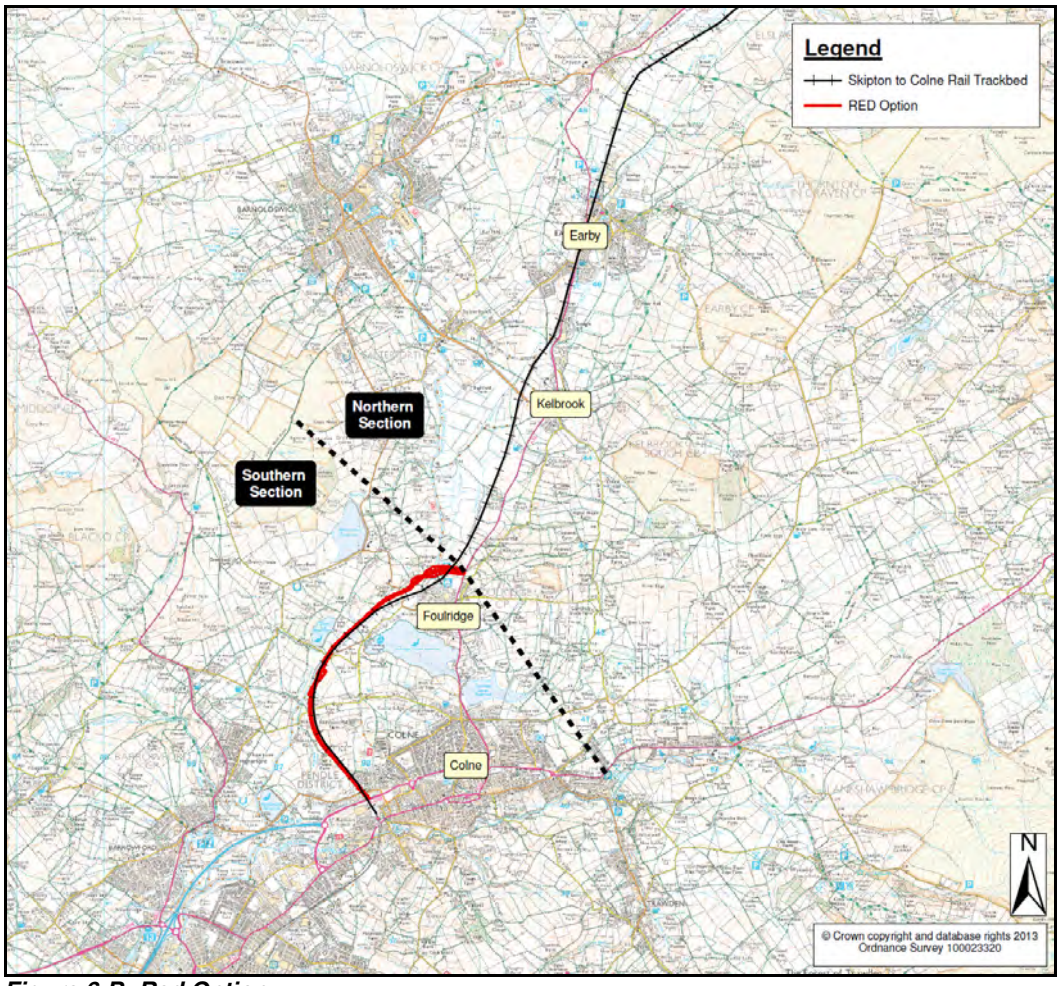

Figure 6-B: Red Option

6.2.2 Brown Option

Description: As the Red Option, but in order to avoid conflict with the railway track bed at Vivary Way, the Brown Option would start from a new junction on the M65 motorway (between the existing Junctions 13 and 14).

The indicative route of the Brown Option is illustrated in Figure 6-C and described in detail in Chapter 7.

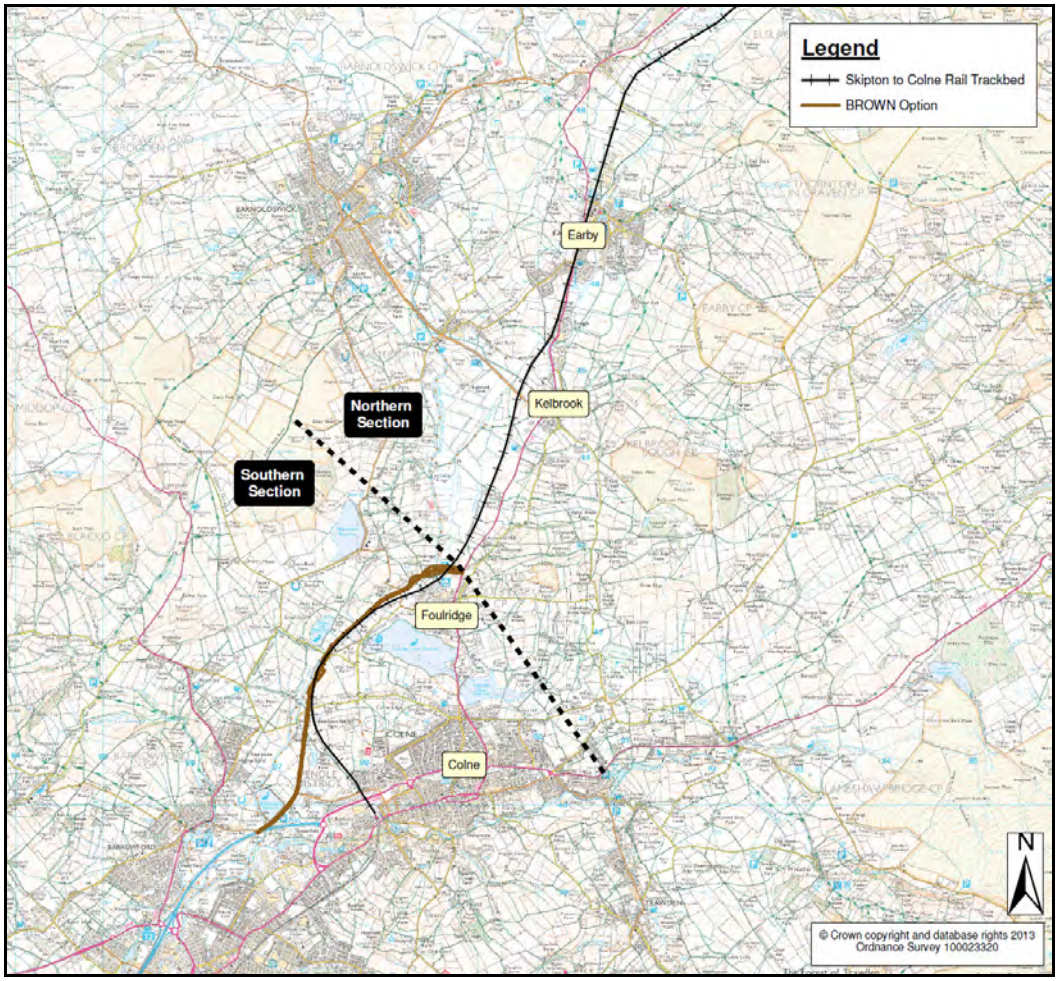

Figure 6-C: Brown Option

6.2.3 Blue Option

Description: An offline route between a new junction on the M65 motorway (between the existing Junctions 13 and 14) and the A56 north of Foulridge, which completely avoids the track bed of the former Colne to Skipton railway line.

The Blue Option ties back in with the A56 at the same location as the Red and Brown Options.

The indicative route of the Blue Option is illustrated in Figure 6-D and described in detail in Chapter 7.

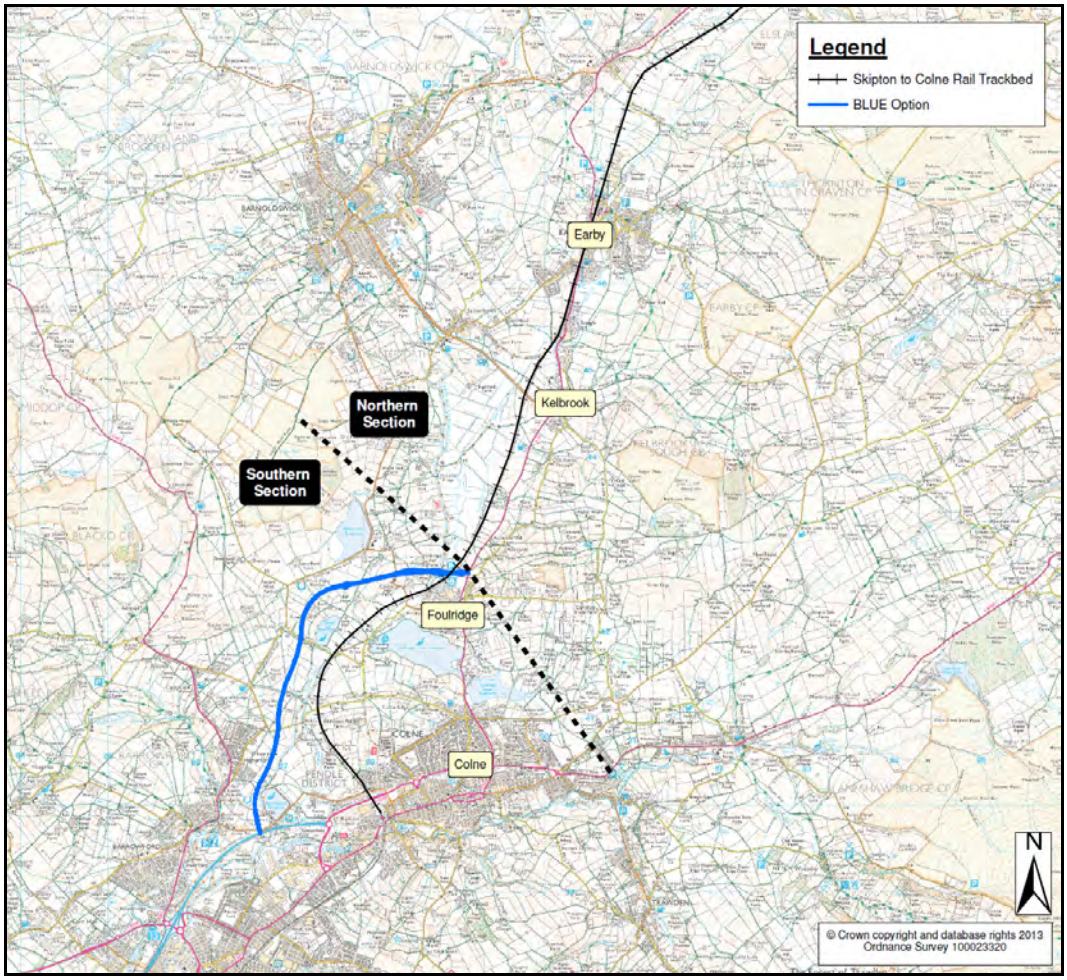

Figure 6-D: Blue Option

6.3 Northern Section

The northern section bypass options in isolation would not provide any relief to the congestion in Colne. It is therefore unlikely that a northern section bypass option would be delivered without a southern section bypass option.

6.3.1 Pink Option

Description: Based upon the northern section of the remitted scheme, this option would start north of Foulridge and tie back in with the A56 to the north of Earby, at the bottom of the Wyswick.

The indicative route of the Pink Option is illustrated in Figure 6-E and described in detail in Chapter 7.

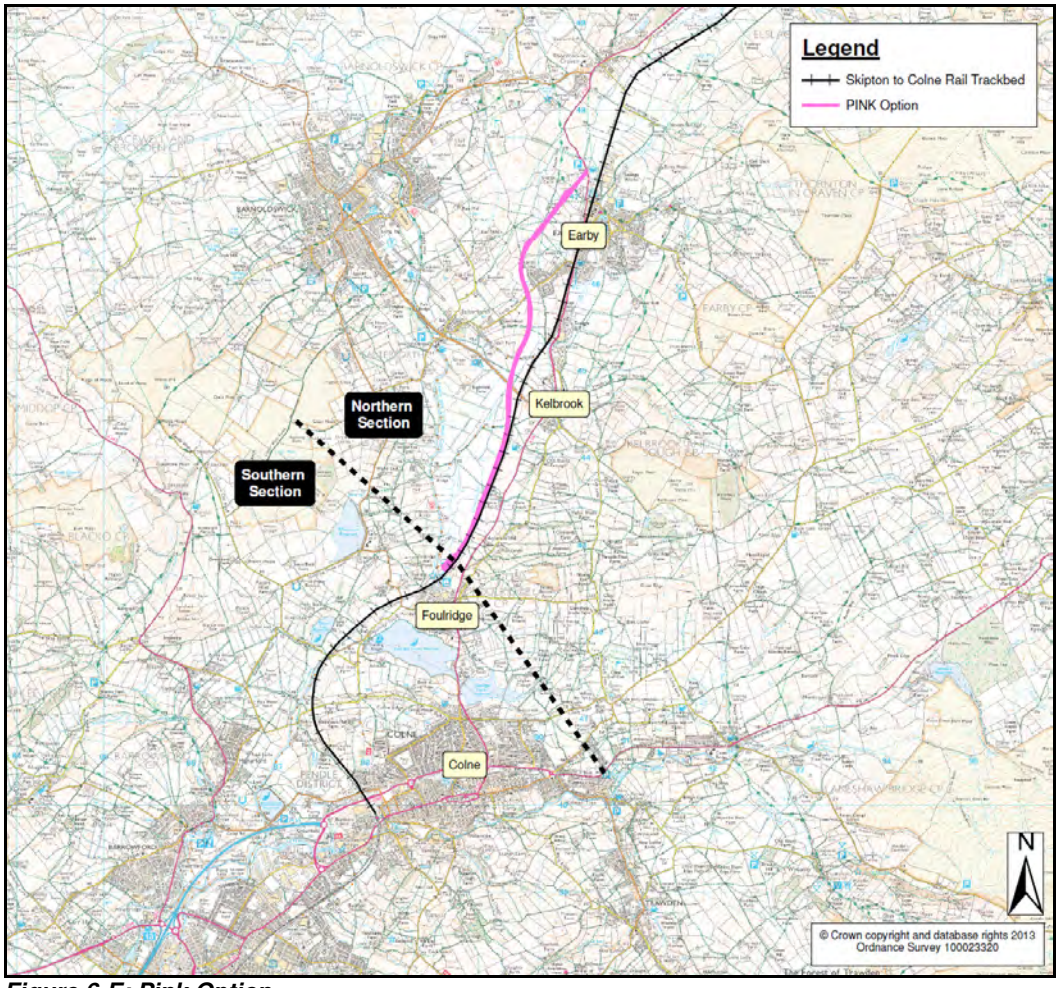

Figure 6-E: Pink Option

6.3.2 Purple Option

Description: As the Pink Option, but with a wider arc around the west side of Earby to a junction with the A56 at the top of the Wyswick.

The indicative route of the Purple Option is illustrated in Figure 6-F and described in detail in Chapter 7.

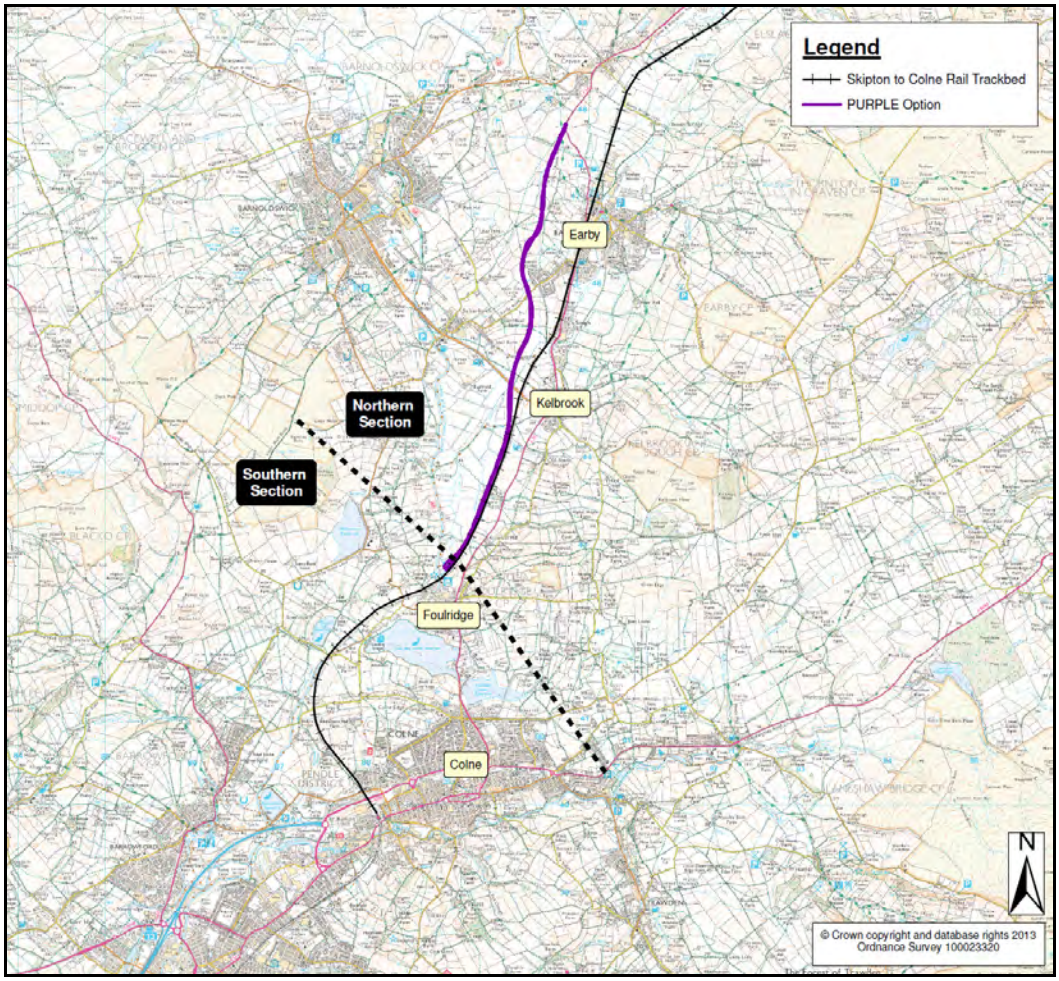

Figure 6-F: Purple Option

6.3.3 Green Option

Description: An East-West Bypass to the north of Colne which would link the A56 and the A6068, and in conjunction with a southern section bypass option would therefore provide a complete bypass of Colne for traffic using either of these routes.

The indicative route of the Green Option is illustrated in Figure 6-G and described in detail in Chapter 7.

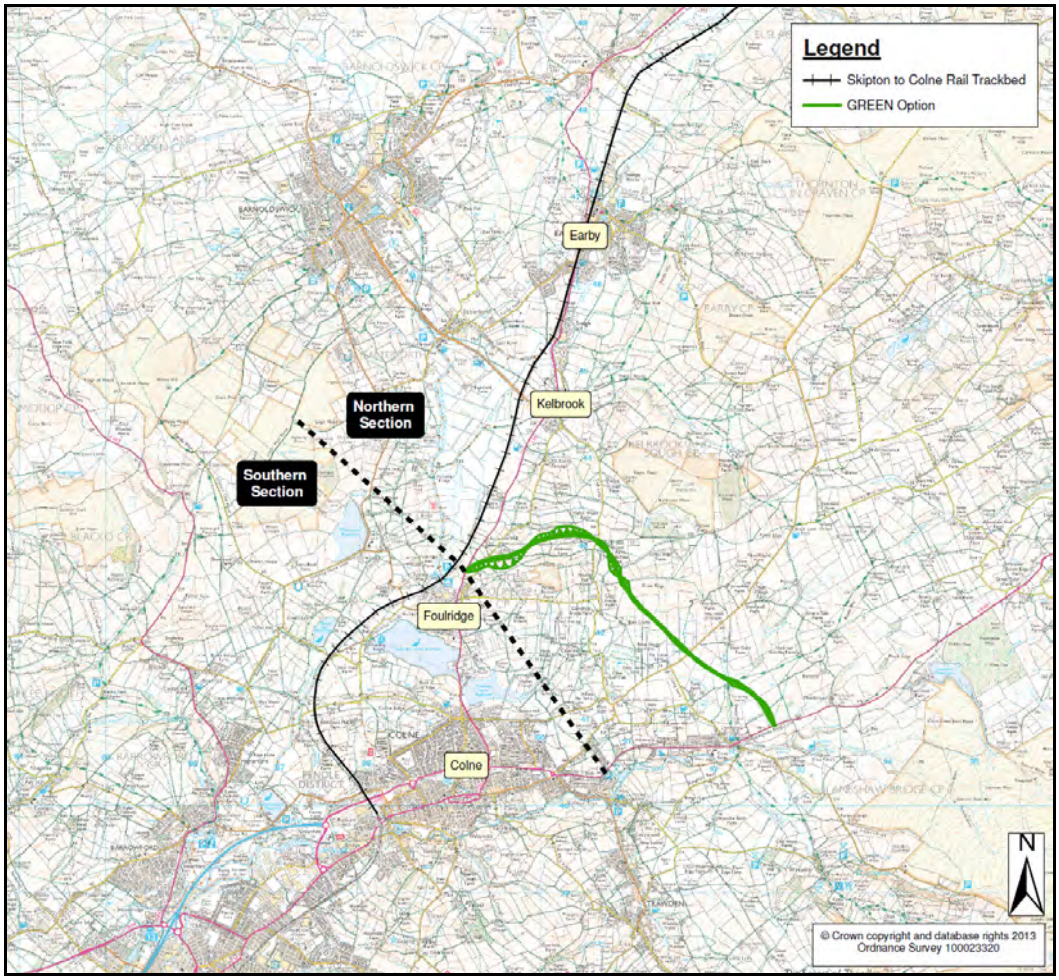

Figure 6-G: Green Option

7 Development of the Shortlisted Bypass Options

7.1 Introduction

Each of the shortlisted bypass options has been developed further to a conceptual design to allow a detailed comparison to be made.

This chapter presents the development of the shortlisted bypass options. For each option, consideration has been given to the following:

- *Design standards*
- *Alignment*
- *Number / type of junctions required*
- *Structures*
- *Impact on Colne to Skipton railway line reinstatement scheme*
- *Environmental Constraints*
- *Costs*

The alignments have been modelled in Bentley MXRoad V8i[1] using landform contour data at 5m intervals. This data has been used to inform the cost estimates for earthwork quantities. Outline drawings of the shortlisted bypass options are included in **Appendix D.**

A summary of each of the shortlisted bypass options is shown in the comparison table in **Appendix E**.

It should be noted that it would be feasible to construct a southern section bypass option independently from a northern section bypass option.

This remainder of this chapter is structured as followed:

- *Assumptions*
- *Red Option*
- *Brown Option*
- *Blue Option*
- *Pink Option*
- *Purple Option*
- *Green Option*

7.2 Assumptions

7.2.1 Design Standards

The design has been undertaken in accordance with various sections of the Design Manual for Roads and Bridges. The following design standards have been applied:

- *TA 79/99 – Traffic Capacity of Urban Roads*
- *TD 9/93 – Highway Link Design*
- *TD 27/05 – Cross-Sections and Headrooms*
- *TD 42/95 – Geometric Design of Major/Minor Priority Junctions*

[1] A 3D Design and Modelling Software Programme

- *HD 24/06 – Traffic Assessment*
- *IAN 73/06 – Design Guidance for Road Pavement Foundations*
- *HD 26/06 – Pavement Design*

All six of the shortlisted bypass options have been defined as rural roads, with a cross section comprising of 2 x 3.65m running lanes, 2 x 1.0m hardstrips, 2 x 2.5m verges and a single 2.0m wide footway.

The pavement design is based on 16.5 million standard axles for a design life of 20 years. Assuming a California Base Ratio (CBR) of 2.5%, the carriageway pavement would comprise of 250mm of Capping, 250mm of Granular Sub-base and 290mm of flexible surfacing.

7.2.2 Alignment

The scheme has been designed to 85kph design speed for all options, with a minimum horizontal curve of 255m radius. Vertically the minimum sag curve is 2,000m radius, the minimum crest curve is 5,500m radius and the maximum gradient is 6%.

The Red, Brown, Pink and Purple options follow the existing rail corridor where feasible and therefore there is limited scope for variations in vertical design. The alignment of the Blue and Green options has been informed by the existing ground level. The horizontal alignment has been chosen to minimise the cut / fill in the earthworks, while complying with the standards in DMRB. The accuracy of the design has been driven by the OS contour information, which is at 5m intervals, and as such the levels on the rail corridor are not well defined.

The cross over between the southern section and the northern section bypass options occurs at a point to the north of Foulridge. Consideration was given to the southern section bypass options joining the A56 to the south of Foulridge. However, there is a restricted width available between Lake Burwain and Foulridge Upper Reservoir and therefore this proposal was not considered viable.

The location of statutory undertakers' equipment has not informed the alignment design as it is unknown at this point how the equipment would impact any of the proposals. An allowance has been included in the cost estimates for any potential diversions that may be required. See drawing B1861600/H/009 included in **Appendix F** for the combined Statutory Undertakers plan.

7.2.3 Junction Strategy

The junction strategy has not been considered in detail and would need to be developed further if any of the bypass options were to be progressed. In general, it is proposed that there would be at grade roundabouts at the southern and northern extent of each option and at the cross over point between the southern and northern sections. It has been assumed that the road would be constructed in advance of any rail reinstatement and therefore intermediate junctions with the side roads would generally be major/minor priority junctions.

No consideration has been given to the locations where agricultural tracks cross the line of the proposed routes. This would be developed as the design is advanced.

7.2.4 Structures

Various structures would be required along any route. It is likely that there would be several minor watercourses that would require culverting. No consideration has been given to accommodation works and it is possible that provision of access may require additional structures. Only the more substantial structures have been identified at this stage. It has been assumed that the clearance over the potential railway would need to be 6m, which is similar to that required for a bridge over a highway. Wherever possible, existing structures have been utilised in the design, although no assessment has been made as to their current condition.

7.2.5 Impact on Railway Reinstatement

The typical cross section of the corridor for the road running adjacent to the railway is shown on drawing B1861600/SK009 in **Appendix G**. The combined road and rail corridor would require a minimum width of 25.5m plus local widening for bends and visibility. Localised widening would be required to incorporate both the railway and the road. This cross section does not include for the extent of any earthworks, which could increase the corridor width significantly.

Previous work has been undertaken by Steer Davis Gleave to consider the impact of reinstating the Skipton to Colne railway[2] and the impact on this railway of the remitted scheme[3]. This report will consider the impact of each option and identify where the construction of the road would preclude later development of the railway.

7.2.6 Environmental Constraints

The environmental constraints have been identified using the data from the Environment Agency website and information provided from Lancashire County Council. The environmental constraints plans are included in **Appendix H**. These have been used to inform the initial route alignments. Further detailed environmental assessment would be required in the examination of any routes taken forward from this study.

7.2.7 Costs

A number of assumptions have been made in developing the cost estimates and these are listed within **Appendix I** along with the details of the cost estimates.

The cost estimates are high level estimates and should be considered as mid range, with ± 40% variance. The ± 40% in the cost estimates allows for the accuracy level associated with producing cost estimates based upon the information available at this stage.

If any of the bypass options are developed further, the cost estimates will need to be further refined.

[2] Future of the Skipton - Colne Railway Formation (Steer Davis Gleave, August 2003)
[3] Assessment of an Alternative Alignment for the A56 (Steer Davis Gleave, October 2003)

7.3 Red Option

7.3.1 Overview

The Red Option is based upon the southern section of the remitted scheme.

The Red Option starts from a new junction on Vivary Way and follows the disused railway track bed before terminating at a new junction with the A56 to the north of Foulridge.

The Red Options is 3.8km long and has 3 structures and 3 intermediate junctions.

An outline drawing of the Red Option is included in **Appendix D** (Drawing B1861600/H/002).

7.3.2 Alignment

The alignment predominantly follows the disused track bed in the bottom of the valley. However, to bring this option to an acceptable junction with the A56 at the northern end and to maintain an acceptable horizontal alignment over the railway and canal, the road deviates to the west of the track bed.

The Red Option has been altered from the alignment of the remitted scheme as the latter ran along the centre of the railway track bed, thus precluding the potential future reinstatement of the railway. One of the conditions of the M65 to Yorkshire Corridor Study was that any new or revised highway proposals should not prejudice the potential future reinstatement of the Colne to Skipton railway line. The alignment of the Red Option has therefore been set at the western side of the rail corridor in order to maximise the space available for a potential railway. In doing so, this alignment removes the need to cross the railway twice and reduces the interaction with the canal. If the railway were to be constructed after the road, then all of the side road junctions to the east of the road would be severed, unless grade separated crossings were constructed, which would be an additional cost to railway reinstatement.

The design would include relaxations to a 3,000m radius crest curve in two locations, at chainage 586 to 793 and 3344 to 3529, to minimise the earthworks volumes.

There is a pinch point around chainage 1700 due to the close proximity of the canal and the track bed. The new road would run between the canal and the railway at this location. Whilst there appears to be sufficient space to widen the corridor towards the canal, there is a risk of undermining the canal construction. It is likely that the Council would have to seek approval from the Canal and River Trust to undertake work in close proximity to the canal, which could be a risk to delivery of the project. In addition, there may be a need to strengthen the canal tunnel where it is crossed by the new road.

The road would be on a small embankment for the first 250m at the southern end, as the existing ground is lower than Vivary Way, it then requires a series of cuttings and embankments to maintain a vertical alignment that complies with the geometric constraints in the design standards.

The road would be on significant embankment (approximately 12-14m above existing ground level) at the northern end of the route. This embankment is

necessitated due to the requirement to bridge the Leeds to Liverpool canal and the Skipton to Colne Railway which is on embankment in this area and to tie into the A56 which is located part way up the valley side.

Access could be provided into the potential employment sites at Barrowford Road and the land north of Foulridge Wharf. Both these sites would require the construction of an access road from the junction with the bypass to the employment site boundary.

7.3.3 Junction Strategy

The Red Option starts at a new at grade roundabout on Vivary Way. There is a conflict between Vivary Way and the potential future reinstatement of the railway at this location due to the narrow corridor.

Assuming the bypass were constructed in advance of the railway, an at grade roundabout would be provided with Vivary Way. Construction of an at grade roundabout would preclude the future reinstatement of the railway. For the purposes of this report and for providing a cost estimate for comparison, the Red Option retains an at grade roundabout with Vivary Way.

If the railway were reinstated in the future, the level of Vivary Way would subsequently have to be adjusted and it is assumed that it would be raised. The junction on Vivary Way containing the bypass would then need to be reconstructed at this higher level. The bypass would need to run along the line of the railway at a raised level, requiring a significant structure over the length necessary to reduce the level difference. In addition, Barrowford Road would be severed by the bypass due to the level difference. The costs and space required to facilitate this raised junction layout are likely to be excessive and therefore this layout is unlikely to be viable.

The Red Option would require four arm staggered at grade priority junctions at Red Lane, Slipper Hill and the B6251 Whitemoor Road. There could be a priority junction for the access to Ball House, Holly Bush, Sand Hall and Mistralls, or access may be provided off Standing Stone Lane. There would be no connection with the private road at chainage 3400 (the extension of Station Road), as access to the property on this road could potentially be maintained by extending the access to Cragg Nook Cottage.

7.3.4 Structures

The Red Option passes through the existing road over bridge on Barrowford Road, this structure may require some modifications as part of this scheme.

The Red Option crosses the line of the canal at around chainage 1900, shortly after the canal has entered Foulridge Tunnel. The strength of this tunnel has not been assessed, although it is understood that it was constructed using the cut and cover technique and is likely to require strengthening.

There would be the need for a new bridge over both the canal and the track bed at around chainage 3500 - 3800. The railway would have to cross the canal at this location, and therefore for the road to cross over both these features, it will have to be at around 16.5m above the existing ground level at this point. A long section sketch along the route in this area is included in **Appendix J** (B1861600/SK003). There would be significant earthworks in this area, however the height of the road would be relatively small in comparison to the valley sides which rise a further 150 -

250m above the level of the road. Consideration was given to moving the junction further north along the A56, where there is greater separation between the railway and the canal. However, the vertical alignment is driven by the level of the A56 which is part way up the valley side. It is therefore considered that there is little benefit in extending the route.

A culvert would be required at around chainage 2400 for an existing watercourse that flows into Wanless Water.

7.3.5 Impact on Railway Reinstatement

The remitted scheme currently runs along the track bed as this is an existing corridor, as such it would preclude the potential future reinstatement of the railway. The alignment of the Red Option has therefore been offset to the western side of the corridor in order to maximise the available space for the railway. However, construction of an at grade junction with Vivary Way would still preclude the potential future reinstatement of the railway. Construction of an elevated junction on Vivary Way is extremely unlikely to be viable from a cost and environmental perspective.

Localised widening would be required to accommodate both the railway and the road, which would require a minimum width of 25.5m and may involve property acquisition and demolition.

As discussed in section 7.3.2, there is a pinch point at around chainage 1700 where the space available is constricted by the canal.

In addition, as discussed in section 7.3.4, the bypass would move away from the track bed to the west at around chainage 3600 to provide an acceptable alignment to cross the line of the railway.

7.3.6 Environmental Constraints

The existing rail corridor has been designated a Biological Heritage Site by Lancashire County Council.

The alignment passes through grade 4 (poor quality) agricultural land and Environment Agency flood zones 2 and 3. The Red Option also crosses the line of the Pendle Cycleway and the Leeds Liverpool canal.

7.3.7 Costs

The Red Option has a preliminary cost estimate of £34 million ± 40%. A detailed breakdown of this cost estimate is included in **Appendix I**.

This preliminary cost estimate is only intended to provide an indication of the comparative difference in price of the shortlisted bypass options. This cost is based upon current information and assumptions available which may change during any future design development. This cost should be updated and verified if the design progresses. It is therefore recommended that this cost should not be used or relied upon for investment decisions.

7.4 Brown Option

7.4.1 Overview

The Brown Option runs from a new roundabout on the M65 motorway approximately 500 metres west of the existing M65 terminal roundabout (Junction 14), and joins the Red Option alignment at chainage 1600 where it then follows the track bed before terminating at a new junction with the A56 to the north of Foulridge. The affected length of M65 is not a trunk road and is therefore the responsibility of Lancashire County Council.

The Brown Option is 4.2km long and has 3 structures and 4 intermediate junctions.

An outline drawing of the Brown Option is included in **Appendix D** (Drawing B1861600/H/003).

7.4.2 Alignment

The Brown Option passes to the east of Barrowford Reservoir, initially on the existing alignment of Barrowford Road, and then joins the alignment of the Red Option at chainage 1600. The Brown Option therefore avoids the relaxation to the crest curve required on the Red Option at chainage 586 to 793. As with the Red Option, it has been assumed that the alignment will run to the west of the rail corridor.

Approximately 700m of Barrowford Road would be required for the bypass, although this road would need upgrading to bring it to the same cross section standard as the remainder of the route.

Direct access could be provided into the potential employment site at Barrowford Road from the junction where the alignment leaves the line of Barrowford Road. Access into the potential employment site on the land north of Foulridge Wharf would be the same as for the Red Option.

7.4.3 Junction Strategy

The Brown Option would start from a new at grade roundabout on the M65 approximately 500 metres west of the existing M65 Junction 14. It has been assumed that the M65 would be reclassified as an all purpose dual carriageway from either junction 13 or this new junction to Junction 14. Reclassifying this length of M65 and introducing a new roundabout would reduce approach speeds to the existing junction 14 roundabout. Currently there are a number of accidents occurring here and these would most likely reduce. The new junction would be designed for high approach speeds and suitable signing and road markings would be included in the detailed design to minimise the likelihood of the accidents relocating to this new roundabout. The new junction would also provide access to Colne Road towards Barrowford.

The Brown Option would have the same junctions as the Red Option, with an additional three arm priority junction with Barrowford Road at chainage 700, on the eastern side of the route.

7.4.4 Structures

This variation has the same structures over the canal and the track bed as required in the Red Option. The Brown Option utilises the existing Barrowford Road bridge over the canal at chainage 100, assuming that it is suitable to carry the new road. In addition this alignment does not affect the bridge on Barrowford Road over the disused railway track bed.

A culvert would be required at around chainage 2800 for an existing watercourse that flows into Wanless Water.

7.4.5 Impact on Railway Reinstatement

The Brown Option avoids the conflict associated with locating a new junction on Vivary Way and reinstatement of the railway.

The impact on the potential railway reinstatement from chainage 1600 heading north is the same as with the Red Option, with particular issues at chainage 2000 (pinch point with canal) and chainage 4000 (northern crossing of the Colne to Skipton railway line track bed).

7.4.6 Environmental Constraints

The potential environmental impact is similar to that of the Red Option. The Brown Option passes through the Environment Agency flood zones 2 and 3 in two locations, although the length affected is similar to the Red Option. The Brown Option crosses the Pendle Cycleway twice. The length of the existing rail corridor affected by this alignment is less than in the Red Option and there is a length of the route running along existing highway which further reduces the potential environmental impact.

7.4.7 Costs

The Brown Option has a preliminary cost estimate of £34 million ± 40%. A detailed breakdown of this cost estimate is included in **Appendix I**.

This preliminary cost estimate is only intended to provide an indication of the comparative difference in price of the shortlisted bypass options. This cost is based upon current information and assumptions available which may change during any future design development. This cost should be updated and verified if the design progresses. It is therefore recommended that this cost should not be used or relied upon for investment decisions.

7.5 Blue Option

7.5.1 Overview

The Blue Option runs from a new roundabout on the M65 motorway approximately 500 metres west of the existing M65 terminal roundabout (Junction 14), and follows a line to the west of the Red and Brown options and the Leeds Liverpool Canal. It passes through agricultural land before terminating at a new junction with the A56 to the north of Foulridge. The affected length of M65 is not a trunk road and is therefore the responsibility of Lancashire County Council.

The Blue Option is 4.7km long and has 3 structures and 3 intermediate junctions.

An outline drawing of the Blue Option is included in **Appendix D** (Drawing B1861600/H/004).

7.5.2 Alignment

The Blue Option passes to the west of Barrowford Reservoir so that the route remains to the west of the canal, up to the crossing point close to the junction with the A56. Consideration was given to a variation which followed the southern section of the Brown Option for around 750m and then deviated to the west to rejoin the Blue Option. However, this variation would require an additional structure to cross the canal and so was not progressed due to the additional cost.

The design would include relaxations to 3,000m on the crest curve in two locations at chainage 1333 to 1594 and 2864 to 3000 to minimise the earthworks volumes. The gradient at chainage 3973 to 4146 is at the maximum of 6%. The cut / fill balance cannot be rationalised on the approach to the canal and track bed crossing. The reinstated railway would have to cross over the canal, and the road then crosses the railway, some 12-14 metres above existing ground level.

This alignment would be unable to provide for direct access into the potential employment site at Barrowford Road as it is severed from the site by the canal. However, Barrowford Road would be directly linked with the M65 at the new junction. Access into the potential employment site on the land north of Foulridge Wharf would be the same as for the Red and Brown Options.

7.5.3 Junction Strategy

The Blue Option would start from a new at grade roundabout on the M65 as with the Brown Option. The Blue Option would require four arm staggered priority junctions at Red Lane, Slipper Hill and the B6251 Whitemoor Road. The B6247 Barrowford Road / Colne Road would be realigned into the new at grade junction on the M65. As in the Red and Brown Options, alternative access provisions would be required to the properties on the private road at chainage 4300 (the extension of Station Road).

7.5.4 Structures

This option has the same structures over the canal and the track bed as required with the Red and Brown options. A culvert would be required at around chainage 3200 for an existing watercourse that flows into Wanless Water.

7.5.5 Impact on Railway Reinstatement

The Blue Option has no impact on the potential railway reinstatement other than where it crosses the line of the track bed at chainage 4500. The vertical alignment at this location is determined by that of the A56 and there would provide sufficient headroom for the railway to pass under the road.

7.5.6 Environmental Constraints

The Blue Option only affects the Biological Heritage Site of the railway corridor where it crosses at chainage 4500.

As with the Red and Brown options, the alignment passes through grade 4 (poor quality) agricultural land for the majority of its length. However, there is a 540m length (chainage 3930 to 4470) which passes through grade 3 (good to moderate quality) agricultural land. No Environment Agency flood zones or listed buildings are directly affected by the route. The Blue Option crosses the line of the Pendle Cycleway.

7.5.7 Costs

The Blue Option has a preliminary cost estimate of £38 million ± 40%. A detailed breakdown of this cost estimate is included in **Appendix I**.

This preliminary cost estimate is only intended to provide an indication of the comparative difference in price of the shortlisted bypass options. This cost is based upon current information and assumptions available which may change during any future design development. This cost should be updated and verified if the design progresses. It is therefore recommended that this cost should not be used or relied upon for investment decisions.

7.6 Pink Option

7.6.1 Overview

The Pink Option is based upon the northern section of the remitted scheme.

The Pink Option starts from a junction with the southern section bypass options, just to the north of Foulridge. The route follows the disused track bed as far as Kelbrook and terminates at a new junction with the A56 to the north of Earby, at the bottom of the Wyswick.

The Pink Option is 5.1km long and has 4 structures and 2 intermediate junctions.

An outline drawing of the Pink Option is included in **Appendix D** (Drawing B1861600/H/005).

7.6.2 Alignment

To facilitate the potential future reinstatement of the railway, the Pink Option has been offset to the west of the track bed for approximately 1,800m. The route then deviates further to the west to pass around Earby. Currently the forward visibility on B6383 Barnoldswick Road is sub-standard on the approaches to the existing bridge over the track bed. As the new road will be on embankment at this point, Barnoldswick Road would be realigned bringing a wider improvement to the existing highway network. The Pink Option joins the A56 at the bottom of the hill known locally as the Wyswick, which has a steep gradient and a poor horizontal alignment.

The design would include relaxations to 3,000m on the crest curve at two locations (chainage 52 to 176 and chainage 3871 to 4113) in order to minimise the earthworks volumes. The Pink Option is located on the valley side as it passes to the west of Earby and therefore there are more earthworks required to provide a platform for the road construction.

Direct access could be provided into the potential employment site identified on the land to the north of Foulridge Wharf, through the introduction of a new junction or off the proposed junction between the southern and northern sections of the bypass. The alignment of the Pink Option may result in some of the potential employment land being lost.

7.6.3 Junction Strategy

The Pink Option would require a junction to be added onto the southern section bypass options, located between the canal and track bed crossings. This section of the road is on a 12-14m high embankment and the design of this junction would need careful consideration if this option is developed further.

There would be a new at grade roundabout at the junction with the B6383, Barnoldswick Road and a staggered four arm priority junction with Earby Road between Salterforth and Earby. A new at grade roundabout would be constructed at the junction with the A56, at the bottom of the Wyswick. Consideration will need to be given on how best to provide access to the properties on Hill Top Lane and to The Grange.

7.6.4 Structures

The Pink Option would require 4 culverts, at chainage 180, 750, 1800 and 3800. No bridges have been identified. It is possible that retaining structures may be required towards the northern extent of the route to reduce the earthworks in the cuttings at chainage 4000 and 4700.

7.6.5 Impact on Railway Reinstatement

The remitted scheme runs along the disused track bed to the north of Foulridge and would therefore preclude the potential future reinstatement of the railway. The Pink Option's alignment has therefore been offset to the western side of the disused track bed in order to avoid impacting on the reinstatement of the railway. This eliminates the need for the road to cross the railway.

7.6.6 Environmental Constraints

As the Pink Option has been offset to the west of the railway track bed it has a minimal impact on the Biological Heritage Site of the corridor.

The Pink Option passes through both grade 3 (good to moderate quality) and grade 4 (poor quality) agricultural land for the full length. A total of 110m of the Pink Option passes through Environment Agency flood zones 2 and 3.The Pink Option crosses regional route 91 Lancashire Cycleway.

7.6.7 Costs

The Pink Option has a preliminary cost estimate of £24 million ± 40%. A detailed breakdown of this cost estimate is included in **Appendix I**. It should be noted that this would be in addition to the cost of a southern bypass option.

This preliminary cost estimate is only intended to provide an indication of the comparative difference in price of the shortlisted bypass options. This cost is based upon current information and assumptions available which may change during any future design development. This cost should be updated and verified if the design progresses. It is therefore recommended that this cost should not be used or relied upon for investment decisions.

7.7 Purple Option

7.7.1 Overview

The Purple Option is very similar to the Pink Option, varying only at the northern extent. The Purple Option starts from a junction with the southern section bypass options, just to the north of Foulridge. The route follows the disused track bed as far as Kelbrook and terminates at a new junction with the A56 to the north of Earby, at the top of the Wyswick.

The Purple Option is 5.4km long and has 4 structures and 2 intermediate junctions.

An outline drawing of the Purple Option is included in **Appendix D** (Drawing B1861600/H/006).

7.7.2 Alignment

The Purple Option follows the Pink Option for approximately 4km before deviating to the west to join the A56 at the top of the Wyswick. Although the Purple Option is slightly longer than the Pink Option (by 300m), the extent of the earthworks associated with this alignment is less. In addition, there is a road safety benefit in joining the A56 at the top of the Wyswick as it removes the need for traffic to negotiate this poorly aligned length of road.

The relaxation on the crest curve at chainage 3871 to 4113 on the Pink Option is not required for this alignment.

7.7.3 Junction Strategy

The Purple Option's junction strategy is the same as for the Pink Option, with the exception that the Purple Option would not to impact on access to Hill Top Lane and The Grange which are not severed by this alignment.

The Purple Option would terminate at an at grade roundabout with the A56 at the top of the Wyswick.

7.7.4 Structures

This option has the same requirements as the Pink Option, but excludes the potential retaining structure at chainage 4700 as the road is on a different alignment and does not have as deep a cutting.

7.7.5 Impact on Railway Reinstatement

The impact on the railway reinstatement is the same as for the Pink Option, as described in paragraph 8.6.5.

7.7.6 Environmental Constraints

The environmental constraints are the same as for the Pink Option, as described in paragraph 8.6.6.

7.7.7 Costs

The Purple Option has a preliminary cost estimate of £25 million ± 40%. A detailed breakdown of this cost estimate is included in **Appendix I**. It should be noted that this would be in addition to the cost of a southern bypass option.

This preliminary cost estimate is only intended to provide an indication of the comparative difference in price of the shortlisted bypass options. This cost is based upon current information and assumptions available which may change during any future design development. This cost should be updated and verified if the design progresses. It is therefore recommended that this cost should not be used or relied upon for investment decisions.

7.8 Green Option

7.8.1 Overview

The Green Option would create an east - west bypass to the north of Colne and Foulridge, if delivered in conjunction with a southern bypass option.

The Green Option starts from a junction on the A56 to the north of Foulridge, which would link with a southern bypass option. It would terminate at a new junction with the A6068 to the east of Laneshaw Bridge.

The Green Option is 4.6km long and has 6 structures and 3 intermediate junctions.

An outline drawing of the Green Option is included in **Appendix D** (Drawing B1861600/H/007).

7.8.2 Alignment

To the east of the A56, the Green Option's alignment follows the contours of the land in order to minimise the route's gradient and the earthworks. However, due to the local topography, significant cuttings and embankments would be necessary. The alignment avoids properties where possible, but there would still be the need for some acquisition and demolition.

The vertical gradient has been relaxed to 8% at 3 locations (chainage 167 to 515, 1089 to 1454 and 2446 to 2614), and is considered appropriate given the local topography. Consideration would need to be given to the introduction of an eastbound climbing lane immediately east of the A56 junction, if this option were to be progressed.

7.8.3 Junction Strategy

The Green Option would link in to at grade roundabouts at each end, forming junctions with the A56 and the A6068.

Four arm at grade staggered priority junctions would be required where the route crosses the minor road running between Skipton Old Road and Cobb Lane, at the junction with Cobb Lane itself, and at the junction with Skipton Old Road (north of Laneshaw Bridge). The side roads would require realigning to bring them into the junction perpendicular to the mainline. Skipton Old Road in Foulridge would be severed by the route at chainage 200, but access would be available off the A56.

7.8.4 Structures

The need for 6 culverts has been identified for watercourses that are crossed by the proposed alignment at chainage 1100, 2000, 2730, 3150, 3250 and 3950. The need for extensive earthworks, predominantly using imported fill, could be mitigated through the construction of retaining structures. The cost of this alternative approach has not been identified at this stage.

7.8.5 Impact on Railway Reinstatement

The Green Option would have no impact upon the potential future reinstatement of the Colne to Skipton railway as the full length of this route is located well to the east of the disused railway track bed.

7.8.6 Environmental Constraints

The Green Option would have a significant environment impact on the landscape to the north-east of Colne, particularly between the A56 junction and chainage 2500.

The Green Option passes predominantly through grade 4 (poor quality) agricultural land, although approximately 300m of the route is through grade 5 (very poor quality) agricultural land.

The Green Option crosses regional route 91 Lancashire Cycleway.

7.8.7 Costs

The Green Option has a preliminary cost estimate of £71 million ± 40%. A detailed breakdown of this cost estimate is included in **Appendix I**. It should be noted that this would be in addition to the cost of a southern bypass option.

This preliminary cost estimate is only intended to provide an indication of the comparative difference in price of the shortlisted bypass options. This cost is based upon current information and assumptions available which may change during any future design development. This cost should be updated and verified if the design progresses. It is therefore recommended that this cost should not be used or relied upon for investment decisions.

8 Appraisal of the Short Listed Bypass Options

8.1 Introduction

The overarching aim of Stage 3 of the M65 to Yorkshire Corridor Study was to provide an initial recommendation on the optimum solutions to take forward for possible major scheme development.

A SWOT analysis of the six shortlisted bypass options has been undertaken to enable a clear comparison to be made and to inform the decision making process.

The SWOT analysis results have been split into the southern section bypass options and the northern section bypass options.

The remainder of this chapter presents the results of the SWOT analysis and is structured as follows:

- *Southern Section SWOT Analysis*
- *Northern Section SWOT Analysis*

8.2 Southern Section SWOT Analysis

Table 8-A presents the results of the SWOT analysis which has been undertaken for the southern section bypass options.

	Strengths	Weaknesses
Common Strengths / Weaknesses	• All three southern section bypass options provide a bypass of Colne and Foulridge and are therefore likely to reduce congestion in these settlements.	• Environmental impact due to route passing through agricultural land to the north of Colne. • Visual impact of a high embankment at the northern extent of all three options where the routes cross over the Leeds Liverpool Canal and the disused railway track bed.
Red Option	• The majority of this route is currently protected for highway development. • This option is the shortest in terms of new road construction. • Provides the opportunity for a direct access into the potential employment site at Barrowford Road in Colne.	• Conflict in vertical alignment between junction at Vivary Way and potential future reinstatement of the railway. • Strategic traffic using the bypass would still have to travel along part of Vivary Way. • Impacts on the disused railway track bed which is classified as a Biological Heritage Site. • Affects an Environment Agency flood zone. • Impacts upon a listed structure.
Brown Option	• A significant portion of the route is currently protected for highway development. • Segregation of local and strategic traffic by avoiding Vivary Way. • Avoids the conflict issue between Vivary Way and the potential future reinstatement of the railway. • Provides the opportunity for a direct access into the potential employment site at Barrowford Road in Colne.	• Impacts on the disused railway track bed which is classified as a Biological Heritage Site. • Affects an Environment Agency flood zone. • Impacts upon a listed structure.
Blue Option	• Segregation of local and strategic traffic by avoiding Vivary Way. • Avoids the conflict issue between Vivary Way and the potential future reinstatement of the railway. • Does not affect the potential future reinstatement of the railway. • Limited impact on the Biological Heritage Site. • Does not affect any Environment Agency flood zones. • Avoids any listed structures.	• Would create a new corridor through open countryside.

	Opportunities	Threats
Common Opportunities / Threats	• All three southern section bypass options open up access to the potential employment site on the land to the north of Foulridge Wharf. • Removal of traffic from Colne town centre could provide opportunities for improved public realm, walking and cycling facilities and public transport priorities.	• Limited space between railway track bed and canal crossings at the northern extent of each option. • Likely that approval will be required from the Canal and River Trust for the canal crossing and any work in close proximity to the canal. • Risk of objections from land and property owners.
Red Option	• Opens up access to the potential employment site on Barrowford Road in Colne.	• Due to the conflict at Vivary Way, this option prevents the potential future reinstatement of the Colne to Skipton railway and therefore objections would be likely. • Restricted widths at various points in the existing corridor make it challenging to fit in both a road and a railway. • Side road connections to the east of the bypass would be severed if the railway were constructed in the future. • Impact upon a Biological Heritage Site • The alignment would require the demolition of a grade 2 listed building.
Brown Option	• Opens up access to the potential employment site on Barrowford Road in Colne. • Potential to improve safety at the existing M65 Junction 14. • Potential to utilise a portion of Barrowford Road.	• Restricted widths at various points in the existing corridor make it challenging to fit in both a road and a railway. • Side road connections to the east of the bypass would be severed if the railway were constructed in the future. • Impact upon a Biological Heritage Site. • The alignment would require the demolition of a grade 2 listed building.
Blue Option	• Potential to improve safety at the existing M65 Junction 14. • Fewer constraints on alignment as route is not in an existing corridor. • Improves access to the potential employment site on Barrowford Road in Colne via a new junction on the M65 Motorway.	• Objection to environmental impact as option is not within an existing corridor.

Table 8-A: SWOT Analysis of Southern Section Bypass Options

In summary, the SWOT analysis for the southern section bypass options shows that whilst the Red Option is currently protected, the route would prevent the potential future reinstatement of the Colne to Skipton railway.

The SWOT analysis has highlighted that out of the southern section bypass options, it is difficult to differentiate between the Brown Option and the Blue Option at this stage in the option development process.

8.3 Northern Section SWOT Analysis

Table 8-B presents the results of the SWOT analysis which has been undertaken for the northern section bypass options.

	Strengths	Weaknesses
Common Strengths / Weaknesses	• All three northern section bypass options would improve access to the potential employment site on the land to the north of Foulridge Wharf. • All three northern section bypass options could be added after completion of the southern section bypass, if considered necessary.	• Would not address the congestion issues in Colne without the completion of a southern section bypass option. • The benefits of the northern section bypass options are unlikely to be as high as the southern section bypass options as congestion is concentrated in Colne. • Environmental impact due to route passing through agricultural land.
Pink Option	• Would remove traffic from the villages of Kelbrook, Sough and Earby. • A significant portion of the route is currently protected for highway development.	• An additional junction would be required on the southern section bypass option, located on embankment between the canal and railway bridges, in order to link the two sections. • Impacts on the disused railway track bed which is classified as a Biological Heritage Site. • Severance of access to properties on Hill Top Lane and The Grange.
Purple Option	• Would remove traffic from the villages of Kelbrook, Sough and Earby. • A significant portion of the route is currently protected for highway development.	• An additional junction would be required on the southern section bypass option, located on embankment between the canal and railway bridges, in order to link the two sections. • Impacts on the disused railway track bed which is classified as a Biological Heritage Site.
Green Option	• Provides an east-west bypass around Colne and Laneshaw Bridge, if delivered in conjunction with a southern section bypass option. • Does not affect the potential future railway reinstatement. • Does not impact on the Biological Heritage Site.	• Would have a significant environment impact on the landscape to the north-east of Colne, particularly between the A56 junction and chainage 2500. • Does not provide any benefit to the villages of Kelbrook, Sough and Earby.

	Opportunities	Threats
Common Opportunities / Threats		• Potential value for money is likely to be lower than the southern section bypass options. • Risk of objections from land and property owners.
Pink Option	• Improve road safety on the B6383 Barnoldswick Road by altering vertical alignment and improving forward visibility.	• Objections from properties whose access will be severed. • Impact upon a Biological Heritage Site.
Purple Option	• Improve road safety on the B6383 Barnoldswick Road by altering vertical alignment and improving forward visibility. • Improve road safety on the A56 by avoiding the Wyswick.	• Impact upon a Biological Heritage Site.
Green Option	• Improve road safety on the A6068 through Laneshaw Bridge.	• High cost in comparison to the other northern section bypass options, principally due to extent of earthworks. • Significant risk of objections from land and property owners. • East - west traffic passing through Colne may not travel further to use the new route if congestion in Colne is sufficiently reduced due to the removal of north - south traffic.

Table 8-B: SWOT Analysis of Northern Section Bypass Options

The potential value for money of the northern section bypass options is likely to be less than the southern section bypass options, particularly for the green option due to its significantly higher cost. This is due to the fact that the southern section is likely to provide the majority of the traffic relief and associated journey time savings. However, detailed traffic modelling and appraisal would be required to quantify the likely transport benefits.

Should a northern section bypass option be taken forward, the SWOT analysis has shown that two options are worthy of further consideration, the Pink Option and the Purple Option. At this stage in the option development process it is difficult to differentiate between these two options, although the Purple Option may deliver greater safety benefits by removing traffic from the Wyswick.

The Green Option is unlikely to be viable due to its environmental impact, topographical constraints and resultant high cost.

9 Impact of Railway Reinstatement on Vivary Way

9.1 Introduction

This chapter discusses the highway implications of reinstating the Colne to Skipton railway line in the Vivary Way area. It does not describe the interaction between the proposed bypass options and the existing railway corridor, which has already been considered.

The remainder of this chapter is structured as follows:

- *Description*
- *Engineering Constraints*
- *Environmental Constraints*
- *Costs*
- *Additional Observations*

9.2 Description

Vivary Way (A6068) is a dual carriageway which crosses the line of the disused track bed to the north of Colne railway station. Due to the geometric constraints of railway alignments and the close proximity to Colne railway station, it is assumed that the railway would be reinstated at a similar level to the existing railway, which is currently at the same level as Vivary Way.

Introducing level crossings is contrary to the Office of Rail Regulation policy to close down level crossings wherever possible, which is driven by the fact that '*Level crossings account for nearly half of the catastrophic train accident risk on Britain's railways.*[4] It would therefore not be possible to introduce a level crossing where the railway would cross Vivary Way. The level of Vivary Way would therefore have to be altered to cross either above or below the proposed railway.

Figure 9-A shows a plan of where the reinstated Colne to Skipton railway line would cross Vivary Way.

[4] *Office of Rail Regulation* (www.rail-reg.gov.uk/server/show/nav.1134)

Figure 9-A: Vivary Way / Railway Plan

9.3 Engineering Constraints

The Colne to Skipton railway line reinstatement scheme would provide a link between the two towns of Colne and Skipton and places further afield. For the purposes of this exercise it has been assumed that the railway would be twin track and electrified.

For Vivary Way to pass under the reinstated railway, there would be several engineering challenges to overcome:

- *As Vivary Way currently sits in a valley, lowering it would steepen the side road junctions which are already steeper than DMRB[5] guidelines. It would not be possible to retain the current Crown Way / Barrowford Road junction with Vivary Way. Therefore, this junction would either have to be stopped up or a bridge constructed over Vivary Way. The loss of the Crown Way / Barrowford Road junction with Vivary Way would result in additional traffic on lower standard unclassified roads.*
- *It could be difficult to drain the lowered Vivary Way and it is therefore possible that a pumped system would be required.*
- *If Vivary Way were to be lowered to cross under the railway, 5.7m of clear headroom would be required. In addition, approximately 1.3m depth would be required for the structure, ballast and railway tracks. Therefore Vivary Way would need to be lowered by approximately 7m, which would result in*

[5] Design Manual for Roads and Bridges

the road being in a deep cutting, with retaining walls up to 7m high that would have to be constructed adjacent to existing buildings.

- *In addition to retaining structures for the cutting there would be a bridge spanning Vivary Way to carry the railway over the road.*

The alternative option is to raise Vivary Way over the railway. This option would require construction of a bridge over the reinstated railway, with a retaining wall on the south west approach due to the close proximity of the Boundary Mills Store. A combination of earthworks and retaining walls would be required on the other approaches. The Crown Way / Barrowford Road / Vivary Way junction would have to be raised so that it could be retained; however this could cause issues with accesses off Crown Way.

Approximately 6m of clearance between the railway track and the soffit level of any structure crossing over the railway track is required. The bridge structure and road construction would result in Vivary Way being raised by approximately 7m above existing at the crossing point, to allow for the deck of the bridge and carriageway construction.

Altering the level of Vivary Way (either above or below the railway) would affect approximately 330m of existing road on both sides of the crossing point of the railway. The approximate long section and footprint of the works in shown on drawing B1861600/SK008 in **Appendix K**.

It would be very difficult to keep Vivary Way open during construction as the road level would need to be altered by around 7m. In addition, there is limited space available to divert the road within the construction site to generate sufficient safe working space. Therefore it is probable that all the traffic would have to be diverted along the A56, running parallel to and to the south of Vivary Way, through residential areas for the duration of the construction period, which is likely to be approximately 9-12 months. It is anticipated that this diversion would cause significant disruption to traffic and worsen congestion within Colne.

Subsequently, a Colne bypass may need to be in place first to act as a diversion route, prior to potentially altering Vivary Way to reinstate the railway.

9.4 Environmental Constraints

There would be a significant visual impact if the level of Vivary Way was altered, whether it was located on a new bridge or in deep cutting to cross the railway. It is also likely that this would have an impact on air quality and noise and potentially severance between residential areas and local facilities.

Alterations to Vivary Way would result in significant earthworks. This would require substantial import or export of material for raising or lowering the road respectively and the inherent environmental disbenefits this brings (e.g. the noise and air quality impacts associated with transporting material and any potential landfill required).

During the construction period there would be a significant impact on the properties along the A56 diversion route due to an increase in the number of vehicles using an already congested route.

9.5 Costs

Both a single carriageway and a dual carriageway bridge carrying Vivary Way over the railway have been priced to provide an indication of the range of costs that would be incurred at Vivary Way as a result of reinstating the railway. The cost estimate includes for raising Vivary Way to a level that allows for the railway to pass underneath the new structure. It also includes for the work on the side roads that are within the affected length. The costs associated with construction of a railway are not included.

The preliminary cost estimate for a single carriageway carrying Vivary Way over the railway is £9 million ± 40% and £11 million ± 40% for a dual carriageway. No allowance has been included for service diversions or land costs in these estimates. The ± 40% in the cost estimates allows for the accuracy level associated with producing cost estimates based upon the information available at this stage.

The cost of lowering Vivary Way to pass under the railway has also been estimated, using broad assumptions as to construction methods. It has been assumed that the side roads would be raised to pass over Vivary Way as it is unlikely that an acceptable vertical alignment could be achieved if they were lowered to join Vivary Way. It has been assumed that Vivary Way would be single carriageway as there would be no access to the Crown Way / Barrowford Road junction. If Vivary Way were to remain as dual carriageway there would be an increase in the cost of the bridges carrying the railway and the side roads over Vivary Way. The allowance for risk and preliminary costs is higher with this option as it would take longer to construct and the costs are more likely to be affected by unknown ground conditions (than an over bridge).

The preliminary cost estimate of lowering the existing Vivary Way into a cutting under the railway is £13 million ± 40% with a steel sheet piled retaining wall or £12 million ± 40% for a contiguous piled wall.

Details of the cost estimates for modifying Vivary Way are included in **Appendix L**.

Due to the lower estimated cost and fewer engineering challenges anticipated, it is recommended that raising Vivary Way over the railway is the better option, should the Colne to Skipton railway line reinstatement scheme proceed.

9.6 Additional Observations

A full route study along the disused Colne to Skipton railway line has not been undertaken as part of this study. However, whilst developing potential highways options, it was noted that there has been some development which has encroached on the track bed at The Old Sidings to the north of Foulridge, at Sough and at Earby to the south of Salterforth Road.

In addition, it is likely that the engineering challenges associated with accommodating Vivary Way and the railway are likely to be repeated where the track bed crosses the A629 Skipton Bypass. However, there may be more opportunity to vary the vertical alignment of the railway to cross the A629 Skipton Bypass due to the proximity of Skipton railway station not being as close as Vivary Way is to Colne railway station.

Since 1970, when the Colne to Skipton railway line was closed, the old track bed has been colonised by various plant species. The impact on this ecological habitat

would have to be assessed if the railway or a bypass were to be constructed along this route, which has been classified as a Biological Heritage Site (BHS) by Lancashire County Council.

10 Summary, Conclusions and Recommendations

10.1 Summary

The M65 to Yorkshire Corridor Study comprises of four distinct stages:

- *Stage 0: Inception*
- *Stage 1: Data Collection and Problem Identification*
- *Stage 2: Option Development, Appraisal and Strategy*
- *Stage 3: Review of Major Highway Proposals*

This Stage 3 Report summarises the findings of the review of the major highway proposals undertaken as part of the M65 to Yorkshire Corridor Study.

The shortlisted bypass options have been split into southern section and northern section options to enable a clear comparison of likely impacts. The shortlisted bypass options are summarised in Table 10-A:

Section	Option	Description
Southern	Red	Based upon the remitted scheme between Vivary Way and the A56 north of Foulridge, following the track bed of the former Colne to Skipton railway line.
	Brown	As the Red Option, but in order to avoid conflict with the railway track bed at Vivary Way, the Brown Option would start from a new junction on the M65 motorway (between the existing Junctions 13 and 14).
	Blue	An offline route between a new junction on the M65 motorway (between the existing Junctions 13 and 14) and the A56 north of Foulridge, which completely avoids the track bed of the former Colne to Skipton railway line.
Northern	Pink	Based upon the northern section of the remitted scheme, this option would start north of Foulridge and tie back in with the A56 to the north of Earby, at the bottom of the Wyswick.
	Purple	As the Pink Option, but with a wider arc around the west side of Earby to a junction with the A56 at the top of the Wyswick.
	Green	An East-West Bypass to the north of Colne which would link up with the A56 and the A6068, and in conjunction with a southern section bypass option would therefore provide a bypass of Colne for traffic using either of these routes.

Table 10-A: Shortlisted Bypass Options

10.2 Conclusions

It is concluded that there are several options worthy of further development to deliver a bypass of Colne and the villages along the A56 in Lancashire.

The SWOT analysis of the southern section bypass options has shown that if the Red Option were delivered it would preclude the potential future reinstatement of the Colne to Skipton railway along the existing disused track bed.

The Brown Option and the Blue Option would provide alternative solutions for a bypass of Colne. However, at this stage in the option development process it is difficult to differentiate between the Brown Option and the Blue Option.

The potential value for money of the northern section bypass options is likely to be less than the southern section bypass options. This is due to the fact that the southern section is likely to provide the majority of the traffic relief and associated

journey time savings. However, detailed traffic modelling and appraisal would be required to quantify the likely transport benefits.

Should a northern section bypass option be taken forward, the SWOT analysis has shown that two options are worthy of further consideration, the Pink Option and the Purple Option. At this stage in the option development process it is difficult to differentiate between these two options, although the Purple Option may deliver safety benefits by removing traffic from the Wyswick.

The Green Option is unlikely to be viable due to its environmental impact, topographical constraints and resultant high cost.

10.3 Recommendations

It is highly unlikely that the Colne to Skipton railway could be reinstated whilst retaining the current protected route of the A56 Villages Bypass (remitted scheme). It is therefore recommended that the current protected route is amended.

A southern section bypass option is likely to provide the majority of the traffic relief and associated journey time savings. It is therefore recommended that the Brown Option and the Blue Option be considered for possible major scheme development.

The northern section bypass options would not provide relief to the congestion in Colne. It is therefore recommended that a northern section bypass option is not delivered without a southern section bypass option.

If the County Council decides to undertake further development work on a bypass, it is recommended that this include traffic, economic and environmental assessments of the Brown, Blue, Pink and Purple Options. This approach will enable the economic and environmental impacts of these options to be assessed in more detail, prior to any potential public consultation exercise.