Preferred Route Option Report

M6 Junction 33 Reconfiguration with Link Road

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Lancashire County Council

www.lancashire.gov.uk

1 Introduction

1.1 Scheme History

1.1.1 The Lancaster Local Plan sets out the need for large amount of housing in South Lancaster. It is expected that in excess of 3,500 new homes could be built on land to the west of the A6, 1,655 new homes during this plan period and the remainder to follow through future plan periods.

1.1.2 The M6 Junction 33 Reconfiguration with Link Road aims to:

- Implement highway links in South Lancaster to support the housing allocated in the Local Plan this includes access to Bailrigg Garden Village;
- Remove traffic and air pollution from Galgate;
- Create improved conditions for public transport service reliability into Lancaster city centre; and,
- Assist the planned expansion of Lancaster University.

1.1.3 Six highway route options for the M6 Junction 33 Reconfiguration with Link Road to the South Lancaster Broad Location Growth Area were put forward for public consultation:

- Eastern 1;
- Eastern 2;
- Central 1;
- Central 2;
- Western 1; and,
- Western 2.

1.1.4 There were three possible corridors (eastern, central and western) and each corridor has two alignment options that were available for consideration during the consultation. These six route options were developed through environmental, traffic and engineering considerations/analysis.

1.1.5 This report describes how the route options and their objectives were selected. The preferred option that will be taken forward will form part of the Environmental Statement (ES) and Development Consent Order (DCO).

2 Route Selection

2.1 Environmental Considerations

2.1.1 Environmental constraints were considered within a suite of surveys with a study area of 5km from the M6. Detailed desktop surveys were undertaken which studied the following environmental topics and compared against some general environmental objectives:

- **Biodiversity**
  - Protect and enhance biodiversity and green infrastructure; and,
  - Protect and enhance sites designated for nature conservation.
- **Population and Human Health**
  - Improve road safety and reduce the number of traffic related accidents and other incidents;
  - Improve segregation of vulnerable road users from traffic; and,
  - Reduce air, noise and light pollution from transport
- **Air Quality**
  - Reduce air pollution impacts, particularly in the Galgate area.
- **Noise**
  - Minimise noise on sensitive areas and places.
- **Climate Change**
  - Reduce carbon dioxide CO_2 emissions for both construction and operation.
- **Water resources and flooding**

- Protect and enhance where possible, the water environment;
- Reduce risk of flooding and increase resilience to the effects of a changing climate; and,
- Conform to the design requirements of the Design Manual for Roads and Bridges (design standards for highways).

- **Landscape**
  - Protect and enhance the character and quality of the Study Area's landscapes and townscapes.

- **Cultural Heritage**
  - Protect and enhance the quality and distinctiveness of the Study Area's historic and cultural heritage.

2.1.2 Completion of these studies assisted in identifying three wide corridors in locations considered to be less constrained in terms of the assessments between M6 Junction 33 and the South Lancaster Broad Location Growth Area. See Appendix 1 which demonstrates the environmental performance of each route option.

2.2 Engineering Considerations

2.2.1 From these three wide corridors, six route options were developed which are feasible in engineering terms.

2.2.2 The routes are intended to:

- Fulfil the transport planning objectives
  - Fulfil the brief and how each of the alignments positively impacts upon travel in Lancaster District.

2.2.3 See Appendix 2 which demonstrates the engineering function of each of the route options.

2.3 Traffic Considerations

2.3.1 All route options were tested against the Lancaster city centre and M6 Junction 33 Traffic Model and were compared with a situation which did not implement the scheme (i.e. a 'do nothing' scenario). Traffic performance considered whether the route options offered the following:

- Reduction of congestion at A6/Stoney Lane in 2025
- New Infrastructure operates congestion free in 2025
- Reduction of congestion at A6/Stoney Lane in 2040
- New Infrastructure operates congestion free in 2040

2.3.2 See Appendix 3 which demonstrates the percentage traffic flow changes at the A6 Galgate for each route option.

2.4 Public Opinion

2.4.1 The consultation has taken account of the public comments and opinions. The preferred route option was Central 1 which received 176 votes. This was closely followed by route option Central 2 which received 48 votes.

2.4.2 The respondents were also asked if they would support a second option, should the first not be suitable. A total of 59 respondents stated they would prefer Central 2 as their second option, then closely followed by Central 1 with 34 respondents choosing this option.

3 Preferred Route Option

3.1.1 Assessment of the route options based on their impact on the environment, engineering feasibility and their traffic performance demonstrates that the preferred route is Central 1. The response from the consultation also indicates that the public would prefer the Central 1 route option.

3.2 Environmental Impacts:

3.2.1 Central 1 also demonstrates that there will be high potential to reduce air pollution impacts, as well as CO_2 emissions during construction and operation of the scheme. This option also demonstrates that there should be minimal noise impacts on sensitive areas and places.

3.2.2 Although there may be some impacts in terms of visual impact/landscape, Central 1 has less of an impact on the Forest of Bowland Area of Outstanding Natural Beauty (AONB) in comparison to the Eastern options which are located closer to the AONB.

3.3 Engineering Feasibility

3.3.1 From an engineering point of view, Central 1 is the most feasible.

3.3.2 Central 1 would only use two design speeds (40 & 60mph) and those changes would be at the junctions. Fewer speed changes makes it less confusing for drivers and a more feasible option compared Western routes which have three design speeds.

3.3.3 Due to the geometry of Central 1 being almost straight, it would be the most attractive route for use by HGVs and other drivers.

3.3.4 Central 1 also has the lowest highway gradient (3%) compared to the Eastern routes which reach the maximum permissible gradient under the Design Manual for Roads and Bridges at 6%.

3.3.5 This route option also provides better drainage flows as there are watercourses situated along the route which could be used to outfall from the required highway attenuation ponds. The other routes have at least one section where the drainage solution would be problematic due to the topography of the area.

3.4 Traffic Consideration

3.4.1 Central 1 route has been chosen as it achieves greater congestion relief on the A6 and Stoney Road junction. The other route options show that congestion will be present at this junction, even in the Opening Year. There is some evidence that Central 1 does experience some high levels of congestion, therefore the junction capacity would be designed to minimise traffic impact and maintain traffic flow.

3.5 Public Opinion

3.5.1 The public opinion has also demonstrated that out of the options presented their preferred option would be Central 1 route option (Figure 1 & 2).

Figure 1: Preferred option count

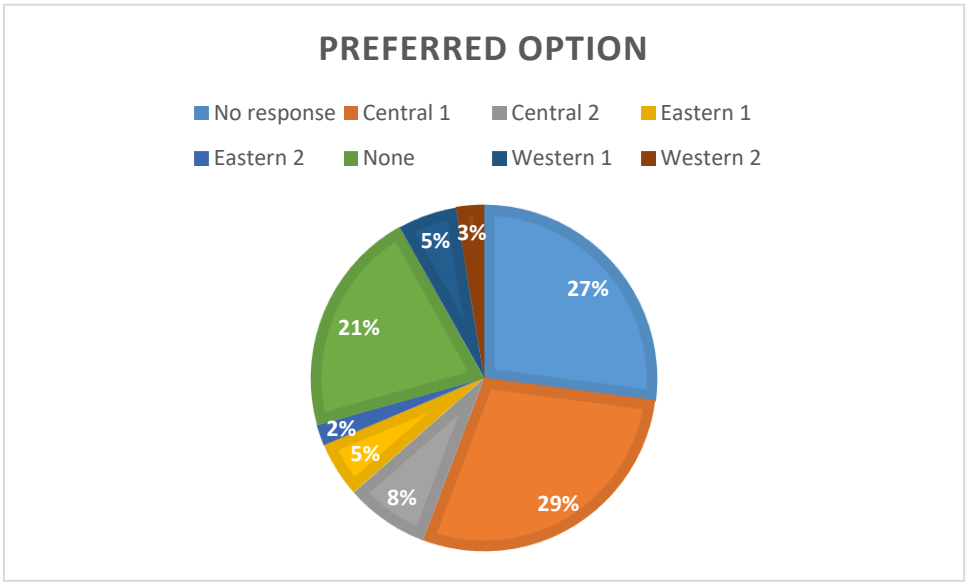
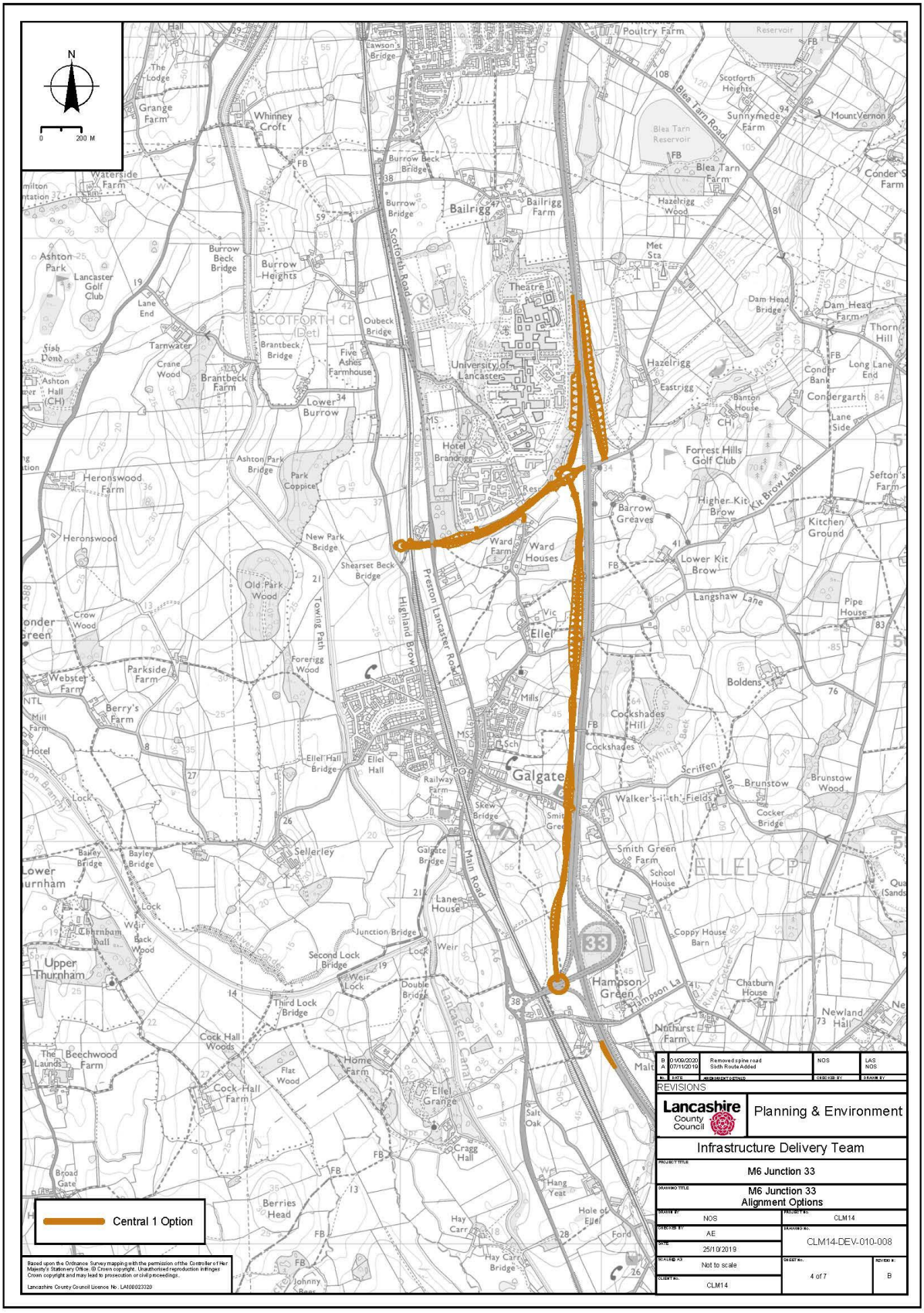


Figure 2: Central 1 Route Option



4 Summary

4.1.1 Overall, Central 1 (the preferred route option) is the most effective and acceptable route due to its predicted traffic performance, environmental impact, engineering feasibility and the response from the consultation also indicates that the public would prefer Central 1 as their chosen option.

4.1.2 The following offers a summary of why this preferred route option has been chosen, in comparison to the other route options:

- The route option complies with the aims of Lancaster Local Plan and the objectives of M6 Junction 33 Reconfiguration with Link Road (as outlined in section 1 of this report);
- Reduces Air Pollution Impacts ;
- Reduces CO_2 emissions;
- Achieves greater congestion relief;
- More feasible in terms of the engineering/construction of the route; and
- Publics preferred route option.

5 Appendix 1

Table 1: Environmental and Technical Performance Matrix: demonstrating the environmental performance of each route option.

	Biodiversity		Population and Human Health			Air quality	Noise	Climate Change	Ground Conditions		Water resources and flooding			Landscape	Cultural Heritage	Engineering
Route	**Protect and enhance biodiversity and green infrastructure**	**Protect sites designated for nature conservation**	**Improve road safety and reduce the number of accidents and other incidents**	**Improve segregation of vulnerable road users from traffic**	**Reduce air, noise and light pollution from transport**	**Reduce air pollution impacts**	**Minimise noise on sensitive areas and places**	**Reduce CO_2 emissions for both construction and operation**	**Conserve soil and agricultural resources**	**Seek to remediate / avoid land contamination**	**Protect and enhance where possible, the water environment**	**Reduce risk of flooding and increase resilience to the effects of a changing climate**	**Conform with the design requirements of the DMRB**	**Protect and enhance the character and quality of the Study Area's landscapes and townscapes.**	**Protect and enhance the quality and distinctiveness of the Study Areas historic and cultural heritage.**	**Consider how well the preferred alignment meets engineering considerations**
Eastern 1	Moderate Potential	Potentially Affected	Moderate Potential	Moderate Potential	Moderate Potential	Moderate Potential	Limited Impacts	Moderate Potential	Moderate Impact	Limited Impacts	Moderate Difficulty	Moderately Vulnerable	Moderate Difficulty	Potentially Affected	Limited Impacts	Likely to be Good
Eastern 2	Moderate Potential	Potentially Affected	Moderate Potential	Moderate Potential	Moderate Potential	Moderate Potential	Limited Impacts	Moderate Potential	Adverse Impact	Limited Impacts	High Difficulty	Moderately Vulnerable	High Difficulty	Potentially Affected	Limited Impacts	Likely to be Moderate
Central 1	Moderate Potential	Potentially Affected	Moderate Potential	Moderate Potential	Moderate Potential	High Potential	Limited Impacts	Higher Potential	Moderate Impact	Limited Impacts	Low Difficulty	Less Vulnerable	Moderate Difficulty	Limited Impacts	Limited Impacts	Likely to be Good
Central 2	Moderate Potential	Potentially Affected	Moderate Potential	Moderate Potential	Moderate Potential	Low Potential	Limited Impacts	Moderate Potential	Moderate Impact	Limited Impacts	High Difficulty	Moderately Vulnerable	High Difficulty	Limited Impacts	Potentially Affected	Likely to be Moderate
Western 1	Moderate Potential	Affected	Moderate Potential	Moderate Potential	Low Potential	Low Potential	Limited Impacts	Lower Potential	Moderate Impact	Limited Impacts	High Difficulty	Moderately Vulnerable	High Difficulty	Limited Impacts	Potentially Affected	Likely to be Poor
Western 2	Moderate Potential	Affected	Moderate Potential	Moderate Potential	Moderate Potential	Moderate Potential	Limited Impacts	Lower Potential	Moderate Impact	Limited Impacts	High Difficulty	Moderately Vulnerable	High Difficulty	Limited Impacts	Potentially Affected	Likely to be Poor

6 Appendix 2

Table 2: The engineering function of each route option						
	Western 1	**Western 2**	**Central 1**	**Central 2**	**Eastern 1**	**Eastern 2**
Design Speed	30, 40, 60mph	30, 40, 60mph	40, 60mph	40, 60mph	40, 60 mph	40, 60mph
Length	Between 4230 and 6521m (to the slip roads)	Between 3487 and 4572m (to the slip roads)	Between 2529m and 3450m (to the slip roads)	Between 2529m and 4410m (to the slip roads)	Between 3193m and 4220m (to the slip roads)	Between 3335m and 4256m (to the slip roads)
Max gradient	4.5%	4.5%	3%	4%	6%	6%
Lancaster Canal Crossing	Yes	Yes	No	Yes	No	No
WCML Crossing	Yes	Yes	Yes	Yes	Yes	Yes
Crossing a river	Yes	Yes	Yes	yes	Yes	Yes
Geometry	Several tight radii bends including 2 on structures, several large cut and fill areas.	Several tight radii bends including 2 on structures, several large cut and fill areas.	Almost straight, short lengths of cut and long lengths of fill	Straight over half the length, several tight radii and an area of cutting over the other half	Several tight radii bends, several large cut and fill areas including two at very large	Several tight radii bends, several large cut and fill areas including two at very large
Number of large structures	5, includes 2 over canal, one over a river and one overbridge for farm access	4, includes 2 over canal and one over a river	4 including one over river, there may be one pedestrian overbridge depending on PROW requirements	5 including one over river, there may be one pedestrian overbridge depending on PROW requirements	2 includes one over river, there are at least 4 farm accesses that may require overbridges	3 includes one over river, there are at least 4 farm accesses that may require overbridges
Drainage Difficulty 1-10	8 There is one area that does not seem to have natural drainage and may require a deep (>10m) pipe to drain.	8 There is one area that does not seem to have natural drainage and may require a deep (>10m) pipe to drain.	4 Several streams and a river all at convenient locations, but most of route on flood plain	6 Several streams and a river all at convenient locations on 50%, more difficult over the other 50%	6 One area near the start of route that may present difficulties	8 Near the start of route will need investigation to determine if Stoney Lane has a system that could be used.
Red = unfavourable, orange = neutral and green = favourable option For more information see Engineering Options Report.						

7 Appendix 3

Table 3: Traffic Performance for each route option

Name	Reduces congestion at A6/Stoney Lane in 2025	New infrastructure operates congestion free in 2025	Reduces congestion at A6/Stoney Lane in 2040	New infrastructure operates congestion free in 2040
Eastern 1	Partially	Yes	Partially	No
Eastern 2	Partially	Yes	Partially	No
Central 1	Yes	No	Partially	No
Central 2	Yes	No	Partially	No
Western 1	Partially	Yes	Partially	No
Western 2	Partially	Yes	Partially	No

Table 4: Percentage traffic flow changes at the A6 Galgate

Route Option	Direction	2025 change (%)			2040 change (%)		
		AM	IP	PM	AM	IP	PM
Eastern 1	NB	-8%	-8%	-6%	-1%	3%	5%
	SB	-45%	-41%	-43%	-59%	-41%	-16%
Eastern 2	NB	0%	-2%	1%	2%	9%	7%
	SB	-42%	-36%	-44%	-57%	-35%	-22%
Central 1	NB	-21%	-20%	-31%	-1%	-7%	-38%
	SB	-39%	-30%	-36%	-65%	-37%	-1%
Central 2	NB	-25%	-24%	-33%	-1%	-14%	12%
	SB	-40%	-35%	-45%	-48%	-36%	2%
Western 1	NB	3%	-19%	-13%	-2%	2%	56%
	SB	-20%	-14%	-5%	-9%	21%	27%
Western 2	NB	-19%	1%	-25%	-30%	-19%	3%
	SB	-1%	5%	-13%	-5%	5%	34%

NB – Northbound
SB – Southbound
IP – Inter-peak