

# A585

## Windy Harbour to Skippool improvement scheme

Stage 2 – Scheme  
Assessment Report



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# 1 EXECUTIVE SUMMARY

## 1.1 Introduction

- 1.1.1 The A585 Windy Harbour to Skippool Scheme is to provide an improvement to approximately 4.5km of the existing single carriageway A585 Trunk Road route that extends in a generally north-west direction for about 19km between M55 Junction 3 and the port of Fleetwood at the northern end of the Fylde Peninsula. The existing route within the study area comprises a rural section of straight single carriageway west of Windy Harbour junction subject to a 50mph speed limit and then passes through the ribbon development between Little Singleton and Skippool. The section is a semi-urban single carriageway with two signal controlled junctions and is subject to a 40mph speed limit. Other main routes have to pass through the urban areas of Poulton-le-Fylde and Blackpool. The route of the trunk road is shown on Figure 1-1.

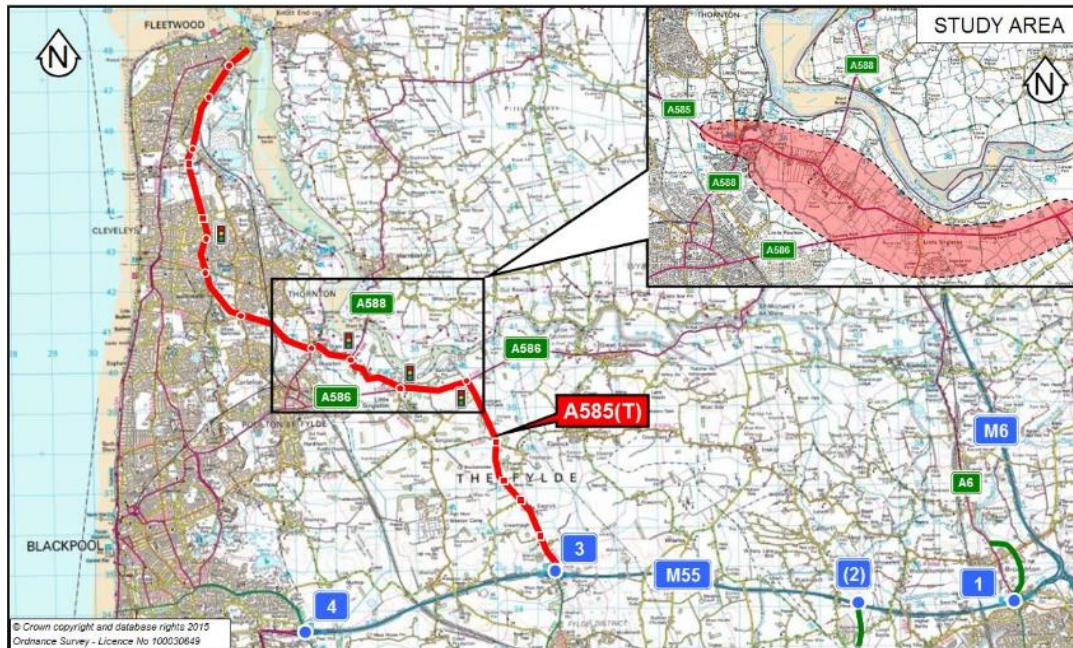


Figure 1-1: A585(T) Route and study area

## 1.2 Format of report

- 1.2.1 Section 2 provides a general introduction to the report
- 1.2.2 Section 3 provides a brief commentary on the history of the A585 route and other existing conditions affecting the options design.
- 1.2.3 Section 4 describes the existing environmental issues affect the Options within the study area.
- 1.2.4 Section 5 considers the local planning issues and constraints
- 1.2.5 Section 6 considers the consequences of not doing the Scheme.
- 1.2.6 Section 7 describes the three Options that were taken forward to the non-statutory consultation.
- 1.2.7 Section 8 provides a summary of the design approach for the options
- 1.2.8 Section 9 considers the land issues and how landowners would be affected.
- 1.2.9 Section 10 provides an assessment of the traffic modelling
- 1.2.10 Section 11 summarises the traffic modelling detailed operational assessment of the Options
- 1.2.11 Section 12 summarises the economics assessment of the Options.
- 1.2.12 Section 13 provides the summary of the environmental assessments.
- 1.2.13 Section 14 describes the non-statutory consultation
- 1.2.14 Section 15 describes the alternative options that were suggested following the non-statutory consultation.

- 1.2.15 Section 16 provides the summary of technology to be provided
- 1.2.16 Section 17 provides the summary of maintenance issues for the options
- 1.2.17 Section 18 discusses buildability of the scheme along with any identified health and safety issues
- 1.2.18 Section 19 provides the Appraisal Summary Tables for Option 1B (Southern Bypass) and Option 2 (on-line).

## 1.3 Options considered

- 1.3.1 Arcadis Consulting (formerly Hyder Consulting) were commissioned by Highways England in April 2015 to complete the Options Identification Stage (PCF Stage 1) for this scheme and subsequently to develop the design of various options for the Options Selection Stage (PCF Stage 2).
- 1.3.2 During the Options Identification Stage a range of 10 possible options were developed in sufficient detail to allow them to be considered by a Stage 2 Value Management Workshop that had the following objectives:
  - To review and agree the aims and objectives of the scheme.
  - To specifically consider the issues, including environmental, affecting the design and construction of each option
  - Decide on the preferred two options to be taken forward for design in Stage 2 to be taken to public consultation - Options Selection - [Maximum of 3 Options]
  - Formally record reasons for discarding options
  - To review and agree working arrangements and timescales.
- 1.3.3 For full details on the grounds for rejecting the option refer to the Stage 2 Value Management Report (HE548643-ARC-GEN-A585-RP-D-2001). A summary of all the options considered by the workshop is given in Section 7. Of this report.
- 1.3.4 Consequently, the three options that were considered to best meet the scheme's objectives were consulted on:
  - Option 1A – Southern Bypass including a junction with Garstang New Road east of Little Singleton [previously known as Option S1];
  - Option 1B – Southern Bypass but not including a junction with Garstang New Road east of Little Singleton [previously known as Option S1A];
  - Option 2 – improvements to the existing A585 (no bypass) [previously known as Option O1].

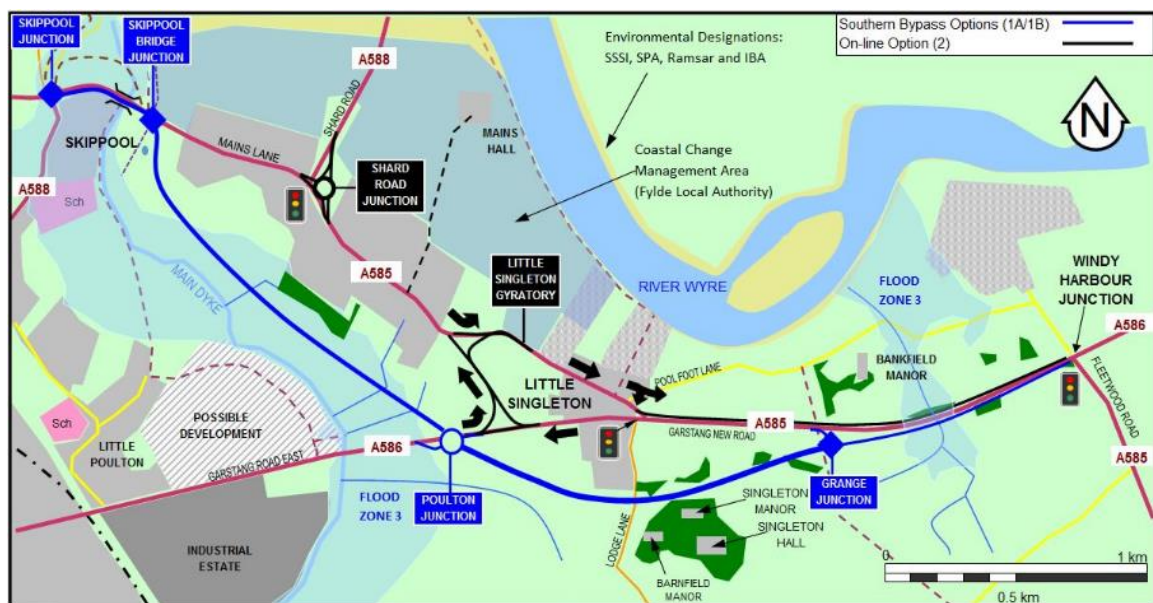


Figure 1-2: Options overview

## **1.4 Non-statutory public consultation**

- 1.4.1 The three options outlined in Section 1.3.4 above were presented to the Non-Statutory Public Consultation that ran for six weeks from 5th September to 17th October 2016. Publicity for the consultation and exhibitions included leaflets to key stakeholders and properties closest to the scheme, flyers distributed to properties within 500m of the A585 corridor from the M55 to Fleetwood, notices published in 3 local newspapers and other documents including the questionnaire on the Highways England website.
- 1.4.2 Public exhibitions were held at two local venues on 16th, 17th and 21st September 2016 attended by in excess of 300 people. A total of 574 completed questionnaires and 37 written responses from members of the public and local residents were received indicating support for improvements on the route with a 78% preference for the bypass to be provided and a general preference for Option 1A. Some alternative arrangements were suggested or requested by members of the public that had not been considered during the Options Selection Stage. A summary of the Public Consultation Report is at Section 14 with details of the alternative suggestions at Section 15.

## **1.5 Traffic and Economics**

### **Strategic modelling**

- 1.5.1 A strategic traffic model was developed from the model but was extended to cover a wider area to suit the needs of this scheme. The base year model was updated to a 2015 base using various traffic surveys to allow that model to be calibrated and verified.
- 1.5.2 The future year models were developed taking into account committed road schemes and development within the area of interest and this formed the do-minimum case against which the scheme options' effects were compared and used to develop the road user benefits.
- 1.5.3 The traffic modelling indicated that Option 1B (Southern bypass) would best accommodate the planned developments on the Fylde peninsula and would:
- operate more safely with spare capacity
  - reduce most journey times
  - provide relief for the rest of the road network.

### **Operational assessment**

- 1.5.4 All the options were tested using a Paramics micro-simulation traffic model for the core network affected by the scheme. Tests were carried out for both options to determine where queues or other problems were identified.
- 1.5.5 The journey time results demonstrate that both schemes offer significant journey time savings compared to the Do-minimum scenario and increase for the design year (2036) compared to the opening year (2021) and the Option 1B Southern Bypass scheme offers significantly higher journey time savings in the westbound direction compared to the Option 2 (on-line) Option. The Option 1B Southern Bypass scheme and the Option 2 No Bypass scheme show a similar level of journey time savings in the eastbound direction.
- 1.5.6 A potentially significant safety and capacity issue was observed in the Option 2 on-line scheme on the one-way northbound link in the proposed gyratory system around Little Singleton, whereby the volume of traffic scissor movements create conflicts resulting in safety and capacity issues due to the short link length.
- 1.5.7 Overall, it is considered that Option 1B Southern Bypass offers the greatest benefits of the two options, particularly in terms of journey time savings and the safe operation of the scheme. The minor operational issues associated with Option 1B Southern Bypass can be addressed with modest adjustments to the scheme design during PCF Stage 3 Preliminary Design. In contrast, the design issues identified as a result of the operational assessment of Option 2 (on-line) are considered to be significant and more difficult to address.

### **Economic assessment**

- 1.5.8 As normal, the full range of benefits and dis-benefits including reductions in accidents, disruption during construction, and evaluated environmental impacts were considered to develop a comparison for Option 1B and 2 in terms of benefit to cost ratios. These are summarised in Table 1-1 and Table 1-2 below.

Option	Road User benefits (PVB)	Present Value of Cost (PVC)	Benefit to Cost Ratio (BCR)
1B (Southern Bypass)	£136.29million	£101.99 million	<b>1.34</b>
2 (On-line)	£60.38million	£36.01 million	<b>1.68</b>

**Table 1-1: Summary of economic benefits (Core growth – weekday benefits only)**

Option	Road User benefits (PVB)	Present Value of Cost (PVC)	Benefit to Cost Ratio (BCR)
1B (Southern Bypass)	£153.33million	£101.99 million	<b>1.50</b>
2 (On-line)	£69.03 million	£36.01 million	<b>1.92</b>

**Table 1-2: Summary of economic benefits (Core growth – weekday and weekend benefits)**

- 1.5.9 Both options were assessed for the effect on accidents over the standard 60-year appraisal period as shown in Table 1-3 below.

Option	Accident benefits	Total number of accidents saved
1B (Southern Bypass)	£11.56million	371.6
2 (On-line)	£2.59million	84.9

**Table 1-3: Accident benefits**

- 1.5.10 The conclusion of the traffic modelling and economic assessment is that Option 1B performs the best and would be likely to achieve the greatest reduction in the number of accidents.

## 1.6 Environmental Assessment

- 1.6.1 Option 1B (Southern Bypass) would have a greater overall impact on the environment in terms of ecology and landscape than the on-line option due to it passing through large areas of rural land including the Main Dyke floodplain. However, it would remove significant flows of traffic from the existing A585 between Skippool and Little Singleton that would provide significant benefits to the residents and non-motorised users along that section of road.
- 1.6.2 Option 2 (On-line) would have a lesser ecological and landscape impact than the Southern Bypass as less rural land would be affected. However, there would be little benefit to residents and non-motorised users along the existing A585 as traffic flows would remain high along that section of road.

## 1.7 Chosen Option and Recommendations (In confidence)

- 1.7.1 Arcadis recommend that Option 1B (Southern Bypass) should be developed further in PCF Stage 3.
- 1.7.2 Further development of the alternative Option 1A Southern Bypass including the connection of Garstang New Road with the bypass at Grange Junction should continue including further traffic and economics modelling and environmental assessment.
- 1.7.3 In addition, traffic modelling and environmental assessment should be developed for including the link road between Skippool Bridge Junction and Shard Road for either Option 1A or 1B of the Southern Bypass.

## 2 INTRODUCTION

### 2.1 Purpose of the Scheme Assessment Report

- 2.1.1 The A585 Windy Harbour to Skippool Improvement Scheme is currently in Stage 2 of the Project Control Framework (PCF) Lifecycle – “Option Selection”. As part of this stage, a non-statutory public consultation was undertaken in September to October 2016 to enable the public to express their views on the options as recommended in the Technical Appraisal Report (TAR) - Report Ref HE548643-HYD-GEN-A585-RP-D-1007 Rev 3, dated April 2016.
- 2.1.2 The Report on Public Consultation (Report Ref HE548643-ARC-GEN-A585-RP-D-2023, dated January 2017) details the consultation process, summarised the responses from members of the public, and discussed further options suggested or requested by the public.
- 2.1.3 This Scheme Assessment Report (SAR) provides details of the technical appraisal of the pre-consultation options, and considers the recommended options in more detail, including revised cost estimates, economic and environmental assessments.
- 2.1.4 This SAR also summarises the Report on Public Consultation and selects an option to recommend for the Preferred Route Announcement.

### 2.2 Project objectives

Road Investment Strategy's Key Performance Indicators	Client Scheme Requirements
1 Making the network safer	Making the A585 route safer by reducing conflicts between users
2 Improving user satisfaction	a) Improve journey time reliability by reducing congestion b) Deliver capacity enhancements to the Strategic Road Network (SRN) whilst supporting the use of sustainable modes
3 Supporting the smooth flow of traffic	Deliver capacity enhancements to the Strategic Road Network (SRN) whilst supporting the use of sustainable modes
4 Encouraging economic growth	a) Improve journey time reliability b) Improve connectivity and community cohesion. c) Support employment and residential/commercial development and growth opportunities; d) Support the removal of obstacles to economic growth potential in both Wyre and Fylde
5 Delivering better environmental outcomes	Reduce/minimise the impact on the wider environment particularly for air quality and noise;
6 Helping cyclists, walkers, and other vulnerable users of the Network	Reduce severance and Improve access across the A585 between Little Singleton and Skippool Junctions
7 Achieving real efficiency	Compliment and realise the full benefits of the earlier Pinch Point scheme at Windy Harbour junction.
8 Keeping the Network in good condition	

**Table 2-1: Scheme Objectives**



### 3 SUMMARY OF EXISTING CONDITIONS

#### 3.1 Scheme history and background

- 3.1.1 In 2014, the Department for Transport (DfT) outlined the aims for the Strategic Road Network (SRN) in the Road Investment Strategy (RIS) Autumn Statement 2014 (AS14(RS)). As part of this, Highways England have developed a Route Based Strategy (RBS) to identify key investment needs on the SRN. The A585 Windy Harbour to Skippool Improvement scheme was identified as a priority in 2014 as part of the Route Based Strategy process and has been included in the Road Investment Strategy for delivery in Road Period 1.
- 3.1.2 Until 1980, Lancashire County Council was responsible for the A585 route. Partly due to the then importance of the port at Fleetwood, the A585 became a trunk road from the M55 to Fleetwood in 1980 and was retained as the strategic route to the port of Fleetwood even after the Fleetwood to Larne roll-on, roll-off ferry ceased operation in 2010.
- 3.1.3 The Fylde Coast Easterly Bypass was originally added to the Department of Transport trunk road programme in 1987 but was withdrawn from the programme in 1994. However, Lancashire County Council decided to protect that route at that time but was not able to secure funding for that scheme. The Fylde Coast Easterly Bypass route is shown in Figure 3-1 as the Red Route.

#### Fylde Coast Sub-Regional Transport Study (2005)

- 3.1.4 In 2005 the Fylde Coast Sub-Regional Transport Study was commissioned by Lancashire County Council to investigate options to improve access to Fleetwood from the national motorway network (the M55). That study, known as the M55-Norcross Link continued until an extensive public consultation was held in 2006. A result of that consultation was that the public indicated a preference for the yellow route (59%) as shown in Figure 3-1. The Blue and Red routes each gained 38% support.
- 3.1.5 In 2007, the Leaders and Chief executives of the three Fylde coast authorities (Blackpool, Fylde and Wyre) agreed that in principle the three Councils would support the 'blue route' (instead of the 'yellow route').

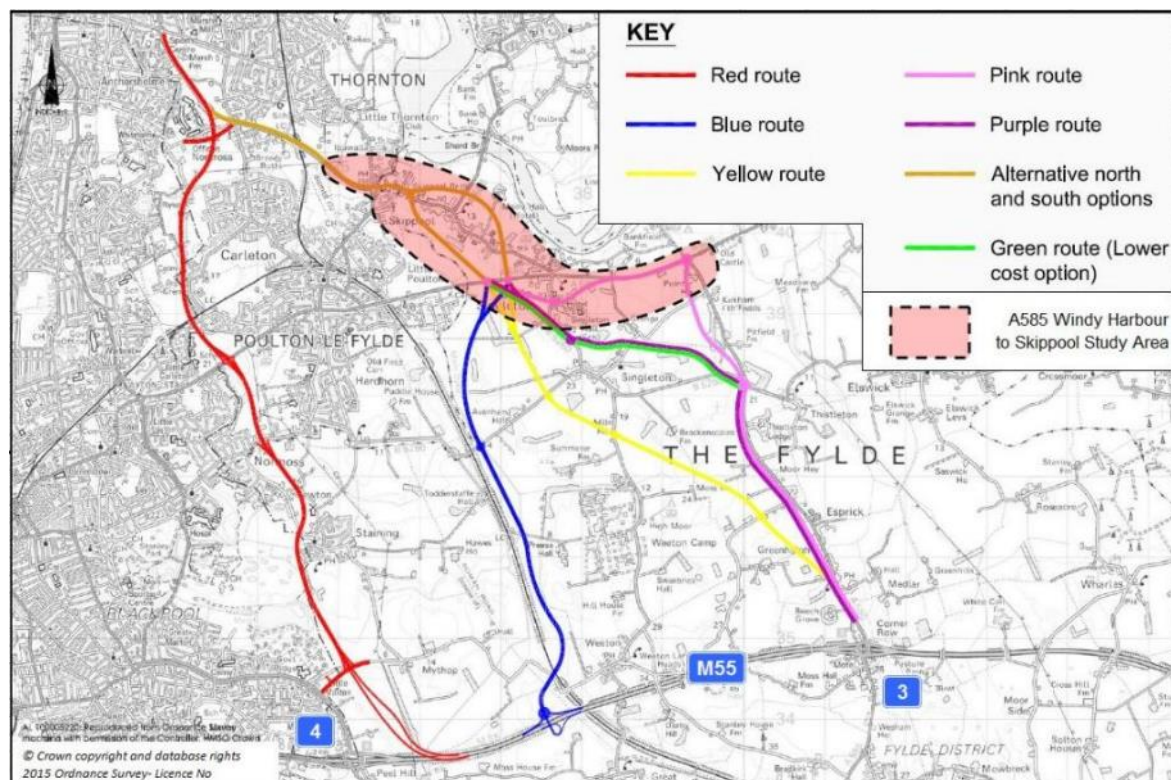


Figure 3-1: M55 - Norcross Study Options



### **Fleetwood-Thornton Area Action Plan (2009)**

- 3.1.6 In 2009 the Fleetwood-Thornton Area Action Plan was prepared and it considered the potential for development on the Fylde Peninsula and its possible effects on the A585 route as part of a sustainable transport strategy. It concluded:

*Sections of the A585(T) outside of the Area are operating close to capacity, and further development within the Area would lead to additional traffic and further congestion. The lack of capacity on the A585(T) could pose a significant constraint to the future development of the Area.*

- 3.1.7 Also in a 2009 report prepared for the Cabinet Members for Sustainable Development and Highways and Planning of Lancashire County Council the recommendations were:

- i) *the route incorporating the Blue Route and the option south of Mains Lane as shown on Drawing No. HC14476/04 attached, be adopted as the route of the proposed M55-Norcross Link Road,*
- ii) *the Cabinet Member for Highways and Planning be requested to adopt and safeguard the route of the proposed M55-Norcross Link Road as shown on Drawing No. HC14476/04 for development control purposes, and*
- iii) *Fylde and Wyre Borough Councils be notified of the approved route of the proposed M55-Norcross Link Road,”*

- 3.1.8 Consequently, the “Blue Route” remains protected by Lancashire County Council.

- 3.1.9 In 2012, as part of the development of the Fleetwood – Thornton Area Action Plan Sustainable Transport Strategy Wyre Borough Council had asked LCC to provide its opinion on the possible de-trunking of the A585 between M55 and Fleetwood. In its response to Wyre Borough Council LCC conclusion stated:

*“Notwithstanding the lack of a strategic case for retaining the A585 between the M55 and Fleetwood as part of the Strategic Road Network, there is no material advantage to the County Council of pursuing de-trunking. Other things being equal, the additional costs arising from de-trunking will outweigh any benefits or likely increased funding, and it would increase the County Council's liabilities and exposure to risk, for example, in relation to winter service provision. De-trunking could also put at risk delivery of the c£11m of mitigation works set out in the Fleetwood-Thornton Area Action Plan Sustainable Transport Strategy.”*

### **South Pennines Route Strategy (2014)**

- 3.1.10 In April 2014, the Highways Agency produced the South Pennines Route Strategy (SPRS) document along with associated Evidence Report and Technical Annex. The South Pennines route includes all east to west sections of the strategic road network (SRN) from the Welsh border through to the coast of England. Included in this strategy was the full extent of the A585 corridor from the M55 to Fleetwood.

- 3.1.11 The SPRS noted that planned growth including possible new uses for the port of Fleetwood along with additional housing would place additional demands on the A585 route. Consequently ensuring that this route can accommodate future economic development was a key priority. Regarding the A585, the SPRS report went on to state that:

- Drivers experience delays and congestion with a particularly high collision risk observed;
- The existing road was not built to Highways Agency standards and was prone to requiring deep structural repairs of the pavements;
- The existing route is difficult to use by cyclists, pedestrians and other vulnerable users;
- The A585 runs close to the southern end of Morecambe Bay Estuary that is designated as a Special Area of Conservation (SAC), Ramsar site and a Special Protection Area (SPA) as well as a Nature Improvement Area.

### **Strategic Outline Business Case (2014)**

- 3.1.12 A series of reports were prepared by the Highways Agency to review the case for an improvement on the A585. In 2014 a Strategic Outline Business Case (SOBC) was developed and it considered that wider growth aspirations could be unlocked and network resilience and safety improved by implementing the plans. The SOBC laid out four objectives for the scheme;

- Reduce congestion on the existing A585 through Little Singleton, Shard Junction and Skippool Junction;
- Reduce severance and improve access across the A585 between Little Singleton and Skippool Junctions;
- Reduce / minimise the impact on the wider environment;
- Improve connectivity and community cohesion;

3.1.13 The SOBC proposed a new offline dual carriageway to bypass the most constrained junctions.

### **Options Assessment Report (2015)**

3.1.14 In March 2015, Highways England prepared an Options Assessment Report for an offline dual carriageway scheme with localised widening on the approaches to the Poulton, Skippool Bridge and Skippool roundabouts. Two options were considered:

- Option A with grade separation at Lodge Lane (Equivalent to the current Option 1A)
- Option B with an at grade junction at Lodge Lane

3.1.15 The Options Assessment Report did not make any direct reference to on-line improvements. However, it included a statement that indicated that *"smaller improvement schemes will not achieve the benefits of an offline solution"*.

### **Stage 0 Scheme Review Report (2015)**

3.1.16 The options identified in the SOBC and OAR were further considered and developed and included an evidence review of previous route options, indicating there would be viable solutions to the current issues on the A585.

3.1.17 However, the SRR also developed an on-line option with a more effective junction at Shard Road and a one-way gyratory at Little Singleton.

3.1.18 The SRR report identified that there was a marked difference in the cost of schemes, with the offline scheme being approximately 3 times higher than the on-line scheme. Although it was noted that a further assessment was required to ensure the strategic fit of both schemes, in relation to the AS14(RS) Performance Specification and the Client Scheme Requirements.

## **3.2 Existing route description**

3.2.1 This section summarises the existing A585 route from Fleetwood to M55 Junction 3 and is described in a generally north-west to south-east direction.

### **Fleetwood to Skippool**

3.2.2 From Fleetwood Docks, the A585 route (Amounderness Way) is single carriageway for a distance of about 9km with 6 major junctions and 4 minor junctions along that section. The entire length of this part of the route is signed as being a clearway and has street lighting throughout.

3.2.3 The section of the route between Norcross roundabout and Skippool Junction is about 1.9km long, is on shallow embankment through a rural landscape and has a number of field accesses, street lighting, but no continuous footways. There are 2 Type B laybys: the northbound layby is about 400m north of Skippool Junction and the southbound layby about 400m south of Norcross Roundabout. That section of the route passes over the currently disused Fleetwood to Poulton single track railway and New Lane about 1.2km north of Skippool Junction.

3.2.4 Within the study area the route layout is as shown in Figure 3-2 and the speed limits on the A585 route are:

- North-west of Skippool roundabout – National speed limit (60mph)
- Skippool roundabout to Little Singleton – 40mph
- Little Singleton to Windy Harbour Junction – 50mph
- South of Windy Harbour Junction – 50mph

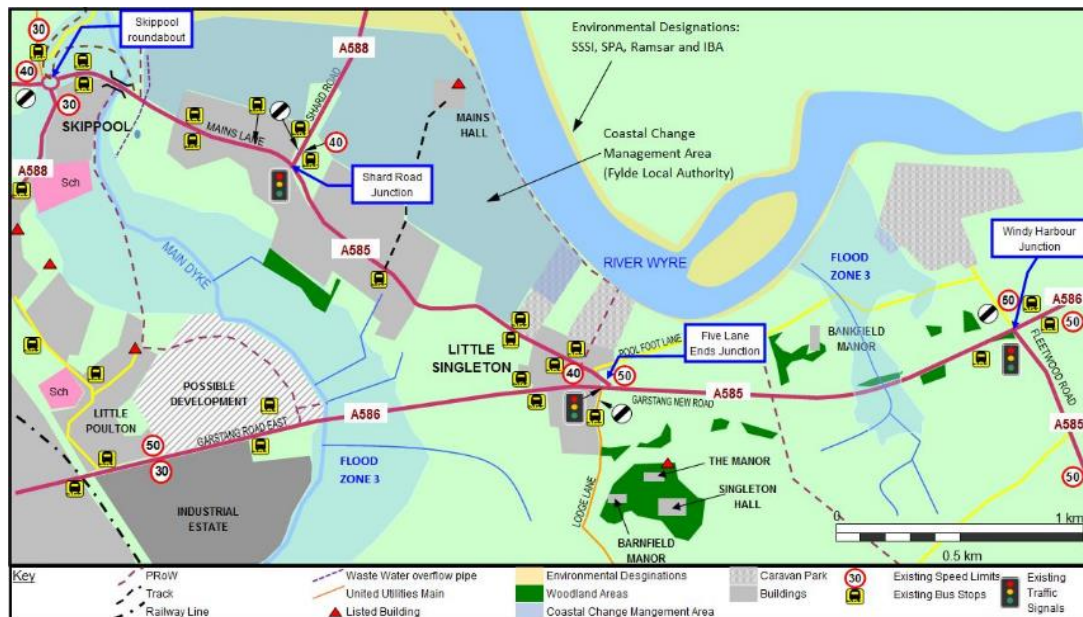


Figure 3-2: Existing road network

### Skippool Junction

- 3.2.5 The study area starts at the Skippool Junction Roundabout where the A585 is intersected by the A588 Breck Road and the B5412 Skippool Road forming a four arm oval shaped roundabout with an average inscribed circle diameter of approximately 65m. The roundabout and its approaches are fully lit. The approaches to the roundabout widen to 2 lanes for each arm, except for the A585 westbound approach that is a short section of dual carriageway. The lanes are all marked to indicate movements permitted in those lanes, except for the A585 westbound approach.
- 3.2.6 There are uncontrolled footway and cycleway crossing points with traffic islands across each of the four arms of the roundabout. This is supplemented with an uncontrolled footway crossing point adjacent to the bus stop layby approximately 65m east of the roundabout.

### Skippool Clough Culvert

- 3.2.7 Skippool Clough Culvert carrying Horsebridge Dyke passes under the Skippool roundabout in a south-north direction and is a mostly a 1.5m diameter concrete pipe that was extended in the 1970's with 1.6m diameter corrugated steel culvert units. The total length of the culvert is 88m long. Masonry headwalls are constructed at both ends, approximately 10m beyond the edges of the existing carriageways. The culvert falls at a gradient of about 1 in 120 from south to north and has a 1.6m diameter flap valve at the northern end, forming part of the tidal defences for Horsebridge Dyke. The crown of the culvert is in excess of 2.5m below existing road level.

### Skippool Junction to Shard Road Junction

- 3.2.8 Immediately east of Skippool Junction the A585 (Breck Road) is a short section of dual carriageway with the two eastbound lanes tapering to a single lane over about 125m. Eastbound there are two side road connections adjacent to Skippool Bridge. Westbound there are also two side road connections with Breck Road both close to the existing Skippool Junction Roundabout. The remainder of the A585 (Mains Lane) through to Shard Road Junction is a single carriageway, typically between 7.5m to 9.3m wide, over a length of about 1km.
- 3.2.9 There are about 50 residential properties and a caravan park along the route in this section with direct access onto the A585. Further there is a petrol station immediately east of Skippool Bridge along with the River Wyre Hotel west of the bridge.
- 3.2.10 There are footways on both sides of the carriageway for this length and a combined footway/cycleway (with demarked cycle route) on the north side of the road between Skippool Junction Roundabout and the junction with Shard Road. This footway/cycleway is, in places, narrow and immediately adjacent to the eastbound traffic lane or separated only by a narrow paved verge and marker posts.

### **Skippool Bridge**

- 3.2.11 Skippool Bridge (also known as Skippool Culvert), built in about 1910 and widened in 1921, carries the A585 trunk road over the Skippool Main Dyke. The original structure comprises 2 No. 1.8m diameter red brick culverts at 3.6m centres. The structure was widened on the upstream side (south) with a single span masonry arch with a span of 6.25m constructed of blue brick with masonry parapets.
- 3.2.12 An upstream masonry cutwater, beneath the arch, stands between the two culverts. Downstream of the culverts stand three masonry cutwaters. Downstream of each culvert, between the cutwaters, are self-opening/closing vertically hinged split tidal flood protection gates (two gates per culvert). It is assumed that these are used to minimise the risk of tidal flooding upstream along Main Dyke to the west of the bridge and that these gates are operated by the Environment Agency although there is no direct access to the gates. However, these gates appear to be redundant as the Environment Agency has installed a new tidal protection gates approximately 200m downstream.

### **Shard Road Junction**

- 3.2.13 Shard Road Junction is an existing T-junction traffic signal controlled using MOVA operating with 3 traffic stages. The approaches to the junction are single lane with short section of widening to provide 2 lanes at the stop lines with one of these lanes being for the turn but with traffic islands on the Mains Lane approaches to the junction. There are no controlled pedestrian facilities at this junction.
- 3.2.14 A588 Shard Road is the only road that crosses over the river Wyre within the scheme extents. This is the only crossing that serves Hambleton and Hambleton Moss side to the north of the scheme extent aside from the Cartford Bridge, Little Ecclestone that is a reduced width tariff bridge or the crossing on Blackpool Lane that is approx. 10km to the east. There are residential and business properties to the west of the Shard Road near the junction with A585 that have direct access to the Shard Road. There is farm access to the Shard Road approx. 300m from the junction.
- 3.2.15 The existing A588 has a wide footway on the west side and a verge on the eastside. There is a hard strip present on both sides of carriageway with drainage gullies. There is a bus stop and a cycle lane near the junction east of the carriageway that stops just before the junction with A585 Mains Lane. There is a provision of the cycleway footway near the junction that is tapered out from the eastside hard strip, this is provided for the cyclist to cross over and join the cycle route to the west of the junction towards Skippool.

### **Shard Road to Little Singleton**

- 3.2.16 The A585 Mains Lane remains as a single carriageway continuing in a generally south easterly direction for about 1.5km and is typically 8.5m wide with footways on both sides. The winding alignment of the road constrains drivers but could also contribute to driver stress and accidents.
- 3.2.17 There are about 80 residential properties and two caravan parks along the route in this section with direct access straight on to the A585.

### **Little Singleton Junction**

- 3.2.18 The Little Singleton Junction (also known as Five Lane Ends Junction) is a signal controlled junction where five roads meet. There are numerous residential and business property frontages in the immediate vicinity of the junction. The dominating traffic movement is the west/east direction (A585/Mains Lane), with dedicated direction turns at various locations. The speed limit changes from 40mph to 50mph from west to east travelling towards the Windy Harbour Junction.
- 3.2.19 There is minimal provision for non-motorised users (NMUs) at this junction with only uncontrolled crossings with no specific phasing for them in the traffic signal sequence.

### **Little Singleton to Windy Harbour Junction**

- 3.2.20 Between the Five Lane Ends Junction and Windy Harbour Road Junction the A585 is a single carriageway, with two lanes in the westbound direction for approximately 300m on the approach to Five Lane Ends Junction. There is a setback footpath on the north side of the route separated from the carriageway by a 1m grass verge. There are no residential frontages or accesses on this portion of the A585 but there are nine field accesses.



- 3.2.21 There are three 900mm diameter culverts that cross A585 Garstang New Road about 0.5km west of Windy Harbour Junction at the low point of the road that is on a 1.8m high embankment at this location. The size of these culverts mean these are considered to be drainage structures.

### Windy Harbour Junction

- 3.2.22 The A585 meets Windy Harbour Road and the A586 Garstang Road approximately 1.7km east of Little Singleton Junction. The Windy Harbour Junction was recently upgraded (pinch point scheme completed in May 2015) and is a signal controlled 4-way crossing with dedicated left and right turning lanes on the east, west and south approaches.
- 3.2.23 The pinch point scheme widened the existing east, west and south approach arms by a lane and introduced full segregation of the A585 turning movements.
- 3.2.24 NMU access at the upgraded Windy Harbour Junction provides a controlled shared footway/cycleway crossing on the south (Fleetwood Road) and east (Garstang New Road) arms, and an uncontrolled shared footway/cycleway crossing at the north (Windy Harbour Road) arm. There is no crossing provision for NMUs on the West arm.

### Windy Harbour Junction to M55 Junction 3.

- 3.2.25 This length of the A585 route is about 5.5km long single carriageway proceeding in a generally southerly direction with six priority tee or staggered-tee junctions. The speed limit is 50mph along the route except where it passed through Esprick where the speed limit is 40 mph. There is street lighting along the whole route and there are no laybys on this section of the route.
- 3.2.26 Junction 3 of the M55 (Wesham Circle) has been upgraded to traffic signals and the Area 10 2015 Route Safety Report commented:

*“Scheme development work is progressing on a scheme to improve the capacity of the roundabout by providing two lanes around the roundabout for northbound traffic from the M55 westbound approach. In addition lane marking alterations on the southbound approach to the junction are planned for Q4 of 2015/16.”*

## 3.3 Traffic Surveys

- 3.3.1 Traffic counts were undertaken in July 2015 and supplemented by further counts in September 2015, to build on historic traffic data available from the 2009 that included road-side interviews. The full set of counts and a summary can be found in the Traffic Data Collection Report number HE548643-HYD-GEN-A585-RP-TR-1013 and further surveys were carried out during 2016..
- 3.3.2 Automatic traffic count (ATC) sites at eight locations four of which were along the A585 corridor and four other locations on the main local road network were carried out to supplement existing ATC sites. In addition, junction classified turning counts (CTC) were carried out at 34 locations within the wider study area of which 10 were within the main study area. The position of these additional traffic counts in proximity to the study area is shown in Figure 3-3 below.

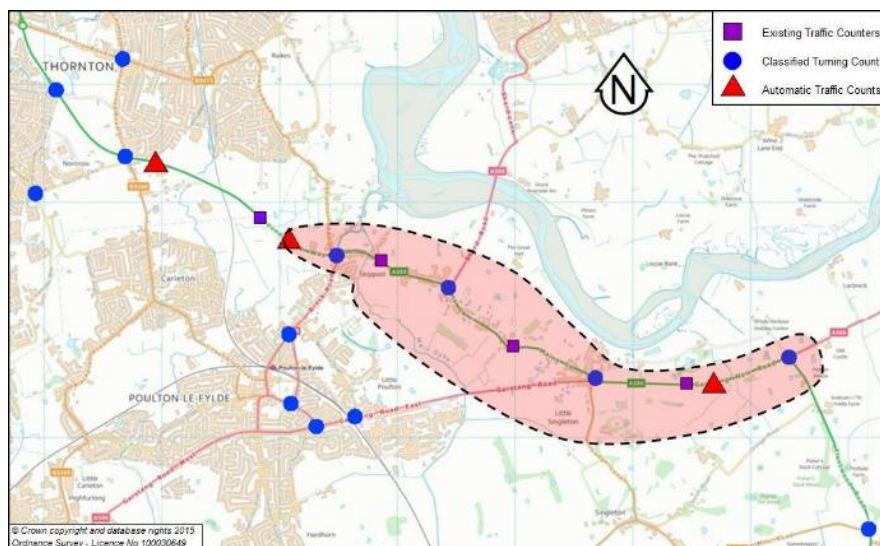
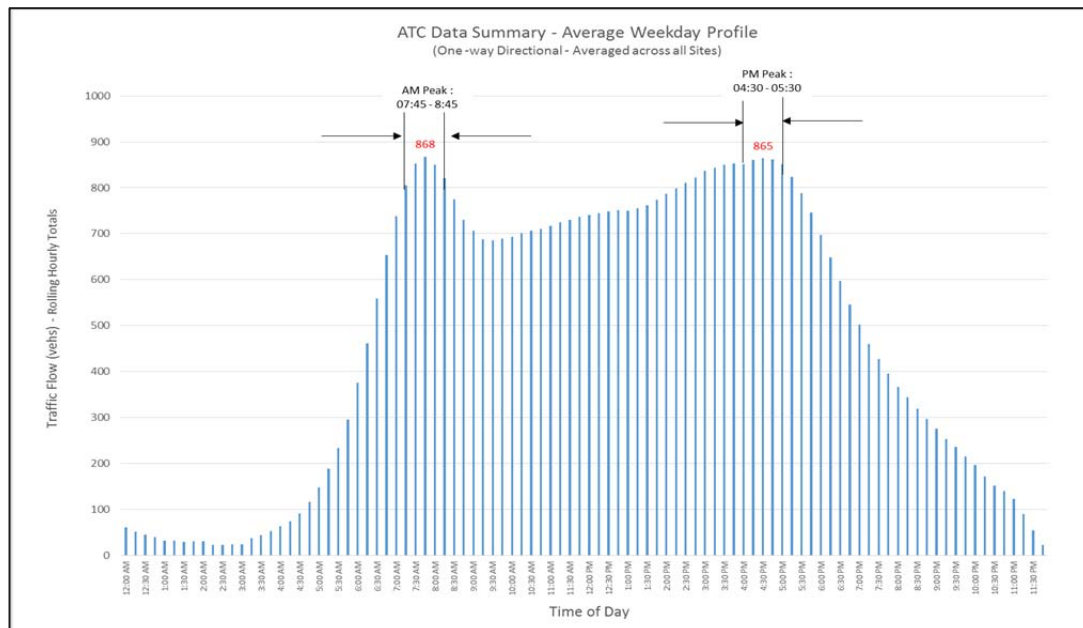


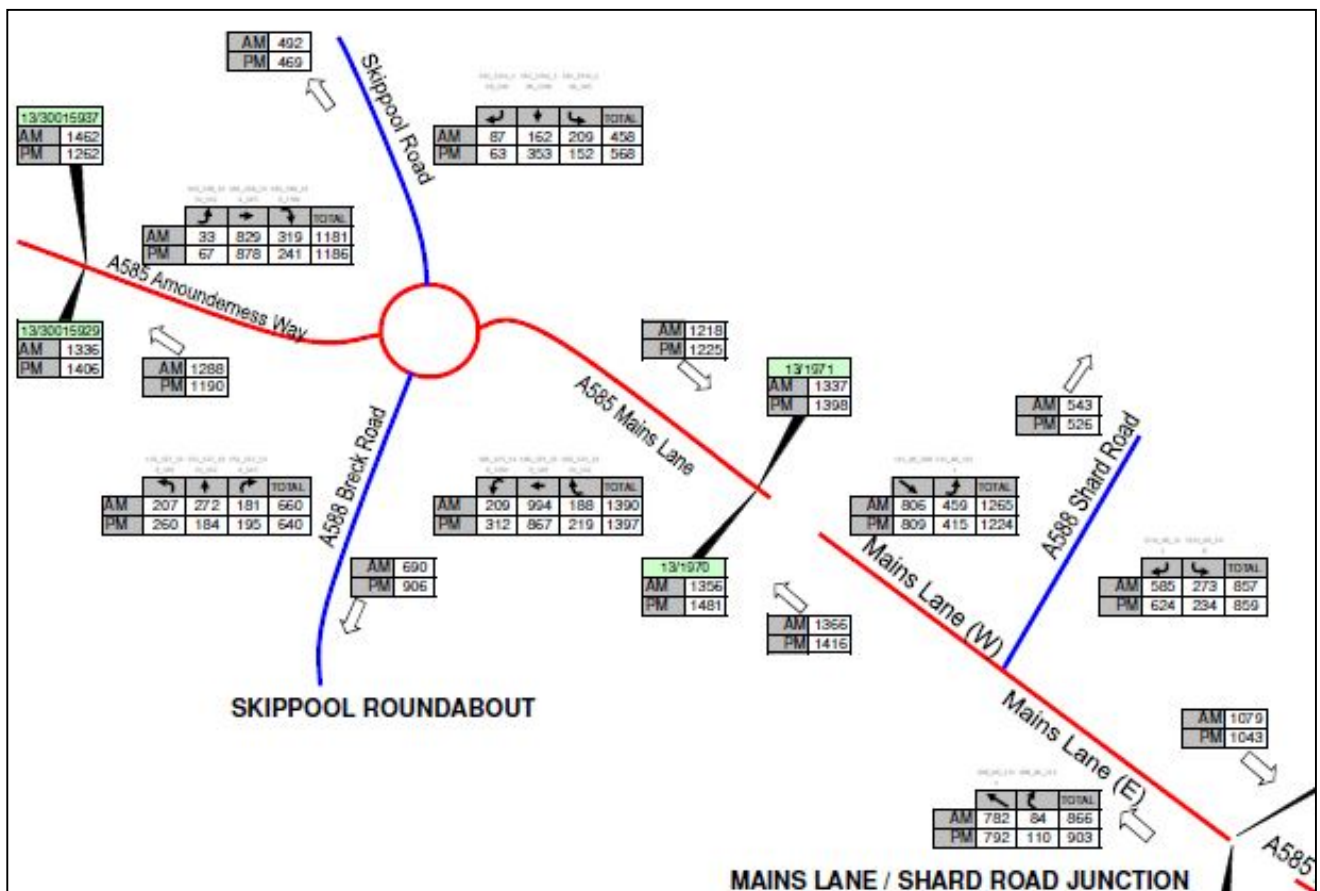
Figure 3-3: Traffic counter locations



**Figure 3-4: Average weekday traffic profile**

3.3.3 Figure 3-4 above shows the existing average weekday traffic flow profile for the A585 within the study area and indicates that the average peak one-way flow throughout the study area is just under 900 vehicles per hour although individual links have higher average peak flows.

3.3.4 Turning movement proportions for the existing main junctions within the study area are shown in Figure 3-5 below.





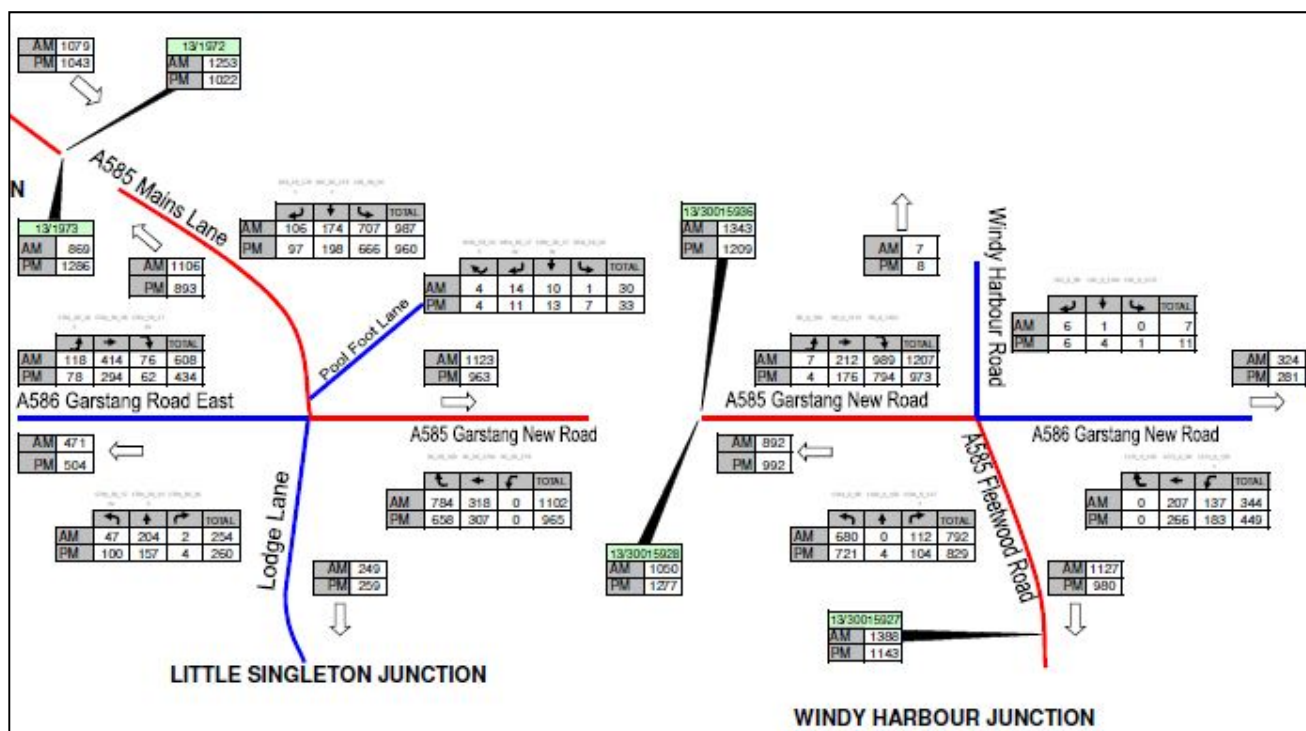


Figure 3-5: 2015 Existing traffic count data

### 3.4 Accident Analysis

- 3.4.1 The SOBC as mentioned above highlighted that the A585 is considered in the top 10% worst links for journey time reliability and casualty rates.
- 3.4.2 Local accident and casualty data covering the study area and its immediate vicinity has been obtained from DfT spanning the 5 year period of 2011 to 2015. The results for the A585 route only are summarised in Table 3-1 and their locations shown in Figure 3-6.

	2011	2012	2013	2014	2015	Total	5 Year Average
Slight	14	15	20	16	19	84	16.8
Serious	2	0	2	3	1	8	1.6
Fatal	1	0	1	0	0	2	0.4
Total	17	15	23	19	20	94	

Table 3-1 Summary of Casualties 2011-2015

- 3.4.3 There are clusters of accidents at and on the approaches to three of the four major junctions: Skippool Junction Roundabout, Little Singleton Junction and Windy Harbour Junction.
- 3.4.4 The Area 13 MAC A585 Route Safety Report 2010-2014 (A585 2140057\_R004) provides a summary and analysis of personal injury accident (PIA) and casualty data for the whole of the A585 trunk road route from M55 Junction 3 to Fleetwood.
- 3.4.5 The Route Safety Report conclusions for the whole of the A585 route included:
- There were 264 PIAs recorded on the A585 during the five-year period 2010-2014 giving an average accident rate of 52 PIAs per  $10^8$  vehicle miles. This rate is significantly high when compared to the national investigatory level for All Trunk A-Roads. Thirty-nine casualties were killed or seriously injured. Both the fatal and serious PIA rates are also above national investigatory levels.
  - Fifty nine per cent of KSI casualties were vulnerable road users (pedestrians 5.1%, motorcyclists 35.9% and pedal cyclists 17.9%). Of the sixteen KSI casualties that do not fall under the vulnerable road user category 56.3% were aged over 65 years old.

- Accidents involving two wheeled vehicles have been identified as a significant problem on the route.
- Twelve accident cluster sites have been identified. Based on an initial analysis of the PIAs and taking into account works/studies previously completed five sites have been recommended for further investigation.
- Accidents 'at or within 20m of a junction', particularly those 'at a T/Y junction' or 'Private drive' or 'Crossroads' or 'Roundabout' have been identified as a significant problem on the route.
- Junctions at Nautical College Roundabout, Skippool Roundabout, Skippool Bridge and Denham Way Roundabout are recommended for possible further investigation.
- Four fatal accidents were recorded during the five-year study period resulting in a fatal accident rate above the national investigatory level.

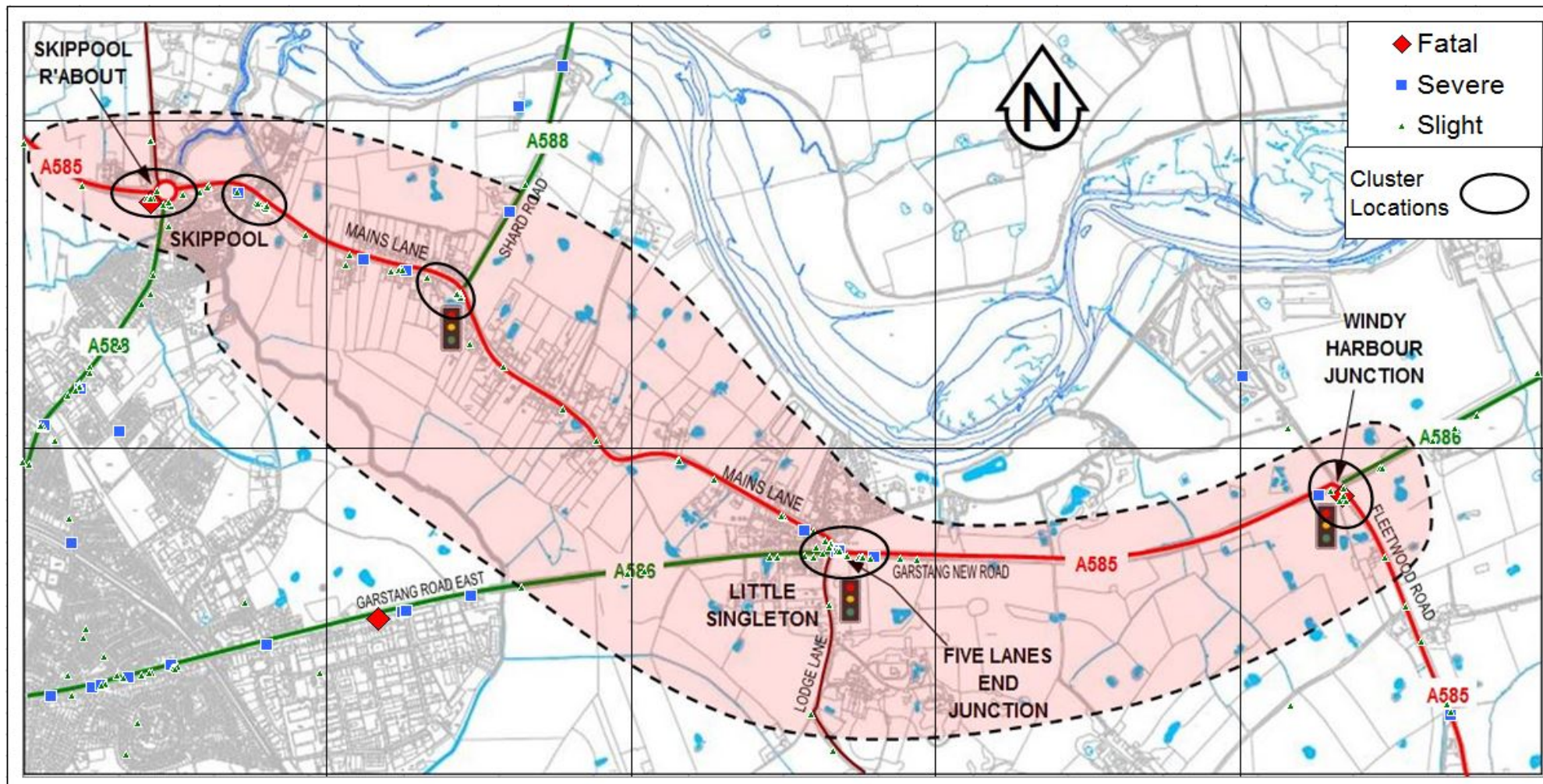


Figure 3-6 Historic accident locations in the study area between 2011 and 2015

- 3.4.6 The Route Safety Study reviewed the clusters within the scheme area and made the following comments that are relevant to the study area.

#### **Skippool Junction Roundabout cluster**

- 3.4.7 Five of the accidents in this cluster site occurred at the A588 Breck Road northbound entry onto the roundabout. Three of these PIAs were recorded in 2013.
- 3.4.8 The fatal accident in 2013 involved an elderly pedestrian who was crossing the A585 when he was struck by a car leaving the roundabout. Following an inquest the Coroner invited the Highways England to consider whether some form of appropriate warning could be installed to notify motorists that pedestrians may be crossing at this location however due to the current highway layout it was determined that a suitable location for a sign that complied with the forward visibility requirements without affecting visibility from the crossing point could not be found.

#### **Skippool Bridge cluster**

- 3.4.9 The accident types within this cluster can be briefly summarised as:
- Rear end shunts at entry filling station or stationary traffic from roundabout (four PIAs)
  - Right turners into filling station failing to see other vehicles (two PIAs)
  - Poor overtaking manoeuvres (two PIAs)
  - A junction restart (one PIA) and a loss of control attempting to evade police (one PIA)

#### **Shard Road Junction cluster**

- 3.4.10 Four of the eight recorded accidents at this cluster site are likely to have been as a result of drivers contravening a red traffic signal. The remaining four are shunts in various directions.
- 3.4.11 This junction is part of on-going A585 traffic modelling including a review in liaison with Lancashire County Council of a possible off-line improvement. However, any significant improvement to the A585 at this location will take several years to develop and deliver.

#### **Singleton Junction cluster**

- 3.4.12 The twelve accidents in this cluster site can be summarised as:
- Shunts on both approaches to the traffic signals (six PIAs, including one driver illness)
  - Right turns across oncoming traffic after possibly contravening traffic signals (four PIAs)
  - Loss of control while negotiating through the junction (two PIAs)
- 3.4.13 As part of a major proposed residential development off Garstang Road East, there has been traffic modelling of this junction to provide a localised improvement that, if implemented, could increase the capacity of the Little Singleton Junction.
- 3.4.14 The accident frequency at the junction has been briefly compared with that predicted by the DMRB COBA manual. Based on current traffic volumes the predicted annual accident frequency (2.3 PIA per year) is very close to the actual average (2.4 per year).

#### **Windy Harbour Junction cluster**

- 3.4.15 Six of the eight recorded PIAs at this cluster site were shunts on approaches to the signal controlled junction.
- 3.4.16 The Windy Harbour Junction fatal incident in 2011 occurred when a car drove into the back of an HGV, resulting in a serious injury for the elderly driver and the fatality of his elderly passenger. However, it is worth noting that the accident at this location was before the junction upgrade finished in 2015.
- 3.4.17 The improvement scheme at this junction is now subject to the Road Safety Audit 12 month and 36 month monitoring as part of the Post Opening Performance Evaluation (POPE).



### 3.5 Topography

- 3.5.1 The study area is situated in the coastal plain between the Irish Sea and the River Wyre. The topography of the area comprises a low lying gently undulating terrain. The terrain is dominated by a north-west to south-east running ridge that lies to the South of the River Wyre. This rises from around 13m AOD at Skippool to 24m AOD at Little Singleton. While the top of the ridge is rounded, the side slopes of the ridge fall, typically, at about 1 in 20.
- 3.5.2 West of the ridge the Skippool–Lytham Channel containing Main Dyke runs in a generally south to north direction and is some 300m to 500m wide. The elevation of the channel is around 4.5m AOD. South of Garstang Road East the main ridge is cut into by a small re-entrant valley approximately 1km long running in a south easterly direction containing a drainage ditch but extends eastwards for a total distance of about 1.6km as a dry valley between Little Singleton and Singleton village.

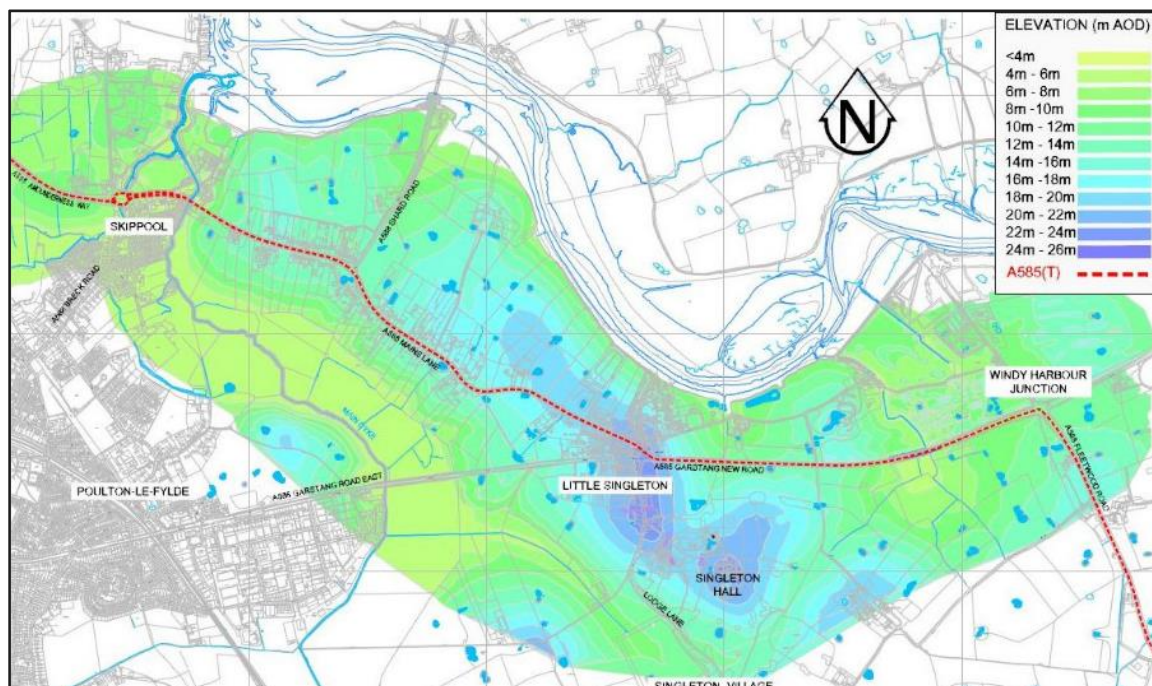


Figure 3-7: Scheme area topography

- 3.5.3 The existing A585 at Skippool Junction Roundabout is at approximately 6.5m (AOD) and falls (travelling eastbound) over about 0.5km on a very shallow gradient to the location of the Skippool Bridge over Main Dyke. From Skippool Bridge, the A585 (Mains Lane) follows the ridge rising gently to an elevation of 23.6m AOD at Little Singleton. From this high point at Little Singleton in an eastbound direction, the topography drops initially with a 6% gradient, before flattening out and dropping again with a gradient of 3% reaching a low point of about 6.4m AOD approximately 500m west of Windy Harbour Junction. From here, the topography rises to the Windy Harbour Junction at 10.5m AOD with gradients of up to 2.5%.

### 3.6 Land use, property and industry

- 3.6.1 The land use, property and industry can be split into two distinct areas along the study route, summarised in the below sub-sections:

#### Skippool Junction Roundabout to Little Singleton

- 3.6.2 Between the Skippool Junction Roundabout and the Five Lane Ends Junction at Little Singleton, the land use is predominantly rural residential ribbon development fronting directly on to Mains Lane and Garstang Road East, with some access roads to small residential estates.
- 3.6.3 There are a few small industrial businesses along the route in this section, including a fuel station and two builder's yards.

3.6.4 Outside of the ribbon development area, the land is largely agricultural. It generally falls in level towards the two main waterways in the area: to the north running largely parallel to the route is the River Wyre, and Main Dyke lies to the south.

3.6.5 The areas either side of the Mains Lane ribbon development are mostly arable fields with hedgerows, occasional trees and numerous small ponds.

### Little Singleton to Windy Harbour Junction

3.6.6 South-west of Little Singleton and beyond the limits of the housing alongside Garstang Road East the area is predominantly arable fields up to Lodge Lane.

3.6.7 East of Lodge Lane is the group of properties at Singleton Hall/Manor and Barnfield Manor. This area is in parkland with dense woodland to its northern boundary.

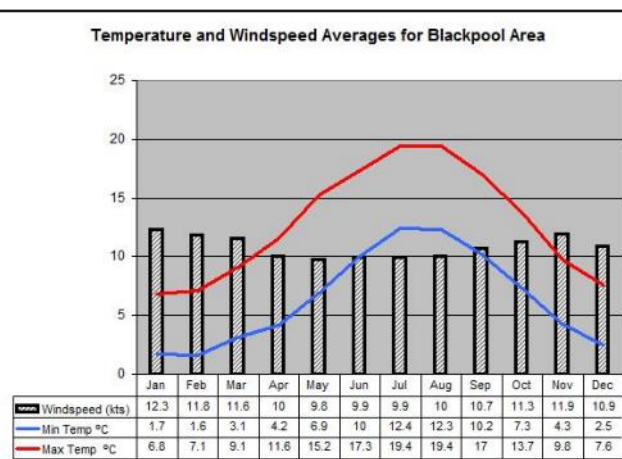
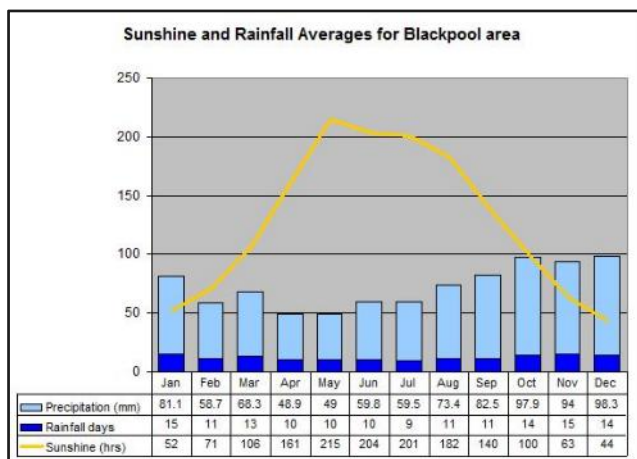
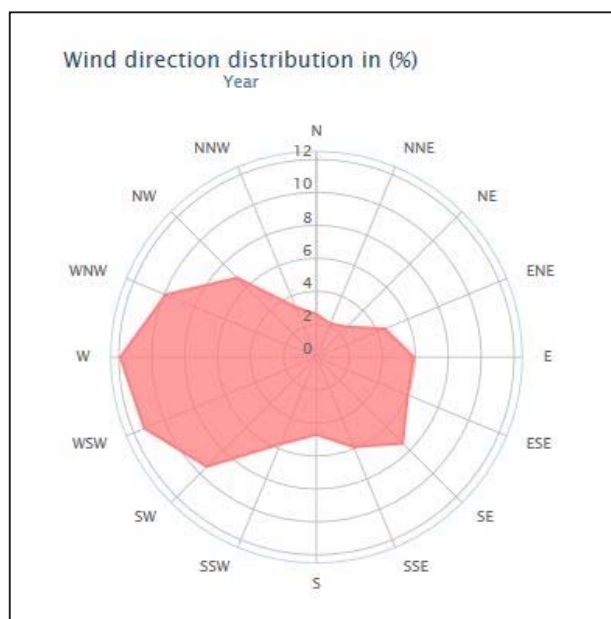
3.6.8 Between the Five Lane Ends Junction and the Windy Harbour Junction, the land outside of the A585 is mostly arable fields with hedgerows, larger groups of trees / woodland and again numerous ponds.

3.6.9 On the northwest side of the Windy Harbour Junction (north of A585 Garstang New Road), the latest land ownership records indicate the site belonging to WES (UK) Limited (Site plot reference 230): a company specialising in the treatment and removal of non-hazardous waste. It is observed that the area has been significantly disturbed over recent years, including regrading, particularly adjacent to the new Windy Harbour Junction.

## 3.7 Climate

3.7.1 The climate is significantly influenced by the site's proximity to the Irish Sea and is generally mild, with sunny summers and cold, wet winters. Snowfall is infrequent, but winter days can be frosty and clear. High pressure systems can occasionally cause very hot summer temperatures or very cold winter temperatures. The average minimum temperature in January is around 36°F (2°C), while the average maximum temperature in July is about 66°F (19°C). Figure 3-8 below indicates the monthly weather averages for the last 10 years and Table 3-2 provides the annual averages from Blackpool Squires Gate Climate Station Statistics.

3.7.2 The prevailing wind is generally from the Westerly direction, based on the readings also taken from the Blackpool Airport statistics.





**Figure 3-8 Weather charts**

Average annual rainfall	871mm
Annual average number of rainy days ( $\geq 1$ mm)	143 days
Maximum fall in 24 hours	N/A
Annual mean daily maximum temperature	12.8°C
Annual mean daily minimum temperature	6.3°C
Annual average number of hours with sunshine	1540 hours
Annual average number of days with ground frost	<10 days
Annual average number of days with an air frost	40 days
Annual average number of days with snow lying at 09h GMT	<5 days
Annual average days with fog at 09h GMT	15 days
Annual Average wind speed at 10m above ground level	10.6 Knots
Annual average number of gales (34km/hr for 10min)	N/A

**Table 3-2: Annual weather statistics**

## 3.8 Drainage

### Watercourses and field drainage

- 3.8.1 The terrain is dominated by a north-west to south-east running ridge that lies to the South of the River Wyre. This rises from around 13m AOD at Skippool to 24m AOD at Little Singleton. While the top of the ridge is rounded, the side slopes of the ridge fall, typically, at about 1 in 20. West of the ridge the Skippool–Lytham Channel containing Main Dyke runs in a generally south to north direction and is some 300m to 500m wide. The elevation of the channel is around 4.5m AOD. South of Garstang Road East the main ridge is cut into by a small re-entrant valley approximately 1km long running in a south easterly direction containing a drainage ditch but extends eastwards for a total distance of about 1.6km as a dry valley between Little Singleton and Singleton village.
- 3.8.2 At the western end of the scheme, Horsebridge Dyke falls in a generally north-easterly direction passing under Skippool Roundabout through Skippool Clough Culvert to discharge into the River Wyre Estuary. The culvert is 1.6m diameter of concrete and extended corrugated steel construction and has a 1.6m diameter flap valve at its northern end to prevent tidal flooding. In the event of tidal flooding the flap valve would be shut and Horsebridge Dyke would be unable to discharge.
- 3.8.3 The bypass route runs along the Main Dyke valley. Main Dyke is an artificial watercourse constructed in the 18<sup>th</sup> 19<sup>th</sup> century and falls in a northerly direction to connect with Horsebridge Dyke before discharging into the Wyre Estuary. The watercourse is protected from tidal flooding by a tidal gate about 200m north of the A585 road. The form of the tidal gate is a pair of flap valves enhanced by lowering gates to be operated in extreme tidal events. This provides protection against tidal flooding to a level of about 6.6m AOD. In the event of tidal flooding the flap gate would be closed and Main Dyke would be unable to discharge.
- 3.8.4 Main Dyke has a number of field ditches that discharge into the watercourse.
- 3.8.5 At the eastern end of the scheme the only watercourse crosses the bypass route about 0.5km west of Windy Harbour Junction. We have called this watercourse Pool Foot Creek. The watercourse is protected by “flood gates” at its discharge into the Wyre Estuary. The level of protection provided by these gates is currently unknown.

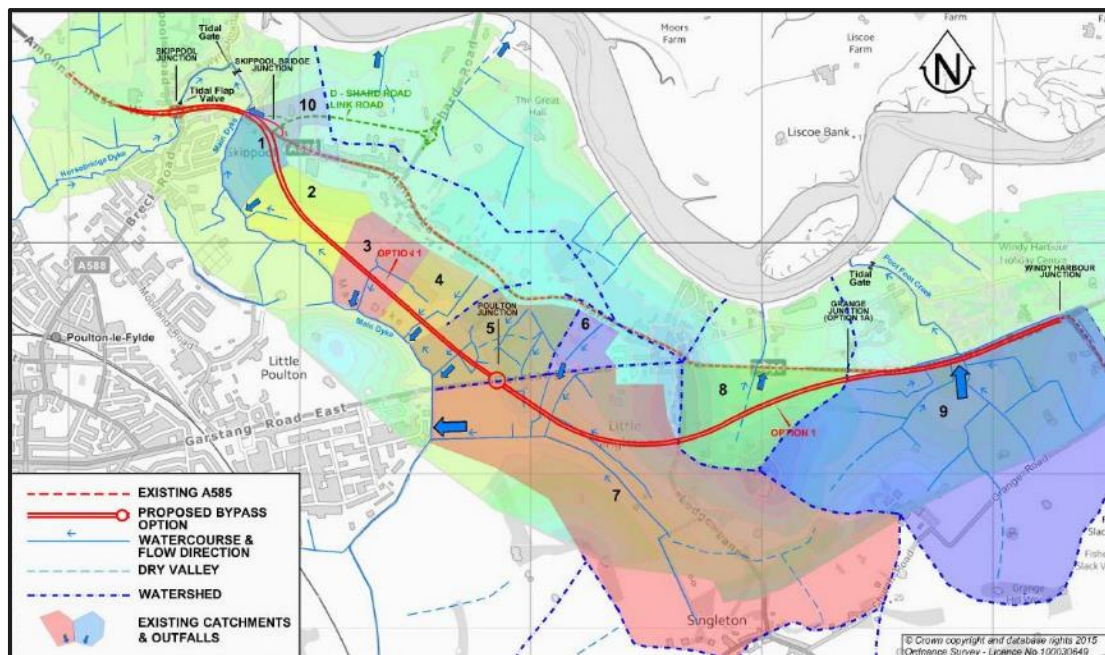


Figure 3-9: Existing watercourses and field catchments

## Highway Drainage

- 1.1.1 The existing highway drainage on the A585 route within the study area is predominantly by trapped gulleys or kerb offset gulleys connecting to carrier drains, with intermediate chambers, that discharge into field ditches or watercourses. In general, there are no specific measures to treat highway discharges but some of the outfalls are provided with flap valves to prevent backflow of water from the larger watercourses.
- 1.1.2 The exception to the above is the drainage network provided for the recently upgraded Windy Harbour Junction that uses combined kerb-drains that discharge to an oversized pipe that has been provided with a penstock valve and vortex flow control device at the outfall from this catchment.
- 3.8.6 Highway drainage of roads managed by the local highway authority appear to be gulleys connecting to carrier drains. The details of the outfalls of those drains networks has not been confirmed at this stage.

## 3.9 Geology

- 3.9.1 The study area used to assess the baseline geology and soil resource is defined as a 50m corridor either side of each Scheme option to take into account additional land-take where options are offline. The exception is EA registered waste sites, where a 1000m buffer has been applied.
- 3.9.2 Within the study area there is agricultural land present that is classed as Grade 2 in the Agricultural Land Classification (ALC).
- 3.9.3 Within this 1km study area for the Scheme options there are no designated geological sites and the geology underlying the options comprises glacial till and tidal flat deposits (predominantly clay and silt) underlain by mudstone bedrock. These soils and rocks tend to have a low permeability that leads to the restriction of movement of contamination.
- 3.9.4 For the majority of the study area, there is underlying Devensian Glacial Till comprising diamicton. There are smaller areas of localised Devensian glaciofluvial deposits. In the vicinity of the watercourse, there are areas of Tidal Flat deposits comprising of clay and silt. Figure 3-10 and Figure 3-11 provides an overview of the Drift and Solid Geology in the study area.



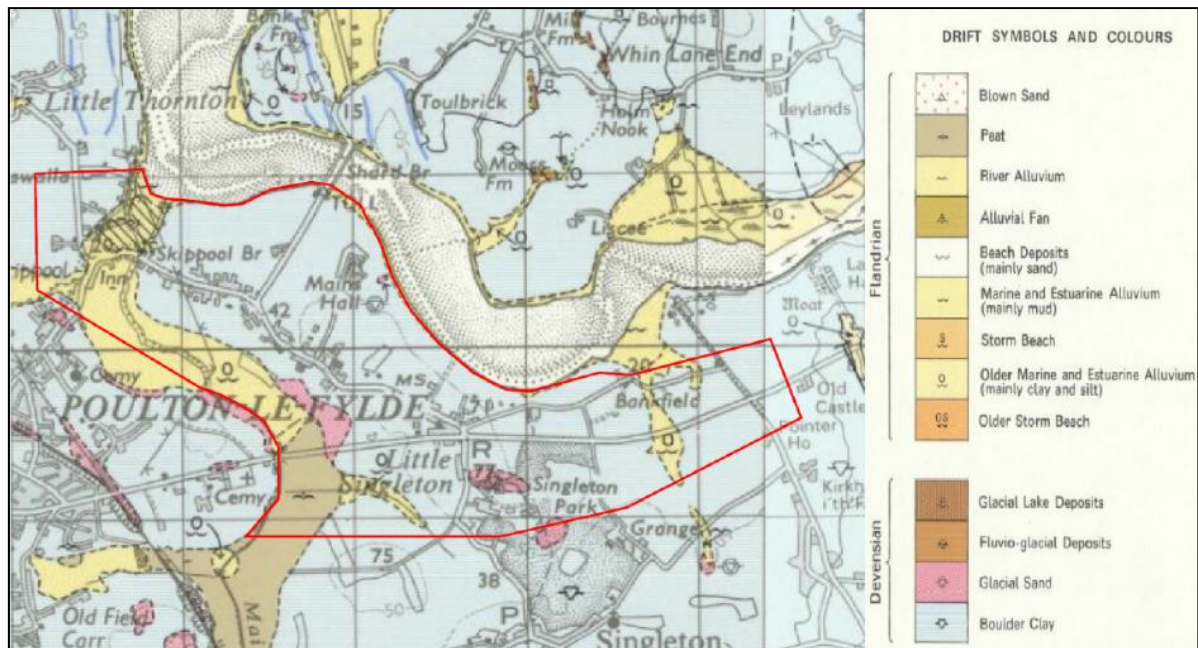


Figure 3-10 Drift geology

- 3.9.5 There are no registered landfill sites that would be directly affected by any of the options, however there may be unregistered sites, where there is currently no information available.
- 3.9.6 The closest landfill site to the options is Skippool Marsh and Skippool Creek historic landfill, located approximately 500m north of the western end of the options. In addition to this Fylde skip hire historic landfill is located 675m south west of the central section of the options.

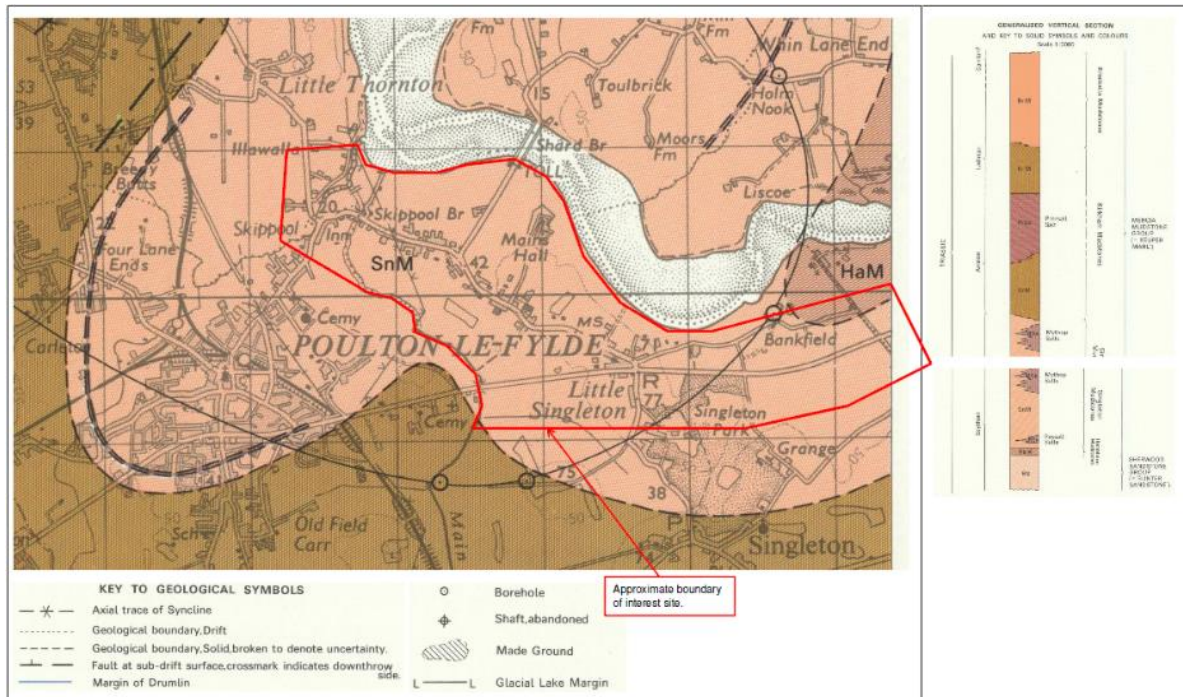


Figure 3-11 Solid geology

- 3.9.7 Further information on the geology present in the areas can be found in report number HE548643-HYD-EGN-A585-RP-EN-1015-“Environmental Assessment Report” and HE548643-ARC-EGT-A585-RP-GE-2007 “Preliminary Sources Study Report”.

### **3.10 Mining**

- 3.10.1 Based on a review of the Coal Authority's online Interactive Map viewer, there are no historical areas of coal mining in the study area. The nearest coal mining areas were:
- Quernmore east of Lancaster - 24km to the north-east of the study area,
  - Hoghton near Blackburn – 24km to the east of the study area and
  - Eccleston / Charnock Richard (south of Preston) – 23km south-east of the study area
- 3.10.2 A review of the British Geological Society (BGS) online interactive map viewer also indicates no obvious historical coal mine workings in the scheme area

#### **Salt field**

- 3.10.3 Salt resources in Lancashire occur at Preesall within the Triassic, Mercia Mudstone Group in a small area to the east of Fleetwood. The principal salt-bearing unit is the Preesall Halite formation, that is preserved in a fault-bounded graben and is continuous with the salt resources that occur beneath Walney Island in Cumbria. The complete sequence of the Preesall Halite Formation, proved by boreholes to be up to about 290 m thick on the western edge of the former brinefield, is only present in the area of the dry-rockhead. Mining of salt, in the form of brine solution, continued until the 1990's but an application to use the voids as gas storage was rejected in 2007.
- 3.10.4 While the Preesall site is to the east of the River Wyre estuary, the full extent of the Preesall salt field has not been determined and should be investigated further to establish whether there is any risk of possible collapses within the area of interest.

#### **Shale gas**

- 3.10.5 There is the potential to exploit shale oil and gas in the area. Cuadrilla obtained a license in 2010 to carry out exploratory investigation at its Grange Hill site including drilling to a depth of 10,700 feet below ground level. The exploration site is off Grange Road located about 700m south-west of Windy Harbour junction and within 600m of the off-line Options. Currently, the Grange Hill site has been retained but no extraction has been carried out.

### **3.11 Physical constraints**

- 3.11.1 The main physical constraints are the existing watercourses, The River Wyre estuary and associated flood plains as described in Section 4.7 above. These features affect the design of bridges, culverts and, in respect to the vertical alignment, the design of the routes and their associated earthworks.
- 3.11.2 The alignment of the options has also been constrained by existing properties – particularly houses and businesses – especially the ribbon development along Mains Lane and the Little Singleton village area.
- 3.11.3 In addition to avoiding the properties, where possible consideration has been given to maintaining reasonable access and egress to all properties. This is a particular issue in Skippool where a number of properties have a frontage directly onto the existing trunk road. This is also an issue for Singleton Hall, Singleton Manor and Barnfield Manor group of properties that currently have access to Lodge Lane close to the route of the Southern Bypass.
- 3.11.4 Geologically, the study area comprises predominantly glacial till with areas of peat and tidal silts. While these are not directly constraints they will challenge the design and construction of the options.
- 3.11.5 It is believed that there are likely to be groundwater issues that would affect the design of the deep Lodge Lane cutting on Southern Bypass Options due to the presence of ponds and groundwater possibly under artesian pressure. This would be confirmed by the proposed ground investigation intended to be carried out at the beginning of Stage 3.

### **3.12 Statutory undertakers' equipment**

- 3.12.1 C2 requests for Statutory Undertakers' (SU) apparatus information were sent in December 2015. As part of PCF Stage 2, C3 (Draft Schemes and Budget Estimates) Inquiries were made to the affected utility companies in May 2016 for the North and South bypass route options. Cost Estimates for the on-line route option were not sought.

- 3.12.2 Existing apparatus is mainly located along the route of the A585 but several pipelines and cables cross the fields adjacent to Skippool and Little Singleton. The utility companies affected are:
- Electricity North West – underground and overhead high(33kV), medium (6.6kV) and low voltage power lines;
  - National Grid Gas – medium and low pressure gas pipelines;
  - BT Openreach – underground cables in ducts and overhead cables on telegraph poles;
  - United Utilities – water supply pipelines and surface water and foul water sewers;
  - Highways England – highway drains and roadside technology equipment.
  - ICI – disused ethylene pipeline
- 3.12.3 The greatest concentration of apparatus is at and east of Skippool Roundabout through to Mains Lane and along the section of Garstang New Road to Windy Harbour Junction. This includes an existing 24" asbestos cement water main that runs along the existing A585 route.
- 3.12.4 There is a similar concentration of apparatus along A586 Garstang Road East and there are distribution electricity, gas, water and telecoms apparatus along Lodge Lane.
- 3.12.5 The 24" asbestos cement water main (mentioned above) continues cross-country in a south-easterly direction from Little Singleton and would form a constraint to the vertical alignment of the Southern Bypass.
- 3.12.6 Significant SU apparatus that is likely to require diversion or protection is described in Section 18.6 below.

## 4 ENVIRONMENTAL STATUS

### 4.1 Introduction

4.1.1 The following section describes the existing environmental baseline for the various Scheme study areas. These are presented by environmental topic. For an overview of the existing environmental constraints reference should be made to the Environmental Constraints Plan included in Appendix C of this report. A summary of the assessment of the Scheme options is contained in Section 13.

### 4.2 Noise

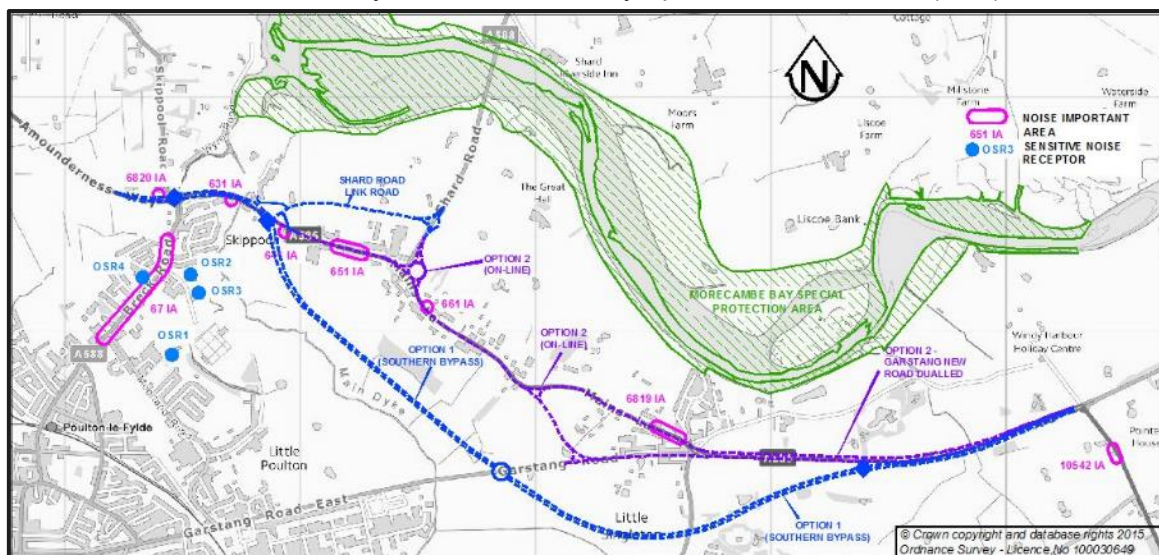
4.2.1 Road traffic noise is likely to be the most prominent noise source in the study area. At Skippool noise levels are likely to be elevated by increased road traffic, particularly at the junction of the A585 and the B5412.

4.2.2 Noise Important Areas have been identified along the A585 between Skippool and Little Singleton and on the B5142 Breck Road that indicate high traffic noise levels. NIA's are presented on Defra Noise Action Plans. NIA's, with respect to noise from major roads are areas where 1% of the population are affected by the highest noise levels from major roads as identified by the strategic noise mapping. This approach has been taken because the population at these locations is likely to be at the greatest risk of experiencing a significant adverse impact to health and quality of life as a result of their exposure to road traffic noise. The NIA's close to the Scheme include (they are also presented on Figure 4-1):

- An area on Breck Road to the south of Skippool Roundabout (67 IA);
- An area to the north-west of Skippool Roundabout (6820 IA);
- Three areas on the A585 Mains Lane between Skippool Roundabout and Shard Road Junction (631 IA, 641 IA, 651 IA);
- An area on A585 Mains Lane south of Shard Road Junction (661 IA);
- An area on Mains Lane in Little Singleton (6819 IA); and .
- An isolated area at Pointer House, Fleetwood Road, south of Windy Harbour Junction (10542 IA)

4.2.3 In addition to the NIA's 598 residential properties are located within close proximity of the Scheme options along with other sensitive receptor locations including:

- OSR1 - Alexandra Nursing Home, Moorland Road, Poulton-le-Fylde, FY6 7EU;
- OSR2 - Breck Primary School, Fouldrey Avenue, Poulton-Le-Fylde, FY6 7HE;
- OSR3 - Brookfield School, Fouldrey Avenue, Poulton le Fylde, FY6 7HE;
- OSR4 - Primrose Bank Rest Home, 153 Breck Road, Poulton-le-Fylde, FY6 7HJ and
- OSR5 - Morecambe Bay and Duddon Estuary Special Protection Area (SPA).

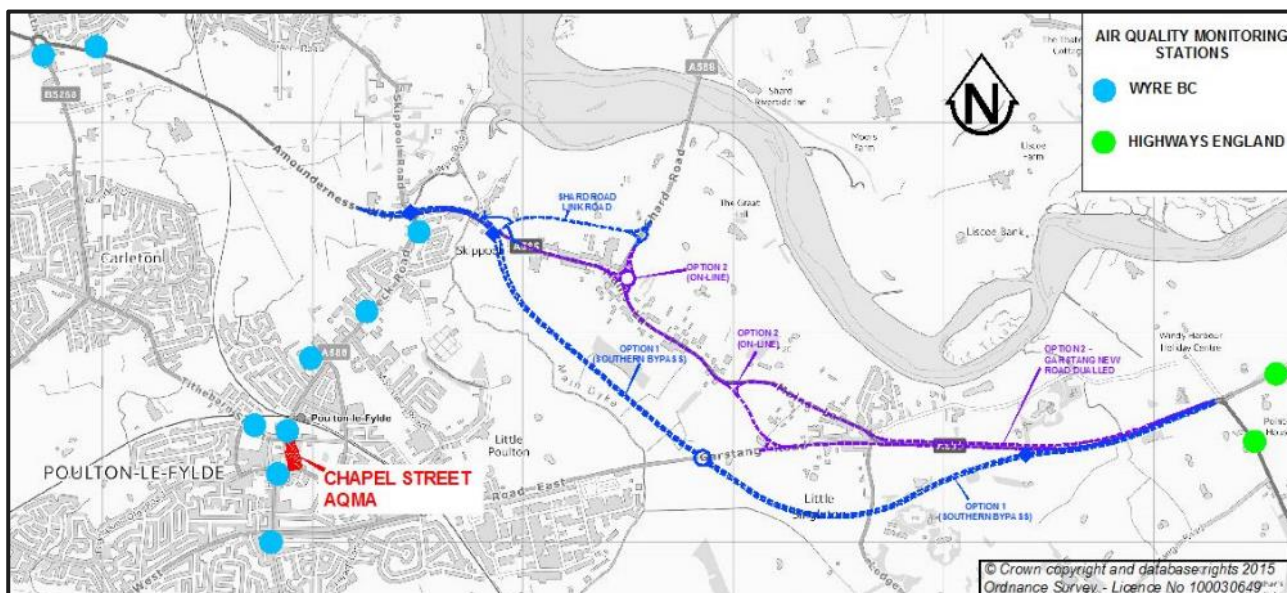




**Figure 4-1: Noise important areas, noise sensitive receptors and the AQMA**

## 4.3 Air quality

- 4.3.1 A review of the information held on Defra's website, and Fylde Borough Council's (FBC) website indicates that there are no Air Quality Management Areas (AQMA) within its administrative area.
- 4.3.2 Air quality monitoring results contained within the FBC Air Quality Progress Reports and the Updating and Screening Assessments do not report any exceedances of the air quality strategy (AQS) objectives from the monitoring results. FBC has no automatic monitoring sites within the borough, therefore there is no automatic monitoring data for NO<sub>2</sub> or PM<sub>10</sub>.
- 4.3.3 A review of the information held on Defra's website, and the Wyre Borough Council (WBC) website indicates that no AQMA have been designated within close proximity of the Scheme. The nearest AQMA is the Chapel Street AQMA located approximately 1.1km south-west of the options in Poulton-le-Fylde town centre (as shown in red on Figure 4-2). The Chapel Street AQMA has been declared by WBC for the exceedance of the annual mean nitrogen dioxide (NO<sub>2</sub>) AQS objective as a result of traffic emissions, congestion and the locality of buildings preventing dispersion of air pollutants.



**Figure 4-2: Air quality sensitive locations and monitoring stations**

- 4.3.4 The closest monitoring locations to the Scheme options are on the A588 at 133 and 168 Breck Road and at the Wyre Council's offices –Breck Road. The 2014 annual mean NO<sub>2</sub> concentration for these sites were 27.9µg/m<sup>3</sup>, 15.0µg/m<sup>3</sup> and 10.4µg/m<sup>3</sup> respectively. Air quality based on the historical results is generally well below the AQS Objectives.
- 4.3.5 Highways England undertook air quality monitoring for a six month period between December 2013 and June 2014 at 12 locations along the A585 corridor. The six months of monitoring indicated that concentrations of nitrogen dioxide (NO<sub>2</sub>) were well below the air quality strategy objectives/European Union (EU) Limit values, with the maximum concentration recorded being 26µg/m<sup>3</sup> on Fleetwood Road approximately 250m south of the Windy Harbour Junction.
- 4.3.6 The air quality monitoring from the local authorities and the Highways England indicates that, generally, air quality does not exceed the air quality strategy objectives/EU limit Values for the main traffic related pollutant, NO<sub>2</sub>.

## 4.4 Landscape and townscape

- 4.4.1 The 1km landscape and townscape study area is wholly located within National Character Area (NCA) 32: Lancashire and Amounderness Plain. This NCA comprises the Fylde coast and is a distinct area that includes Blackpool and Fleetwood. The study area is not located within an Area of

Outstanding Natural Beauty or a National Park. However, non-designated parkland 'Singleton Hall and Parkland' is located within the study area.

4.4.2 For the purpose of the assessment, the landscape resource within the 1km study area was sub divided into four scheme-level landscape character areas (LCA) as shown in Figure 4-3. These comprise:

- LCA 1: Wyre Estuary Open Farmed Hinterland. The open coastal farmland east of the A585 line corridor between west of the Wyre Estuary and north of the A585 between Skippool in the north and Pool Foot Lane in the east;
- LCA 2: Main Dyke Farmland. The low lying river valley farmland west of the A585 between the area south of Skippool in the north running to the east of Poulton Le Fylde to the A586 / and Poulton Industrial Estate in the south;
- LCA 3: Singleton Enclosed Farmland. The gently undulating enclosed farmland within the south part of the study area between the A585 and the village of Singleton; and
- LCA 4: Singleton Hall and Parkland. The intimate designed landscape in the south part of the study area immediately east of the B5260.

4.4.3 At the scheme level the following four local townscape character areas (TCA) have been identified based on the local form and appearance of the urban and built areas:

- TCA 1: Little Poulton. The suburban townscape located to the west of Main Dyke;
- TCA 2: Skippool. The suburban and trunk road townscape located at the junction of the existing A585 and A588;
- TCA 3: A585 Mains Lane. The trunk road townscape of the ribbon development along the A585 between Skippool and Little Singleton; and
- TCA 4: Little Singleton. The trunk road townscape that is located at the busy junction of the existing A585 and A586.

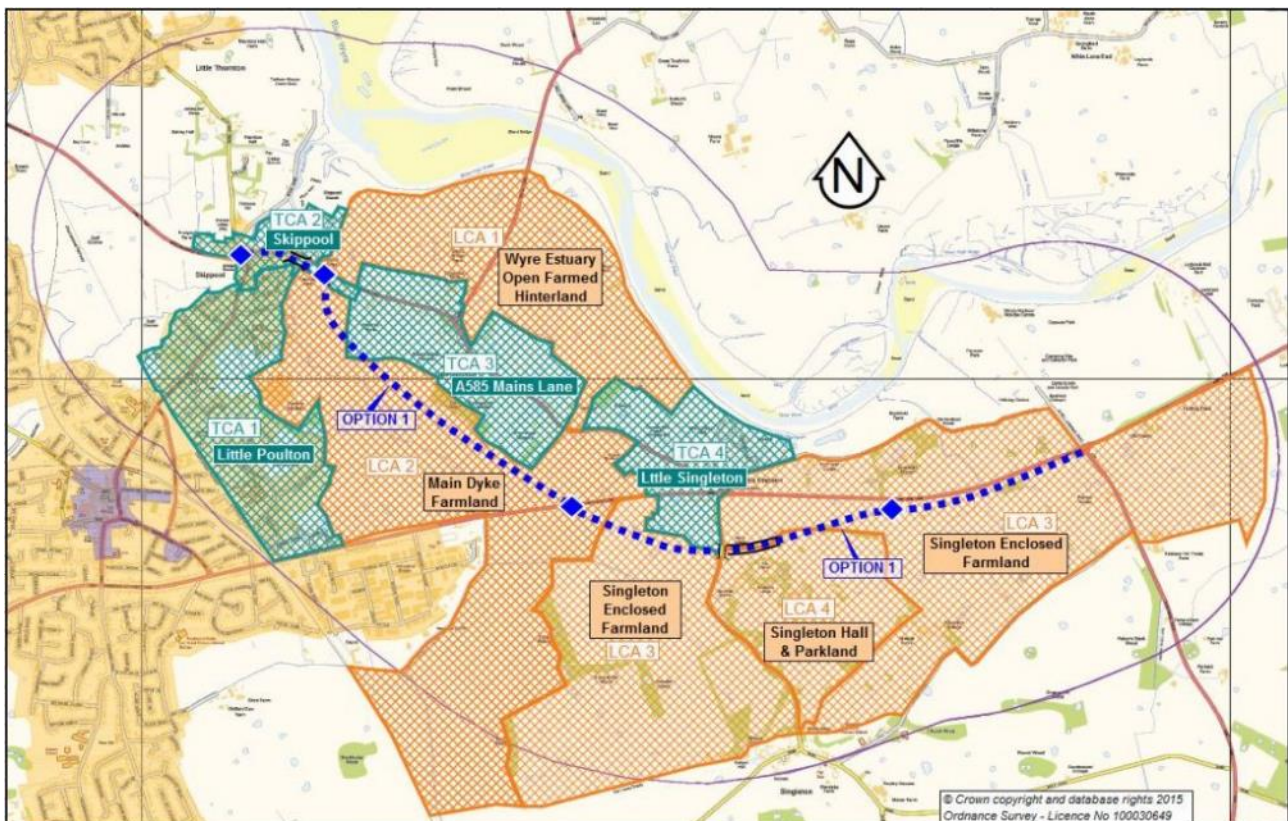


Figure 4-3: Landscape and townscape character areas

## 4.5 Historic environment



4.5.1 There are no World Heritage Sites, scheduled monuments, registered parks and gardens or registered battlefields within the 1km study area or immediately adjacent to it. However, the 1km study area contains nine Grade II listed buildings (Shown by red triangles in Figure 4-4):

- Dovecote at Mains Hall – north of Mains Lane, Little Singleton;
- Mains Hall – north of Mains Lane, Little Singleton;
- Former Chapel of St James and adjacent Priest's House off Moorland Road, East Poulton-le-Fylde;
- The Manor, Off Moorland Road, East Poulton-le-Fylde;
- End Cottage Old Farm, Little Poulton Lane, Little Poulton;
- Ice House at Singleton Hall, Little Singleton;
- Fire Engine House, Singleton Village;
- Church of St Anne, Singleton Village; and
- Lychgate to Church of St Anne, Singleton Village.

4.5.2 The 1km study area also contains parts of two Conservation Areas:

- The Poulton-le-Fylde Conservation Area falls partially within the western extent of the study area; and
- The Singleton Conservation Area is located approximately 1km south of the Scheme and covers the extents of the village of Singleton.

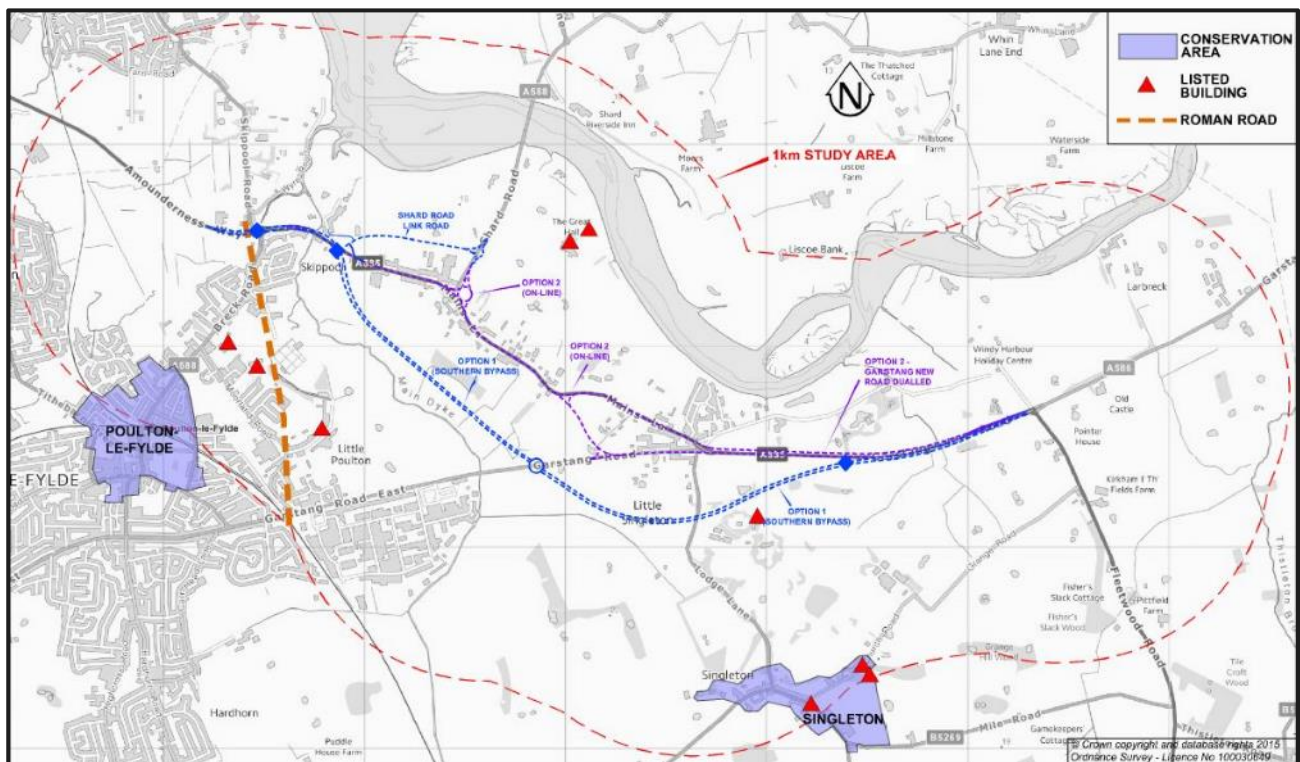


Figure 4-4: Heritage sites within Study Area

4.5.3 The Lancashire Historic Environment Record lists 230 non-designated heritage assets within the 1km study area. A number of these relate to the find spots of prehistoric artefacts that demonstrate the presence of human activity and/or settlement in the millennia leading up to the Roman invasion of Britain circa AD 50. In addition, it is believed that the route of the Ribchester to Poulton-le-Fylde Roman Road crossed the western edge of the study area.

4.5.4 The historic landscape character of the study area includes sand and mud flats, ancient enclosure, post-medieval enclosure, ancient and post-medieval settlement, modern settlement and modern recreation.

## 4.6 Biodiversity

4.6.1 Within the biodiversity study area (1km for non-statutory designated sites, records relating to protected/notable species and field surveys, 2km for sites listed within the Natura 2000 network and 30km for Special Areas of Conservation where bats are noted as a qualifying interest) the following features are present:

- Statutory Designated Sites
  - Morecambe Bay and Duddon Estuary Special Protection Area;
  - Morecambe Bay Ramsar site;
  - Wyre Estuary Site of Special Scientific Interest;
  - Wyre-Lune recommended Marine Conservation Zone;
- Non Statutory Designated Sites
  - Skippool Marsh and Thornton Bank Biological Heritage Site;
  - Shard Bridge Field Ditch Biological Heritage Site;
  - River Wyre – Upper Tidal Section Biological Heritage Site;
- Priority Habitats
  - Deciduous woodland;
  - Hedgerow;
  - Coastal Saltmarsh
  - Mudflats;
  - Coastal and floodplain grazing marsh;
  - Ponds;
  - Rivers;
  - River Wyre;
  - Skippool Creek;
  - Main Dyke;
  - Horsebridge Dyke
- Protected / notable species;
  - Protected and notable plants (including fungi);
  - Invasive flora;
  - Aquatic invertebrates;
  - Terrestrial invertebrates;
  - Fish;
  - Great crested newts;
  - Reptiles;
  - Wintering/passage birds; and breeding birds;
  - Badgers;
  - Water voles;
  - Otters;
  - Hedgehog;
  - Brown hare; and
  - Bats.

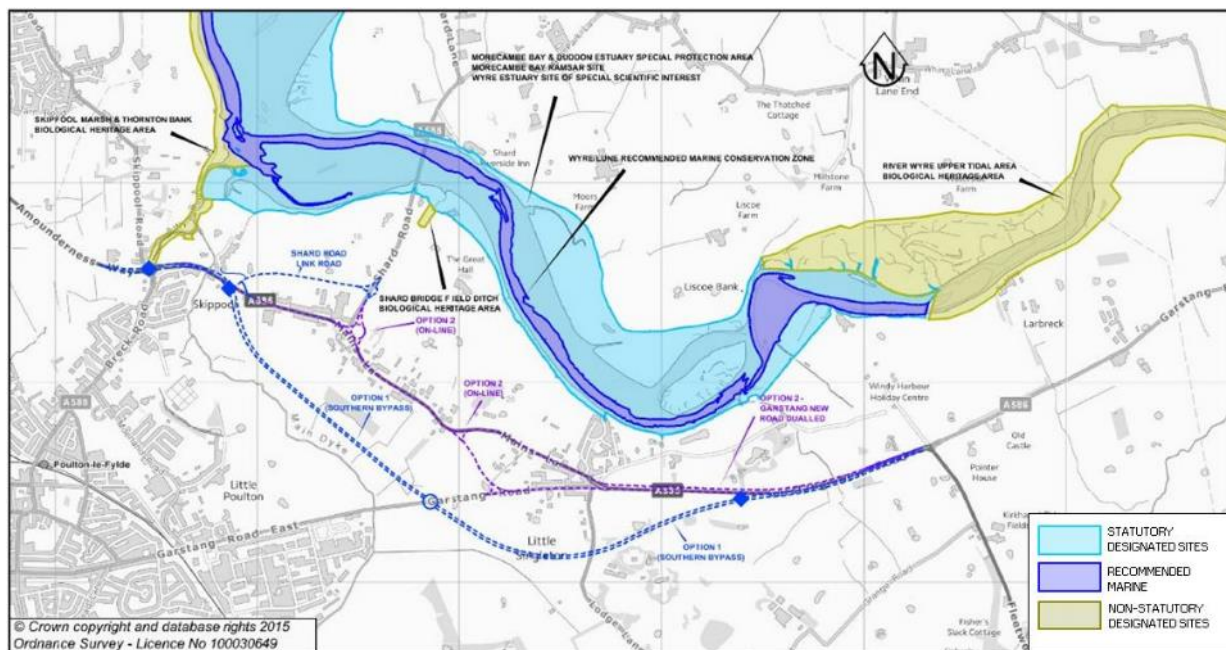


Figure 4-5: Statutory and non-statutory designated sites

## 4.7 Water environment

- 4.7.1 The 1km study area is located to the south of the Wyre Estuary. The River Wyre is designated by the Environment Agency as a Main River and, rising in the Forest of Bowland in central Lancashire, follows a southerly then westerly flow path, becoming tidally influenced below the weir at St Michael's. From Skippool, just downstream of Shard Bridge, to Fleetwood, the banks of the river form the Wyre Estuary Country Park.
- 4.7.2 Other surface water features in the study area include the Main Dyke and the Horsebridge Dyke (both also designated as main rivers), that drain to the Wyre estuary via the Skippool Creek at the western extent of the study area and an unnamed watercourse that crosses Garstang New Road to the east.
- 4.7.3 The agricultural nature and low lying topography of the study area means that there are also a number of existing field drains routing through the study area, and many of the agricultural fields also contain a number of ponds.
- 4.7.4 The study area receives an average annual rainfall of approximately 900mm and is underlain by soils that are described as reddish fine loamy over clayey soils with slowly permeable sub soils.

### Groundwater quality

- 4.7.5 The Environment Agency's website indicates that there are no groundwater Source Protection Zones within the study area.

### Surface water quality

- 4.7.6 With regard to surface water quality the River Wyre and Main Dyke are both monitored under the Water Framework Directive (WFD). Based on the second cycle of WFD River Basin Management Plans the watercourses within the study area are currently:

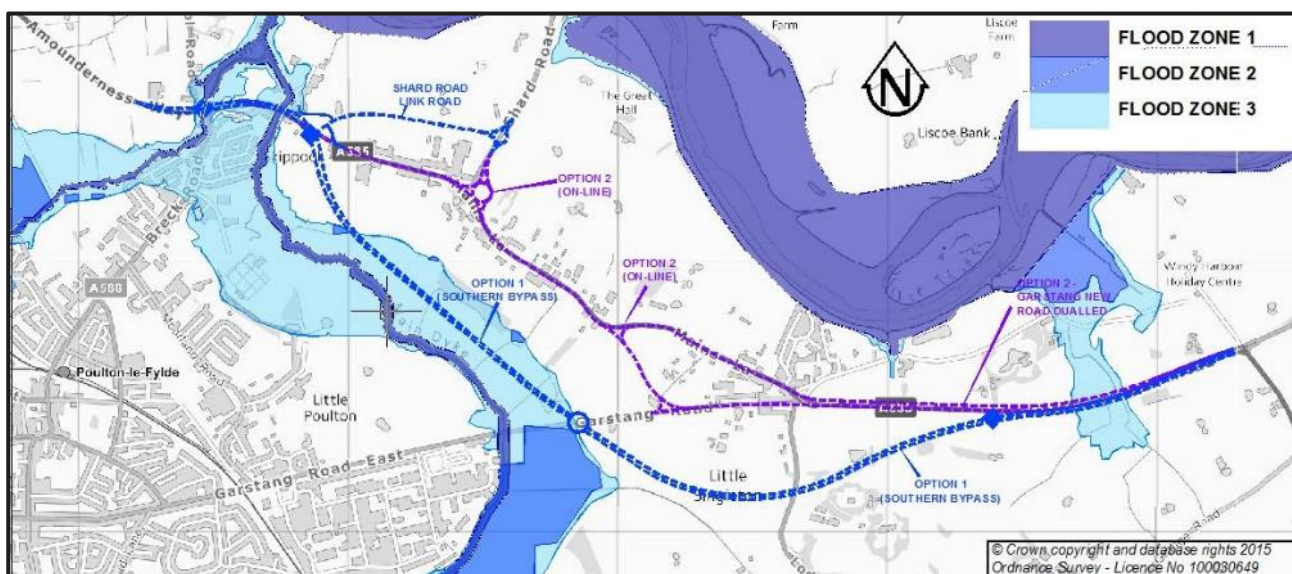
Watercourse	Classification	Ecological Status	Chemical Status
River Wyre	heavily modified, transitional waterbody (estuarine)	Moderate potential	Fail
Main Dyke (Hillylaid Pool)	heavily modified waterbody	Moderate potential	Good
Horsebridge Dyke	heavily modified waterbody	Moderate potential	N/A
Watercourse (Pool Foot Creek)	heavily modified waterbody	Moderate potential	N/A

**Table 4-1: Watercourses - Surface Water Quality**

- 4.7.7 The Environment Agency (EA) has supplied details of pollution incidents that have had an effect on the water environment within the study area. In the ten year period of record (2004 to 2014) a total of sixteen incidents were recorded, all of which were classified as Category 3 (Minor) incidents. Pollutants comprised raw sewage, oils/fuel and fire-fighting runoff and predominantly affected the Main Dyke.

## 4.8 Flood risk

- 4.8.1 The EA Flood Map for Planning illustrates that lands within the 500m study area are located within Flood Zones 1 and 2. In addition parts of the study area, particularly towards the eastern and western boundaries are located in Flood Zone 3 (refer to Figure 4-6). This flood zone shows the area that could be affected by flooding from the sea with a 1 in 200 or greater chance of happening each year or from a river with a 1 in 100 or greater chance of happening each year. Some areas are also indicated to benefit from protection by flood defences.



**Figure 4-6: Scheme flood risk map**

- 4.8.2 Existing flood defences comprise a mixture of walls and embankments adjacent to the banks of the Main Dyke and the Wyre Estuary, in addition to the Skippool Tidal Barrier and tidal doors. The tidal door structure is attached to the north side of Skippool Bridge and tidal flaps appear to have to be manually closed to protect Main Dyke against the impact of a storm surge in the Wyre Estuary. However, it is believed the tidal doors have been superseded by the Skippool Tidal Barrier.
- 4.8.3 The existing risk of flooding from groundwater has been assessed with reference to British Geological Survey (BGS) mapping that defines groundwater flood risk susceptibility into three categories:
- Limited potential for groundwater flooding to occur;
  - Potential for groundwater flooding of assets located below the ground surface; and
  - Potential for groundwater flooding to occur at the surface.
- 4.8.4 The baseline risk of flooding from artificial sources (reservoirs and canals) within the study area is concluded to be low as there are none of these features within the study area.



## 5 PLANNING FACTORS

### 5.1 Planning Constraints

- 5.1.1 As the A585 provides the only viable major transport link into the area there is pressure from the local planning authorities and stakeholders to ensure that it operates effectively and efficiently to allow the potential for economic growth in line with the aspirations of their emerging local plans.
- 5.1.2 It should be noted that both Wyre Council and Fylde Council – within which the Study Area is located – are in the process of updating their Local Plans and these have referenced various other specific documents.

### 5.2 Wyre Council Local Plan

#### Wyre Council – Existing Local Plan

- 5.2.1 Wyre Council's existing Local Plan was adopted in 1999 and directly affects the Study Area to the north-west of Skippool Roundabout and to the west covering the eastern fringes of Poulton-le-Fylde. The main (Core) policies affecting the study area are:
- North-west of Skippool Roundabout the A585 Amounderness Way passes through Greenbelt (CORE 3)
  - Area of open farmland immediately to the west of Main Dyke between Skippool and A586 Garstang Road East (CORE 9)
  - Recreational Open Space areas near Moorland Road, East Poulton
  - Employment area (Poulton Industrial Estate) south of A586 Garstang Road East (EMPL2 & various infill sites under EMPL1)

#### Fleetwood Thornton Area Action Plan

- 5.2.2 The Fleetwood-Thornton Area Action Plan (AAP) was adopted by Wyre Council in 2009 to look ahead to the year 2021, setting out a comprehensive vision and spatial planning framework for the Fleetwood-Thornton area, within Wyre Borough. The AAP aimed to address the key issues facing the area, and in particular, focused on delivering significant growth and development to secure the sustainable regeneration of this strategically important site. The boundaries of the land (the 'Area') to which the AAP relates are shown in Figure 2.1. The AAP forms part of Wyre's Local Development Framework thus affording it significant material weight in any decisions on planning applications within the Area.

#### Wyre Council New Local Plan

- 5.2.3 Wyre's emerging new Local Plan will set out a vision for growth and development of the entire borough to 2031, including where new homes, employment and shops will be located as well as which areas will be protected. As part of that plan the following vision was stated:

*By 2031 there will have been substantial improvements to accessibility and connectivity. Existing accessibility issues along the A585 will have been tackled and traffic through the town centre of Poulton-le-Fylde will have been reduced. Enhanced walking and cycling routes will have strengthened links within and between settlements. Improvements along the A6 corridor will be in place to enable necessary new development to occur. Accessibility will also have been enhanced through a new section of the tramline linking Fleetwood to Blackpool North Railway Station.*

- 5.2.4 To inform the development of the new Wyre Local Plan the council carried out a public consultation on Issues and Options from 17 June to 7 August 2015. As part of that consultation an "Issues and Options" document was prepared to identify the key issues facing the borough – including an ageing population, pressure for new housing and the creation of sustainable economic growth – and the options for addressing them.
- 5.2.5 The main matters raised included:
- Inadequate infrastructure (including highways, schools, doctors, drainage) to support development;
  - There is no need for further housing questioning the SHMA methodology

- Lack of employment to support the increased population
- Need for a mix of housing including affordable housing and housing for the elderly
- Further Green Belt should be designated around rural settlements

5.2.6 In response to matters raised during the consultation Wyre Council responded to the issue related to the A585:

<i>Matter Raised</i>	<i>Council Response</i>
<i>There is a lack of capacity within the strategic highway network (e.g. A585(T)) to support the level of residential development proposed</i>	<p><i>The Council recognise the limitations of the existing strategic highway network and is working closely with Highways England (HE) and the Local Highway Authority (LHA) - Lancashire County Council to address these concerns. This work involves considering the capacity and potential deliverable improvements to road infrastructure to support growth. Where improvements to the network are required this will be set out in the Infrastructure Delivery Plan (IDP) which will accompany the Local Plan. The IDP will include information about how any improvements will be funded and delivered</i></p> <p><i>With regards to the A585, in December 2014 the Government announced a new major scheme to bypass Little Singleton. HE is currently working in considering design options for the scheme taking into account development needs in the Wyre. Public consultation on Options will be undertaken by Highways England in Summer 2016.</i></p>
<i>A new and faster route to the M55 should be considered.</i>	<i>The Fylde Coast Highways and Transport Masterplan is the appropriate vehicle to consider alternative routes to the M55. The current Masterplan adopted in July 2015 identifies a North Fylde Coast Connectivity Study to be completed 16/17.</i>

5.2.7 Currently several key evidence base documents are being prepared, and the timetable for the New Local Plan will be updated once the documents have been completed towards the end January/beginning February 2017.

5.2.8 In the New Local Plan consultation document dated June 2015 – the Spatial Vision and Strategic Objectives included the following that are relevant to the Scheme:

- Reducing Wyre's carbon footprint through the promotion of a sustainable pattern of development.
- Ensuring that the risk from coastal, fluvial and localised flooding is minimised when locating new development and if development is required in areas at risk that risk is mitigated.
- Improving flood defences in Wyre in areas where people and property are already at risk from flooding or are likely to be in the future, in accordance with the council's adopted Flood and Coastal Defence Strategy Plan and Land Drainage Strategy or successors.
- Managing surface water run off through the incorporation of sustainable drainage systems (SuDS) with new developments and conserving permeable surfaces.
- Ensuring that new major traffic generating developments are sited within the Fylde peninsula in locations that are accessible by a variety of modes of transport.
- Improving public transport, as well as opportunities for walking and cycling, within and beyond the borough.
- Enhancing traffic management and reducing congestion, particularly on the A585(T).
- Conserving and enhancing environmentally sensitive areas of importance for biodiversity, geodiversity and landscapes, including the Forest of Bowland Area of Outstanding Natural Beauty, Bowland Fells SSSI and SPA, Wyre Estuary and Lune Estuary SSSIs, Morecambe Bay SPA and Ramsar and Biological Heritage Sites.
- Ensuring that development protects and where possible enhances biodiversity.
- Improving access to the coast and countryside for tourism and recreation through partnership, including through the improvement of the Wyre Way and North West Coastal Trail without compromising sensitive environments.
- Protecting Wyre's best quality agricultural land.
- Ensuring that the quality of surface waters and groundwater is not compromised.



- Establishing a borough wide network of parks, Green Belt, other open spaces and waterways. Improve the quality, connectivity and accessibility to this network.
- Ensuring that new development contributes towards the infrastructure needs of the area and its local communities, as identified by the Wyre Local Development Framework Infrastructure Delivery Plan or successors.

### 5.3 Fylde Council Local Plan

5.3.1 Future development within Fylde will be guided by the plans and policies within the Fylde Local Plan. The plan period will run from 1st April 2011 to 31st March 2032.

5.3.2 Consultation took place on The Publication Version of the Fylde Local Plan to 2032 for a period of 6 weeks commencing 11 August 2016. The Local Plan to 2032 was submitted to the Secretary for Examination on 9 December 2016.

5.3.3 The proposed Policies Map shows:

- The majority of the study area is in "Countryside Area" (GD4)
- The Coastal Change Management Area (ENV1) covering much of the area east of Mains Lane
- The RAMSAR site (ENV2) along the Wyre Estuary
- The Sites of Special Scientific Area (ENV2) along the Wyre Estuary
- The Fylde Coastal Way (T4) along the northern part of Mains Lane and Shard Road)
- The safeguarded route of the M55 (Junction 3) to Fleetwood Corridor Improvements (T1) [also known as the "Blue Route"]
- The A585(T) Skippool to Windy Harbour Improvements (T1) [This scheme]
- 3 small Strategic housing sites in Singleton Village (H1)

5.3.4 Fylde Council's Infrastructure Delivery Plan was published in August 2016 and gave details of the transportation policies (T1 & T4). For the M55 to Fleetwood Corridor Improvements it stated:

*There is significant traffic congestion on the A585(T) at peak times and increasingly at other times of the day and at weekends, and development proposed in the emerging Wyre Local Plan and Wyre's adopted Fleetwood-Thornton Area Action plan will place additional pressure on this route. There is a long standing aspiration to build a dual carriageway road to connect a new junction on the M55 east of Peel Hill to the Victoria Road roundabout on the A585(T) between Thornton and Cleveleys. This scheme, known as the 'Blue Route' would alleviate traffic congestion and improve north-south road links north of the M55 and enhance accessibility to and from Fleetwood. Fleetwood is still officially classified as a port and has commercial sailings linked to the offshore energy sector.*

*The southern section of the 'Blue Route', which lies within Fylde, would link the A586 Garstang Road East with the M55 between Junctions 3 and 4. This section would comprise a new junction on the M55 to the east of Junction 4 at Peel Hill and a new 7.5km dual carriageway link to the A586 Garstang Road East to the west of Little Singleton. Funding for the Blue Route is uncertain; its cost is estimated to be around £150 million at 2012 prices but this could rise to over £200 million, taking account of inflation. If the 'Blue Route' were to go ahead, funding could not be secured within the lifetime of the Local Plan. Nevertheless, the Local Plan should show the route as a protected line, at least until the M55 to Fleetwood Corridor Study presents its findings. This study will consider the scale and scope of the problems on the A585(T) and wider issues that are intrinsically linked to the operation of the A585(T) and access onto the M55 at Junction 3, north of Kirkham and Wesham.*

5.3.5 For the A585 "Skippool to Windy Harbour Improvements" it stated:

*This Highways England scheme is likely to comprise a new offline bypass of Little Singleton. The scheme would remove the current pinch point at Five Lane Ends and provide the opportunity to improve the A585(T) Mains Lane / A588 Shard Road junction. It could also remove rat-running traffic from Singleton. Work on developing this scheme is at a very early stage of option development, so as yet the form the scheme could take is not known. A Preferred Option will be put to a public consultation during 2016, before the formal consultation process to seek a Development Consent Order begins in 2017. At this stage, it is anticipated that construction work would begin in 2019/20 and be completed in 2021/22, well within the*

*Local Plan period.*

## 5.4 Fylde Coast Highways and Transportation Masterplan

- 5.4.1 This document was published jointly between Lancashire County Council and Blackpool Council in July 2015, the aim of which was to expand on their Local Transport Plans that set out their transport priorities. These strategies establish a commitment to support the economy and to tackle deep-seated inequalities in its people's life chances, revitalising communities and providing safe, high-quality neighbourhoods. It went on to state:

*We want to ensure that the A585(T) operates as effectively as possible by carrying forward a programme of viable improvements. We therefore propose to build on the work that the HE are starting now and to work together to design and take forward the recently announced A585(T) Windy Harbour to Skippool Improvements and then any further scheme or schemes needed to remove any final pinch-points on the corridor.*

*Highways England is also currently working to resolve capacity issues at Windy Harbour and at Junction 3 on the M55 and have committed to monitoring the southern section of the A585(T) from Windy Harbour to M55 Junction 3, bringing forward improvements where appropriate and beneficial, for instance potential improvements at the Thistleton crossroads.*

*By dealing with the congestion at these significant junctions, the numbers of vehicles using inappropriate roads to avoid congestion should be greatly reduced.*

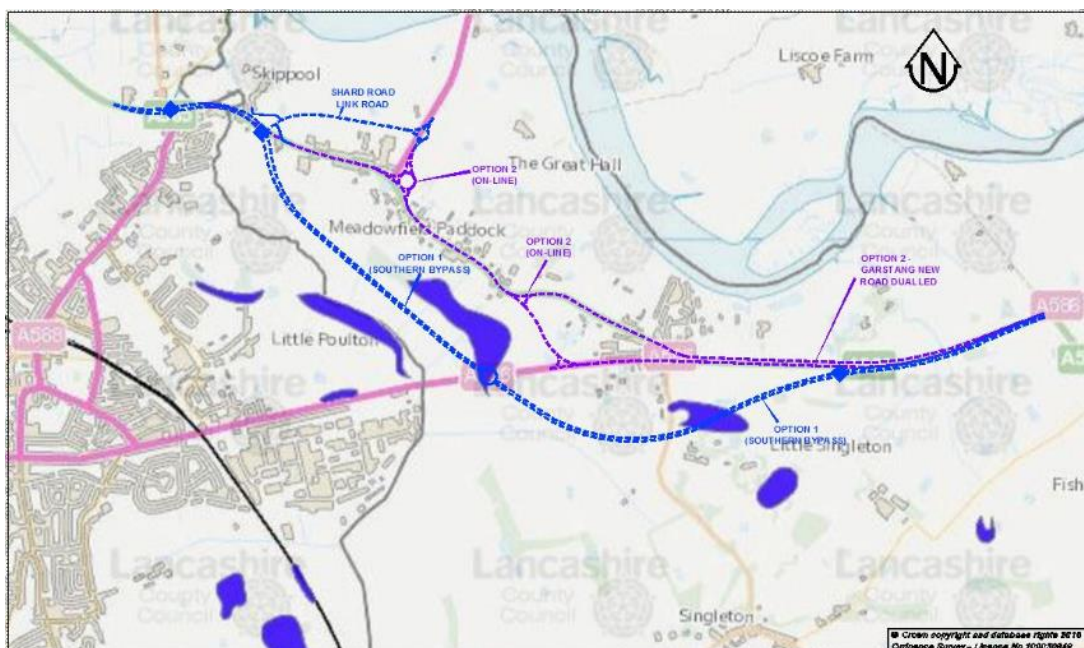
*However, in the light of further evidence received during the consultation, we do not propose to rescind protection on the alignment of the M55 to Norcross Link until the full impacts of changes to the highways network both along the A585(T) and around Preston have been reviewed.*

*We will therefore undertake a specific North Fylde Coast Connectivity Study. The work will gather together the findings of our existing traffic modelling work and also the work being done by Highways England. It will also quantify the extent of rat-running and road safety problems in the wider corridor of concern that is influenced by the A585(T).*

*Only when the study has been completed will a final decision on the 'Blue Route' be taken. However, the County Council's position remains that the route will be difficult to fund and that we must urgently seek more readily deliverable alternatives if possible.*

## 5.5 Lancashire County Council - Mineral Safeguarding

- 5.5.1 The Minerals and Waste Local Plan for Lancashire includes a proposals map, which designates Mineral Safeguarding Areas. Some of these designated areas may be affected by the scheme. An extract from Lancashire County Council's MARIO map system showing these areas is shown with the Scheme options in Figure 5-1.



**Figure 5-1: Lancashire County Council - Mineral Safeguarding Areas**

## 6 DO NOTHING CONSEQUENCES

- 6.1.1 The A585 currently suffers from congestion, journey time delays and a high level of reported accidents at the junction locations. If left without intervention the general growth of traffic on the route and surrounding area the number of incidents is likely to continue to increase proportionally.
- 6.1.2 A quote for the Strategic Outline Business Case (SOBC):
- “Existing traffic conditions on the A585 will deteriorate and intervention by the creation of smaller improvement schemes is likely to be required but will not provide the same overall benefit. Noise levels will also increase and air quality will deteriorate.*
- Growth on the Fylde / Wyre peninsula, including significant development areas at Fleetwood & Thornton will be constrained”.*
- 6.1.3 The Stage 1 A585 Traffic Forecasting Report indicated that the ‘Do Nothing Consequences’ or ‘Reference Case’ as referred to by the report, consistently inform the worst return for journey times and congestion for the identified return periods 2021 and 2036.
- 6.1.4 The Stage 2 Traffic Forecasting Report confirmed that the existing network would not support the planned development on the Fylde peninsula and as can be seen from the developing Wyre and Fylde Local Plans, the affected planning authorities clearly consider that improvements to the A585 trunk road corridor are essential to support the future development within their boroughs.

## 7 SUMMARY OF ALTERNATIVE SCHEME OPTIONS

### 7.1 Introduction

7.1.1 During the options selection stage, 10 alternatives were developed and assessed for their compliance with the project objectives. These were considered in a value management workshop in In summary these were:

Option	Description
S1 (Taken to the consultation as <b>Option 1A</b> )	A dual carriageway from Skippool Junction would pass to the west and south of Little Singleton with 3 new at-grade junctions (Skippool Bridge, Poulton and Grange) and would connect with the west arm of Windy Harbour Junction. The layout would include a new dual carriageway bridge across Main Dyke and the bypass would be in cutting south of Little Singleton including a new bridge carrying Lodge Lane over the bypass.
S1A (Taken to the consultation as <b>Option 1B</b> )	As Option S1 but with no junction with Garstang New Road east of Little Singleton (Grange Junction) and the section of Garstang New Road east of Little Singleton would be decommissioned.
S2 <b>Rejected</b>	As Option S1 but with an at-grade T-Junction with Lodge Lane South of Little Singleton. The bypass would be in shallow cutting at Lodge Lane and the side road would be severed. <b>Rejected as would have introduced an at-grade junction that could have encouraged traffic to use inappropriate local routes and the close spacing of the junctions</b>
S3 <b>Rejected</b>	Single carriageway version of Option S1 <b>Rejected as would not have had sufficient capacity to cope with predicted future traffic growth and would potentially be less safe than the dual carriageway option</b>
S4 <b>Rejected</b>	Single carriageway version of Option S2 <b>Rejected as would not have had sufficient capacity to cope with predicted future traffic growth and would potentially be less safe than the dual carriageway option</b>
S5 <b>Rejected</b>	Version of Option S1 but with section of existing Garstang New Road removed east of Little Singleton with no provision of a junction on the proposed bypass east of Little Singleton. A new link road to the north-west of Little Singleton would be provided between the Poulton Junction and Mains Lane. <b>Rejected as was similar to Option S1A but included the additional link to the north-west of Little Singleton.</b>
N1 <b>Rejected</b>	Dual carriageway passing to the north of Mains Lane but re-joining the Option S1 route at Poulton junction with the bypass passing under Shard Road and an additional junction at Mains Lane to the north-west of Little Singleton <b>Rejected as was longer than Option S1 and with an additional junction would have reduced benefits. Also the additional structure and cutting would have had increased environmental dis-benefits.</b>
N2 <b>Rejected</b>	As Option N1 but with an at-grade junction with Shard Road <b>Rejected as was longer than Option S1 and with two additional junctions would have reduced benefits. Also the additional junction would have had increased environmental dis-benefits.</b>
O1 (Taken to the consultation as <b>Option 2</b> )	Route following and retaining the existing single carriageway between Skippool and Little Singleton with improved at-grade junctions at Shard Road. A one-way gyratory system would be provided around Little Singleton using parts of Garstang Road East and Mains Lane and a new northbound link road to the north-west of Little Singleton. Garstang New Road east of Little Singleton to Windy Harbour Junction would be converted to dual carriageway.
O2 <b>Rejected</b>	Variant of Option O1 with roundabouts on the one-way gyratory around Little Singleton. <b>Rejected as was the gyratory arrangement with roundabouts was less efficient in dealing with traffic flows.</b>

**Table 7-1: Options Considered**



7.1.2 Following a review on these identified options, the three options which were considered to best meet the scheme's objectives were consulted on. These are:

- Option 1A – Southern bypass including a junction with Garstang New Road east of Little Singleton
- Option 1B – Southern bypass but not including a junction with Garstang New Road east of Little Singleton
- Option 2 – improvements to the existing A585 (no bypass)

## 7.2 Options developed further

### Form of junctions

7.2.1 For the off-line options (1A and 1B), the form of the proposed junctions was not fixed but would either be roundabouts or traffic signal layouts. An initial traffic and economics assessment was carried out to determine which variant would perform better (resulting in reduced delays and improved journey time reliability). Traffic modelling carried out at PCF Stage 0 concluded that the existing layout of Skippool roundabout was causing significant delays. The traffic model was revisited during PCF Stage 1 and the options assessed using S-Paramics, with the traffic signals option proving to perform significantly better at Skippool Junction and Skippool Bridge Junction but the roundabout layout at Poulton Junction seemed to perform better.

7.2.2 The proposals to provide a traffic signal junction layout at Skippool Junction was ratified by the project board for all options, and it will be subject to a full operational assessment review at Stage 3.

### De-trunking

7.2.3 For Options 1A Mains Lane (from Skippool Bridge Junction to Little Singleton) & Garstang New Road (to Grange Junction) would normally be de-trunked and handed over to Lancashire County Council and a commuted sum would have to be agreed for them taking over the 3km of the existing road.

7.2.4 Similarly for Options 1B the existing Mains Lane (from Skippool Bridge Junction to Little Singleton) would be normally be de-trunked and handed over to Lancashire County Council. However as the section of Garstang New Road east of Little Singleton would be decommissioned the commuted sum would be probably be reduced. (see Table 7-2).

## 7.3 Option 1A



**Figure 7-1: Option 1A overview**

### **Route description**

- 7.3.1 Option 1A would be a mostly offline dual carriageway bypass. Working in a west to east direction, Option 1 connects to the existing A585 Amounderness Way single carriageway running in a generally easterly direction approaching Skippool Junction on a gentle left hand curve and downward gradient.
- 7.3.2 The layout of Skippool Junction would either be an improved roundabout (possibly signalised) or a new traffic signal controlled crossroads junction with additional lanes for the A585 and dedicated left and right turn lanes. The signal controlled junction option would be designed with full pedestrian and cycle crossing facilities.
- 7.3.3 East of Skippool Junction the alignment would be a short section (350m) of dual carriageway generally following the profile of the existing road with a low point (6.2m AOD) between Skippool Junction and Skippool Bridge. The design speed would be 40mph along this section of the route. On the north side of the road, the existing footway/cycleway would be re-provided. On the south side of the road existing property threshold levels including at the Skippool Service Station (petrol) constrain the layout.
- 7.3.4 This area between Skippool Bridge and Main Dyke is shown to be in the Flood Zone 3 (1 in 200 risk of tidal flooding).
- 7.3.5 At Main Dyke, a new dual carriageway bridge would be provided (New Skippool Bridge) and the level of the road would be determined by clearances required by Environment Agency above water levels in Main Dyke and threshold levels of adjacent properties. The existing Skippool Bridge would be demolished and re-built in stages to enable continual traffic use. The northern half of the bridge would be constructed just north of the existing bridge so the traffic can be diverted onto it while the southern half of the bridge is constructed on the line of the existing.
- 7.3.6 A new junction (Skippool Bridge Junction) would be provided where the route would leave Mains Lane south of Main Dyke. The junction would provide a connection between the new route and existing Mains Lane that would be retained. Within the junction, the profile would rise from Skippool Bridge to just east of the junction. For the roundabout layout, the junction would straddle the existing road and a connection would be provided to Old Mains Lane north of the existing road.
- 7.3.7 For the traffic signal layout the junction would generally be over or west of the existing road as a Tee junction forming the connection to Mains Lane. An eastbound slip road would connect to Mains Lane and a right turn lane would be provided for west to northbound traffic.
- 7.3.8 From Skippool Bridge junction the design speed increases to 70mph. The dual carriageway would head in a south easterly direction from Skippool Bridge junction. At about the mid-point to the new Poulton Junction (~700m) there will be laybys for both carriageways.
- 7.3.9 From Skippool Bridge junction the route reaches a high point (11.2m AOD) about 100m south-east of the junction having swung westwards and then, gently eastwards as an offline dual two lane all-purpose bypass travelling southeast towards the A586. From the high point the bypass would be on embankment up to 3.5m high within the Main Dyke flood plain. The route would descend at 0.67% and cross over several ditches before reaching a low point (6.8m AOD) 900m southeast of Skippool Bridge Junction. The low point was determined from the predicted 1 in 200 year tidal flood level of 6.65m AOD.
- 7.3.10 A new at-grade junction (Poulton Junction) would be provided with A586 Garstang Road East that would be situated east of the Garstang Industrial Estate and would provide access to Poulton-le-Fylde and Little Singleton via the existing A586 Garstang Road East.
- 7.3.11 The route then progresses offline in an eastward direction, the route will move into deep cutting (up to 8.6m) to pass under a new bridge carrying the B5260 Lodge Lane and would continue in retained cutting past Singleton Manor, Barnfield Manor and Singleton Hall.
- 7.3.12 About 200m east of the cutting, the route would continue to climb at about 4% gradient to pass over a 24" asbestos cement water main retaining wall and then proceed to climb to tie in at grade with the existing Windy Harbour junction.

- 7.3.13 The link would connect to the existing Garstang New Road at Grange Junction that is an at-grade junction and then upgrades Garstang New Road towards the recently constructed Windy Harbour Junction. The existing section of Garstang New Road immediately east of Grange Roundabout would become redundant.

## 7.4 Option 1B

- 7.4.1 Option 1B is a variant to Option 1A and does not provide Grange Junction with its connection to Garstang New Road east of Little Singleton. The horizontal alignment of the bypass east of Lodge Lane would be slightly different from that for Option1A in that a larger radius curve would be been provided to the tie in with Garstang New Road approaching Windy Harbour Junction to allow the provision of lay-bys for both carriageways on this longer link.
- 7.4.2 The main effect of this option is that Garstang New Road east of Little Singleton would be decommissioned over a length of about 1.1km as it would not be connected to the bypass. This would have several consequences that have been considered and are presented in Table 7-2 below.

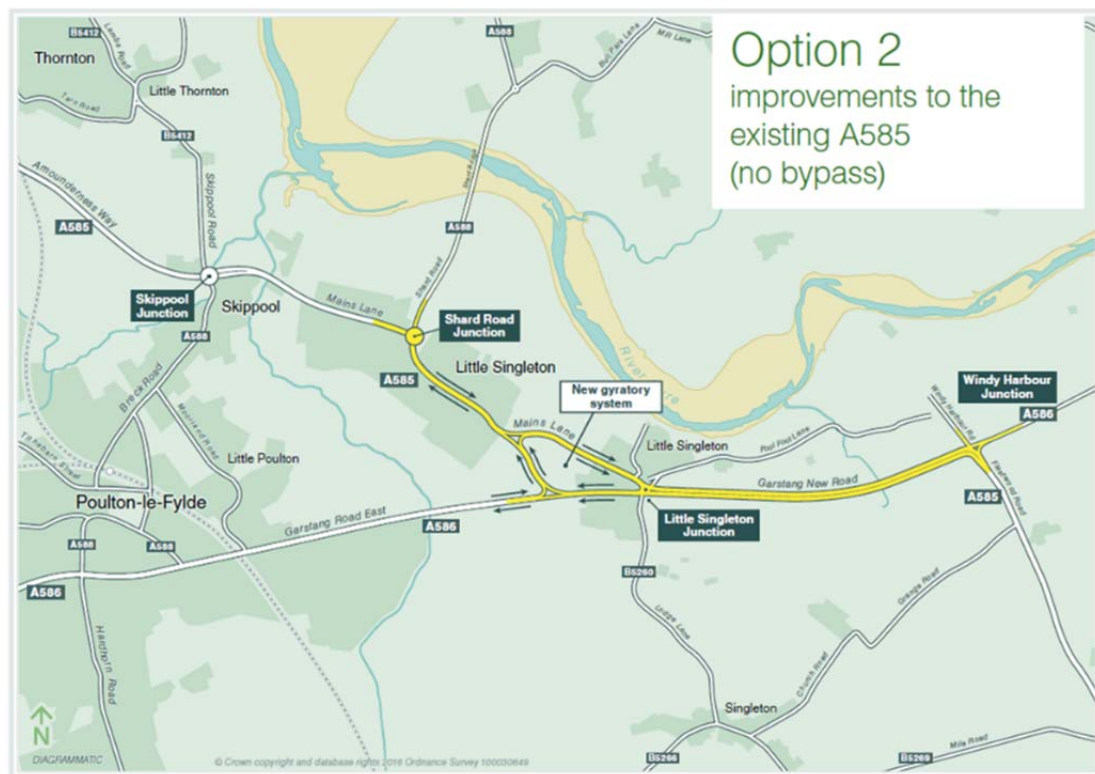
Issue	Problem	Mitigation
Garstang New Road (GNR) would be detrunked	Lancashire CC may not want to take over responsibility	Pay commuted sum
Loss of existing highway asset	Existing asset would be wasted	
Diversion route	Decommissioned GNR cannot provide a diversion route if bypass (Windy Harbour to Poulton Junction) has to be closed	There would be limited opportunity to provide a diversion route and traffic would be likely to use unsuitable local routes (refer to Section 7.6.8 below).
Local Traffic	All local traffic from Mains Lane/Singleton heading east has to use Garstang Road East to Poulton Junction	Some local traffic would use local routes through Singleton village. Consider discussions with Lancashire CC regarding traffic management along Lodge Lane.
Bus routes 76 & 400 (school)	Services passing E-W along GNR in Little Singleton would not be able to continue E-W	U-turn in Little Singleton only possible with roundabout to replace Little Singleton Junction traffic signals layout
GNR would be dead end	Open to abuse. Fly tipping & squatting	Insert moveable gate at Little Singleton end and at footpath crossing point.
Moveable gates	Security of gates not guaranteed	Woul be the responsibility of Lancashire CC to manage the security of the gates
Footpath crossing GNR & Option 1B	With no Grange Junction, at-grade crossing of bypass may not be safe. Subway not popular and liable to flood	Footbridge over bypass
Footbridge over bypass	Not popular & visually intrusive	Alternative at grade crossing could be considered but would pose a hazard for pedestrians crossing the bypass route.
BT & MP Gas in south verge, Med Voltage Elec in north verge	Stats companies would prefer remain with suitable access unless diverted	Pay for diversions – additional costs
Route for footway/cycleway from Windy Harbour to Little Singleton	Would only need (say) 5m wide corridor. Existing Road = 9.3m, Hedge to Hedge = 16.3m	Divert electricity to south side of road. Excavate north side of road and plant trees/shrubs in carriageway and north verge
Scope for compensation planting	Utilities apparatus in both verges	Divert electricity to south side of road. Excavate north side of road

Issue	Problem	Mitigation
		and plant trees/shrubs in carriageway and north verge
Lighting to footway/cycleway	Assume lighting would be required for security. Existing lighting 12m columns + assumed Highways England private cabling on both sides	Remove existing lighting and replace with (say) 5m hinged columns at 30m centres on one side only.
Farmers access to fields between GNR & Bypass	GNR currently provides access to 3 arable fields	Retain track to provide access (wide enough for combine harvester)
Layout of Five Lane Ends (Little Singleton) Junction	Traffic signal junction would not necessarily be required	Reconfigure junction as uncontrolled roundabout to allow for U-turns

**Table 7-2: Consequences of decommissioning Garstang New Road**

7.4.3 At this stage of the design, a footbridge across the bypass has been included in Option 1B.

## 7.5 Option 2



**Figure 7-2: Option 2 overview**

- 7.5.1 Option 2 would be an on-line improvement option designed to minimise land take and utilise as much of the existing A585 as possible. The option would start with a fully signalised junction at Skippool Junction similar to that for Option 1A with associated turning lanes and crossing facilities for non-motorised users. East of Skippool Junction the layout would reduce to a single carriageway (as existing) and the existing bridge over Main Dyke would not be widened.
- 7.5.2 East of Main Dyke, the existing Mains Lane carriageway would be retained as existing through to the junction with Shard Road.
- 7.5.3 The existing signalised junction at Shard Road would be replaced with a priority controlled roundabout although an enlarged traffic signal tee-junction would also be possible. The form of this junction would be decided based on which proved to be most efficient. Existing access to properties would be retained with the roundabout layout. Uncontrolled footway/cycleway crossing points would be provided across all arms of the roundabout.



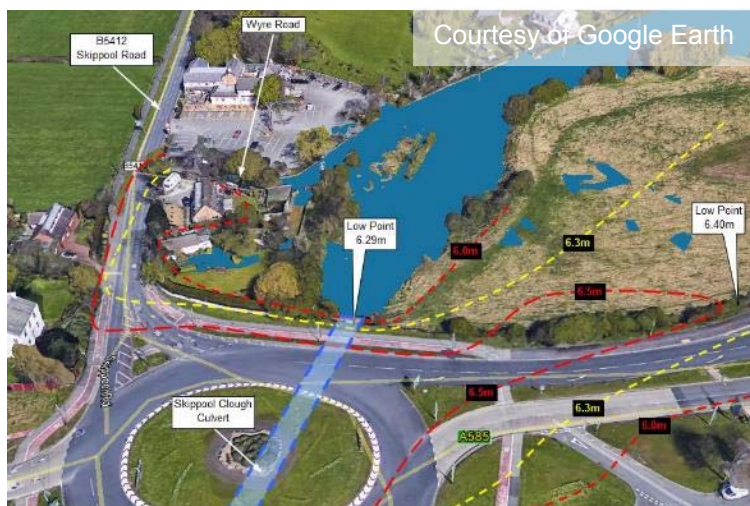
- 7.5.4 The scheme would then continue on the existing A585 Mains Lane to a new triangular island (Green ways junction) separating the east and west bound traffic. This island would be the start of a one-way gyratory system connecting the A585 Mains Lane, the A586 Garstang Road and Pool Foot Lane at the modified Five Lane Ends junction in Little Singleton.
- 7.5.5 From Five Lane Ends junction heading west along the A586 Garstang Road East the existing road would be two lanes one-way to a second new triangular Island (Poulton Junction) splitting the left and right-hand lanes from the east and bringing the eastbound traffic from Poulton-le-Fylde onto a new link connecting up to Greenways junction completing the one-way gyratory.
- 7.5.6 The existing section of Garstang New Road between Five Lane Ends Junction and Windy Harbour Junction would converted to a dual carriageway with a new eastbound carriageway constructed on a separate shallow embankment on the north side of the existing road. The existing carriageway would be modified to carry only westbound traffic. Extensions to four existing culverts would be required under the new embankment. This new link will tie into the existing Windy Harbour junction with minimal changes to the existing layout.

## 7.6 Network operational resilience

- 7.6.1 Option 1B – the southern bypass would be a dual two lane arrangement and would offer better network resilience than the existing semi-urban single carriageway or the Option 2 on-line layout. In addition, it should be less prone to major disruption due a road traffic incident. However, there are a number of locations where the network could be compromised being:

### Skippool Junction

- 7.6.2 The existing road network at Skippool Junction has the lowest elevation of the A585 route with parts of the road being at less than 6m AOD. Horsebridge Dyke passes under the existing roundabout and is tidal and a tidal surge would overtop the existing limited defences if the tide reached 6.3m AOD that would result in parts of the road being at least 0.3m deep in water. The flood risk assessment has concluded that this would occur with a 1 in 10 year tidal flood event in which case the road would be impassable.



- 7.6.3 The designs for Option 1B and Option 2 at this location both assume that the existing road levels cannot be significantly raised due tying in to the existing road levels and adjoining properties.
- 7.6.4 Alterations to the levels at the north end of Skippool Clough Culvert could be considered but would not prevent flooding entering the road system north of the junction on Skippool Road.

### Main Dyke floodplain embankment

- 7.6.5 The design of the proposed embankment crossing the Main Dyke floodplain is currently designed to have a centreline low point of 6.8m resulting in a lowest carriageway level of 6.5m AOD. The flood risk assessment has identified that, with the new Skippool Bridge the flood levels within the flood plain should be lower than existing and the 1 in 200 year fluvial flood event would be at about 5.3m AOD. HD 45 requires a road to have a freeboard of 500mm above this flood level and that is currently achieved. However, in the event of a 1 in 200 year tidal flood event, it is estimated that the flood level would reach about 7.1m that would have overtopped the existing tidal gates and the bypass would be impassable for about 200m along the embankment. Obviously, this would not apply to Option 2 as it would not cross the Main Dyke floodplain.

### West of Windy Harbour junction



- 7.6.6 West of Windy Harbour a similar situation occurs where the road passes over an un-named watercourse that connects directly to the River Wyre estuary. In the 1 in 200 year tidal flood event, it is estimated that the flood level would reach about 6.9m AOD that would have overtopped the existing tidal gate and the bypass would be impassable for about 200m along that section of road. This would apply equally to Option 1B and Option 2.

### **Incident on the Bypass**

- 7.6.7 In the event of an incident closing the bypass, traffic would normally be re-routed along alternative roads. With Option 1B, the ability to re-route traffic along the old A585 detrunked road would be affected by the lack of connection between Garstang New Road and the bypass east of Little Singleton.
- 7.6.8 If the incident were between Skippool Bridge and Poulton Junction in either Options 1A or 1B, then traffic could use the old A585. But, for Option 1B, if the incident were between Poulton Junction and Windy Harbour junction then traffic would probably divert along Lodge Lane from Little Singleton to re-join the A585 at Thistleton Junction or further south. For Option 1A, with Garstang New Road retained, there would be the likelihood that traffic could rejoin the bypass at the Grange Junction rather than use the local roads.

## **7.7 Works to de-trunk the existing A585 road**

- 7.7.1 De-trunking would be an Order under sections 10 and 12 of the Highways Act 1980 that would identify the roads which the Secretary of State proposes to de-trunk as part of the scheme. De-trunking would apply when a section of the existing trunk road would no longer be maintained by Highways England on behalf of the Secretary of State for Transport and responsibility for that section of road would be transferred to the local highway authority: in this instance Lancashire County Council (LCC).
- 7.7.2 The De-trunking Order would be prepared with other orders (Line Order, Side Roads Order, Compulsory Purchase Order) that would be prepared for the scheme to be considered as part of the Development Consent Order process (DCO).
- 7.7.3 The Department for Transport's, Road Network Policy Consultation – January 2011<sup>1</sup> indicated:

*In order for a road to be detrunked, the local authority and the Secretary of State will usually need to agree:*

- Costs – generally, there are no immediate cost implications to detrunking a road, and no transfer payment is necessary. Maintenance funding is currently based on a formula, and will adjust automatically to reflect the total length of road for which a local authority is responsible.*
- Operational arrangements – arrangements for the management of the road must be in place to ensure motorists continue to enjoy an acceptable service. For instance, if any HA [Highways England] technology remains on the road, arrangements must be made to fund its continued operation or to disconnect it from the HA [Highways England] managed network.*
- Lines of demarcation – for legal purposes, it is essential that a proper line of demarcation is agreed. Generally, we would expect the HA [Highways England] to retain any slip roads and junctions onto the strategic road network, and that the boundary line will then be drawn at the first appropriate location.*

- 7.7.4 Currently, three options have been presented as part of the non-statutory consultation, being:

- Option 1A, bypass option with junctions at Skippool, Skippool Bridge, Poulton and Grange
- Option 1B as Option 1A but no junction at Grange
- Option 2, on-line option

- 7.7.5 Of these options, Option 2 would not involve any de-trunking of the existing route.

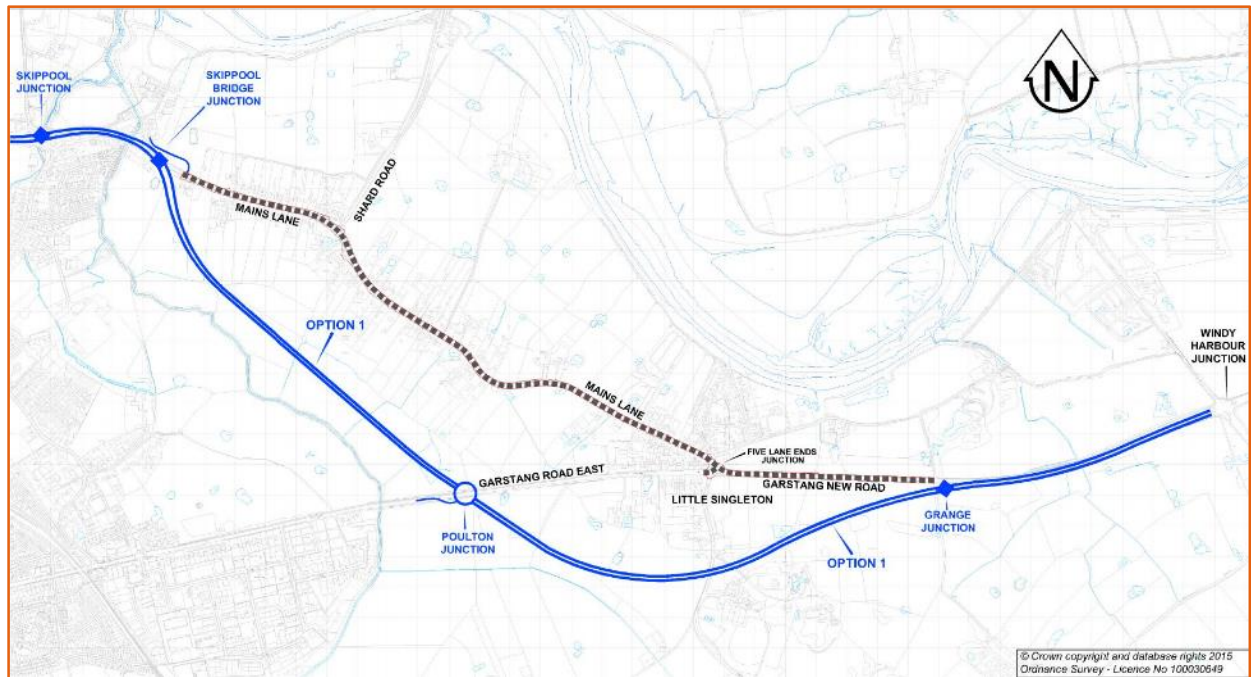
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[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/2439/roadnetworkconsultation.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/2439/roadnetworkconsultation.pdf)

## Overview

- 7.7.6 Until 1980, Lancashire County Council was responsible for the A585 route. Partly due to the then importance of the port at Fleetwood, the A585 became a trunk road from the M55 to Fleetwood in 1980 and was retained as the strategic route to the port of Fleetwood even after the Fleetwood to Larne roll-on, roll-off ferry ceased operation in 2010.
- 7.7.7 For both Option 1A and 1B, the length of the existing A585 route that would be detrunked would be a 2.8km length of the existing single carriageway being parts of Mains Lane and Garstang New Road between the proposed Skippool Bridge Junction and Grange Junction as indicated by the black dashed line in Figure 7-3 below.



**Figure 7-3: Option 1A/1B - Detrunking of the Existing A585**

- 7.7.8 Within that length are the following assets that would be affected by the detrunking:
- About 29,000 sq.m of carriageway pavement;
  - 5km of footways (some designated shared footway/cycleway);
  - About 150 accesses to properties, businesses and fields;
  - 5.6km of grass verges (varying widths);
  - 2 individual traffic signal controlled junctions (Shard Road Junction and Little Singleton Junction);
  - A system of street lighting comprising approximately 156 12m metal columns with high pressure sodium type lamps – details of the power supply to the columns is currently unknown;
  - A highway drainage system comprising mainly trapped gulleys and carrier drains – the full details of the drainage system and arrangement of the outfalls is currently not fully understood;
  - One culvert under Garstang New Road;
  - One variable message signs, traffic counter loops and cabinets and one speed camera;
  - Various regulatory, warning and direction traffic signs.
- 7.7.9 The age and condition of the assets on this section of road have not been assessed.

## Option 1A

- 7.7.10 For Option 1A, the whole of the existing road would be retained and, by agreement, would be taken over by Lancashire County Council.

## Option 1B

- 7.7.11 For Option 1B, the existing length of Garstang New Road east of Little Singleton would not be connected to the bypass at Grange Junction and would potentially be decommissioned as a highway for all users over a length of about 750m . However, Garstang New Road has been identified as a possible route for non-motorised users to link Windy Harbour Junction with Little Singleton.

### **Liaison with Lancashire County Council**

- 7.7.12 A meeting has been held with Lancashire County Council (LCC) to discuss the issue of whether they would adopt the existing A585 and also the possible decommissioned Garstang New Road forming part of Option 1B as it was considered that their view may influence the final choice between Options 1A and 1B.
- 7.7.13 During the early part of PCF Stage 3 formal discussions should be entered into with LCC regarding the potential to de-trunk the A585 route. This should include arrangements to:
- better understand the age, condition and types of assets including carrying out a joint condition survey;
  - what works LCC would require to be undertaken to the existing road before they would be prepared to adopt the detrunked road;
  - Clearly understand what legal rights and obligations would be transferred;
  - Transfer any affected Highways England land to LCC;
  - Carry out initial discussions to agree the basis for calculating the Commuted Sum for Maintenance;
  - Preparing a draft "Statement of Common Ground" document in anticipation of the DCO process.
  - Agree arrangements for the transfer of any new side roads to LCC. These would include:
    - Old Mains Lane link road
    - The possible Shard Road Link Road
    - Roads connecting Garstang Road East to Poulton Junction
    - Changes to Lodge Lane adjacent to the bypass

### **Works Possibly Required Before Adoption**

- 7.7.14 The following is a list of works that LCC may wish to see carried out before they agree to adopt the de-trunked road, and they should be included on the risk register:
- Traffic calming measures;
  - Enhancements to pedestrian and cycle provisions;
  - Alterations to Shard Road traffic signal junction;
  - Alterations to Little Singleton traffic signal junction – particularly related to Option 1B
  - Changes to the street lighting system (subject to age and condition) – possible upgrade to LED lighting or changes to the lighting along Garstang New Road if it is to be decommissioned but retained for non-motorised users;
  - Modifications to all road signing
  - Detailed condition survey of all drainage assets
  - Resurfacing of the carriageway

### **Transfer of Other Obligations**

- 7.7.15 As part of the transfer of the detrunked road, LCC would take on the following obligations that they would probably want to be considered as part of the Commuted Sum:
- General maintenance of the detrunked road;
  - Winter maintenance;
  - Management of the additional road including road safety issues;
  - Development control and planning obligations for the detrunked road;
  - Management of utilities work under the New Roads and Street Works Act 1991

## 8 DESIGN INFORMATION

### 8.1 Introduction

8.1.1 This section provides a summary of the main design aspects for Option 1 (A&B) and Option 2 only.

### 8.2 Road Layout and Standards Used

8.2.1 The main design standards used for PCF Stage 1 & 2 to date for the design of the Options has been the following from the Design Manual for Roads and Bridges (DMRB) and Interim Advice Notes:

Standard Number	Title	DMRB Section
TD 19/06	Requirement for Road Restraint Systems	2.2.8
HD 33/16	Design of Highway Drainage Systems	4.2.3
HA 107/04	Design of Outfall and Culvert Details	4.2.7
TD 09/93	Highway Link Design	6.1.1
TD 27/05	Cross Sections and Headrooms	6.1.2
TA 85/01	Guidance on Minor Improvements to Existing Roads	6.1.3
TD 16/07	Geometric Design of Roundabouts	6.2.3
TD 50/04	The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts	6.2.3
TD 42/95	Geometric Design of Major/Minority Priority Junctions	6.2.6
TD 41/95	Vehicular Access to All Purpose Trunk Roads	6.2.7
TA 86/03	Layout of Large Signal Controlled Junctions	6.2.8
TD 69/07	The Location and Layout of Lay-Bys and Rest Areas	6.3.3
TA 12/07	Traffic Signals on High Speed Roads	8.1.1
TA 15/07	Pedestrian Facilities at Traffic Signal Installations	8.1.1
TD 71/16	Technology Overview and General Requirements	9.1.1
IAN 69/15	Designing for Maintenance	
IAN 145/16	Directional signs on Motorway and all-purpose Trunk roads At grade and compact Grade separated junctions	

**Table 8-1: Design Standards, Advice Notes and Interim Advice Notes**

### 8.3 Design speed

8.3.1 For all options, the close spacing of the junctions means that the layout of the links is not fully compatible with TD9/93 and departures from standards for “Aspects not Covered by Standards” with respect to design speeds might be required. As part of that issue an assessment of the likely speeds that could be achieved between the junctions has been carried out. This is included as Appendix E.

8.3.2 In summary this indicates that, with a moderately aggressive driving style, 70mph can be achieved when the link between junctions is more than about 650m long and that results in a design speed of 120kph being used.

### **Option 1A & 1B**

- 8.3.3 For Options 1A & 1B, the proposed speed limit at Skippool Junction through to and including Skippool Bridge Junction would be 40mph due to the semi-urban nature of the road, the closeness of the junctions and the need to retain existing accesses onto the road. The design speed would therefore be 70kph.
- 8.3.4 For the off-line bypass sections, the road would have no speed restriction and the design speed would therefore be 120kph.

### **Option 2**

- 8.3.5 For Option 2 the speed limit for the retained single carriageway sections of Breck Road and Mains Lane would be 40mph as existing. Where the one-way gyratory would be provided at Little Singleton the same speed limits would apply due to the short link lengths and semi-urban nature of the roads. The design speed would therefore be 70kph.
- 8.3.6 For the section of Garstang New Road from Little Singleton to Windy Harbour Junction that would be upgraded to dual carriageway there would be no speed limit and the design speed would therefore be 120kph.

## **8.4 Cross section**

### **Option 1A & 1B**

- 8.4.1 Dual carriageway sections would be Dual 2 lane All-Purpose (D2AP) standard, as detailed in Figure 4-3a in TD27/05. This cross section consists of two carriageways; each with two 3.65m wide lanes, plus 1m wide hard strips on both side of the carriageway, a central reserve width of at least 2.5m and 2.5m wide verges.

### **Option 2**

- 8.4.2 Where the existing single carriageway would be retained the existing carriageway width would remain the same. For the new section of single carriageway this would be (S2) standard, as detailed in Figure 4-3a in TD27/05. This cross section has the same dimensions as one of the D2AP carriageways.
- 8.4.3 For the section of Garstang New Road from Little Singleton to Windy Harbour Junction the new eastbound carriageway would have the D2AP carriageway dimensions but would be provided with a two-way footway/cycleway.

## **8.5 Junction options**

### **Option 1A & 1B**

- 8.5.1 For Option 1A and 1B the form of the junctions has not been fixed as part of Stage 2 design as this is awaiting the updated traffic model and the associated operational assessment. This was confirmed as part of the public consultation information. However, the Stage 1 traffic modelling using the Paramics micro-simulation indicated the following arrangements were best operationally:
- Skippool Junction – traffic signals
  - Skippool Bridge Junction – traffic signals
  - Poulton Junction – roundabout
  - Grange Junction (Option 1A only) – traffic signals

### **Option 2**

- 8.5.2 For Option 2, the choice of junction types had less flexibility and the following arrangements were developed and tested:
- Skippool Junction – traffic signals (but see below)
  - Shard Road Junction – traffic signals or roundabout
  - Little Singleton Junction – traffic signals.



- 8.5.3 For Skippool Junction, the Stage 1 traffic modelling indicated that with this on-line option the roundabout layout would not cope with the predicted traffic growth and it was concluded that the traffic signal layout similar to that proposed for Option 1 would be provided.

## **8.6 Traffic signal junction design**

- 8.6.1 The layouts for the traffic signal junction was based on TD50/04 taking into account the predicted traffic flows and resulting queue lengths as modelled in Paramics. The layouts therefore provided dedicated turning lanes where required but did not provide additional ahead lanes for the A585 dual carriageway route.
- 8.6.2 The junction designs also catered for pedestrian and cycle crossing movements to TA15/07 (referring to Traffic Advisory Leaflet 5/05) with the assumption that these would all be controlled movements facilitated by islands between the ahead and turning lanes.

## **8.7 Roundabout junction design**

- 8.7.1 The design of the roundabouts for all Options has been based on TD16/07 and have been checked for their effectiveness using ARCADY and Paramics programs.
- 8.7.2 Uncontrolled pedestrian and cycle facilities have been included in the design of the roundabouts although this will need to be reviewed during PCF Stage 3 for compliance with the recently issued IAN/195 "Cycle Traffic and the Strategic Road Network".

## **8.8 Drainage design**

### **General**

- 8.8.1 The following text identifies the concept for the highway and land drainage systems required for Option 1 as developed during PCF Stage 2 and is intended to be the basis for the design to be developed during PCF Stage 3.

### **Concept**

- 8.8.2 The drainage system as a whole shall be able to rapidly remove water from the carriageway and prevent flooding of the carriageway and shall not make the risk of flooding any worse than existing.
- 8.8.3 The drainage design shall consider water quality issues by the provision of suitable treatment facilities. Where those treatment facilities have to be located in or close to floodplains, then the design shall ensure that these cannot be flushed out by a flood event.
- 8.8.4 The drainage system shall accommodate such run-off from the highway and its associated earthworks slope (internal catchments) and shall consider the run-off from adjacent (external) catchments and increased rainfall intensities (related to predicted climate change effects), where possible, within the various constraints of the scheme design – in particular the land constraints. Where necessary, the highway drainage system shall deal with any intercepted groundwater.
- 8.8.5 Collection of run-off from neighbouring land will be considered by the design but, where practicable, would be kept separate from the carriageway runoff and treatment systems to minimise the capacity requirements for the highway drainage systems.

### **Culverts**

- 8.8.6 A number of existing culverts will be affected by the bypass route. A decision on whether these can simply be extended or will need to be replaced will have to be made. Several new culverts have been identified in the drainage concept. At this stage, it is assumed that these would need to be 1.2m diameter for maintenance access and would need to be provided with trash/access screens at both ends. All the culverts would be maintained by Highways England.

### **Effects on Floodplains**

- 8.8.7 The design of the drainage system will have to take into account the existing floodplains particularly along the Main Dyke valley. This will include:
- Understanding the worst case flood levels as determined from the Flood Risk Assessment and ensuring that the road is designed to avoid being affected by those flood events;

- Ensuring that the highway drainage does not make the flooding worse than existing including the provision of storage features;
- Considering specific design issues including;
- Outfalls – where flap valves or similar will need to be considered;
- Storage and treatment features – where the risk of flushing out will need to be considered.

### **Internal Catchments**

- 8.8.8 Existing road catchment areas will be determined from existing survey information based on the high and low points on the carriageway along with contributing areas within the highway boundary.
- 8.8.9 The impermeable area of the existing and proposed carriageways and other paved areas is assumed to be 100%. Run off from road cutting and embankment slopes will also contribute. Their impermeability factors will be dependent on the soil type and the slope of the surface.

### **External Catchments**

- 8.8.10 Catchments outside the highway boundary will be determined from the ground profile sloping towards the highway using existing contour details. The upstream extent of the catchment will be the natural watershed or such other detail that subdivides and intercepts the catchment such as watercourses, collecting sewers, highways with drainage systems etc. The contribution of these catchments will be assessed to determine their impermeability factors based on the soil category, slope gradients, hard surface features etc.

### **Storage**

- 8.8.11 In general, storage for the drainage network will need to be sufficient to limit the rates of discharge at the existing outfalls to the existing flows allowing for the increased requirements of the additional highway surface area and rainfall intensities.
- 8.8.12 The form of the storage will be chosen to suit the physical constraints and maintenance requirements in the following order of preference bearing in mind that storage provision could also provide some measure of treatment to improve water quality:
- surface pond (either retention or detention pond);
  - lined or unlined oversized ditches
  - open-topped tanks;
  - oversize pipework;
  - underground storage tank.
  - Choices between different forms of storage will be made based on:
  - the environmental impact;
  - land-take requirement;
  - flood levels (to prevent these items being flushed out);
  - interaction with other design elements and
  - cost.

### **Locations of outfalls / discharge points**

- 8.8.13 Any new outfalls required by the works will have to be designed to comply with the requirements of DMRB and, where discharges are into “main rivers” these would also require environmental permits to be agreed with the Environment Agency. The arrangement of the highway and existing catchments along with storage pond locations and outfalls to watercourses are shown on Figure 8-1.

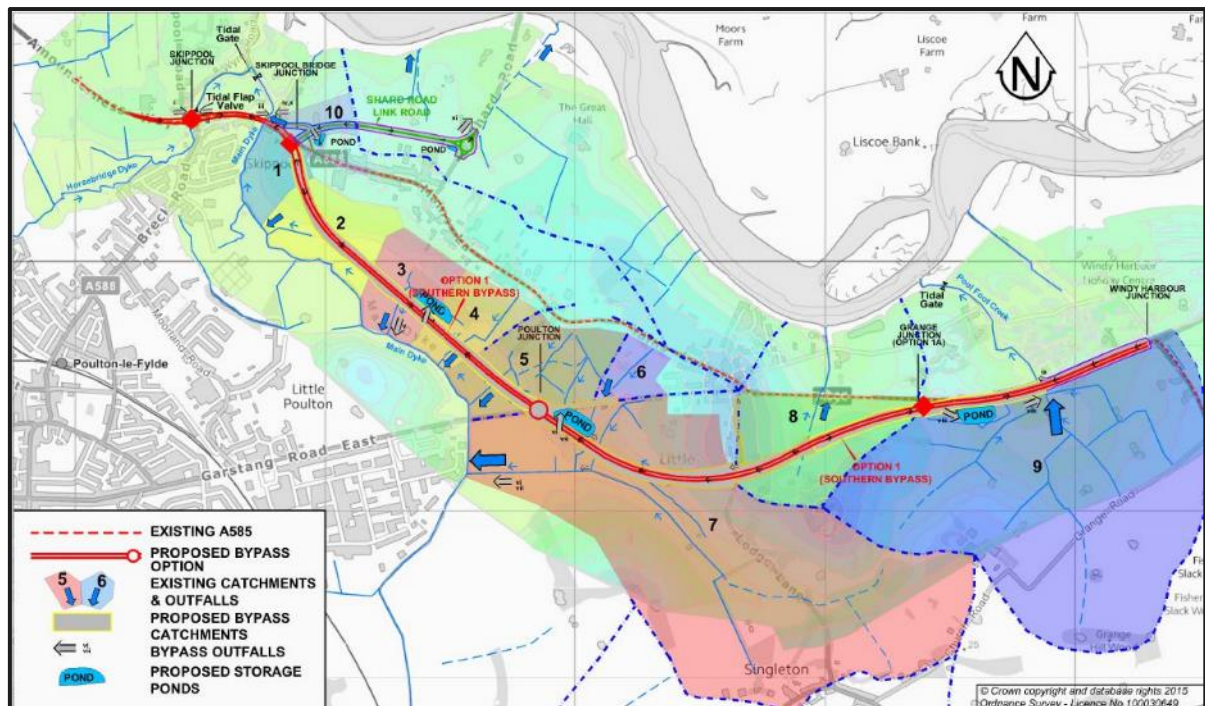


Figure 8-1: Existing catchments and proposed Option 1 highway drainage outfalls

## 8.9 Earthworks

- 8.9.1 Several issues have been identified regarding the excavation of the Lodge Lane cutting and construction of the Main Dyke floodplain embankment that are the main earthworks features within the scheme. The developing design is reliant on the early procurement of ground investigation throughout the scheme to allow an efficient earthworks design to be developed. Currently, without better information, a series of conservative assumptions has been made to allow a scheme footprint to be determined.

### Lodge Lane cutting

- 8.9.2 The cutting is up to 8.6m deep on both sides of the Lodge Lane bridge and passes through glacial till material of unconfirmed engineering characteristics. Also, the geological mapping indicates a cap of glacial sand/gravel immediately east of Lodge Lane and this cap may intersect groundwater and the depth of the cutting may encounter lower artesian water features that could cause uplift of the base of the cutting.

### Main Dyke floodplain embankment

- 8.9.3 The embankment crosses the existing floodplain and is between 2.5m to 5m high with a low point centrally located. The embankment would be constructed over the existing underlying peat and alluvial deposits that are expected to be very soft and settlement is expected. It is probable that the peat would have to be removed before the embankment is constructed. The duration of the settlement period is a major factor in the overall scheme construction programme.
- 8.9.4 There are also concerns that the material excavated from the Lodge Lane cutting may need treatment (possibly by lime stabilisation) before it can be used to form the embankment.
- 8.9.5 The lower levels of the embankment could be affected by possible flooding. The current assessment of the flood risk indicated that up to a level of about 5.5m AOD the embankment would have to be formed from an imported granular fill.

## 8.10 Other highway design issues

### Road restraint systems

- 8.10.1 The road restraint risk assessment process has not been carried out as part of Stage 2 but an indication of the features likely to require protection has been made and these would include:

- Structures – bridge parapets, abutments and piers and retaining walls
- Roadside features – lighting columns, large signs
- Culverts, ponds and other water hazards

8.10.2 Pedestrian guard rail will be provided to the top of all retaining walls and in the vicinity of the junctions. However, these have to be considered carefully to ensure that they fulfil their purpose effectively without introducing other hazards.

### **Pavement design**

8.10.3 There are no abnormal issues to be considered for the carriageway pavement design apart from the design of the overlay and tie-ins to the existing road network – at both ends of the scheme.

### **Signs and Markings design**

8.10.4 A sign destination strategy will be developed to ensure consistency of signs destinations for traffic using the bypass and other local route. The strategy will also consider the signing for speed limits along the bypass and whether to extend the existing clearway arrangements that apply to Amounderness Way towards Fleetwood.

### **Lighting and electrics design**

8.10.5 At this stage, it is not expected that the bypass will be lit except in the vicinity of the junctions and some existing lighting will probably be removed. However, the section between Skippool Junction and Skippool Bridge Junction would be lit due to the closeness of the junctions and the semi-urban nature of this short link.

8.10.6 Existing lighting along the A585 (that would be detrunked) may be altered subject to the agreement of Lancashire County Council.

### **NMU considerations**

8.10.7 The design does not specifically include provision for pedestrians and cyclists along the route of the bypass as the existing road network would have reduced traffic flows and would better link communities rather than encouraging those users to deal with high speed traffic on the bypass.

8.10.8 The exceptions to this would be in the Skippool areas and west of Windy Harbour junction where the route joins the existing roads. Special attention will be required for suitable provision in the form of footways and cycleways in these areas and at the proposed junctions to achieve a design that satisfies the aspirations of Highways England's Cycling Strategy that would provide an integrated, comprehensive and high quality cycling network that includes facilities which are safe and separate from traffic, that enables users of all abilities to cycle and encourages cycling as a sustainable form of transport.

8.10.9 It is anticipated that the section of the existing A585 that is to be detrunked would include enhanced facilities for pedestrians and cyclists to address the existing difficulties encountered in using the existing road.

## **8.11 Structures design**

8.11.1 Apart from the culverts (see Section 8.8 above) the structures works is limited to 2 new bridges, 2 major retaining walls and a number of minor retaining structures. In addition, remedial work may be required to the existing Skippool Clough culvert at Skippool Junction that would be reviewed following a detailed inspection of the condition of that structure.

### **New Skippool Bridge**

8.11.2 The new bridge would completely replace the existing bridge over Main Dyke and would be a piled fully integral concrete structure to carry the new dual carriageway and footway/cycleways. The bridge would have to be constructed in 2 phases to allow traffic to continue to use the existing road before being diverted onto the north half of the new bridge to allow the existing bridge to be demolished.

### **New Lodge Lane Bridge**

8.11.3 The new bridge would be built on-line of existing road with temporary diversion to the west.

- 8.11.4 The form of the bridge would be a two span integral design avoiding the need for expansion and movement joints and bridge beam bearings. It is anticipated that the foundations would be contiguous concrete piles supporting a pilecap with associated wing walls on the west side of the bridge. The deck would be formed using precast concrete beams spaced at about 2m with an in-situ concrete deck and concrete parapet beam upstands supporting N2 type parapets.
- 8.11.5 There would be diversion of minor utilities apparatus through the bridge deck including medium pressure gas, water supply, LV electricity and BT ducts.

### **Grange Footbridge**

- 8.11.6 For Option 1B, a footbridge is proposed halfway between Little Singleton and Windy Harbour Junction at the point where Singleton Footpath No 2 crosses the route. This would be a single span steel through truss integral structure across the bypass with 1 in 20 slope steel ramps on both sides. Painting of this footbridge would be a maintenance issue.

### **Retaining Walls**

- 8.11.7 Retaining walls up to 8m high would be provided to the east of the proposed Lodge Lane bridge. These are assumed to be of contiguous piled construction at this stage. However, precast L shaped units may be used for lower height sections.
- 8.11.8 There are likely to be other sections of lower height retaining structures (not necessarily walls). The form of these walls has not been determined at this stage.

## **8.12 Relaxations and Departures from Standards**

### **Option 1A & 1B**

- 8.12.1 The alignment of the off-line bypass options is generally in compliance with TD9/93 and TD 27/06 although the spacing of the junctions is less than the 2km expected by TD9/93 Clauses 1.6 and 1.7. However, this was discussed with Highways England's Safety, Engineering and Standards - Safe Roads Team and they have agreed that the alignment parameters within TD9/93 should be used but might need to be considered as an aspect not covered by standards. Despite the short link lengths, the analysis in Appendix E of what speeds would be achievable indicated that, for the bypass, speeds up to 70mph would be reached allowing for reasonable acceleration and deceleration rates. Therefore the full 120kph design speed has been used for the bypass links.
- 8.12.2 For the traffic signal layout at Skippool Bridge Junction, that would have a speed limit of 40mph, the horizontal curvature of the through route is a 180m radius that is 2 steps below desirable for the 70kph design speed. This would normally require a 7% crossfall for the through carriageway but due to the pedestrian crossing arrangements and the close proximity of the New Skippool Bridge the current design has provided a 5% crossfall to both through carriageways. As this combination applies through the junction this could be considered to be a departure from standards to TD9/93 Clauses 1.24 and 1.26 subsection (a).
- 8.12.3 The horizontal alignment of the off-line bypass east of Poulton Junction is a 720m radius combined with 7% crossfall and stopping sight distances of 215m. The horizontal alignment and stopping sight distances are both one step below desirable minimum for the 120kph design speed and this amounts to a relaxation in accordance with TD9/93 Clause 1.24.

### **Lodge Lane realignment**

- 8.12.4 Design speed for the realignment of Lodge Lane has been assumed to be 70kph. However, road is a derestricted single carriageway that should require the design speed to be 100A kph. Road is responsibility of Lancashire County Council and may require the speed limit to be reviewed.
- 8.12.5 To minimise the level differences between the bypass and Lodge Lane the horizontal curvature of Lodge Lane realignment is 360m with super-elevation of 3.5% - Table 3 requires 360m curvature to have 5% super-elevation for 70kph design speed. Also the vertical curvature of Lodge Lane realignment has a crest with K=10 - Table 3 requires minimum crest of K=17 for 70kph design speed. These aspects for the side road realignment would be considered to be departures from standards.

### **Safety fence**



8.12.6 There are a number of locations where an access that has to be retained is in close proximity to a proposed bridge and this affects the length of verge mounted safety fence that can be provided being less than the 30m required by TD19/06 Clause 3.28 and Table 3.1. This occurs at:

- Skippool Bridge westbound approaching the bridge – due the existing petrol station exit
- Skippool Bridge westbound leaving the bridge – due the existing Breck holiday home access
- Lodge Lane Bridge southbound approaching the bridge due to the existing access at North Lodge.

### **Option 2**

8.12.7 As with Options 1A & 1B, the lengths between the junctions is less than the 2km expected by TD9/92 Clause 1.6 and might need to be considered as an aspect not covered by standards.

8.12.8 Design speed for new the 250m long link road between Poulton and Greenways Junctions considered to be 70kph for 40mph. However, the one-way link connects roads with 50mph and 40mph speed limits.

## **9 LAND ISSUES**

### **9.1 Overview**

- 9.1.1 Option 1B (Southern Bypass) would require approximately 30 hectares of land while Option 2 (on-line) would only require about 9 hectares within the “Area of Development”.
- 9.1.2 Guidance sought from Highways England has indicated that Option 1B would be considered a Nationally Significant Infrastructure Project (NSIP) that would have to be taken through the Development Consent Order (DCO) process.
- 9.1.3 It was also indicated that Option 2 option falls within the Alteration NSIP criteria (as Highways Act 1980 Orders [HA80] would be required), but it does not meet the test on the area of development threshold of 12.5ha and therefore could be progressed via the HA80 Orders route.

### **9.2 Land referencing**

- 9.2.1 Information has been sought from Land Registry for the area of interest for both options but this has indicated that several substantial areas are un-registered. This particularly affect Option 1B.
- 9.2.2 Further discussions are on-going about obtaining information from the Rural Payments Agency that may inform about ownership or tenancies for the agricultural areas affected by the options.

### **9.3 Further required land referencing work**

- 9.3.1 Further work will have to be done during Stage 3 / Stage 4 to refine the land ownership information. This will include:
- Obtaining all relevant Office Copy 2 (OC2) information plans and any missing title information from Land Registry;
  - Refining the Polygon Plus information to avoid gaps and overlaps between plots based on the detailed topographical surveys;
  - Reviewing the title information and plans to identify lessees, tenants, rights and easements that may have to be considered in the finalising of the CPO documentation;
  - Research to confirm details of ownership and occupancy information for all plots and particularly those related to unregistered land areas.
  - Seek confirmation from Highways England about how to deal with plots registered to Lancashire County Council (previous highway authority) that lie within the A585 Trunk Road boundary.

## 10 STRATEGIC TRAFFIC MODELLING

### 10.1 Overview

- 10.1.1 The Traffic Forecasting Report (TFR)<sup>2</sup> is the fourth in a series of traffic related PCF products that documents the options assessment work for the 'A585 Windy Harbour to Skippool Scheme' that was undertaken during PCF Stage 2. It follows the Appraisal Specification Report (ASR)<sup>3</sup>, the Traffic Data Collection Report (TDCR)<sup>4</sup> and Local Model Validation Report (LMVR)<sup>5</sup> and is accompanied by the Economic Assessment Report (EcAR)<sup>6</sup>.
- 10.1.2 The TFR describes the development of the forecast year traffic models for the A585 Improvement Scheme during PCF Stage 2 for the three scheme options listed considering fixed and variable demand tests for the Core, Low Growth and Optimistic scenarios particularly related to planned development and other infrastructure proposals,
- 10.1.3 Following an options sifting process and a Value Engineering Workshop held during PCF Stage 1, the following three options were taken forward for further traffic modelling during Stage 2:
- a southern route offline dual carriageway with a bridge under Lodge Lane (Option S1)
  - a northern route offline dual carriageway with a bridge under Lodge Lane (Option N1)
  - an on-line scheme with a gyratory system at Little Singleton and upgrading of the junction at Shard Road to a roundabout (also known as "no bypass") (Option O1).
- 10.1.4 It should be noted that the northern offline option known as Option N1 was not taken to the non-statutory consultation and that southern offline option known as Option S1 was described as Option S1A or S1B depending on whether the Grange Junction connecting the bypass to Garstang New Road or not and, for the consultation, were renamed as Option 1 and 1a respectively. Option O1 was similarly renamed as Option 2.
- 10.1.5 A preliminary assessment of the options above was undertaken to confirm which options would be developed further for Stage 2 assessment. The northern route was rejected following the preliminary assessment as the traffic modelling showed that it provided poor value for money (BCR < 1.0). The preliminary assessment of the options is discussed in more detail in technical note "A585 Windy Harbour to Skippool Preliminary Assessment" – (HE548643-ARC-GEN-A585-TN-TR-2003-v2.0).

### 10.2 Previous forecasting work

- 10.2.1 PCF Stage 0 - Scheme assessments undertaken in February 2015 tested an 'offline solution to the A585', in the form of 'Southern Bypass' and an 'on-line solution' featuring a one-way gyratory system around the Little Singleton area, along with junction improvements at Little Singleton (Five Lane Ends) and at the Shard Road junction with A585 Mains Lane
- 10.2.2 These tests concluded that both options would potentially offer considerable benefits to drivers in terms of journey times and congestion relief, however, the existing Skippool roundabout is seen preventing the entire benefits from being realised.
- 10.2.3 As a part of PCF Stage 1, 48 variants of the three main options of the proposed A585 Windy Harbour to Skippool Improvement Scheme were developed and assessed. The results have been reported in the "S-Paramics Sensitivity Testing Report", Reference No - HE548643-HYD-GEN-A585-RP-TR-1023.
- 10.2.4 The options were expanded at Stage 1, with the addition of a third option, an off-line option with a northern bypass. Sifting of three main options of the proposed A585 Windy Harbour to Skippool Improvement Scheme using S-Paramics microsimulation models was undertaken.
- 10.2.5 All the three schemes assessed offered value for money, with the on-line scheme offering the highest Benefit to Cost Ratio (BCR). However, when combined with various other factors, and

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<sup>2</sup> TFR = HE548643-ARC-GEN-A585-RP-TR-2059 V2.0

<sup>3</sup> ASR = HE548643-HYD-GEN-A585-RP-TR-2044 V5.0

<sup>4</sup> TDCR = HE548643-ARC-GEN-A585-RP-TR-2022 V4.0

<sup>5</sup> LMVR = HE548643-ARC-GEN-A585-RP-TR-2039

<sup>6</sup> EcAR = HE548643-ARC-GEN-A585-RP-TR-2058 V1.0

measured against the scheme objectives at the A585 Options Sifting Workshop on April 1st 2016, it was recommended that Option S1 Grange + Skippool Bridge be taken forward for consultation as the preferred option, with the O1 Base and N1 Grange + Skippool Bridge being presented as non-preferred options. The results of the above work have been documented in the Stage 1 Traffic Forecasting Report (HE548643-HYD-GEN-A585-RP-TR-1014) submitted in May 2016.

## 10.3 Strategic traffic model

### Geographic model coverage

- 10.3.1 The A585 Improvement Scheme traffic model covers in detail, the authorities of Wyre, Fylde and Blackpool. It is bounded by the M6 to the east and by the edges of the Fylde Peninsula to the north, west and south.
- 10.3.2 Figure 10-1 below illustrates the geographic coverage of the model.

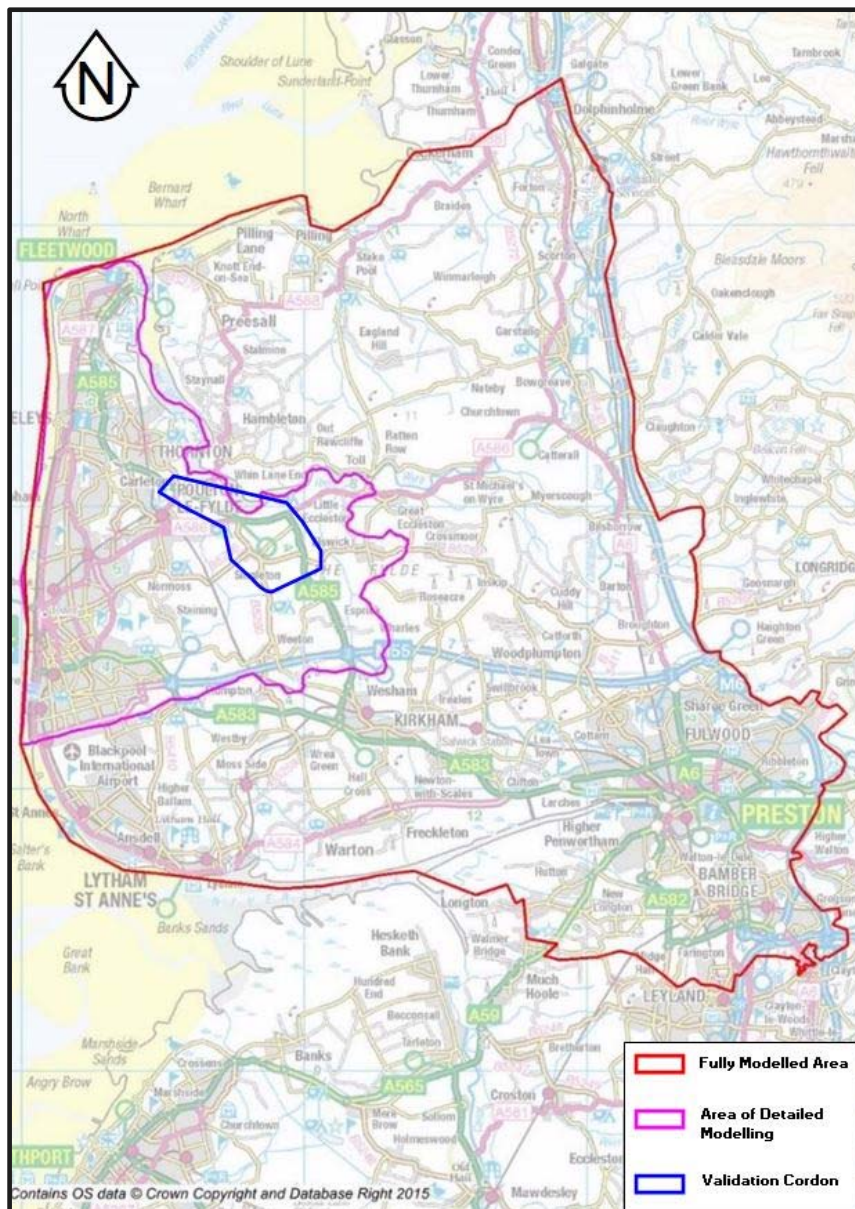


Figure 10-1: Geographic model coverage

### Model time periods

- AM Peak Period: 07:30 – 9:30
- Inter-Peak Period: 09:30 – 15:00

- PM Peak Period: 15:00 – 18:00.

### Network Structure

10.3.3 The A585 traffic model consists of two key modelled areas namely, the Fully Modelled Area (FMA) and the External Area.

10.3.4 The network structure for the A585 traffic model within these key modelled areas is described below:

- Fully Modelled Area (FMA) is the area over which the proposed scheme is expected to have an influence, focusing on the A585 to the north of the M55 and to the west of the M6, including the principal settlements of Fleetwood, Blackpool, Cleveleys, Poulton-le-Fylde, Singleton and number of smaller areas, as illustrated in Figure 10-1.
- The FMA is further sub-divided into the model simulation area or Area of Detailed Modelling (hereafter referred to as the ADM) and the 'Rest of FMA'.
- Area of Detailed Modelling (ADM): The ADM is the area over which significant scheme impacts are anticipated. This area is characterised by small zones, very detailed networks and junction modelling, with all trip movements represented. The ADM of the A585 traffic model contains a total of 81 signalised junctions, 47 roundabouts and 241 priority junctions.
- Rest of FMA: The Rest of FMA is the area over which scheme impacts are anticipated but which are relatively less in magnitude. This area is coded as buffer network within SATURN and is characterised by relatively larger zones, less network detail than for the area of detailed modelling, and link-based speed/flow modelling.
- External Area: The External Area is the area outside the anticipated area of scheme influence, characterised in the A585 traffic model by large zones, skeleton networks and fixed speed modelling without any capacity constraint. The External Area represents a sizeable proportion of the rest of Great Britain.

### Model zoning system

10.3.5 The A585 Improvement Scheme model zoning structure was designed in accordance with the guidance set out in WebTAG Unit M3.1 (Section 2.3) and was graded from the smallest to largest as:

- Local areas (Homogeneous land use)
- Output areas (including, Lower & Middle Super Output Areas)
- Wards
- Districts
- Counties
- Regions.

Model Area	Number of Zones
Area of Detailed Modelling (ADM)	69
Rest of Fully Modelled Area (RoFMA)	25
External Area (EA)	96
<b>Total</b>	<b>190</b>

**Table 10-1:A585 Windy Harbour to Skippool – Model Zoning System**

## 10.4 Model calibration and validation

10.4.1 Calibration of a highway assignment model is the process which ensures that the assignment model adequately reproduces the actual travel pattern in the geographic area under consideration. The development of a traffic model for the proposed A585 improvement scheme that accurately represents observed conditions will help to ensure there is no inherent bias in the decision-making process.

10.4.2 The A585 model calibration procedure involved a number of tasks, each of which were designed to ensure that the model adequately reproduced the observed traffic flows and travel times in the study



area. The process of network calibration involved several checks to the model, as part of the network refinement process.

- 10.4.3 Once the network file had reached a sufficient level of early calibration, matrix estimation was performed on the prior matrices to improve the level of traffic flow calibration across all calibration screenlines and cordons.
- 10.4.4 The link and screenlines flow calibration exercise focused on 150 links, 92 turns, four screenlines and one cordon as described. Of the 150 links, 104 lie on screenlines and cordons and the remaining 46 links are additional calibration links separate to the screenlines and cordons.

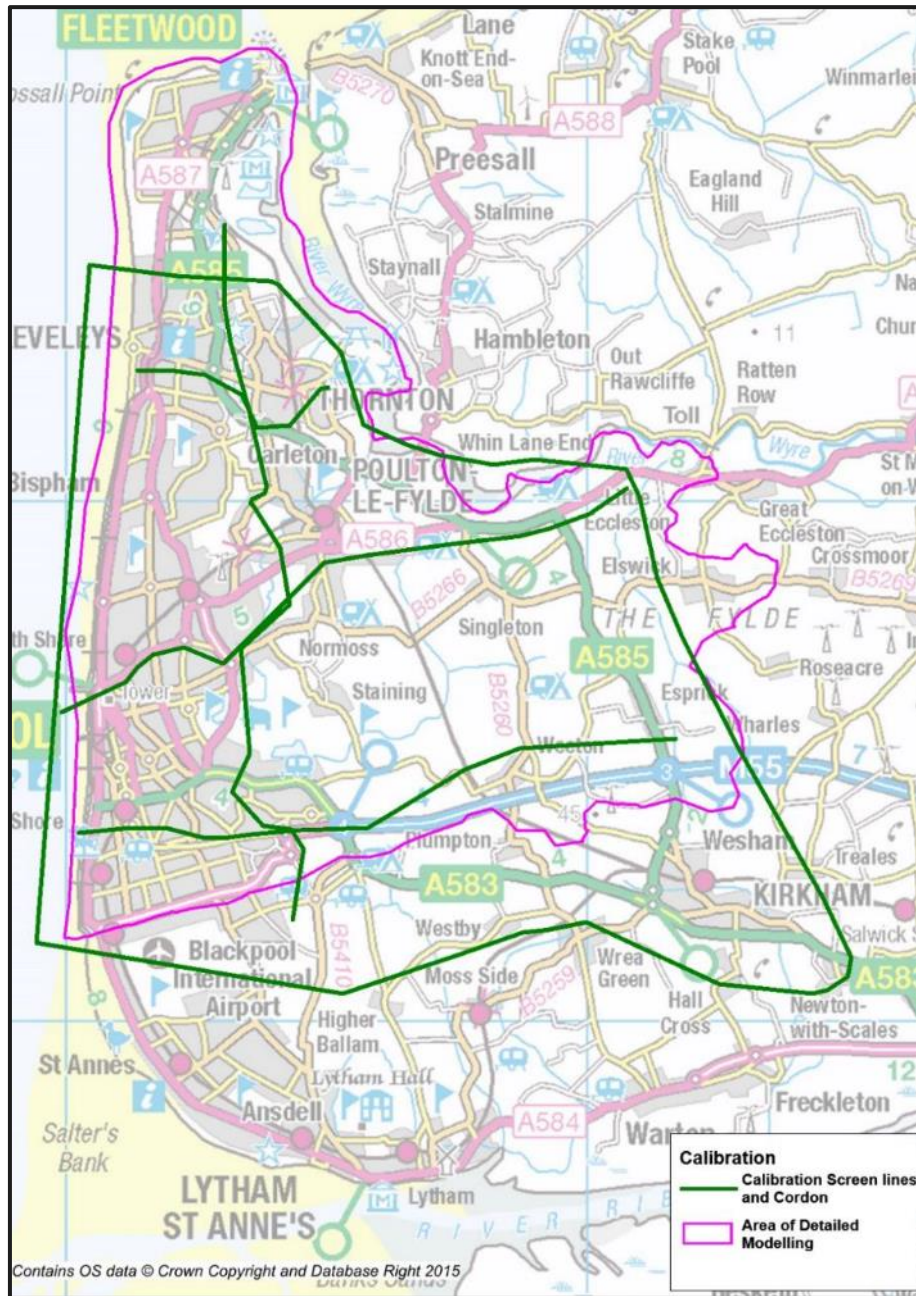


Figure 10-2: A585 Windy Harbour to Skippool - Calibration Cordon/Screenlines

### Turning counts

- 10.4.5 Turning counts were undertaken over two week days in July 2015 and the results were compared against the modelled counts in accordance with WebTAG guidelines on model validation. An average was then taken from the two survey days and compared against the corresponding

modelled counts to determine the GEH value. The peak hour results satisfied the WebTAG requirement for at least 85% of the turning counts achieving a GEH less than 5.

### **Link counts**

- 10.4.6 Link count surveys were also taken in July 2015 by a combination of automatic traffic counters and TRADS sites along the scheme length. The results showed that in the AM peak 80% and 90% in the PM peak passed the validation criteria. At the point of these surveys the Windy Harbour junction improvements were still underway so it was considered that some of the TRADS counts may not have been reflective of the current traffic conditions.

### **Journey times**

- 10.4.7 Fourteen (bi-directional) journey time routes were selected across the FMA, for validating the A585 base year journey time validation. The routes were selected to cover a wide geographical area, with specific consideration given to routes on which it is anticipated that traffic will be affected by the scheme.
- 10.4.8 The modelled journey times were extracted for each modelled time period and compared with the corresponding observed journey time information extracted from the Trafficmaster database.
- 10.4.9 Although, no specific criterion exists in the WebTAG for validating segments within a journey time route, a time-distance analysis of the journey time routes was also carried out to assess the segmental journey time performance of the A585 base year traffic model.
- 10.4.10 In total, 93% of routes in AM, 93% of routes in IP and 96% of routes in PM were seen to be passing the WebTAG criteria for validation of journey time. The model was seen to perform well in terms of replicating the observed journey times to the required standards set out in WebTAG Unit M3.1.

### **Traffic flow volumes validation**

- 10.4.11 The model traffic flow validation was undertaken in accordance with the flow validation criteria set out in WebTAG Unit M3.1; details can be found in the Local Model Validation Report (Report no. HE548643-ARC-GEN-A585-RP-TR-2039). The calibration and validation was carried out on a set of screenlines and individual links, and the locations chosen were independent of each other.

## **10.5 Model convergence**

- 10.5.1 The stability of the assignment must be examined in order to ensure that model results are sufficiently robust, stable and consistent to use as a basis for decision making.
- 10.5.2 A measure of convergence is obtained from the delta statistic (%GAP in SATURN), which is defined as the difference between the time costs along the chosen routes and the minimum cost routes for the entire network using the equilibrium assignment. Further assessment of the performance of the traffic assignment was carried out by evaluating the percentage of links that show less than 1% change in the assigned traffic flow between four successive iterations and the percentage of link delays with less than 1% change.
- 10.5.3 The modelled journey times passed the WebTAG criteria in all three time periods, and the model performs well on all strategic and other major routes in all model time periods.

## **10.6 Overview of demand forecasting procedure**

- 10.6.1 The scheme opening year is 2021, with a design year of 2036. Demand matrices for the future years were developed by applying growth factors obtained from the DfT's TEMPRO v6.2 software to the 2015 matrices to reflect background traffic growth.

### **Scenario definition**

- 10.6.2 The following definition has been used for the scheme assessment with guidance on uncertainty in forecasting (WebTAG Unit M4: Forecasting and Uncertainty):

Scenario	Supply	Demand	National Growth
Core	Near Certain and More Than Likely Schemes	Near Certain and More Than Likely Developments	Standard TEMPro
Optimistic	Near Certain, More Than Likely and Reasonably Foreseeable Schemes	Near Certain, More Than Likely and Reasonably Foreseeable Developments	High Growth
Low Growth	Near Certain and More Than Likely Schemes	Near Certain and More Than Likely Developments	Low Growth

**Table 10-2: Modelled scenarios**

### Core Scenario

10.6.3 The Core Scenario for the Scheme assessment was defined in accordance with WebTAG guidance. WebTAG states that the Core Scenario should be based on the following, representing the best basis for decision making given current evidence:

- National Trip End Model (NTEM) growth in demand, at a suitable spatial area
- Sources of local uncertainty that are more likely to occur than not
- Appropriate modelling assumptions.

### Do-Minimum

10.6.4 The Do-Minimum network and degree of certainty included are:

Local Authority	Scheme	Level of Certainty	By 2021	By 2036
Highways England	A585/A586 Windy Harbour junction improvement	Certain	Y	Y
Lancashire / Preston	M55 to A583 Preston Western Distributor (PWD)	Near Certain	Y	Y
Lancashire	M55 J1 capacity improvements (Broughton Roundabout)	Certain	Y	Y
Lancashire / Preston	East West Link Road (North West Preston) (linked to PWD)	Near Certain	Y	Y
Lancashire / Preston	M55 new J2 (part of PWD)	More than Likely	Y	Y
Lancashire / Preston	Cottam Link Road (part of PWD)	More than Likely	Y	Y
Lancashire / Preston	Cottam Parkway station	More than Likely	N	Y
Fylde	Lytham Moss M55 to St Annes / Heyhouses Link Road	Near Certain	Y	Y

**Table 10-3: Do minimum highway network**

### Do-Something

10.6.5 Do-Something refers to the two tested options:

- Option 1B Southern bypass
- Option 2 On-line (no bypass)

### Development

10.6.6 The total number of proposed dwellings and employment from the uncertainty log for individual authorities within the Fully Modelled Area (FMA) are presented in Table 10-4

Council	Core/Low		Optimistic	
	Dwellings	Employment	Dwellings	Employment
Fylde	4654	1941	5096	3141
Blackpool	994	3000	994	3000
Wyre	2703	16	9806	16
<b>Total</b>	<b>8351</b>	<b>4957</b>	<b>15896</b>	<b>6157</b>

**Table 10-4: Uncertainty Log - Summary of Housing and Employment Developments**

- 10.6.7 Wherever sufficient data on the development phasing was not available, it was assumed that 50% of the total number of dwellings/employment developments would be built by 2021, with the remaining 50% completed by 2036.

### Development Trip Rates

- 10.6.8 Each development was assigned a model zone (or zones) to estimate the number of development trips generated. Trip rates for the developments for each time period were taken from the respective transport assessment (TA) reports and wherever information on trip rates was not available, average trip rates of developments having a similar land use was adopted for the respective time periods. For instance, where a trip rate was not available for a development with B2 type of land use, an average trip rate of other developments with B2 type land use with information available on trip rates from TAs were adopted.

## 10.7 Test for applying variable demand modelling (VDM)

- 10.7.1 The following choices are explicitly modelled in the DIADEM demand model:
- increases or decreases in the frequency of trips made
  - changes in destination.
- 10.7.2 For the Variable Demand Model (VDM), the hierarchy of responses reflects that in the WebTAG advice (unit 3.10.3) with frequency (the least sensitive) at the top of the hierarchy and trip distribution (the most sensitive) at the bottom of the hierarchy.
- 10.7.3 The DIADEM application consists of independent models of each of the three main time periods (0800-0900, 1000-1600 average hour and 1600-1700). The two peak hour models are deemed to represent travel in the peak periods, i.e. including the hours before and after the modelled hour.
- 10.7.4 The primary inputs to each model are the Reference Case matrices as discussed in previous chapters and travel costs from the base year highway assignment models. The demand segmentation in DIADEM is the same as for the assignment models.

## 10.8 VDM methodology

- 10.8.1 The demand modelling process in DIADEM is entirely incremental. For the creation of a forecast year Do-Minimum, base year costs are compared with costs that result from application of Reference Case demands (i.e. from development proposals and growth as forecast in TEMPRO) to revised supply (e.g. new highway and schemes). Resulting cost changes are input to DIADEM, which then adjusts the demand taking account of possible traveller responses – i.e. changes of destination or trip frequency. These revised demands are then re-loaded to the supply to generate a new set of costs, and the process continues in an iterative manner until satisfactory convergence is achieved.
- 10.8.2 Before applying the Variable Demand Model (VDM), realism testing was carried out to ensure that the VDM parameters gave a realistic response to changes in travel costs.
- 10.8.3 The A585 Base Year (with roadworks) SATURN model of 2015 was used to carry out the realism testing in accordance with the guidance in WebTAG (Unit 3.10) and the methods described in the DIADEM manual.
- 10.8.4 For these traffic forecasts, it has been necessary to code the Do-Minimum and Do-Something networks for both 2021 and 2036. The Do-Something reflects the proposed scheme options. The following runs have been carried out:
- VDM forecasts for each time period for the Do-Minimum for 2021 and 2036

- VDM forecasts for each time period for the Do-Something for 2021 and 2036.

## 10.9 Impact of DIADEM on trip matrices

10.9.1 The impact of variable demand, applied using DIADEM, on the Reference Case matrices for the Do-Minimum and Do-Something are presented in the Traffic Forecasting Report. These show a marginal increase in traffic from the Do-Minimum to Do-Something.

## 10.10 Assignment Changes in Model Traffic Flow (Core Scenario)

10.10.1 The impact of A585 Windy Harbour to Skippool improvement scheme on the highway network is assessed by analysing the resulting changes in the travel conditions across the highway network with respect to changes in traffic flows, journey times and a reduction in delay for the proposed two scheme options.

10.10.2 The changes in travel conditions are presented for the two scheme options for all time periods and forecast years.

### Without and With Scheme- Option 1B (Southern Bypass)

10.10.3 The largest changes in the highway flow across all modelled time periods occur on the strategic routes of A585 and the M55. The scheme benefits the long-distance traffic that use the strategic roads of A585 and M55 to travel from the authorities of Wyre and Blackpool to the rest of UK.

10.10.4 It can be seen that the traffic from Blackpool and Wyre using the local roads to reach the M55 in the 'Without Scheme', now heads towards the A585 in the 'with Option 1B Southern Bypass scheme option'.

10.10.5 A reduction of trips is observed on other roads, primarily the local roads within the Blackpool authority. In addition, it can be seen that vehicles that were using A588 Breck Road in north-east Poulton-le-Fylde now uses Garstang Road East (A586) and the bypass to head towards the north.

10.10.6 Figure 10-3 and Figure 10-5 show the predicted change in traffic flows from the existing A585 route to the Southern Bypass for the 2036 design year. Along Mains Lane the two way annual average weekday traffic (AAWT) flows are predicted to change as shown in Table 10-5 and indicates a significant reduction in traffic on the existing A585 route between Skippool Bridge Junction and Little Singleton and also some relief for A588 Breck Road in the north-east of Poulton-le-Fylde.

Part of Existing Route	2036 Do Minimum	2036 Option 1B	Difference
Mains Lane north of Shard Road Junction	38817	15841	-22976
Mains Lane from Shard Road Junction to Little Singleton	28889	2850	-26038
Garstang Road East, Little Singleton – east of bypass	11509	2201	-9308
Garstang Road East, Poulton-le-Fylde – west of bypass	11919	18383	<b>+6464</b>
A588 Breck Road south-west of Skippool Junction	16383	13006	-3377

**Table 10-5: Existing Routes AAWT flow comparison (Option 1B: 2036 Core Scenario)**



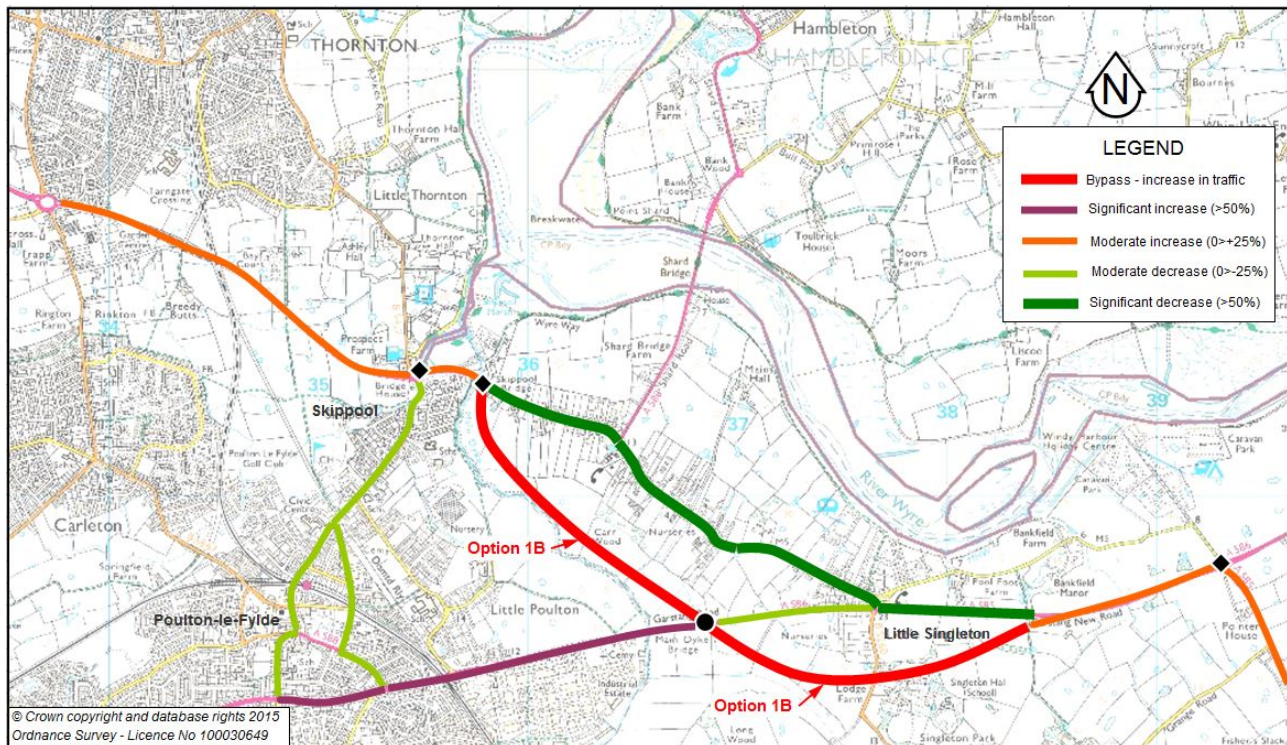


Figure 10-3: Option 1B - Summary of traffic flow changes

### Without and With Scheme- Option 2 (On-line / No Bypass)

- 10.10.7 Option 2 No Bypass is an online improvement option of the A585 from Windy Harbour to Skippool junction. The signalised intersection is introduced at the Skippool junction and the Shard Road junction is improved to a roundabout junction as a part of the improvement scheme. The Little Singleton junction is converted to triangular one-way gyratory to ease the congestion levels. These improvements from Windy Harbour to Skippool draws more traffic on to the A585.
- 10.10.8 The changes in model flow with respect to Option 2 (on-line) follows a similar trend as that of the Option 1B Southern Bypass, attracting the long-distance trips from the Blackpool and Wyre to feed into the M55.
- 10.10.9 However, Figure 10-4 and Figure 10-6 show the predicted change in traffic flows along the existing A585 route to the Southern Bypass for the 2036 design year. Along the existing road network the two way AAWT flows are predicted to change as shown in Table 10-6 and indicate that, from Shard Road Junction through Little Singleton to Windy Harbour, most of the existing road network would experience increased traffic flows compared to the do-minimum case..

Part of Existing Route	2036 Do Minimum	2036 Option 2	Difference
Mains Lane north of Shard Road Junction	38817	39294	<b>+477</b>
Mains Lane from Shard Road Junction to Little Singleton Gyratory	28889	30709	<b>+1820</b>
Mains Lane, Little Singleton (within Gyratory)	28796	24329 (one way)	-4467
Garstang Road East, (within Gyratory)	11509	21094 (one way)	<b>+9585</b>
Garstang Road East, Poulton-le-Fylde – west of Gyratory	11919	13122	<b>+3203</b>
Garstang New Road (East of Little Singleton)	35837	41371	<b>+5534</b>
A588 Breck Road south-west of Skippool Junction	16383	14896	-1487

Table 10-6: Existing Routes AAWT flow comparison (Option 2: 2036 Core Scenario)

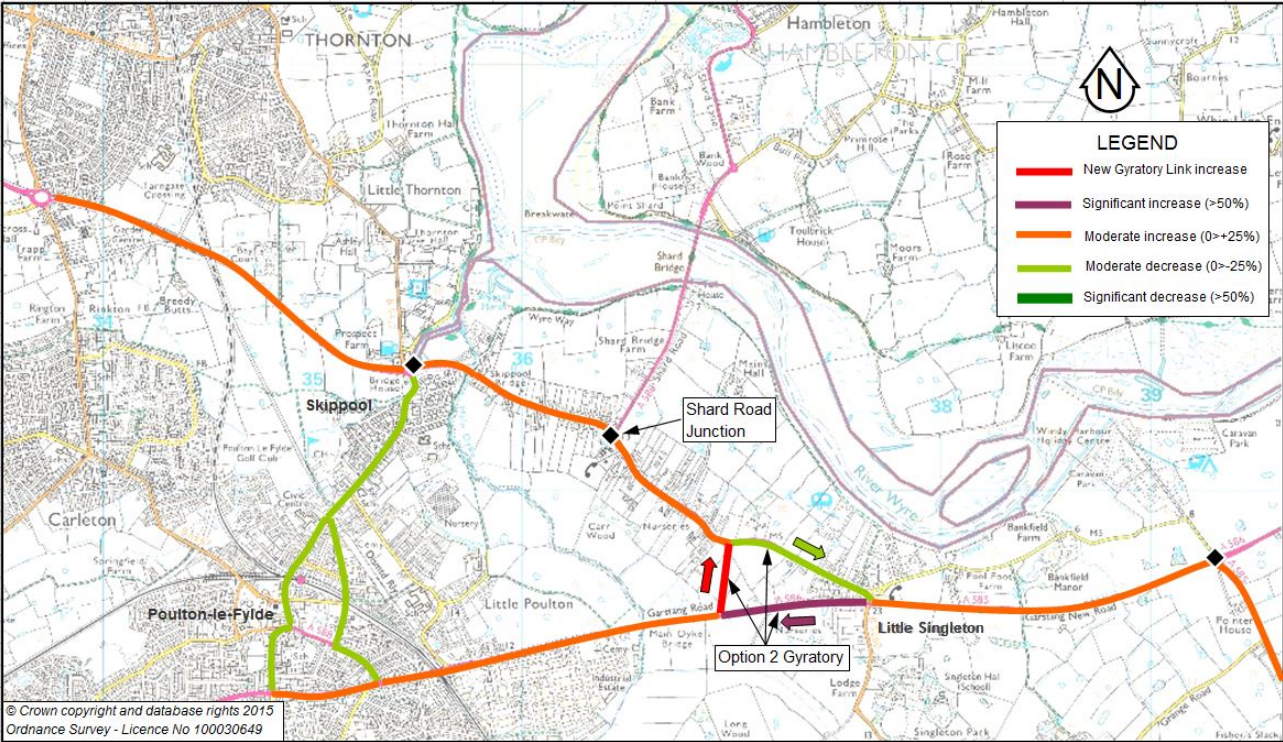


Figure 10-4: Option 2 - Summary of traffic flow changes



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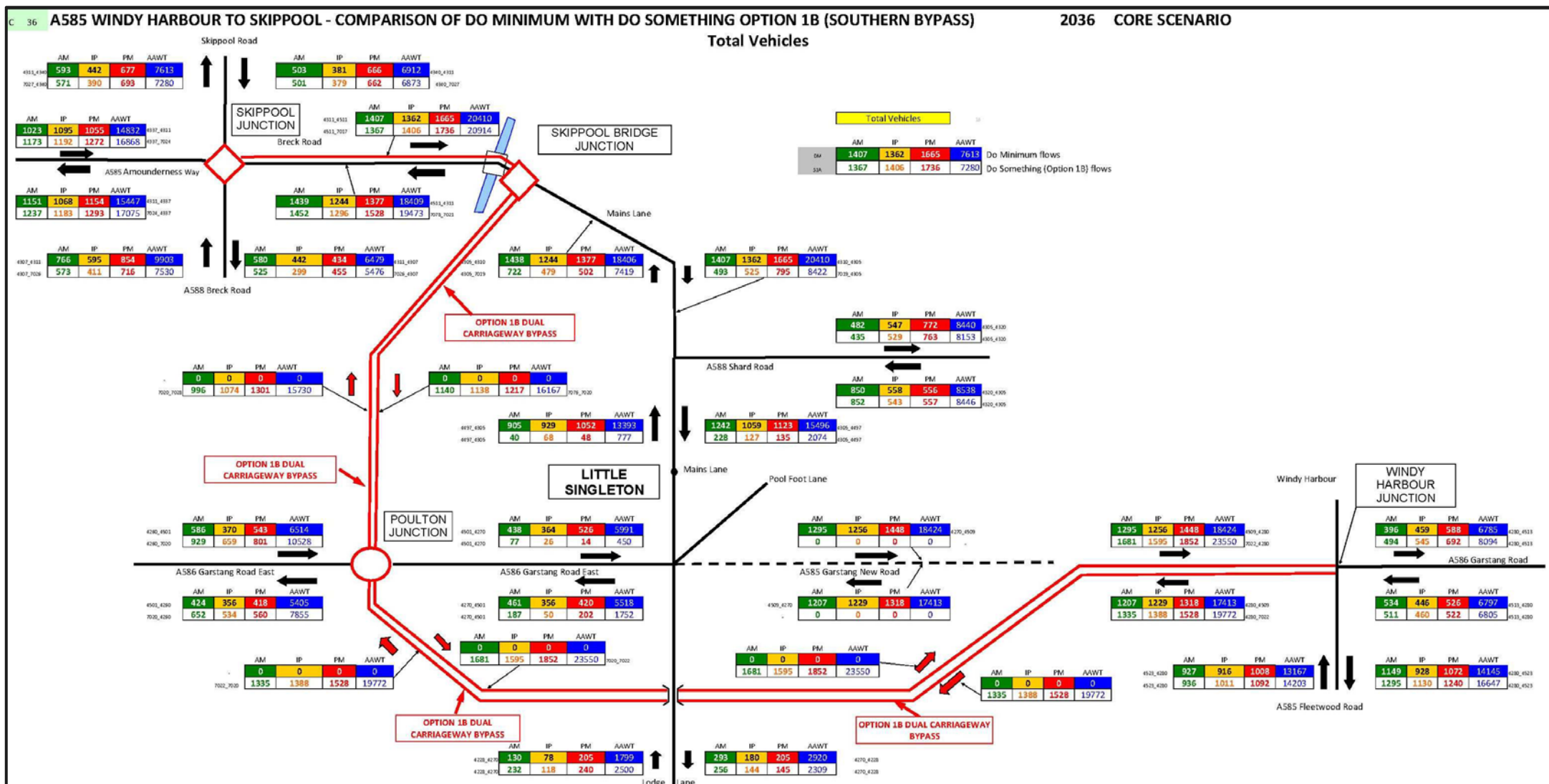
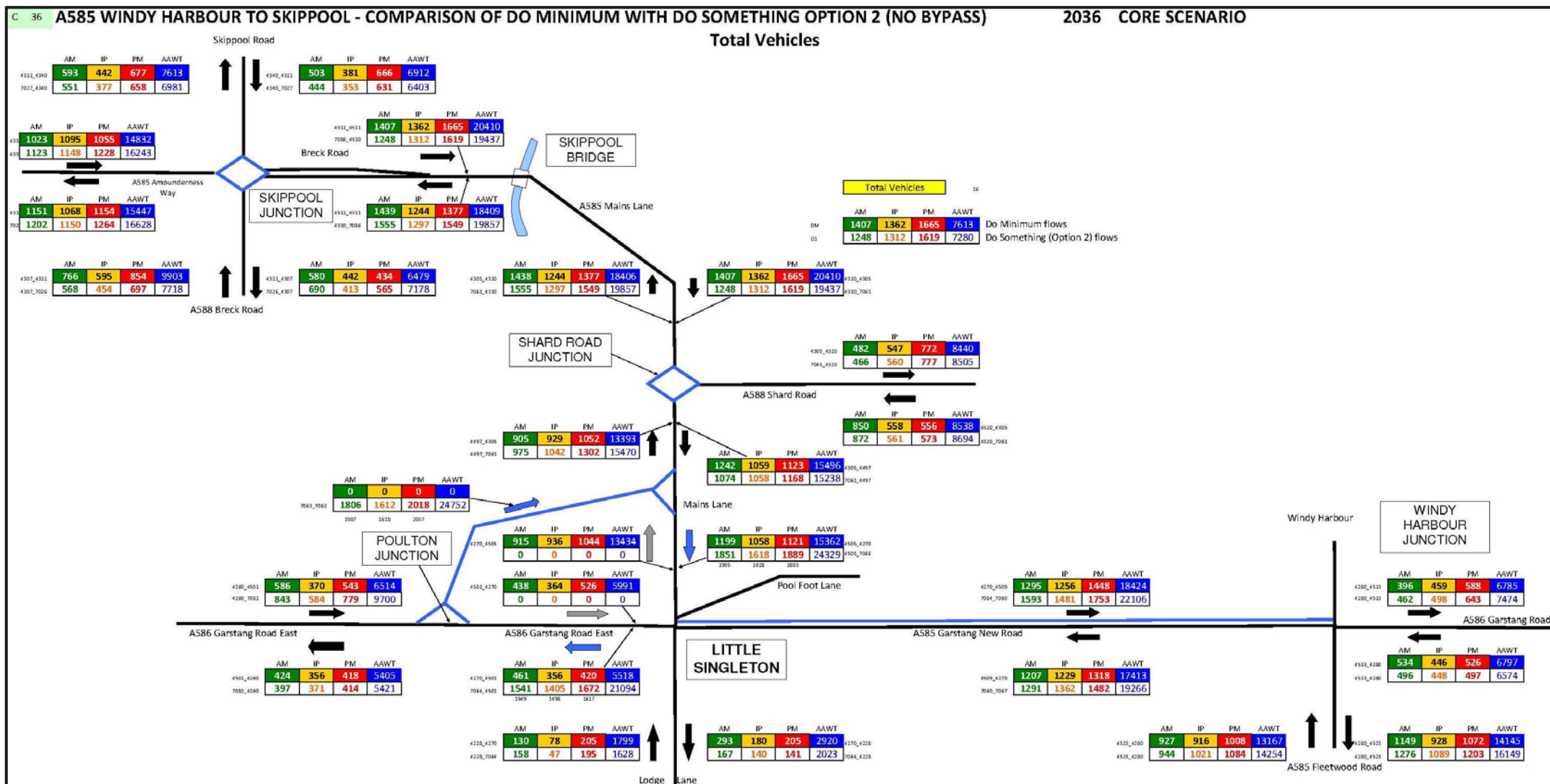


Figure 10-5: Option 1B (Southern Bypass) - 2036 core scenario. Comparison of Do Minimum with Do Something Total Vehicle Flows

A585 Windy Harbour to Skippool  
Stage 2 - Scheme Assessment Report

**Figure 10-6: Option 2 (On-line/ No bypass) - 2036 core scenario. Comparison of Do Minimum with Do Something Total Vehicle Flows**

## 10.11 Ratio of traffic volume to capacity

- 10.11.1 The Volume to Capacity Ratio (V/C) is a measure that reflects the mobility and quality of travel of a facility or a section of a facility. It compares roadway demand with roadway supply (carrying capacity). For example, a V/C of 100% indicates the roadway facility is operating in excess of operating capacity. DMRB advises that a practical volume to capacity ratio of less than 85% is required for queuing to be avoided.
- 10.11.2 The Core Scenario contains future development (8,351 homes and 4,957 jobs) which has been classified as Near Certain or More than Likely and represents approved development or development which is within the consent process or where the submission of a planning or consent application is imminent. The Local Authority future development aspirations for the area which are included in the Local Authority Local Plans which are less certain are categorized as reasonably foreseeable and have been included in the Optimistic Scenario. In addition to the development contained in the Core Scenario the Optimistic Scenario contains additional an additional 7,545 homes and 1,200 jobs. The Optimistic Scenario therefore includes 15,896 homes and 6,157 jobs.
- 10.11.3 The A585 between Windy Harbour Junction and the Skippool Junction is approaching practical capacity or in excess of practical capacity in the Without Scheme Core Scenario in all time periods in the design year 2036. The modelling shows that the proposed development in the area could not be supported without an improvement to the A585.
- 10.11.4 It is shown that Option 1B continues to operate well in the Design Year 2036 with a V/C Ratio less than 75% in all time periods. In contrast Option 2 (No Bypass) V/C ratio has scheme sections approaching or in excess of practical capacity in both the morning and the evening peaks.
- 10.11.5 Option 1B therefore has reserve capacity to support the Local Authority future housing and employment development aspirations in the area which are less certain. Option 2 (No Bypass) barely supports the development included in the core scenario and has little or on some scheme sections no reserve capacity to support the future housing and employment development aspirations in the area which are less certain.
- 10.11.6 With regards to the consultation responses that local councillors and members of the public concern that they believe the bypass will just pass the problems further downstream I wonder if we could respond by saying that this is not a matter of the scheme transferring the problems downstream and that the extent of the scheme will not address residual problems elsewhere in the network that are outside of the scheme extent. The scheme will not transfer the problems downstream however it will not address all of the areas of the network where demand exceeds supply.

## 10.12 Strategic modelling conclusions

- 10.12.1 Option 1B (Southern bypass) would accommodate the planned development in the Fylde peninsula and would generally operate well within the capacity of the new network, attracting traffic from Wyre and Blackpool. It would also provide substantial relief on the existing road network in the area and would improve journey time reliability.
- 10.12.2 While Option 2 (on-line) would provide some additional capacity for traffic along the A585 route and would attract longer distance traffic from Wyre and Blackpool. However, this would be operating with little spare capacity particularly in the peak periods and would provide no relief on the existing A585 route between Skippool and Little Singleton.
- 10.12.3 Neither option would relieve all the congestion on the entire A585 route but the modelling indicates that Option 1B would best accommodate the planned development.



## 11 OPERATIONAL ASSESSMENT

### 11.1 Introduction

- 11.1.1 An operational assessment has been undertaken for the scheme options using a microscopic multi-modal traffic flow simulation software package - Paramics Discovery 17 (SIAS) software. It was deemed that this was necessary because the strategic modelling tools are not always able to capture the complexity of the road network and consequent traffic movements, and especially driving behaviour of individual vehicles which is crucial in modelling congested networks.
- 11.1.2 The Stage 2 Operational Modelling results can be referred to in more detail in HE548643-ARC-EGN-A585-TN-TR-2004-v2.0 Stage 2 A585 Operational Junction Modelling. The Operational Future Year modelling was carried out based on the calibrated and validated 2015 Base Paramics models for the AM and PM peak periods. The extent of the study area covered by the Future Year modelling is shown in Figure 11-1 being an extract of the larger SATURN model area.

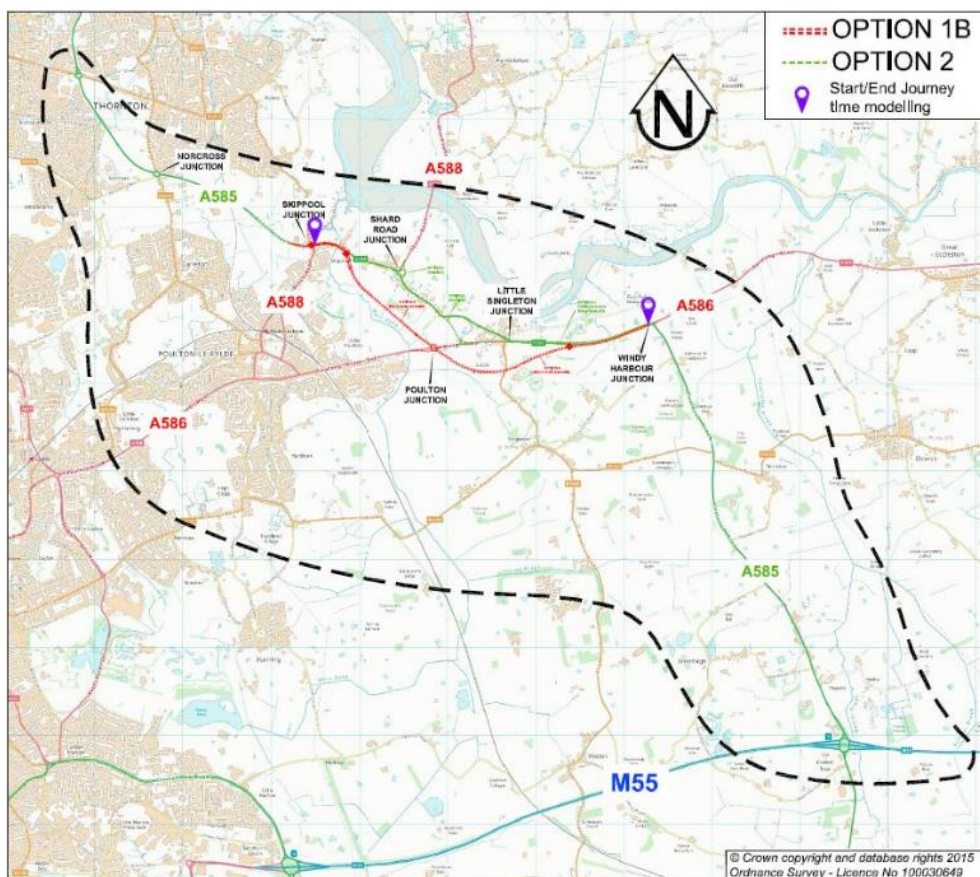


Figure 11-1: Extent of Paramics modelling

- 11.1.3 The benefit of undertaking microsimulation modelling is that traffic behaviour can be observed in each time period across the network. This allows observation of the build-up of traffic queues over time in each time period allowing the modeller to identify areas where there is vehicle conflict and consequently the opportunity for resolution of these conflicts and hence minimise delay and optimise network performance. In practice, this has allowed alterations to the operating parameters of the various junction within constraints to be tested including, for example, signal timing and phasing at traffic signal junctions.
- 11.1.4 Based on the analysis of the hourly flow variation of traffic entering each surveyed junction, the following peak periods were established and modelled in Paramics:
- 0800 - 0900 AM peak with 1 hour warm up (0700-0800) and 30 minute cooldown (0900-0930) periods
  - 1700-1800 PM peak with 1 hour warm up (1600-1700) and 30 minute cooldown (1800-1830) periods

11.1.5 Traffic forecast flows were obtained from the Stage 2 A585 Post Variable Demand Highway Assignment Traffic Model for the Without Scheme Scenario and the Option 1B (Southern Bypass) and Option 2 (on-line) cases and tested for the following scenarios:

- Opening Year – 2021
- Design Year – 2036.

## 11.2 Do-minimum future year scenario

11.2.1 The junction arrangements along the A585 route for the do-minimum network are:

- Norcross Junction – roundabout
- Skippool Junction – roundabout
- Shard Road/Mains Lane – traffic signals
- Little Singleton Junction – traffic signals
- Windy Harbour Junction – traffic signals
- Junctions south of Windy Harbour Junction to M55 Junction 3 – priority
- M55 Junction 3 – traffic signals

## 11.3 Journey times

11.3.1 The journey time comparisons were made between the eastern arm of Skippool Junction and the western arm of Windy Harbour Junction in both directions and include the times to enter the junction at the end of each journey (see Figure 11-1).

11.3.2 The results of the journey time comparison between the 2015 Base and Do-Minimum Scenarios (2021 and 2036) show that the overall journey time increase across all peaks for both future years. The comparisons with Do-minimum and Option 1B and Option 2 are shown in Table 11-1 and Table 11-2 below.

Peak period	Route Direction	Do minimum	Option 1B (Southern Bypass)			Option 2 (On-line)		
		Average JT (secs)	Average JT (secs)	Savings (secs)	Savings (%)	Average JT (secs)	Savings (secs)	Savings (%)
AM	A585 EB	345	276	69	20%	278	67	19%
	A585 WB	337	258	79	23%	325	12	4%
PM	A585 EB	311	218	93	30%	239	72	23%
	A585 WB	388	253	135	35%	347	41	11%

**Table 11-1: 2021 Opening year - Scheme option journey time comparison**

Peak period	Route Direction	Do minimum	Option 1B (Southern Bypass)			Option 2 (On-line)		
		Average JT (secs)	Average JT (secs)	Savings (secs)	Savings (%)	Average JT (secs)	Savings (secs)	Savings (%)
AM	A585 EB	362	284	78	23%	280	82	23%
	A585 WB	407	273	134	39%	346	61	15%
PM	A585 EB	348	225	123	35%	241	107	31%
	A585 WB	516	267	249	48%	380	136	26%

**Table 11-2: 2036 Design year - Scheme option journey time comparison**

11.3.3 The AM results show that the eastbound journey time savings are very similar for both schemes in both modelled years, offering up to a 23% reduction in journey times in the design year. Option 1B Southern Bypass option offers significantly higher westbound journey savings in both modelled

years. The westbound journey time savings in the Option 2 (on-line) option are relatively small in the opening year, however they improve significantly in the design year.

- 11.3.4 Journey time savings as a result of both schemes are higher in the PM peak, with journey time savings of up to 45% in the Option 1B Southern Bypass Scheme. The Option 1B Southern Bypass option offers higher journey time savings in both directions in each of the modelled years compared to Option 2 (on-line) option.

## 11.4 Problem locations

- 11.4.1 As a result of the detailed modelling, a number of problem locations were identified and were studied in more detail. The location of these are shown on Figure 11-2 and the issues are described in Table 11-3 below.

- 11.4.2 At the extremities of the modelled area it is noted that:

- The Norcross Junction, and the surrounding area in general, is significantly over-saturated in all of the models, with the only real change across models being which arm is the most affected.
- At Windy Harbour Junction the outputs at show a slight increase in queue lengths as a result of the higher flows in the Scheme models, but do not indicate any capacity problems and there is scope to improve the operation of the junction by refining the existing signal timings.
- On the A585 south of Windy Harbour Junction the only issue I was the queuing on the northern arm approaching the M55 Junction 3 roundabout with the increased flows from Option 1B seeming to push this arm over capacity, which results in very long queues and delays to southbound traffic.
- At Thistleton North Junction, south of Windy Harbour, there was no indication of congestion and with Option 1B there were reduced flows along Mile Road east of Singleton Village due to traffic reverting to the A585 route rather than 'rat-running' through the village.

## 11.5 Operational assessment - conclusions

- 11.5.1 The journey time results demonstrate that both schemes offer significant journey time savings compared to the Do-minimum scenario and increase for the design year (2036) compared to the opening year (2021) and the Option 1B Southern Bypass scheme offers significantly higher journey time savings in the westbound direction compared to the Option 2 (on-line) Option. The Option 1B Southern Bypass scheme and the Option 2 No Bypass scheme show a similar level of journey time savings in the eastbound direction.
- 11.5.2 The volume of traffic in the design year is observed to have a significant impact in the Norcross area, with severe congestion and long queues building up on all arms of the Norcross roundabout in all models.
- 11.5.3 A potentially significant safety and capacity issue was observed in the Option 2 on-line scheme on the one-way northbound link in the proposed gyratory system around Little Singleton, whereby the volume of traffic scissor movements create conflicts resulting in safety and capacity issues due to the short link length.
- 11.5.4 Overall, it is considered that Option 1B Southern Bypass offers the greatest benefits of the two options, particularly in terms of journey time savings and the safe operation of the scheme. The minor operational issues associated with Option 1B Southern Bypass can be addressed with modest adjustments to the scheme design during PCF Stage 3 Preliminary Design. In contrast, the design issues identified as a result of the operational assessment of Option 2 (on-line) are considered to be significant and more difficult to address.

### Further work

- 11.5.5 Some minor operational issues were observed in the Option 1B Southern Bypass scheme, however it is considered that these are primarily due to the design of certain junction approaches and exits and could be overcome with minor adjustments to lane lengths. It is considered that these minor improvements would potentially release additional capacity in certain areas of the scheme and therefore improve the journey time savings associated with the scheme, enhancing the economic performance of the scheme.

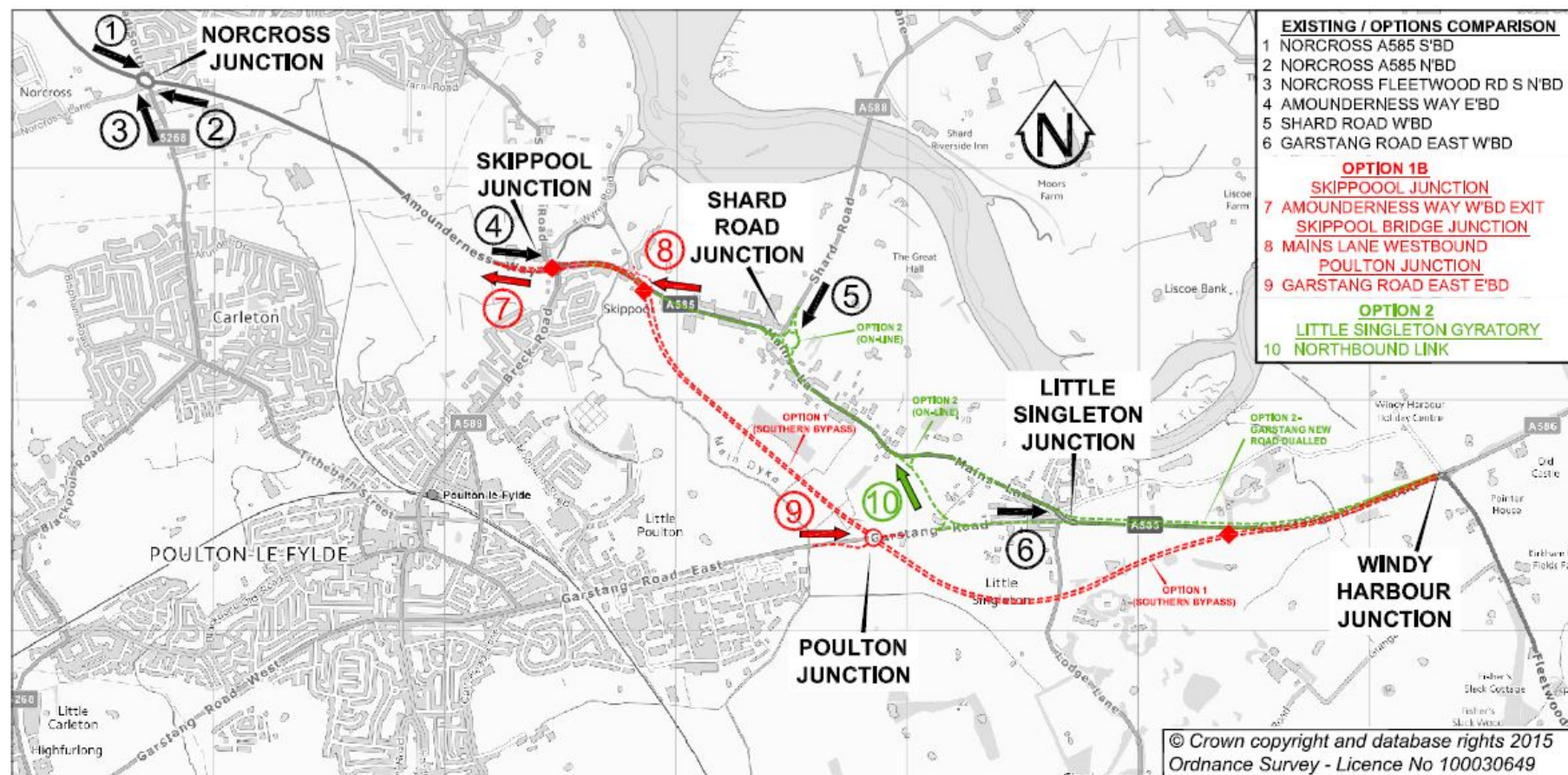


Figure 11-2: Operational Assessment of problem junctions for Design Year (2036)

Ref	Location	Existing network results	Option 1B results	Option 2 results
1	Norcross Roundabout: A585 eastbound approach	Queues more than 20 vehicles for about half of AM peak hour	Queues more than 10 vehicles for only about half of AM peak hour	Queues more than 50 vehicles for most of AM peak hour
2	Norcross Roundabout: A585 westbound approach	build to more than 100 vehicles for last 10 minutes of PM peak hour	greater than existing rising to up to 180 vehicles for the last 10 minutes of PM peak hour due to increased release of westbound traffic from Southern bypass	less than existing rising to up to 60 vehicles for the last 30 minutes of PM peak hour due to reduced release of westbound traffic from Option 2



Ref	Location	Existing network results	Option 1B results	Option 2 results
3	Norcross Roundabout: Fleetwood Road South northbound approach	Queues build to more than 100 vehicles for last 25 minutes of AM peak hour	Queues rise to 40 vehicles for about 15 minutes of AM peak hour	Queues more than 40 vehicles for last 40 minutes of AM peak hour
4	Skippool Junction: A585 Amounderness Way Eastbound approach	Queues build to more than 80 vehicles for last 40 minutes of AM peak hour	Queues limited to no more than 25 vehicles throughout the AM peak hour	Queues limited to no more than 25 vehicles throughout the AM peak hour
5	A588 Shard Road Junction with Mains Lane southbound approach	Queues more than 90 vehicles for about 45 minutes of AM peak hour	Queues more than 20 vehicles for about 30 minutes of AM peak hour due to reduced flows on Mains Lane	Queues more than 10 vehicles for about 30 minutes of AM peak hour due to improved flows at new Shard Road Junction (roundabout) releasing traffic from Over-Wyre to east and west.
6	Little Singleton Junction A586 Garstang Road East eastbound approach	Queues build to more than 90 vehicles for last 30 minutes of PM peak hour	Queues negligible due to traffic reassigned to Southern Bypass	Not applicable due to Little Singleton gyratory
7	Option 1B: Skippool Junction westbound exit to A585 Amounderness Way	Not applicable	Delays caused to westbound A585 traffic due to two lanes of traffic merging. Consider extending length of merge	Not applicable
8	Option 1B: Skippool Bridge Junction westbound entry from Mains Lane	Not applicable	Queues for side road traffic from Mains Lane approaching junction due to short length of two lanes Consider extending length of 2 lanes on approach	Not applicable
9	Option 1B: Poulton Junction eastbound entry from Garstang Road East	Not applicable	Queues for side road traffic from Garstang Road East approaching roundabout due to short length of two lanes Consider extending length of 2 lanes on approach	Not applicable
10	Option 2: Little Singleton gyratory northbound link	Not applicable	Not applicable	Conflict due to opposing "scissors" movements of eastbound and northbound traffic over short length of link.

**Table 11-3: Operational Assessment of problem junctions for Design Year (2036)**



## 12 ECONOMIC ASSESSMENT

### 12.1 Summary of assessment approach

12.1.1 The Economic Assessment Report (Report Number HE548643-ARC-GEN-A585-RP-TR-2058 Version 2.0) (EcAR) details how the benefits and costs of the improvement scheme were derived as part of the economic assessment process, and then to present the associated results. The economic analysis of the monetised costs and benefits of a scheme forms a key element in the overall value for money assessment as prescribed within WebTAG. This report sets out the results in narrative terms and in the standard appraisal tables required by WebTAG.

12.1.2 The EcAR:

- Summarises the transport modelling process undertaken;
- details the data used and justifies assumptions used in the economic appraisal process;
- reports the monetised costs and benefits in both geographical and temporal terms as appropriate;
- combines the monetised costs and benefits for each assessed option in standard economic appraisal tables to produce economic performance indicators.

12.1.3 The main traffic objectives of the scheme are to:

- Reduce congestion on the existing A585 through Little Singleton, Shard and Skippool junctions
- Improve journey time reliability
- Reduce the obstacles to the economic growth potential in both Wyre and Fylde

12.1.4 Three options were initially assessed in the EcAR being:

- Option 1B – Southern bypass with no connection to Garstang New Road west of Windy Harbour Junction (With Bypass) [previously known as Option S1A];
- Option N1 – Northern bypass;
- Option 2 - on-line improvement with a gyratory system at Little Singleton (No Bypass) [previously known as Option O1].

However, an early sifting exercise resulted in Option N1 being rejected as it was more expensive and offered lower benefits than the Southern Bypass option.

12.1.5 The economic assessment was used both fixed demand SATURN assignment models and Variable Demand Models (VDM) for the Core scenario, and for the Low Growth and Optimistic Growth scenarios. The SATURN model is described in more detail in Section 10.

12.1.6 The following is a summary of the methodology used to undertake the economic assessment:

- The economic assessment was undertaken in accordance with the relevant WebTAG guidance documents comprising industry-standard computer programs, TUBA, COBALT and QUADRO.
- The traffic data used in the economic assessment was derived from the SATURN traffic model and Highways England's Traffic Information System (TRIS) and Traffic Flow Data System (TRADS) and information from Trafficmaster™ database.
- The economic assessment was undertaken over the standard 60 year appraisal period with 2021 being the scheme "Opening Year", 2036 being the "Design Year" and 2080 being the "Horizon Year". All costs and benefits were discounted to the Present Year Value of 2010. For the purposes of the economic appraisal no traffic growth was assumed after 2036, the last modelled year.

12.1.7 In addition to the assessment of economics for the weekday scenarios, tests were also carried out including weekend benefits.

### 12.2 Summary of results

12.2.1 The tools used to arrive at the benefit-cost ratio (BCR), based on direct benefits, were:

- The Transport Users Benefit Appraisal (TUBA) tool which calculates transport user benefits,

changes in charging revenues and indirect taxation and the economic impact of changes in greenhouse gas emissions. The appraisal was carried out using the TUBA (version 1.9.8 Interim).

- Accident savings resulting from the A585 Windy Harbour to Skippool Improvement scheme were assessed using the DfT's Cost and Benefit to Accidents – Light Touch (COBALT) program (version 2013.2).
- The (dis)benefits to the transport user arising from construction and the regular major maintenance work of the future A585 Windy Harbour to Skippool Improvement Scheme were assessed using Highways England, Transport Planning Group's Queues and Delays at Roadworks (QUADRO) software (version 4 R14).
- The effects of the A585 Windy Harbour to Skippool Improvement scheme on the greenhouse gases, air quality and noise levels were be monetised in line with TAG Unit A3 - Environmental Impact Appraisal.

12.2.2 In order to exclude impacts not directly attributable to the scheme in the assessment of transport user benefits, the analysis for estimation of benefits using TUBA and COBALT were carried out on a cordoned area of the Stage 2 A585 forecast traffic model. The extent of the economic assessment cordon area is shown in Figure 12-1.

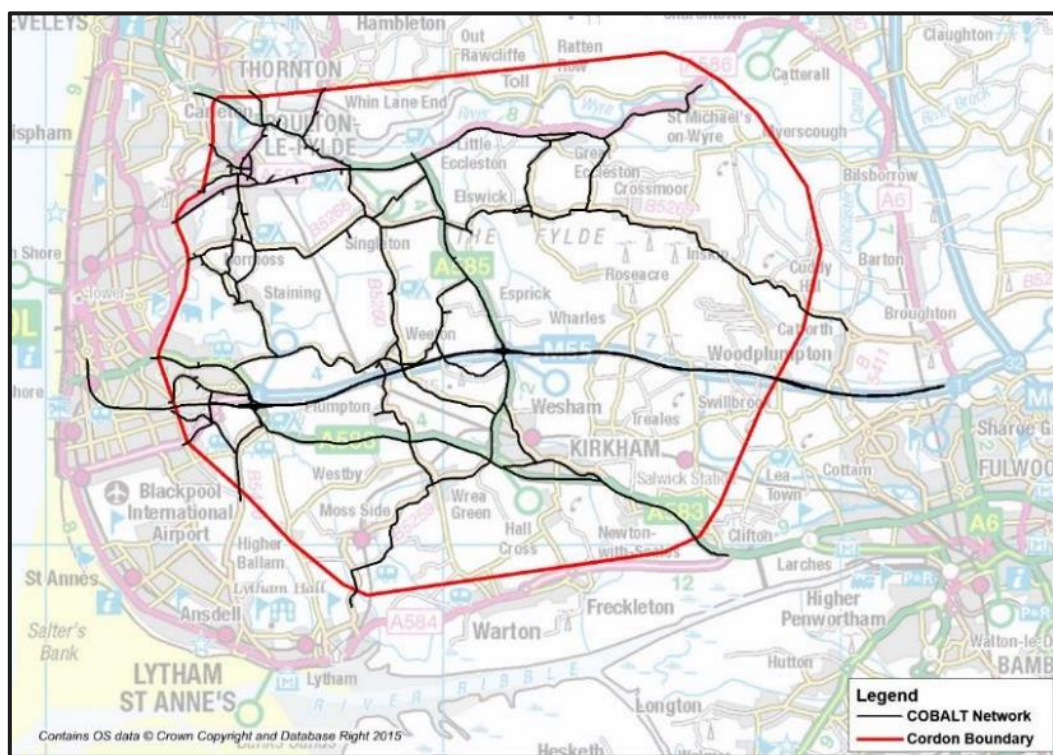


Figure 12-1: COBALT road network

## 12.3 Transport user benefits

- 12.3.1 The expected economic impacts of the A585 Windy Harbour to Skippool Improvement Scheme have been established, following the methods set out in the Department for Transport's (DfT's) modelling and appraisal guidance Web- based Transport Appraisal Guidance (WebTAG). The economic assessment was carried out using standard procedures and economic parameters as defined by WebTAG Unit A1.
- 12.3.2 Transport User Benefit Appraisal (TUBA) software (version 1.9.8 Interim) was used to undertake the economic assessment for the A585 Improvement scheme. This software has been produced by the Department for Transport (DfT) to carry out transport scheme economic appraisal using a 'willingness to pay' approach with fixed or variable demand.
- 12.3.3 The calculation of the economic benefits to road users incorporates the use of the Department for Transport's (DfT) Transport User Benefit Appraisal (TUBA) program. TUBA carries out economic

appraisal in accordance with the DfT's Transport Analysis Guidance as set out in Unit A1-1 'Cost-Benefit Analysis' and WebTAG Data Book.

- 12.3.4 TUBA calculates the user benefits in time, fuel vehicle operating costs (VOC), non-fuel VOC and charge, operator and government revenues, and the scheme costs, discounted to the present value year.

## 12.4 Accident benefits assessment results

- 12.4.1 Accident savings resulting from the A585 scheme were assessed using the DfT's Cost and Benefit to Accidents – Light Touch (COBALT) program. The COBALT computer program forecasts the number of personal injury accidents (PIAs) and casualties by severity within a selected cordoned area (see Figure 12-1 above).
- 12.4.2 The economic results relate to the total costs of accidents on the study network over the appraisal period (discounted to and in the 2010 price base year) for the without-scheme and with-scheme forecasts, and the total economic benefit of the scheme (which will be negative if there is a dis-benefit). The total benefit is the total 'with-scheme' cost subtracted from the total 'without-scheme' cost.
- 12.4.3 The accident results are calculated by comparing the total number of accidents over the appraisal period for the without-scheme to the with-scheme forecasts.
- 12.4.4 The casualty results relate to the number of fatal, serious and slight casualties over the appraisal period for the without-scheme and with-scheme forecasts, along with the difference between the forecasts for each severity level as shown in Table 12-1.
- 12.4.5 It should be noted that the accident benefits are discounted present values, in 2010 prices and values (£ millions). Casualties saved and accident benefits are over the 60-year assessment period.

Scheme	Casualty benefit (£ millions)						Total casualties benefits saved by scheme (£ millions)			
	‘Without Scheme’			‘With Scheme’						
	Fatal	Serious	Slight	Fatal	Serious	Slight	Fatal	Serious	Slight	TOTAL
Option 1B Southern Bypass	91	1029	9911	93	991	9575	-2.1	37.7	336	371.6
Option 2 No Bypass	91	1029	9911	93	1014	9839	-2.1	15.4	71.6	84.9

**Table 12-1: Casualty benefits summary - Core growth scenario**

### Accident Savings

- 12.4.6 The accidents saved as a result of the A585 Windy Harbour to Skippool Improvement scheme are calculated as the difference between the number of accidents in the 'Without Scheme' and 'With Scheme' scenarios. Table 12-2 presents the summary of the accidents saved for the core scenario over the 60-year appraisal period for each option.

Scheme	Total Accidents		Total Accidents saved by scheme
	'Without Scheme'	'With Scheme'	
Option 1B Southern Bypass	7929.6	7617.9	311.6
Option 2 No Bypass	7929.6	7840.5	89.0

**Table 12-2 Accidents benefits summary – Core growth scenario**

- 12.4.7 Assessments were also carried out for low growth and optimistic growth scenarios.
- 12.4.8 Table 12-3 presents a summary of the Option 1B and Option 2 accident assessment economic results for the Core Scenario over the 60-year appraisal period. There is an overall reduction of £6.4 million in accident costs for Option 1B (Southern Bypass) and a slight increase of £3.36 million in accident costs for Option 2 (No Bypass) over the 60-year assessment period.

Scheme	Accident Costs (£m)		Accident Benefits saved by scheme (£m)
	'Without Scheme'	'With Scheme'	
Option 1B Southern Bypass	397.76	386.21	11.56
Option 2 No Bypass	397.76	395.17	2.59

**Table 12-3: Core Scenario Accidents Benefits Summary**

## 12.5 Construction and maintenance delays (dis-)benefits

- 12.5.1 Traffic management works during construction tend to result in changes in journey times and vehicle operating costs. Construction work also has an impact on accidents. These impacts need to be appraised within the economic assessment of a scheme. Generally, the presence of roadworks results in increased travel costs and hence the benefits due to construction works are normally negative.
- 12.5.2 Since Option 1B (Southern Bypass) has a part of its construction online and Option 2 No Bypass (on-line) scheme is being constructed along the same alignment as the existing alignment, traffic will inevitably encounter delays at certain times during various construction phases. The delays in existing traffic can, however, be kept to a minimum using effective traffic management measures.
- 12.5.3 QUADRO (Queues and Delays at Roadworks) is used to compute the total cost of construction works in terms of time delay, vehicle operating costs and accident costs, as well as incorporating the costs of the works themselves. User dis-benefits are assessed based on queues developing at roadworks or additional time taken to travel via an alternative route.
- 12.5.4 Following a review of the Traffic Management Plans and programmes provided by BAM Morgan Sindall Joint Venture (bmJV), an assessment of the delay to road users due to the construction of Option 1B and Option 2 using QUADRO was carried out.

### Maintenance Dis-benefits

- 12.5.5 In addition to assessing the delay to road users during construction, it is necessary for the economic assessment to take account of the cost of maintaining the new section of the A585 Windy Harbour to Skippool Improvement scheme in Option 1B (Southern Bypass) and the existing section of the A585 and associated improvement works in Option 2 (No bypass) during the 60-year assessment period. For Option 1B it is currently expected that the bypassed section of the existing A585 would be detrunked and its maintenance responsibility would be transferred to the local highway authority and therefore those maintenance costs are not included.

Option	Construction dis-benefits	Maintenance dis-benefits
Option 1B Southern Bypass	2,177,867	£700,708
Option 2 No Bypass	7,273,517	£2,897,376

**Table 12-4: Construction and maintenance dis-benefits**

## 12.6 Environmental Impacts

- 12.6.1 The effects of the A585 Windy Harbour to Skippool Improvement Scheme on the following indicators have been monetised in line with TAG Unit A3 - Environmental Impact Appraisal:
- Greenhouse Gases
  - Local Air Quality
  - Noise.
- 12.6.2 The Environmental Assessment Report contains details of the provenance and results of the assessments made.

- 12.6.3 The overall transport dis-benefits (including indirect tax revenue and greenhouse gas benefits) during construction of Option 1B Southern Bypass is £2.18 million. The overall transport dis-benefits (including indirect tax revenue and greenhouse gas benefits) during construction of Option 2 No Bypass is £7.27 million.

### Air Quality and Noise

- 12.6.4 The effects of air quality and noise of the construction of Option 1B and Option 2 were considered and are summarised in Table 12-5 below:

Indicator	(a) Appraisal output criteria	(b) Potential impact	(c) Qualitative Comments
Noise	Any change in alignment of transport corridor or any links with significant changes (>25% or <-20%) in vehicle flow, speed or %HDV content. Also note comment in TAG Unit A3.	No	The change in traffic flows is less than 20%, and therefore do not require assessment for Noise.
Air quality	Any change in alignment of transport corridor or any links with significant changes in vehicle flow, speed or %HDV content: <ul style="list-style-type: none"> <li>• Change in 24-hour AADT of 1000 vehicles or more</li> <li>• Change in 24-hour AADT of HDV of 200 HDV vehicles or more</li> <li>• Change in daily average speed of 10kph or more</li> <li>• Change in peak hour speed of 20kph or more</li> <li>• Change in road alignment of 5m or more</li> </ul>	No	The changes in traffic flow do not warrant an assessment for Air Quality.

**Table 12-5: Air quality and noise: economic appraisal**

## 12.7 Costs

- 12.7.1 The preparation of scheme costs for the A585 Windy Harbour to Skippool Improvement scheme has been carried out following the principles set out in TAG Unit A1.2 'Scheme Costs'. The costs have been estimated under two broad headings – Investment costs and Operational and Maintenance costs.
- 12.7.2 The expenditure profiles are based upon cost estimates for each financial year prepared in Q1 2016 prices and then inflated to outturn costs using Highways England projected construction related inflation. These costs have then been rebased to 2010 calendar year profiles for economic calculations, using the GDP-deflator series as published in the WebTAG Databook. These prices are then discounted to 2010.
- 12.7.3 The total cost estimated for the two A585 Windy Harbour to Skippool Improvement scheme options are summarised in Table 12-6. These costs exclude all VAT (both recoverable and non-recoverable) and historic costs.

Cost Category	Option 1B Southern Bypass	Option 2 No Bypass
Preparation	£6,715,274	£5,513,438
Supervision	£1,258,735	£1,261,215
Land	£73,765,582	£25,399,374
Construction	£14,605,382	£3,834,793
<b>Total</b>	<b>£96,344,973</b>	<b>£36,008,820</b>

**Table 12-6: Scheme Costs (Discounted) - (in £, 2010 prices)**

- 12.7.4 The assessment of the maintenance cost of the options has been prepared based on the current industry rates.

## 12.8 Overall economic performance of options



- 12.8.1 Combining the scheme costs and user benefits/dis-benefits, provides an overall economic appraisal of the A585 Windy Harbour to Skippool Improvement scheme. The Benefit-Cost Ratios (BCRs) for the two scheme options of A585 Windy Harbour to Skippool Improvement for all the growth scenarios are presented in Table 12-7.

Metric	Core Growth		Low Growth	Optimistic Growth
	Option 1B	Option 2	Option 1B	Option 1B
Present Value of Benefits (PVB)	£136.29m	£60.38m	£119.55m	£129.87m
Present Value of Costs (PVC)	£101.99m	£36.01m	£101.99m	£101.99m
Net Present Value (NPV)	£34.29m	£24.37m	£17.56m	£27.87m
<b>Benefit-Cost Ratio (BCR)</b>	<b>1.34</b>	<b>1.68</b>	<b>1.17</b>	<b>1.27</b>

**Table 12-7: Summary of economic assessment weekday benefits only**

- 12.8.2 It is observed that the Option 1B Southern Bypass has the highest NPV of £29.14m, but the Option 2 No Bypass has the highest BCR of 1.50.
- 12.8.3 Table 12-8 summarises the BCR of two scheme options and all growth scenarios including the additional weekend time period benefits.

Metric	Core Growth		Low Growth	Optimistic Growth
	Option 1B	Option 2	Option 1B	Option 1B
Present Value of Benefits (PVB)	£153.33m	£69.03m	£134.88m	£147.52m
Present Value of Costs (PVC)	£101.99m	£36.01m	£101.99m	£101.99m
Net Present Value (NPV)	£51.34m	£33.02m	£32.89m	£45.52m
<b>Benefit-Cost Ratio (BCR)</b>	<b>1.50</b>	<b>1.92</b>	<b>1.32</b>	<b>1.45</b>

**Table 12-8: Summary of economic assessment including additional weekend benefits**

- 12.8.4 The corresponding BCR, considering additional weekend time period benefits for the core growth scenario is seen to be 1.5 and 1.7 for Option 1B Southern Bypass and Option 2 No Bypass respectively.

## 13 SUMMARY OF ENVIRONMENTAL ASSESSMENT

### 13.1 Introduction

- 13.1.1 The paragraphs that follow summarise the potential impacts / effects for each environmental topics presented in the Stage 2 update of the Environmental Assessment Report, within the WebTAG worksheets and Appraisal Summary Tables for the Southern Bypass (Option 1A) and the on-line Option (Option 2). Within the Southern Bypass there is a sub-option (Option 1B) that is a variant of Option 1A which involves the removal of the connection to existing Garstang New Road at Grange Junction.
- 13.1.2 Potential impacts arising from Option 1B were not assessed separately as it was not considered this variant would materially affect the assessment / appraisal findings at this stage – therefore Options 1A and 1B are referred to as Option 1 in the paragraphs that follow.

### 13.2 Limitations of assessments

- 13.2.1 The following is a list of limitations relates to the current status of the environmental assessments and all the following would be enhanced as part of the PCF Stage 3 works:
- i) No construction information such as compounds, storage and duration have yet been considered.
  - ii) The appraisal is based on initial vertical and horizontal alignments for each of the Scheme options
  - iii) No detailed lighting or drainage design has yet been developed for each of the Scheme options.
  - iv) Whilst mitigation measures have been considered, they have not yet been appraised and agreed by Highways England and are not represented on the current proposals for each option.
  - v) The Local Planning Authority and other relevant stakeholders have not been consulted in relation to the selection of the representative landscape viewpoints.
  - vi) The assessment of heritage assets and archaeological remains has been obtained from third party sources and relies on the accuracy of that data. No field surveys have been carried out at this stage.

### 13.3 Noise

- 13.3.1 The results of noise modelling undertaken for Options 1 and 2 show there are more properties affected by perceptible increases in the short-term and long-term (opening year and design year) than perceptible decreases. For Option 1 increases are predominantly located to the south of the existing A585 and properties that back onto the proposed Southern Bypass along Mains Lane / Barnfield Manor (Lodge Lane). Perceptible reductions associated with Option 1 are predicted to be most prevalent along the existing route of the A585. For Option 2 perceptible road traffic noise increases would occur along Mains Lane within the village of Little Singleton and at residential dwellings along Breck Road in Skippool. Option 2 would not result in any perceptible noise decreases. Table 13-1 below provides a summary.

Option	Year	Residential Dwelling	NIAs	SPA
Option 1	Opening Year	Perceptible increase at 253 dwellings and perceptible decrease at 172 dwellings.	Seven of the eight NIAs predicted to experience a perceptible decrease greater than 1dB within the study area.	Reductions at the majority of the western part of the SPA within the study area. Increases in a small eastern section of the SPA in the study area.
	Design Year	Perceptible increases at 192 dwellings and perceptible decrease at 48 dwellings.	Five of the eight NIAs predicted to experience a perceptible decrease	Reductions at the majority of the western part of the SPA within the study area. Increase in the eastern

Option	Year	Residential Dwelling	NIAs	SPA
			greater than 3dB within the study area.	section of the SPA in the study area.
Option 2	Opening Year	Perceptible increases at 66 dwellings and perceptible decrease at no dwellings.	One of the eight NIAs is predicted to experience a decrease in road traffic noise of greater than 1dB within the study area.	Increases in noise level across the SPA within the study area.
	Design Year	Perceptible increases at 38 dwellings and perceptible decrease at no dwellings.	No NIAs are predicted to experience a decrease in road traffic noise of greater than 3dB within the study area.	Increases in noise level across the SPA within the study area.

**Table 13-1: Summary of Noise Modelling**

13.3.2 Although the model outputs at this stage are relatively coarse, the results indicate that the majority of the road traffic noise increases greater than or equal to moderate would exceed a lowest observed adverse effect level (LOAEL) (in the long and short-terms) but may remain below a Significant observed adverse effect level (SOAEL). At this stage, it is not possible to determine if this is significant until a more detailed noise model is available and a mitigation strategy for the preferred option has been developed.

## 13.4 Air Quality

13.4.1 The results of the Design Manual for Roads and Bridges (DMRB) screening model assessment for Option 1 predicted nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>) concentrations for the 35 worst-case receptors are well below the Air Quality Strategy objective (40 µg/m<sup>3</sup>) both with and without the Project in the opening year (short term). The highest modelled concentrations were 28.9 µg/m<sup>3</sup> for the do minimum scenario and 27.6 µg/m<sup>3</sup> for the do something scenario. Therefore, no significant effects are predicted including within the AQMA (Chapel Street, Poulton-le-Fylde) and there is a low risk of non-compliance with the EU limit values.

13.4.2 For Option 2 the DMRB screening model assessment also predicted NO<sub>2</sub> and PM<sub>10</sub> concentrations for the 35 worst-case receptors well below the Air Quality Strategy objective (40 µg/m<sup>3</sup>). The highest modelled concentrations were 28.9 µg/m<sup>3</sup> for the do minimum scenario and 27.8 µg/m<sup>3</sup> for the do something scenario. Therefore as per Option 1 no significant effects are predicted including within the AQMA (Chapel Street, Poulton-le-Fylde) and there is a low risk of non-compliance with the EU limit values.

## 13.5 Landscape and townscape

13.5.1 The assessment concluded that the Option 1 (Southern Bypass) would result in adverse effects on two scheme level landscape character areas; Singleton Hall and Parkland and Main Dyke Farmland. For Option 2 (the on-line improvement) the assessment concluded that this would result in minor adverse effects to one scheme level landscape character area; Skippool.

13.5.2 It was also determined that the Option 1 would result in beneficial effects on three of the townscape character areas (Skippool, A585 Mains Lane and Little Singleton) as a result of the proposed mitigation measures, including tree planting and reducing traffic flows on Mains Lane. For Option 2 the assessment determined small beneficial effects on two of the townscape character areas (Skippool and A585 Mains Lane), again as a result of the mitigation measures proposed such as tree planting and reduced traffic flows on certain roads.

- 13.5.3 In addition to the scheme-level landscape character areas and townscape areas an assessment was undertaken from eight representative viewpoints. The assessment concluded that Option 1 would result in negative effects on six views:
- B5260 Lodge Lane: View looking west to Main Dyke and Poulton Industrial Estate;
  - B5260 Lodge Lane: View looking east;
  - A585 Mains Lane: Looking west and north towards Skippool Bridge;
  - Garstang Road East: Looking east from the public right of way (PRoW);
  - Little Poulton Lane: Looking north and east from a PRoW and residential properties; and
  - The Wyre Way: PRoW looking south towards Skippool Bridge.
- 13.5.4 The assessment for Option 2 concluded that there would be minor negative effects on three views:
- B5260 Lodge Lane: View looking east;
  - Garstang Road East: Looking east from PRoW; and
  - Little Poulton Lane: Looking north and east from PRoW and residential properties.
- 13.5.5 Mitigation measures such as planting new trees, a new woodland block and hedgerows would help to lessen the predicted negative impacts on Options 1 and 2 and would be explored further at PCF Stage 3.

## 13.6 Historic environment

- 13.6.1 The assessment determined that there would be no direct physical impacts to designated heritage assets with respect either Options 1 or 2. However, potential impacts to the settings of one designated asset, a Grade II listed building was identified with respect to Option 1 (Icehouse at Singleton Hall). Although the Icehouse is located within woodland that would not be directly affected by Option 1, it is considered that any adverse impacts could be reduced through tree planting.
- 13.6.2 Potential direct physical neutral – moderate adverse effects were identified for Options 1 and 2 related to archaeological remains associated with the non-designated Ribchester to Poulton-le-Fylde Roman Road (to the north-west of Skippool Roundabout) and Singleton Park and currently unknown archaeological remains.
- 13.6.3 For Option 2, a potential negative impact to the setting of Singleton Park was also identified, however impacts could be minimised through mitigation measures including tree planting.
- 13.6.4 Possible direct physical impacts to currently unknown archaeological remains for both Scheme options were also identified.
- 13.6.5 Minor negative impacts to the historic landscape character within the 1km study area were identified for both Scheme options.
- 13.6.6 At PCF Stage 3 a strategy for mitigation would be drafted based on the outcomes of the assessment of the preferred option to minimise adverse effects.

## 13.7 Biodiversity

- 13.7.1 The Habitat Regulations Assessment Screening Report that has been drafted for Option 1 based on the bird surveys undertaken to date concludes that there are no 'Likely Significant Effects' on the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. However, there are uncertainties attached to this conclusion as it is based upon a single year of wintering bird surveys and it has not been discussed with Natural England. Following discussions with Natural England and upon completion of a second season of wintering bird surveys this conclusion would need to be revisited.
- 13.7.2 Worst case, following discussions with Natural England and a second year of wintering bird surveys, on a precautionary basis the Option 1 may result in large or very large significant effects on the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. Due to the offline elements of the option being located on potentially functionally linked land associated with these designations – i.e. land used by the qualifying wintering / passage birds but not part of the designation.

- 13.7.3 Moderate - large adverse effects were also predicted on the coastal and floodplain grazing marsh habitat as Option 1 would require the loss of S41 Habitats <sup>7</sup> (passes through approximately 1.9km of this habitat). The loss of coastal and floodplain grazing marsh is being investigated relating to its use by wintering wildfowl (i.e. functionally linked land, as above). However, embedded mitigation would help to avoid unnecessary removal / damage of this habitat. In addition, pollution events during construction (i.e. from chemicals, particulates noise and light) would also be avoided through the use of a Construction Environmental Management Plan (CEMP) and by the use of improved measures related to the new highway.
- 13.7.4 It is considered that Option 2 would have fewer negative effects on the higher value receptors than Option 1. However, the same uncertainty to functionally linked land would also apply to Option 2.
- 13.7.5 Further survey work (including a second year of wintering bird surveys) is required during PCF Stage 3 to fully determine direct and indirect impacts associated with protected species and habitats so that a suitable mitigation and compensation can be designed.

## 13.8 Water environment

- 13.8.1 The water environment assessment considered the potential impacts of the Options 1 and 2 on the water environment, the setting of which comprises the lower catchment of the River Wyre, its tributaries the Main Dyke and Horsebridge Dyke (being designated main rivers) and a number of local drains / ditches.
- 13.8.2 The construction phases of both Options 1 and 2 were considered to have the potential to generate contaminated surface water run-off from works sites and excavations providing a pathway for pollutants to reach watercourses and groundwater bodies affecting water quality. However, following the implementation of best practice pollution prevention techniques and working methods, that would be detailed in a CEMP effects could be reduced to neutral / slight adverse.
- 13.8.3 Both Options (but Option 1 to a much greater degree) would result in an increase in impermeable land cover and so could lead to increased surface water run-off rates and volumes. This could then pose flood risk to third parties linked to increased water levels and flows in receiving ditches, which may also be at increased risk of blockage / reduced conveyance capacity due to sedimentation. However sustainable drainage design would reduce such affects and may provide betterment in terms of treating discharges of highway runoff (Refer to Section 8.8).
- 13.8.4 Option 1 also involves construction within the floodplain (defended tidal floodplain and the river floodplain of the Main Dyke). However, the Flood Risk Assessment prepared for Option 1 in consultation with the Environment Agency during PCF Stage 2, predicts that the scheme does not increase flood risk to surrounding areas inclusive of tide locked conditions. The FRA concludes that flood extents and depths would be reduced.
- 13.8.5 Flood risk as a result of Option 2 was anticipated to be neutral.
- 13.8.6 Effects on groundwater flow patterns as a result of Options 1 and 2 following mitigation are anticipated to be slight adverse / neutral but this is subject to the outcome of a ground investigation due to be carried out during Stage 3.
- 13.8.7 At PCF Stage 3 the FRA would be further progressed and mitigation measures would be developed with the design team to minimise adverse effects.

## 13.9 Mitigation measures

- 13.9.1 During PCF Stage 2 detailed mitigation measures were not developed for either option. Only standard mitigation typically adopted for road schemes during construction and operation was assumed within the environmental assessments. Examples of mitigation assumed included:
- Adhering to a Construction Environmental Management Plan (CEMP)
  - Adhering to the Environment Agency's Pollution Prevention Guidance (PPG) [although withdrawn they still represent good practice]
  - Minimising land take / habitat loss
  - Retaining as many trees as possible

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<sup>7</sup> Section 41 of the Natural Environment and Rural Communities Act (2006)



- Where species licences are required it was assumed that there would be no issues with gaining licence' from Natural England
- If any water abstraction is required as part of the construction process, it was assumed the EA would be contacted and the appropriate licenses would be obtained. Any abstraction practices would be in accordance with the guidelines and requirements of these licences
- Appropriate diversion measures necessary to close / divert public rights of way (PRoW) and in relation to any road closures that may be necessary would be sought from the relevant authority with no issue

13.9.2 Detailed mitigation measures such as the location of noise barriers, earthwork bunds, planting strategies and mitigation for protected species will be developed as part of the Environmental Statement prepared for the preferred option at PCF Stage 3. Mitigation will be developed in consultation with statutory and key stakeholders and discussions with the design team and Highways England regarding feasibility.

## 14 PUBLIC CONSULTATION

### 14.1 Introduction

- 14.1.1 This section summarises the Report on Public Consultation (Report Ref HE548643-ARC-GEN-A585-RP-D-2023 issued in January 2017), that describes the Public Consultation in detail.

### 14.2 Consultation Arrangements

- 14.2.1 A non-statutory public consultation was undertaken for six weeks from Monday 5 September to Monday 17 October 2016. The exhibitions were arranged to provide an opportunity for members of the public to discuss the scheme with members of the project team.

- 14.2.2 As part of the public consultation, public exhibitions were held on:

- Friday 16 September 2016 - 2pm to 8pm at Singleton Village Hall, Station Road, Singleton, FY6 8LL
- Saturday 17 September 2016 - 10am to 4pm Singleton Village Hall, Station Road, Singleton, FY6 8LL
- Wednesday 21 September 2016 - 4pm to 8pm Wyre Civic Centre, Breck Rd, Poulton-le-Fylde, FY6 7PU

- 14.2.3 Attendance at the exhibitions was recorded in the form of visitor's books that recorded:

Date	Number of Visitors
Friday 16 September 2016	128
Saturday 17 September 2016	75
Wednesday 21 September 2016	113
TOTAL	316

- 14.2.4 The purpose of the Non-Statutory Public Consultation was to provide an opportunity for stakeholders such as the general public, the road user and any other interested party to be informed of the proposed location and options being put forward and to then take into account public opinion of the proposed options. Upon review of the public feedback, any valid issues were taken into account. Consideration of whether the design of the scheme would need to be modified to accommodate the issues raised was done. This document summarises the responses to the comments provided.
- 14.2.5 The Non-Statutory Consultation also provided valuable input from the public on any local issues that may or may not have been previously identified in the desktop studies of the area.

### 14.3 Consultation Material

- 14.3.1 A Public Consultation Leaflet was produced to explain the scheme proposals to the public and to provide contact details for the return of questionnaires and requests for further information. A copy of the leaflet is included in Appendix D. The leaflet included details of: the scheme background, the options that have been developed, a brief summary of the results of the environmental and economic assessments, details of the consultation process and the current scheme programme along a link to the scheme webpage at the following address: [www.highways.gov.uk/a585windyharbour-skipool](http://www.highways.gov.uk/a585windyharbour-skipool). The exhibition display panels were based on the information contained in the Public Consultation Leaflet details of the public exhibition and scheme webpage were also included.
- 14.3.2 The Public Consultation Leaflet included a questionnaire to provide a convenient way for members of the public to provide written comments on the scheme options. The questionnaire was designed to collect views on the 3 recommended scheme options. The majority of questions required simple responses (check boxes and ranking scores) to obtain views on a number of specific aspects of the scheme options. Space was also provided to enable the respondents to provide additional comments.
- 14.3.3 The scheme website was intended to provide an alternative source of information on the scheme, and included background information on the scheme, details of the Public Exhibition and an online version of the questionnaire as well as a 3D fly-through presentation (only of Option 1B).

- 14.3.4 The 3-dimensional fly-through and plan that were available to view on the Highways England website only showed the layout of Option 1B. This information indicated possible traffic signal junction layouts at Skippool Junction and Skippool Bridge Junction and a roundabout at Poulton Junction. However, these junction layouts have not been finalised at this stage and may change depending on the outcome of the traffic modelling and operational assessment that may indicate that the layout of these junctions could change.

## 14.4 Exhibition Publicity

- 14.4.1 At the start of the consultation period 2,300 brochures were delivered to the households in closest proximity to the scheme. Landowners who would be affected by land take as a result of the options presented in the consultation but who's postal address was not in close enough proximity to automatically be sent a brochure were also sent one.
- 14.4.2 The flyers were distributed to a further 21,000 homes in key areas surrounding the scheme including Skippool, Little Singleton, Poulton-le-Fylde, Carleton, Thornton and Fleetwood. The distribution areas for the flyers and brochures can be seen in Figure 14-1.

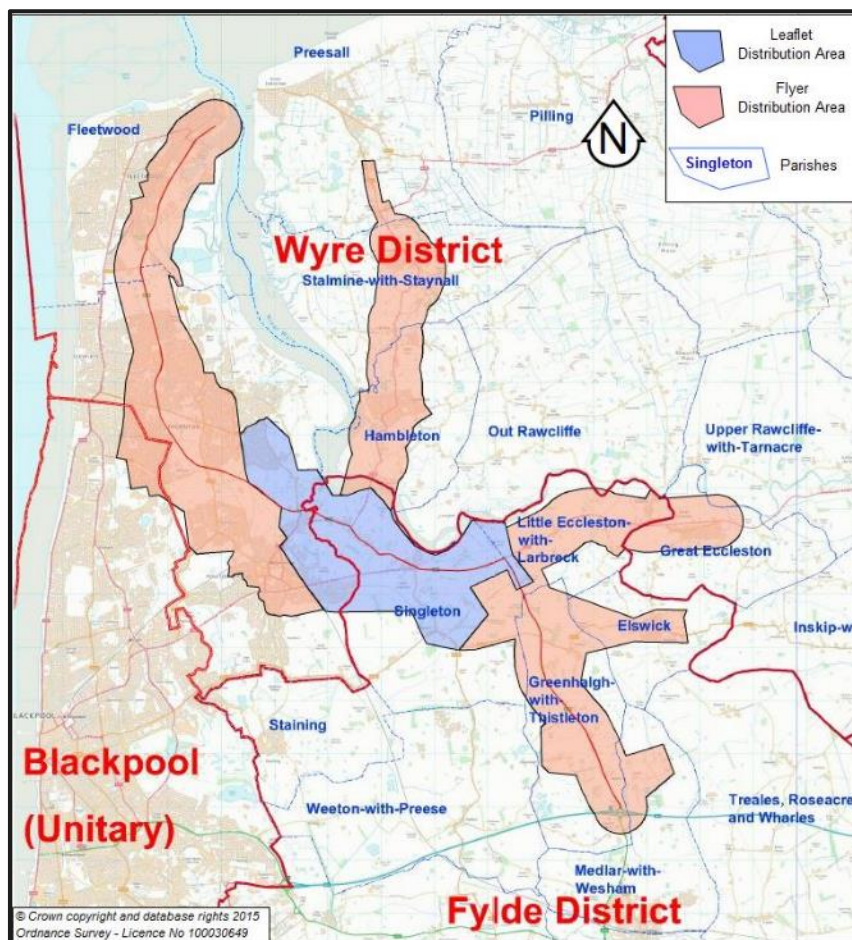


Figure 14-1: Brochure and flyer distribution areas

- 14.4.3 The public exhibitions were advertised, on 14<sup>th</sup> September 2016 in the following local newspapers:
- The Blackpool Gazette;
  - Lancashire Evening News
  - Fleetwood News

## 14.5 Pre-consultation meetings

- 14.5.1 Meetings were held in advance of the formal consultation with:
- Councillors (from Fylde, Wyre and Lancashire County Council)– 6<sup>th</sup> July 2016

- Paul Maynard MP for Blackpool North and Cleveleys - 7 July 2016
- Mark Menzies MP for Fylde – 15 July 2016
- Ben Wallace MP for Wyre and North Preston – 22 July 2016
- Singleton Parish Council – 28<sup>th</sup> July 2016
- Poulton and Carleton Resident's Association – 9<sup>th</sup> August 2016

14.5.2 In addition, a separate meeting was held with the A585 Windy Harbour to Skippool Improvement Scheme Reference Group (that includes representatives of local residents and businesses) on 4<sup>th</sup> October 2016.

## **14.6 Liaison with potentially affected landowners**

14.6.1 All of the landowners (20) who are likely to be directly affected by landtake as a result of Option 1 were contacted on 10<sup>th</sup> August 2016. A letter was sent to the reputed landowners based on information obtained from the Land Registry or as had been obtained from previous contacts. The letter gave details of the scheme, information about the forthcoming consultation and contact details for the Highways England Project Manager and the Public Liaison Officer. Following this, a number of stakeholders contacted the Public Liaison officer to request more information about the scheme or to arrange meetings to discuss the scheme in relation to their property. A number of plans were sent out that showed the proposed layout in relation to individual's land.

14.6.2 As a result of the letters a number of face-to-face meetings were held with some of the directly affected landowners.

## **14.7 Summary of consultation response**

14.7.1 A total of 574 completed questionnaires and 37 written responses from members of the public and local residents were received. In summary the responses to the main questions were:

- 93% of responses agreed or strongly agreed that something needed to be done to improve the route (Q5)
- 78% indicated a preference for the bypass to be provided while 12% preferred the on-line improvement to be provided (Q10)
- 49% indicated a preference for Option 1A, while 29% preferred Option 1B but within that question 17% indicated they did not want a bypass and 5% did not respond (Q11)

14.7.2 Some alternative arrangements were suggested or requested by members of the public that had not been considered during the Options Selection Stage and these are described in Section 15 of this report.

## **14.8 Questionnaire Responses**

### **Postcode Analysis**



**Figure 14-2: Questionnaire responses shown by postcode**

- 14.8.1 The postcode analysis allowed the responses to be split into “zones” but the full result of that analysis is shown at Figure 14-2. The size of the circles indicates the number of responses from a particular postcode unit.

Zone	Total
1-Scheme area	112
2-Poulton	121
3-Thornton Cleveleys	208
4-Fleetwood	43
5-Over Wyre	38
6-South of the scheme	18
7-Blackpool	11
8-East of the scheme	15

**Table 14-1: Total Questionnaire Responses by Zone**

### Response to questions

- 14.8.2 The information from the questionnaires indicated that the ages of the respondents who answered this question were:  
16-24: 1%, 25-34: 32%, 35-44: 10%, 45-54: 14%, 55-64: 24%, over 65: 38% and preferred not to say 5%
- 14.8.3 In comparison the age demographic for the Scheme Area Zone indicates that a higher proportion (49%) of the respondents were in the 65+ grouping



- 14.8.4 Question 1 sought information on why the respondents use the existing A585 route. The most common uses stated were Leisure and Residential which received 418 and 387 responses, respectively.
- 14.8.5 Question 2 sought to investigate which modes of transport were most commonly used by the respondents. Participants were asked to select all the responses which were applicable to them. The most commonly used mode of transport was car, receiving 566 responses. Question 3 went on to ask about the primary mode of transport. Of the 574 responses, 549 indicated that the car was the main mode of transport.
- 14.8.6 Question 4 looked into how frequently the respondents use the Windy Harbour to Skippool route. The results show that the most frequently selected response was:
- Daily = 275, more than once a week = 186, weekly = 55, more than once a month = 34. Only 17 of the respondents use the route monthly or less frequently.
- 14.8.7 Question 5 asked if something needed to be done to improve congestion on the A585 between Windy Harbour and Skippool Junction. 535 responses agreed or strongly agreed with this statement.
- 14.8.8 Question 6 asked if the respondents understood the proposals. . 537 responses agreed or strongly agreed with this statement.
- 14.8.9 Questions 7, 8 & 9 asked if the respondents considered the preferred option (Option 1) will:
- Q7 – Improve journey time – 427 agreed, 52 neither agreed/disagreed and 86 disagreed
  - Q8 – Improve safety – 386 agreed, 96 neither agreed/disagreed and 82 disagreed
  - Q9 – Improve access for pedestrians and cyclists – 320 agreed, 155 neither agreed/disagreed and 88 disagreed
- 14.8.10 Question 10 asked which option they preferred. Overall 444 questionnaire responses (78%) favoured Option 1 (bypass). 68 (12%) favoured Option 2 (improvements to existing A585). 22 (4%) had no preference and 37 (6%) did not answer the question.
- 14.8.11 Poulton and the scheme area returned 83 (69%) and 73 (65%) support for Option 1 respectively. There was more support for Option 2 in these areas though with 25 (20%) at Poulton and 21 (19%) in the scheme area
- 14.8.12 As can be seen from the number of responses in Table 14-2 below the zones closest to the scheme (1-Scheme Area and 2-Poulton) indicated a lower proportion supporting Option 1 (66%) and a higher proportion supporting Option 2 (20%) compared with the overall response.

ZONE	Option 1	Option 2	Neither	No preference	Not Answered	Grand Total
1-Scheme area	73	21		8	10	112
2-Poulton	83	25		8	5	121
3-Thornton Cleveleys	185	9		12	2	208
4-Fleetwood	40	1	1	1		43
5-Over Wyre	30	5		3		38
6-South of the scheme	8	3		5	2	18
7-Blackpool	9	2				11
8-East of the scheme	13				2	15
9-Anonymous	3	2			1	6
Grand Total	444	68	1	37	22	572
	78%	12%	0%	6%	4%	

**Table 14-2: Question 10 Responses by Area**

- 14.8.13 Question 11 sought to gain an understanding of whether the respondents had a preference for either Option 1A or 1B. The participants were asked whether they prefer 1A, 1B or don't want a bypass. The results show that 49% of the responses stated a preference for Option 1A, 29% preferred

Option 1B and 17% responded to say they don't want a bypass.

14.8.14 Question 12 was split into five parts and looked into whether participants agreed with the preferred option proposals at the various locations through the preferred scheme. For each of the sections the majority of people (typically more than 70%) who responded either agreed or strongly agreed with the option proposals. Less than 20% of respondents stated that they disagreed or strongly disagreed with any section of the preferred route.

### **Free-text analysis**

14.8.15 Free text input was available for responses for the following questions:

- Question 10: Which option do you prefer? - Please give a reason for your answer.
- Question 11: Which of the bypass options do you prefer? - Please give a reason for your answer.
- Question 12: I agree with the Preferred Option (Option 1, a bypass) at [various] locations: If you would like to explain the reasons for your answers to any of the answers above, please do so here.
- Question 13: If the preferred option of a bypass is accepted, please say if you have a view on how we could improve the bypassed section of the A585 (the existing road), for example pedestrian crossings or improved cycle facilities
- Question 18: Is there anything else you'd like to tell us?

14.8.16 A lot of comments (146) related to the need for widening or improvement of the A585 routes at either end of the scheme. An improved access to Fleetwood in the north and the M55 to the south was considered essential if it was to avoid merely moving the congestion to another location.

14.8.17 A lot of people also expressed the preference of the original Blue Route (53) or an alternative direct access to the M55 as previously suggested.

14.8.18 Questions were raised whether the scheme would:

- cater for future residential and business developments.
- reduce congestion in Poulton-le-Fylde
- improve cycle and pedestrian provision along the bypass and on the existing road network

14.8.19 Free-text responses to Question 11 were split for and against retaining the connection of the bypass to Garstang New Road depending on their preference for 1A or 1B with counter arguments for both.

14.8.20 Those in favour of 1A indicated:

- 70 indicated that it would provide easier access for Little Singleton / Mains Lane residents
- 40 indicated that this option would improve access from Over Wyre via Shard Road – traffic that would otherwise have to use either Skippool Bridge or Poulton Junctions
- 28 indicated that this option would allow the existing road to be available should the bypass have to be closed for an incident
- Several other comments were made about wasting the existing road if Garstang New Road were closed and also concerns about fly-tipping on the closed road.

14.8.21 In general, Option 2, although viewed upon as a cheaper solution, was felt to be far more disruptive to the area during construction affecting in particular access to local housing. Also increased noise and lower air quality would contribute to the disruption. Many people felt that the gyratory suggested would either be too confusing or would not have the desired effect. In addition Option 2 was perceived by many as not being able to adequately address the growth in traffic particularly in light of the additional housing being proposed for the area. However this option was felt to be less disruptive to the local environment in terms of farmland, flora and fauna.

14.8.22 There was also a view from some who expressed no option preference that either nothing needed to be done apart from improving signals, removing traffic lights and replacing signalised junctions with free-running roundabouts or that both solutions were a waste of money as nothing would improve the current situation.

## Direct correspondence

- 14.8.23 Written consultation responses were received from 37 members of the public during the consultation period. The comments were generally similar to those raised in the questionnaires but in many cases went into more detail. The comments received have been analysed and a summary of the common topics raised within these letters is provided in Table 14-3 below that is presented by the number of comments.

Ref	Subject	Number of Responses
1	Proposals won't solve the traffic problems / traffic problem is elsewhere – particularly between Fleetwood and Skippool and between Windy Harbour Junction and the M55 Junction 3.	17
2	Concerns expressed about environmental issues (including noise, air quality, visual intrusion, ecology/wildlife) and detrimental effect on quality of life. Queries regarding mitigation.	15
3	Creation / move bottlenecks to either end of the scheme/ not solve the problem of bottlenecks	14
4	Scheme needs to be bigger/cover a larger area / this is only part of a larger scheme	9
5	Why is the "Blue Route" to the M55 not being developed? / Why does the route not extend to the M55? / "Blue Route" would solve problems / propose alternative route very similar to "Blue Route"	8
6	Alternative options not considered / not enough info on alternative options	8
7	How can the budget be justified when the problem aren't resolved.	8
8	Formally states objection to Option 1 - Bypass	5
9	Why wasn't I contacted prior to the consultation	5
10	Cost of 'Full Scheme' / more money will need to be spent later to extend current works.	5

**Table 14-3: Main Issues Raised from Public Written Responses**

- 14.8.24 As can be seen from Table 14-3 above [items Ref 1, 3, 4 & 7] the main issues raised in written correspondence relate to the perception that the scheme will not deal with issues between Fleetwood and Skippool and Windy Harbour Junction and the M55 Junction 3.

- 14.8.25 In addition to the questionnaires a number of written responses to the consultation have been received during the consultation period. The main points raised in these responses are outlined below. The official responses from key stakeholders to this letter are summarised in Table 14-4.

**Table 14-4: Summary of Consultation Responses from Key Stakeholders**

Stakeholder	Comments
Lancashire County Council (LCC)	<p>Council has received a number of representations with regard to this consultation which generally fall into two categories: 1. Concerns about environmental impact of scheme, 2. Concerns about the ability of scheme to resolve the existing problems, worsening problems at other points and view that 'Blue Route' scheme should have been progressed instead.</p> <p>LCC continues to protect the line of the 'Blue Route' for development control purposes but it does not believe the route is deliverable in the foreseeable future. Alternative solutions therefore need to be identified.</p> <p>LCC and HE are committed to making improvements to the remaining pinch points on the route. This scheme represents a major step towards this aim.</p> <p>Option 1B represents the best overall solution to the problems experienced on this length of the A585.</p> <p>Continuing support is contingent on Highways England working with LCC to identify solutions that will address the problems experience elsewhere along the route.</p>
Fylde Borough Council	The Fylde Local Plan to 2032 supports the delivery of the A585 Skippool to Windy Harbour improvements.

Stakeholder	Comments
	<p>The Local Plan commits Fylde Council to working closely with HE in the development of schemes to minimise landscape, biodiversity, drainage, severance and noise impacts and to ensure commitment to environmentally sensitive design, mitigation and habitat restoration.</p> <p>The Local Plan safeguards the line of the 'Blue Route'. The section of this scheme between Skippool and Garstang Road coincides with the line of this previously identified route. As such, this part of the proposal has been extensively considered and supported in principal through a series of previous decisions made by this Council.</p> <p>It is essential that a Landscape and Visual Impact Assessment is carried out which should consider the parkland associated with Singleton Hall.</p> <p>Projects offers opportunity to enhance the planting in the area to provide visual and biodiversity improvements which would help off-set the impacts of the proposed works. Mitigation planting measures suggested.</p> <p>Listed structures and the impacts on their setting should be assessed.</p>
Wyre Borough Council	<p>Growth in Wyre is mainly constrained by the capacity on the road network. The proposed improvements are critical to opening up and facilitating economic and housing developments on the peninsula.</p> <p>Emphasise the need for the final scheme to take account of the future growth of the borough.</p> <p>Option 1 would provide dual carriageway access and a greater capacity, consequently the preferred option in Option 1.</p> <p>Option 1 also provides a part of a potential future north-south route along the Fylde Coast.</p> <p>Lack of impact on local residents, businesses, and the current roads weigh in favour of Option 1.</p> <p>Council request that the scheme consider improvements at current A585/A588 junction as this is a major pinch point which also constrains growth Over Wyre.</p> <p>If Option 2 was selected, improvements would need to include Skippool roundabout which is also a pinch point constraining growth. If this would fall outside the remit of option then this adds further weight to the selection of option 1.</p>
Councillor from Lancashire County Council	<p>Believes one of the major aims of the scheme should be to reduce the levels of traffic in the centre of Poulton which could be achieved by locating the Poulton Junction Roundabout to the west of the Main Dyke and as close to Poulton as possible. Refer to section 15.9 for consideration of the alternative.</p> <p>It would be short sighted if HE and LCC did not work together to improve the overall situation with regard to traffic and congestion.</p> <p>Traffic congestion and safety issues are well known in Poulton. Retail and residential development has and will continue to increase and will compound the situation.</p>
Cycling UK	<p>Area has strong culture of cycling for leisure and sports as well as commuting and other utility cycling.</p> <p>Currently heavy traffic on the A585 causes severe severance for local cyclists.</p> <p>Other parts of Highways England are developing a shared pedestrian/cycle path along the North East side of the A585 from Fleetwood to Skippool so it is important that high quality cycle provision should continue beside the road to Windy Harbour junction.</p> <p>Where there is a two way cycle path (or shared path) on one side of the road only, then it is important that it should continue for several miles and that signs should tell cyclists that it continues for X miles otherwise they will be unlikely to cross over to use it.</p> <p>Option 2: This is potentially very dangerous for cyclists due to the type of junctions used on the gyratory</p> <p>Option 1A: this option is preferable. Concern expressed that the plans and flythrough show no cycle or pedestrian facilities along most of the new bypass. This is not a motorway, it is an improved general purpose road and is open to vulnerable road users and there should be facilities available for them.</p> <p>Concern expressed at facilities for cyclists at the various junctions that appear complex.</p>
Freight Transport Association (FTA)	<p>FTA support the improvements and would prefer to see a bypass to the south of the A585 to limit disruption during construction.</p>
Health and Safety	<p>Please note we do not comment on feasibility. We will give general advisory comments at EIA stage and then statutory comments under Section 42 of The Planning Act 2008</p>

Stakeholder	Comments
Executive for NSIPs	(as below). We would not want to prejudice/sway our decision at this early stage. For all NSIPs in England and the few that qualify in Wales: HSE is a statutory consultee, for the purposes of regulation 11 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009. HSE is a statutory consultee under Section 42 of the Planning Act 2008 having been prescribed as such by regulations made under that section for 'All cases'
Canal and River Trust	This application falls outside the notified area for its application scale. We are therefore returning this application to you as there is no requirement for you to consult us in our capacity as a Statutory Consultee. We are happy to comment on particular applications that fall outside the notified areas if you would like the Canal & River Trust's comments in specific cases, but this would be outside the statutory consultation regime and must be made clear to us in any notification letter you send.
Joint Nature Conservation Committee	This development proposal is not located within the offshore area, does not have any potential offshore nature conservation issues and is not concerned with nature conservation at a UK level. JNCC therefore does not have any comments to add to this consultation.

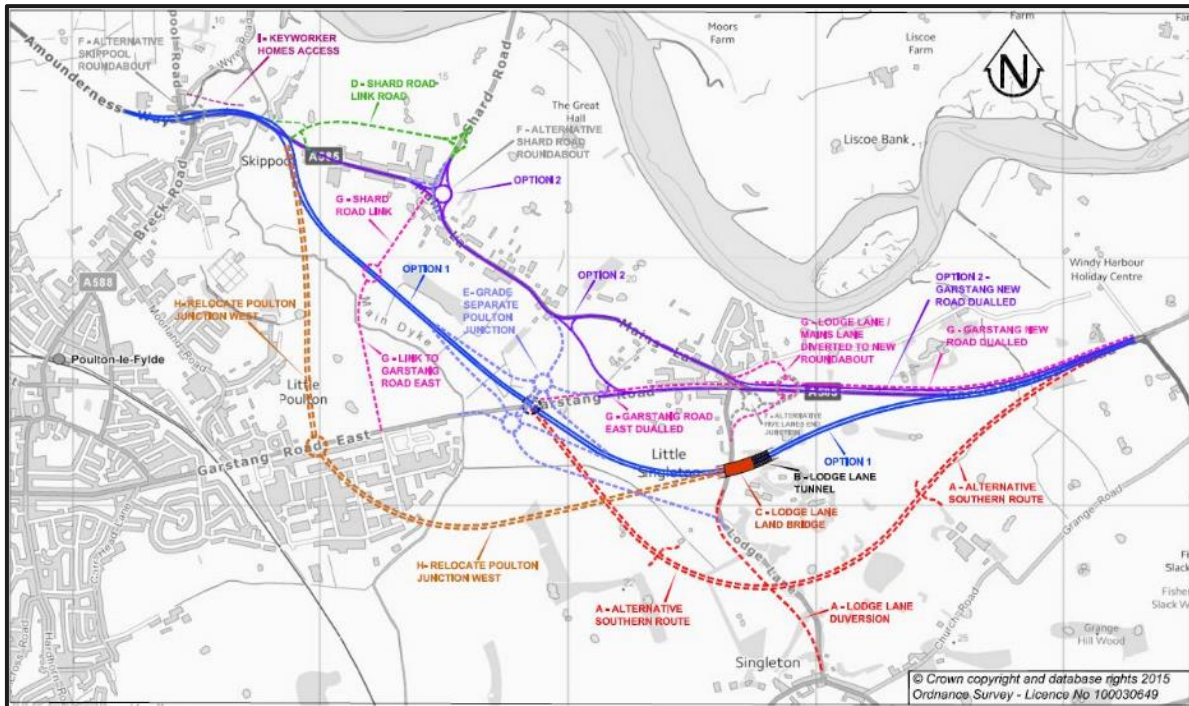
14.8.26 The majority of responses from the key stakeholders indicate support for the scheme and where a route preference has been provided this has been for Option 1. A number of concerns were raised by cycling UK regarding the designs. With suitability for cyclists and pedestrians a key objective, early input into the design from this key stakeholder is of great benefit to the project.



## 15 POST-PUBLIC CONSULTATION OPTIONS

### 15.1 Overview

15.1.1 Various alternative suggestions were proposed by a number of respondents mostly in the form of a concept sketch or written description and these (along with Option 1 and 2) are shown in Figure 15-1 and described below:



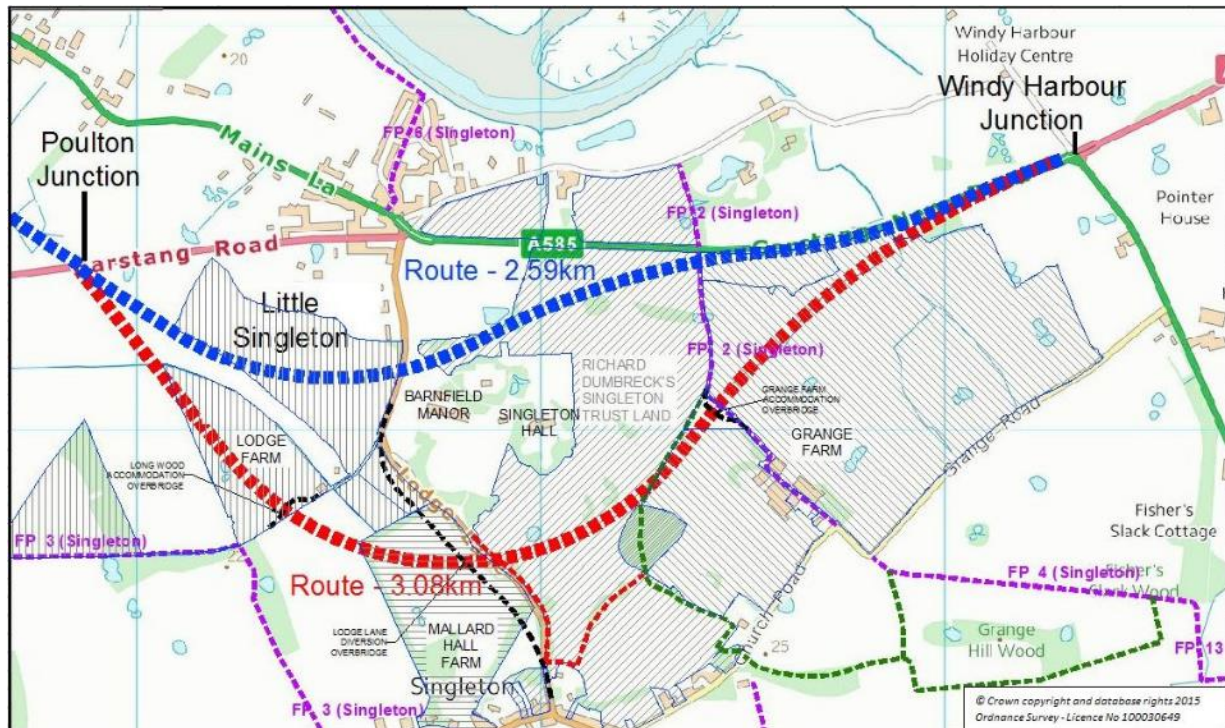
**Figure 15-1: Suggested alternative options**

- A. Alternative Southern Bypass – route passing further south of Little Singleton to avoid properties close the current Option 1 route that is close to properties on Lodge Lane (shown red);
- B. Putting the section of Option 1 passing under Lodge Lane in tunnel extending beyond the woodland to the north of Singleton Hall (Shown solid black);
- C. A shorter version of the tunnel (a land bridge) for Option 1 that would extend about 110m to the east of Lodge Lane that would reduce the severance of the access to Singleton Hall and allow existing pasture land east of Lodge Lane to be reinstated (shown solid red);
- D. Provision of a link road between the Skippool Bridge Junction and Shard Road (shown green);
- E. Grade separation of Poulton Junction with other modifications to various side road connections (shown lilac);
- F. Alternative form of junctions related to Options 2 at Skippool Junction, Shard Road / Mains Lane Junction and at Little Singleton (Five Lane Ends) (shown mauve);
- G. Composite layout with bypass from Skippool Bridge Junction to Poulton Junction but with a link from Shard Road to this bypass. Then use existing Garstang Road East through Little Singleton but making changes at Little Singleton Junction providing a roundabout east of the existing junction (shown pink).
- H. Relocate Poulton Junction west of Main Dyke to allow bypass to relieve traffic in Little Poulton (shown orange).
- I. Alternative access to Keyworker Homes development

### 15.2 Alternative Southern Bypass route (A)

15.2.1 The suggestion to reroute the bypass in the Lodge Lane area was first made at a meeting with stakeholders. The point was raised that Option 1 crosses Lodge Lane in the area that is most

significantly populated and that if the route was move further south fewer people would be affected. Two written consultation responses also raised this point about relocation the bypass in the Lodge Lane area. The proposed route was not detailed or sketched by the stakeholders but has been developed separately on instruction from Highways England and is outlined in Figure 15-2.



**Figure 15-2: Alternative Southern Bypass route (A)**

- 15.2.2 A route passing to the south of the properties on Lodge Lane would be approximately 0.5km longer and would therefore be more expensive to construct and would have lower travel benefits. In addition, it would provide greater severance to the Richard Dumbreck's Singleton Trust Land passing across the middle of Singleton Park as well as severing Grange Farm land more than the proposed southern route would.
- 15.2.3 From Poulton Junction the route would be on shallow embankment to the tributary of Main Dyke, at this point the route would then pass into shallow cutting along the ditch valley. The route would intersect the farm access track for Lodge Farm, requiring a new bridge to be constructed over the bypass. The route would then pass on shallow embankment on a 720m left hand curve and would intersect the existing Lodge Lane. The existing Lodge Lane would be diverted to the west of the existing road to avoid the existing woodland. The route then continues on 720m left hand curve on shallow embankment routed to minimise the impact on Caudle Wood. The alignment would then reverse to a 2040m right hand curve (to allow provision of laybys). The route intersects Grange Farm track, that also serves as the Singleton Public Footpath No. 2. An accommodation overbridge would be required to maintain access to either side of the mainline. The route would then tie into the existing A585 Garstang New Road to the west of Windy Harbour Junction.
- 15.2.4 The alternative route would require two additional structures compared with the existing southern corridor, and the Lodge Lane structure would have a large skew that would result in a more complex structural design. The route would also be about 0.5km longer (adding approximately 18 seconds to the journey times, based on 60mph speed). Changes would be required for the access into Singleton Lodge and long lengths of Statutory Undertaker diversions would be required, that would add costs to the scheme.
- 15.2.5 The largest benefits for the alignment are that the scheme would be running more than 350m from Barnfield Manor and Singleton Hall in the existing valley between Singleton and Little Singleton, significantly reducing the visual impact on the local residents, and there would be less disruption to Lodge Lane due to the diverted alignment.

- 15.2.6 There would be a significant impact of this route on the setting of the Singleton Hall parkland and there would probably be a perception that this route would cause severance between Little Singleton and Singleton Village.

### **15.3 Lodge Lane tunnel (B)**

- 15.3.1 Local residents expressed concern that the proposed bypass (Option 1) running to the south of Little Singleton was very close to neighbouring properties and requested consideration of the provision of a tunnel on the link between Grange Junction and Poulton Junction.
- 15.3.2 A tunnel, classified as any structure longer than 150m (BD78/99 – Design of Road Tunnels), would be feasible, but such a structure would significantly increase the cost of the scheme. The direct costs for a tunnel of a similar size (c. 190m long and c.12m deep), proposed on the A57 Trans-Pennine Programme, was in the order of £26m. This figure would exclude the level of regulation associated with the operation of the tunnel. It is expected that the vertical alignment would need to be lowered by 1.5 – 2m to accommodate the additional equipment and cover, the new levels would be likely to directly conflict with the asbestos cement water main running to the east of the area.
- 15.3.3 We note that there are also hazards due to the east – west nature of the structure that low sun (generally at dawn and dusk) would be a safety concern with strong glare affecting drivers leaving the tunnel portals.
- 15.3.4 The main benefit would be to reduce the impact on the pasture/ land north of Barnfield Manor and Singleton Hall, potentially allow the existing field area to be returned to pasture and minimise the perceived severance between Little Singleton and Singleton.

### **15.4 Lodge Lane land bridge (C)**

- 15.4.1 A possible alternative to the provision of a tunnel is the provision of a land bridge at Lodge Lane, refer to Figure 15-3 below.
- 15.4.2 The advantages of providing the land bridge are Lodge Lane could be constructed on existing alignment and access road to The Manor and Singleton Hall could be reinstated on the existing alignment. The length of the structure would be approximately 110m that falls outside the requirements of the BD 78/99, and could accommodate the reinstatement of the paddock on top of the tunnel (subject to legal agreements). The structural design of the high section of retaining wall would be simplified through using the land bridge deck as a prop. The perceived severance would be reduced between Singleton and Little Singleton.
- 15.4.3 The dis-benefits include increased cost of construction compared to the existing Option 1 proposal, temporary land would be required from the paddock during the construction phases, land would still be required temporarily to the west side of Lodge Lane to allow temporary diversion of the road.



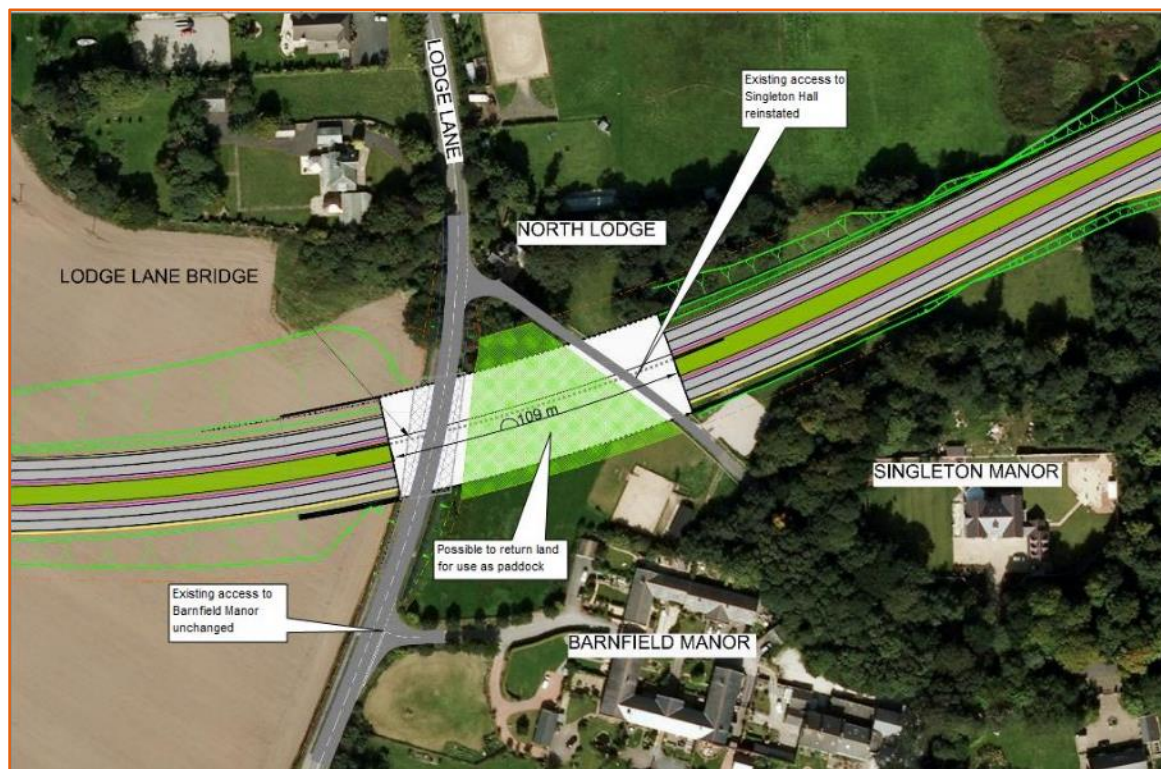


Figure 15-3 - Lodge Lane Land Bridge alternative (C)

## 15.5 Skippool Bridge Junction to Shard Road Link Road (D)

- 15.5.1 Local residents suggested that there should be a link connecting A588 Shard Road to the A585 bypass. Residents along Mains Lane were concerned that, particularly with Option 1B, all flows from Shard Road would be passing along the link between Shard Road and Skippool Bridge Junction, that is likely to worsen the current situation for the residents along this length. Feedback received during the events identified a number of options that could be provided, a majority of which are unlikely to be achievable due to the amount of land required or on cost grounds.
- 15.5.2 The Link Road would form part of Option 1 running between the Skippool Bridge Junction and Shard Road approximately 250m north-east of the existing junction between Shard Road and Mains Lane and immediately adjacent to Shard Bridge Farm.
- 15.5.3 The single carriageway Link Road would run approximately 40m north of the gardens of properties on the north side of Mains Lane and would pass through predominantly agricultural land. See Figure 5-3 below for more details. The greatest complexity with the introduction of this link relates to how Skippool Bridge Junction could operate.
- 15.5.4 The design of the Shard Road Link Road has been connected to the traffic signal layout of Skippool Bridge Junction for Option 1 although a similar arrangement would be provided should Skippool Bridge Junction be a roundabout.
- 15.5.5 The Link Road would climb from Skippool Bridge Junction on the uphill gradient of 1.0% for about 150m where the Link Road would be on embankment up to 2.5m high. Throughout that area, the Link Road would be on a right hand curve travelling eastwards to a high point using a gentle crest curve. At that point the Link Road would be at-grade. From the high point, the Link Road would be straight and would descend with a constant gradient of 0.67% (1 in 150) towards the Shard Road Junction and would be either on shallow embankment or in shallow cutting.
- 15.5.6 The Shard Road Junction has been designed as a three-arm roundabout although other forms of junction could be considered. This junction would be the low point of the Link Road east of the high point and would have to be drained towards the Skippool Bridge Junction.
- 15.5.7 Connections would be provided between Mains Lane and Old Mains Lane and the Link Road to the north-east of Skippool Bridge Junction. These would be single carriageways and would join the Link

Road with a staggered Tee junction layout. However, the arrangement of the Link Road would have to have right turn lanes into Mains Lane and Old Mains Lane to ensure that turning traffic did not block through traffic on the Link Road.

- 15.5.8 Provision would be made for a central island within the tee-junction to allow a two-stage crossing for pedestrians and cyclists.
- 15.5.9 Farm access connections would be provided off Old Mains Lane and the new Shard Road roundabout.

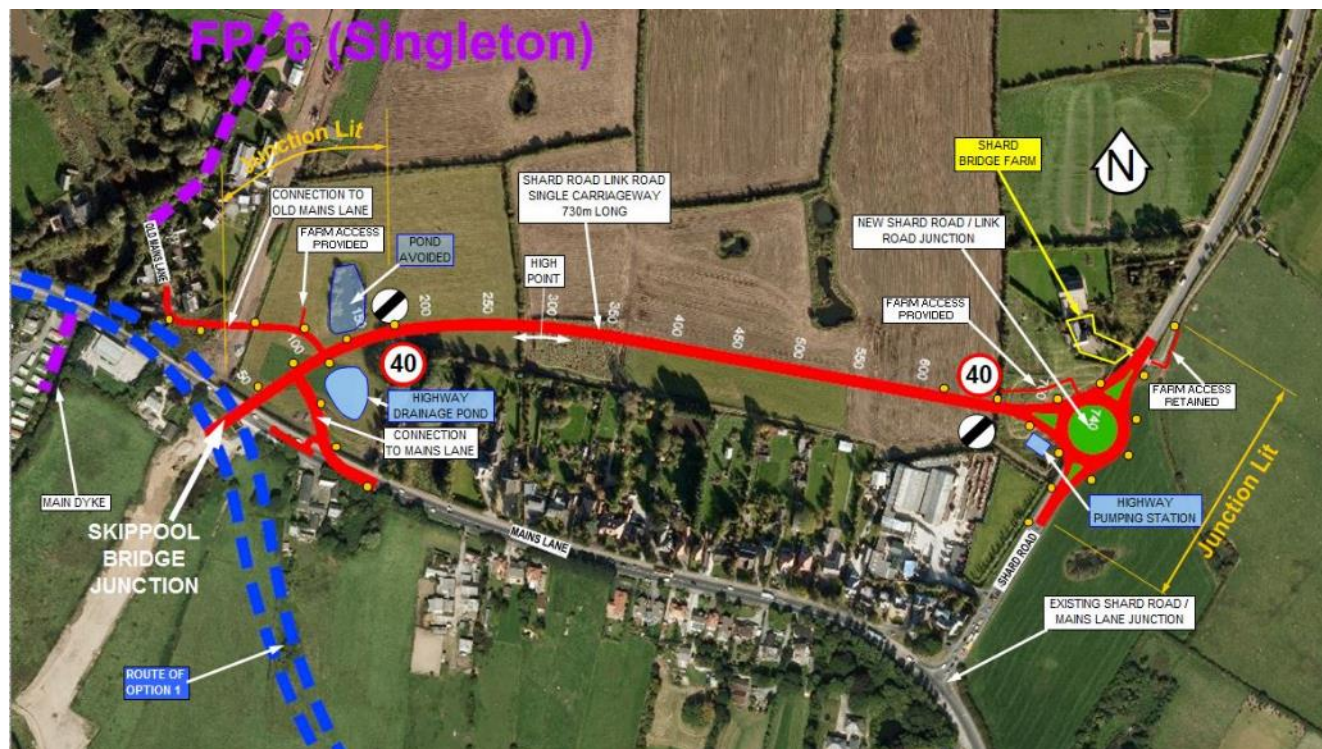


Figure 15-4 – Provision of Shard Road link road (D)

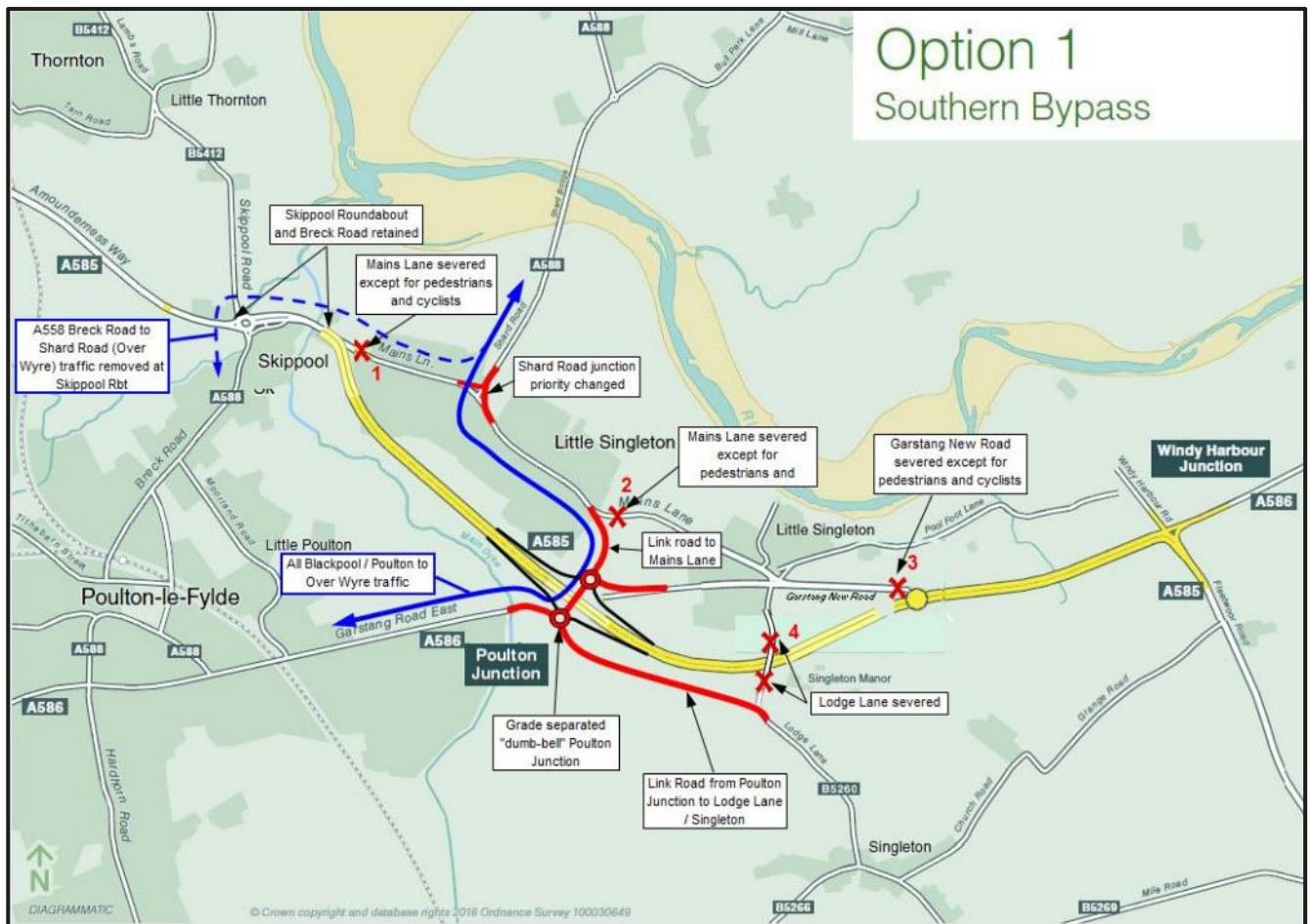
## 15.6 Grade separated junction at Poulton Junction + road closures (E)

- 15.6.1 One suggestion was made to make Poulton Junction a grade separated junction and various road closures that would allow uninterrupted traffic flow along the bypass as shown on Figure 15-5. The stakeholder perceives this would have the following advantages:

- Better journey times along the A585
- Traffic from A588 for Blackpool/Poulton removed from existing Skippool Island. Reducing delays for A585 and B5412/Brook Road.
- Less traffic along Breck and Poulton centre – reducing pollution and congestion
- Most construction in open area adjacent to Garstang Road, less disturbance during construction compared with Skippool Creek that is a very difficult and compact site
- Safer cycle/pedestrian route along existing routes rather than bypass.

- 15.6.2 This suggestion has been considered by the project team. A grade separated junction at Garstang Road East (Poulton Junction) would improve flows on the bypass but this form of junction is more expensive than a roundabout or traffic signal junction. In addition, the layout with a pair of 5 arm dumb-bell roundabouts would have to be large to operate effectively and link over the bypass. As such, these roundabouts on embankments up to 10m high would encroach into the Main Dyke flood plain. Also, the westward link road connecting to Garstang Road East would have to extend beyond the bridge over Main Dyke that would require a replacement bridge over that watercourse. Consequently this suggestion is not considered to be viable.





**Figure 15-5: Grade Separated Poulton Junction alternative (E)**

- 15.6.3 The stakeholder also suggested that Skippool Roundabout and Breck Road/Mains Lane would be kept as existing to the west of Main Dyke but could benefit from closing access to Mains Lane east of where the bypass would start (where we have indicated Skippool Bridge Junction). As a result of that, traffic from Breck Road, Poulton to Over Wyre via Shard Road would have to use Garstang Road East, Poulton Junction, and the new link road to Mains Lane to Shard Road junction.
- 15.6.4 From surveys of the traffic turning movements at Skippool Roundabout it is anticipated that while removing turning traffic would provide some relief to congestion at the roundabout it is believed this would not be sufficient to help the roundabout to cope with future traffic flows along and across the A585 route.
- 15.6.5 The dual carriageway bypass would merge to a single carriageway east of the bridge over Main Dyke to avoid needing to carry out major works at the bridge site.
- 15.6.6 This merge for westbound traffic from two lanes to one could cause safety and operational issues particularly as this would occur on the bend from the bypass route to pass over the Main Dyke bridge.
- 15.6.7 In addition, it was suggested that there would be road closures to vehicles (but not pedestrians and cyclists) at the following locations as shown on Figure 5-4 above:
1. Mains Lane east of Main Dyke – where the bypass would commence;
  2. Mains Lane to the north-west of Little Singleton – where your Poulton Junction to Mains Lane link road would join Mains Lane;
  3. At Garstang New Road east of Little Singleton (as our Option 1B);
  4. Lodge Lane – where it would be crossed by the bypass.
- 15.6.8 These suggestions have been considered. There are concerns that these closures would leave the west end of Mains Lane and Little Singleton very isolated and may cause problems for the

emergency services and bus operators. However, as a result of the proposed closures the residents would probably benefit from removal of through traffic and these routes should be safer for pedestrians and cyclists.

## 15.7 Alternative on-line junction layouts (F)

- 15.7.1 Alternative junction layouts for Skippool Traffic Island, Mains Lane and Shard Road Junction and Singleton Crossroads and Service Station have been proposed by a stakeholder. They suggest that these changes would remove the main bottlenecks between Windy Harbour and Skippool at a much lower cost than Option 1. It has been suggested that this would maintain the present connectivity between local communities and the petrol service station at Little Singleton would become more accessible.

### Skippool Junction

- 15.7.2 Figure 15-6 below shows the plan for the stakeholders' proposal for Skippool Traffic Island. The stakeholder suggests that Skippool Bridge Junction, that is part of Highways England's Option 1, would create long tailbacks extending back to Breck Road, Amounderness Way and Skippool Road. They perceive that as a result of Skippool Bridge Junction the queues that previously formed at Singleton Cross Roads and Shard Road would combine into one large tailback at this junction.
- 15.7.3 The suggested large oval roundabout layout proposed for Skippool junction would not normally be considered acceptable to current design standards, however a larger roundabout would probably have increased capacity over the existing layout.

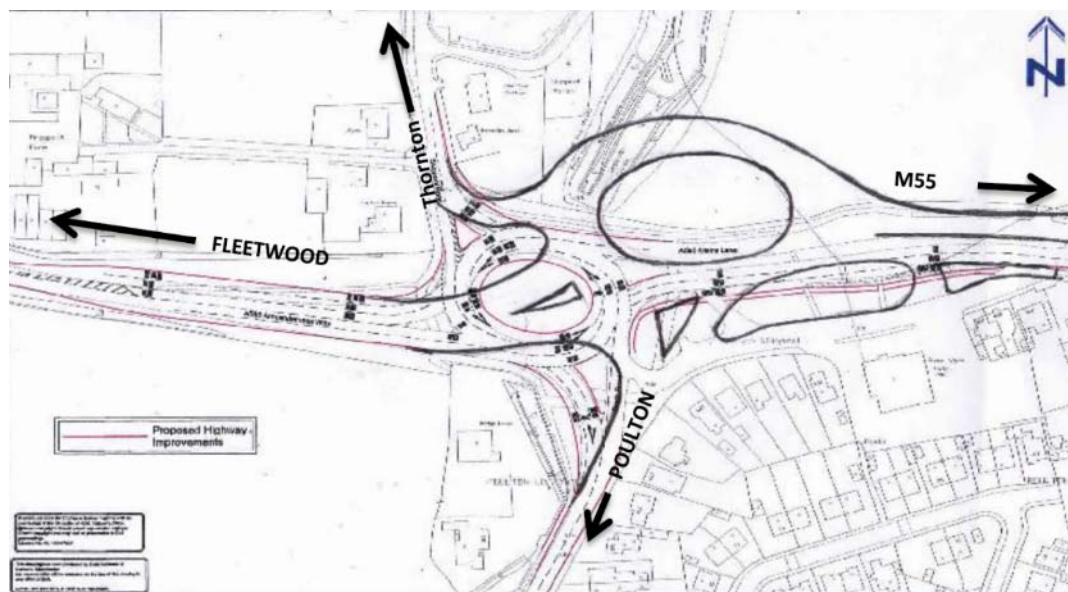
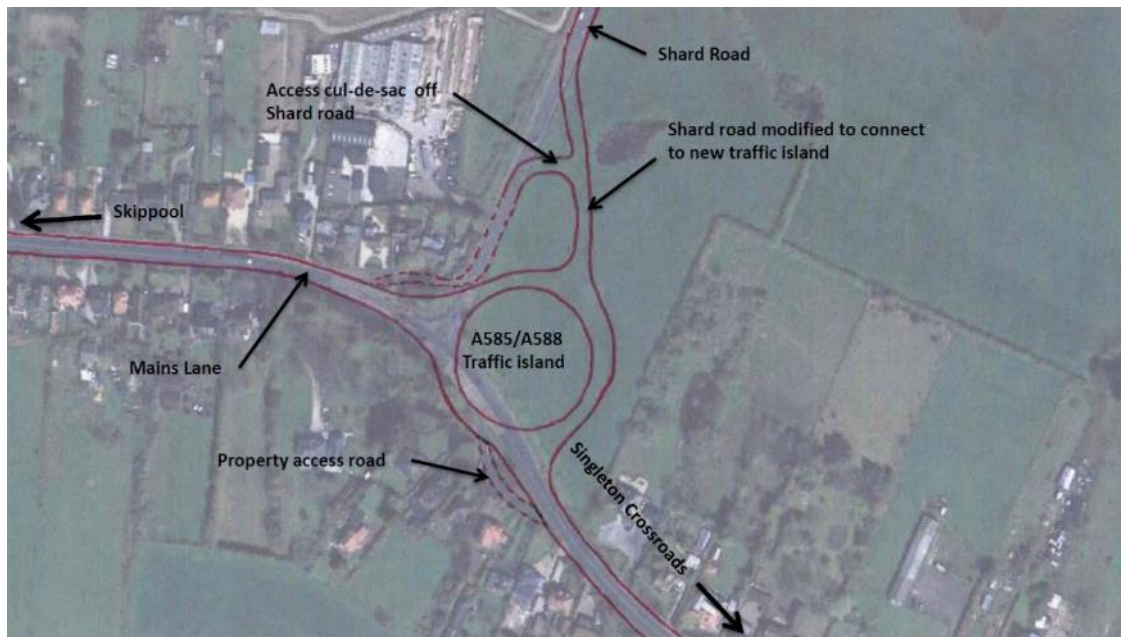


Figure 15-6: Proposed layout for Skippool Traffic Island (F)

### Shard Road Junction

- 15.7.4 The stakeholder perceives that the present junction at Shard Road is one of the main causes of congestion on Mains Lane. They suggest that their proposed layout, shown in Figure 15-7, that consists of a large roundabout, would improve traffic flow in all directions.
- 15.7.5 The suggested roundabout layout for the Shard Road junction with Mains Lane has been considered as part of Option 2 (on-line option). An alternative enlarged traffic signal layout at this location has also been considered. It is likely that either of these layouts would reduce congestion at this junction but would still not address the main issue of traffic using the existing Mains Lane that is not suited to large volumes of through traffic.

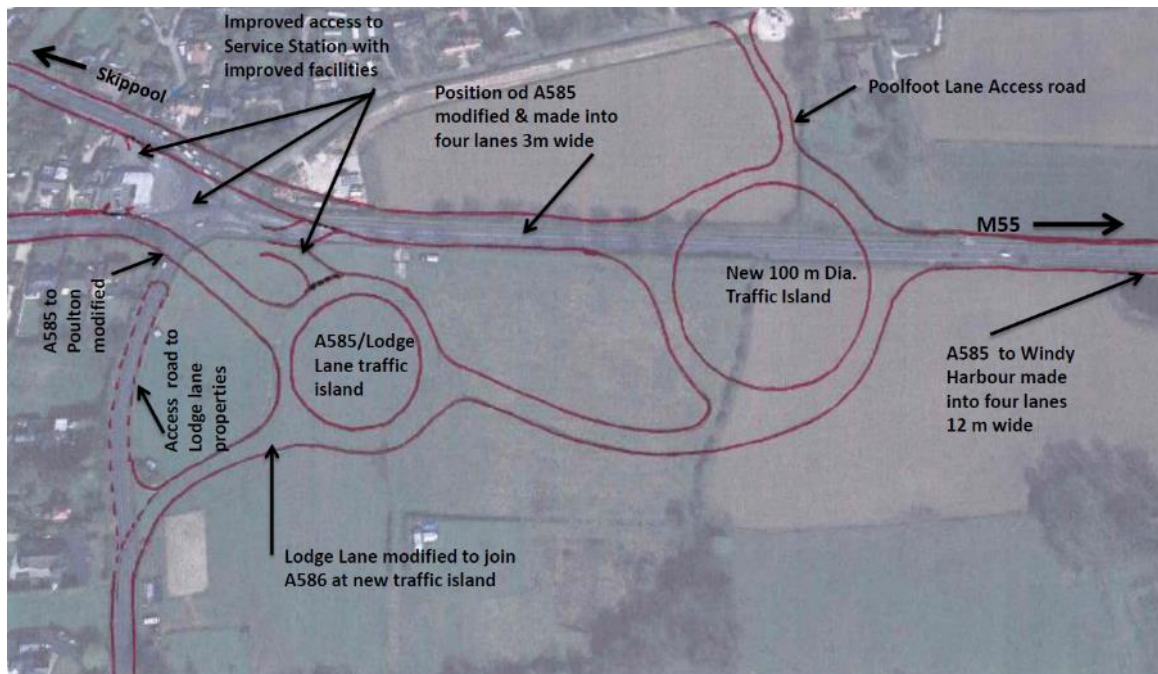




**Figure 15-7: Proposed layout for Mains Lane and Shard Road Junction (F)**

### Singleton Crossroads

- 15.7.6 The layout in Figure 15-8 below is the stakeholders' suggestion for improvements at Singleton Crossroads. They propose that this layout would be less expensive than Highways England's proposed bypass and the money saved should be used to improve the highway north-west of Skippool which at present causes significant delays for the large numbers of people commuting from Fleetwood to Cleveleys.



**Figure 15-8: Proposed layout for Singleton Crossroads and Service Station (F)**

- 15.7.7 All of these suggestions have been reviewed by the project engineers.. The form of the junctions for either the Option 1 bypass or Option 2 on-line proposals have not been finalised and, subject to various constraints a larger roundabout could be tested following this suggestion to see whether it would provide the necessary improvements to capacity and safety.

- 15.7.8 For the proposed Little Singleton Junction, Option 2 (on-line option) proposed an improvement to the Little Singleton traffic signal junction in conjunction with a gyratory system around Little Singleton along with dualling Garstang New Road east towards Windy Harbour Junction. The large roundabout proposed by this stakeholder could be provided as an alternative to the traffic signals and would suit the eastward dualling towards Windy Harbour junction.
- 15.7.9 However, although no traffic modelling and operational assessment has been carried out on this layout it is felt that traffic to/from Poulton and Lodge Lane would probably be disadvantaged compared to the traffic signals and gyratory arrangement proposed for Option 2. In addition, with all the existing traffic remaining on Mains Lane to the north-west, the suggested access and egress to the Shell petrol station would not be acceptable due to safety concerns. However, improved access of Garstang Road East could probably be provided.

## 15.8 Bypass to Mains Lane but retaining Garstang New Road through Little Singleton. (G)

- 15.8.1 A further suggestion for an alternative layout was provided by one of the previous correspondents as shown at Figure 15-9: Alternative Composite Layout.

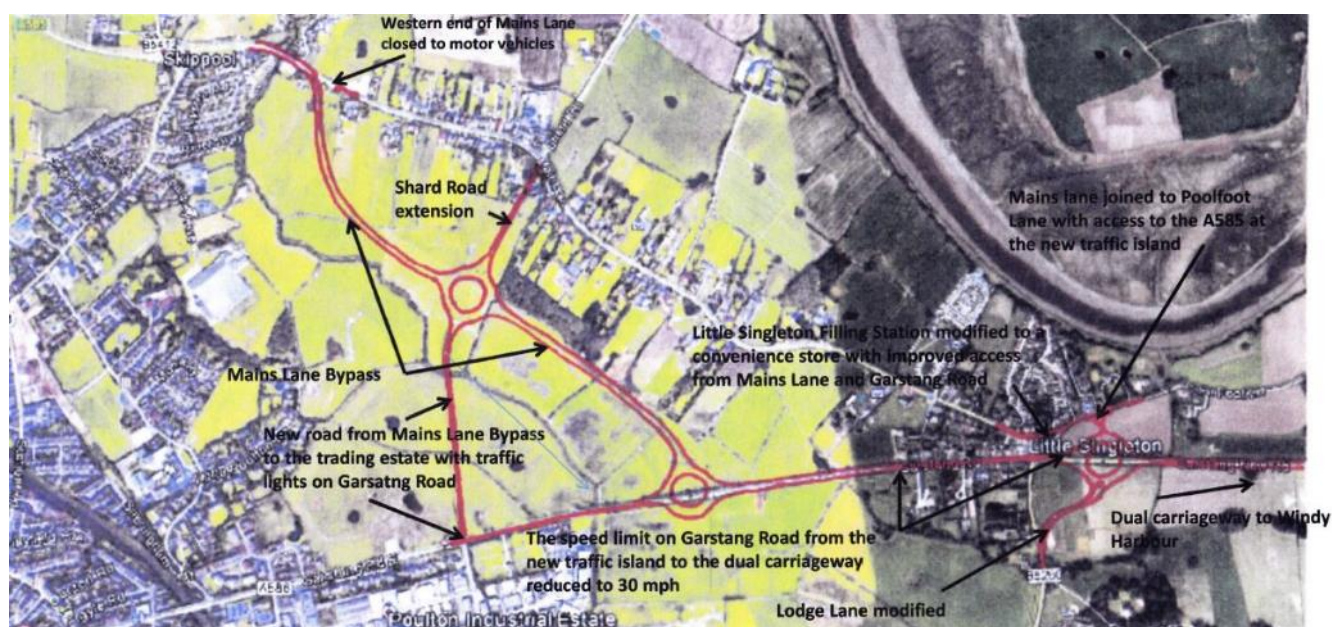


Figure 15-9: Alternative Composite Layout (G)

- 15.8.2 The text accompanying this suggestion states:

*There is a belief amongst Councillors and Officials that unless one of the options prepared by Highways England is accepted, improvements to the A585 will not take place. It follows that the consultation is a time wasting exercise unless all the rational options are given careful consideration.*

*The above plan gets round the disruptive and expensive Lodge Lane underpass in Option 1 and the Shard Road extension provides direct access to the new Mains Lane Bypass and Garstang Road. As a consequence the volume of traffic currently using the centre of Poulton would be significantly reduced. Under this arrangement traffic from Shard Road would not cause the excessive congestion Skippool roundabout that will arise if Option 1 is applied.*

*An alternative route could be made from Shard Road via Mains Lane to the bypass on agricultural land, but it would not have comparable traffic flow benefits. With the western end of Mains Lane closed to motor vehicles, traffic to and from the new roundabout at Little Singleton would be negligible. The plan would make a greater contribution to improving road access to the coast at a lower cost than any of the options under consideration.*

- 15.8.3 A traffic assessment using the Stage 1 Paramics microsimulation traffic model was run on this option using the following:

- Skippool Junction as either existing roundabout, enlarged roundabout (as Figure 15-6) or signals;
- 60mph dual carriageway from Skippool Junction to new Shard Road extension roundabout;
- 60mph dual carriageway to Poulton Junction roundabout;
- Single carriageway links from Shard Road to bypass and from Bypass to Garstang New Road at Poulton industrial Estate with traffic signals at both junctions;
- 30mph dual carriageway on line of Garstang Road East through Little Singleton;
- Removal of Five Lane Ends traffic signals in Little Singleton;
- Roundabout to east of Little Singleton connecting to diverted Lodge Lane and Mains Lane;
- 70mph dual carriageway from Little Singleton roundabout to Windy Harbour Junction.

15.8.4 Various operational scenarios were tested for the AM and PM peak hour journey times on the A585 route between Skippool Junction and Windy Harbour Junction and the performance of traffic on the A585 route was compared with similar scenarios that had previously been run for Option 1A, Option 1B and Option 2. The comparative tests in terms of journey times is shown in Table 15-1 below.

Scenario	AM Journey Time (Secs)			PM Journey Time (Secs)			Combined	Rank
	Windy Harbour to Skippool	Skippool to Windy Harbour	2-Way	Windy Harbour to Skippool	Skippool to Windy Harbour	2-Way	2-Way	
Option 1A	296	284	580	251	235	486	1066	2
Option 1B	281	273	554	245	227	472	1026	1
Option 2	375	275	650	358	272	630	1280	5
Option G Base	487	275	762	264	266	530	1291	6
Option G New Skippool Roundabout	449	267	716	253	257	510	1225	4
Option G Skippool Signals	340	277	617	297	274	571	1187	3

**Table 15-1: Comparison of A585 Journey Times**

15.8.5 As can be seen, Option G with signals provided at Skippool Junction was ranked 3<sup>rd</sup> in terms of journey times behind Option 1A and 1B but had lower journey times than Option 2. It was also noted that the Option G with Skippool Signals did not result in significant queues on the A585 between Skippool and Windy Harbour.

15.8.6 There are a number of issues with the suggested route being:

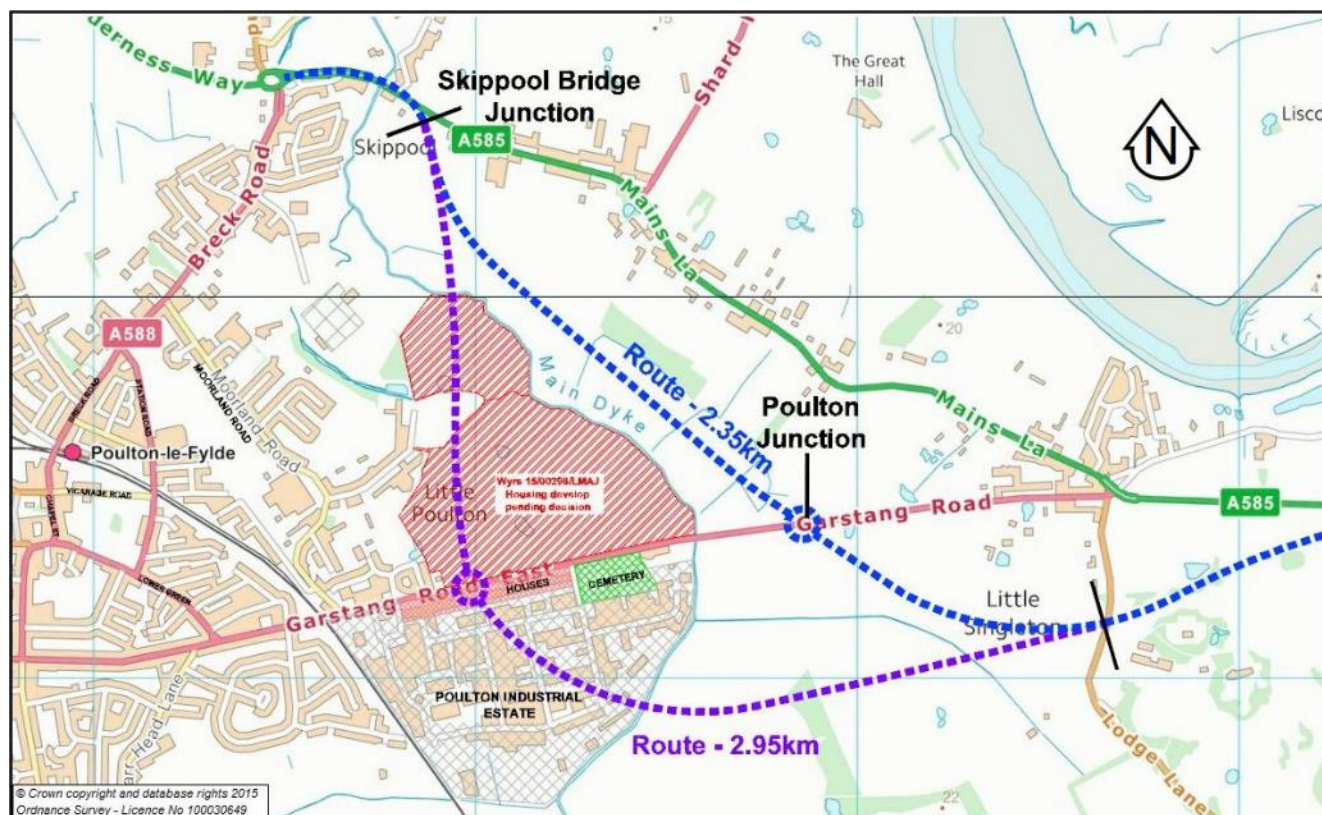
- Does not perform as well as Option 1;
- Proposed 30mph restrictions along Garstang New Road dual carriageway resulting in lower Journey Time benefits;
- Shard Road extension would require 1 or 2 properties and affect area of woodland and ponds;
- Dual carriageway on Garstang Road East requires land from the front gardens of at least 12 properties;
- 28 properties would need direct access onto that dual carriageway;
- Would increase severance through the middle of Little Singleton;
- The link to A586 Garstang Road East would pass through land that is currently the subject of a planning application (Wyre 15-00298) for the development of 525 houses. However, this planning application is still pending a decision.

## 15.9 Relocate Poulton Junction to the west of Main Dyke (H)

15.9.1 A County Councillor requested that the proposed Poulton Junction (part of Option 1) be relocated to the west of Main Dyke to make that junction as close as possible to Poulton town centre as that would relieve heavy traffic flows in the east of the town. We have interpreted to route suggested and this is shown in purple on Figure 15-10.



15.9.2 The route as shown avoids Poulton New Cemetery and, as suggested, the junction position is as close as reasonably possible to Poulton town centre. In this respect it could provide some relief by attracting some traffic from A588 Breck Road, Moorland Road and Station Road in east Poulton. No assessment of this effect has been made at this stage.



**Figure 15-10: Route for Poulton Junction Relocated West of Main Dyke (H)**

15.9.3 There are a number of issues with the suggested route being:

- It would require two additional crossings of Main Dyke and would intersect more of the Main Dyke flood plain;
- It would pass through land that is currently the subject of a planning application (Wyre 15-00298) for the development of 525 houses. However, this planning application is still pending a decision;
- It would require the demolition of a number of houses on the south side of Garstang Road East
- It would have a significant effect on the Poulton Industrial Estate requiring the demolition of at least a dozen industrial units and would disrupt the internal road network of the estate potentially resulting in significant adverse effects to the local economy;
- Without providing a further junction south-east of the industrial estate it would be difficult to allow for the aspirations of Fylde Borough Council to extend the industrial estate southwards;
- The route would be much closer to houses in Little Poulton
- The route would be approximately 0.6km longer than that of Option 1 measured between Skippool Bridge Junction and Lodge Lane. This would typically add about 20 seconds to the journey time that would adversely affect the economic case for the scheme.

## 15.10 Alternative Access to Keyworker Homes Development (I)

15.10.1 Keyworker Homes submitted a planning application (Wyre/14/00902/FUL) for an office development on the north side of Breck Road immediately west of Main Dyke. That application reused the access onto the A585 from the existing United Utilities pumping station. As access onto the trunk road is normally discouraged Highways England asked for a design to be prepared for an alternative access that did not connect to the trunk road.

15.10.2 A single alternative access was considered that connected the proposed development with Wyre Road and then to B5412 Skippool Road as shown in Figure 15-11. This access road would also serve the United Utilities pumping station.



**Figure 15-11: Keyworker Homes Development Alternative Access (I)**

15.10.3 This design would connect to Skippool Road at the existing Wyre Road junction and requires part of Wyre Road to be widened. It would take land from the Thornton Lodge public house car park for the widened Wyre Road (including removal of some trees) and for provision of a 4.5m x 90m visibility splay. It would also take land from Chestnut Cottage (property immediately south of Wyre Road junction) for an improved junction bell mouth layout to accommodate a 6 wheel 12m long rigid vehicle (likely size of tanker going to the pumping station). Land is also required from the frontage along Skippool Road for the left hand visibility splay.

15.10.4 The access road would cross land that is prone to tidal flooding but would be built above the recognised flood level. It would require a bridge (structurally to take full highway loading) to span Horsebridge Dyke (north of Skippool Clough culvert) and would have a clear span of 15m with the underside of the beams at 5.2m AOD to limit the access road level where it ties in to Wyre Road – This would have to be agreed with the Environment Agency. As this section of Horsebridge Dyke is tidal it is unlikely that a simple culvert solution would be acceptable to the Environment Agency.

15.10.5 The access road would be clear of the land-take required for WH-S scheme in that area.

15.10.6 An alternative route for the access road could be closer to Skippool Junction but this would require the purchase of Throstles Nest property and would add a junction between Wyre Road and Skippool Junction that would probably be unsafe. It would almost certainly require Skippool Road to be widened north of Skippool junction and there would be additional costs from utilities diversions along the existing road. It would also be very close to the north end of Skippool Clough Culvert and this may not be acceptable to the Environment Agency.

## 15.11 Summary of alternative options

15.11.1 A sifting workshop was held on 26<sup>th</sup> January 2017 to decide whether any of the stakeholders' alternative options should be developed further. The result of that workshop was that the following should be investigated in more detail before the Preferred Route Announcement:

- Alternative C – Lodge Lane Land Bridge
- Alternative D – Skippool Bridge Junction to Shard Road Link Road
- Alternative I – Keyworker Homes Access

15.11.2 The workshop considered a technical, economic and environmental evaluation of the alternative arrangements proposed by respondents was carried out. A summary of the evaluation of each alternative option is shown in Table 15-2. († The costs shown are over and above the estimated Option 1 baseline costs, and reflect the “most-likely” cost.)

Ref	Description	Value for money score	Cost Change (†)	Final recommendation
A	Alternative Southern Bypass	2	Increase High	<b>REJECTED</b> Does not sufficiently address the Client Scheme Requirements, particularly when compared with Option 1A/ 1B.
B	Lodge Lane Tunnel	1	Increase Very High	<b>REJECTED</b> Does not sufficiently address the Client Scheme Requirements, especially with respect to “Reduce accidents along scheme routes”, “Asset Management/ Collaborative relationships in Highways England” and “Value for Money”. Due to the substantial increase in cost both in capital expenditure as well as ongoing operational expenditure.
C	Lodge Lane Land Bridge	2.5	Increase Very High	<b>CONSIDER FURTHER</b> Will not have an impact on the Preferred Route Announcement as it falls within the boundaries of the red line boundary. This option should be considered further during the development stage to ensure best value for money is being obtained.
D	Skippool Bridge Junction to Shard Road Link Road	3	Increase high	<b>CONSIDER FURTHER</b> Enhances the traffic flows by separating strategic traffic (travelling along the SRN) and local traffic wishing to access Little Singleton/ Singleton etc. The team considers that this should be incorporated into the red line boundary for Preferred Route Announcement.
E	Grade separated junction at Poulton Junction + road closures	3	Increase high	<b>REJECTED</b> Does not sufficiently address the Client Scheme Requirements, especially with respect to “Reduce/minimise the impact on the wider environment, particularly AQ and Noise”, “No net loss of biodiversity” and “Reduce severance and improve access across the A585 between Singleton and Skippool Junctions”.
F	Alternative on-line junction layouts	2	Less than Option 1A	<b>REJECTED</b> Does not sufficiently address the Client Scheme Requirements, especially with respect to “Improve journey time reliability” and “Deliver capacity enhancements to support employment and residential/ commercial development and growth opportunities”
G	Bypass to Mains Lane but retaining Garstang New Road through Little Singleton	2.5	Increase High	<b>REJECTED</b> Does not sufficiently address the Client Scheme Requirements, especially with respect to “Improve journey time reliability”, “Reduce/minimise the impact on the wider environment, particularly AQ and Noise” and “No net loss of biodiversity” as a result of the functionally linked land.
H	Relocate Poulton Junction to the west of Main Dyke	1	Increase Very High	<b>REJECTED</b> Does not sufficiently address the Client Scheme Requirements, especially with respect to “Deliver capacity enhancements to support employment and residential/ commercial development and growth opportunities”, “Reduce/minimise the impact on the wider environment, particularly AQ and Noise” and “Asset Management/ Collaborative relationships in Highways England”
I	Keyworker Home Access	3	Increase Medium	<b>CONSIDER FURTHER</b> The additional cost cannot necessarily be justified without backing from Project Board due to the additional cost. This is something that will need to be agreed to ensure there is a strategic need for the alternative.

**Table 15-2 Prioritised Option Scoring Summary**



## 16 SUMMARY OF TECHNOLOGY ASSESSMENT

### 16.1 Utilisation of Technology

16.1.1 In March 2016 the Expressways Technical Note (HE\_DES\_V1.0\_20160309) was issued by Highways England. It documented the high level core requirements all of which shall be present for a route to be designated an Expressway.

Ref	Requirement
1	A route or scheme can only be designated as an expressway if all of the core requirements are present and the length exceeds 10 miles or the terminal junctions intersect with another expressway, motorway or edge of conurbation/ major transport hub such as an airport.
2	Expressway designation gateway and exit signing. [Consideration being given to introducing a new class of road].
3	Maximise opportunities for environmental, aesthetic and community enhancement of expressway corridors. Requirements and advice to be determined.
4	Non-motorised Users (NMUs) and slow moving vehicles shall be prohibited from using an expressway. Where practicable, alternative provision shall be considered so that NMUs journey experience should at a minimum, be no worse for any group than before the implementation of the scheme. This will need to be assessed on a scheme by scheme basis and considered at a regional level.
5	Highest quality geometry dual 2 or 3 lane all purpose trunk road (APTR) carriageway operating at national speed limit; clearway; grade separated junctions or left only movements; and no central reserve gaps. In addition to these requirements there shall be no direct public access/egress to/from an expressway other than at junctions with 'B' classified roads or greater.
6	Central reserve rigid concrete barrier (RCB) shall be provided.
7	Emergency turnaround provision - emergency crossing points shall be provided in the central reserve and shall be supplemented by hardened verges (where required) to support vehicles with a large turning circle. Where practicable, consideration shall be given to co-locating emergency crossing points with emergency refuge areas (ERAs) to provide the required turning area.
8	VMS for incident/traffic management with wind down or ladder access. Signing/carriageway signalling and customer information with spacing/visibility requirements in accordance with IAN 161 – the requirements for smart motorways. Provision of variable mandatory speed limits (VMSL) for congestion management. Compliance and enforcement measures are to be determined.
9	Standardised ERA design that is consistent with a smart motorway ERA design except the expressway requirements includes double yellow lines and it is combined with a maintenance hardstanding area. ERAs co-located with VMS sites (refer to Annex C) to also facilitate maintenance access – technology devices shall be clustered at an ERA wherever practicable.
10	Provision of an above ground traffic detection system.
11	Pan-tilt-zoom (PTZ) closed circuit television (CCTV) cameras providing comprehensive coverage.
12	Technology assets integrated into Highways England traffic management system (CHARM) controlled from regional control centres (RCC).
13	Traffic Officer 'On road' and Control Centre support – service level is currently being determined to meet the performance objectives.
14	Off network rest/service areas at not more than 28 mile intervals and no more than 30 minutes driving time apart in accordance with TD 69 and DfT Circular 02/2013 "The strategic road network and the delivery of sustainable development.
15	Junction numbering and 'on road' reference (e.g. 500m spaced driver location signs) system.

**Table 16-1 Expressway Core Requirements**

16.1.2 Both Option 1A and 1B have route lengths of approximately 4.5km and neither have terminal junctions that intersect with another expressway, motorway or edge of conurbation / major transport hub such as an airport. This automatically rules the scheme out from being designated an Expressway as per Requirement 1. (see also Arcadis Technical Note HE548643-ARC-GEN-A585-TN-D-2011)

16.1.3 As a result it is not intended to provide the technology that would be associated with an Expressway. Therefore the technology provision would be probably be limited to:

- Traffic counter loops on the approaches to and departures from all new junctions (equivalent to MIDAS loops);
- Traffic signal controllers using either MOVA or a SCOOT type system and associated traffic detector loops;
- Possible provision of pan-tilt-zoom CCTV mast mounted cameras at critical junctions;
- Possible provision of emergency roadside telephones at proposed laybys;
- Lighting connected to a central management system;
- Sensors for the monitoring of water levels and water quality in highway drainage ponds and associate telemetry outstations.

16.1.4 It is not intended to provide:

- Variable message signs (except as required to replace existing message signs on the new route)
- Above ground traffic detection system.



## **17 SUMMARY OF MAINTENANCE ASSESSMENT**

### **17.1 Overview**

- 17.1.1 This section only discusses the maintenance implication of the southern bypass Options (Option 1A & 1B) and the on-line Option (Option 2).
- 17.1.2 The options have been considered by the Maintenance and Repair Strategy Statement (Report No. HE548643-ARC-GEN-A585-RP-D-2026) that has been discussed with the maintenance teams of Highways England and Lancashire County Council.
- 17.1.3 Options 1A and 1B as dual carriageways would provide flexibility for maintenance operations with the ability to close lanes in periods of lower traffic flow.
- 17.1.4 In addition, Option 1A that would provide a connection to the bypass from Garstang New Road would have the extra flexibility to allow traffic to be temporarily diverted onto the local road network through Little Singleton if one of the bypass carriageways had to be closed.
- 17.1.5 Maintenance of on-line Option 2 would be considerably more difficult as the majority of its length would remain as a single carriageway that, for many maintenance operations would require lane closures and traffic signal control.
- 17.1.6 Where signalised junctions, roundabouts and structures are being implemented, ongoing maintenance will be required for duration of the feature's life span. This will result in a slightly increased risk to road workers; the scheme would look to reduce the exposure to road workers. The structures would need ongoing inspections and repairs throughout the life of the structure.

### **17.2 Options 1A and 1B highways elements**

#### **Fencing (including environmental barriers)**

- 17.2.1 Boundary treatment will vary along the route depending on whether the adjacent land is a property or agricultural land. Boundary treatments for neighbouring properties is anticipated to be on a like-for-like basis and would be the responsibility of the neighbouring land-owner. However, this is subject to future negotiations. For the agricultural land it is anticipated that the boundary treatment would be post and rail fencing that would become the responsibility of the adjacent landowner. It is not anticipated that there would be a need for badger or deer fencing (or similar) that would require such fencing to be maintained by Highways England.
- 17.2.2 Access to neighbour agricultural land from the bypass will be avoided wherever possible.
- 17.2.3 Provision of environmental barriers within the scheme has not been confirmed at this stage although there are locations where the proximity of properties mean that their use could be likely. If this is the case and these are placed along the highway boundary then these would be the responsibility of Highways England to maintain. All other environmental barriers within the highway would be the responsibility of Highways England. It is anticipated that such barriers would be timber absorptive type on steel posts.

#### **Road restraint systems – (Vehicle and Pedestrian)**

- 17.2.4 The design for the RRS has been empirical assuming protection is provided to:
- Bridge abutments, parapets and piers
  - Retaining walls
  - Culverts, watercourses and significant ditches and ponds
  - Large advance direction signs
  - Street lighting columns
  - Environmental barriers
- 17.2.5 RRS would be provided within the central reserve of the bypass in the form of double-sided safety fence. However, this would be twin lines of safety fence where it would need to diverge for the central pier of Lodge Lane Bridge and on the approaches to junctions where some larger signs have to be provided in the central reserve.
- 17.2.6 For the section of the scheme including Skippool Junction and Skippool Bridge Junction where it is

proposed a 40mph speed limit would apply no final decision has been made about the provision of RRS and will need to be considered in Stage 3.

### **Pedestrian guard railing at traffic signal junctions**

- 17.2.7 At Windy Harbour Junction the layout of the western approach to the junction would be altered and the current provision of pedestrian guard railing would be altered to suit the final arrangement. This would include alterations to “force” all pedestrians and cyclists to cross to the north side of Garstang New Road as it is not intended for the bypass to be used by pedestrians and cyclists.
- 17.2.8 If traffic signals are provided at Skippool Junction and Skippool Bridge Junction, it is anticipated that pedestrian guard railing would be provided to guide pedestrians to the controlled crossing points and could also be required in the central reserve to reduce the risk of jay-walking especially in the vicinity of the replacement bus lay-bys.

### **Parapets and handrails on structures**

- 17.2.9 N2 type parapets typically 1.4m high would be provided on all new bridges to allow for use by cyclists.
- 17.2.10 Handrails would be provided along the top of all retaining walls and culvert headwalls greater than 1m high. Typically, these may be of tubular steel construction. If any flights of stairs are required to provide access to cabinets or drainage features then handrails would be provided along the full length of the stairs.

### **Drainage**

- 17.2.11 At this stage, there has been no detailed design carried out for the proposed drainage system for this option.
- 17.2.12 The scheme is within flood zones at three locations:
- At and east of Skippool Junction to Main Dyke
  - Either side of Garstang Road East at Poulton Junction
  - Near Pool Foot Creek west of Windy Harbour Junction.
- 17.2.13 The main risk of flooding is from tidal flooding along the River Wyre estuary from any unprotected areas adjacent to Main Dyke, Horsebridge Creek and Pool Foot Creek. The vertical design of the bypass options has attempted to avoid the road surface being flooded throughout although some below-ground assets would be affected in the extreme flood event.
- 17.2.14 In principle, the proposed method of surface water collection would be:
- At junctions – combined kerb/drains with occasional road gulleys connected to carrier pipes
  - Along the bypass – concrete vee-channel with intermediate outfalls to carrier pipes
  - On bridge decks – continuous deck-drain units.
  - On Lodge Lane (side road) – gulleys
- 17.2.15 Where an existing ditch is to be used to drain the highway the length of the ditch from the highway outfall to the main watercourse would need to be included in the CPO as a S250 Right to maintain the ditch.
- 17.2.16 All new outfalls would have to be provided with some or all of the following:
- Storage – either in the form of a pond or oversized pipes with a suitable flow control device (e.g hydrobrake)
  - Spillage containment – some means of preventing a main spillage of a contaminant entering the main watercourse
  - Treatment – where possible treatment facilities would be provided to improve discharged highway water quality
  - Reverse flow control (e.g. flap valves or similar) to prevent a flood event flushing out the containment and treatment facilities
  - Monitoring systems – remote telemetry systems connected to the Highways England maintenance system

- Vehicular access – ideally from the side road network.

17.2.17 It should be noted that the storage and/or containment system for the section of the route between Skippool Junction and Skippool Bridge Junction is likely to have to be a buried tank system with oil interceptor due to the closeness of the outfalls into Horsebridge Creek and Main Dyke. The outfalls into the watercourses would have to be fitted with flap valves (or similar) to prevent tides and other high-water events flushing out the tanks.

17.2.18 The retaining walls on either side of the bypass on the east side of Lodge Lane are in an area of possible perched groundwater so measures would be included to provide back of wall drainage. Similarly, the cutting at Lodge Lane is up to 8.6m deep and could encounter areas of upward ground water flows. It is hoped that an early ground investigation will be carried out to confirm whether this is an issue.

17.2.19 Ditches or cut-off drains may have to be provided at the tops of cuttings and bottoms of embankments once the groundwater regime is fully understood. In addition, measures to prevent artificial groundwater lowering that could affect nearby ponds will have to be considered.

### **Culverts**

17.2.20 A number of new or extended culverts would be required through embankments. These would extend the full width of embankments and would typically be more than 25m long. HA 107/04 (4.7) requires such culverts to be 1.2m diameter to allow access and as such these would then be classified as structures. This may be a problem with the existing culverts passing under Garstang New Road at Pool Foot Creek.

17.2.21 The upstream end of the culverts would have to be provided with “trash screens” inclined at 45° and would be provided with a padlocked man-access panel (HA 107/04 Section 8). Downstream ends of culverts may not be provided with screens as public access is considered unlikely.

### **Highways ducts**

17.2.22 Ducts and drawpit chambers would be provided for the proposed lighting systems at the new or modified junctions and for power and traffic detectors associated with any traffic signal installations. The layout of these ducts, chambers and any cabinets has not been designed at this stage.

17.2.23 Elsewhere, it is not proposed to provide a full longitudinal duct system along the bypass sections although this may be reviewed if it necessary to provide emergency roadside telephones at proposed layby positions.

17.2.24 Empty cross-carriageway ducts would probably be provided on either side of the junctions and possibly at other locations midway along the bypass links.

### **Earthworks**

17.2.25 At this stage of the design, with limited information about the soil characteristics of the (mostly) glacial till the earthworks side-slopes have been assumed to be 1 in 3 for cuttings and embankments. As further information is obtained then the side slope angles may be modified.

17.2.26 There are extensive lengths of shallow embankment particularly across the Main Dyke valley and Pool Foot Creek valley. The underlying ground is potentially soft and settlement during construction is anticipated. It is likely that surcharging of the embankments will be required to limit the overall construction programme. However, this should not result in post construction maintenance issues.

17.2.27 Cut-off ditches or drains may be required at the top of cuttings. It is currently assumed that these would be required and would have to be lined to reduce the risk of ground-water-induced slip failures of the cutting slopes.

17.2.28 Ditches at the toe of embankments would require maintenance access and it has been advised that a flat area between the embankment and ditch should be about 5m wide.

17.2.29 For the locations where embankments may be at risk from flooding these areas would be protected by rip-rap type stoning or similar but these areas would have to be inspected at least annually for possible damage.

### **Road pavements**

17.2.30 The likely pavement construction would be flexible or flexible composite including areas of overlay and at tie-ins to the existing roads. No real issues are expected for the new road construction.

17.2.31 High skid-resistant surfacing would be provided on the approaches to any traffic signal controlled junction and on the approaches to roundabouts / circulatory carriageway as required by HD36/06 Table 3.1.

17.2.32 We have assumed that concrete construction would be required for proposed laybys and bus bays due to the possibility of damage to flexible surfacing by spilled fuels and oils.

### **Kerbs, footways and paved areas**

17.2.33 Combined kerb drains would be provided where required in the vicinity of junctions where kerbs would normally be required adjacent to footways and cycleways.

17.2.34 Shared footway/cycleways would be provided in flexible construction but the surface of the cycleway would be in a red-coloured surfacing. Dropped kerbs would be provided at all crossing points along with tactile paving.

17.2.35 Tactile paving – various forms of tactile paving would be provided to suit controlled or uncontrolled crossing points and interfaces with footways/cycleways and would use precast concrete slabs (400mm x 400mm units) and details will attempt to avoid the areas of tactile paving at manholes and other chambers.

### **Traffic signs**

17.2.36 Large advance direction signs would be provided on the approaches to the proposed junction with additional finger or stacked direction signs at the junctions.

17.2.37 Various warning, advisory and mandatory signs would be required along the bypass and at the junctions. Where required by current regulations lighting for some of the signs would be provided by private ducted cabling from nearby lighting columns.

17.2.38 There would be replacement of signs on the eastbound approach to Windy Harbour Junction as the existing x-height is too small for approach speed.

### **Road lighting**

17.2.39 Street lighting would be provided in the immediate vicinity to junctions as it is unlikely to be able to justify lighting on the bypass links. However, it would be expected that the on-line dualling between Skippool Junction and Skippool Bridge Junction would be lit as this is an urban section of road and the junctions are close together.

17.2.40 The expected provision of lighting would use 12m steel columns mounted in the verges and provided with LED lamps controlled by a central lighting management system. The lighting columns would not be passively safe but would be protected by safety fence where required by TD19/06.

17.2.41 Lighting on the side roads would be altered to suit to the new road layouts and would be provided with lighting to the requirements of Lancashire County Council Highways. It should be noted that sections of the existing trunk road would be de-trunked and would be handed over to Lancashire County Council. At this stage there has been no discussion with LCC about that handover.

### **CCTV masts and cantilever masts**

17.2.42 A decision to provide CCTV coverage at the junction may be taken during design development. If so, these would be categorised as structures and would also need to be provided with suitable maintenance accesses.

17.2.43 Cantilever masts are likely to be required at traffic signal installations with high speed approaches. Again these would be categorised as structures. Traffic signals on these masts would have LED aspects to limit the ongoing maintenance requirements.

### **Electrical work for road lighting and traffic signs**

17.2.44 Any new system of lighting on the trunk road would be powered by a new “private” ducted cabling and feeder pillar arrangement. The provision and location of the feeder pillars will have to be agreed with Electricity North-West but with consideration of maintenance access for the electricity supply company and Highways England maintenance staff to avoid the feeder pillars being located off the new dual carriageway if possible.

### **Technology equipment including traffic signals**

17.2.45 As discussed in Section 16 above there would be limited communications provided on the bypass options. Any communications equipment would be connected to power and communications cabinets and these would have to be provided with suitable accesses and would probably also need a telemetry outstation to connect to the Area 13 control room.

17.2.46 Traffic signal controllers would have to be carefully considered to allow a safe maintenance access to be provided and for them to be positioned to allow a clear view of the traffic signals in operation.

### **Retaining walls**

17.2.47 Retaining walls up to 8m high would be provided to the east of the proposed Lodge Lane bridge. These are assumed to be of contiguous piled construction at this stage. However, precast L shaped units may be used for lower height sections.

17.2.48 There are likely to be other sections of lower height retaining structures (not necessarily walls). The form of these walls has not been determined at this stage.

## **17.3 Option 1A and 1B Bridges (existing and new)**

### **Skippool Clough culvert (SMIS No 19720)**

17.3.1 The existing culvert would be retained but insitu sections that provide access points from the surface may need to be modified. It is likely that the existing manholes providing these access points would be removed as they would be within traffic lanes. Consequently, access to the 87m long culvert would be from either of the existing headwalls. However, it is noted that the northern headwall has a massive flap valve to protect against flooding and access via this headwall should be considered to be hazardous. Entry into the culvert should be considered to be into a "Confined Space".

17.3.2 The existing structure was last inspected in 2012 and, particularly the sections of corrugated steel pipes, should be inspected again to determine whether there has been any significant deterioration.

17.3.3 Existing points of highway drainage discharge into the culvert may be retained but ideally would be re-routed to avoid the need for access into confined spaces.

### **Skippool Bridge (SMIS Nos 13265 & 13266)**

17.3.4 The existing masonry bridge would be demolished as it was considered to be problematic to extend the bridge to suit the proposed dual carriageway layout. See 17.3.5 below for the likely construction phasing.

### **New Skippool Bridge**

17.3.5 For Options 1A & 1B the existing bridge would be demolished but the replacement bridge would be built in stages to keep traffic running. New north half of bridge built north of existing bridge and traffic diverted to allow existing bridge to be demolished and new south half of bridge built on line of existing bridge.

17.3.6 The form of the bridge would be a single span integral design avoiding the need for expansion and movement joints and bridge beam bearings. It is anticipated that the foundations would be contiguous concrete piles supporting a pilecap. The deck would be formed using precast concrete beams spaced at about 2m with an in-situ concrete deck and concrete parapet beam upstands supporting N2 type parapets.

17.3.7 Drainage outfalls would be provided on the downstream (north) side of the new bridge through low training walls on both sides of the Main Dyke watercourse.

17.3.8 It should be noted that there would need to be diversions of utilities apparatus through the new bridge and these would include:

- United Utilities - 600mm diameter water main in north footway
- National Grid (gas) 90mm polyethylene medium pressure gas main
- BT-Openreach – multi-way ducts
- Electricity North-West - Medium voltage (6.6kV) and low voltage underground cable in north footway

### **New Lodge Lane Bridge**



- 17.3.9 The new bridge would be built on-line of existing road with temporary diversion to the west.
- 17.3.10 The form of the bridge would be a two span integral design avoiding the need for expansion and movement joints and bridge beam bearings. It is anticipated that the foundations would be contiguous concrete piles supporting a pilecap with associated wing walls on the west side of the bridge. The deck would be formed using precast concrete beams spaced at about 2m with an in-situ concrete deck and concrete parapet beam upstands supporting N2 type parapets.
- 17.3.11 There would be diversion of minor utilities apparatus through the bridge deck including medium pressure gas, water supply, LV electricity and BT ducts.

### **Grange Footbridge**

- 17.3.12 For Option 1B, a footbridge is proposed halfway between Little Singleton and Windy Harbour Junction at the point where Singleton Footpath No 2 crosses the route. This would be a single span steel through truss integral structure across the bypass with 1 in 20 slope steel ramps on both sides. Painting of this footbridge would be a maintenance issue.

### **Environmental Works**

- 17.3.13 The possible environmental works have not been identified at this stage but would include mitigation measures such as:
- Mounding to provide screening
  - Replacement and new tree planting
  - Measures to protect ecologically sensitive ponds and water courses
- 17.3.14 These would be detailed during Stage 3 and those that would remain the responsibility of Highways England would need vehicular access to be provided.

### **Utilities Apparatus Diversions**

- 17.3.15 Utilities apparatus would mostly need to be diverted away from the proposed carriageways in the vicinity of the junctions with the majority of the works between Skippool Junction and Skippool Bridge Junction including the 600mm diameter asbestos cement water main that runs along Breck Road/Mains Lane. In addition to this there are extensive pipes and supplies associated with the neighbouring properties and the Skippool Pumping Station north of Breck Road.
- 17.3.16 At this stage, none of the diversions have been confirmed. However, some of the larger items may be abandoned rather than removed with some pipes to be grouted up.
- 17.3.17 The majority of other clashes are at the proposed Poulton Junction and west of Windy Harbour Junction along Garstang New Road. However, the existing 600mm diameter asbestos cement water main crosses the route of the bypass about 500m east of Lodge Lane and a diversion of the main may be required at that location but the main would still cross the bypass.

## **17.4 Option 2 maintenance**

- 17.4.1 Option 2 would utilise all of the existing A585 route between Windy Harbour and Skippool as well as about 0.7km of Garstang Road East that is currently the responsibility of the local highway authority.
- 17.4.2 Of the existing A585 route about 1.6km would remain two-way single carriageway from Skippool Junction to the Greenways Junction north-east of Little Singleton. The A585 was not originally constructed to Highways Agency standards but now forms part of the trunk road network meaning the pavements are prone to requiring deep structural repairs that can be complicated by constraints on maintenance activities.
- 17.4.3 It should be noted that no allowance has been made in Option 2 for the operational costs and user delay costs of carrying out maintenance works that would mostly require traffic signal one-way working on Breck Road and Mains Lane between Skippool Junction and Little Singleton.

## **18 BUILDABILITY**

### **18.1 Introduction**

18.1.1 Contractor input was sought to assess Options 1 and 2, in terms of the buildability issues. The items assessed included:

- Health & Safety Issues;
- Forms of Construction;
- Temporary Works considerations;
- Programme constraints including those by 3<sup>rd</sup> parties;
- Traffic Management during the construction phase;
- Implications with existing Statutory Undertakers Apparatus;
- Works to new and existing structures;

### **18.2 Construction assumptions**

18.2.1 The delivery partner raised the following issues as part of their review for Option 1:

- Access through the village of Little Singleton on the A585 for bulk earthworks and deliveries should be avoided if possible. Therefore construct main site access at Windy Harbour junction at the contract start, then working East to West gaining access through the site on permanent works fill or temporary haul roads.
- Because of the rural location bulk deliveries and specialist labour could be an issue.
- Plant crossing required at Poulton Junction / Garstang Road East and Lodge Lane.
- No utility diversion durations known, therefore make a four week allowance for each in the programme.
- Earthworks material assessment – Glacial Till could be difficult to be used as a structural fill for embankments. Generally it has a high sediment contentment which gives it unacceptable liquid and plastic limits and would require stabilisation to make it usable.
- As the route appears to cross tidal flats it is likely the embankment fill will have to be imported, it will need to be a Class 1 free draining material which will give something like a 1:2.5 slopes. A primary concern would be settlement and drainage issues. It is not uncommon for Glacial Till deposits to be up to 8m thick so vertical drains and a surcharging will almost certainly be required.
- Fill will need to be imported. A design solution for the excavated material locally in a landscape / flood barriers etc. is required.
- Additional temporary land for topsoil storage and compounds should be allowed for.
- The new alignment is crossed by a waste water sewer and water main in four locations. Of most concern is the crossing at ch3500. The remaining crossings are in areas of shallow fill and protection slabs should be an acceptable design solution.
- Structures require piled foundations.
- More investigation is required to establish line and levels for the waste water utilities to improve deliverability. Can a design understanding be agreed to protect / sleeve the pipes in areas of fill. Can the crossing at 3500 be realigned pre contract by directional drilling?

### **18.3 Health & Safety Issues**

As well as the more specific major Health & Safety issues that are discussed within this section, other more obvious issues which should be considered during the life of the project are listed below:

- Traffic Management & Works adjacent to Live Traffic;
- Traffic Management (within the site);
- Working at Height;
- Working alongside ponds, drainage ditches and other watercourses;
- Fire arrangements;
- Lifting Operations;

- Contaminated Ground;
- Excavations;
- Confined spaces;
- Temporary Works;
- Site security;
- Manual Handling.

- 18.3.1 The Options require works to the existing road network, junctions and connecting private and business accesses. The traffic management measures to keep the roads and accesses open to traffic, pedestrians and cyclists would require careful consideration.
- 18.3.2 Much of the options are within Flood Zone 1 to 3 and measures to protect site personnel and the temporary and permanent works would have to take the possibility of flooding into account.
- 18.3.3 Works at Skippool Bridge where working over a tidal watercourse would need special measures that would have to be agreed with the Environment Agency. In particular, for the demolition of the existing bridge (Option 1) measures such as a “crash deck” would need to be provided over the watercourse.

## **18.4 Site compound considerations**

- 18.4.1 Various site locations have been considered including a review by the Delivery Partner. These would be located adjacent to the main work sites and are likely to be:
- Possibly west of Skippool Junction on the south side of Amounderness Way to serve the Skippool Junction works with access off Amounderness Way
  - Immediately west of the Skippool Bridge site on the north side of Breck Road to serve the Skippool Bridge and the junction works with access off Breck Road;
  - Near Lodge Lane bridge site but not accessed off Lodge Lane. A haul route from Garstang New Road would be required
  - South of Garstang New Road
- 18.4.2 The Breck Rd location would be preferred as it would be able to walk to the bridge works without negotiating the Skippool Junction.
- 18.4.3 All the site compounds will require alterations to the existing road network to provide safe access and egress to the compounds.

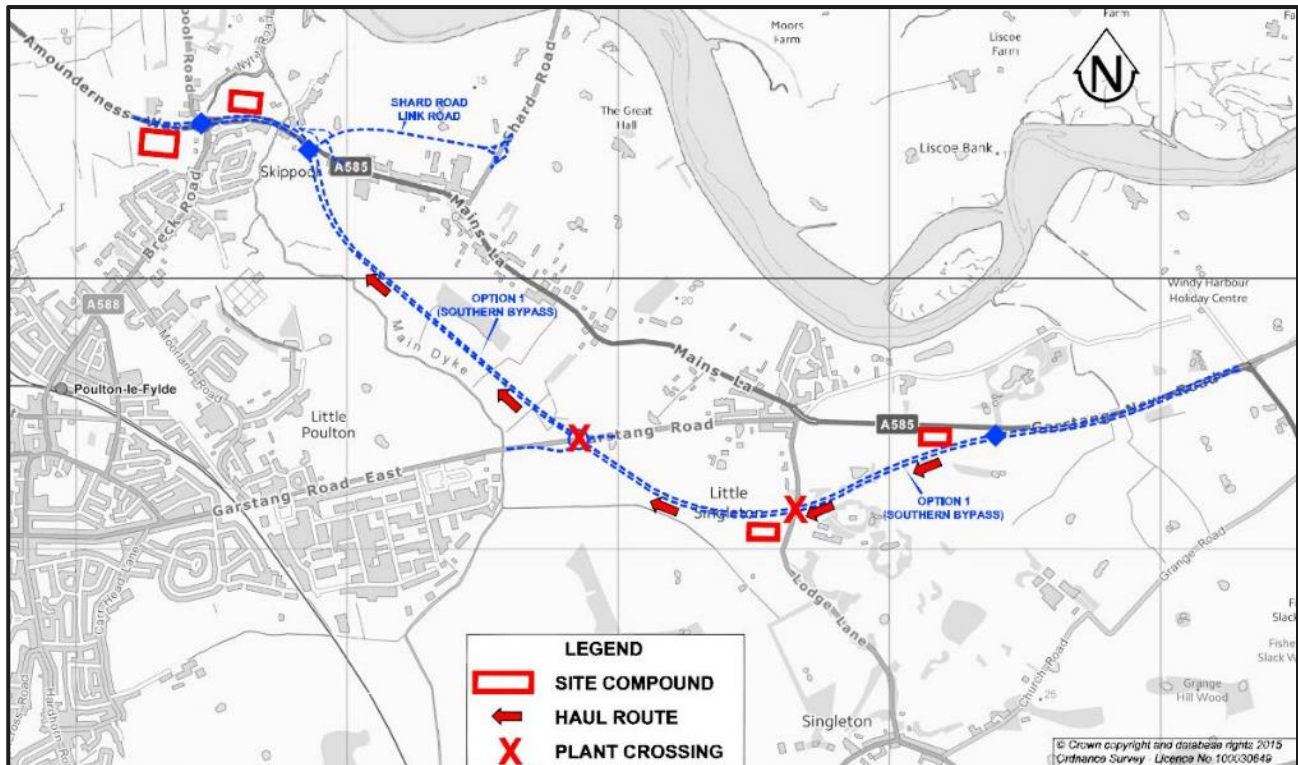


Figure 18-1: Southern Bypass - possible site compound locations

## 18.5 Construction phasing and temporary traffic management

- 18.5.1 The construction phasing and temporary traffic management issues during construction have been considered for Option 1 by the Delivery Partner and suggested traffic management proposals are indicated below with diagrams contained in Appendix F:
- 18.5.2 The most complicated area for traffic management is at Skippool Junction due to the need to keep two way traffic flowing on the A585 as well as dealing with side road traffic from Skippool Road and Breck Road during conversion of the roundabout to a signalised crossroads layout. It is likely that traffic may have to be limited to no more than 30mph through these areas.
- 18.5.3 Traffic Management will be complex and highly disruptive. To some extent the road works themselves will slow traffic flows but the implementation of a 20mph speed limit may be necessary. Stacking and filter lanes plus any ghost hatching will need to be removed to create construction areas and barriered safety zones.

### Skippool Junction

- 18.5.4 Skippool Junction Phase 1 would require the size of the existing roundabout to be reduced and make all traffic use the existing westbound carriageway to provide working space on the north side of the roundabout and on the north side of the existing eastbound carriageway.
- 18.5.5 The next phase would be to construct a temporary small roundabout to the north and to move A585 traffic onto the sections of new road built during Phase 1 including two way traffic along the new westbound carriageway towards Skippool Bridge.
- 18.5.6 The final phase would be to install traffic signal control to allow the remainder of the signalised junction to be constructed.

### Skippool Bridge

- 18.5.7 The works at Skippool Bridge follow the same sequence as the previous buildability review with the northern half of the bridge built first before the A585 traffic is transferred onto the completed northern deck to allow the original bridge to be demolished and the southern half of the structure to be built.

- 18.5.8 Within the revised programme the traffic switch onto the northern deck happens at the same time as Phase 2 TM is implemented on Skippool junction and this link may want to be maintained to prevent traffic having to be switched between carriageways between the two areas of work. The demolition period for the original structure has been increased and as this is over a watercourse crash decks under the bridge and consultation with the Environment Agency will be required.

### **Skippool Bridge Junction**

- 18.5.9 For the majority of the works at this junction the intention would be to maintain the traffic on the existing alignment as shown in Phase 1 and construct as much of the new junction off-line as possible. Works would start with the construction of the new section of 'Old Mains Lane'. With this completed and open to local traffic as an access, Phase 2 would allow the section of new eastbound carriageway to be built including an allowance for any diversion works to move utilities so that they can pass over the northern section of the new bridge before the existing structure is demolished.
- 18.5.10 The work in the southern side of the existing alignment is not as critical as the northern and a resource link has been included to allow the earthworks etc on the south side to progress while the utility diversions take place on the north. Phase 3 TM is implemented when the traffic is switched to the northern half of the bridge and allows the new splitter islands at the junction to be completed and the westbound carriageway up towards the new deck. There should be no requirement for temporary traffic signals during the phase and the new permanent signals would be erected as the islands are completed and would only be made operational when the bypass is opened.
- 18.5.11 However, during Phase 3 of the TM the petrol station adjacent to the bridge may have to be closed for a period as it would be difficult to maintain access while the works to the new carriageway are completed.

### **Main Dyke floodplain embankment**

- 18.5.12 This section of the new southern bypass requires a significant volume of fill material in order to achieve the new vertical alignment and to allow for a settlement period to be included within the programme it is important that these works are started early in the programme. The intention would be to supply this material from a works access at the location of the new Poulton Junction roundabout to permit these works taking place in parallel to those at Skippool Bridge Junction. The volume of earthworks to be undertaken is not inconsiderable and the completion date is directly linked to how quickly the material in this section can be imported and placed.
- 18.5.13 It is assumed that any fill material will be sourced from the east of the works to avoid additional traffic through Little Singleton junction.
- 18.5.14 It is also assumed that band drain installation is required to reduce the settlement period for the fill material and that culverts passing through the embankment would be constructed prior to earthworks filling operations.

### **Poulton Junction to Lodge Lane**

- 18.5.15 The intention within the programme is that there would be a haul road installed from Chainage 3900m to Lodge Lane Bridge to for the supply of materials to this area without the need to send construction traffic down Lodge Lane. With the haul road established the earthworks operation would move to Chainage 2300m and carry out the bulk earthworks and any necessary ground improvements. While the programme does not currently show it would also be possible to complete the drainage/roadworks in this section if resources were available and no settlement periods were required.
- 18.5.16 The earthworks to the East of Lodge Lane is linked to the completion of the bridge and retaining walls in this location. This is linked so that the access is maintained for as long as possible to supply materials & resources from within the works. At present this means the completion of this section is on the critical path, but both the excavation and roadworks durations are estimates at present and confirmation of volumes may allow the assumed durations to be revised.

### **Lodge Lane Bridge**

- 18.5.17 The first activity in this area is to create the temporary diversion that off-line temporary traffic diversion. Once the Lodge Lane traffic is diverted onto this alignment works would start to build the



new bridge abutments starting with the piling. Once the abutment piling had been completed localised excavation would take place at the structure to allow the centre pier piles to be installed and then all three items would be built services by a full time crane at this location. Once the deck was completed and utility diversions made, the traffic would be switched onto the new bridge and once this has happened the 'plug' that formed the temporary diversion would be excavated releasing uninterrupted plant movements between Ch 2300 – 3900m to facilitate the completion of the roadworks.

- 18.5.18 The two large retaining walls would probably be contiguous piled walls and the intention would be for these piles to be installed directly after those for the adjacent bridge abutments. The capping beam would then be built before any excavation works take place to allow it to be built in advance of the bulk excavations works and to mitigate the risk of working at height during its construction. The cladding to the front face of this wall can take place at any time after the bulk earthworks, but at present it is shown late in the programme once there is an improved access along the almost complete carriageway.

### West of Windy Harbour Junction

- 18.5.19 These works are almost independent from the main works to create the off line Bypass and therefore to minimise peaks in resources it is assumed that these works would start in before the main off line works to allow the Delivery Partner some latitude to level resources across the site. A period has been added at the end to allow for the decommissioning works to the redundant section of Garstang New Road.

## 18.6 Statutory undertakers' apparatus – Option 1

- 18.6.1 The majority of the statutory undertakers' apparatus that would be affected by the diversions lie within the existing road network although there are a number of cross-country cables (above and below ground) and pipelines that would be affected. NRSWA C2 and C3 enquiries have been made with all affected organisations.
- 18.6.2 For Option 1, the likely diversions are detailed in the Stage 2 Statutory Undertakers C3 Cost Estimate report (HE548643-HYD-VUT-A585-RP-C-2005) and are summarised as:

Location	Diversion	Diversion Length
<b>North West Electricity</b>		
Skippool Roundabout	33kV underground cable crossing A585	190m
Skippool Roundabout	Low voltage underground cable crossing A585	150m
Feed to Skippool Pumping Station	Medium voltage (6.6kV) and low voltage underground cable crossing A585 west of Skippool Bridge	50m
Skippool Bridge and Skippool Bridge junction	Medium voltage (6.6kV) and low voltage underground cable in north footway	180m
Skippool Bridge Junction	Medium voltage (6.6kV) and low voltage underground cable in south footway	170m
West of Lodge Lane	Medium voltage (6.6kV) overhead cable on wooden poles	150m
Supply to Singleton Hall from west of Lodge Lane	Medium voltage (6.6kV) overhead cable on wooden poles diverted to underground cable	300m (including temporary diversion)
Supply from Singleton Hall to North Lodge, Lodge Lane	Low voltage underground cable in existing access road diverted to east footway of Lodge Lane and through Lodge Lane Bridge	250m (including temporary diversion)
Across Southern Route to north of Garstang Road East	Medium voltage (6.6kV) underground cable crossing Southern route	100m

Location	Diversion	Diversion Length
<b>Cadent Gas (formerly National Grid Gas)</b>		
Across Breck Road immediately east of Skippool Roundabout	150mm ductile iron low pressure main replaced with 180mm PE main laid in open cut including road crossing	150m
At Old Mains Lane junction	63mm medium pressure PE main replaced with 90mm PE main as road crossing	40m
At new Skippool Bridge Junction	90mm medium pressure PE main diverted around proposed junction with 90mm PE main in open cut	210m
At new Poulton Junction	250mm medium pressure PE main diverted around proposed junction with 250mm PE main in open cut	200m
At Garstang New Road west of Windy Harbour Junction	250mm medium pressure PE main diverted alongside proposed dual carriageway with 250 mm PE main laid in open cut	950m
At Lodge Lane bridge site	160mm medium pressure PE main diverted at proposed bridge site with 180mm PE main laid in open cut	130m (including temporary diversion)
<b>GTC (Gas distribution)</b>		
Access to Singleton Manor / Hall	Diversion of medium pressure main laid in open cut	150m (including temporary diversion)
<b>British Telecom (Openreach)</b>		
Skippool Roundabout	Extend road crossing and new duct route in north footway	60m
Breck Road and Mains Lane near Skippool Bridge Junction	Extend road crossing and new duct route in north footway including ducts through new Skippool Bridge	400m
Mains Lane near Skippool Bridge Junction	Overhead cables in the south footway diverted to duct route in the south footway with road crossings at the Junction	200m
Garstang Road East (Poulton Roundabout)	New duct route in north footway with new road crossings at the Junction	200m
Lodge Lane	New duct route in east footway and through new Lodge Lane Bridge. (Note: a temporary diversion would be required to allow bridge construction – it is not clear whether this has been included in the estimate)	200m (including temporary diversion)
Garstang New Road from Grange Junction location to Windy Harbour Junction	New duct route in southern verge with road crossing to connect to existing ducts in Garstang New Road	1000m
<b>United Utilities (Water supply and sewers)</b>		
Skippool Marsh to Skippool Bridge	24" asbestos cement (AC) water main to be diverted out of carriageway. Temporary bypass required	350m
New Skippool Bridge	24" water AC main diverted out of carriageway. Highways England to provide temporary service bridge and design and construct room within bridge decking	50m

Location	Diversion	Diversion Length
Skippool Bridge Junction	24" water AC and 90mm main to be diverted out of carriageway. Main cannot be shut off therefore temporary bypass must be provided	100m
Poultton Junction	24" main to be diverted around roundabout. Temporary bypass required	150m
West of Lodge Lane	315mm PE main to be diverted. Highways England to provide and install suitable duct across new road construction	200m
Lodge Lane	110mm and 90mm PE mains. Highways England to install duct within bridge deck	100m (including temporary diversion)
Between Lodge Lane and Garstang New Road	24" water AC main to be diverted below proposed carriageway. Highways England to install suitable duct within new road construction for the new main. Temporary Bypass required	200m

**Table 18-1: Option 1 utilities apparatus diversions**

18.6.3 In addition to the above, it has been identified that a disconnected 6" (150mm) ethylene pipeline belonging to ICI crosses the route of Options 1 & 2 at Garstang New Road and would be affected by the construction of the Shard Road link road. Details of how this pipeline would be affected will be confirmed during Stage 3.

## 18.7 Statutory undertakers' apparatus – Option 2

18.7.1 This on-line option would have changes to the existing road layout at:

- Skippool Junction
- Shard Road Junction with Mains Lane
- Western one-way link road west of Little Singleton with new junctions with Mains Lane and Garstang Road East
- Little Singleton Junction (Five Lane Ends)
- Additional eastbound carriageway to the north of the existing Garstang New Road

18.7.2 As this was not the preferred option at the time of seeking C3 responses from the statutory undertakers no details have been sought of the possible diversions that may be required.

## 18.8 Programme Constraints

18.8.1 The overall Scheme programme could be affected by:

- Late provision of ground investigation works currently programmed during Stage 3;
- Seasonal environmental surveys that may affect progress of the Scheme's development;
- Delays to the progress of the Scheme through the Development Consent Order process (Stage 4);
- Statutory Undertakers lead-in periods for diversionary and / or protection works as detailed in Section 18.6 or 18.7 above;
- Seasonal ecological mitigation works including translocation of protected species and the like that may affect when parts of the site may become available;
- Earthworks – particularly the treatment of fill and potential settlement of embankments that would be within the Main Dyke valley;
- Complex traffic management measures - particularly in the Skippool area.

## 18.9 Draft construction programme – key dates

18.9.1 The key dates in the high-level programme produced for the Option 1 are shown in Table 18-2. These dates are subject to review by the Delivery Partner and any possible advanced works that could include works on areas obtained by agreement and utilities diversion works.

Activity	Approx. Date
Access to the site	March 2020
Site set up (compounds and other access points) established	March 2020
Ecological surveys	January 2020 to July 2020
Advanced Works (topsoil strip, translocation works)	March 2020 to September 2020
Start of construction	September 2020
Skippool Junction to Skippool Bridge Junction Phase 1	September 2020 to May 2021
Skippool Junction to Skippool Bridge Junction Phase 2	May 2021 to December 2021
Skippool Bridge Phase 1	September 2020 to May 2021
Skippool Bridge Phase 2	May 2021 to December 2021
Embankment Construction (including settlement period)	September 2020 to November 2021
Lodge Lane Bridge and retaining walls (including temporary diversions)	September 2020 to October 2021
Switch traffic onto new Lodge Lane Bridge	October 2021
Scheme Open to traffic	March 2022
Works related to detrunked existing A585	March to August 2022
Demobilisation and full completion	August 2022

**Table 18-2: Draft construction programme key dates**

## 19 APPRAISAL SUMMARY TABLES

### 19.1 Option 1B (Southern Bypass)

<b>Date produced:</b>			31st August 2017	<b>Contact:</b>	
<b>Name of scheme:</b>	Option 1B			<b>Name</b>	David Hopkin
<b>Description of scheme:</b>	A southern route offline dual carriageway from Skippool Junction to the west and south of Little Singleton with 2 new at-grade junctions (Skippool Bridge and Poulton) and would connect with the west arm of Windy Harbour Junction. The layout would include a new dual carriageway bridge across Main Dyke and the bypass would be in cutting south of Little Singleton including a new bridge carrying Lodge Lane over the bypass. The section of Garstang New Road east of Little Singleton would be decommissioned.			<b>Organisation</b>	Highways England
				<b>Role</b>	Project Manager

Impacts		Summary of key impacts	Assessment					
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Business users benefit significantly from the provision of the A585 Windy Harbour to Skippool Improvement scheme through reduced travel times (including a reduction in congestion) amounting to £52.00m PV. About 37% of the value of the journey time changes occur due to this group. The vehicle operating cost amounts to a dis-benefit to users of £1.14m PV. There is also a benefit of £0.48m to business users during construction and maintenance giving an overall net benefit of £51.33m PV.	Value of journey time changes(£)		£52.00m	N/A	£51.33m	
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			
			13.14	38.86	0.00			
	Reliability impact on Business users	A Journey Time Reliability assessment has not been undertaken at this Stage.						
Regeneration	A Regeneration Assessment has not been undertaken at this Stage.							
Wider Impacts	A Wider Impacts assessment has not been undertaken at this Stage.							
Environmental	Noise	Road traffic noise decreases would occur at the junction between Garstang Road and Mains Lane in the village of Little Singleton and at residential dwellings on the southern side on Mains Lane between Little Singleton and Skippool. Design year road traffic noise increases would occur at the rear of residential dwellings situated to the south of Mains Lane between Little Singleton and Skippool where contributions from the new road would be greatest. There would also be noise increases towards the east of Lodge Lane, south of Little Singleton. All Noise Important Areas (NIA) within the study area would benefit from Option 1 in the Design Year - four of which would be perceptible.	225 people would experience reduced daytime noise in the forecast year. 140 people would experience an increase in daytime noise in the forecast year.			N/A	£0.42M	Not required during PCF Stage 2.



Impacts		Summary of key impacts	Assessment				
			Quantitative		Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Environmental	Air Quality	For Stage 2 the EAR predicted NO2 concentrations below the annual mean AQS objective of 40µg/m³ at all receptors, with the highest modelled NO2 concentration being 27.6µg/m³. There is predicted to be no increase in pollutant concentrations within the designated AQMA as a result of the option. The modelling results based on the current traffic data indicate there are unlikely to be any exceedances of AQS objective criteria and therefore unlikely to be a significant impact on air quality.	Local air quality modelling has been completed for worst case receptor locations using the DMRB screening tool at PCF Stage 2.		N/A	Not undertaken for PCF Stage 2.	Not required during PCF Stage 2.
	Greenhouse gases	Carbon dioxide emissions increase as a result of the Scheme option by 260,578 tonnes.	Change in non-traded carbon over 60y (CO2e)	260,578	CO2 emissions increase	-£11.97m	
			Change in traded carbon over 60y (CO2e)	0			
	Landscape	The Scheme would have a major change on the designed landscape of Singleton Hall and Park and ta moderate change on the tranquillity and rural features resulting in urban encroachment into the rural urban edge landscape of the Mains Dyke.	N/A		Large Adverse	N/A	
	Townscape	The removal of existing trunk road traffic from A585 Mains Lane and A586 would result in a beneficial change.	N/A		Slight Beneficial	N/A	
	Historic Environment	Potential impacts to the settings of the Grade II listed Ice House at Singleton Hall have been identified. Direct physical impacts on two non-designated heritage assets have been identified along with impacts on archaeological remains associated with the former Ribchester to Poulton le Fylde Roman road and Singleton Park. Construction works associated with the Scheme also have the potential to impact on currently unknown archaeological remains within the Scheme footprint.	N/A		Moderate Adverse	N/A	
	Biodiversity	No direct impacts on the Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site. However there is the potential for a direct loss of, agricultural land and coastal grazing marsh that lies within foraging range of the majority of bird species for which the SPA / Ramsar Site is designated and which may therefore be "functionally linked". Current data, based on desk study and one year of field survey, suggests that significant effects are not likely. However, uncertainty remains, pending ongoing surveys. Effects on a number of habitats and protected/notable species through habitat loss, fragmentation and potential pollution/degradation in habitat quality require mitigation.	N/A		Large / Very Large Adverse	N/A	

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Impacts		Summary of key impacts	Assessment					
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Environ	Water Environment	The alignment traverses the floodplain of the Main Dyke with mitigation required for loss of floodplain storage/impediment of floodplain flow paths and construction phase detriment to water quality. Also this option requires deep cuttings, opening a potential pollution pathway to underlying aquifers.	N/A			Slight Adverse	N/A	
	Social	Commuting and Other users	Commuting and Other transport users benefit significantly from the provision of the A585 Windy Harbour to Skippool Improvement scheme through reduced travel times (including a reduction in congestion) amounting to £88.84m PV. There is a slight increase in vehicle operating costs, primarily due to the increase in vehicle kilometres, amounting to £12.36m PV. There is a disbenefit of £0.52m to the commuting and other transport users during construction and maintenance giving an overall net benefit of £75.96m PV.	Value of journey time changes(£)		£88.84m	N/A	£75.96m
Net journey time changes (£)								
0 to 2min				2 to 5min	> 5min			
23.68				65.16	0.00			
Reliability impact on Commuting and Other users		A Journey Time Reliability assessment has not been undertaken at this Stage.				N/A		
Physical activity		A Regeneration Assessment has not yet been undertaken at this Stage.				N/A		
Journey quality		A Wider Impacts assessment has not yet been undertaken at this Stage.				N/A		
Accidents		It is expected that there would be a decrease of around 312 accidents across the study area with the A585 Windy Harbour to Skippool Improvement scheme in place over the 60 year appraisal period.	£11.56m				£11.56m	
Security		As the schemes involve upgrades to an existing route, there will be minimal changes to the security of the area.				N/A		
Access to services		The schemes do involve some changes to the road network, however it is unlikely to cause any significant changes to the public transport system.				N/A		
Affordability		An initial assessment screening suggests a negative personal affordability impact overall with the lower income groups experiencing the smallest proportion of the negative impact.						
Severance	There will be no new or altered pedestrian facilities as part of the schemes.				N/A			
Option and non-use values					N/A			

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Public Accounts	Cost to Broad Transport Budget	The Cost to the Broad Transport Budget for the A585 Windy Harbour to Skippool Improvement scheme amounts to £101.99m PV. It includes investment costs of £96.35m and maintenance costs of £5.65m.	£101.99m	N/A	£101.99m	
	Indirect Tax Revenues	There is a reduction in indirect tax revenue of £8.99m.	-£8.99m	N/A	-£8.99m	

**Table 19-1: Appraisal Summary Table for Option 1B**

## 19.2 Option 2 (On-line : No bypass)

<b>Date produced:</b>	31st August 2017
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<b>Contact:</b>	
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<b>Name of scheme:</b>	Option 2	<b>Name</b>	David Hopkin
<b>Description of scheme:</b>	Route following and retaining the existing single carriageway between Skippool and Little Singleton with improved at-grade junctions at Shard Road. A one-way gyratory system would be provided around Little Singleton using parts of Garstang Road East and Mains Lane and a new northbound link road to the north-west of Little Singleton. Garstang New Road east of Little Singleton to Windy Harbour Junction would be converted to dual carriageway.	<b>Organisation</b>	Highways England
		<b>Role</b>	Project Manager

Impacts		Summary of key impacts	Assessment					
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Business transport users benefit significantly from the provision of A585 Windy Harbour to Skippool Improvement scheme through reduced travel times (including a reduction in congestion) and vehicle operating costs amounting to £25.53m PV and £0.11m PV respectively. About 36% of the value of the journey time changes occur due to this group. There is also a disbenefit of £3.41m to business users during construction and maintenance giving an overall net benefit of £22.23m PV.	Value of journey time changes(£)		£25.53m	N/A	£22.23m	
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			
			23.40	2.13	0.00			
	Reliability impact on Business users	A Journey Time Reliability assessment has not been undertaken at this Stage.						
	Regeneration	A Regeneration Assessment has not been undertaken at this Stage.						
Wider Impacts	A Wider Impacts assessment has not been undertaken at this Stage.							
Environmental	Noise	Road traffic noise decreases would occur along Mains Lane within the village of Little Singleton and at residential dwellings along Breck Road in Skippool. Road traffic noise increases would occur towards the west of the proposed new road along Mains Lane. No Noise Important Areas are predicted to experience a perceptible decrease or increase in road traffic noise within the study area.	96 people would experience reduced daytime noise in the forecast year. 6 people would experience increase in daytime noise in the forecast year.			N/A	£0.18M	Not required during PCF Stage 2.
Environmental	Air Quality	For Stage 2 the EAR predicted NO2 concentrations below the annual mean AQS objective of 40µg/m³ at all receptors, with the highest modelled NO2 concentration of 27.8µg/m³. There is predicted to be no increase in pollutant concentrations within the designated AQMA as a result of the option. The modelling results based on the current traffic data indicate there are unlikely to be any exceedances of AQS objective criteria and therefore unlikely to be a significant impact on air quality.	Local air quality modelling has been completed for worst case receptor locations using the DMRB screening tool at PCF Stage 2.			N/A	Not undertaken for PCF Stage 2.	Not required during PCF Stage 2.

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Impacts		Summary of key impacts	Assessment					
			Quantitative			Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
	Greenhouse gases	Carbon dioxide emissions increase as a result of the Scheme option by 78,628 tonnes.	Change in non-traded carbon over 60y (CO2e)		78,628	CO2 emissions increase	-£3.62m	
			Change in traded carbon over 60y (CO2e)		0			
	Landscape	The Scheme would have a minor change on rural features resulting in urban encroachment into the rural landscape at the settlement edge.	N/A			Slight Adverse	N/A	
	Townscape	The townscape features are typical of the trunk road and main road network of the Fylde. The construction of two large scale roundabouts and the loss of local features of amenity interest within the small scale ribbon development along A585 Mains Lane would result in a moderate negative change.	N/A			Moderate Adverse	N/A	
	Historic Environment	Potential impacts to the setting of the non-designated Singleton Park. Construction works associated with the Scheme also have the potential to impact on currently unknown archaeological remains within the Scheme footprint.	N/A			Slight Adverse	N/A	
	Biodiversity	Current data, based on desk study and one year's field survey effort suggest that impacts on Morecambe Bay and Duddon Estuary SPA and Morecambe Bay Ramsar site through the loss/fragmentation of functionally linked land are not likely. Effects on a number of habitats and protected/notable species through habitat loss, fragmentation and potential pollution/degradation in habitat quality require mitigation.	N/A			Moderate / Large Adverse	N/A	
	Water Environment	The alignment only marginally encroaches into the floodplain, there are no deep cuttings, so only very limited potential to create a pollution pathway to underlying aquifers and the increase in impermeable land cover is relatively small.	N/A			Neutral	N/A	
Social	Commuting and Other users	Commuting and Other transport users benefit significantly from the provision of A585 Windy Harbour to Skippool Improvement scheme through reduced travel times (including a reduction in congestion) amounting to £45.66m PV. There is a slight increase in vehicle operating costs, primarily due to the increase in vehicle kilometres with a dis-benefit of £2.98m PV. There is a disbenefit of £4.04m to the Commuting and Other transport users during construction and maintenance giving an overall net benefit of £38.64m PV.	Value of journey time changes(£)		£45.66m	N/A	£38.64m	
			Net journey time changes (£)					
			0 to 2min	2 to 5min	> 5min			
38.98			6.68	0.00				
Social	Reliability impact on Commuting and Other users	A Journey Time Reliability assessment has not been undertaken at this Stage.				N/A		
	Physical activity	A Regeneration Assessment has not yet been undertaken at this				N/A		



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Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
		Stage.				
	Journey quality	A Wider Impacts assessment has not yet been undertaken at this Stage.		N/A		
	Accidents	It is expected that there would be a decrease of around 89 accidents across the study area with the Option 2 A585 Windy Harbour to Skippool Improvement scheme in place over the 60 year appraisal period.	£2.59m		£2.59m	
	Security	As the schemes involve upgrades to an existing route, there will be minimal changes to the security of the area.		N/A		
	Access to services	The schemes do involve some changes to the road network, however it is unlikely to cause any significant changes to the public transport system.		N/A		
	Affordability	An initial assessment screening suggests a negative personal affordability impact overall with the lower income groups experiencing the smallest proportion of the negative impact.				
	Severance	There will be no new or altered pedestrian facilities as part of the schemes.		N/A		
	Option and non-use values	This is not applicable to A585 Windy Harbour to Skippool Improvement scheme		N/A		
Public Accounts	Cost to Broad Transport Budget	The Cost to the Broad Transport Budget for the A585 Windy Harbour to Skippool Improvement scheme amounts to £36.01m PV.	£36.01m	N/A	£36.01m	
	Indirect Tax Revenues	There is a reduction in indirect tax revenue of £0.35m.	-£0.35m	N/A	-£0.35m	

Table 19-2: Appraisal Summary Table for Option 1B

# APPENDIX A – SCHEME PLANS

## **APPENDIX B – STATUTORY UNDERTAKERS' PLANS**

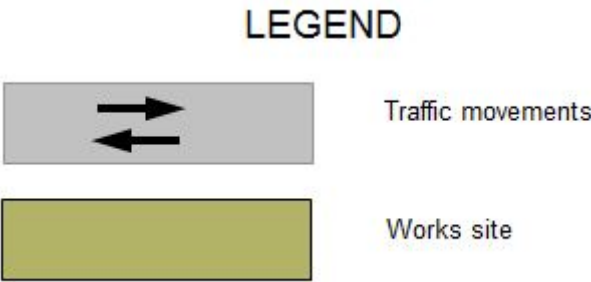
## **APPENDIX C – ENVIRONMENTAL CONSTRAINTS PLAN**

## **APPENDIX D – PUBLIC CONSULTATION LEAFLET**

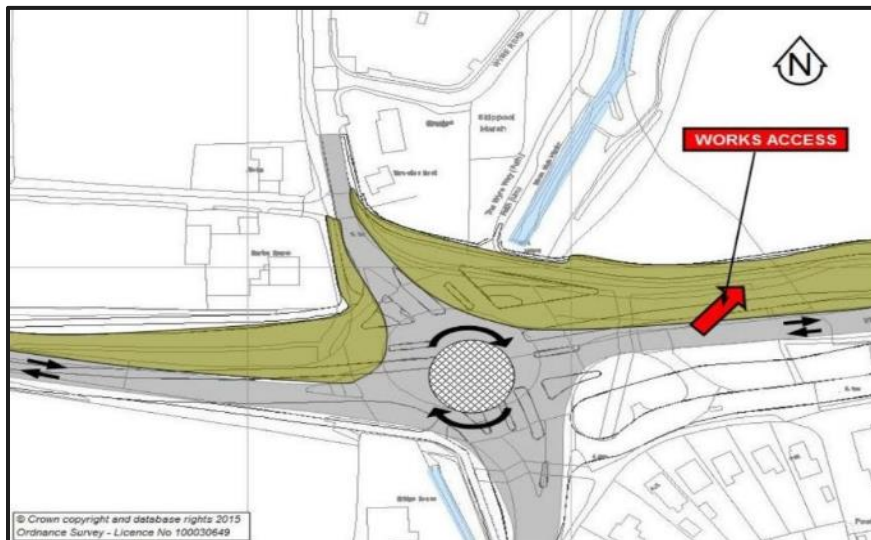


## **APPENDIX E – ASSESSMENT OF DESIGN SPEED**

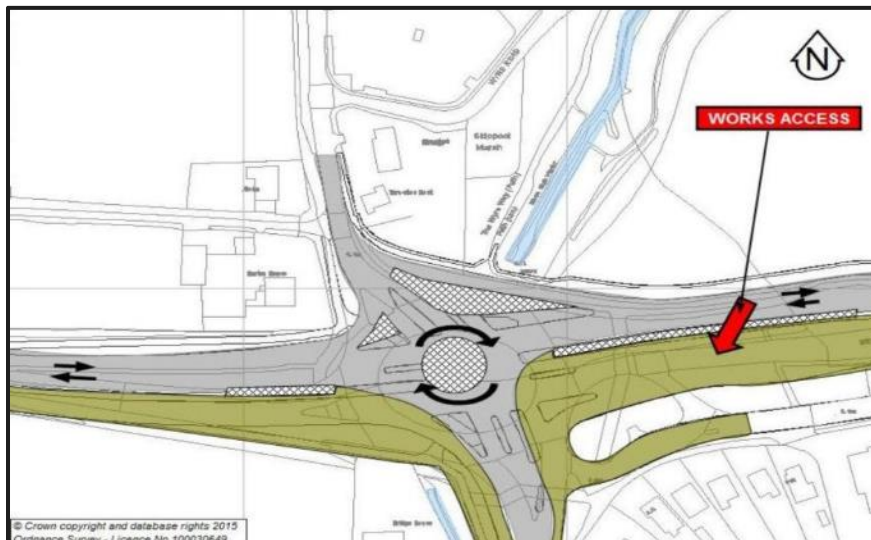
**APPENDIX F:OPTION 1-TEMPORARY TRAFFIC MANAGEMENT**



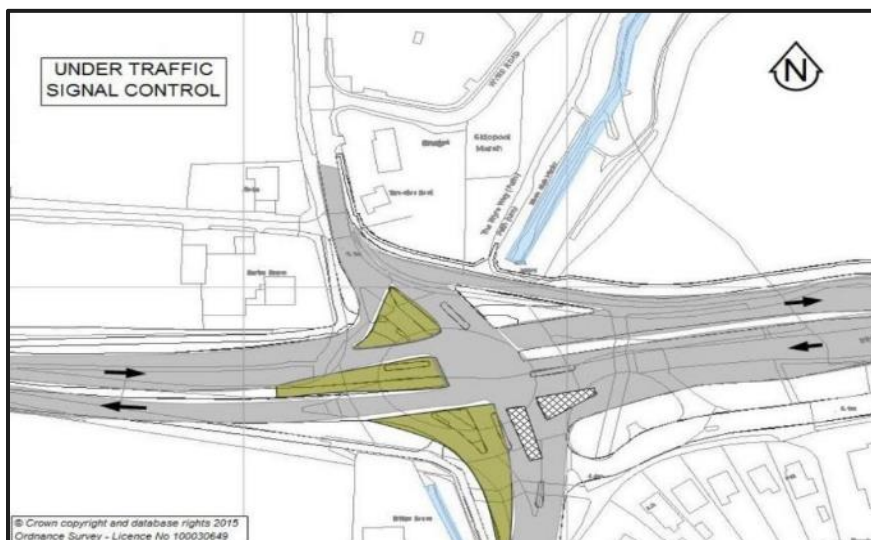
### SKIPPOOL JUNCTION – PHASE 1



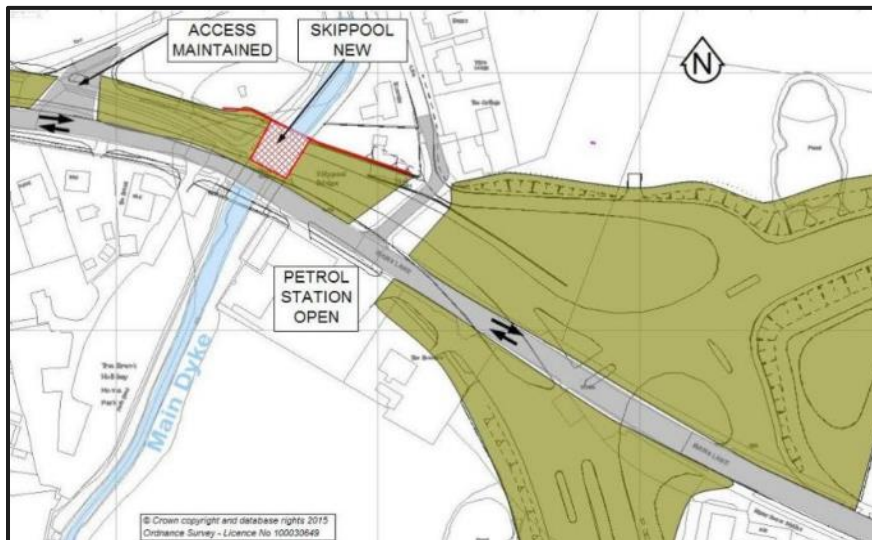
### SKIPPOOL JUNCTION – PHASE 2



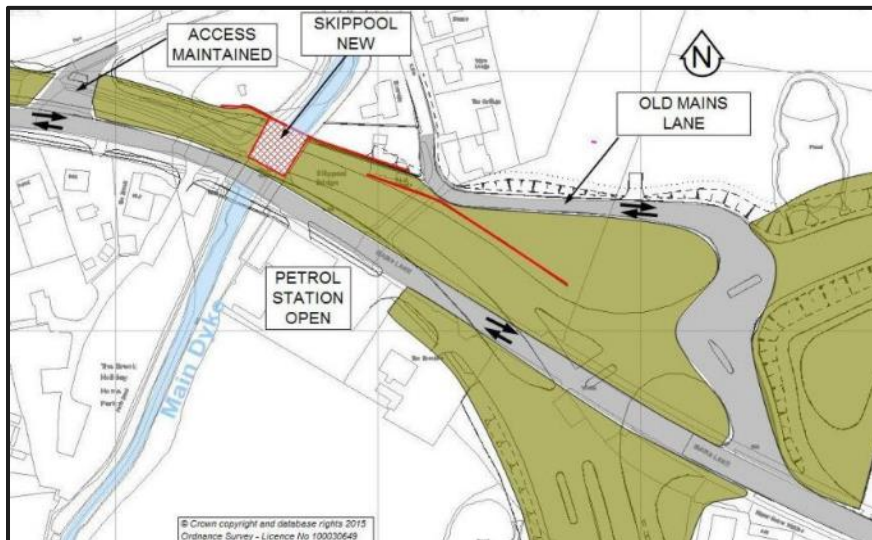
### SKIPPOOL JUNCTION – PHASE 3



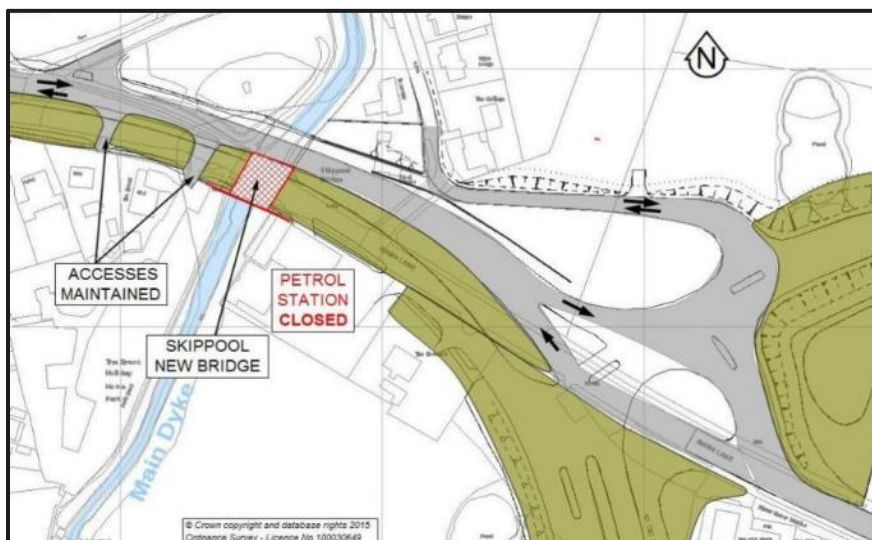
### SKIPPOL BRIDGE JUNCTION – PHASE 1



### SKIPPOL BRIDGE JUNCTION – PHASE 2



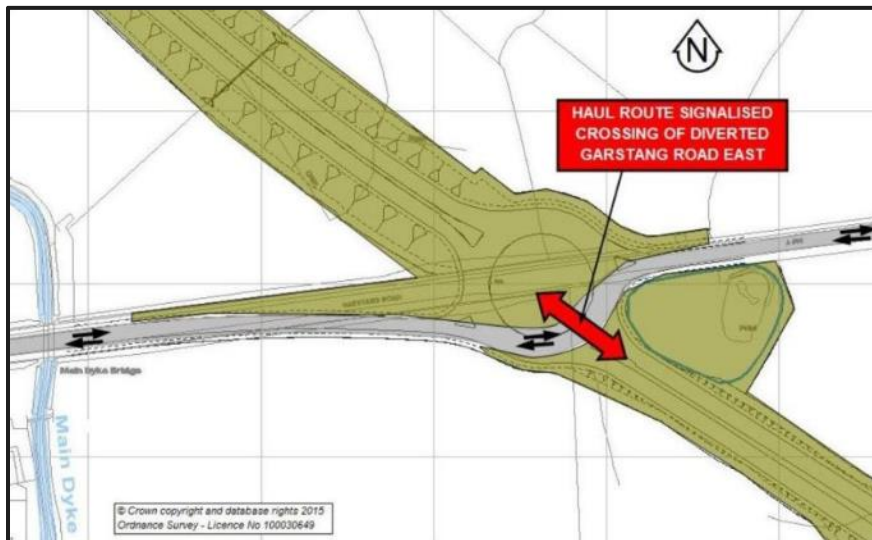
### SKIPPOL BRIDGE JUNCTION – PHASE 3



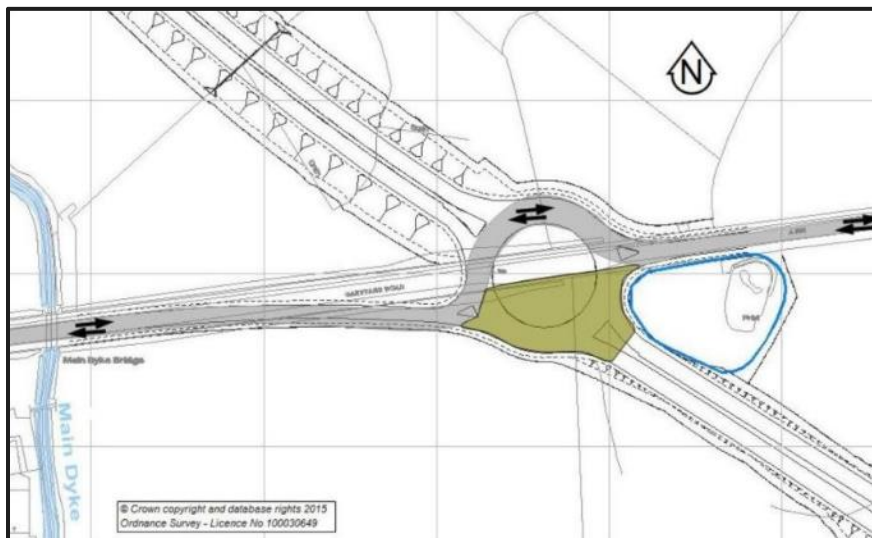
### POULTON JUNCTION – PHASE 1



### POULTON JUNCTION – PHASE 2

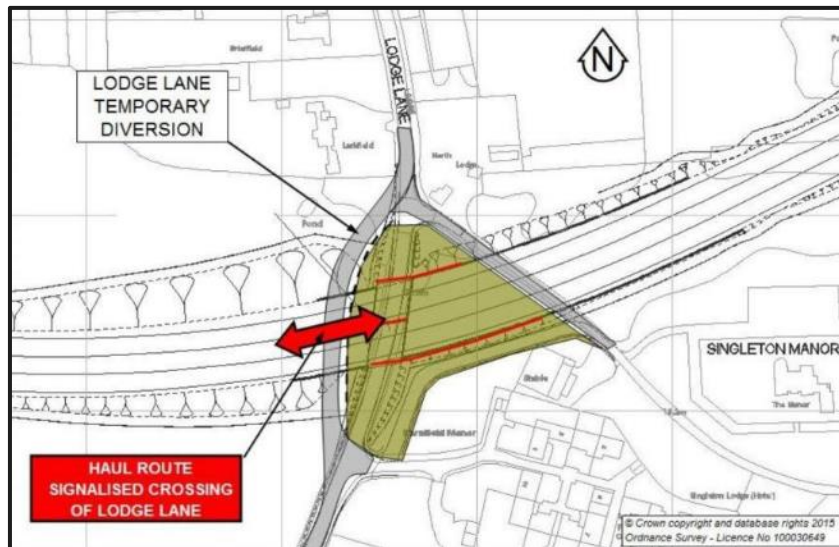


### POULTON JUNCTION – PHASE 3

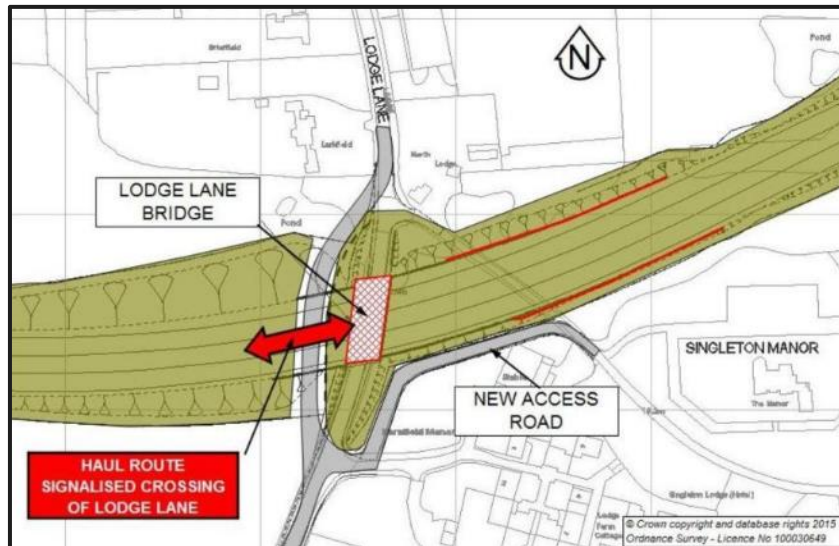




## LODGE LANE – PHASE 1



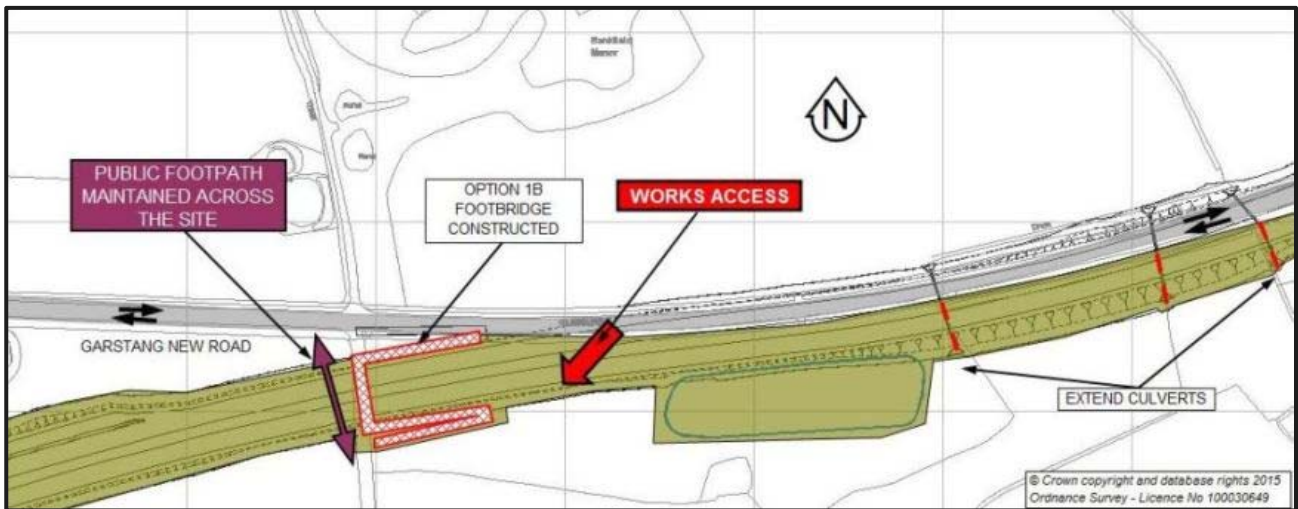
## LODGE LANE – PHASE 2



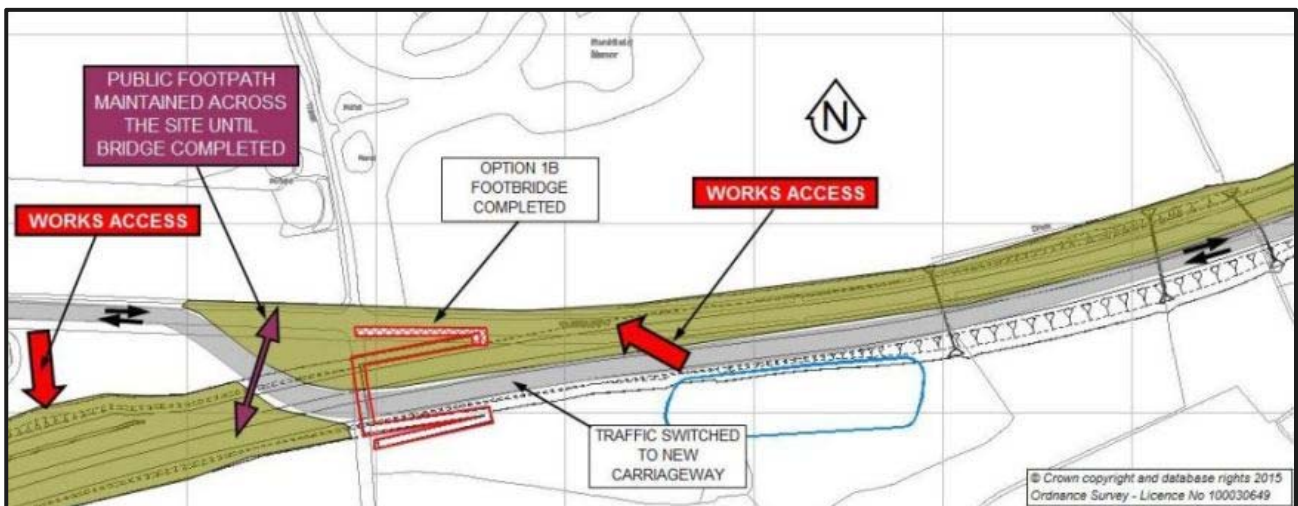
## LODGE LANE – PHASE 3



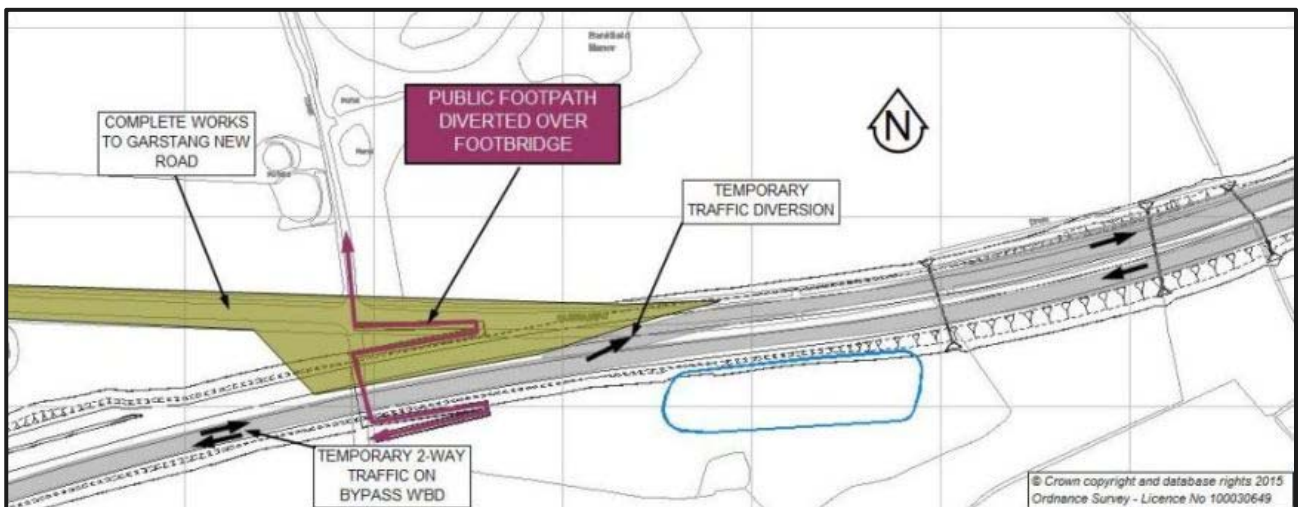
## WEST OF WINDY HARBOUR – PHASE 1



## WEST OF WINDY HARBOUR – PHASE 2



## WEST OF WINDY HARBOUR – PHASE 3



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