

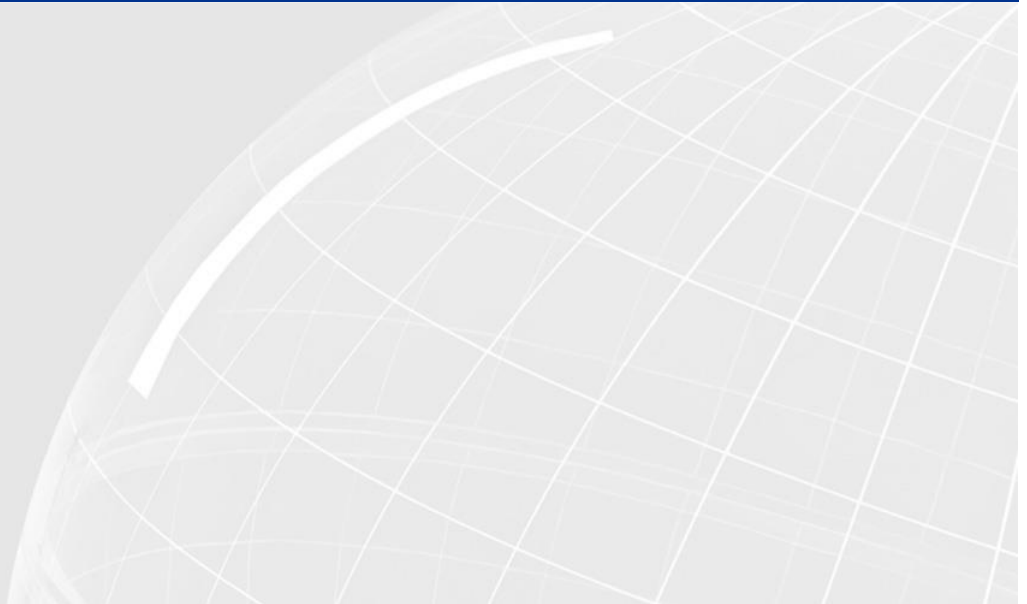


Preston Western Distributor – Outline Business Case

Options Assessment Report

June 2017

Lancashire County Council



Preston Western Distributor – Outline Business Case

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1. Introduction

1.1 Purpose of Document

This document represents the Options Assessment Report (OAR) to support the Outline Business Case (OBC) of the Preston Western Distributor (PWD) scheme.

In line with the Department for Transport's Transport Business Case guidance (January 2013) a key part of the OBC is a detailed assessment of the options developed to address local objectives to find the preferred solution.

Option Development is the first stage of the transport appraisal process followed by further appraisal of better performing options, in order to obtain sufficient information to enable decision-makers to make a rational and auditable decision about whether or not to proceed with intervention. Figure 1-1 shows the stages of the option development process required by Web-based Transport Analysis Guidance (WebTAG) in the development of an OAR.

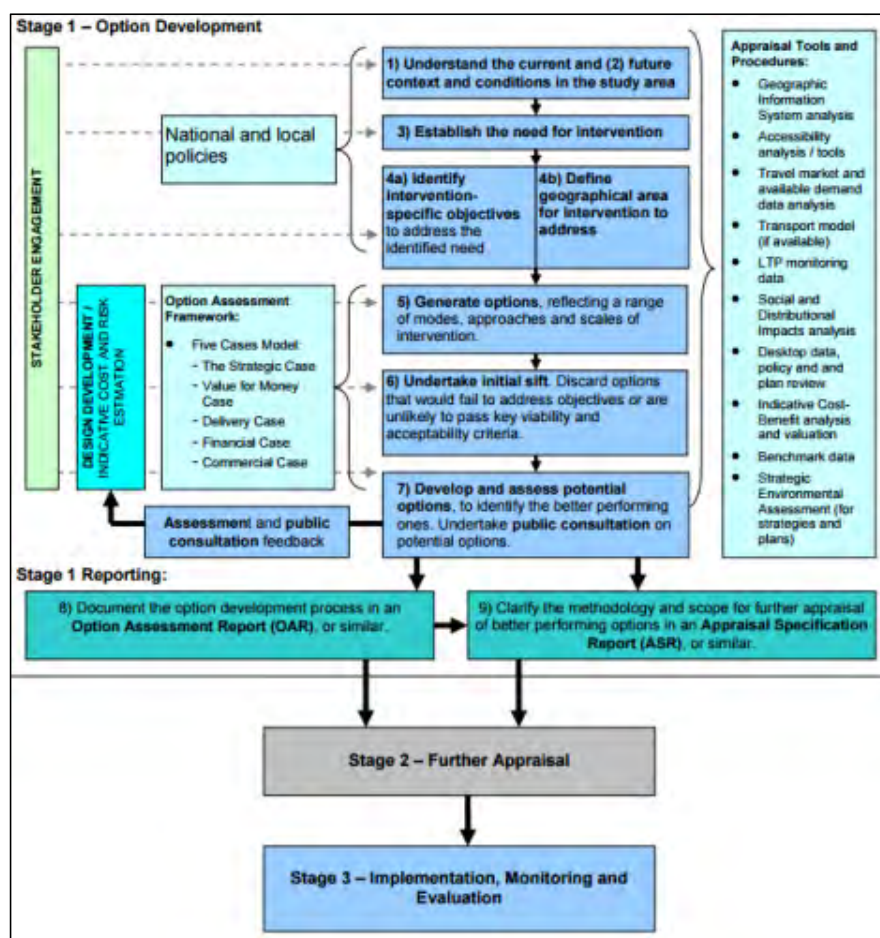


Figure 1-1: The Option Development Process

The purpose is to identify and sift options that best deliver the strategic needs for north Preston as set out in the Central Lancashire Core Strategy.

This process is completed in line with the requirements set out within the DfT's Transport Analysis Guidance (TAG). This report therefore follows this guidance, and identifies the need for intervention, generates a set of potential options and sifts the options against the strategic objectives for Central Lancashire and Preston.

The result is a preferred option and a next best / low cost option identified in accordance with TAG guidance as part of a business case submission.

In line with Figure 1-A the option assessment adopts a standard sifting approach to the assessment and scoring of each potential option against a list of identified objectives, viability and deliverability criteria based on the qualitative analysis.

Future modelling and economic appraisal of a preferred option and next best alternative will be undertaken to meet DfT and WebTAG requirements- as noted as part of Stage 2 Further appraisal.

1.2 Document Structure

The remainder of the report is structured to follow the 8 steps in the WebTAG option development process up to the development of an options assessment report.

Each stage of the process is documented within the following chapters:

- Chapter 2: Current and Future Situation
- Chapter 3: Objectives Identification
- Chapter 4: Option Generation
- Chapter 5: Option Sifting
- Chapter 6: Summary

2. Current and Future Situation

2.1 Introduction

This chapter summarises the current and future conditions in terms of traffic, walking, cycling, public transport and future development impacts, as they pertain to the need for intervention. This provides an evidence base against which a set of evidence-led and consistent objectives can be derived, and scheme options can then be consistently appraised against.

A review of existing policy documents has also been undertaken to compile a baseline case of current and future conditions in the study area from which problems can be identified. The policy review covers the:

- Lancashire Strategic Economic Plan (March 2014);
- Central Lancashire Core Strategy (July 2012);
- Central Lancashire Highways and Transport Masterplan (March 2013); and
- North West Preston Masterplan: Transport Assessment (URS, January 2014)

This chapter is structured under the following headings:

- Understanding the Current Situation;
- Future Situation;
- The Need for Intervention; and
- The Requirement for a Strategic Intervention.

2.2 Understanding the Current Situation

The Preston urban area is bounded by the M55 to the north, the M6 to the east and the River Ribble to the south. The city centre itself is connected by the A583 / A5085 to Blackpool, the A6 to Garstang and Chorley, crossing the River Ribble, and the A59 which connects to Southport and Liverpool in the south west and Blackburn and the Ribble Valley in the east and shares two Ribble bridges in Preston with A582 traffic.

Preston is well connected to the strategic road network, being served by four motorways:

- *M61 – Preston to Manchester (via Chorley and Bolton) accessed at J9;*
- *M65 – Preston to Colne via (Blackburn, Accrington and Burnley) accessed at J1;*
- *M55 – Preston to Blackpool (via Kirkham) accessed at J1; and*
- *M6 – for travel north and south towards Scotland and the Midlands accessed at junctions 29, 31, 31a (southbound access and northbound exit only) and via M55 J1.*

The majority of the key 'A' roads are 30-40mph single carriageways, constrained by their urban or semi-urban surroundings. The exceptions are stretches of dual carriageway on the A6, A582 and A59 all south of the Ribble.

The motorways and key 'A' roads in Preston are shown in Figure 2-1.

Preston is served by one railway station towards the south of the city centre; this is a major stop on the West Coast Main Line (WCML), with long distance train services to Manchester, Birmingham and London (Euston) in the South and Glasgow and Edinburgh to the North. It also provides Northern Rail services in the North West and Yorkshire, with direct services to Blackpool (5tph), Lancaster (3-5tph), Blackburn (2tph), Bradford (1tph), Leeds (1tph), Wigan (4tph), Bolton (3tph), Manchester (4tph) and Liverpool (1tph direct with up to 3tph via Wigan or Ormskirk).

Other local stations at Salwick, Leyland, Lostock Hall and Bamber Bridge provide access only to a limited set of Northern Rail services and none of the long distance WCML services that benefit Preston railway station.

The Preston urban area has a local bus network connecting local communities and the city centre with at least hourly services run by Preston Bus and Stagecoach.

Within the North West Preston area, Tanterton, Ingol and Lea have direct bus services into Preston City Centre with a frequency of 3 or 4 buses per hour. Cottam is served by the Preston Orbit (circular) bus route which connects Cottam with Lea, Ingol and the city centre as part of a wider loop around the Preston urban area.

Longer distance bus routes across Lancashire are accessible from Preston Bus Station. Locations accessible by bus include Blackpool, Lancaster, the Ribble Valley and Skipton, Blackburn, Burnley, Leyland, Chorley, Bolton, Wigan, Southport and Liverpool.

The existing key road network, rail network and public transport hubs in Preston and the local surrounding area can be seen in Figure 2-1.

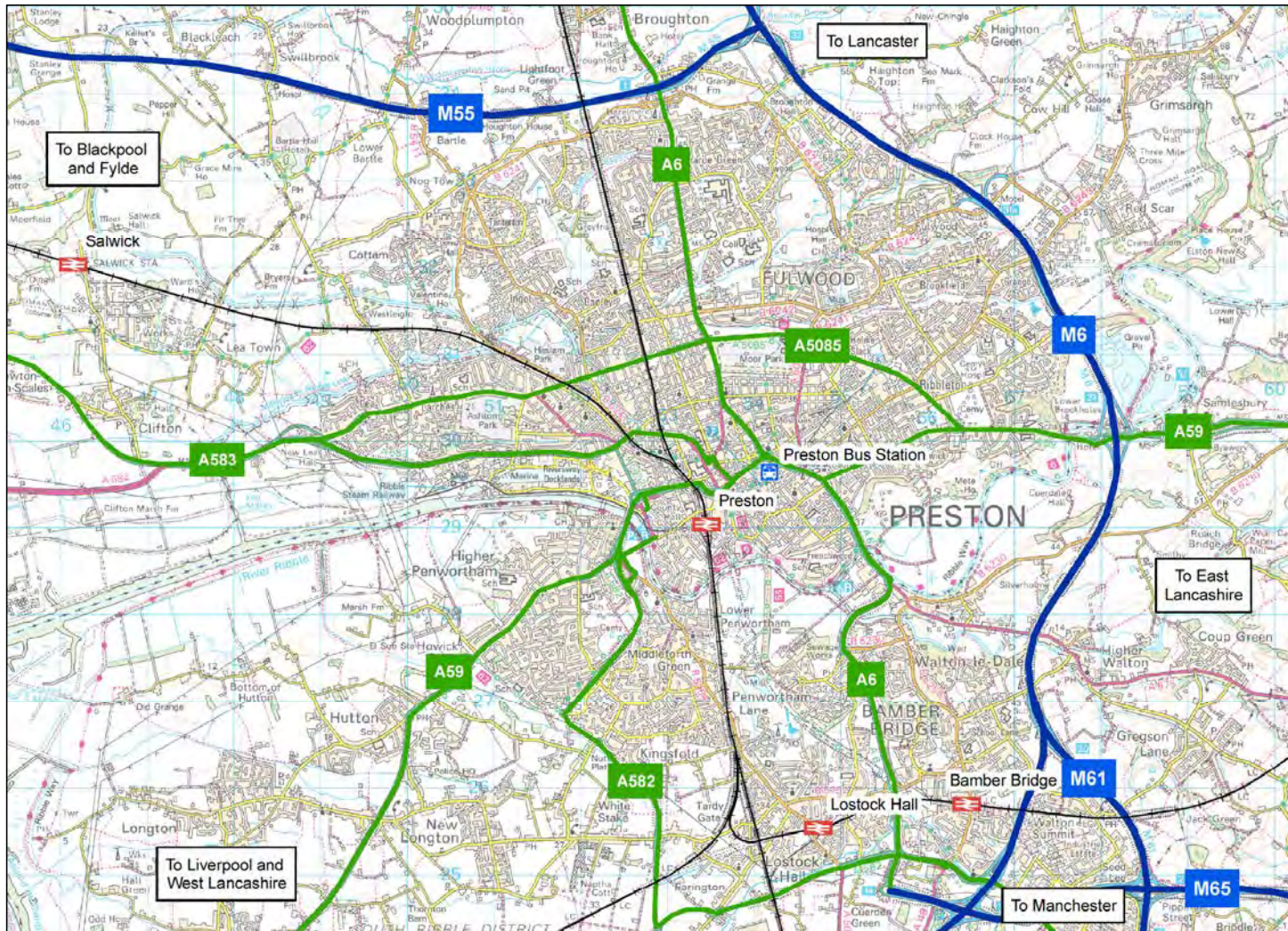


Figure 2-1: Existing Transport Infrastructure

Figure 2-2 below highlights the key strategic movements in Central Lancashire as identified in the Central Lancashire Transport Masterplan (CLTM).

This demonstrates the extent of non-motorway movements that pass through Preston itself, therefore placing greater demand on the A-road network and river crossings.

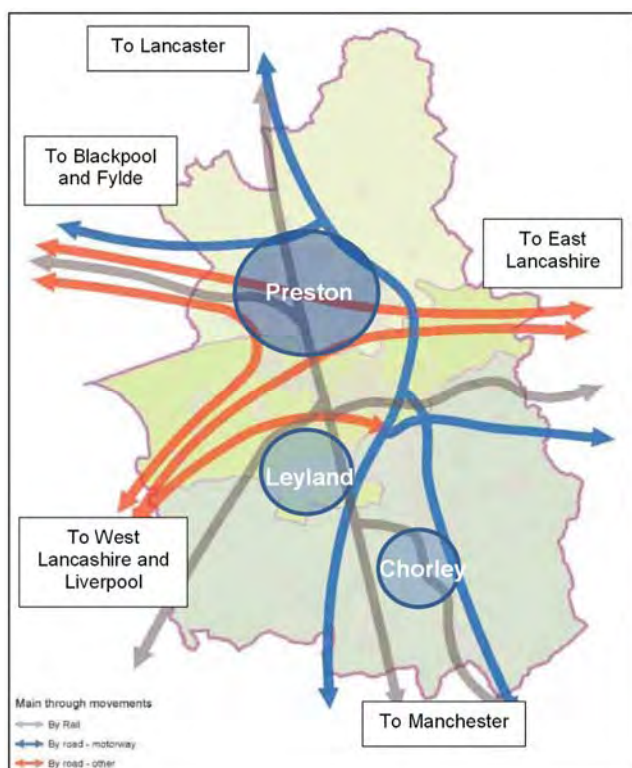


Figure 2-2: Strategic Movements through Central Lancashire

Table 2-1 shows the observed Annual Average Daily Traffic (AADT) flows on the arterial routes in Preston, to and from Preston, and the strategic road network and how they compare with the standard DMRB Congestion Reference flows (CRF) for this type of road – across the day.

Road	Observed AADT of arterial routes (2-way, vehicles)	Congestion Reference Flow
A6 (North of Preston)	25,000	21,000
A6 (South of Preston)	36,000	33,000
A582	32,000	32,000 / 58,000
Tom Benson Way	12,000	21,000
Eastway	15,000	21,000
A583	26,000	33,000
A5085	11,000	21,000
A59	32,000	25,000 / 58,000
M6 J31a-J32	98,000	130,000
M55 J1-J3	54,000	97,000

Table 2-1: Arterial Route AADTs

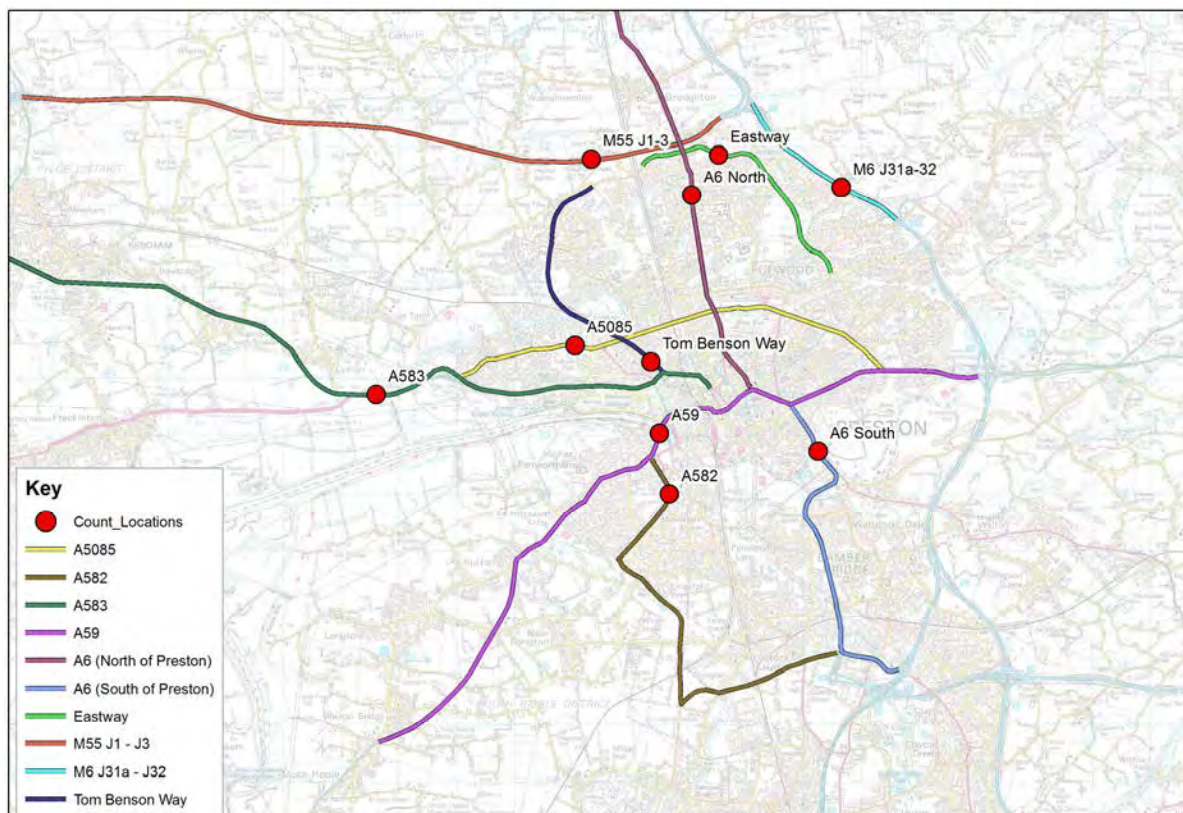


Figure 2-3: Arterial Route AADT Locations

The highest flows are on the motorway network M6 and M55 around Preston as would be expected.

Running north-south through Preston, the A6, A582, Tom Benson Way and Eastway carry the largest volumes of traffic, whilst east-west, the A583, A5085 and A59 carry the largest amounts of traffic.

Comparison of the observed AADT to CRF traffic levels shows that some of the roads (A6 north and south of Preston, the A59 within Penwortham and the single carriageway sections of the A582) carry more traffic than they were designed to. It should be noted that the CRF applies to the link capacity only and the effect of junctions must be considered separately.

As Preston is a major employment hub, the city acts as a large net importer of labour both from within Lancashire and from outside of the county with a net inflow of around 23,000 commuting trips. This is demonstrated in

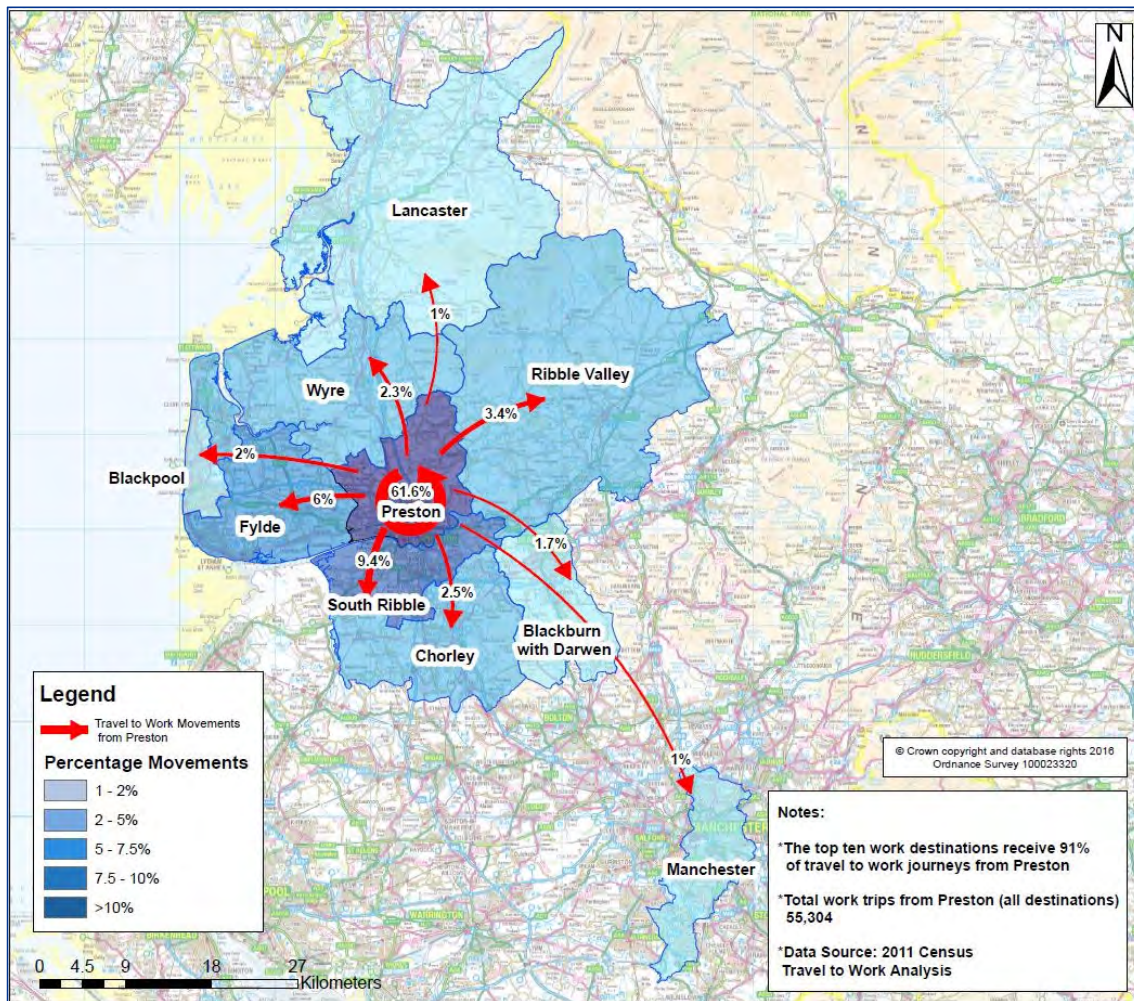


Figure 2-4: Top Ten Travel to Work Movements from Preston

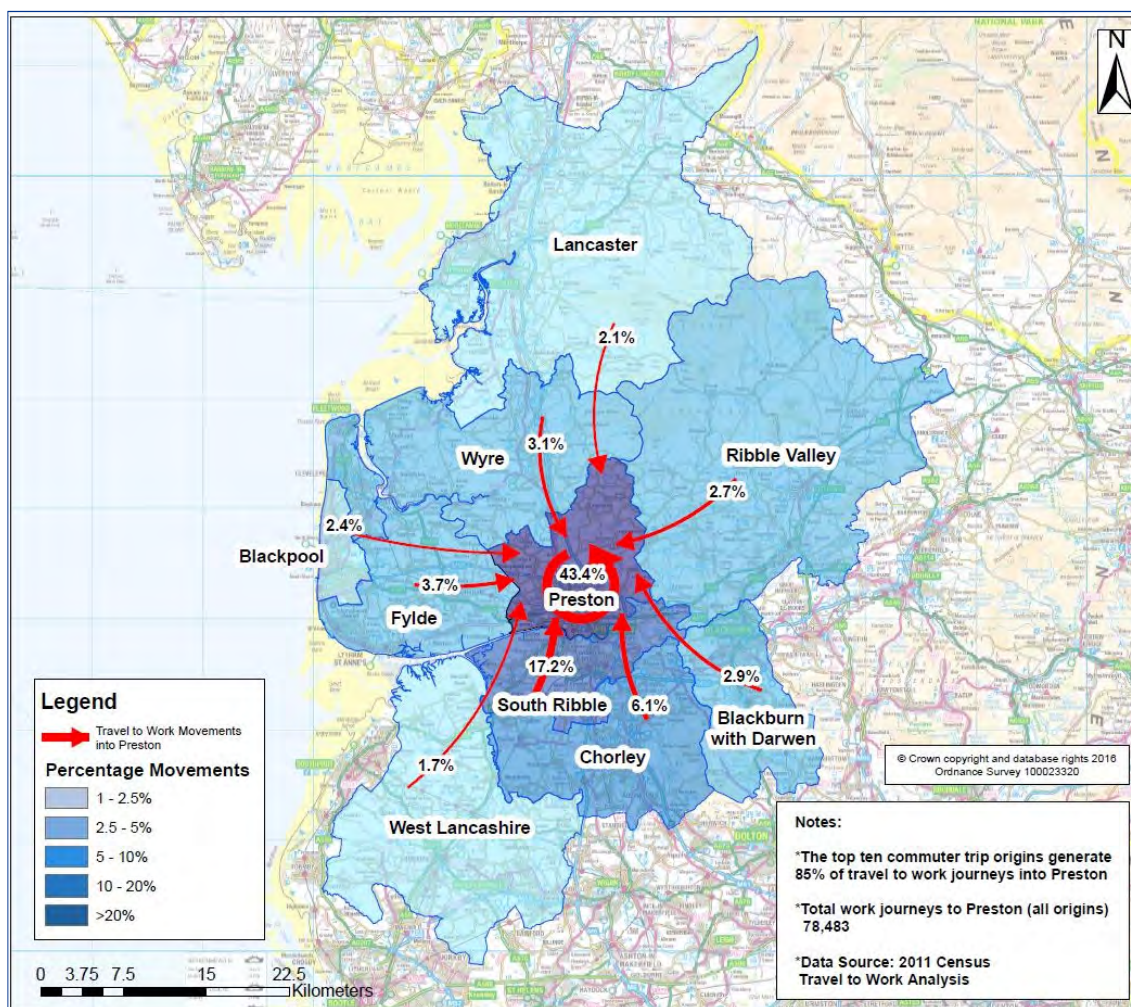


Figure 2-5: Top Ten Travel to Work Movements into Preston

Private car is the predominant mode of transport and the main method of commuting in comparison to the public transport alternatives within the Preston District. As shown in Table 2-2 the percentage of people driving to work by car (59%) and as a passenger (7%) is significantly larger than rail (1%), Bus (11%) or walking and cycling (16%).

These values are consistent with the values for England.

Walking and bus travel together account for 25% of commuter trips in Preston which is 6% higher than the North West average.

This is likely due to the urban nature of Preston where journeys will be shorter compared to the rural journeys included in the regional and national averages, and the limited lack of local rail services in particular, meaning that bus is the only public transport option available for most trips within the Preston area.

Method of Travel to Work	Percentage of People in Employment		
	Preston	North West	England and Wales
Driving a car / van	59%	63%	58%
Passenger in car / van	7%	6%	5%
Bus	11%	8%	7%
Train	1%	3%	5%
Walking	14%	11%	11%
Cycling	2%	2%	3%
Other (including working from home)	6%	7%	11%
Total	100%	100%	100%

Table 2-2: Method of Travel to Work (2011 National Census)

The population's reliance on the car is also reflected in the high level of car ownership.

Table 2-3 below shows that 75% of households within Central Lancashire and 69% of the households within Preston own at least one car or van, and 31% and 26% respectively own two or more vehicles.

This compares to 75% of households in England which have one car or van and 30% which have two or more car or vans.

No. of cars in the household	Preston	Central Lancashire	England
No cars or vans	31%	25%	25.6%
1 car or van	42.2%	43.4%	42.2%
2 cars or vans	21.3%	24.7%	24.7%
3 cars or vans	4.1%	5.2%	5.5%
4 or more cars or vans	1.4%	1.7%	1.9%

Table 2-3: Car Ownership (Census 2011)

The high dependency on private vehicles contributes to congestion in the Preston urban area, as the next most popular mode - walking - is generally limited to short distance trips only.

Most public transport journeys are made by bus which must share the road space with other vehicles. This leads to poor journey times and poor journey time reliability on bus services.

There are also very limited local rail alternatives.

Currently, no rail station serves northwest or indeed northern Preston. The nearest stations are at Preston where the Lancashire wide rail network and West Coast Mainline services can be accessed, or Salwick in Fylde which is an infrequent, peak period only halt for the Blackpool South - Colne service.

As a result, the high dependency on private vehicles contributes to congestion in the Preston urban area, as the next most popular mode - walking - is generally limited to short distance trips only.

Analysis of congestion along the key arterial routes during the morning and evening peak times has been undertaken using Traffic Master data collected in September – November 2013. The results of the analysis are shown in Figure 2-6 and Figure 2-7 for both AM and PM peaks periods respectively. It can be seen that there are multiple locations along the key arterial routes where the average traffic speed is below 20mph.

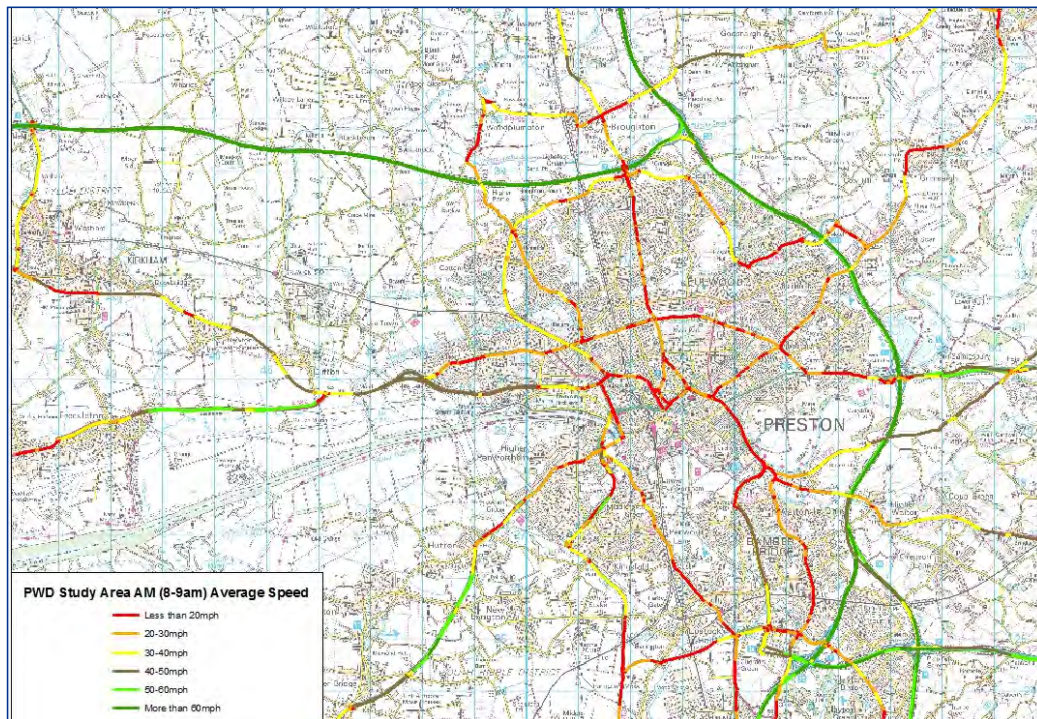


Figure 2-6: Traffic Master Average Speeds - AM

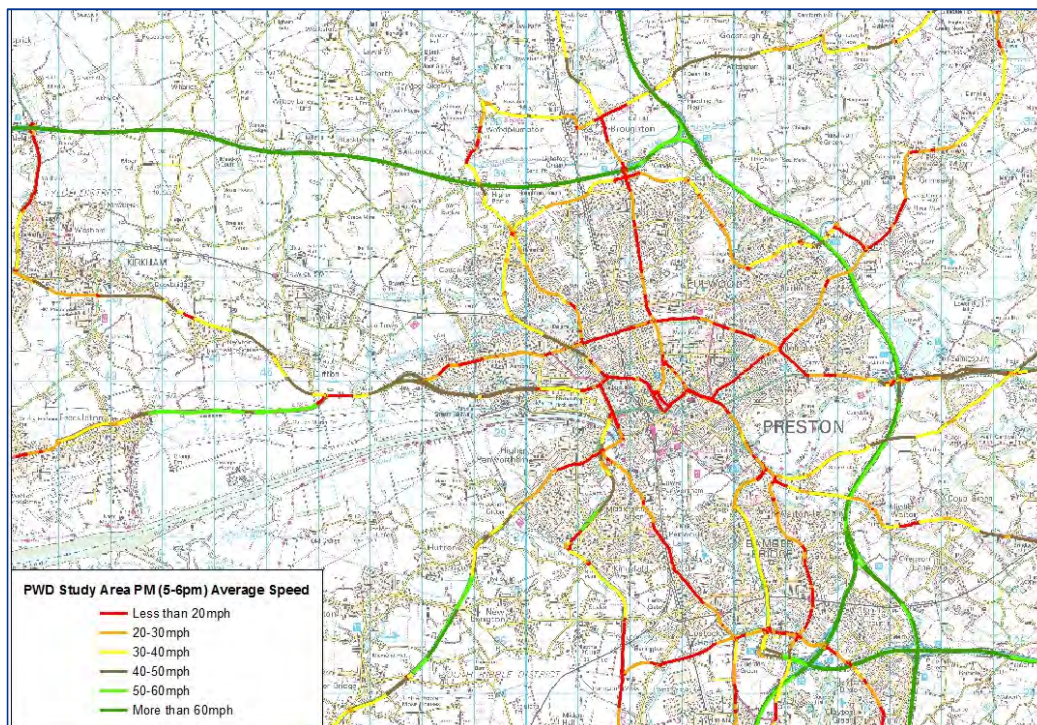


Figure 2-7: Traffic Master Average Speeds – PM

Congestion also results in significant delays to traffic at key junctions in Preston; rather than just slow speeds in TrafficMaster data. Table 2-4 below shows a list of junctions with significant delay per vehicle on the approach in either AM or PM peak.

These junctions have been identified by local council specialists based on local knowledge and this is consistent with the outputs from the Central Lancashire Traffic Model (CLTM) which show delays of over 30 seconds per vehicle at these junctions. The table shows that the junctions with significant delays are comprehensively spread on all key routes to and from Preston.

Junction Number	Major road	Junctions with Significant Delay
1	M55	J1 Off-Slips to A6
2		A585 approaches to J3
3	M6	M55
4		M61
5	A6	Broughton Crossroads
6		Eastway
7		Lightfoot Lane
8		Black Bull Lane
9		B6242
10		A5085
11		Aqueduct Street
12		Sedgewick Street
13		Church Street
14		A59
15		Capital Way
16		A582
17		B6258
18	Eastway	Wychnor
19		A6
20		Sherwood Way
21		B6421
22	Tom Benson Way	Tulketh Brow
23		A583
24	B5411	A5085
25	A5085	Lea Road
26		Pedders Lane
27		Brook Street
28		A6
29		Miller Road
30		B6243
31		Sir Tom Finney Way
32	A583	Freckleton road (Kirkham)
33		Pedders Lane
34		Port Way
35		A5072
36	A584	Kirkham Road (Freckleton)
37	A59	Lindle Lane
38		Cop Lane
39		A582
40		A5072
41		Wellfield Road
42		Bow Lane
43		M6 J31

44		Arnhem Road
45		Scotforth Road
46		A6
47		Friargate
48	B5254	Through Lostock Hall
49		A59
50	A582	Chain House Lane
51		Croston Road
52		B5254/A5083
53	B6242	M6 J31a
54		B6421
55		M6 J31a

Table 2-4: Major Road Junctions with Significant Delay

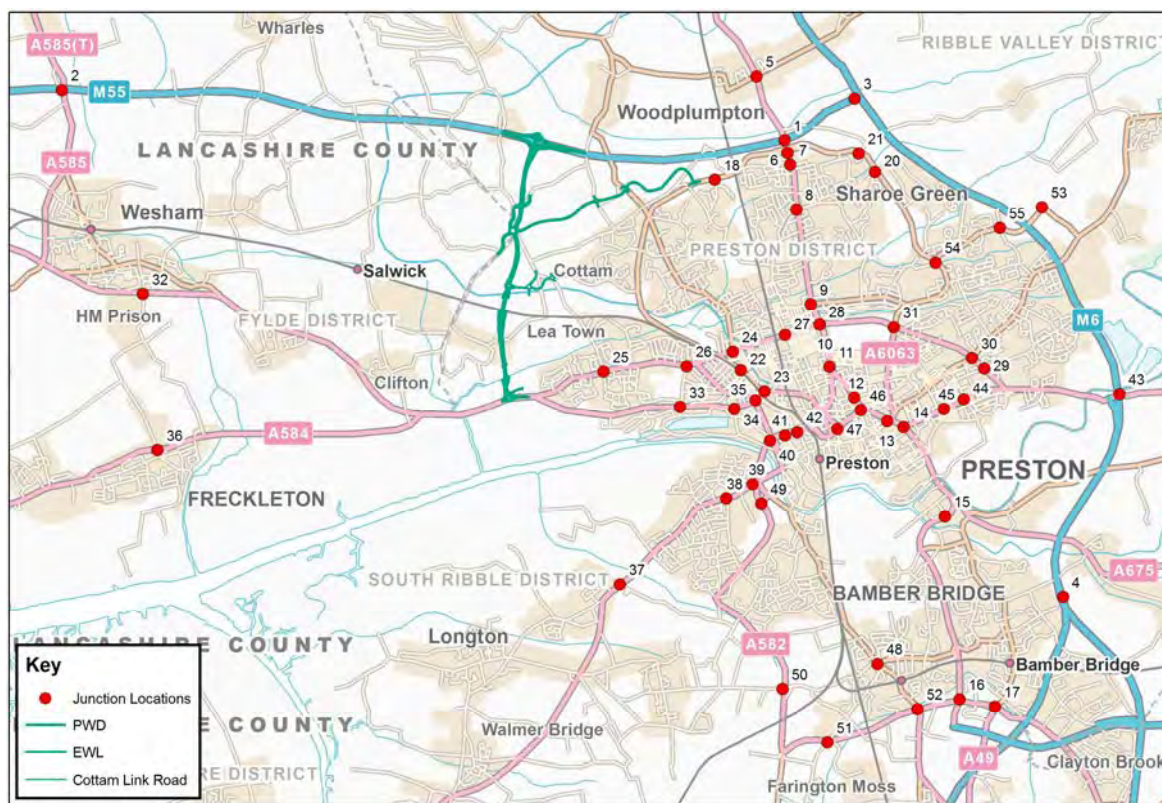


Figure 2-8: Major Junctions with Significant Delay (2014)

The analysis shows significant delay at junctions is present on the approaches to Preston on the A582, A583, B5254 through Lostock Hall, Tom Benson Way, A59 (both east and west of Preston) and A6 (both north and south of Preston). It is also notable that the Eastway / A6 junction south of M55 J1 experiences delay as does Lightfoot Lane in 2014 as well as the M6 between J29 and J31a.

Access to the strategic road network is subject to significant delay as well. Queues are present in the morning and evening peaks on the approaches to the M55 J1. This junction provides strategic access to the north of Preston via the A6 but the current level of demand is causing congestion on both M55 J1 and the A6.

In addition, the M55 J3 approaches on the A585 also have peak time delays. This junction is not only the primary access point for Kirkham and Wesham, but also for traffic to Warton and the Enterprise Zone.

There are 3 Ribble crossings (excluding the M6), all of which experience delay on the approaches in both peak periods. The limited river crossing capacity causes the 3 existing bridges to act as pinch points on the Preston road network.

Orbital routes around Preston also experience significant delay including the M6, sections of the A5085 in an arc around the north of Preston centre, Lightfoot Lane north of Preston and the A582 and Chain House Lane around Lostock Hall.

The CO2 emissions are highest in 'stop-start', slow speed conditions. Congestion in Preston District is therefore likely to be responsible for high levels of CO2 emissions.

Accesses to/from key employment sites in and around Preston are affected by congestion resulting in significant losses to the economy and frustration for the commuters. The location of key employment sites is shown in Figure 2-9

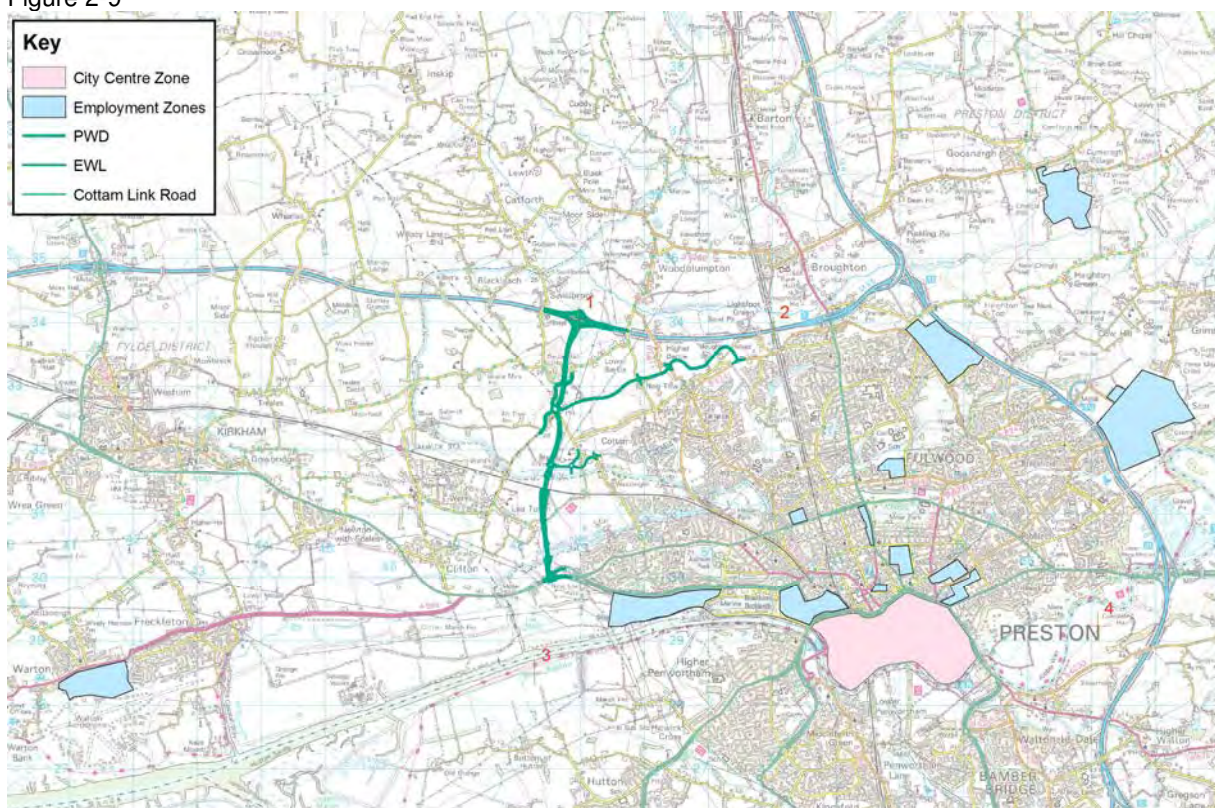


Figure 2-9: Key employment sites

Problem 1: Congestion

Congestion in the morning and evening peak periods cause lengthy travel times and poor journey time reliability for strategic east-west and north-south traffic through Preston. It is preventing ease of access to/from key employment sites, as well as causing delays and frustration for motorists and increased CO2 emissions.

Significant delay is present on key approaches to the strategic road network, and especially at M55 J1 and J3 in particular.

Congestion, even at current traffic levels is comprehensive, and is present on all key arterial and radial routes to/from the City.

Congestion in central Preston leads to long and unreliable journey times to/from (and between) Warton and Samlesbury. The route between the two sites is of particular importance to local economy as it links the two Enterprise Zones (which together form the Lancashire Enterprise Zone).

In 2014 Jacobs undertook a study of the route linking two Enterprise Zone sites (Warton to Samlesbury Route Management Strategy, Jacobs, 2014) which concluded that the majority of the route functions are currently underperforming due to traffic congestion in key areas along the route.

The alternative route to Warton is via the M55 J3 and either along the A585/A584, or more typically via local rat-runs in the AM/PM peaks via Wrea Green to access Warton. However, the routes are constrained by nature of the narrow rural roads with restricted driver sight, and are not designed for such traffic presently- or indeed for future growth at the site.

Poor access to/from Warton Enterprise Zone results in slow journey times and poor journey time reliability for employees, suppliers and customers thus constraining the potential of one of the fastest growing enterprise zones in the country.

Problem 2: Warton Enterprise Zone accessibility

The present access to/from Warton from M55 J3 is a major constraint and issue to accessing the strategic road network from the Lancashire Enterprise Zone sites and one the core centres of advanced manufacturing in the country.

As was demonstrated in Table 2-2 most public transport journeys in Preston are made by bus. For many trips bus is the only sustainable alternative to car due to limited local rail alternatives in Preston and insufficient 'public realm' or highways space to prioritise walking and cycling.

Buses however must share the road space with other vehicles and suffer the same delays as other road users unless there are dedicated bus lanes; of which there are presently few in Preston. This leads to long journey times and poor journey time reliability on bus services whilst current network simply does not have enough spare capacity to allow bus priority measures to be installed.

Problem 3: Poor bus journey times and reliability

Bus journeys have long journey times and poor reliability, notably on the A6 corridor, due to lack of capacity on the existing road network

It needs to be noted on each of the points above that the analysis is undertaken prior to future growth from development and background traffic sources, which is additive to the issues presently observed.

As a result of congestion, and limited capacity on the majority of routes, accidents totals, and accident rates, are also an issue in Preston. Analysis of accident rates has been undertaken, based on recent observed accident data from 2010-2014. For the key roads, a simple analysis has compared the observed accident rate with the national average expected for a road of that type. These national average rates are based on those used within COBA-LT, the industry-standard software used for the appraisal of the accident savings on major highway schemes.