

M62 junctions 18-29 route-based strategy March 2013



Document history

M62 junctions 18-29 route-based strategy

Highways Agency

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Executive summary

Introduction

The development of this route-based strategy flows from the recommendations of Alan Cook in his report *A Fresh Start for the Strategic Road Network*. The strategy has clearly identified the role which the M62 between junctions 18-29 has to play in the developing economies of both Greater Manchester and West Yorkshire. Whilst it is not evident that demand for city to city trips between Leeds and Manchester is currently, or will become, significant, the whole route provides a vital trans-Pennine link for long-distance and predominantly commercial traffic.

It is clear that there exists a conflict in demand for the capacity of the corridor between that traffic undertaking long distance journeys, linking ports, industry and end-users, and local traffic, mainly commuter based, which hops on and off the network along the urban sections. This highlights the need for the adoption of a balanced approach to developing and managing the route to ensure that the strategic function of the route (as part of the strategic road network, Strategic National Corridor, Trans European Network - Transport and United Nations Economic Commission for Europe International E-road network) is maintained while accommodating this local usage of the route where possible.

Both national and local growth strategies rely on the strategic road network to deliver their objectives, but in turn the success of meeting these objectives puts an even greater pressure on the network. The analysis within section 2 identifies the current pressures on the network, with section 3 forecasting this into future years to demonstrate the likely future pressures. Without a planned approach, this could lead to problems, including economic and environmental disbenefits, with the network becoming particularly vulnerable to these increasing pressures.

Maintaining availability of the asset through effective maintenance, development of new infrastructure, working closely with partners and road users and taking a long view on funding and asset condition will ensure the future efficiency of this important route.

Scope and context

Scope

The purpose of the route-based strategies is to inform the investment strategy for the network on a route by route basis, including operations, maintenance and any enhancements for the next spending review period and 10 years beyond that. It looks to facilitate economic growth, continue to manage journey time reliability and safety performance and maintain a resilient asset. The key objectives for the strategy is to: test the approach to inform how they will be implemented in the

future; address road based issues on the strategic road network, forming the basis for making decisions on funding for the next spending review period; be a mechanism to engage with local stakeholders, to bring together national and local priorities and deliver tangible results that are strategically focused and realistic.

Context

The M62 has been the subject of a number of strategic studies in recent years, all recognising the strategic importance of the route between ports and the potential for linking the economic centres of Manchester and Leeds City Regions. Fundamentally the M62 (incorporating the northern section of M60) is an important trans-Pennine link in the strategic road network. The route specifically being considered in this route-based strategy, between junctions 18 (Simister) and 29 (Lofthouse), is of direct significance to a number of local authorities in West Yorkshire and Greater Manchester and is key to road-based access of Manchester Airport and large freight distributors further afield. In this respect, the Highways Agency has been working closely with all of the local authorities in relation to their development plans and this route-based strategy considers the implications of these economic growth aspirations across the corridor, while also comparing them against the Department for Transport's predictions for traffic growth over the same period.

The 37 mile corridor is made up primarily of dual 3 lane motorway, with 4 lane stretches in some parts and is currently undergoing an upgrade to managed motorway between junctions 25-30. Leeds and Manchester are two of the ten largest urban areas in England, each city at the heart of their respective City Regions, and the M62 forms part of a direct motorway link between the two cities carrying a wide variety of passenger and freight traffic. The M62 as a whole is designated as part of the Trans European Transport Network. The route has distinct inter-urban sections (junctions 18-21 and junctions 23–29), with the middle section being through a rural Pennine landscape and containing the highest point on a motorway in England, bringing with it a high risk of disruption during severe weather. There currently exists no local high capacity alternative strategic trans-Pennine route on which to divert road users should the M62 become unavailable due to an incident, road works or a severe weather event, leading to congestion on local roads adjacent to the corridor when such closures occur.

The length between junctions 18 and 22 is managed and maintained under the Asset Support Contract in Highways Agency Area 10, whilst junctions 22 to 28 is managed and maintained under the Managing Agent Contract in Highways Agency Area 12. The link between junctions 28 and 29 is managed and maintained as part of the M1-A1 (Lofthouse to Bramham) Link Design Build Finance Operate (DBFO) contract by Connect (M1-A1) Ltd.

Capacity and capability of the route and future requirements

In sections 2 and 3 both current and future operation of the route has been considered in relation to a number of indicators and the views of directly affected stakeholders, including local enterprise partnerships, local authorities, existing and emerging local transport bodies and significant traffic generators. Previous studies have also been taken into account as well as the variety of strategic demands on the route at a local, national and international level, linking the main centres of population and facilitating access to ports and airports.

In particular, the future demand on the route has been analysed based on the development aspirations of all local authorities bordering or directly affecting the route.

The following operational themes have emerged from this analysis:

- Current **operational performance** issues in the peak period demonstrate specific issues in the more urban lengths of the route, most notably (but not limited to) the West Yorkshire element of the network to the west of Leeds. This performance is expected to improve by 2018, due to the benefits being achieved by the managed motorway schemes being implemented / planned. However, by 2028, the route will again be nearing capacity in some locations and the conditions on eastern section of the route are expected to deteriorate, with the issue (as now) concentrated in the more urban areas.
- Existing **highways safety** concerns are seen along the route, with much of its length having an accident rate above average for the rest of the strategic road network. Specific issues have been identified in terms of locations of accident intensity, causal effects (such as snow, ice and wet conditions), accident types (including those involving single vehicles and heavy goods vehicles) and locations of accident clusters / fatal accidents. Up to 2028 increased flows on the network are likely to exacerbate existing safety issues across the route, although committed schemes such as the managed motorway schemes should offer benefits.
- The current **condition of the asset shows** that there are areas of asset deterioration along the route, though much of this will improve as a result of managed motorway schemes. Structures are ageing and may require significant levels of maintenance during the strategy period. For the future, a well planned and programmed maintenance regime is needed to maximise route availability and minimise disruption due to maintenance and repairs.
- Some parts of the route already carry various **environment** related designations. Where air quality is measured by the Highways Agency, the EU defined limit values are exceeded. There are a number of Department for Environment, Food and Rural Affairs noise first priority locations, but noise data is not commonly measured or reported across the network.

- At an **operational management** level, there are a high number of incidents across the length of the route, presenting location specific issues. Diversion routes are in place, but are not strategic high capacity alternatives. Indeed, because of the geography of the route in extreme weather conditions these have a high probability of being closed at the same time as the M62. The impact of incidents is expected to become more focussed as traffic flows on the route increase.
- Analysis has shown that with currently planned investment the route can support the growth aspirations along it until 2018 at least. Beyond that it is recognised that further work will be needed to identify the investment needed to support growth up to and beyond 2028. Indeed, this further study work should also identify areas along the route where development beyond 2028 will be feasible from a transport network perspective.

Route strategy

In order to facilitate economic growth, maintain reliability and safety and manage the asset this strategy is informed by analysis of the current use and future aspirations for the route. A stepped approach is taken in (i) identifying the desired strategic outcomes, (ii) the development of areas for intervention that contribute to these outcomes and (iii) setting out the steps to implement the strategy.

Strategic direction

Analysis has identified that the demands on this corridor will continue to grow, especially on the urban sections, for the foreseeable future. It is also clear that this growth is likely to present some fundamental problems focussed around junctions which need consideration and planning for in the immediate short term. In order for the Highways Agency to manage this growth in demand and to give a clear strategic direction for the future, we will:

- Develop **physical improvements** to the network. These must complement existing schemes to address the conflict between demand from the strategic road network and that of local traffic traversing the route and address stress where this route links to other elements of the strategic road network. Options for improvements may also influence maintenance decisions during the strategy period.
- Cooperate with partners to support **other networks' improvements** and develop a greater degree of integration with operators of other networks to achieve the most efficient use of all networks.
- Make best use of existing and emerging **technology** to improve operational efficiency by gathering data on the use of the route and by providing information to road users and the operators of other networks.

- Improve **network management** through incident management, deployment of materials and resources and by developing ways to manage access to the network.
- **Influence travel behaviour** through better informed road users who will be better equipped to decide when, where and how to travel.
- Make use of **other influences** and opportunities to access resources and support for route enhancement. The provision of long term funding or new funding sources is needed to allow the Highways Agency to plan and programme future investment over a longer term with increased certainty.
- Take a balanced view of strategic and tactical decision making within the **Highways Agency's processes** to minimise future disruption and minimise whole life costs, through delivery of a programme of quality and intelligence-led renewals.

Strategic actions

A number of potential actions have been developed in discussion with both internal and external stakeholders. These actions are not a scheme based wish list but rather explore what will be needed to maintain an accessible and efficient route with a recognition that a mix of solutions will be required. However it is clear from this strategy that the solutions are likely to involve a significant provision of infrastructure outside the scope of current funding predictions and will be further defined once the performance specification for the strategic road network has been announced. There will be a need for an even greater level of interaction with local stakeholders to balance the demands of the strategic road network and local traffic.

Throughout the development of this strategy, discussions have taken place around wider transport influences and current thinking around national transport policy, such as future initiatives (including road user charging) and funding. As this type of policy will be developed at a national level, led by Ministers and the Department for Transport, this strategy does not make any direct reference to these within the outcomes or solutions, nor does it debate the benefits or influences that they could have.

Implementing the strategy

In addition to the development and delivery of short, medium and long term actions, the implementation of the strategy will require periodic review and further study on specific issues on the network. These will include: levels of economic growth in the region; maintenance and improvement options for the asset, particularly for ageing structures; and continued co-operation with local authorities to assist in the ongoing identification of development sites and opportunities.

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Scope and
context

1



1 Scope and context

1.1 The M62 route

Background

- 1.1.1 Alan Cook's report *A Fresh Start for the Strategic Road Network*, published in November 2011, made a number of recommendations, one of which was that the Highways Agency, working with local authorities and local enterprise partnerships, should initiate and develop route-based strategies for the strategic road network.
- 1.1.2 The Secretary of State's response to the Cook review, published in May 2012, accepted the recommendation for route-based strategies, stating that it would enable a smarter approach to investment planning and support greater participation in planning for the strategic road network from local and regional stakeholders.
- 1.1.3 The Highways Agency has begun this process by developing three route-based strategies including within the North East of England, the M62 from Manchester (junction 18) and Leeds (junction 29). The route was selected as a section of the strategic motorway network that connects two major City Regions and because of known road based issues, but with as yet limited solutions identified. The strategy seeks to address road based issues, provide a mechanism to engage with local partners, and ultimately bring together the national and local priorities to agree the needs of the route.
- 1.1.4 This strategy aims to bring together the numerous national and local studies that have already been carried out on this stretch of road to inform investment decisions. Local stakeholders have also been involved in developing the strategy to ensure that their priorities have been taken into account. The impact of development on the route has been investigated as well as local business needs.
- 1.1.5 The route-based strategy does not outline a 'shopping list' of potential schemes, but rather presents a higher level consideration of which parts of the corridor will become most stressed and when this will occur, as well as a consideration of how these stresses and demands can be managed.

Scope

- 1.1.6 The purpose of the route-based strategies is to inform the investment strategy for the network on a route by route basis, including operations, maintenance and any enhancements. It looks to facilitate economic growth, continue to manage journey time reliability and safety performance and maintain a resilient asset. The key objectives for the strategy is to: test the approach to inform how they will be implemented in the future; address road based issues on the strategic road network, forming the basis for making decisions on funding for the next spending

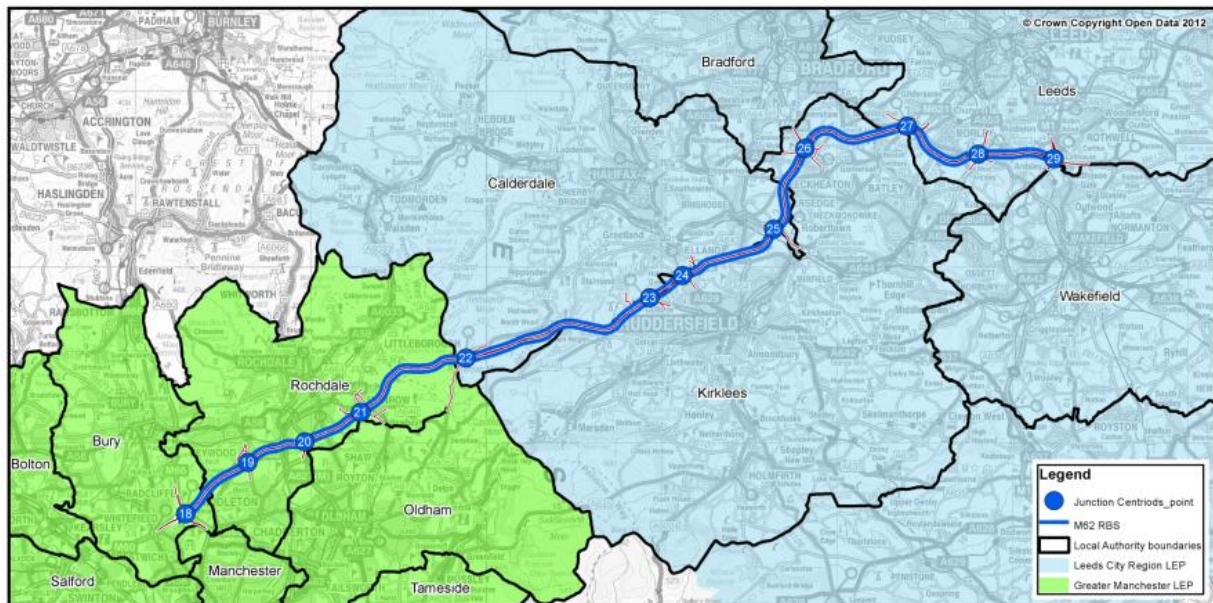
review period; be a mechanism to engage with local stakeholders, to bring together national and local priorities and deliver tangible results that are strategically focused and realistic.

- 1.1.7 This route-based strategy covers: how to achieve the strategic road network objectives on the M62, and the local priorities agreed with stakeholders; investigation of an initial five year period plus a longer term horizon (a further 10 years); considers opportunities for innovation, the role of other networks and other techniques; maintenance, operational activities and improvements including both capital and operational costs; and the impact on local roads in surrounding areas that interface with the route. The route-based strategies do not cover other forms of transport (although recognising that the strategic road network does not operate in isolation, train stations, ports, and airports all have an influence). Engagement with local stakeholders has been focussed on the strategic road network.

Overview

- 1.1.8 The M62 has been the subject of a number of strategic studies in recent years, the most recent being the *M62 Route Action Plan* (Northern Way with Highways Agency and Halcrow, November 2006) and the *Delivering a Sustainable Transport System (DaSTS) study on Trans Pennine Connectivity* (Northern Way, March 2010). It has also featured in the *Network Analysis of Freight Traffic* (Department for Transport (DfT), September 2009). All of these studies recognise the strategic importance of the M62 between ports and the potential for linking the economic centres of Manchester and Leeds City Regions. Fundamentally the M62 (incorporating the M60) is an important trans-Pennine link in the strategic road network.
- 1.1.9 As identified in fFigure 1.1 below, the M62 between junctions 18 to 29, is of direct significance to the five West Yorkshire Authorities of Bradford, Calderdale, Kirklees, Leeds and Wakefield and the Greater Manchester Authorities of Bury, Oldham and Rochdale. The route is key to road-based access to Manchester Airport and large freight distributors as far afield as Wigan and Stockport. The Highways Agency has been working closely with all of the local authorities in both the Manchester and Leeds City Regions on their development plans, all of which are at different stages of completion. Indeed, specific memoranda of understanding (MoU) or other protocols exist or are under development between the Highways Agency and some of the authorities to formalise a joint approach to the consideration of future demands on the strategic road network.

Figure 1.1 – Spatial relationship of the route



1.1.10 This route-based strategy considers the implications of the growth aspirations along the corridor within these development plans and as identified through consultation with key stakeholders. It also compares them against the Department for Transport’s predictions for traffic growth over the same period.

Route description

1.1.11 The M62 between junctions 18 and 29 is a 37 mile corridor made up primarily of dual 3 lane motorway, with 4 lane stretches in some parts. The corridor is currently undergoing an upgrade to managed motorway between junctions 25-30 which will deliver a combination of controlled motorway and dynamic hard shoulder running when it becomes fully operational in October 2013. A further managed motorway scheme incorporating junctions 18-20 is under preparation.

1.1.12 Leeds and Manchester are two of the ten largest urban areas in England, each city at the heart of their respective City Regions. The M62 forms part of a direct motorway link between the two cities and carries a wide variety of passenger and freight traffic. There are a number of freight generators in the trans-Pennine area, including a large amount of logistics warehousing and background freight demand between the ports of the Humber and Merseyside. The M62 as a whole is designated as part of the Trans European Transport Network (TEN-T) connecting Ireland with northern Europe.

1.1.13 The route has distinct inter-urban sections between junctions 18-21 and between junctions 23-29, the middle section being through a rural Pennine landscape and containing the highest point on a motorway in England. This brings with it a high risk of disruption during severe weather and particular issues linked to gradients.

- 1.1.14 The link between junctions 21 and 22 ranks as one of the worst parts of the strategic road network for vehicle fires, primarily involving heavy goods vehicles. The corridor as a whole has a higher than average number of injury road collisions than the rest of the motorway network.

- 1.1.15 Currently no local alternative strategic trans-Pennine road link of sufficient capacity exists on which to divert road users should the M62 become unavailable due to an incident, road works or a severe weather event. Signed emergency diversion routes (EDR) use local diversions which lead to congestion on local roads adjacent to the corridor.

Capacity and capability of the route

2



2 Capacity and capability of the route

2.1 Overview

- The route has a number of strategic and sometimes competing functions.
- Stakeholder consultation and a review of local strategies together have identified key issues and potential opportunities.
- Demand is focussed on the urban sections of the route from in the morning and after peaks with only a 15% reduction in demand in between these times.
- Incidents have a high potential to disrupt the route and differ between the urban and rural sections and relative to gradients and the height of some of the route.
- There are more accidents on this route than the average across the strategic road network.
- There are areas of asset deterioration across the route some of which will be addressed by the managed motorway scheme between junctions 25–30. The majority of structures are at or approaching 50 years old and may limit options for future improvements either by capacity or by condition.
- Elements of the network are covered by various air and noise environmental designations. Where air quality is measured, the EU defined limit values are exceeded.
- At an operational management level, there is a high level of incidents along the length of the route, with specific locations of incident intensity. Responsibility is shared between two Traffic Officer Service regions, with occasional need for cross-border mutual aid. There are no local high capacity strategic diversion routes. When the M62 is closed traffic is diverted onto the local road network which in extreme weather conditions is also affected.
- Previous strategies and studies including the Highways Agency/Northern Way and DaSTS trans-Pennine connectivity study have been considered.

2.2 Route overview

Introduction

2.2.1 The M62 between the Humber and Liverpool ports, including the length being reviewed, has been identified as being strategically important in both a national and trans-European context. It carries the designations of:

- Strategic road network (SRN).
- Strategic National Corridor (SNC).
- Trans-European Network – Transport (TEN-T).

- United Nations Economic Commission for Europe (UNECE) International E-Road Network.

2.2.2 These designations are further described in **Appendix A**.

Route overview and context

2.2.3 The following indicators below have been provided to better understand how the route operates currently.

Annual average daily traffic (AADT)

- The route experiences significantly high AADT levels on the urban elements of the network (notably between junctions 18-20 and junctions 25-29), with lower levels on the more rural elements (between junctions 20-25).
- When benchmarked against all 822 links on the strategic road network in the northern region, all but one of the links sit within the top 20% of links in terms of AADT, with all those in the urban areas (junctions 18-20, junctions 25-27 and junctions 28-29) being in the top 5% of links.

Traffic profiles

- The peak hours (morning 7am – 8am / evening 4pm – 5pm) sees average traffic levels across the network approaching 4,500 vehicles per hour (maximum traffic levels approaching 5,500 vehicles per hour).
- During the inter-peak period (between 8am and 4pm) these levels do not fall away significantly from the peak period, with average traffic flow levels remaining above 3,500 vehicles per hour.
- Average weekday daily traffic levels along the route are 60,000 vehicles each way, with little deviation between each day of the week (a slight increase through the week from Monday to Friday), and average weekend daily traffic levels at 43,000 vehicles per direction, with little deviation between Saturdays and Sundays.
- The seasonal profile is typical with notably higher levels of traffic between June and October and notably lower levels during January and December, when flows tend to be only 85% of the peak monthly levels.

Vehicle delay

(Average vehicle hour delay per km – all traffic travelling below free flow speeds.)

- Vehicle delay is most prevalent on the sections of the network between junctions 23-24 and 25-27 in both directions and westbound between junctions 29-27.
- Less intense delay is prevalent in the other urban elements of the network, with the rural section (junctions 20-23) having lower levels of delay.
- When benchmarked against all 822 links on the strategic road network in the northern region, the sections identified above as having significant levels of

delay sit within the top 10% of links. While less intense delay has been identified for all other links, all but five of the links on the M62 sit in the top 30% of links.

‘On-Time’ reliability

(‘On-time’ reliability identifies the average monthly percentage of link transits (journeys) on time – link transits are defined as on time if the journey time is equal or faster than a defined reference journey time.)

- The greatest issue of reliability exists between junctions 21-22 and junctions 26-27 in both directions, where the percentage of link journeys on time is below 70%.
- All other elements of the route have less severe reliability issues.
- When benchmarked against all 822 links on the strategic road network in the northern region, while the sections above have been identified as having the greatest issue with reliability, only one of them (junctions 27 to 26) sit in the top 20% of links.

Freight

(As identified in the *Network Analysis of Freight Traffic* (DfT, September 2009))

- A number of sources of freight traffic exist along the route including logistics warehousing (along the Manchester-Liverpool and Leeds-Wakefield elements of the corridor); the Port of Liverpool; the Humber Ports and oil refineries; the peak district quarries; and major population centres.
- The busiest section on the route corridor is that through the Leeds/Bradford area. Of the 70,000 vehicles per day on this section, between 8,000 and 9,000 are HGVs (15% of traffic or 28% in passenger car unit (PCU) terms). (*Note, PCU is the standard unit to measure the volume of traffic, to enable different vehicle types to be taken into account*)
- The corridor is dominated by domestic freight traffic (at 90%) and also dominated by very short distance movements (50% of heavy goods vehicles travelling less than 100km).
- Between 10% and 15% of overall freight traffic is in the morning and evening peak hours.

Trip patterns

(Based on 2001 Census ‘Journey to Work’ data)

- The journeys between Manchester City Region and Leeds City Region are not as prevalent as others (e.g. those between Leeds City Region and Sheffield City Region) and are relatively balanced in either direction. Car drivers (at 84%) represent the main mode share for such movements.
- In relation to these movements at a local authority level, of those trips between the Leeds City Region (as a residential origin) and Manchester City Region (as

a work destination), the main origins are Kirklees (30% of such trips), Calderdale (28%) and Leeds (16%). Of those trips between the Manchester City Region and Leeds City Region, the main origins are Rochdale (18%) and Oldham (15%).

- 2.2.4 The route extends across two Highways Agency regions (North West and North East) and two operating areas (Area 10 and Area 12 respectively).
- 2.2.5 The route includes the highest point on a motorway in England – between junctions 21 and 22 at 1,220 feet or 372 metres above sea level, and has some of the steepest inclines – between junctions 21 and 22 where the gradient is around 4% (a 1 in 25 slope).

2.3 Stakeholder information

Overview

- 2.3.1 Stakeholder engagement has been integral to the understanding of the role that the M62 fulfils. It is vital to the route-based strategy to emphasise that, while being distinguished in relation to the ownership and classification of routes, the road network acts as a single entity with road users concerned with the performance of their journey irrespective of these classifications.
- 2.3.2 As outlined in section 1, the Highways Agency already works closely with all authorities in both the Manchester and Leeds City Regions. Through direct engagement with stakeholders as part of this route-based strategy, the aim has been to define the local priorities for the route and use these with the strategic road network priorities and information on future traffic levels of the network to define what outcomes we are collectively trying to achieve on the route to support economic growth.

Stakeholder engagement

- 2.3.3 We engaged with key representatives from local authorities along the route (including planning, transport policy and highways teams), partners from the Leeds City Region, West Yorkshire Integrated Transport Authority (ITA), Transport for Greater Manchester (TfGM) and Manchester Airport Group, collectively representing the Leeds and Manchester local enterprise partnerships, and members of staff from the Department for Transport.
- 2.3.4 The detailed findings from the stakeholder engagement event are provided in **Appendix B**, with a summary of the themes provided below:

M62 route now:

- Route function – strategic/local; relationship with other modes.
- Operational performance – key locations and causes of performance issues.
- Route management – diversion strategy and incidents.

- Barriers to economic growth.

M62 route in the future:

- Development aspirations – key locations and scale of development.
- Transport influences – strategic road network and wider planned interventions (including other modes).
- Future traffic situation – likely future issues on the route.
- Future barriers to economic growth.

Potential Solutions:

- Physical solutions – dealing with identified issues.
- Improvements to other networks – including rail and bus.
- Technology interventions – role of transport and wider technology.
- Network management – incident management and diversion routes.
- Opportunities to Influence travel behaviour.

Stakeholder strategy / policy

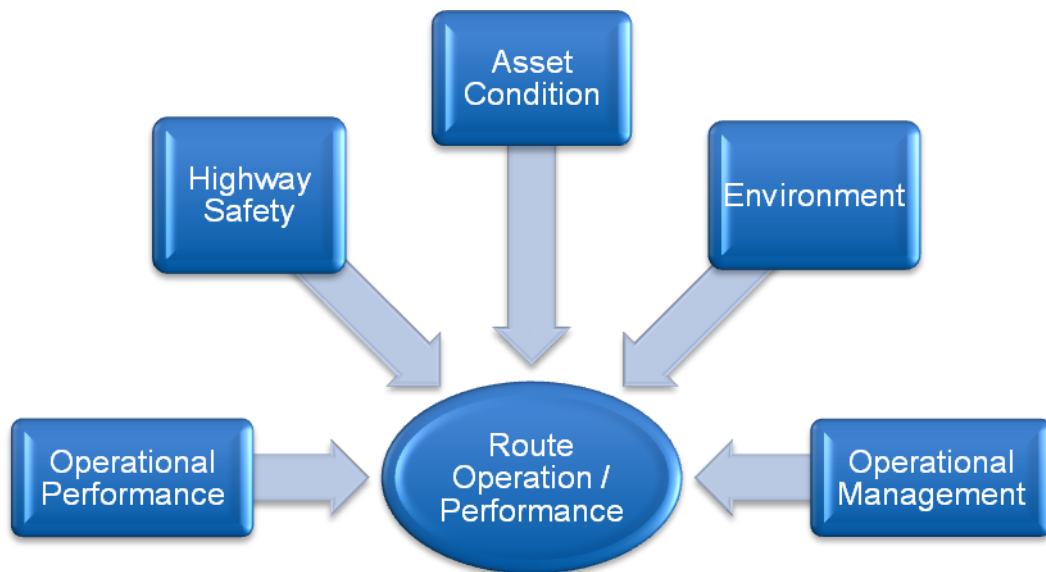
2.3.5 In addition to these discussions the planning and transport strategies and policies of the stakeholders have been taken into account. This is vital in understanding the role that the route plays in supporting the local economy and also in understanding the relationship between the M62 route and the local road network in terms of their capabilities, capacity and interface.

2.3.6 Other relevant stakeholder information gained from previous liaison (for example, in relation to the recent Pinch Point Programme submissions) is considered at relevant points within the strategy.

2.4 Route operation and performance data

2.4.1 Operation and performance of the route has been considered in relation to the themes shown in figure 2.1 below. These are indicators which, with further study will help us to understand the underlying issues which will need to be addressed in the future.

Figure 2.1 – route operation and performance – themes investigated



2.4.2 These themes are cross-cutting in terms of facilitating economic growth, continuing to manage journey time reliability and safety performance and maintaining a resilient asset.

Operational performance

2.4.3 The route serves a vital role in supporting both the national and local economies, providing road space for long distance strategic freight traffic as well as more localised business and commuter related traffic. The following section analyses the current demand on the route. The assessment method is described in **Appendix C**.

Assessment outputs

2.4.4 The findings of this analysis for the morning and evening peak hours are contained in figures 2.2 and 2.3 respectively. These provide an overview of the operation of the route showing both links and junctions. The following commentary explains how to interpret what is shown:

- In each of the diagrams the operation of the route is shown through a series of coloured links and circles. The links represent the stretches of mainline carriageway that lie between each junction, with the circles representing the junctions (the inner circle showing the operation of the slip roads and the outer ring showing the operation of the local road approaches and circulatory carriageway).
- For the links, the colours on the links represent the relative flow compared with the capacity, where:

- i. Green: the demand flow is up to 85% of the capacity across the peak hour, therefore this can be considered as free flowing;
 - ii. Amber: the demand flow is between 85% and 100% of the capacity across the peak hour, therefore the link may have a breakdown in movement due to flow at certain times in the peak hour;
 - iii. Red: the demand flow is over the available capacity across the peak hour; and
 - iv. Purple: these links have to be considered in a different way. There are certain areas across the network where the speed is below 60% of the designated speed of the road for over half the peak hour. These links are *speed-stressed* and therefore have another factor besides the capacity of the road limiting the flow. It is often the case that a junction is causing a queue on the link meaning that both the flow and the speed are low. These links remain purple in future years unless a scheme is in place that will cause the speed-stress to be removed.
- The number shown adjacent to each link is the anticipated flow on the link in passenger car units (PCUs). The use of PCUs makes certain that heavy goods vehicles are accounted for fully in the assessment by assigning road space used rather than counting a single vehicle.
 - For junctions, operation is shown by the relative increase in journey time due to the movement of traffic on either the strategic road network (inner circle) or the local road network (outer circle):
 - i. Where the inner circle or the outer circle is shown as green there is no delay caused by traffic on either the strategic road network or the local road network.
 - ii. If either the inner circle or outer circle is yellow, amber or red then this section of the journey time is either twice, three or four times as long than expected.
 - iii. Where the junction number is shown as grey no data has been collected. The outer circle is also shown as grey at junctions with no connection to the local road network (e.g. junction 18 and 29).

Figure 2.2 – 2011 morning peak network operation

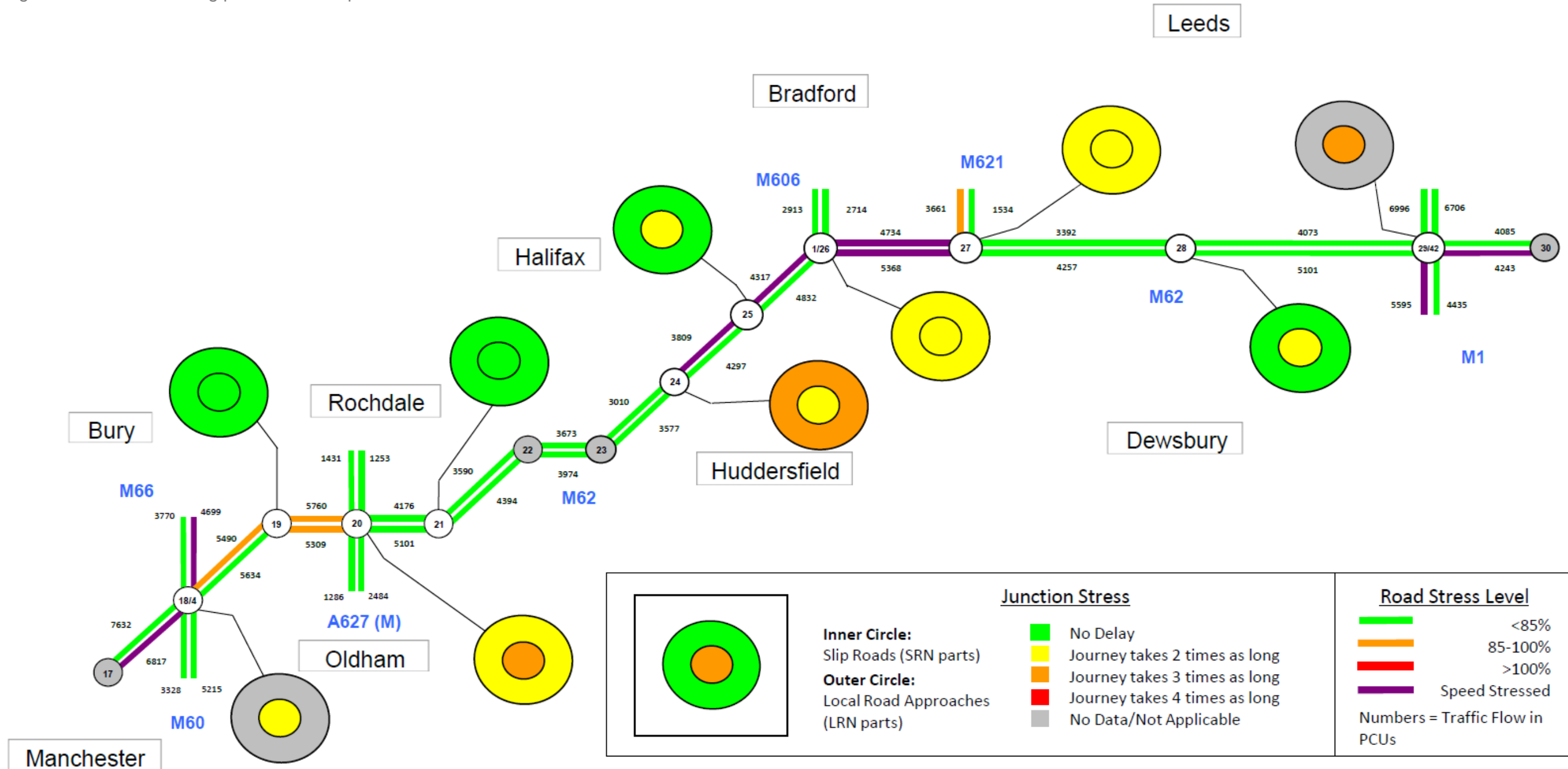
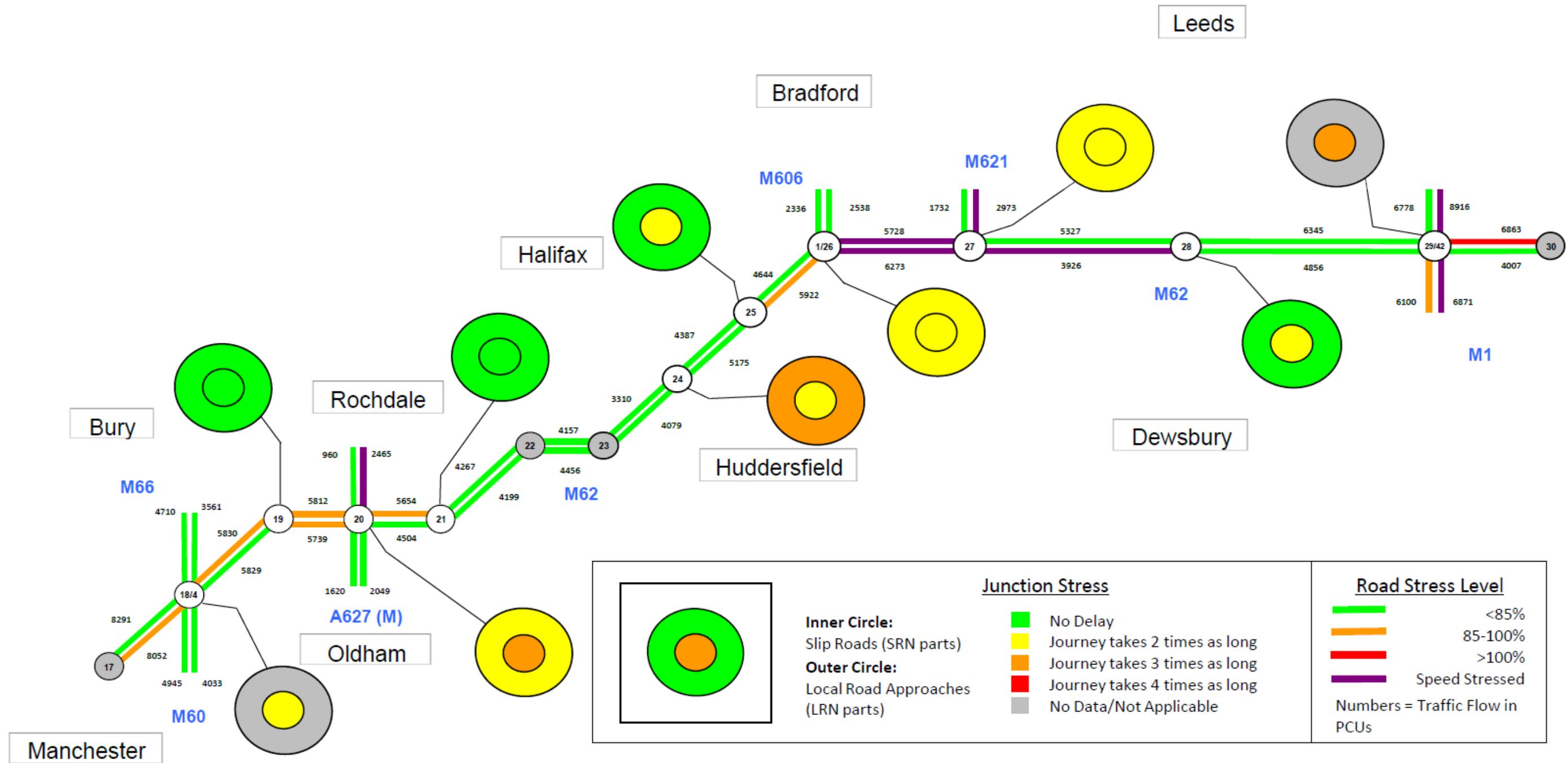


Figure 2.3 – 2011 evening peak network operation



2.4.5 In both the morning and evening peak period, the flow on the majority of the M62 links is below 85% of the capacity. In the base year there are a number of speed stressed (purple links), the majority of which are from junction 24 to 27. These are locations where the speed is below 60% of the speed of the road for over half the peak hour. It is likely that these links are suffering reduced speed due to queuing at the junction merge and diverges. The managed motorway scheme from junction 25 to 30, which is due to open in 2013, will remove the stress on the purple links by providing additional capacity.

2.4.6 The operation of the junctions follows a similar pattern to the links where the majority have at least one section as free-flowing. However, there is a greater level of flow breakdown on the slip roads, which are in the same areas as the speed stressed links. Most notably, junctions 20, 24, 26 and 27 are suffering from journey times of at least twice the time expected when no delay is present in both time periods. The managed motorway scheme will not be changing the capacity of the junctions.

Highway safety

2.4.7 The route can be divided into three sections with two groups of characteristics which contribute to the nature of accidents that take place:

- **Junction 18-21 and junction 24-29** - dominated by flows from the urban areas and sometimes peak congestion. The nature of flows contributes to a large number of rear end shunt accidents, particularly in areas of queuing.
- **Junction 21-24** - characterised by longer distance movements and a reduced level of congestion (relative to other sections), steep gradients and, at times, poor weather conditions.

Existing accident situation

2.4.8 Using the most recently available data (2008 – 2010) it has been possible to analyse the location and characteristics of killed and seriously injured accidents (KSI) taking place on the route and, where appropriate, compare these with national averages. More detail on this analysis is contained in **Appendix D**.

2.4.9 Over the three year period, there were 594 injury accidents between junctions 18 and 29. Relatively few accidents are categorised as fatal or serious (7%).

2.4.10 When considering the accident rate per billion vehicle miles and casualty severity ratio, it is clear that there is considerable variation along the route - to some extent reflecting the random nature of accident occurrence. The worst link overall is that between junctions 28 and 29, where accident rates very high in both directions. Only eight of the 24 links along the route have a figure above average. This shows that, while there are a significant number of links where the accident rates are higher than average, the severity of these accidents tends to be lower. A good example of this is junctions 20 to 21 westbound where there is a very high

accident rate, but the casualty severity ratio is zero (i.e. no killed or serious injured casualties).

Contributory factors

2.4.11 There are a number of characteristics of the route that contribute to the likelihood and severity of accidents. These include the weather conditions (which can increase the likelihood of accidents) and the involvement of heavy goods vehicles in accidents (which can increase the severity of accidents due to their size and weight), both of which are characteristics of the M62.

Cluster sites and fatal accidents

2.4.12 The locations of accident cluster sites (where three or more accidents took place in a 50 metre section of carriageway over the three year period) as well as the location of fatal accidents have been investigated.

2.4.13 **Appendix D** details the location of both the cluster and fatal accidents, with the associated tables providing specific details.

2.4.14 Looking at these cluster sites, it can be seen that:

- The majority of cluster sites exist within the West Yorkshire area, between junctions 24 and 29, reflecting the high traffic volumes on this section of the route.
- The majority of cluster sites are located on or around junctions (13 of the 17 cluster sites are at junctions) - the exception to this being two clusters on the high level section between junctions 21 and 23.
- Only 11% of accidents in the available data formed part of a cluster.
- The majority of the clusters were slight accidents and there were no fatal accidents in any of the clusters. The reason for this low level of severity is the tendency for accidents to happen close to junctions, especially those which are congested and with low speeds. Congestion causing rear end shunts on or around slip roads is the main issue, followed by lane changing problems. The four clusters on links have a variety of causes.

2.4.15 Fatal accidents generally appear to be isolated events with few common themes. The exceptions to this are accidents B and C, which took place close to cluster 7. This section of carriageway is steeply graded and the accidents may have been caused by vehicles not keeping far enough apart. Accident B took place in poor weather conditions, which may have exacerbated the existing problem due to skidding. The presence of both an accident cluster and two fatal accidents on this stretch of carriageway underlines the issues associated with this section. However, as noted above, mitigation measures for this problem have already been implemented.

Asset condition

2.4.16 The assets that are managed by the Highways Agency along the route are numerous and varied, extending beyond the road pavements themselves to include other highways structures, an array of drainage and geotechnical assets, and supporting infrastructure including technology and lighting.

2.4.17 It is key to the fulfilment of the routes purpose that the asset is resilient to the variety of factors that influence its condition. To develop an understanding of the current condition of the asset, this review has given specific consideration to the following elements in an analytical manner, with qualitative consideration given to other elements:

- Pavement conditions;
- Condition of structures; and
- Technology provisions.

2.4.18 Each is discussed in more detail in turn below.

The condition of the pavement asset

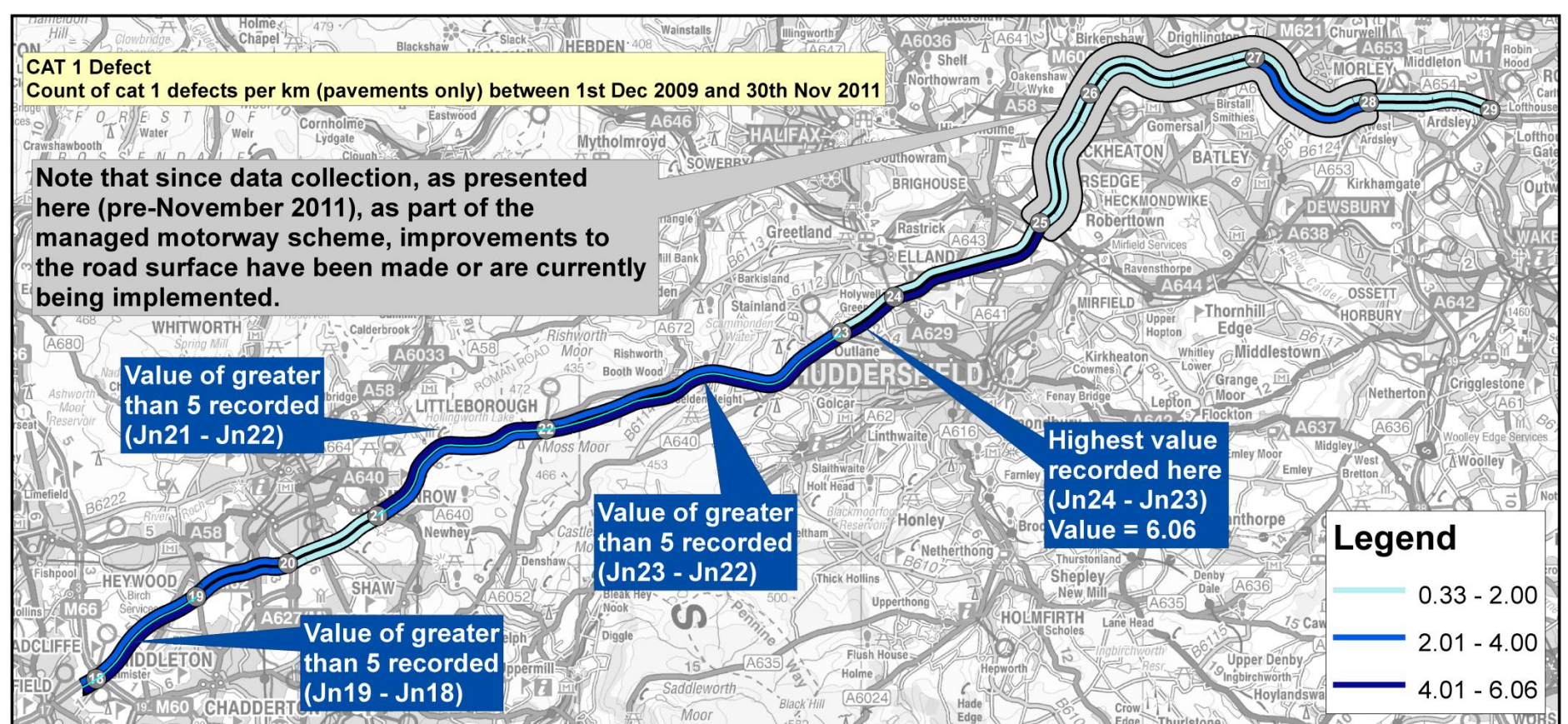
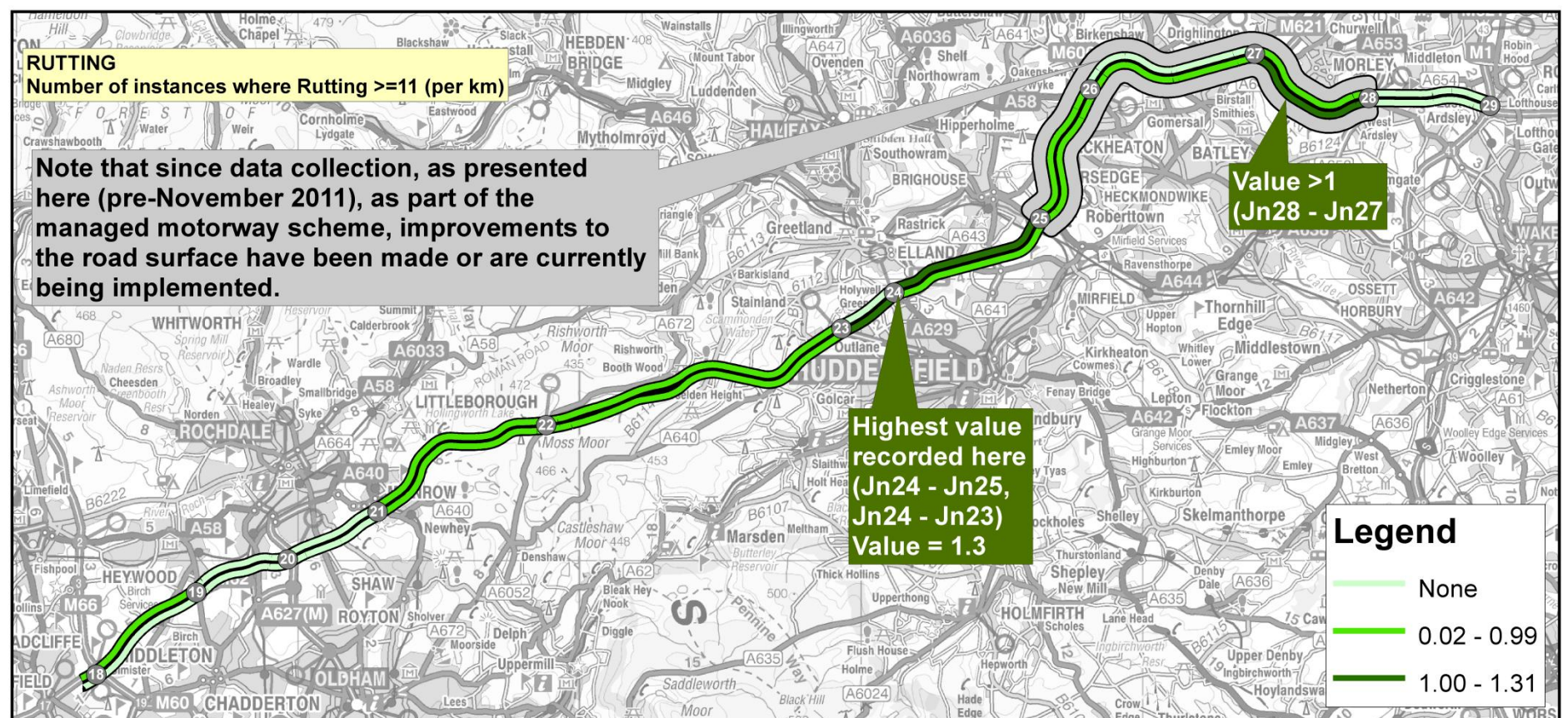
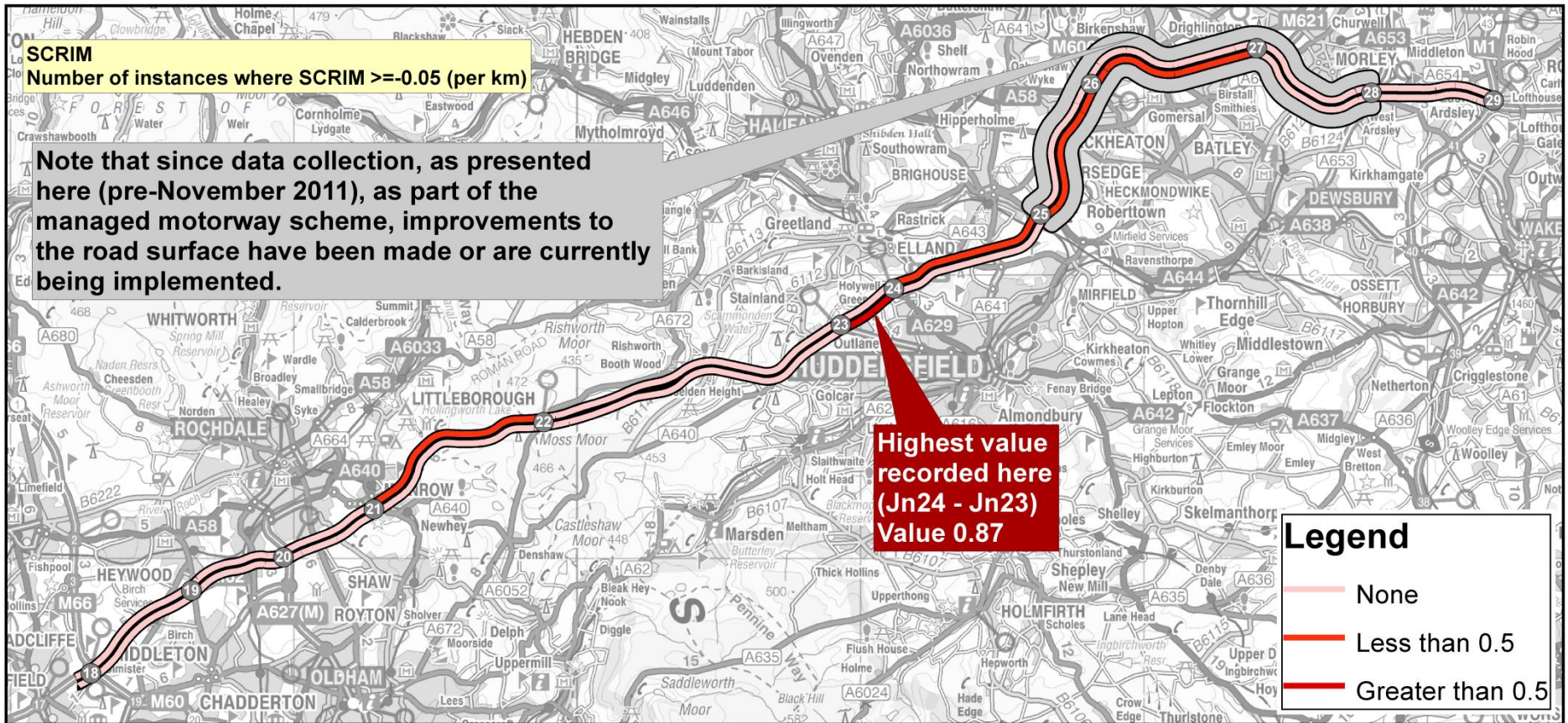
2.4.19 The condition of the pavement is influenced by an array of factors including the density and type of traffic demands, exposure to severe weather and the quality of the pavement achieved from the implementation and renewal regimes that are in place. In measuring the condition of the asset, a number of indicators can be used as described below:

- **SCRIM** provides a measure of the skid resistance of the pavement, with an investigatory level (the stage at which an investigation of the potential negative effects is required and potential treatment action) of anything below 0 per km. A pavement may remain at or below this investigatory level if investigation and accident analysis identifies that no treatment is warranted.
- **Rutting instances** which are grooves in the road usually caused by heavy vehicles, can be used to evaluate safety and structural aspects of the pavement surface condition. Rutting levels of 11-20 are of a moderate nature and 20+ of a severe nature.
- **Enhanced longitudinal profile variance (ELPV)** which is used as an indicator of ride quality, has an investigatory level of 3 for moderate issues and 4 for severe issues.
- **Category 1 defects** identifies the count of road surface / condition defects that are obvious hazards.

2.4.20 Information relating to how these indicators vary along the corridor are provided in figure 2.4 below, where it can be seen that the condition of the network varies along the route, by location and condition indicator.

- 2.4.21 It should be noted that the data presented in figure 2.4 is indicative of the latest available data (pre-November 2011). As part of managed motorway works, improvements to the road surface will be delivered between junctions 25 and 28.
- 2.4.22 Reduced funding has led to focussing pavement maintenance on short stretches of patching, this may lead to the need for more significant repairs in the future. The move from hot rolled asphalt surfaces on the network to thin surfacing (to manage surface noise) in 1995 has also reduced serviceable life from between 20-25 years to 12-15 years. Taken together these approaches may mean that we will reach a situation of needing significant pavement replacement.

Figure 2.4 – condition of the network



The condition of the structures asset

2.4.23 There are a large amount of structures along the route, including the bridges that span the motorway to bridges that carry the motorway over deviating terrain; from large culverts to small span structures; and from retaining walls to sign/signal gantries and mast schemes. The majority of structures are at or approaching 50 years old. Junction 29, Lofthouse 'top deck' is showing signs of significant deterioration and flex in the structure means that the surface is prone to early failure.

2.4.24 As levels of growth and demand become clearer during the 15 years considered by this strategy, this will advise the future maintenance programme for structures. Where junction issues become most critical, it may be better value in the long term to replace and enhance some structures rather than make a large investment to prolong their life in their current form. From current analysis for instance, junction 29 shows significant capacity and conflict issues by 2028. A new interchange here could greatly improve these motorway to motorway movements and provide a structure with lower maintenance requirements than already exist with the current structure.

The technology asset

2.4.25 Technology plays an increasingly critical part in the operation and management of the network and in supporting the overall objectives of the Highways Agency. To this end, the technology asset along the route is considerable, particularly in the more urban areas.

2.4.26 The risks associated with a poor performing or non-operational technology asset include contribution to incidents, congestion and traffic delay resulting in damage to the Highways Agency reputation and environmental impacts associated with queuing and longer journeys.

2.4.27 Table 2.1 provides an overview of the current technology in use along the route, including:

- VMS / EMS – variable message signs and enhanced message signs.
- CCTV – closed circuit television.
- ERT – emergency roadside telephone.
- Ramp metering.
- ANPR – automatic number plate recognition cameras.
- NRTS – national roads telecommunications service infrastructure.
- Meteorological / environmental sensors.
- MIDAS – motorway incident detection and automatic signalling.
- Lane signals.

Table 2.1 – current technology provision

Link / Junction		VMS / EMS	CCTV	ERT	Ramp Metering	ANPR	NRTS	Meteorological Sensor	Environmental Sensor	MIDAS	Lane Signals	Ramp metering comments
J18	Junction		•				•					
J18-19	Eastbound	•	•	•			•			•	•	
J19-18	Westbound	•	•	•			•			•	•	
J19	Junction				•		•					Eastbound only
J19-20	Eastbound	•	•	•			•			•	•	
J20-19	Westbound	•	•	•			•			•	•	
J20	Junction				•		•					Westbound only
J20-21	Eastbound	•	•	•			•			•	•	
J21-20	Westbound	•	•	•			•			•	•	
J21	Junction						•					
J21-22	Eastbound	•	•	•			•	•	•	•		
J22-21	Westbound	•	•	•			•	•	•	•		
J22	Junction						•		•			
J22-23	Eastbound	•	•	•			•	•		•		
J23-22	Westbound	•	•	•			•			•		
J23	Junction						•					
J23-24	Eastbound	•	•	•			•			•		
J24-23	Westbound	•	•	•			•			•		
J24	Junction						•		•			
J24-25	Eastbound	•	•	•			•			•		
J25-24	Westbound	•	•	•			•			•	•	
J25	Junction				•		•					Eastbound only
J25-26	Eastbound			•			•			•		
J26-25	Westbound			•			•			•		
J26	Junction		•			•	•					
J26-27	Eastbound			•			•		•	•		
J27-26	Westbound			•			•			•		
J27	Junction		•			•	•					
J27-28	Eastbound			•			•			•		
J28-27	Westbound			•			•			•		
J28	Junction				•		•					Westbound only
J28-29	Eastbound	•		•			•			•	•	
J29-28	Westbound	•		•			•			•	•	
J29	Junction		•			•	•					

Other asset condition indicators

- 2.4.28 The majority of **geotechnical** issues on the strategic road network are closely related to drainage issues and the data currently available to the Highways Agency is of too crude a nature to measure geotechnical risks. That said, there are no known geotechnical risks on the route that have been identified as requiring specific monitoring or geotechnical solutions.
- 2.4.29 With respect to **drainage**, it is anticipated that flood events will continue to be higher than the national average for a variety of reasons including the higher susceptibility to higher rainfall levels compared to the rest of the country. Maintaining the drainage asset in good condition is vital to minimising the impact of these events.
- 2.4.30 The **lighting** asset includes all lighting columns and lit signs in addition to the associated cables. A significant investment in new lighting equipment has recently been made along much of the route. There remains a need to monitor lighting columns frequently and undertake reactive maintenance.

Environment

- 2.4.31 The *Highways Agency Environmental Strategy 2010–15* identifies the environment as sitting core to the Highways Agency's role and to be considered at all levels of operation with a commitment to minimise the negative consequences of the desire to travel. The Highways Agency Environment vision is "To lead the world in the environmental performance of roads".
- 2.4.32 The strategy identifies a number of priorities: air quality; noise and vibration; material resources and waste; soil and geology; natural conservation; drainage and water quality; landscape; cultural heritage; accessibility; society and community; and spatial planning, with the challenges to delivering these priorities being: climate change; pleasing stakeholders; the recession (needing to deliver more with less); and the need to develop guidance to assist with and manage the impacts on the environment.

Air quality

- 2.4.33 Vehicular traffic using the strategic road network is a source of air pollution which has an impact on air quality. The Highways Agency's approach to air quality is driven by the EU directive on ambient air quality and cleaner air for Europe which sets limit values for certain pollutants which must not be exceeded in the UK. Further, the *UK Air Quality Strategy* sets air quality objectives, and if these are expected to be breached a local authority is required to declare an air quality management area (AQMA).
- 2.4.34 The coverage of AQMAs in relation to the route are identified in 2.8 below, where it can be seen that there are two AQMAs that directly relate to the route, these being the Greater Manchester AQMA which covers the element of the M62 specifically in Bury and Rochdale (between junctions 18-22) and the Wakefield City AQMA which

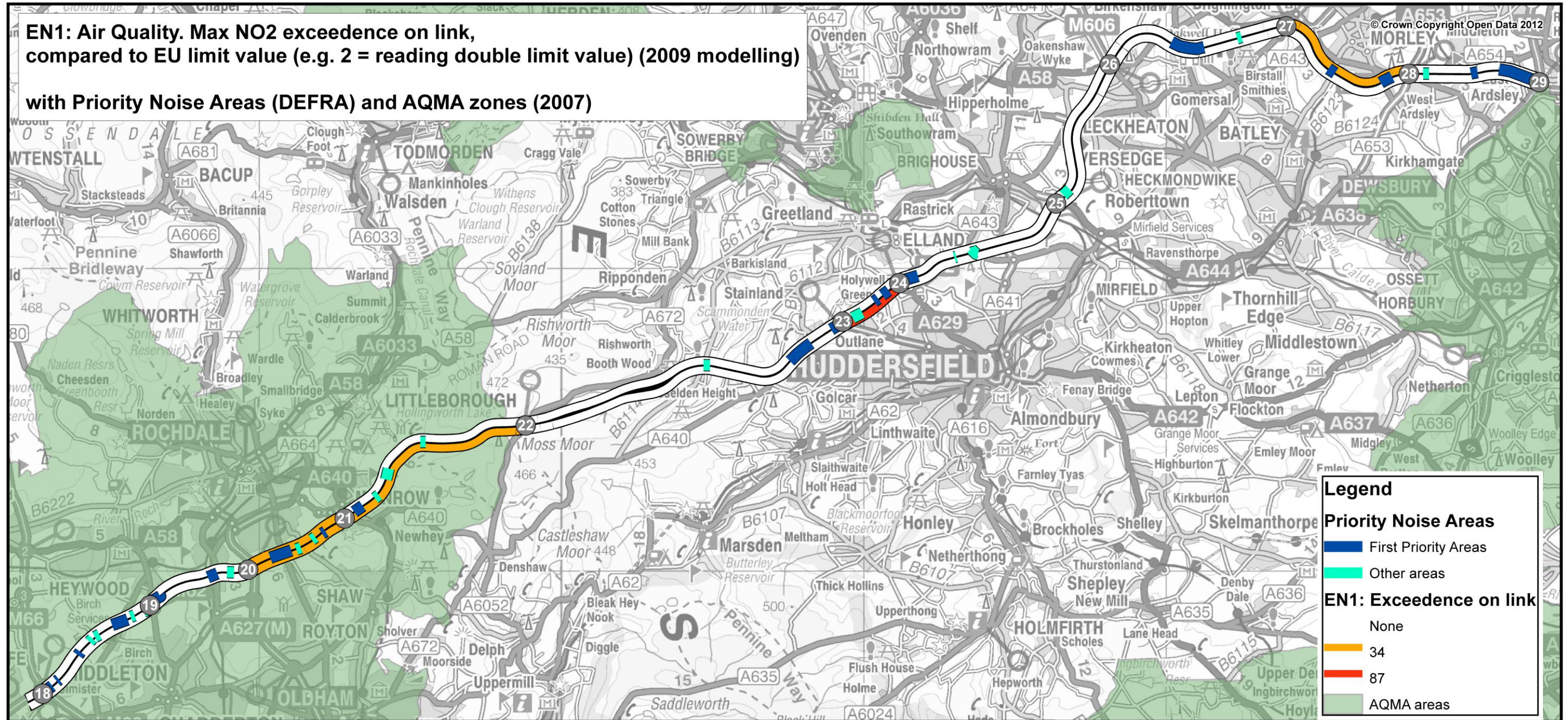
lies immediately south east of M62 junction 29. The Highways Agency is also aware of other non-AQMA areas where air quality readings are leading local authorities to do further monitoring and investigation.

- 2.4.35 Air quality data, specifically in relation to Nitrogen Dioxide emissions, is gathered by the Agency at some points on the network and is also presented in figure 2.5, where the extent to which the EU limit value is exceeded is identified, significantly in a number of cases.

Noise

- 2.4.36 The *2002 EU Environmental Noise Directive (END)* introduced a requirement for five yearly cycles of noise mapping and action planning for major sources of noise, including road traffic. The *Environmental Noise (England) Regulations (ENR) 2006* transpose END into English legislation, placing a legal duty on authorities such as the Highways Agency to implement the National Noise Action Plans as policy.
- 2.4.37 The Department for the Environment, Food and Rural Affairs (Defra) has identified Important Areas (IAs) across England - these being where the 1% of the population that are affected by the highest noise levels from major roads. These are shown on Defra's strategic noise maps, with priority on investigating IAs with First Priority Locations (FPLs) – these are locations with road traffic noise levels in excess of 76 decibels according to the results of Defra's strategic noise maps.
- 2.4.38 However, the installation of any noise mitigation measures that have been identified from ongoing policies and programmes outlined above will be subject to funding being made available.
- 2.4.39 Figure 2.5 identifies the Defra IAs along the route. It can be seen that there are a number of IAs on the network that are classified as being FPLs. These areas should be addressed through the planned maintenance programme where solutions are available.

Figure 2.5 – environmental designations / data



Operational management

- 2.4.40 The management of the route through the National and Regional Traffic Control Centres, the Traffic Officer Service and the use of technology play a key role in the reliability and safety of the network. The service provided is supported through both the Regional Control Centre and patrols on the route. This section aims to consider some of the operational management issues on the route.

Events / seasonal issues

- 2.4.41 There are a number of venues where large and high profile events take place, which are ultimately serviced by the route. These include a number of sporting facilities and stadia (e.g. Old Trafford, Manchester; Etihad Stadium, Manchester; Galpharm Stadium, Huddersfield; Elland Road, Leeds), fixed annual events (e.g. Leeds Festival) and year round attractions (e.g. Trafford Centre, White Rose Centre). In association with some of these venues, there are associated traffic management regimes and roadwork embargos in place.
- 2.4.42 It is not considered that the route is subject to particular seasonal variations associated with summer holidays, day trips and other summer events in the same way that other routes are.

Climate / weather

- 2.4.43 As a cross-Pennine route containing the highest part of the motorway network in England (372 metres, 1221 feet), the route is subject to weather conditions of a more severe nature than those experienced in other parts of the country and on other parts of the strategic road network. Data from the Met office identifies that the route, not limited to, but particularly in the elevated rural elements between junctions 21 and 24, is located in areas that are susceptible to lower mean temperatures, significantly higher rainfall and greater number of instances of snowfall.
- 2.4.44 As well as the operational issues this brings (e.g. the safety issues discussed earlier and the relationship of accident rates with wet conditions), this can also make it difficult to deliver both maintenance and improvement schemes.

Traffic mix

- 2.4.45 The route carries a relatively high proportion of freight traffic with an average of 15% of traffic being heavy goods vehicles, mostly on relatively short journeys of under 50km and 2% of the traffic being port to port heavy goods vehicles traffic traversing the country. A large proportion of traffic, particularly at peak times, is made up of relatively short journeys within and between the urban lengths or the route.

Route characteristics

- 2.4.46 The route has some of the highest incidence of heavy goods vehicle fires due to the steep inclines around junction 21 and 23. In addition, the route includes the highest point on an English motorway which is very exposed and liable to poor

weather conditions. Careful consideration must be given to any departures from standards which may have an operational impact (for example approving sections with no hard shoulder where there are steep inclines).

Technology provision

- 2.4.47 Technology provision along the route enables us to collect information on the traffic conditions (through MIDAS and ANPR although at a reduced level) and to then communicate these conditions to drivers through variable message signs. Currently there are no variable message signs between junction 25 and 28. CCTV cameras along this route aid with incident verification.

Incidents

- 2.4.48 As with accident data, incident data has been assessed for the period 2008 – 2010. This data covers all events which involved the closure of a lane on the M62. The majority of these incidents were related to planned road works and were therefore excluded from the analysis.
- 2.4.49 An analysis of incidents over the 12 months up to 30 November, 2012 highlights the 10 most common types of incident and the impact they have on the route, which are outlined below in Table 2.2.

Table 2.2 – common incident types

Route – M62 Incident Type	Number of Carriageway Impact Incidents	Average Impact Duration (minutes)
Breakdown – in live lane	1901	25.6
Debris	769	13.2
Road Traffic Collision – damage only	413	26.1
Other obstruction (excl. Breakdown)	128	12.8
Breakdown - hardshoulder	122	16.0
Road Traffic Collision – minor injury	68	81.4
Observation – infrastructure problem	58	90.0
Road Traffic Collision – serious injury	53	101.3
Vehicle Fire	38	68.3
Breakdown – offside tyre change	31	30.7

- 2.4.50 The remaining data includes lane closure associated with a wide variety of issues. For example, animals on the carriageway, breakdowns and vehicle fires. Accident data is also included within incident data – this includes all accidents types (i.e. including non-injury accidents), rather than the KSI data used in accident analysis earlier in this report.
- 2.4.51 Due to the volume of data it is not possible to identify individual issues or themes. However it is possible to compare incidents on a link by link basis, as shown in table 2.3.

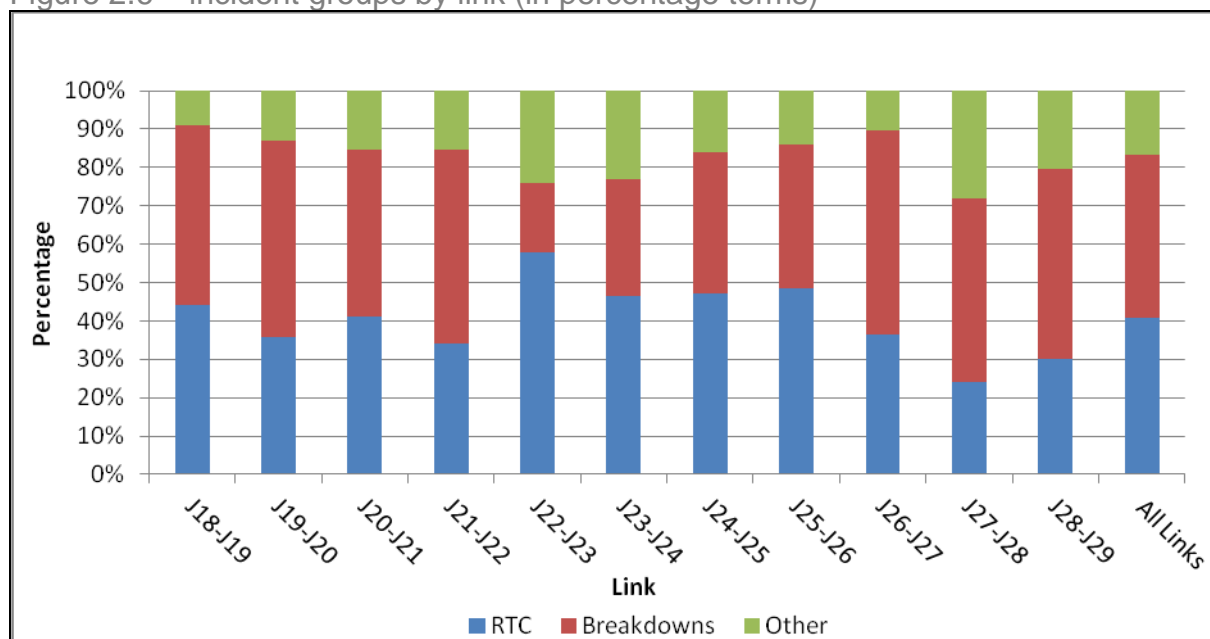
Table 2.3 – M62 incident data (2008 – 2010)

Link	Incidents per billion vehicle miles (excluding roadworks)			
	All incidents	Road traffic collisions (RTC)	Breakdowns	Other
Junction 18-19	53.93	23.81	25.26	4.86
Junction 19-20	63.37	22.77	32.35	8.25
Junction 20-21	79.20	32.57	34.42	12.21
Junction 21-22	61.94	21.13	31.28	9.53
Junction 22-23	45.41	26.20	8.23	10.98
Junction 23-24	48.13	22.32	14.65	11.16
Junction 24-25	55.68	26.30	20.38	9.00
Junction 25-26	45.02	21.85	16.85	6.32
Junction 26-27	62.22	22.64	33.14	6.44
Junction 27-28	48.13	11.64	23.03	13.46
Junction 28-29	54.66	16.51	27.05	11.10
Average All Links	54.44	22.23	23.14	9.07

2.4.52 It can be seen that there is a strong fluctuation between incident rates along the route, with the high level section between junctions 22 and 24 having low incident rates. Clearly road traffic collisions and breakdowns form the majority of the total number of incidents along the carriageway. Figure 2.6 presents the percentage of the three constituent incident groups across the links.

2.4.53 The impact of incidents on our motorways has remained constant over the last two years.

Figure 2.6 – incident groups by link (in percentage terms)



2.4.54 This shows that:

- the effect of breakdowns diminishes on the high level, less congested parts of the route, likely due to lower traffic volumes reducing the need to close a lane when a breakdown occurs, but also due to a lower overall incidence of breakdowns.
- there appears to be little overall pattern to the incidence of accidents of all categories.
- those categorised as 'other' do not follow a consistent pattern, likely due to incidents such as vehicle fires or animals on the carriageway likely to follow a relatively random pattern.

2.4.55 The regularity and severity of incidents was identified as a key issue by stakeholders where it was highlighted that there was a high perception of susceptibility to incidents, both in relation to their regularity and their effects.

2.4.56 In relation to **diversion routes**, it is the M62 as a strategic corridor offers the sole east-west trans-Pennine corridor between the Greater Manchester and Leeds City Regions. The strategic alternatives lie approximately 60 miles to the north (via the A66(T) corridor and 50 miles to the south (via the A50 corridor). There currently exists no local strategic high capacity trans-Pennine road link on which to divert road users should the M62 become unavailable. Agreed emergency diversion routes (EDR) use local roads when links are closed and lead to congestion on these roads. Indeed in severe weather these alternative routes may themselves become unavailable.

2.5 Previous studies and strategies

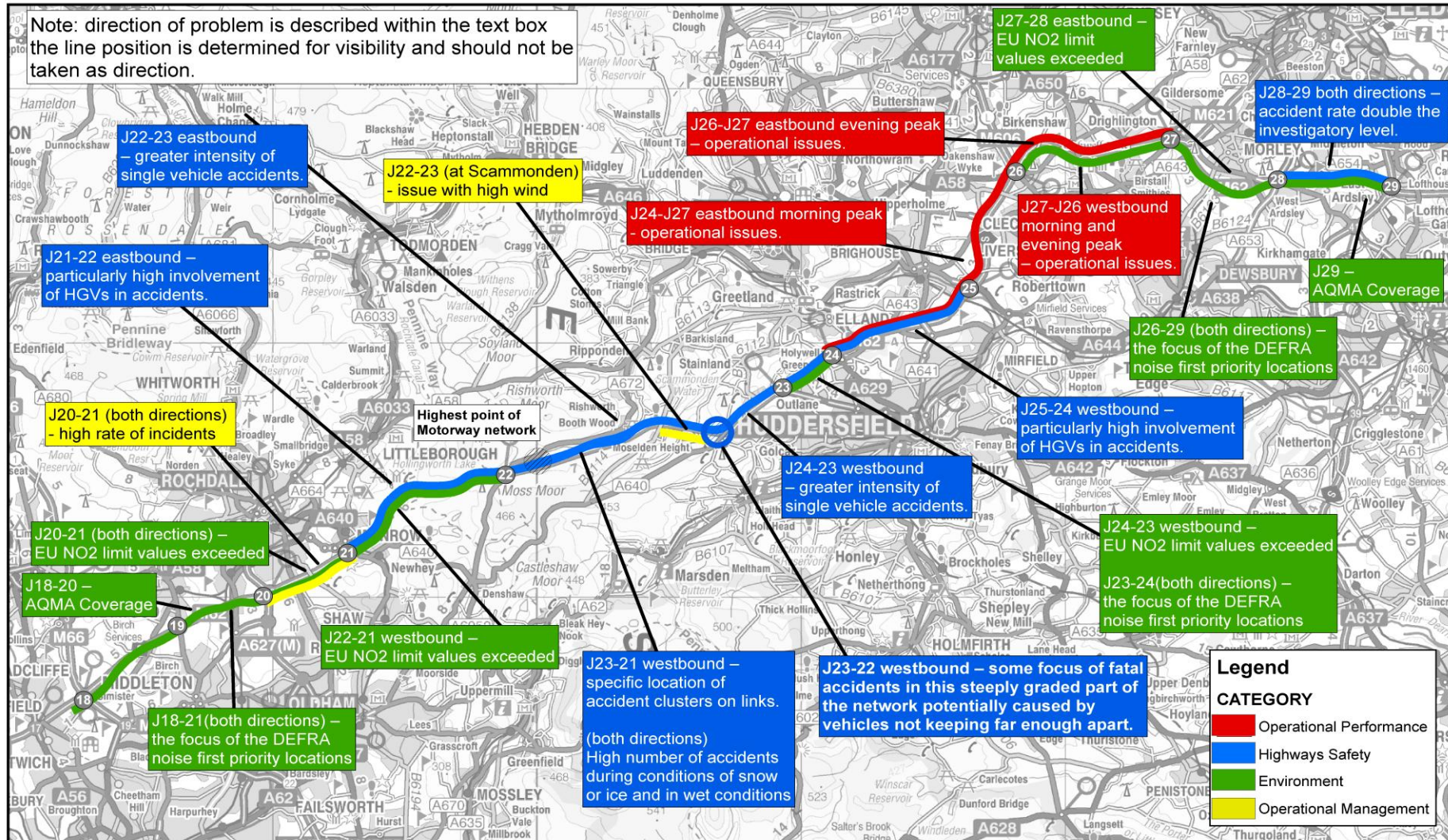
2.5.1 A number of studies have been undertaken on this route in the past. The most recent of these have been considered in this strategy, particularly where they relate specifically to the trans-Pennine corridor. Details of the relevant studies can be found in **Appendix E**.

2.5.2 There are also a number of studies that the Highways Agency has progressed in undertaking their role in the spatial planning process (recently developing the *West Yorkshire Infrastructure Study*) and in promoting schemes (such as the appraisal work for the managed motorway schemes). While of relevance and the information within them has been used to inform the strategy, they are not specifically detailed here as their intentions are in relation to scheme specific elements rather than the fully-rounded aspirations of this strategy.

2.6 Existing route characteristics

2.6.1 A summary of route characteristics are presented in figure 2.7 below.

Figure 2.7 – the route now - location specific findings



Future route requirements

3



3 Future route requirements

3.1 Overview

- Development aspirations of the local authorities adjacent to this route have the collective potential to deliver 350,000 new jobs and 200,000 new homes.
- Local development plans recognise the fundamental role of the strategic road network to deliver this growth.
- Whilst there is agreement that development should be located in sustainable locations there remains a potential conflict between the strategic and local aspirations for the route. Strategy in the future needs address these demands to ensure that the route serves its strategic function, accommodates the local usage of the route and promotes development in those areas where capacity exists on the network.
- The future **operational performance** of the route is expected to improve by 2018, due to the benefits being achieved by the managed motorway schemes. However, by 2028, the additional capacity provided by the junction 25 to 30 scheme will be offset by increasing traffic growth on the route. The route operation will deteriorate, with the issue (as now) concentrated in the more urban areas. In particular, junction problems will become more severe, impacting on the route's overall performance, and less easily solved through minor improvement schemes.
- While not fully analysing the future performance of the route in relation to **highways safety** and **environment**, increased flows on the network are likely to exacerbate existing issues, although committed schemes could offer benefits. Future monitoring of environmental issues is likely to be required in order to appropriately monitor against EU defined limits.
- **Operational management** issues will need close scrutiny in future years with increasing traffic levels, the split of the route between two operational regions and the implications of the managed motorway schemes. Incidents within these schemes will have more chance of being live-lane incidents and may challenge the Traffic Officer Service to develop new operating methods.

3.2 Local priorities

3.2.1 Beyond the M62, the corridor has a typical hierarchal road system, with the strategic road network managed by the Highways Agency, and other important routes connecting into the strategic road network, in particular the remainder of the Primary Route Network being managed by local highway authorities.

3.2.2 With its many junctions along the network, and subsequent connectivity with areas of both an urban and rural nature, the strategic road network acts as a key driver of the local economy. However, while essential for a modern economy that the

strategic road network provides efficient movement of goods and people, such aspirations also put great pressure on the network and its ability to serve its purpose.

- 3.2.3 A range of sources, identified in figure 3.1, has been used to identify local priorities and aspirations within this section.

Figure 3.1 – defining the local priorities – the sources



- 3.2.4 More details on each of these is in **Appendix F**.

3.3 Future developments and network usage

- 3.3.1 The future of the network is likely to be dynamic with periods of change and fluctuation influenced by a variety of factors, not least national and global economic performance. While the economy continues to be volatile and places a certain degree of restraint on growth in the immediate short term, the ambition remains for significant growth beyond this, typified by the aspirations of the local enterprise partnerships and the local authorities discussed above in section 3.2 and the economic growth focus of central Government.

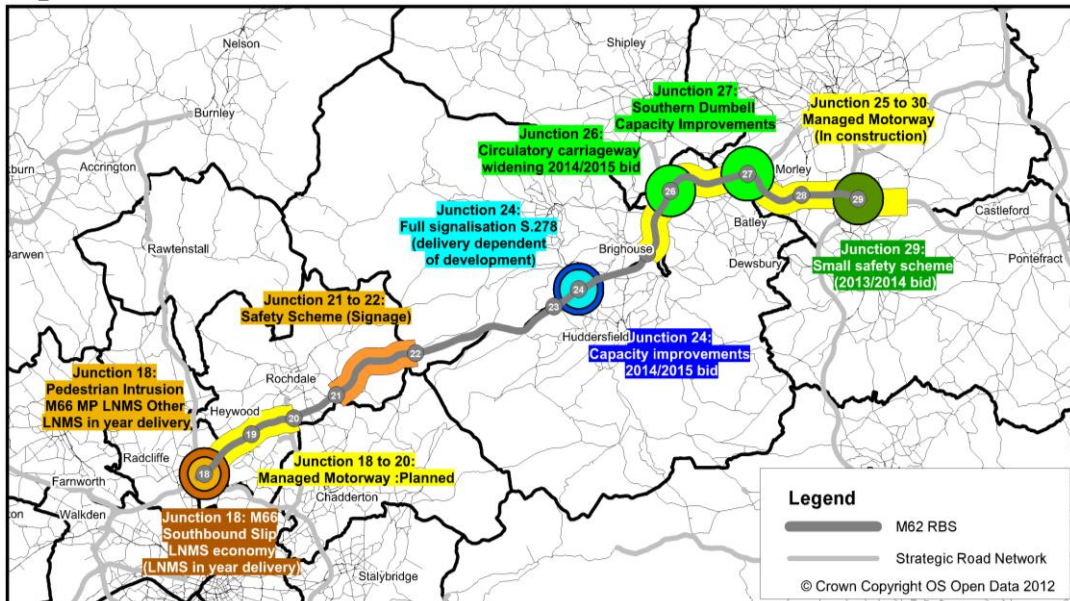
Future development aspirations

- 3.3.2 As noted above in section 3.2, having considered the development plans of those ten local authorities that reside in direct contact with the route, the spatial aspirations over the period that this strategy covers (April 2014 + 15 years) extend to approximately 350,000 jobs and nearly 200,000 dwellings. This accounts only for those local authorities directly adjacent to the corridor and when wider growth is also factored in (including for instance the other authorities in Greater Manchester including the core of the City Region in Manchester and Salford), the scale of aspirations is intense and will ultimately influence the demand to travel on the M62 corridor.

Future strategic road network schemes

- 3.3.3 There are a number of committed schemes proposed along the length of the M62 with which the strategy is concerned. Figure 3.2 identifies the locations of these schemes.

Figure 3.2 – committed SRN schemes - overview



3.3.4 To provide some further context, the following overview provides an overview of each of these schemes:

- **M62 junction 18 pedestrian intrusion scheme** – a local network management scheme (LNMS) tasked with dealing with a pedestrian intrusion issue at this location.
- **M62 junction 18 M66 southbound slip LNMS scheme** - lengthening of the designated southbound left turn link from the M66 to the M62, with part of the hard shoulder being used as a running lane. The aim of the scheme is to reduce congestion and improve safety and journey times.
- **M60 junction 8 to M62 junction 20 managed motorway scheme** – this will increase the capacity of the 5 mile section of the M62 between junctions 18 and 20 by making it a managed motorway. This will help to relieve congestion by converting the hard shoulder to a running lane and using technology to vary speed limits. The proposals include lengths of narrow lanes to avoid expensive structural works and can be achieved without land take. In the October 2010 Spending Review, the Chancellor announced that the scheme will be prepared for start of construction before 2015, subject to the outcome of statutory processes. Alongside the Budget announcement on the 21st March 2012, the Government confirmed that this scheme is planned to commence in financial year 2014/15.
- **M62 junction 21-22 safety scheme** – the introduction of variable message signs and static signs to reduce lane changing and shunt accidents on this section.
- **M62 junction 24 full signalisation scheme** – the delivery of which is dependent on a development coming forward.

- **M62 junction 24 capacity improvements scheme** – partial signalisation of the circulatory carriageway.
- **M62 junction 26 circulatory carriageway widening scheme** – widening of the circulatory carriageway.
- **M62 junction 25-30 managed motorway scheme** - will help to relieve congestion by using technology to vary speed limits. This will also allow the hard shoulder to be used as a running lane at peak times to create additional capacity. Work started in 2011 and is being undertaken section by section. The aim is to have the first two sections fully operational in summer 2013 with the rest entering operation by autumn/winter 2013.
- **M62 junction 27 capacity improvements scheme** – improvements to capacity at the southern dumbbell.
- **M62 junction 29 small safety scheme.**



Wider transport developments and other influences

- 3.3.5 While this strategy is road-based and concerned primarily with the strategic road network, it is important to consider the wider transport offer / influences that could influence the intensity and pattern of travel along the route.

Public transport

- 3.3.6 The trans-Pennine public transport offer is primarily provided by the two railway corridors – the North trans-Pennine route between Manchester and Leeds via Huddersfield and the Caldervale line between Manchester and Leeds via Bradford and Halifax.
- 3.3.7 There are commitments to improve both lines with the electrification of the North trans-Pennine route to make journeys faster, quieter and more reliable and improvements to the Caldervale line as part of the Northern Hub project to allow more frequent services.
- 3.3.8 At a more local level the public transport offer is founded on travel to /from the main centres, primarily Manchester, Leeds and the other urban centres. Significant improvements to the provisions (as identified in the review of the respective local transport plans) are identified, including for example, the expansion of the Metrolink system in Manchester to those areas that are situated directly on the M62 corridor at Rochdale and Oldham.

Airport / ports

- 3.3.9 It is clear from the designations of the route that facilitating access to strategic major ports and airports, is a key role of the route, with the significant economic

benefits that they bring. The following section therefore intends to consider the future aspirations of such:

- **Manchester Airport** - In 2006, the airport handled 22 million passenger per annum (mppa) and 151,000 tonnes of cargo. The *UK Aviation Forecasts (DfT, August 2011)* highlighted that by 2009 the number of passengers had dropped to 18.6mppa, with future forecasts (low / medium / high) of 30mppa / 35mppa / 35mppa by 2030.

The *Manchester Airport Ground Transport Plan* identified that 9.8% of passengers had an origin / destination in West Yorkshire, with a further 11.3% in other areas east of the Pennines that could make use of the M62. Although emphasis on passenger access to the airport is placed on sustainable access, a significant proportion of these movements are by private car.

Expansion of freight facilities through the further development of the World Freight Terminal and the Manchester Airport Enterprise Zone will lead to a further reliance on the road network to support freight movements throughout the day.

- **Leeds Bradford International Airport** - In 2005, the airport handled 2.6mppa. The *UK Aviation Forecasts* highlighted that by 2009, the number of passengers had stagnated at 2.6mppa with a future forecast (in low / medium / high scenarios) of 4mppa by 2030.

Compared to Manchester Airport, the Master Plan identifies that over 89% of passengers originate in the Leeds City Region, so although more locally focussed there exists the potential for some impacts on the route, particularly given the closer proximity of the airport to the route than Manchester Airport.

- **Other airports in the northern region**, which are more detached from the route include Liverpool, Durham Tees Valley, Doncaster Sheffield, Humberside and Blackpool. These are of a smaller nature in terms of passenger numbers and as such have a less significant relationship with the M62 corridor being considered.
- About 95% of the total volume of UK import and export trade arrives through the nations **ports**. The *National Policy Statement for Ports (DfT, January 2012)* recognises that the most significant impact associated with future port development is likely to be on the surrounding road infrastructure, with a likely increase in congestion. While the route is a significant distance from the ports, it does provide a strategic link between ports and as part of trans-European routes. The ports of **Holyhead, Liverpool, Hull and Grimsby and Immingham** carry vast amounts of cargo and passengers.

Technology changes

- 3.3.10 Wider technological advancements are likely to create opportunities to embrace and challenges to face. The development of home technology (superfast broadband / information systems) provides the potential to create more flexible

working patterns that could ultimately reduce the need to travel and particularly so in the peak periods. Improved technology also offers an opportunity to improve real time in-car information to drivers. The development of electric cars, while relatively slow in its progression and uptake at present, will offer the ability to travel in the same manner but with lesser environmental impacts, although there exists potential challenges in dealing with aspects such as vehicle breakdowns and providing charging points to support such networks.

Operational performance

3.3.11 The future operational performance of the corridor is critical to facilitating future economic growth. This element of the report seeks to forecast forward the analysis of the network in the critical peak periods to understand the potential future operating conditions.

Assessment method

3.3.12 The general approach to the modelling has mirrored that described in section 2 in relation to the assessment of the current operation of the network. The following additional information is provided in relation to the 2018 and 2028 assessments.

3.3.13 The **land use assumptions** contained in the models can be summarised as follows:

- In the North West (Area 10) - uses local distribution of developments from Summer 2012 with overall trip end growth constrained to TEMPRO.
- Yorkshire & Humber (Area 12) – uses local distribution of developments based on the latest versions of development plan information provided by local authorities. With no constraints applied, growth is predicted to be slightly above TEMPRO levels.
- This may mean that future performance predictions between junctions 18 and 22 are under-estimated.

3.3.14 For the two forecasts (2018 and 2028), it has been assumed that all development plan development would be in place by 2028, with a proportion of the development assumed to be built by 2018.

3.3.15 The **highway assumptions** are founded on the committed improvements outlined above in figure 3.2 being implemented in line with their planned delivery phases.

Assessment outputs

3.3.16 For both future years, 2018 and 2028, two assessments have been undertaken as follows:

- The impact of the anticipated local authority planning data upon both the links and the junctions has been presented; and

- A comparison between the anticipated local authority impacts on the links with the Department for Transport anticipated impact upon the M62.

3.3.17 The analysis outputs are presented in figures 3.3 through to 3.10 below, utilising the same formatting convention as in section 2 of this report for the 2011 analyses.

Figure 3.3 – 2018 morning peak network operation (development plan)

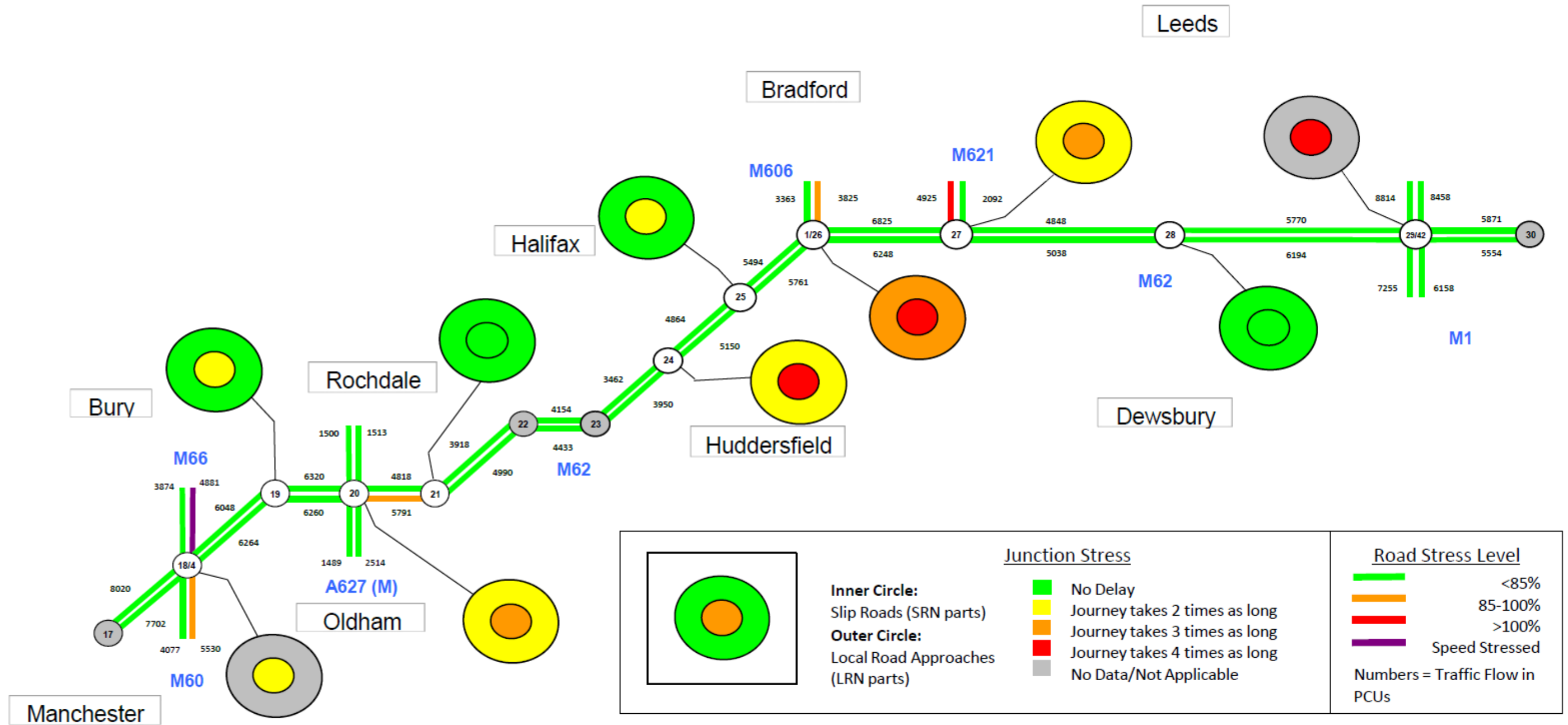


Figure 3.4 – 2018 evening peak network operation (development plan)

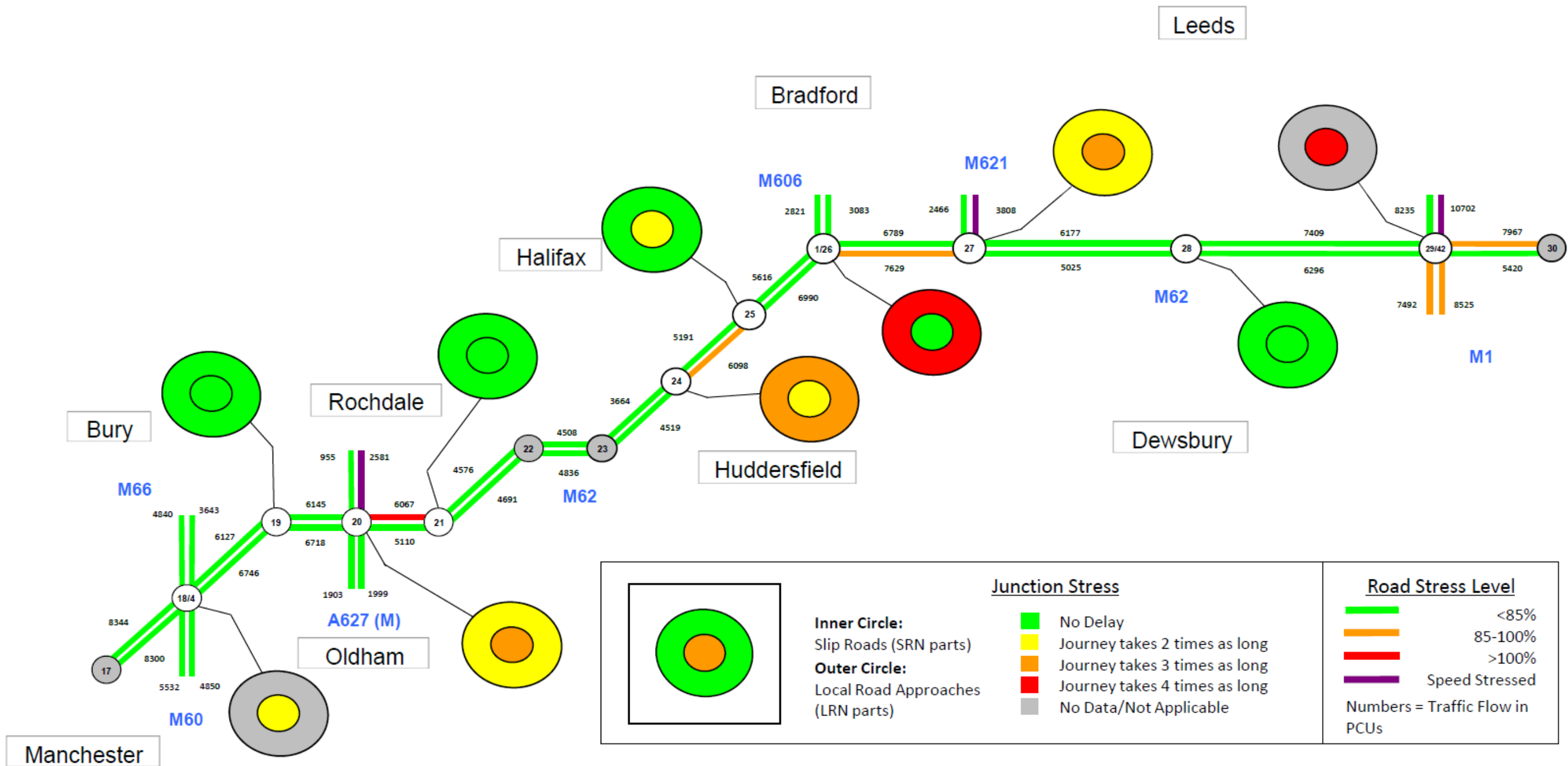


Figure 3.5 – 2018 morning peak network operation (comparison of DfT forecast and development plan forecast)

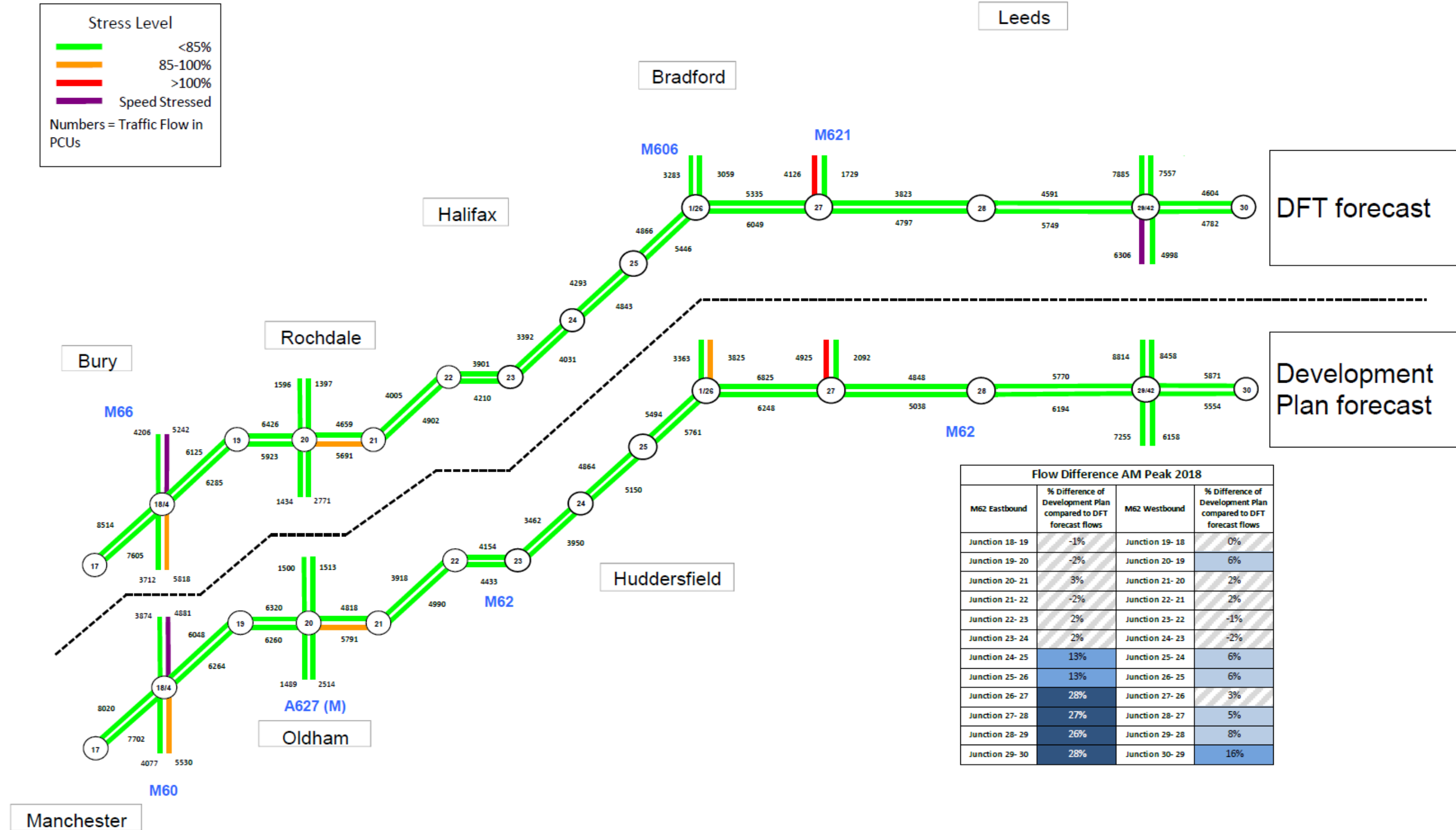


Figure 3.6 – 2018 evening peak network operation (comparison of DfT forecast and development plan forecast)

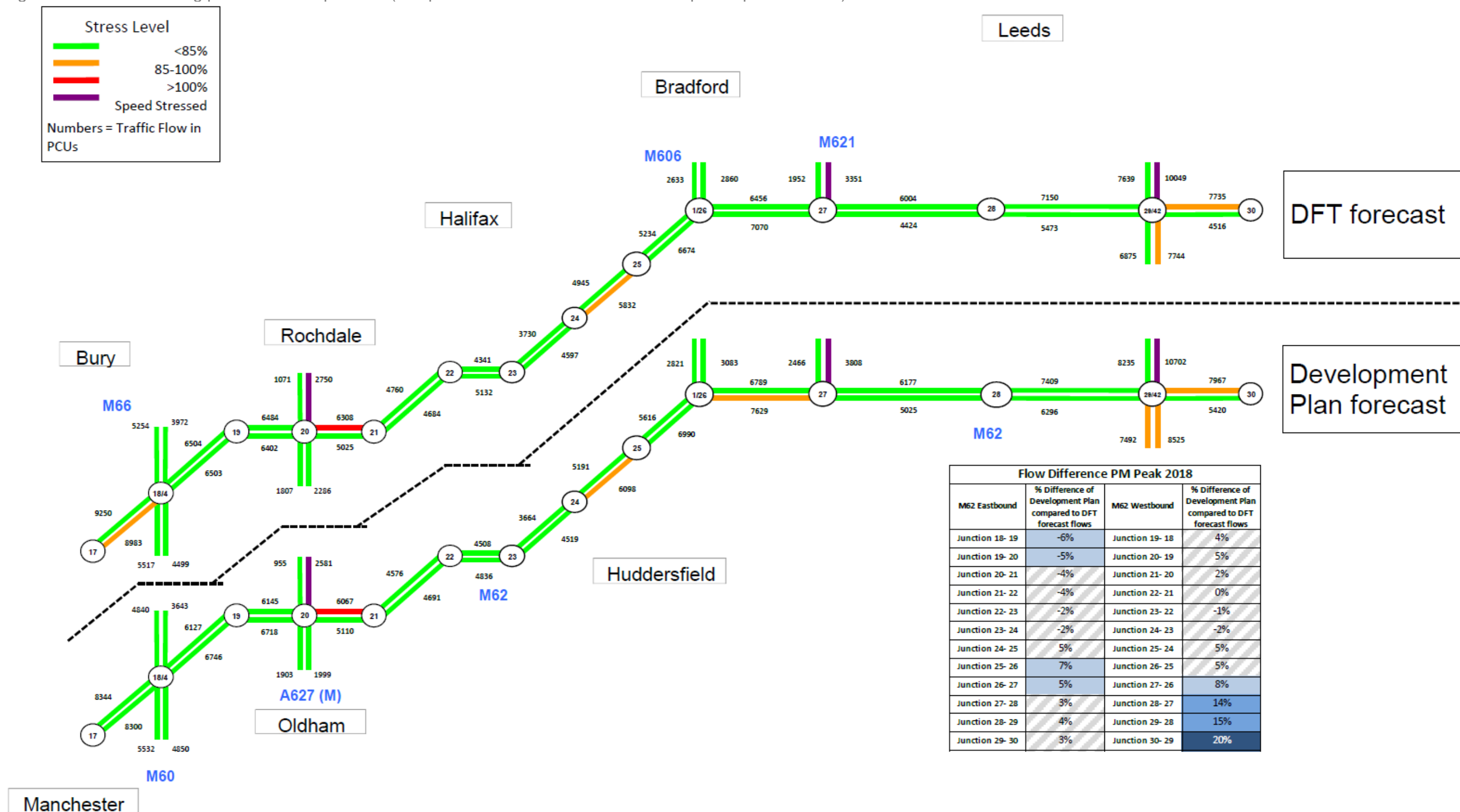


Figure 3.7 – 2028 morning peak network operation (development plan)

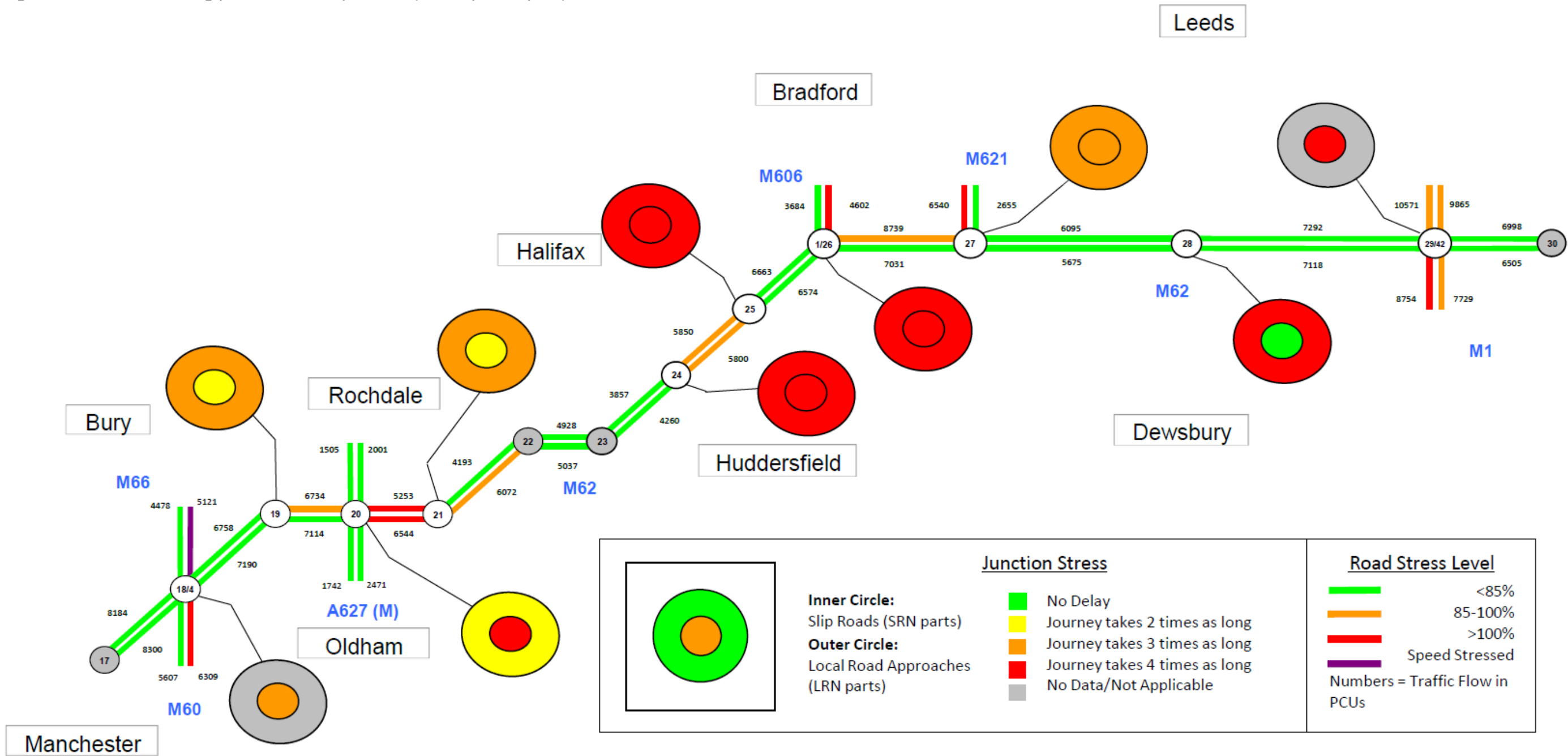


Figure 3.8 – 2028 evening peak network operation (development plan)

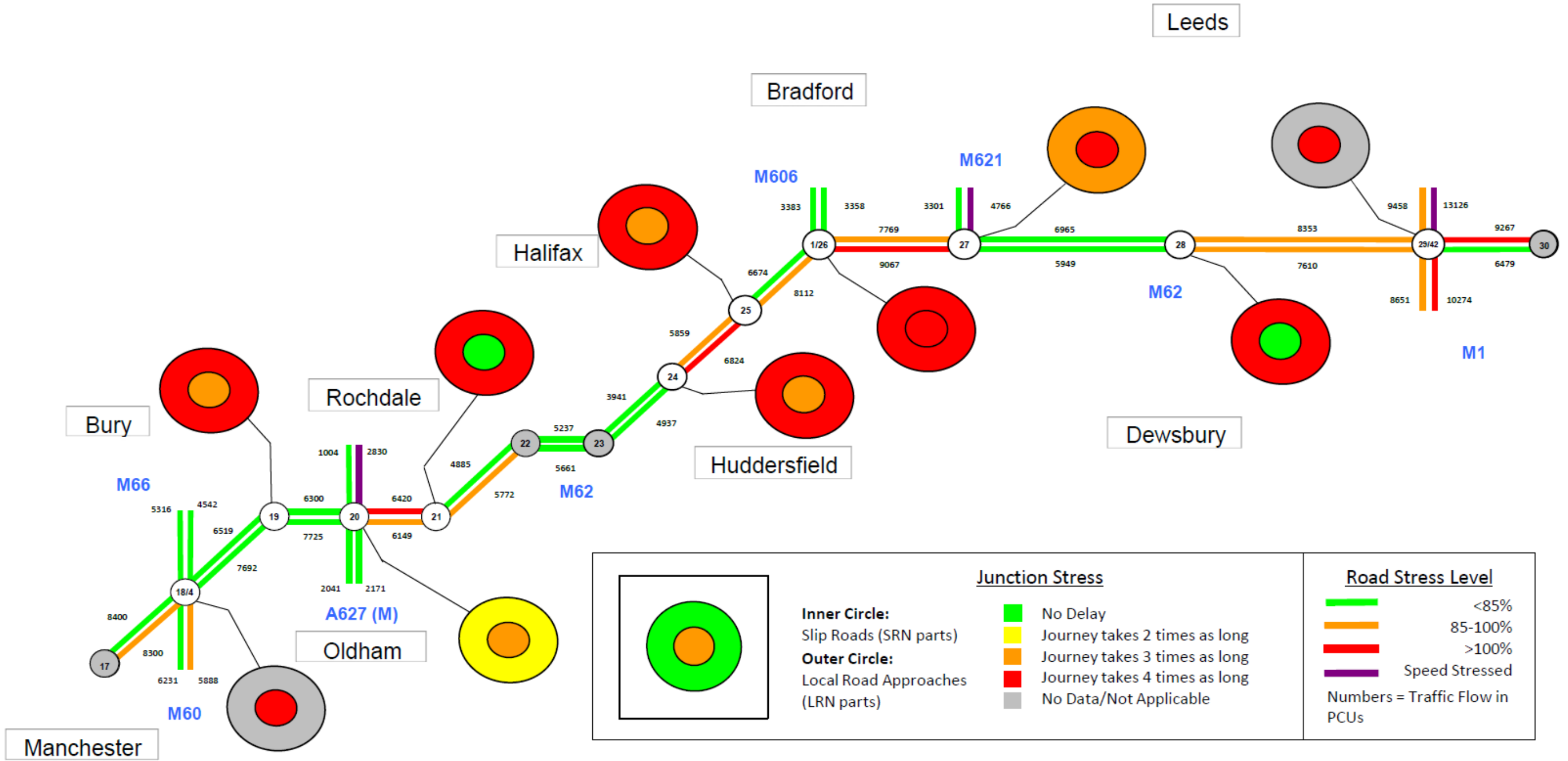


Figure 3.9 – 2028 morning peak network operation (comparison of DfT forecast and development plan forecast)

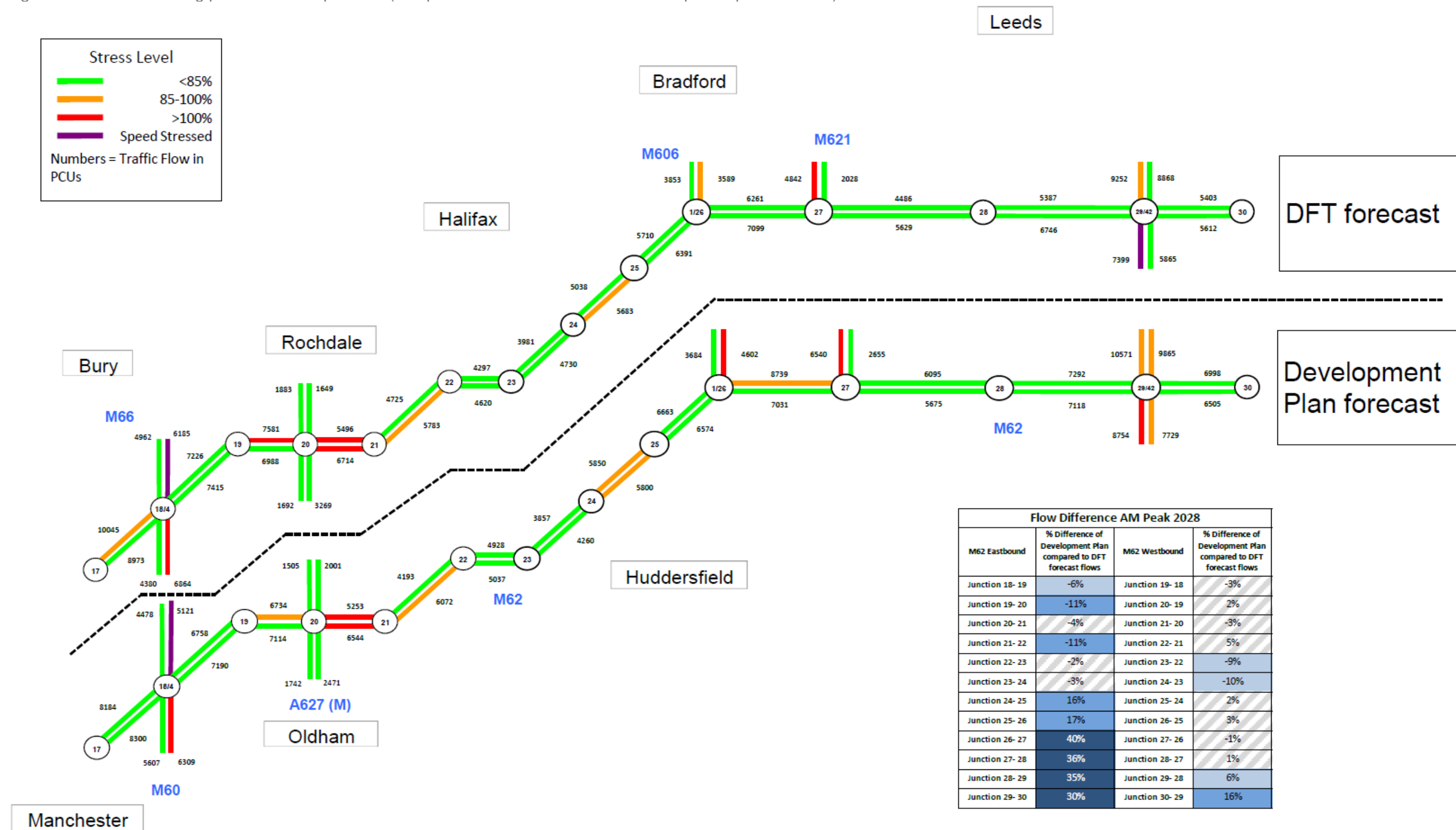
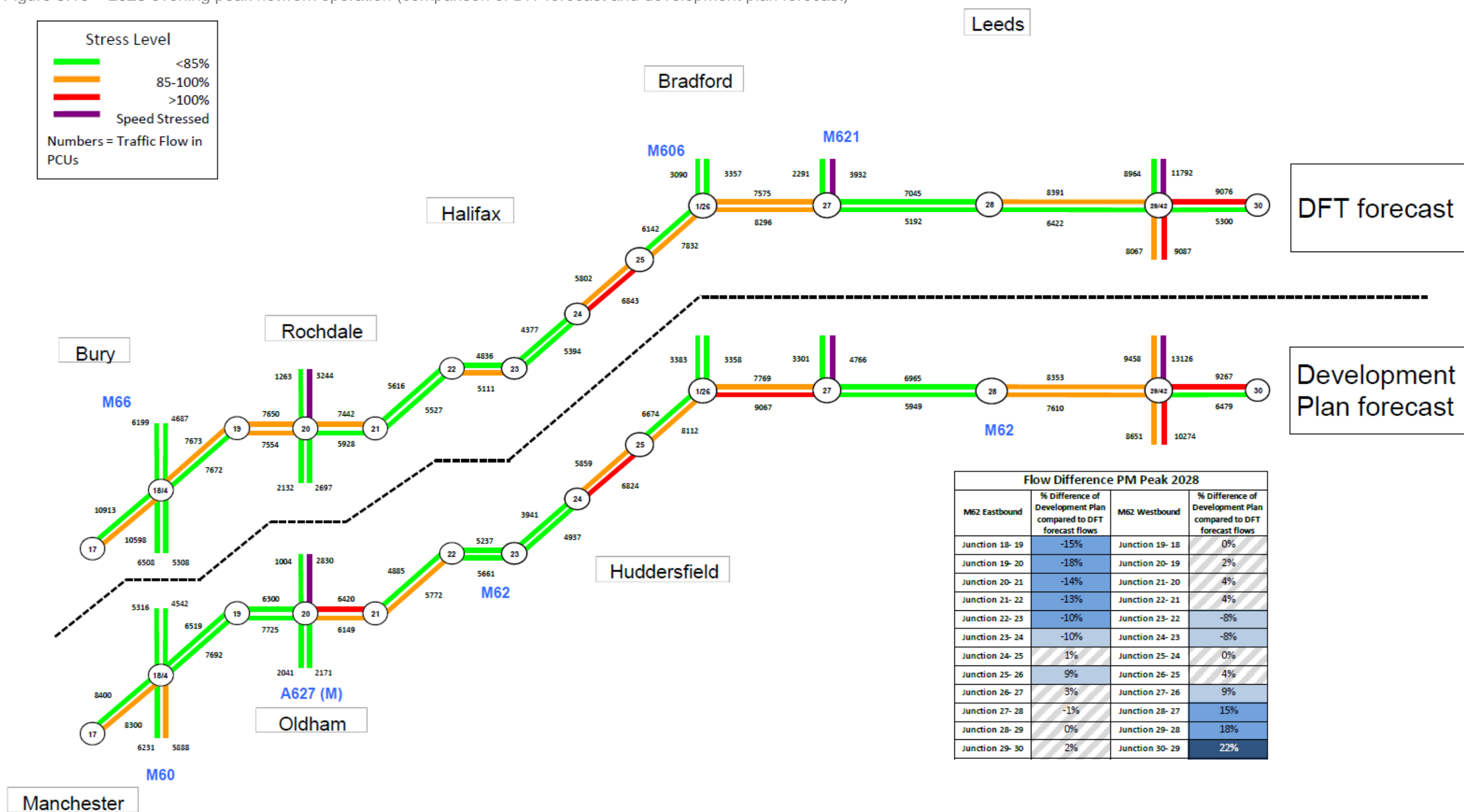


Figure 3.10 – 2028 evening peak network operation (comparison of DfT forecast and development plan forecast)



Analysis interpretation

- 3.3.18 At a link level it can be summarised that:
- Between 2011 and 2018, the operation of the links is forecast to improve in both the morning and evening peak periods. This is due to the opening of two managed motorway schemes on the M62 between junctions 18-20 and junctions 25 and 29. The operation of the M62 is expected to improve most by managed motorways in the morning peak period.
 - By 2028, the additional capacity provided by the junction 25 to 30 managed motorways scheme will be offset by increasing traffic growth on the route. This is shown by a number of amber and red links in both the morning and evening peak periods. The key problems in operation are located from junctions 20-21, junctions 24-27 and junctions 28-29. The Highways Agency West Yorkshire infrastructure study suggests that this will become critical by 2028.
- 3.3.19 At a junction level, it can be seen that the operation follows a similar pattern from 2011 through to 2028:
- In 2018 a number of the junctions, most notably junctions 20, 24, 26 and 27 will suffer from journey times of at least twice the time expected when no delay is present in both peak periods.
 - By 2028, a degree of delay is expected across all junctions where data has been collected on the M62 from junctions 18-29. Where delay was predicted in 2018, this is expected to extend, meaning that the journey time through the junction is expected to be at least 4 times the journey time when the section of network is free-flowing.
 - The junctions will face increasingly competing demands between local traffic trying to cross the route and other traffic trying to either enter or leave the motorway. The West Yorkshire infrastructure study suggests that these will have a significant impact on the overall operation of the route, particularly between junctions 27 and 29.
- 3.3.20 Solutions are already under consideration for junctions 24 to 29 which will alleviate some of the junction related issues and accommodate anticipated growth up to 2018.
- 3.3.21 A comparison has been undertaken to understand the differences between the flows that Department for Transport expect to occur on the network in future years with the flows generated by the local authority development aspirations.
- 3.3.22 The outputs show that overall the Department for Transport flows (which apply predicted flows across the wider region, rather than distributing around areas of growth) are slightly lower than the flows forecast to be generated by the anticipated development within each local authority area. In both the 2018 and

2028 outputs, the greatest differences (28-40%) are towards the eastern end of the M62 and in the eastbound direction.

Highway safety

Future position

- 3.3.23 As identified above, in coming years, there are a number of improvement schemes planned for the M62. These are mainly related to mitigating capacity and flow issues but are also expected to contribute to improving safety.
- 3.3.24 The committed schemes affect the majority of sites that currently have a problem with accident clusters. The managed motorway schemes to be implemented on both sides of the Pennines are largely related to improving flow and capacity. However, it is likely also to reduce conflict around junctions due to the lane drop / lane gain arrangements arising from the use of the hard shoulder. This will allow vehicles to exit from the hard shoulder straight onto the slip road (and vice versa), limiting the need for lane changing.
- 3.3.25 Other committed schemes at circulatory carriageways are likely to help reduce congestion on slip roads, and therefore potentially reduce the scope for rear end shunt accidents in queues.

Future Highways Agency influence

- 3.3.26 The Highways Agency Business Plan identifies initiatives aimed at contributing to the safety related goals and performance measures, including:
- The **Highways Agency safety framework** supports the national road safety framework, and identifies targeted interventions based on analysis of personal injury collisions data. In previous years the Highways Agency was set specific casualty reduction targets, but these are now replaced by a commitment within the safety framework to deliver a reduction in the number of road casualties.
 - In 2012-13, a **safety action plan** will be developed, setting out the approach to the delivery of safer roads and the reduction in the number of people who are killed or seriously injured both using and working on the network. This approach enables the identification and development of measures to further mitigate risk, including measures to reduce the risk that comes from poor driver behaviour.
 - **Regional safety reports** will cover both historic data of safety performance, and evidence-based actions that have been carried out with external safety stakeholders, identifying opportunities to engage through partners with individual road user groups.

Asset condition

Future position

- 3.3.27 Well planned and programmed maintenance will ensure that the asset is in the right condition to deal with future demands on the route. Increased traffic levels,

however will put more stress on the asset and may lead to the need for significant improvement to some elements and increased maintenance needs.

3.3.28 In the short term managed motorway schemes will significantly enhance the road surface and the technology provision along part of the route. This is identified in table 3.1.

Table 3.1 – committed technology provision (new provisions associated with managed motorway in green)

Link / junction		VMS / EMS	CCTV	ERT	Ramp metering	ANPR	NRTS	Meteorological sensors	Environmental sensors	MIDAS	Lane signals	Ramp metering comments
J18	Junction	●	●	●			●			●	●	
J18-19	Eastbound	●	●	●			●			●	●	
J19-18	Westbound	●	●	●			●			●	●	
J19	Junction	●	●	●	●		●			●	●	Eastbound only
J19-20	Eastbound	●	●	●			●			●	●	
J20-19	Westbound	●	●	●			●			●	●	
J20	Junction	●	●	●	●		●			●	●	Westbound only
J20-21	Eastbound	●	●	●			●			●	●	
J21-20	Westbound	●	●	●			●			●	●	
J21	Junction						●					
J21-22	Eastbound	●	●	●			●	●	●	●		
J22-21	Westbound	●	●	●			●	●	●	●		
J22	Junction						●		●			
J22-23	Eastbound	●	●	●			●	●		●		
J23-22	Westbound	●	●	●			●			●		
J23	Junction						●					
J23-24	Eastbound	●	●	●			●			●		
J24-23	Westbound	●	●	●			●			●		
J24	Junction						●		●			
J24-25	Eastbound	●	●	●			●			●		
J25-24	Westbound	●	●	●			●			●	●	
J25	Junction	●	●	●	●		●			●	●	Eastbound only
J25-26	Eastbound	●	●	●			●			●	●	
J26-25	Westbound	●	●	●			●			●	●	
J26	Junction	●	●	●		●	●			●	●	
J26-27	Eastbound	●	●	●			●		●	●	●	
J27-26	Westbound	●	●	●			●			●	●	

Link / junction		VMS / EMS	CCTV	ERT	Ramp metering	ANPR	NRTS	Meteorological sensors	Environmental sensors	MIDAS	Lane signals	Ramp metering comments
J27	<i>Junction</i>	●	●	●		●	●			●	●	
J27-28	<i>Eastbound</i>	●	●	●			●			●	●	
J28-27	<i>Westbound</i>	●	●	●			●			●	●	
J28	<i>Junction</i>	●	●	●	●		●			●	●	Westbound only
J28-29	<i>Eastbound</i>	●	●	●			●			●	●	
J29-28	<i>Westbound</i>	●	●	●			●			●	●	
J29	<i>Junction</i>	●	●	●		●	●			●	●	

3.3.29 It is crucial that consideration is given to technology asset maintenance and renewal (with a view to the design life of technology provisions estimated at 15 years) and risk of obsolescence. There are a number of technology assets that need to be managed in the coming years as they approach the end of their design life and as technological advancements are made. In particular, the maintenance of ageing structures to prolong their lives could become a significant burden. At some junctions, particularly junction 29, which will suffer from significant congestion and conflict issues by 2028, it may be more cost effective in the long term to replace these structures and at the same time redesign the junction layout.

Future Highways Agency influence

3.3.30 The Highways Agency Business Plan identifies initiatives aimed at contributing to the asset condition related goals and performance measures, including:

- Continuation of a programme of improvements to **asset management** systems and processes, and to improve the quality and coverage of our asset condition data. Delivery of the first elements of the integrated asset management information system will enable the Highways Agency to more effectively prioritise the programme of asset renewals and ensure that appropriate maintenance and renewal activities are undertaken at the optimal time in the asset's life cycle, helping to reduce costs while ensuring an effective level of service.
- **Asset support contracts (ASCs)** will begin to be implemented and will be used to drive service providers to deliver an agreed level of service on the network, while providing best value. The North West (Area 10) ASC contract has recently been let and commenced, with the North East (Area 12) contract to be converted to ASC within the short term.

- For **Traffic technology**, in facing the challenge of improving the reliability of the technology asset, during 2012-13 work will be undertaken to optimise its use in traffic flow, incident management, and information provision. Regional technology maintenance contracts (RTMCs) within the ASCs are being rolled out, with an aim of reducing costs and improving efficiency by delivering more targeted, outcome-based technology maintenance.
- 3.3.31 In line with the Highways Agency aim of reducing energy consumption (a 35% reduction by 2015) and energy costs, a number of lighting initiatives are being introduced, including Midnight Switch Off (MNSO) and Full Lighting Switch Off (FLSO). While there are no present commitments to such initiatives on the route, a stringent criteria based analysis will highlight where there are opportunities for such on any element of the corridor and such opportunities will be investigated. It should be noted, however, that the ability to implement MNSO requires an investment in lighting equipment to allow this to be done which has been completed along much of the eastern part of this route.
- 3.3.32 While the managed motorway schemes support the wider objectives of the strategy, they do cause asset management issues as they will limit the opportunity to access the network. In such areas of the network, maintenance activities may be restricted to overnight periods to reduce the delay implications that they could cause and new traffic management techniques for maintenance may need to be developed.

Environment

Future position

- 3.3.33 A growing economy and resulting increased traffic levels as forecast earlier in this section and the need to manage the environmental consequences of such traffic increases are to a degree at odds with each other.
- 3.3.34 The level of traffic is forecast to increase significantly by 2028 with the level of operational performance (in terms of delay and queuing on the network) forecast to deteriorate.
- 3.3.35 While this is the case, there are measures available to better manage the network. An example of this is the Environmental Assessment for the M62 junctions 25-30 managed motorway scheme, where it was specifically identified that the scheme could provide the following environmental benefits in addition to the performance and economic benefits:
- Noise – While additional capacity would be provided, traffic would be more regularly moving and therefore less often at a standstill. Without the scheme in place 2,900 people living or working in proximity to the route would be annoyed by the noise of the route. With the scheme nearer to 2,800 would be annoyed.

- Local air quality – There would be an overall improvement with a reduction in pollution around the M62, with small increases in concentrations in the wider area.
- Greenhouse gases – There would be an overall improvement with the scheme. While vehicle kilometres would increase, there would be lower CO2 emissions.

3.3.36 At a wider level there are technological advances which are likely to become more prevalent (as discussed earlier in this report) including electric cars and communication and information systems.

Future Highways Agency influence

3.3.37 The Highways Agency Environmental Strategy identifies a commitment to deliver the most effective solutions to minimise the **air quality** impacts resulting from traffic using the network. In directly associating this with the EU limit values, there is a commitment to operate and develop the network with a view to working towards compliance with statutory air quality limits. To this end the following actions are specified:

- Working in partnership with local authorities towards the delivery of the National Air Quality Strategy, preparing air quality action plans and implementing measures in AQMAs.
- Maintaining and supporting Highways Agency guidance on air quality assessment and making available air quality monitoring data.
- Working to develop and evaluate traffic control systems (e.g. managed motorway and ramp metering) which reduce vehicle emissions.
- Working towards improved performance in emissions control during construction/maintenance activities.
- In relation to **noise**, the Environmental Strategy outlines that the Highways Agency will work with other Government departments to deliver the requirements of the Environmental Noise Directive.

3.3.38 The Highways Agency will continue to be fully engaged with the spatial planning process, which ultimately has an influence on environmental change and work with local authorities to identify the most sustainable locations for development. Locating development to reduce the need to travel will assist in reducing emissions.

Operational management

Future position

3.3.39 The Highways Agency has a role to play in reducing the number and impact of incidents on the network. Consideration and development of the methods used to respond to incidents, primarily through technology means and careful management and application of the Traffic Officer Service will be required to

ensure operational and cross-border issues do not hinder the ability of the route to meet the wider objectives.

- 3.3.40 Managed motorway schemes bring significant benefits but will pose a number of future challenges in operational terms, including issues associated with routine operations (e.g. where to plough snow to) and in terms of incident management, where the absence of a hard shoulder will require revised approaches to reaching and responding to incidents.

Future Highways Agency influence

- 3.3.41 The Highways Agency Business Plan identifies initiatives aimed at contributing to the operational management of the network, including:

- For **traffic management**, while outlining that the Traffic Officer / information services are valued by customers and that incidents are responded to promptly and safely, to improve performance and reduce the cost of the traffic management operations the Highways Agency is changing the way it works through a Future Operating Model. This will see a number of changes implemented in the way in which the service is delivered. In 2012-2013, the Highways Agency will:
 - i. Seek to increase flexibility by looking into deploying single-crewed Traffic Officer vehicles to some incidents.
 - ii. Make better use of operations information to deploy Traffic Officers where they can be most effective.
 - iii. Review the fleet of vehicles that are used.
 - iv. Make improvements to control centre operations.
 - v. Improve customer contact activities.
- The commitment to, and implementation of, the **CLEAR (Collision, Lead, Evaluate, Act and Reopen) initiative** – with the aim of reducing the duration times of motorway incident closures. Working closely with Department for Transport and in partnership with other incident responders, including the Association of Chief Police Officers, Fire and Rescue, ambulance service and the Home Office, the initiative looks to identify issues that need to be addressed by all organisations involved in incident management. The specific areas that CLEAR will cover include:
 - i. The CLEAR 10-point plan covering a range of issues, including analysis of intelligence to fully understand the issues, police training, new tools and technologies, sharing best practice and improving the understanding of each organisations roles.
 - ii. Diesel and oil spill kits for Traffic Officers, reducing the need for significant repairs to the road asset where diesel has been spilled, and resulting lane closures.

- iii. Carriageway clearance: new policy, procedures, training and towing kits will enable Traffic Officers to remove broken down vehicles from live lanes more effectively, significantly reducing the delays from such incidents.
- iv. Working with the Vehicle and Operator Services Agency to reduce the number of HGV incidents, and tackling operators whose vehicles repeatedly break down or are involved in incidents.
- In relation to routine maintenance and **winter service** – lessons learned from the recent severe winters have already delivered improvements that have been implemented to keep the network open and safe during severe winter weather. New weather information services will also be embedded across the Highways Agency to improve responses to all types of severe weather.
- For **provision of information**, it is recognised that the provision of accurate and timely information is central to the Highways Agency's role as network operator. The National Traffic Information Service aims to deliver information quicker and more accurately, through the gathering of improved traffic data (better coverage, better data quality). This will enable customers to make better informed journey choices and allow the Highways Agency and its partners to manage and clear incidents more effectively.

3.4 Future route requirements and performance

3.4.1 There are a number of key route-wide findings coming from the analysis of the route in the future which are summarised below:

Operational performance

- A general improvement in network performance by 2018, primarily associated with the managed motorway schemes.
- By 2028, there is likely to be a deterioration in performance in West Yorkshire as the benefits of managed motorway between Junctions 25-30 are offset by further traffic growth.
- The Department for Transport traffic growth scenario demonstrates a lower growth level and different growth distribution (with subsequent less intense issues on the network) than the local authorities' development and growth aspirations.

Safety

- The committed schemes (including managed motorway) will offer some benefit.
- Increased flows in the future are likely to exacerbate the existing safety situation.

Asset condition

- Even with well planned maintenance, increased investment in the asset, in real terms, will be needed.

Environment

- Increased flows in the future are likely to exacerbate the environmental situation, although some benefit could be achieved from committed schemes (including managed motorway).
- Future data collection and analysis regime is likely to be required to be implemented in response to EU limits.
- Continued close working with local authorities and future reviews of this strategy should help identify sustainable locations for development that can be served by the transport network.

Operational management

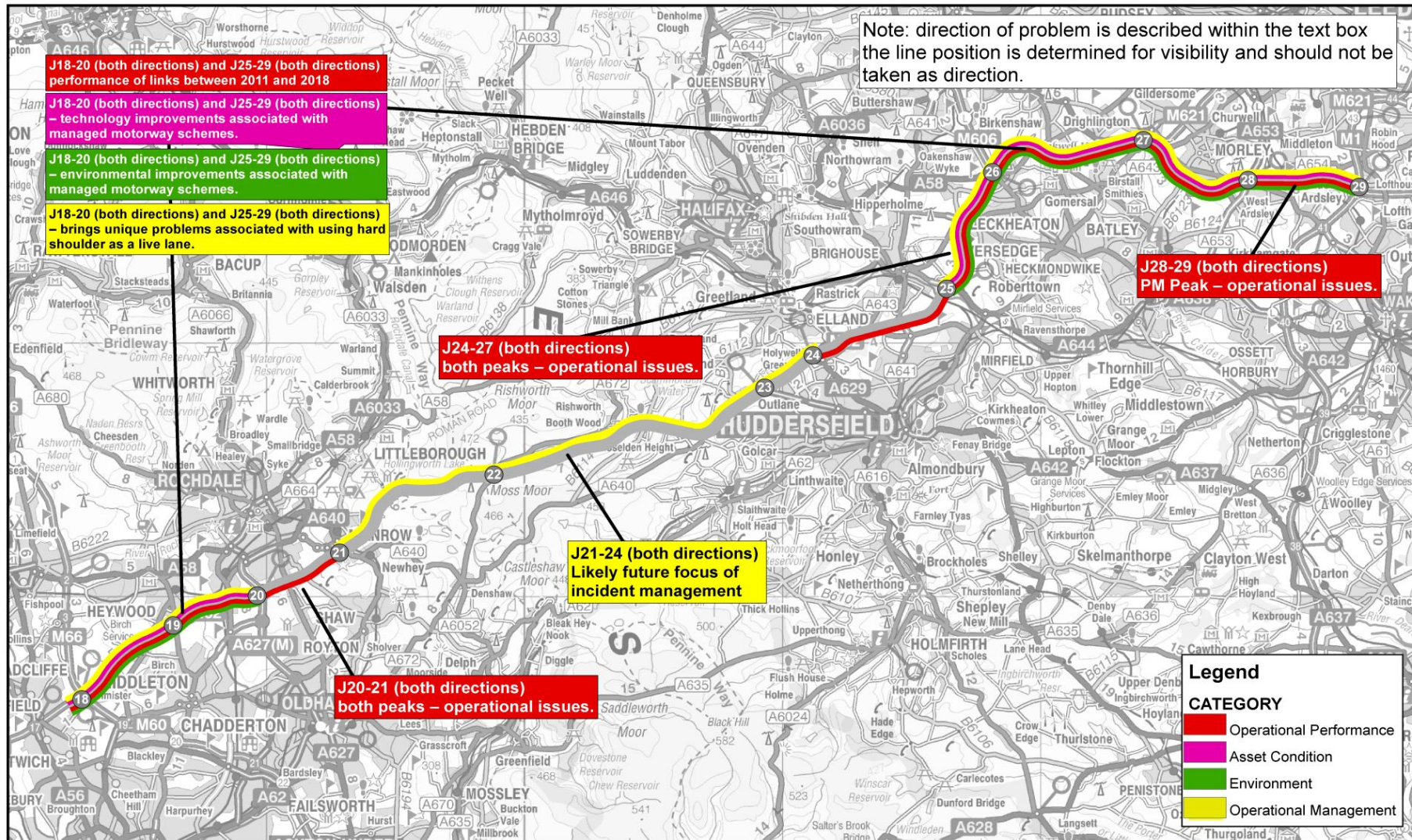
- The growth in demand will challenge the resourcing and operating methods still further in the future.

3.4.2 In addition to these, there are a number of location-specific issues spanning the range of issues. These are presented in figure 3.11 below.

3.4.3 It is clear that there is a certain level of synergy between the local and strategic priorities in relation to aspects such as needing to focus development in sustainable locations and seeking to minimise the need to travel by private car. However there exists a certain degree of conflict in how the route is used and how it is anticipated to operate in the future.

3.4.4 It is also clear that a remit of the Highways Agency, both generally in supporting Government objectives and specifically as part of this strategy is to facilitate economic development. The route will need to fulfil a pivotal role in strategically linking main centres of population and facilitating access to major ports, airports and rail terminals at both a national and international level.

Figure 3.11 – the route in the future - location specific findings



Route strategy **4**



4 Route strategy

4.1 Overview

- Demands on this corridor will continue to grow, especially on the urban sections, for the foreseeable future. It is clear that this growth is likely to present some fundamental problems focussed around junctions which need consideration and planning for in the immediate short term.
- A wide range of solutions will be required, but the solutions are likely to involve a significant provision of infrastructure outside the scope of current funding predictions.
- Interaction and integration with local stakeholders will be essential to balance the demands of the strategic road network and local traffic and influence development locations in the future.
- Long term resource management will minimise whole life costs of assets and strategic road network operation.

4.2 Strategic approach

4.2.1 Whilst some elements that will affect the future ability of the route to facilitate economic growth, maintain reliability and safety and manage asset resilience along the route are uncertain, the considerations in sections 2 and 3 of this route-based strategy clearly demonstrate that demands on this corridor will continue to grow, especially on the urban sections, for the foreseeable future. Further, it is clear that this growth is likely to present some fundamental problems focussed around junctions which need consideration and planning for in the immediate short term.

4.2.2 In order for the Highways Agency to manage this growth in demand and to give a clear strategic direction for the future, we will:

- Develop **physical improvements** to the network, to complement the outcomes of the managed motorway schemes, to address (i) the growing conflict at junctions between demand from the strategic road network and that of local traffic traversing the route and (ii) the operational issues that will arise where this route links to other elements of the strategic road network. It is unlikely that low cost interventions will be able to deliver the scope of separation / mitigation that may be needed to maintain efficiency on the route. Options for improvements may also influence maintenance programming decisions during the strategy period.
- Cooperate with partners to support **other networks' improvements**. In recognition that the strategic road network does not operate in isolation, a greater degree of integration with operators of other networks, including local

highway networks, is needed to release maximum efficiency. This may demand the use of Highways Agency funds to enhance or improve other networks, where clear benefits to the strategic road network can be demonstrated.

- Make best use of existing and emerging **technology** to improve operational efficiency by gathering data on the use of the route and providing information to road users and the operators of other networks. Creating true integration of real time information systems will, for instance, allow travellers to be given the best information and to be managed between different networks for maximum efficiency. Indeed better technology may prevent the need for many journeys.
- Improve **network management** through incident management, deployment of materials and resources and developing ways to manage access to the network. As demand increases, given the predicted finite nature of the asset, the Highways Agency will have to develop better ways of maintaining availability and access to the asset.
- **Influence travel behaviour** through better informed road users who will be better equipped to decide when, where and how to travel. As well as sharing real time information with local authorities and others, the Highways Agency should support local authorities in their management and enforcement of the planning system to reduce the number of trips generated through economic growth.
- Make use of **other influences** and opportunities to source resource and support for route enhancement. The ability to identify long term investment through the development of route-based strategies needs to be matched by the provision of long term funding or new funding sources to allow the Highways Agency to plan and programme and get the best value for every pound spent.
- Take a measured view of strategic and tactical decision making within the **Highways Agency's processes** to minimise future disruption of the network and minimise whole life costs, the Highways Agency should make investment decisions based on anticipated future use and wherever possible deliver a programme of quality renewals. To do this we must remove significant data gaps and variations in the use of data across regions. This will allow us to make accurate predictions of the future demand on the network and the state of the asset.

4.2.3 These strategic priorities align with the Highways Agency's business plan objectives and will help us continue to provide safe roads, reliable journeys and informed travellers.

4.3 Strategic actions

4.3.1 The actions identified to support this strategic approach are defined below in table 4.1. These are qualified in the table as follows:

- Relationship of Action with the strategy purpose – identifies which strategic action is satisfied.

- Timescale of action – the short-term ‘preparatory’ actions can be identified as covering the period to pre-April 2014. As such the medium-term actions are those which should be investigated for subsequent implementation within the first five year period (i.e. 2014-2019) and the long-term actions which should then be investigated for implementation within the subsequent ten year period (2019 – 2029).
- For action delivery, while the focus of the actions is in relation to the operation of the M62 route specifically, the actions identified to achieve the aspirations of the strategy are not solely related to the strategic road network, and in many cases require working with delivery partners. Any reliance on third parties in delivering the stated objective is therefore identified.

Table 4.1 – schedule of actions

Strategic direction	Action	Action location	Relationship to route-based strategy purpose				Timescales			Action delivery
			Facilitate economic growth	Manage journey time reliability	Manage safety performance	Maintain a resilient asset	Short (pre-2014)	Medium (2014-19)	Long (beyond 2019)	
Physical network improvements	Undertake further studies into the scale and definition of physical junction improvements	Route-wide	✓	✓	✓		✓	✓		Specific improvements require further investigation (tied in with wider aspirations to improve data and modelling approaches) but approach can be advanced immediately. Merit in considering effects of managed motorway schemes on junctions and local networks.
	Develop and implement junction improvements which manage the interaction between strategic and local road network	J24, J26, J28	✓	✓	✓			✓		Network improvements are unlikely to be of a low cost nature and will complement managed motorway schemes. Those junctions identified in the 'action location' are those that are identified in section 3 as being the likely focus of future issues, but further investigations should confirm this. This action will also consider the aspirations for a new junction (J24a) and the potential benefits of motorway access management.
		J25	✓	✓	✓			✓	✓	
	Implement junction improvements which deal with motorway to motorway issues	J26, J29	✓	✓	✓			✓		
J18, J27		✓	✓	✓			✓	✓		
Other networks' improvements	Investigate integration of route with other modes	Route-wide (but focussed on problem areas)	✓	✓			✓	✓		Potential for extent of co-operation with partners requires further investigation but approach can be advanced immediately.
	Investigate the impact of improvements on SRN to other networks and how other networks can be supported that offer clear benefit to the SRN	Route-wide (but focussed on problem areas)	✓	✓	✓		✓	✓		Specific improvements require further investigation (tied in with wider aspirations to improve data and modelling approaches) but approach can be advanced immediately. Merit in considering effects of managed motorway schemes prior to identification.
	Influence and support the implementation of improvements to adjacent local road networks	J26	✓	✓	✓			✓		Network improvements are unlikely to be of a low cost nature, although could focus on maximising person throughput through the junctions (e.g. through the implementation of priority bus lanes). Those junctions identified in the 'action location' are those that are identified in section 3 as being the likely focus of future issues, but further investigations should confirm this. Solution could extend to developing local parallel routes.
		J19, J21, J24, J25, J26, J28	✓	✓	✓				✓	
Technology	Develop an integration strategy between SRN and local road network	Route-wide	✓	✓	✓	✓	✓			Investigate and take forward 'MoU' type agreements for the sharing of information and provision of information to road users and develop integrated cross-network protocols to the management of network (e.g. roadwork planning) including interactions with utility companies (e.g. permit schemes) on local networks.
	Investigate potential for improvement of information provision through technology means	Route-wide	✓	✓	✓	✓	✓	✓		Investigate opportunities to deliver information to the road user in a manner which will enable more efficient use of the network and enable choices to be made in relation to the need for such journeys. Ensure accuracy of information (e.g. on signage) to build the level of trust in the system. Improve asset management information systems.
	Influence wider technology provisions	Route-wide	✓	✓	✓		✓	✓	✓	Investigate the opportunities and threats that wider technology provision (e.g. superfast broadband / information systems and electric cars) bring, with a focus on embracing the opportunities they bring in relation to the need to use the route, and developing strategies to ensure any potential negative effects are appropriately incorporated to the long-term strategy.
Network management	Continue to review the Traffic Officer patrol strategy; resourcing plan/risk analysis; and opportunities for intelligent resourcing	Route-wide (but focussed on the more remote rural areas)	✓	✓	✓		✓			The investigation of issues during the development of this strategy has identified that the Traffic Officer Service will need to be reactive to the future traffic patterns (e.g. the changing focus of the service once managed motorways is in place). This investigation should ensure that the strategy is appropriately implemented, that the resources available are adequate and correctly sited and that opportunities to be pro-active and intelligence-led are grasped.
	Implement Traffic Officer Service strategy (identified through above action)	Route-wide (but focussed on the more remote	✓	✓	✓			✓		The implementation of the strategy for the Traffic Officer Service will focus on the outcomes of the strategy review action, but as with the physical interventions, there will need to be a degree of balance with the effects of the managed motorways scheme and thus their

Strategic direction	Action	Action location	Relationship to route-based strategy purpose				Timescales			Action delivery
			Facilitate economic growth	Manage journey time reliability	Manage safety performance	Maintain a resilient asset	Short (pre-2014)	Medium (2014-19)	Long (beyond 2019)	
		rural areas)							implementation is identified for the medium term.	
	Enhance the approach to responding to incidents to reduce their negative consequences	Route-wide (but focussed on the more remote rural areas)	✓	✓	✓		✓	✓	Review the current protocols to incident response with partners (e.g. emergency services) and investigate advances in approach (including technology solutions) to ensure that incident response time is efficient as possible to reduce the delay impacts (and resultant impacts on the economy) that are caused by incidents and their associated lane / road closure.	
	Investigate physical network management solutions to better manage the network	Route-wide	✓	✓	✓	✓			Investigate the measures that are available to make best use of the network, including, but not limited to, those that consider managing network demands (e.g. dedicated lanes (either permanent or temporary) and supporting enforcement technology) and to assist in responding to incidents (e.g. gates on slip roads for closure of links during incidents and central reserve gates to support management of incidents).	
	Implement physical network management solutions	Route-wide	✓	✓	✓	✓		✓	Implement the physical network management solutions that can contribute to the wider aspirations of this strand (enhancing the Traffic Officer strategy, incident response approach and physical network management solutions).	
	Develop clearer strategies for diversion routes at both local and strategic levels	Route-wide	✓	✓	✓	✓	✓	✓	A strategy for, and enhancements to, the identification to road users of, diversion routes at a local level needs to be developed to ensure their effectiveness in providing the most suitable alternatives in such instances of their requirement. At a strategic level, consideration needs to be given to the strategic diversion strategy (including the investigation of the need for additional strategic diversion routes) such that strategic movements are catered for in such instances of their requirement.	
Influencing travel behaviour	Develop methods to improve information provided to road users	Route-wide	✓	✓			✓	✓	Better inform road users in relation to their travel choices and develop and instigate methods to equip road users with the ability to make better travel decisions.	
	Support local authority practices to deliver greater benefits from sustainable travel options	Route-wide	✓	✓			✓	✓	Including the sharing of information between the Highways Agency and LAs, and supporting the LAs in their management and enforcement of the planning system to manage the number of trips resulting from economic growth.	
Other influences	Influence the development of a long term approach to the whole management of the route	Route-wide	✓	✓	✓	✓	✓	✓	To align the efficient delivery of all processes of route management (including the delivery of schemes and asset maintenance and renewals along the route) ensure that a long term approach is taken.	
	Use existing and potential funding mechanisms and approaches efficiently	Route-wide	✓	✓	✓	✓	✓	✓	Ensure delivery of best value route outcomes through the efficient use of the Highways Agency budget. Investigate and influence mechanisms to work with partners and joint-funding approaches and explore the potential to utilise Highways Agency budgets on non-SRN elements of the network, where there are clear beneficial outcomes achieved.	
	Ensure the strategy aligns and reacts appropriately to other influences and opportunities	Route-wide	✓	✓	✓	✓		✓	The strategy will need to evolve to ensure it remains appropriate to evolving transport policies.	
	Work with local authorities and developers to identify sustainable areas suitable for development towards the end of the strategy period and beyond	Route-wide	✓	✓	✓	✓		✓	Whilst growth aspirations and development allocations are defined within local development plans, growth will continue beyond the strategy period. A collaborative approach to future land allocation will make best use of available road space.	
Highways Agency	Develop a more integrated approach to gathering and utilising data and intelligence	Route-wide	✓	✓	✓	✓	✓	✓	This strategy has identified that, while there is an array of data collected and available to the Highways Agency, there are several weaknesses in this data provision, stretching from lack of data (e.g. origins and destinations of movements, environmental information) through to	

Strategic direction	Action	Action location	Relationship to route-based strategy purpose				Timescales			Action delivery
			Facilitate economic growth	Manage journey time reliability	Manage safety performance	Maintain a resilient asset	Short (pre-2014)	Medium (2014-19)	Long (beyond 2019)	
processes									lack of accuracy of data (e.g. in relation to the asset). A cross-Highways Agency interrogation of data needs (including consideration of future legislative responsibilities) is required to ensure that the network is understood and developed on a sound basis.	
	Develop route specific integrated cross-regional processes that recognise the strategic nature of this route		✓	✓	✓	✓	✓		In the development of this strategy it has been highlighted that the route has a strategic importance, primarily as a corridor of strategic national importance. Currently all operations of the Highways Agency (stretching from asset management to the Traffic Officer Service) operate at a regional level, neglecting the cross-regional nature of this route and the merits of better co-ordinating this should be investigated.	
	Ensure contractual and regime approaches contribute to whole life cost management		✓	✓	✓	✓	✓	✓	Consider the approaches of the contracts and regimes (again covering all operations) to ensure that the whole life costs of the asset are managed rather than taking a short term view that could lead to long term consequences and associated expense.	

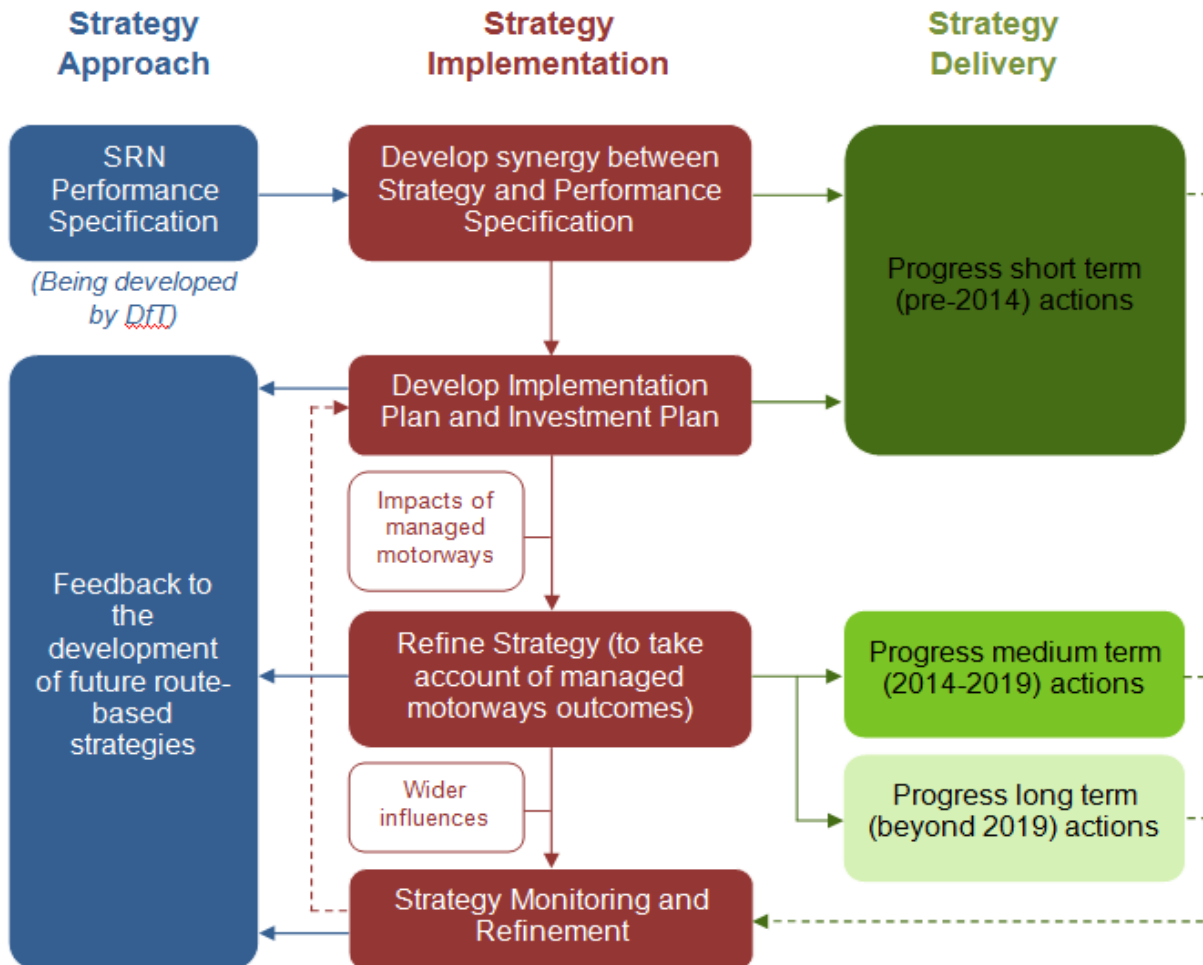
4.4 Strategic summary

- 4.4.1 The development of this route-based strategy has clearly identified the role which the M62 between junctions 18-29 has to play in the developing economies of both Greater Manchester and West Yorkshire. Whilst it is not evident that demand for city to city trips between Leeds and Manchester is currently, or will become, significant, the whole route provides a vital trans-Pennine link for long-distance and predominantly commercial traffic.
- 4.4.2 It is clear that there exists a conflict in demand for the capacity of the corridor between that traffic undertaking long distance journeys, linking ports, industry and end-users, and local traffic, mainly commuter based, which hops on and off the network along the urban sections. This demands the adoption of a balanced approach to developing and managing the route to ensure that the strategic function of the route (as part of the strategic road network, SNC, TEN-T and UNECE networks) is maintained while accommodating this local usage of the route where this is possible.
- 4.4.3 Both national and local growth strategies rely on the strategic road network to deliver their objectives, but in turn the success of meeting these objectives puts an even greater pressure on the network. The analysis within section 2 identified the current pressures on the network, with section 3 forecasting this forward into future years to understand the likely future pressures. Without a planned approach, this could lead to problems, including economic and environmental disbenefits, with the network becoming particularly vulnerable to these increasing pressures.
- 4.4.4 Maintaining availability of the asset through effective maintenance, development of new infrastructure, working closely with partners and road users and taking a long view on funding and asset condition will ensure the future efficiency of this important route.
- 4.4.5 We must not lose sight of the importance of considering the needs of road users. Any future strategy must have their needs and capabilities at their heart.

4.5 Implementing the strategy

- 4.5.1 This report sets out the strategic outcomes and recommended actions in seeking to achieve the purpose of the strategy - to facilitate economic growth, manage journey time reliability and safety performance and to maintain a resilient asset. Figure 4.1 sets out the next steps in implementing the strategy.

Figure 4.1 – next steps in implementing the strategy



4.5.2 In addition to the delivery of the schedule of actions (presented in table 4.1) identified in the short, medium and long term, the other fundamental themes to the implementation of the strategy are focussed on:

- **Informing the delivery of the future programme of strategies** – a clear aspiration of the development of the three initial route-based strategies was to inform and steer how they are delivered in the future. Lessons-learned through the development of the M62 route-based strategy and a review of the approach to each of the other strategies, together, will help to identify the approach to be adopted in the future.
- **Strategy refinement (in response to managed motorways)** – while the outcomes of the managed motorway schemes have been modelled and forecast (including within the operational assessment undertaken within the development of this strategy), to ensure the outcomes complement the managed motorway schemes and to enable the true impacts of the schemes outcomes to be fully considered, a refinement step (post managed motorway implementation and during the next spending review period) is considered to be crucial.

- **Strategy monitoring** – A defined programme of strategy monitoring and review is needed to respond to a changing economic environment. This system of review will ensure that planned economic growth can be fully supported and in the longer term will help both the Highways Agency and local authorities identify areas for development beyond 2028.

Appendices



Appendices

Glossary

Abbreviation	Description
AADT	Annual Average Daily Traffic
AGMA	Association of Greater Manchester Authorities
ANPR	Automatic Number Plate Recognition
AQMA	Air Quality Management Area
ASC	Asset Support Contract
CCTV	Closed Circuit Television
DaSTS	Delivering a Sustainable Transport System
Defra	Department for the Environment, Food and Rural Affairs
DfT	Department for Transport
ELPV	Enhanced Longitudinal Profile Variance
EMS	Enhanced Message Sign
END	Environmental Noise Directive
ENR	Environmental Noise (England) Regulations
ERT	Emergency Roadside Telephone
EU	European Union
FLSO	Full Lighting Switch Off
FPL	First Priority Location
GMCA	Greater Manchester Combined Authority
GMS	Greater Manchester Strategy
GVA	Gross Value Added
HGV	Heavy Goods Vehicle
IA	Important Area
ITA	Integrated Transport Authority
KSI	Killed and Seriously Injured
LA	Local Authority
LEP	Local Enterprise Partnership
LNMS	Local Network Management Scheme
LRN	Local Road Network
LTP	Local Transport Plan
MAC	Managing Agent Contractor
MIDAS	Motorway Incident Detection and Automatic Signalling
MNSO	Midnight Switch Off
MoU	Memorandum of Understanding
NAT	Network Assessment Tool
NRTS	National Roads Telecommunications Service
PCU	Passenger Car Unit
RTC	Road Traffic Collision
SNC	Strategic National Corridor

Abbreviation	Description
SoS	Secretary of State
SRN	Strategic Road Network
TEMpro	Trip End Model program
TEN-T	Trans-European Network - Transport
TfGM	Transport for Greater Manchester
UNECE	United Nations Economic Commission for Europe
VMS	Variable Message Sign

Appendix A - route designation

Strategic road network (SRN)

The length of the M62 route being considered forms part of the SRN, which is designed to cover journeys undertaken at a national level and strategically linking together key locations in the UK. While the SRN constitutes only 2.4% of the nation's road network, it carries around a third of all traffic and two-thirds of all freight.

Operated by the Highways Agency on behalf of the Secretary of State for Transport, the SRN (made up of all purpose trunk roads and motorways) demonstrates the following functions:

- Linking the main centres of population;
- Facilitating access to major ports, airports and rail terminals;
- Enabling access to peripheral regions; and
- Providing key cross-border routes to Scotland and Wales.

Strategic national corridor (SNC)

The M62 forms part of the network of SNCs, reflecting key transport arteries across all modes. The criteria for these corridors have been defined as being those corridors that link two or more of the following strategic destinations and where there is evidence of substantial strategic traffic flows:

- The ten largest cities in England;
- The ten busiest ports in England;
- The seven busiest airports in England; and
- Wales, Scotland and Northern Ireland.

Trans-European network – transport (TEN-T)

The TEN-T network is seen as being fundamental to the mobility of people and goods across the EU and form part of a wider system of networks covering telecommunications and energy. It is envisaged that the body responsible for the TEN-T co-ordinates improvements to transport infrastructure and systems to provide integrated and intermodal long-distance routes.

TEN-T covers 30 cross-European transport axes and priority projects, with project number 26 'railway/road axis – Ireland / United Kingdom / Continental Europe' containing the M62 corridor along with the trans-Pennine rail route).

United Nations Economic Commission for Europe (UNECE) International E-Road Network

The UNECE E-Road Network intends to create cross-European axes of travel. The M62 corridor forms part of European route E20 between Shannon in Ireland and Saint Petersburg in Russia and European route E22 between Holyhead in the UK and Ishim in Russia.

Appendix B – stakeholder event key findings

In addition to the general and ongoing dialogue between the Highways Agency and stakeholders, the particular focus of the engagement as part of the route-based strategy was centred on a stakeholder event that took place on the Wednesday 24th October at the George Hotel in Huddersfield. This event was well attended by key representatives from local authorities along the route (spanning planning, transport policy and highways teams), partners from the Leeds City Region, West Yorkshire Integrated Transport Authority (ITA), Transport for Greater Manchester (TfGM) and Manchester Airport Group. Members of staff from the Department for Transport and the Highways Agency were also in attendance to input and co-ordinate the event.

The aim of the event was to:

- Engage with local stakeholders to bring together national and local priorities for the route.
- Determine stakeholder priorities, an understanding of the interaction with the local road network; known information regarding the current operation of the route; the impact of development aspirations; the likely future operation of the route and potential solutions.
- As one of the initial route-based strategies, act as a learning process for the future development of strategies.

In order to capture this information, the event was structured with a presentation on the scope and context of the route-based strategies (as outlined in section 1 of this report); three primarily workshop focussed discussions in relation to (i) the M62 route now, (ii) the M62 route in the future and (ii) potential solutions; and a summary presentation as to the next steps in the process of developing the strategy.

Table B.1 - the M62 route now

Theme	Commentary
Route function	<ul style="list-style-type: none"> • The role of the M62 is unclear – is it to provide for strategic long distance or commuting traffic. • There is a clear conflict between strategic and commuting traffic, but current data does not allow this to be fully understood. • There is no direct linkage between road-based and rail-based strategies.
Current network operation	<ul style="list-style-type: none"> • Congestion was identified as being prevalent across the network, particularly on the urban sections. The intensity and period of issues varied across the network. • The morning and evening peaks were recognised as being the most intensely trafficked, but other periods were also identified as having issues. • Perceived to be a high number of incidents / accidents with some key hot spots also identified. Also considered that this might be a disruption (the magnitude) issue rather than the volume of accidents. • Weather / fog related issues on the rural elements of the route.
Traffic and route management	<ul style="list-style-type: none"> • High proportions of freight traffic utilise the route. • Issues with the diversion strategy. No strategic diversion available means diversions lead to local road network issues. • Incidents on the network cause major issues and need to be managed more efficiently.
Barriers to economic growth	<ul style="list-style-type: none"> • Journey time reliability. • Land Use Planning / Transport Planning relationship. The Highways Agency still seen as a barrier. • Balance between the Strategic and Local Road Networks. • A number of potential sources of evidence were identified which will be investigated during the development of the strategy.
Evidence sources	<ul style="list-style-type: none"> • A number of potential sources of evidence were identified which will be investigated during the development of the strategy.

Table B.2 - the M62 route in the future

Theme	Commentary
Development aspirations	<ul style="list-style-type: none"> • Specific employment and residential developments which could influence travel patterns at the M62 were identified. • The scale and location of developments are of a significant nature with the main focus of aspirations for new developments being in the urban areas in the vicinity of the route on both sides of the Pennines.
Transport influences	<ul style="list-style-type: none"> • A number of city region transport initiatives (e.g. West Yorkshire Transport Fund, Greater Manchester Transport Innovation Fund (TIF) and Transport Strategy for Manchester City Centre) were identified. • Rail initiatives were summarised (electrification of trans-Pennine line via Huddersfield and speed improvements on the Calder Valley line). • Managed motorway schemes on the SRN were outlined (under construction for junctions 25-30 and planned for junctions 18-20), but it was considered that they only provide a short-term solution. • Some aspirations were identified for a new M62 junction (24a).
Future traffic situation	<ul style="list-style-type: none"> • Existing issues will become prevalent across the network (over and above current issues), with a continuation of the conflict between strategic and commuting traffic. • North-south local-local movements across M62 junctions could rise, driven by local growth.
Future barriers to economic growth	<ul style="list-style-type: none"> • The performance of the M62 will become a barrier to growth. • Concern that if the economy grows too fast, the Highways Agency will constrain new developments in order to maintain the function of M62 for existing users.
Other key messages	<ul style="list-style-type: none"> • Potential behavioral shifts (e.g. from commuting to working from home). • Future developments could make areas more self-contained with a reduction in cross-commuting. • Changes in the relative price of car and public transport travel will have a significant influence on the use of the route. • Planning policy changes could have a negative influence, causing the release of more peripheral sites. • Question whether the Department for Transport's proposed Roads Strategy will deal with reallocation of roadspace to economically more valuable trips. • Freight providers and users may become more assertive relative to car users - there could be more influence via the local enterprise partnerships in this respect.

Table B.3 - potential solutions

Theme	Commentary
Physical improvements	<ul style="list-style-type: none"> • Potential for physical improvements at junctions to reduce the conflict between strategic and local traffic. • Schemes needed to react to safety issues on the network.
Improvements to other networks	<ul style="list-style-type: none"> • Rail network improvements including: improving existing lines/reopening lines including frequency improvements; better interaction between road and rail (advertise alternative); move more freight to rail (freight management strategy); and fare reductions. • Bus network improvements including: dedicated bus corridors and improved frequencies; new generation transport (guided bus); Park and Ride (to intercept traffic); better bus partnerships and improved journey times to make the bus network more attractive; fare reduction; and a return to a regulated bus network.
Technology	<ul style="list-style-type: none"> • Transport management technology including: tolls / road user charging; integrated traffic management between road networks and modes; the requirement for an interface strategy between the strategic and local network; improve accuracy of gantry signs; and better management of variable message signs. • Wider technology including: superfast broadband / working from home; and electric cars could solve environmental problems (pollution) but could cause more issues in terms of congestion.
Network management	<ul style="list-style-type: none"> • Incident response including: better incident response required (e.g. on the railways the target is 71 minutes to re-open after a fatality - recent closures on the M62 have been near 12 hours); consider location of Traffic Officers; and consider influencing emergency services response procedure. • Diversion routes including: improving diversion routes; and marketing and signing of them.
Political influences	<ul style="list-style-type: none"> • Monetary influences including: tolls; foreign vehicle charging (lorries); road tax regimes; fuel taxes / prices; and improve partnership working and develop joint funding opportunities between all service providers. • Political influences including: access to services; the influence of the political cycle on long term planning; the land-use / transport planning interaction; and consideration that the route should not be looked at in isolation
Influencing travel behaviour	<ul style="list-style-type: none"> • Improved driver information, including better information about costs; and providing the ability to influence travel decisions. • Influencing local authority practices. • Travel planning including: strengthening the role from perception that TPs are just needed to get through planning to one of delivering results and being appropriately managed and enforced; and developing a co-ordinated approach to deliver strategic results.

Appendix C - assessment method

The analysis has used existing models and model runs. Previous modelling of the M62 has been undertaken in two parts reflecting the two regions that the M62 crosses and the focus around the main urban centres. It has therefore been necessary to use data from different models in order to cover the whole of the study area. Background to these models, and an explanation of how the data from them have been utilised is provided below.

A total of four models have been used in order to provide the required geographical coverage of the route while providing sufficient detail to understand the future conditions at junctions as well as the mainline of the route:

- In the North West (Area 10):
 - i. A SATURN highway model is being used to study the impacts of a managed motorway scheme covering the M60 junction 8 to the M62 junction 20 around Manchester. This model is a derivative of the Transport for Greater Manchester (TfGM) SATURN model and has been used to provide mainline information.
 - ii. The Manchester managed motorway study is also making use of the M60 Mesoscopic model. This model covers a substantial part of the M62 between the M60 and the Greater Manchester boundary and has been used to provide information about the operation of junctions.
- In Yorkshire & Humber (Area 12):
 - i. The Network Assessment Tool (NAT) spreadsheet model has been used for a number of years to provide a high level assessment of future stress levels on the motorway mainline. The NAT model provides the data for the mainline assessment.
 - ii. This has more recently been linked with a West Yorkshire Mesoscopic model which covers all of the M62 through West Yorkshire providing full coverage of the study area on the east side of the Pennines. This model informs the junction assessments.

Between them, these four models provide sufficient coverage and detail for the majority of the study route.

Appendix D – highway safety

Existing accident situation

Using the most recently available data (2008 – 2010) it has been possible to analyse the location and characteristics of killed and seriously injured accidents (KSI) taking place on the route and, where appropriate, compare these with national averages.

Over the three year period, there were 594 injury accidents between junctions 18-29. Relatively few accidents are categorised as fatal or serious (7%). The link with the largest absolute number of injury accidents is between junctions 22-23, in both directions. However, the length of this link is twice the average of the route, and when accounting for this, the significance of the accident rate is reduced.

When considering the accident rate per billion vehicle miles and casualty severity ratio, it is clear that there is considerable variation along the route - to some extent reflecting the random nature of accident occurrence. The Highways Agency Safety Operational Folder gives a level of 12 accidents per billion vehicle miles above which link accident levels require investigation. Of the 24 links along the route, 12 are above the investigatory level. The worst link overall is that between junctions 28-29, where accident rates are more than double the investigatory level in both directions. The casualty severity ratio (i.e. the ratio of fatal or serious accidents to the total number of casualty accidents) has an investigatory level of 0.09 (i.e. 9% of casualty accidents being serious or fatal). Only eight of the 24 links along the route have a figure above the investigatory level. This shows that, while there are a significant number of links where the accident rates are higher than the investigatory level, the severity of these accidents tends to be lower. A good example of this is junctions 20-21 westbound where there is a very high accident rate, but the casualty severity ratio is zero (i.e. no killed or serious injured casualties).

Contributory factors

There are a number of broad factors that contribute to the likelihood and severity of accidents. These include the weather conditions (which can increase the likelihood of accidents) and the involvement of HGVs in accidents (which can increase the severity of accidents due to their size and weight).

In relation to weather conditions:

- The route has a higher level of accidents in wet or icy conditions than the national investigatory level from the Safety Operational Folder. The relatively high number of accidents during conditions of snow or ice is mainly attributable to the high level sections of the route between junctions 21-23. It should also be noted that, during the period for which this data has been analysed, there were exceptionally cold winter conditions with significantly more snow and ice than historic averages.

- The number of accidents taking place in wet conditions was also above the investigatory level. Whilst this can (to some extent) be attributed to the high level sections between junctions 21-23, higher than investigatory levels occur on much of the route.

In considering single vehicle accidents and the involvement of HGVs in accidents:

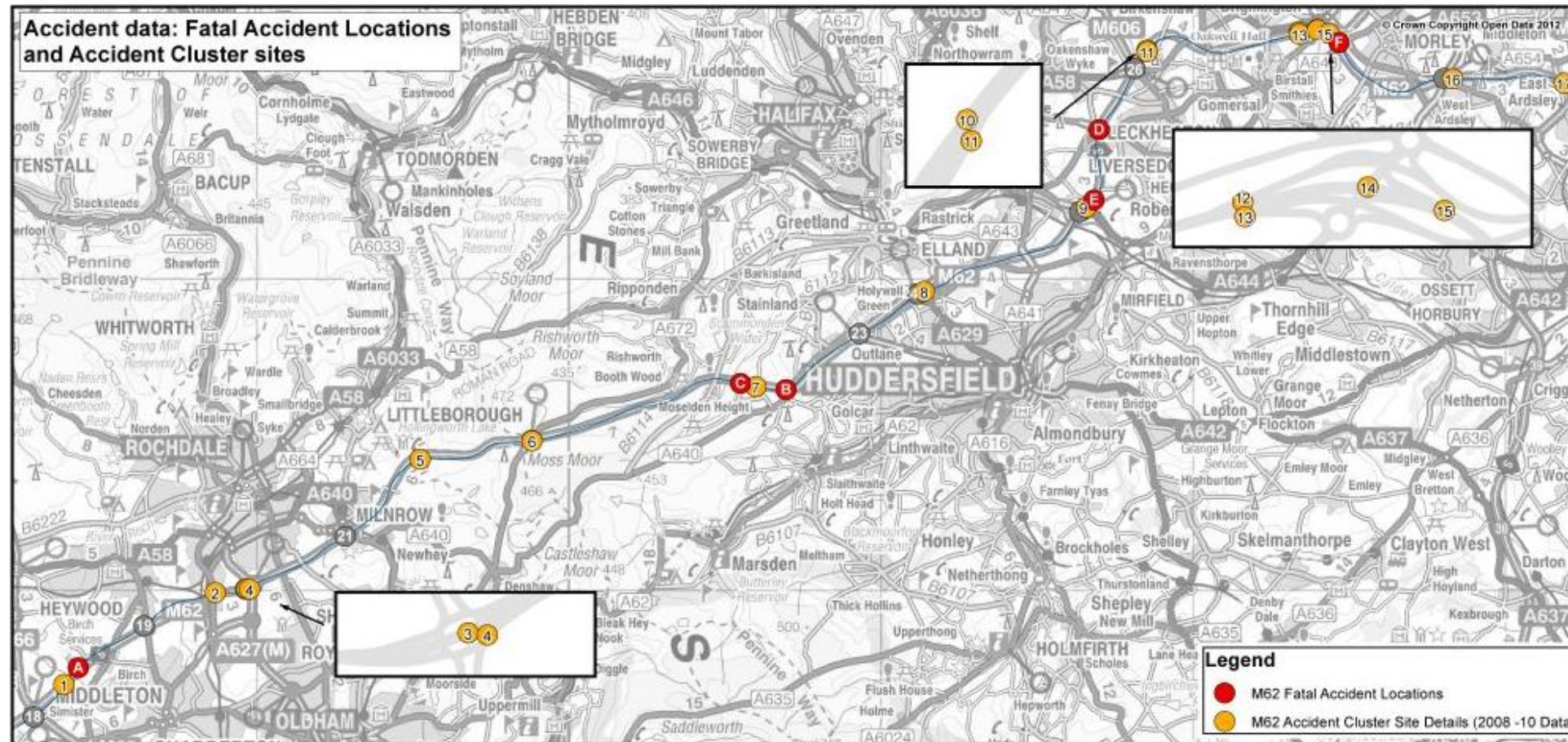
- The number of single vehicle accidents is lower than the investigatory level on average. However, there are a number of specific links where values are considerably higher, including eastbound between junctions 22-23 and westbound between junctions 24-23, suggesting a difference in character of accidents at these locations, compared to the most common route accident type (rear end shunts) which, by definition, involve multiple vehicles.
- The involvement of HGVs in accidents is slightly higher than the investigatory level, reflected by the high volume of HGVs that use the M62. There are a number of locations where HGV involvement rates are very high, including eastbound between junctions 21-22 and westbound between junctions 25-24. While the reason for this is unclear, it does underline the overall issue with large numbers of HGVs being involved in accidents.

Cluster sites and fatal accidents

The locations of accident cluster sites (where three or more accidents took place in a 50 metre section of carriageway over the three year period) as well as the location of fatal accidents have been investigated.

Figure D.1 presents the location of both the cluster and fatal accidents, with the associated tables providing specific details.

Figure D.1 – location of accident clusters and fatal accidents



Map Ref.	Fatal Accident Location	No. of Fatalities	Fatal Accident Description
A	J18-19 westbound	3	Multiple vehicle accident in dry conditions and daylight
B	J22-23 westbound	3	Single vehicle accident in snow and darkness
C	J22-23 westbound	1	Multiple vehicle accident in wet conditions and daylight
D	J25-26 eastbound	1	Multiple vehicle accident in dry conditions and daylight
E	J25-26 westbound	2	Multiple vehicle accident (involving HGV) in dry but dark conditions
F	J27-28 eastbound	7	Multiple vehicle accident (involving HGV) in dry conditions and daylight

4.5.3

Map Ref	Cluster Location	Cluster Description	Severity	Junction or Link?
1	J18-19 eastbound (1km east of J18)	No common theme.	Serious	Link
2	J19-20 westbound (bridge west of J20)	Accidents took place in rain or snow – issue with skidding.	Slight	Link
3	J20 (westbound within junction)	Rear end shunt.	Slight	Junction
4	J20 (top of westbound merge)	Shunts in queues on slip road.	Slight	Junction
5	J21-22 westbound (bridge at Nicholas Pike)	Falling gradient – issues with vehicles not keeping distance.	Serious	Link
6	J22 (eastbound within junction)	No common theme.	Slight	Junction
7	J22-23 westbound (Hey Lane over bridge)	Vehicles too close together – signs already in place to this effect.	Slight	Link
8	J24 (westbound diverge)	Issues with queuing on slip road.	Serious	Junction
9	J25 (westbound diverge)	Sighting of vehicles queuing on diverge is poor from mainline – vehicles approach too fast.	Slight	Junction
10	J26 (eastbound merge)	Merge issues in periods of congestion – rear end shunts.	Slight	Junction
11	J26 (westbound diverge)	Lane changing issues and rear end shunts in congestion.	Slight	Junction
12	J27 (eastbound diverge)	Issues with queuing on slip road.	Slight	Junction
13	J27 (westbound merge)	Merge issues in periods of congestion – rear end shunts.	Serious	Junction
14	J27 (eastbound within junction)	Rear end shunts during periods of congestion.	Slight	Junction
15	J27 (eastbound merge)	Rear end shunts during periods of congestion.	Slight	Junction
16	J28 (westbound diverge)	Issues with lane changing at off slip road to get in right lane for circulatory.	Slight	Junction
17	J29 (westbound merge)	Complex junction layout including slip roads from M1.	Slight	Junction

Looking at these cluster sites, it can be seen that:

- The majority of cluster sites exist within the West Yorkshire area, between junctions 24-29, reflecting the high traffic volumes on this section of the route.
- The majority of cluster sites are located on or around junctions (13 of the 17 cluster sites are at junctions) - the exception to this being two clusters on the high level section between junctions 21-23.
- Only 11% of accidents in the available data formed part of a cluster.
- The majority of the clusters were slight accidents and there were no fatal accidents in any of the clusters. The reason for this low level of severity is the tendency for accidents to happen close to junctions, especially those which are congested and with low speeds. Congestion causing rear end shunts on or around slip roads is the main issue, followed by lane changing problems. The four clusters on links have a variety of causes.

Fatal accidents generally appear to be isolated events with few common themes. The exceptions to this are accidents B and C, which took place close to cluster 7. This section of carriageway is steeply graded and the accidents may have been caused by vehicles not keeping far enough apart. Accident B took place in poor weather conditions, which may have exacerbated the existing problem due to skidding. The presence of both an accident cluster and two fatal accidents on this stretch of carriageway underlines the issues associated with this section. However, as noted above, mitigation measures for this problem have already been implemented.

Appendix E – previous studies

Northern Way/Highways Agency M62 Route Action plan

The Northern Way published a report *Moving Forward: The Northern Way First Growth Strategy Report* (September 2004) in which the commitment was expressed to close the economic gap between the North of England and the rest of the UK and highlighted the key contribution that good transport links make to economic growth.

Emanating from this ambition was the Northern Way/Highways Agency *M62 Route Action Plan (2006)*, which aimed to establish an evidence base for the route and identify possible solutions, primarily associated with congestion and journey time unreliability covering a 25 year horizon. While concentrating on the operation of the M62 corridor, the Action Plan considered potential interventions across modes and made recommendations including elements of ramp metering, managed motorway, prohibition of HGV overtaking, along with a wide range of smarter choice measures which would offer significant benefits.

DaSTS Trans Pennine Connectivity study

This was one of the DaSTS national studies undertaken in 2010 and being undertaken jointly by the Department for Transport and the Northern Way, to consider the corridors between (and beyond) the Manchester, Leeds and Sheffield City Regions, including the M62 corridor. Working paper 2 developed an understanding of the road routes and working paper 3 considered the economic importance of the trans-Pennine links. Key messages emanating from this work can be summarised as:

- The networks carry a variety of passenger and freight traffic, characterised by high levels of interaction with local movements. In relation to the operation of the Leeds – Manchester route congestion adds 32 minutes to a 46 mile journey and in the opposite direction 24 minutes, with significant delay also occurring outside the peak periods.
- The future position of the network, in terms of delay, is likely to worsen and that the planned interventions (managed motorways) was unlikely to be sufficient alone and further initiatives were required.
- The North's city regions under perform compared to the national average and city region economies in the South East and are not meeting their full potential. To support economic growth there needs to be adequate capacity, such that journeys can be made reliably and with reasonable journey times. There is evidence to support the notion that enhancing connectivity between City Regions is integral to accelerating the North's economic growth.
- Linking areas of economic need with locations with stronger economic growth can support the stronger areas and facilitate the growth of the weaker areas.

- The economic benefits brought by Manchester Airport are substantial, but surface access capacity is the most significant constraint to the Airport's future growth. Similarly, the North's ports provide substantial economic benefits.

Department for Transport Network Analysis of Freight Traffic

As part of the DaSTS process, and following the identification of the SNCs, in order to better understand freight movements along these corridors, this network analysis was undertaken to supplement the existing understanding of freight traffic volumes with other more detailed information in relation to the nature of such freight trips. Some of the key findings of this analysis are outlined in section 2.1 of this strategy report, but it can be repeated here in that:

- A number of sources of freight traffic exist along the route including logistics warehousing (along the Manchester-Liverpool and Leeds-Wakefield elements of the corridor); the Port of Liverpool; the Humber Ports and oil refineries; the peak district quarries; and major population centres.
- The busiest section on the route corridor is that through the Leeds/Bradford area. Of the 70,000 vehicles per day on this section, between 8,000 and 9,000 are HGVs (15% of traffic or 28% in PCU terms).
- The corridor is dominated by domestic freight traffic (at 90%) and also dominated by very short distance movements (50% of HGVs travelling less than 100km).
- Between 10% and 15% of overall freight traffic is in the morning and evening peak hours.

Appendix F – defining local priorities

Local enterprise partnerships (LEPs)

Formed in 2011, LEPs represent a partnership between local authorities and the business community tasked with identifying the priorities for investment in roads, building and facilities in their respective areas with a focus on leading economic growth and creating jobs. LEPs also had the opportunity to identify Enterprise Zones, which can take advantage of tax incentives and simplified local planning regulations.

While LEPs are in their relative infancy and it remains relatively unclear as to their likely future role in transport, the Highways Agency is keen to work with the LEPs to ensure that the SRN serves its purpose in supporting such aspirations for economic growth. The following provides an overview of the two LEPs that have a direct relationship with the route – Leeds City Region and Greater Manchester.

The **Leeds City Region LEP** includes the local authorities of Barnsley, Bradford, Calderdale, Craven, Harrogate, Kirklees, Leeds, Selby, Wakefield and York. Governance of the LEP is through the Leeds City Region Leaders Board and the Leeds City Region LEP Board which are responsible for setting direction and delivering different aspects of a joint economic plan. The two Boards are supported by five expert panels, one of which focuses on transport.

The LEP's strategic priorities stem from the Leeds City Region LEP Plan. This draws upon an evidence base compiled over several years to support calls for local and national investment to improve the speed and reliability of road and rail links, join up the City Region as an economic area, and provide better connections to London and other northern city regions. The current work of the LEP on transport relates to three themes:

- Securing greater local control over transport spending and decision-making including, rail franchises and creating a £1 billion transport fund as part of the City Deal.
- Supporting the full implementation of the Northern Hub rail improvement project in Manchester and building the case for additional future rail investment in Yorkshire.
- Supporting the case for high-speed rail.

The Leeds City Region LEP Plan focuses on four strategic priorities for creating sustainable economic growth, one of which is creating the infrastructure for growth.

The **Greater Manchester LEP** includes the local authorities of Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan. The LEP aims to play a key role in shaping strategy and overseeing

delivery in a number of areas including the low carbon economy and planning, housing and transport. The economic priorities of the LEP include delivering super-fast broadband; improving rail connectivity across the North West (through the Northern Hub and High Speed Rail); and improving international connectivity via Manchester Airport, Liverpool Airport and the Liverpool Super Port.

The ten authorities in Greater Manchester have developed a statutory Combined Authority to co-ordinate key economic development, regeneration and transport functions. The Greater Manchester Combined Authority (GMCA) was established in 2011 and works in partnership with the Association of Greater Manchester Authorities (AGMA). To help drive forward the GCMA transport functions, a new 'Transport for Greater Manchester Committee' was created. GCMA is still reliant on 'Prosperity for All: the Greater Manchester Strategy' (GMS) approved by AGMA in 2009. It sets a strategic direction up to 2020 and is currently being reviewed. The GMS is based around eleven priorities to help deliver prosperity for all and a higher level of sustainability and quality of life for the city region. Those that relate to transport include:

- Significantly improve transport connectivity into and within the city region.
- Expand and diversify the city region's economic base through digital infrastructure.
- Increase the international connectivity of the Manchester city region's firms.
- Achieve a rapid transformation to a low carbon economy.

City Deal

In December 2011, the Government announced that it intended to negotiate 'City Deals' to give local government greater control over decision making and spending. Leeds and Manchester were among the first eight cities to benefit from 'City Deals'. The following provides an overview of the two 'City Deals' that have a direct relationship with the route – Leeds City Region and Greater Manchester.

The **City Deal for the Leeds City Region** was signed in July 2012 and gives the ten partner councils (identified in the review of the LEP above) greater control over spending and decision-making to ensure interventions are aligned with the needs of the city region economy. The Leeds City Region City Deal includes:

- The £1 billion West Yorkshire Infrastructure Fund Plus to improve public transport and the highways network.
- An additional £400m fund to strengthen infrastructure across the City Region.
- Ultra-fast broadband to be rolled out across the City Region by 2015 (with implications for home-working).

The measures to be secured by the West Yorkshire Infrastructure Fund Plus have not yet been defined, but will include schemes drawn from the Local Transport

Plan and the Core Strategies of the partner councils. They will be focused on supporting economic growth and job creation.

In relation to the **Greater Manchester City Deal**, the Greater Manchester Authorities were amongst the first to sign a City Deal agreement with the Government in March 2012. An implementation plan is in development, with proposals being developed in more detail and milestones being identified. The Greater Manchester City Deal includes the following features:

- A revolving Infrastructure Fund, allowing Greater Manchester to ‘earn back’ a portion of additional tax revenue from Gross Value Added (GVA) increases resulting from local investment in infrastructure. Greater Manchester will earn back the £1.2 billion invested up front in transport infrastructure as the Greater Manchester economy grows. The City Deal includes a commitment to allow a maximum of £30m a year to be earned back over a 30 year period. TfGM has been undertaking a review of the transport priorities to identify the projects that will maximise earn back potential:
- A Greater Manchester Investment Framework to align core economic development funds with City region objectives. This relates to increasing local decision-making on spend using Regional Growth Fund, Growing Places Fund and Local Sustainable Transport Fund monies.
- A Low Carbon Hub, with a plan to reduce emissions by 48% by 2020.
- Working with Department for Transport on a package of transport proposals including devolution of the Northern Rail franchise, bus improvement measures and devolution of local transport major scheme funding.

Development plans

The Highways Agency actively engages in all stages of the planning process and has been working with local authorities in contributing to the transport evidence base and facilitating the delivery of sustainable development. In offering this advice, the Highways Agency provides technical support to guide the identification of the location, scale and timing of proposals in relation to the SRN and providing guidance on the appropriate scale and nature of improvements to the SRN.

Development aspirations for local authorities along the corridor will place additional strain on the route and this is likely to exacerbate the existing problems. It is therefore essential that the forward planning element of this strategy considers these additional pressures and these are summarised at a high level within this section.

When considering the five West Yorkshire Authorities of Bradford, Calderdale, Kirklees, Leeds and Wakefield and the Greater Manchester Authorities of Bury, Oldham and Rochdale, based on the latest development plans to which the Highways Agency is aware, it is apparent that there are **spatial aspirations** (note

- estimates in some parts due to the information provided within the various plans) for approximately over 350,000 jobs and nearly 200,000 dwellings.

It is clear that this significant scale of additional development will bring with it a need to travel and in many cases a need to travel between areas that are served by the M62 route. It is not clear at this time as to the likely level of development that is achievable and whether such aspirations will be delivered, with wide and varied influences upon this, not least the national and global economic situation. None the less, these are the aspirations of each local authority to which they will seek to steer and influence future growth and it is this level of development, alongside that of the Department for Transport national forecasts, which are subsequently considered in this section.

In relation to the development aspirations, it is clear that there are some common themes:

- Some recognition given to the fact that developments will influence commuting patterns and use of the M62 corridor, although some authorities development aspirations seek to reverse this trend.
- Many of the local authorities along the route are seeking to locate new development in locations adjacent to the SRN and particularly the M62 corridor, or more precisely in the vicinity of junctions on the route, to capitalise on access to the sub-regions within which they are located and beyond. This is particularly so in relation to employment and specifically warehousing / logistics elements of development.

Furthermore, given the strategic nature of the route, the wider aspirations of those local authorities that are not situated directly on the route, stretching from Merseyside and Greater Manchester to the Humber, also have distinct relationships with the route. While these are not specifically considered within this section, it is clear that their influence is also of significance.

Beyond the spatial aspirations of the development plans, they also set out **transport initiatives** that would support delivery of their respective spatial visions. It is apparent that there are a number of themes coming from the spatial plans relating to transport, including:

- Developments will put pressure on the transport network (local and strategic) and cross-modes.
- Development plans aspire to locate development in sustainable locations where there is good public transport provision, or seek to improve such provisions to improve sustainability. Nonetheless, they will still generate high levels of road based trips.
- A recognition of the importance of improving strategic road and rail links to the cores of the City Regions and key transport hubs (including the airports).

- A greater emphasis on the need for strong demand management policies to assist in managing increased traffic demands.
- Logically, all of the development plans have a degree of relationship with the Local Transport Plans (LTPs) of Greater Manchester and West Yorkshire, which are discussed in the subsequent section of this report.

Local Transport Plans (LTPs)

Information in relation to the transport issues being faced and the priorities for forward investment at a local level are contained in the two respective LTPs for West Yorkshire and Greater Manchester as outlined below.

The **West Yorkshire LTP 2011-2026** identifies that while not specifically considering the SRN, work is undertaken closely with the Highways Agency to consider links to and movements on the SRN. The LTP identifies that the area forms an economically important position in the North of England, and that West Yorkshire is well-placed on the national transport network and generally has good access to the motorway network (M1 and M62) and main rail lines, with international gateways provided by Leeds Bradford and Manchester International Airports and by the seaports on the Humber, Mersey and Tyne/Tees estuaries.

The LTP supports the M1 and M62 managed motorway schemes, the development of longer-term capacity solutions for the SRN and targeted local highway improvements to reduce congestion.

Greater Manchester's third LTP 2011/12–2015/16 recognises the importance of an effective transport network in realising the economic potential of Greater Manchester. The LTP objectives centre around supporting the economy, minimising the impact of climate change, minimising adverse health impacts, providing equality of transport opportunities, and maximising value for money.

The LTP, while focusing on the Greater Manchester urban area, recognises the strong links with neighbouring authorities including those across the Pennines in Yorkshire. Recognising that such cross-boundary issues relate primarily to the SRN, a short-term priority will be to work closely with the Highways Agency to develop a common approach to managing the highway network and the demand for use of that network e.g. through measures which encourage the use of more sustainable modes.

Note is also made of the closer working relationships established with the Highways Agency on planning issues. This has led to the development of a protocol through which the ten planning authorities, the Agency and TfGM have agreed to work together to identify the transport implications of proposed developments, determining how best to mitigate the negative impacts.

The LTP also identifies the need to adopt an 'Integrated Network Management' approach with the Highways Agency whereby traffic controls on the SRN are co-

ordinated with those on the adjoining local road network. This will help to better manage the highway network both for local needs and to support strategic international, national and regional movements into and through Greater Manchester.

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