The Marches Local Enterprise Partnership

# THE MARCHES AND MID WALES JOINT APPRAISAL FRAMEWORK

## Phase 2 Final Report


003
FEBRUARY 2020

PUBLIC

The Marches Local Enterprise Partnership

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Phase 2 Final Report

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WSP

The Mailbox
Level 2
100 Wharfside Street, Birmingham
B1 1RT

Phone: +44 121 352 4700

WSP.com

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| Signature | | | |  |
| Authorised by | - | Paul Byron | Paul Byron | Paul Byron |
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# GLOSSARY

**AADF** – Annual Average Daily (traffic) Flow

**AQMA** – Air Quality Management Areas

**BCR** – Benefit Cost Ratio

**CAF** – Midlands Connect's Common Appraisal Framework

**DALs** – Differential Acceleration Lanes

**DfT** – Department for Transport

**EAST** – Early Appraisal Sifting Tool

**GBFM** – Great Britain Freight Model

**GVA** – Gross Value Added: The increase in the value of the economy due to the production of goods and services

**HGV** – Heavy Goods Vehicle

**IMD** – Index of Multiple Deprivation – Identifies the most deprived areas in a national context

**JAF** – Joint Appraisal Framework

**LA** – Local Authorities

**LEP** – Local Enterprise Partnership

**LSOA** – Lower Super Output Area

**NTM** – National Transport Model

**On-line enhancements** - Straightening, removing bends and widening of narrow sections at selected locations on routes

**ONS** – Office of National Statistics

**Sections of 2 on 1 roads** - Developing short sections of overtaking opportunities on existing routes

**SRN** – Strategic Road Network – The English A roads and motorway network managed and maintained by Highways England

**TAG** – Department for Transport's Transport Analysis Guidance: It contains best practice guidance for the development, appraisal and evaluation of proposed transport interventions in England.

**Trunk Road** – The Welsh A roads which are the responsibility of the Welsh Government, and maintained and operated by the Local Authority Trunk Road Agents

**VfM** – Value for Money

**WelTAG** – Welsh Government's Transport Appraisal Guidance for Wales

**WTS** – Wales Transport Strategy

# EXECUTIVE SUMMARY

The Marches Local Enterprise Partnership (LEP) in partnership with the Growing Mid Wales Partnership, Welsh Government, Shropshire Council, Telford & Wrekin Council, Herefordshire Council, Midlands Connect (MC), Highways England (HE) and Department for Transport (DfT), has developed The Marches and Mid Wales Joint Appraisal Framework (JAF). The purpose of which is to ensure an investment programme appropriately addresses the study area's transport needs.

The assessment of 34 interventions from The Marches and Mid Wales Freight Strategy (2018) required a bespoke Joint Appraisal Tool, in line with DfT's Transport Analysis Guidance and Welsh Government's Transport Appraisal Guidance (TAG and WelTAG). This tool takes into consideration the study area's distinctive rural needs. The Marches and Mid Wales has unique characteristics for appraisal, including topography which leads to frequent hilly and bendy roads that contribute to significantly longer single carriageway routes, limited overtaking facilities and extended journey times.

During development of this study, several authorities declared an official climate emergency, as well as the Welsh Government and West Midlands Combined Authority. The assessment focuses on improving network efficiency through shortening journey times and improving journey time reliability. Reducing journey times and time spent in slow or stop-start traffic will also reduce carbon emissions.

Since the Freight Strategy's publication in 2018, there is increasing importance in the climate and decarbonisation agenda. Future iterations of the JAF will reflect the changing needs in strategic priority and context.

Transport barriers, leading to extended journeys times and poor journey time reliability, also need addressing. This then unlocks inclusive economic growth across the study area by increasing productivity and access to high skilled, higher value employment opportunities.

This report forms Phase 2 of The Marches and Mid Wales JAF process, assessing the interventions identified in The Marches and Mid Wales Freight Strategy.

These interventions were assessed using evidence against criteria including strategy objectives, affordability and deliverability (including legal, stakeholder and practicality). The application of the assessment process has produced a prioritised list of potential projects for delivery.

This scoring framework ranks the top 10 best performing interventions as follows:

- Improved maintenance of the Strategic Road Network
- Hereford Bypass and Southern Link
- M54 Link to northbound M6/M6 Toll
- Crawler lanes
- Leominster Bypass
- A483 Pant to Llanymynech Bypass
- Definition of Freight Route Network for Transport Planning purposes
- Signing of access between the Freight Route Network and key attractors or generators of freight
- Dualling of the A5/A483 between Shrewsbury and Ruabon
- 30mph speed limits with warning signs and traffic calming interventions

Outcomes from this study will support a prioritised road investment programme and refresh the programme set out in the Freight Strategy and Investing in Strategic Transport Corridors in The Marches (2016).

The prioritised interventions will be forwarded to the next stage of development as funding opportunities arise.

# 1. INTRODUCTION

## 1.1. BACKGROUND AND SCOPE

Phase 1 of the study developed The Marches and Mid Wales Joint Appraisal Framework (JAF) tool to assess those interventions in The Marches and Mid Wales Freight Strategy best suited to improve intra and inter-regional journey time and journey time reliability.

The JAF aligns to Department for Transport (DfT) Transport Analysis Guidance (WelTAG) and Welsh Government Transport Appraisal Guidance (WelTAG). It is a bespoke appraisal tool to consider the distinctive study area characteristics and rural needs, where existing appraisal tools are more urban focused.

Phase 1 of the study identified a set of objectives aligned with the Freight Strategy and updated to reflect the need to consider all modes of transport, selected for this assessment project. These are:

- To reduce the cost of, and **increase the journey time reliability**, of transport movements in and through The Marches and Mid Wales, in particular for the freight and logistics industry;
- To **support the economic growth and prosperity** of The Marches and Mid Wales by stimulating new (and safeguarding existing) inward investment, providing employment and opportunities for increased productivity and growth;
- To **increase the safety** of the transport network in The Marches and Mid Wales thereby reducing the cost of collisions/incidents on the economy, health and well-being;
- To **reduce emissions**, particularly greenhouse gases, particulate matter and nitrogen dioxide thereby reducing the environmental and social cost of congestion and pollution; and
- To **minimise as far as possible the other negative impacts of freight transport** on residents of The Marches and Mid Wales, such as the contribution that freight transport makes to levels of congestion and noise and intimidation of vulnerable road users thereby reducing the economic and social costs on other road users and non-road users.

Interventions identified as a priority will help to improve road journey times and journey time reliability in a predominately rural area with a highly dispersed population, few routes, long diversion route distances and a sizeable number of slow-moving vehicles.

Phase 2 of the study assesses all 34 interventions identified in the Freight Strategy to establish a prioritised road investment programme and refresh the programme set out in the Investing in Strategic Transport Corridors in The Marches Report (2016).

Since the publication of the Freight Strategy and delivery of Phase 1 of the study, several local authorities, Welsh Government and West Midlands Combined Authority have declared a climate emergency.

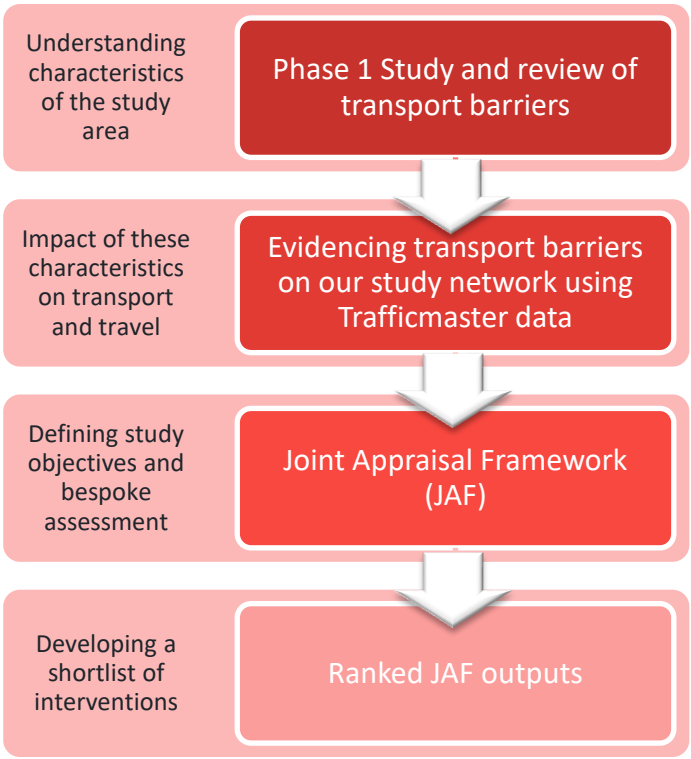
The JAF is a live and iterative process that should reflect changes in policy and strategic context. While the assessment currently focuses on improving network efficiency through shortening journey times and improving journey time reliability which will support reductions in carbon emissions, future iterations of the JAF will reflect on emerging priorities.

## 1.2. STRUCTURE OF REPORT

This report provides strategic rationale for use of The Marches and Mid Wales Joint Appraisal Framework (JAF) to assess the interventions for the area along with a summary of the assessment and prioritisation results. The study follows the process outlines in **Figure 1** and chapters include:

- **Chapter 2**
  Geographical and Transport Context
- **Chapter 3**
  The Evidence (Trafficmaster data)
- **Chapter 4**
  Aims of Intervention
- **Chapter 5**
  Intervention Assessment Process
- **Chapter 6**
  Assessment Results and Sensitivity Testing
- **Chapter 7**
  Summary and Recommendations

**Figure 1 - Study Process**



# 2. GEOGRAPHICAL AND TRANSPORT CONTEXT

## 2.1. TRANSPORT BARRIERS

This chapter gives an overview of the study area context and identifies transport barriers resulting in inefficient highway network operation. Using topics identified in Phase 1 and highlighted as key objectives, a review of evidence illustrates the effect of these barriers on the transport network. This evidence demonstrates a distinct need for interventions to improve network efficiency.

The identified transport barriers increase journey time and reduce journey time reliability for road users (**Table 1**). In addition to increased costs to operators, longer and slower journeys also produce more emissions. Focusing on journey time and journey time reliability supports the Freight Strategy objectives, including reducing emissions.

This study uses 2016 Trafficmaster (set out in **Chapter 3**) as evidence for journey time and reliability. Consequently, wider evidence to describe the barriers, is also based on 2016 to ensure consistency. The wider evidence illustrating the effects of the barriers is necessarily selective, given the nature of this report.

**Table 1 - Transport Barriers and their Impact**

| Transport Barrier | Journey Time Impact | Journey Time Reliability Impact |
|---|---|---|
| Population Density and Distribution | ✓ Medium | ✓ Low |
| Topography | ✓ High | ✓ High |
| Flooding | ✓ Low | ✓ High |
| Level Crossings | ✓ High | ✓ Low |
| Road Traffic Collisions | ✓ Low | ✓ High |
| Roadworks | ✓ Medium | ✓ Medium |

### Population Density and Distribution

A dispersed population in The Marches and Mid Wales highlights the importance of journey time and reliability, between and within, urban and rural areas. The 2015 National Travel Survey shows that those living in rural hamlets and villages travel 90% further than those in urban conurbations[1].

Based on data from the Office of National Statistics (ONS) for mid-2016 estimates, the study area population comprises 675,700 people in The Marches and 329,900 people in Mid Wales.

[1] *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/611304/annual-road-traffic-estimates-2016.pdf*

Based on ONS 2015 mid-year estimates, the population density of The Marches and Mid Wales (118 people per sq. km and 35 people per sq. km respectively) is significantly less than the national average for England and Wales (3,159 people per sq. km). Principal urban locations such as Hereford, Telford, Shrewsbury and Aberystwyth have the most concentrated population. Hereford has the highest population density in the study area.

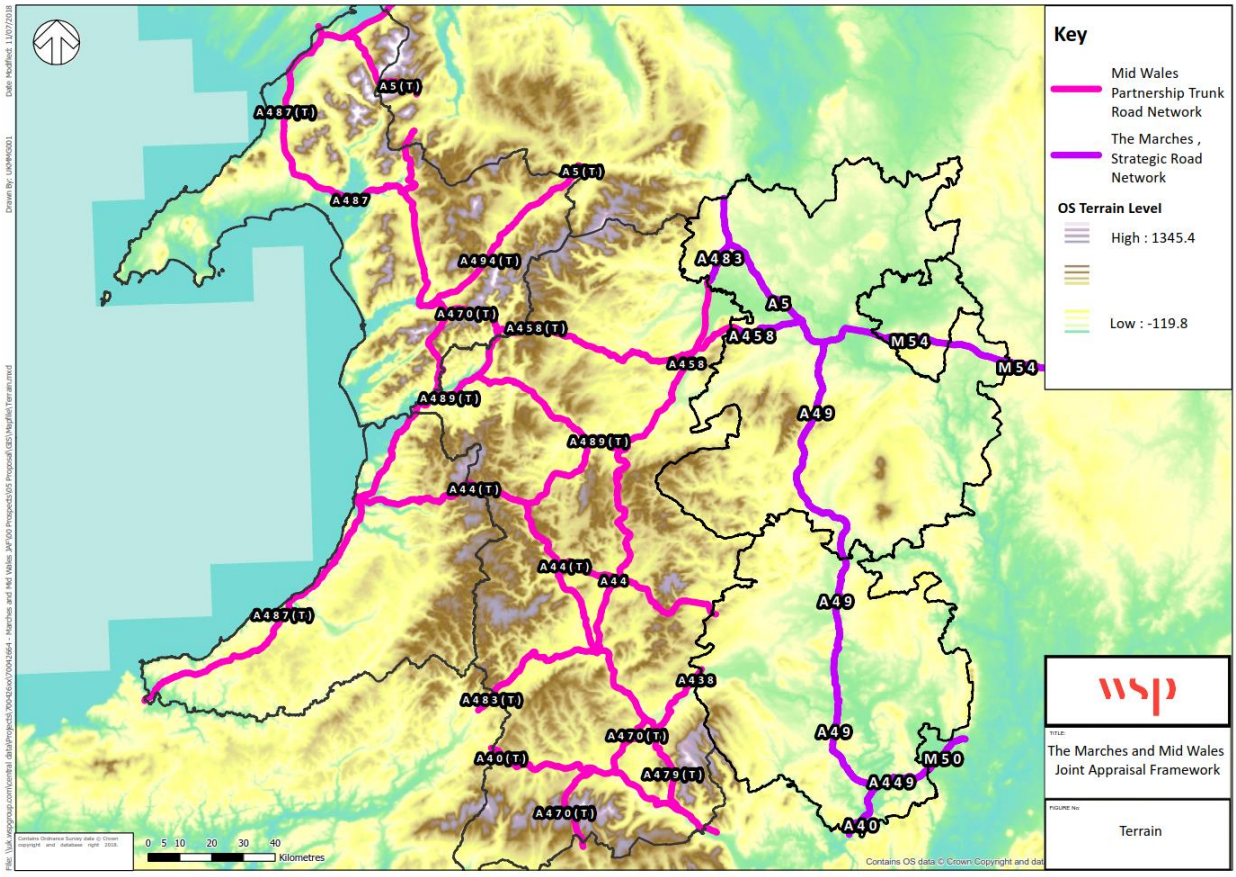
## Topography

The study area geography contains transport barriers in terms of variability of its terrain, settlement and land use patterns. **Figure 2** shows topography overlaid by the trunk road network. It highlights areas of steep inclines/declines and significant bends. Difficult terrain is a transport barrier in Mid Wales, which adversely affects journey times and reliability. The combination of modest traffic volumes and difficult terrain means that dual carriageways rarely offer value for money.

Phase 1 analysed a sample of journey times in The Marches, Mid Wales and crossing between the two countries in comparison with the rest of the UK. The quickest time for off-peak weekday trips (Thursday 14:00) showed the best-case journey time scenario. The journey speed is based on distance and average off-peak journey time for Thursday at 14:00.

Point-to-point origin and destinations analysed in Phase 1 show that, between Ross-on-Wye and Newport (Telford and Wrekin), via the A49, has an average speed of 34 mph and is 43% longer via the road network than crow-fly distance. Similarly, the route between Brecon and Welshpool has an average journey speed of 40 mph and is 34% longer via the road network than the crow-fly distance. These figures show that the study area contains road corridors that cross challenging terrain. This makes for less efficient journeys, with slower speeds and extended journey lengths and times.

**Figure 2 - Trunk Road Network with Terrain**



The distinctive topography results in a largely single carriageway network. Providing roads to dual carriageway standard is particularly expensive in hilly and mountainous areas, so such schemes may not offer value for money when traffic flows are modest.

A consequence of a predominantly single carriageway network, with steep gradients and tight curves, is that large or slow-moving vehicles are difficult to pass and so increase journey times and reduce journey time reliability. Between 1990 and 2015, heavier Heavy Goods Vehicles (HGVs) moved an increasing proportion of goods by road. As a result, road freight in HGVs is now more concentrated in heavier lorries than in the past[2].

Large or slow-moving vehicles in the study area tend to fall into one of two categories:

- HGVs transporting freight and agricultural vehicles such as tractors; and
- Tourist traffic such as cars towing trailers and motorhomes.

**HGVs and agricultural traffic**

The MDS Transmodal GB Freight Model shows that key roads affected by a sizeable number of freight vehicles include:

- A456 connecting Leominster, Kidderminster and Birmingham;
- M50 / A40 Ross-on-Wye connecting to Worcester and the Midlands;
- A438 Eardisley - Hereford to A4103 Worcester;
- M5, A483 Chester / Wrexham / Oswestry to the A5 Shrewsbury;
- M54 / M6 / Birmingham Motorway Box; and
- North Wales route - A55 Holyhead to Chester.

Following Phase 1 of this study, National Farmers' Union representatives supplied additional information, giving a qualitative view of the distribution of agricultural vehicles over the area and year as well as vehicle size:

- Whilst silage activities lead to increased frequency of vehicle use in May and July, the main months for agricultural vehicle use are August (rape, barley), September (rape, barley, wheat, potatoes and apples) and October (wheat, potatoes, apples, sugar beet and maize).
- The presence of large numbers of small to medium farms in the area mean that agricultural vehicles tend to be numerous, small and often slow, as a result.
- Livestock markets and abattoirs see a high density of farm-based vehicles on nearby roads, with concentration of these vehicles on certain days and times.
- Farm vehicle type and size will vary, with smaller, more traditional tractor trailer combinations in the uplands, and larger, more powerful vehicles of wider variety in the lowlands including combine harvesters.
- On public highways, there is no recognised formal code of practice which requires farmers/hauliers to pull over to let queued vehicles pass although drivers of slower vehicles often do.

[2] *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/611304/annual-road-traffic-estimates-2016.pdf*

- The importance of ensuring there are enough lay-bys where agricultural vehicles and other slow-moving vehicles can pull in safely to allow traffic to pass was highlighted. Designs of lay-bys need to be long and wide enough to suit the increase in size of agricultural vehicles.

**Tourism**

A report published in March 2019 found that there were 8.1 million overnight domestic UK trips to Wales in the first nine months of 2018, generating expenditure of £1.539 billion. There were 784,000 trips taken in Wales by international visitors during the first nine months of 2018 with an expenditure of £320 million. These are in addition to the 75 million tourism day visits to Wales in the same period[3].

A survey published in March 2017 found that, in 2016, 14% of UK staying tourists used a touring caravan, campervan or motorhome during their visit. This represents an increase of more than twice the 2013 figures (6%)[4]. As these visitors will be using key network routes to travel to and from their destination there is the potential for increased journey times and journey time variability for other road users, particularly during peak holiday periods.

## Flooding

Flooding is a result of particularly intense or extended periods of rainfall such that drainage systems are unable to cope. It is one type of extreme weather event that forecasters expect to become more frequent in response to climate change.

Flooding results in road closures often resulting in extended journeys via lengthy diversion routes. This increases journey times and reduces journey time reliability.

Principle urban centres benefitting from flood defences include Welshpool, Aberystwyth, Newtown, Brecon, Hereford, Leominster and Shrewsbury.

Sections of the network prone to flood events include:

- A49 between Hereford and Leominster, Ludlow and Onibury, Church Stretton and Shrewsbury;
- A5 near Oswestry, Montford Bridge and Shrewsbury;
- A470 near Caersws;
- A40 south of Brecon;
- A458 & A483 near Welshpool in Powys; and
- A487 and A489 near Machynlleth in Ceredigion.

Flooding can cause major disruption to transport networks; it affects journey time, reliability and safety. Some examples below outline the extent of flooding impacts. The Environment Agency has warned that intense bouts of flooding are set to become more frequent and is one of the nation's major threats[5]. Thus, flooding is likely to continue to affect transport across the UK and any transport investment programme for The Marches and Mid Wales must reflect flood risk and ensure network operation is resilient to extreme weather events.

[3] https://gweddill.gov.wales/statistics-and-research/wales-tourism-performance/?lang=en

[4] https://gov.wales/sites/default/files/statistics-and-research/2019-05/wales-visitor-survey-2016-uk-staying-visitors.pdf

[5] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/644968/UK_National_Risk_Register_2017.pdf

The flood events listed below illustrate the effects flooding has on network operation:

- In November 2016 heavy rain across Wales caused significant transport problems. In Gwynedd, several trees fell blocking the carriageway and closed the A497 in both directions between B4412 (Nefyn) and A499 (Pwllheli). Flooding closed the A5 between B4366 Felin Hen Road and Ffordd Bangor (Bangor Road).
- These floods also affected the Great Western Railway, with London to Cardiff services cancelled in a bid to reduce delays on that line. Flooding between Bristol Parkway and Swindon shut the lines, while other services were able to be diverted[6]. Therefore, alternative travel arrangements were made, leading to an increase in car journeys.
- In October 2019 flash flooding caused disruption to the transport network. Flooding led to numerous rail line closures, including that between Shrewsbury and Welshpool, Crewe and Hereford. Bus replacement services were organised but flooding on roads meant buses were unable to run between Shrewsbury and Newport.
- Flooding caused the closure of many roads in Shropshire, Herefordshire and Worcestershire7. There was also closure of several trunk roads and minor roads in Blaenau Gwent, Caerphilly, Ceredigion, Monmouthshire, Powys, Wrexham and Cheshire.
- In Builth Wells, Powys, the A483 closed northbound at Broadway, with Stagecoach Wales warning it was unable to use the town's bus station. Flood water blocked the A469 between Ystrad Mynach and Llanbradach in both directions, while highways officials closed the A4048 at Troedrhiw, Blaenau Gwent. The A40 Brecon Road was closed in both directions between Crickhowell and Abergavenny while the A488 Clun bridge in Shropshire was also shut[8].
- Herefordshire and parts of Wales declared a 'major incident' in February 2020 due to significant and widespread flooding. Events led to many road closures and train cancellations around the study area, including closures on A44, A49, A438, A483, A470, A487 Dyfi Bridge.

## Level Crossings

Level crossing operation on key routes in the study area also increase journey times and reduce journey time reliability. With plans for an increase in rail service frequencies, these negative effects are likely to increase without wider intervention.

Key locations where trunk roads intersect with level crossings include the A458 near Buttington and the A49 at Onibury. Currently, railway lines with the highest daily frequency (including passenger and freight train) and greatest number of crossings are:

- Welsh Marches Railway Line (Newport – Shrewsbury) - 76-108 trains per day;
- Shrewsbury - Chester Line - 27-50 trains per day;
- Cambrian Line (Dyfi Junction to Pwllheli) - 27-50 trains per day; and
- Heart of Wales Line (Craven Arms, Shropshire – Llanelli) - 8-24 trains per day.

[6] https://www.bbc.co.uk/news/uk-wales-38043877

[7] https://www.bbc.co.uk/news/uk-england-50199254

[8] https://www.bbc.co.uk/news/uk-wales-50192517

Vehicles travelling on these routes experience increases in journey time and unreliability due to level crossing operation. Many of these locations experience a high volume of trains per day travelling at high speeds. Onibury in Shropshire has over 100 trains per day using the crossing[9].

Any incidents that occur at these locations result in traffic diversions via lengthy and often substandard diversion routes.

### Collisions

Collisions between vehicles or those with other road users often result in road closures, some for extended periods. Closures can last for several hours as police treat the collision location as a crime scene if someone is seriously injured or killed.

Between 2013 and 2017 the most serious collisions occurred on A roads and at junctions on the trunk road network in and around urban centres including: Hereford, Shrewsbury, Telford, Aberystwyth and Newtown.

Routes where clusters of fatal and serious incidents have occurred include:

- A49 between Ludlow and Shrewsbury and between Hereford and Whitchurch;
- A5 between Shrewsbury and Oswestry;
- A438 near Wrexham and between Llandrindod Wells and Welshpool;
- A40 between Abergavenny and A4076 Powys;
- A529 near Market Drayton, A487 between Cardigan and Machynlleth and
- A470 in Brecon and Dolgellau.

In some locations, incidents on the network lead to lengthy diversions which prolong journey length and time.

There were some 400 personal injury road traffic collisions each year between 2013 and 2017, resulting in approximately 600 casualties on Herefordshire's roads[10].

The A49 is highlighted as one of The Marches' most dangerous routes[11]. **Table 2** outlines the location and severity of some collisions across the network.

**Table 2 - Collision Locations**

| Location | Slight | Serious | Fatal |
|---|---|---|---|
| A49 in Onibury | | 8 | |
| A49 in Little Stretton | | 4 | 1 |
| A49 in Dorrington | | 3 | 3 |
| On Brockton Way in Shropshire | | ~7 | 1 |
| A5 at Crackley Bank and Weston Under Lizard | | 6 | 2 |

[9] Network Rail 2018

[10] https://www.herefordshire.gov.uk/info/200196/roads/210/road_accident_investigation_and_prevention

[11] https://www.shropshirestar.com/news/emergency-services/2017/02/22/shropshires-most-deadly-roads-map-highlights-countys-crash-hotspots/

| Location | Slight | Serious | Fatal |
|---|---|---|---|
| At Emstrey Island on the outskirts of Shrewsbury | | 4 | 1 |
| A458 at Rushmere | | 3 | 2 |
| At the junction of the A458 and B4380 in Cressage. | | 6 | |
| At Shotton on the A5 between Nescliffe and Oswestry | 7 | 1 | |
| In Mid Wales on the A483 at Llynderw | | 4 | 1 |
| A483 at Abermule, near Newtown | | 7 | |
| A483 as it comes into Newtown | | 4 | |

## Roadworks

Roadworks often require lane closures, single way working and night closures to ensure a safe working environment for operatives. Such closures increase journey times and reduce journey time reliability. Diversions can be lengthy and add traffic to already busy alternative routes.

The dataset used for evidence in this study (**Chapter 3**) is that for 2016. The following examples are for roadworks undertaken in this year:

- Between November 2015 to January 2016, there were four closures on the M54. The eastbound section of the M54 near junction 4 was closed for several days and nights during November and December for repairs. Work between the Cosford and Wolverhampton exits overran due to bad weather and only reopened on December 15. The motorway was closed overnight eastbound from junction 3 at Cosford to junction 2 at the i54 on December 23 for resurfacing works. There were also long-running M54 works in the first half of 2015 that saw an extensive 40mph speed limit put in place.
- Works on A roads affected traffic south of Shrewsbury, around Welshpool and towards Buttington. A new pedestrian crossing installed at Bayston Hill caused at least three overnight closures on the A49 between Dobbies roundabout, south of Shrewsbury, and Church Stretton.
- The A483 trunk road operated temporary traffic lights, with some long delays on the Welshpool bypass, Welshpool Railway Station roundabout and between Smithfield Road (B4381) and A458 to Shrewsbury in January 2016[12].
- The closure of the A490 (main road from Shropshire into Mid Wales) was closed during the day for 10 weeks. Resurfacing works started on the road, south of Chirbury towards Churchstoke across the border, from September 2016. This entailed a full closure between 09:00 and 15:00 for two and half months[13].

[12] https://www.shropshirestar.com/news/2016/01/04/shropshire-and-mid-wales-motorists-facing-a-chaotic-start-to-2016-as-more-roadworks-announced/ *Published: Jan 4, 2016*

[13] https://www.shropshirestar.com/news/transport/2016/08/25/major-route-between-shropshire-and-mid-wales-to-close-for-10-weeks/ *Aug 25, 2016*

## 2.2. SUPPORTING IMPROVED AIR QUALITY AND REDUCING $CO_2$ EMISSIONS

### Air Quality

In line with the Freight Strategy objectives there is a need to reduce emissions, particularly greenhouse gases, particulate matter and nitrogen dioxide in The Marches and Mid Wales.

As part of this in The Marches area there is a requirement to reduce air pollutants in Air Quality Management Areas (AQMAs). The Welsh Government's Well-Being of Future Generations Act (2015) highlights the need to reduce the levels of $NO_2$ pollution in the air which is one of the national indicators accompanying the Act.

There are several AQMAs within the study area, including Shrewsbury, Bridgnorth, Leominster, Oswestry and Hereford. These locations have significant levels of air pollution that transport interventions could address.

This will require transport interventions which will minimise the negative impact of travel on air quality whilst still providing a high-quality transport service for all road users.

### Carbon Emissions

During Phase 2 of this study 398 councils across the UK have declared an official climate emergency[14]. These authorities covered several levels of government and included Gwynedd Council, Herefordshire Council (UA), Shropshire Council, Telford and Wrekin Council and Wrexham County Borough Council as well as the Welsh Government, West Midlands Combined Authority and numerous parish and town councils across the study area.

This highlights the need to target a state of carbon neutrality. Thus, the assessment process places greater emphasis on prioritising the environment, particularly carbon ($CO_2$) emissions in decision making.

The Welsh Government is currently developing the next Wales Transport Strategy (WTS). The revised WTS (publication due in May 2020) will include a key focus on moving to lower carbon modes of transport to meet the Welsh Government's decarbonisation targets and reduce the growing number of Air Quality Management Areas (AQMAs)[15]. The Welsh Government's Prosperity for All: A Low Carbon Wales (2019) highlights this direction.

WTS needs support by the most effective transport interventions, minimising the negative affect of travel on air quality and reducing carbon emissions, while still providing a high-quality transport service. Actions already taken in parts of the study area include speed restrictions in Wrexham to mitigate air quality issues. Changes in technology, such as move to electric vehicles and other alternative fuels, will support additional improvements in air quality and carbon emissions.

As the JAF is a live and iterative process, future iterations should be updated to reflect changes in context, for example, the decarbonisation agenda. It is recommended that appropriate targets and monitoring information is available so that further conditional outputs and outcomes can be developed.

[14] https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/

[15] http://www.senedd.assembly.wales/mgIssueHistoryHome.aspx?IId=25649

## 2.3. SUMMARY

The following transport barriers prevent efficient operation of the transport network in The Marches and Mid Wales, particularly achieving a reduction in journey times and an increase in journey time reliability. Using evidence that reflects the affects of these barriers on journey times in transport programme development will support realisation of The Marches and Mid Wales Freight Strategy objectives and that value for money can be achieved:

- **Dispersed population with long distances between centres of population** – results in significant journey distances leading to long journey times which increases likelihood of delays and diversions.
- **Distinctive topography and land uses** – results in a predominantly single carriageway network with limited overtaking opportunities due to the prohibitive cost of dual-carriageways. Coupled with a largely agricultural land use, this results in a sizable number of large and slow-moving vehicles which delay other road users.
- **Road works, collisions and extreme weather events** e.g. Flooding, landslips, fallen trees – result in road closures and diversions which are often significant given the lack of suitable alternative routes, particularly for large vehicles.
- **More trains, more often are forecast for level crossings**– results in further increases in journey time and reduced journey time reliability.

# 3. THE EVIDENCE

Having identified transport barriers, this study requires evidence as to the impact of these barriers on efficient road network operation. Successful application of the appraisal framework in the prioritisation of schemes must be based on data which contain an up to date and statistically robust picture across the study area.

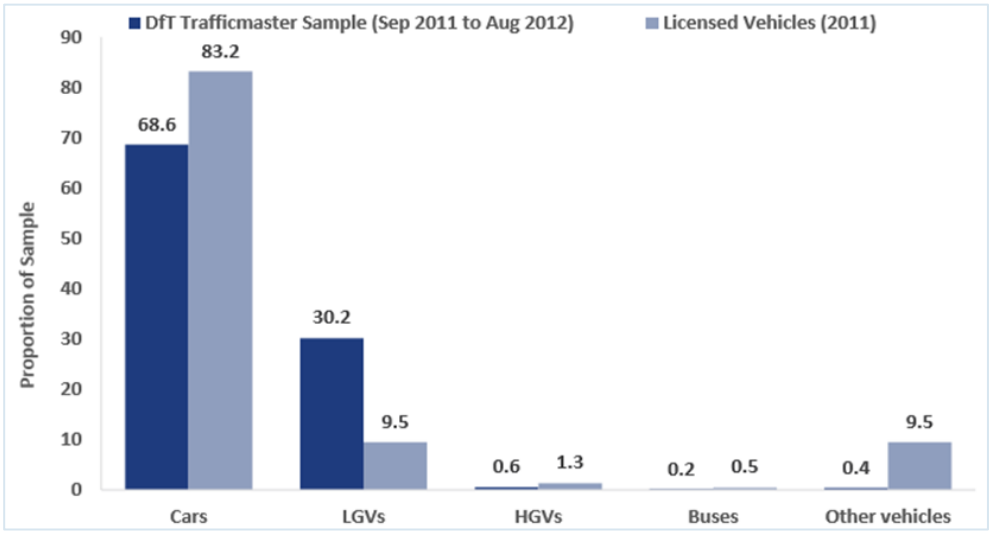
Following Phase 1, we needed a strengthened, consistent and robust evidence base to inform scoring of interventions. Further information on these recommendations and steps taken to address them are found in the **Additional Evidence Report** (**Appendix B**).

Trafficmaster is considered to be the most appropriate dataset covering the whole study area for identifying network performance. While Trafficmaster may have flaws in terms of fleet bias it remains an accessible dataset, providing journey time data that covers a wide area, with a significant sample size including seasonal variations. It thus forms a robust dataset for building final recommendations.

Trafficmaster data contains vehicle counts with their journey times for the Integrated Transport Network (ITN) road links in 15-minute time bands. The data is GPS based, capturing vehicles using satellite navigation systems. A report on Trafficmaster sampling published in 2014 found that *"Due to the types of vehicles that tend to have 'built-in' Trafficmaster GPS devices fitted - Fleet Vehicles (for Fleet Tracking purposes) and vehicles that have theft tracking systems; these types of vehicles are likely to be slightly over-represented in the DfT Trafficmaster vehicle sample"*[16].

The chart below shows the make-up of the sampled analysis in the 2014 report compared to licensed vehicles in the equivalent period. Cars are slightly underrepresented and light goods vehicles overrepresented within that sample.

**Figure 3 - Trafficmaster Sample vs. Total Licensed Vehicle Stock (2011 – 2012)**




*Source: Use of the Strategic Road Network Sampling and Methodology 2014*

[16] *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/343418/strategic-road-network-sampling-methodology.pdf*

Trafficmaster data is sampled from 2016 for this study. As part of understanding the dataset (Section 3.1) this report considers general traffic conditions in 2016 and what this snapshot of the traffic situation shows in relation to long term trends. There is no information to suggest that the sampling bias within the study area would be different to that in **Figure 3.**

## 3.1. UNDERSTANDING THE DATASET

This study uses Trafficmaster data for Welsh trunk road routes and major A roads and B roads / for England across the full study area for an average of three months in 2016, February, June and August. These months cater for seasonal variability including consideration of specific factors that affect network operation in the study area such as summer holiday traffic and seasonal farm traffic.

The data provided covers an average of seven days for different time periods, selected based on standard network peaks as follows:

- AM (07:00 – 10:00);
- PM (16:00 – 19:00);
- Interpeak (10:00 – 16:00); and
- Free flow period (19:00 – 07:00).

Output maps, provided in **Appendix B,** illustrate some key performance indicators. Journey times and journey time reliability are proxies for network efficiency. The maps show:

**Journey Times**

- Average free-flow (night-time) speeds (mph); and
- Average speeds in the AM / PM / Interpeak periods.

**Journey Time Reliability**

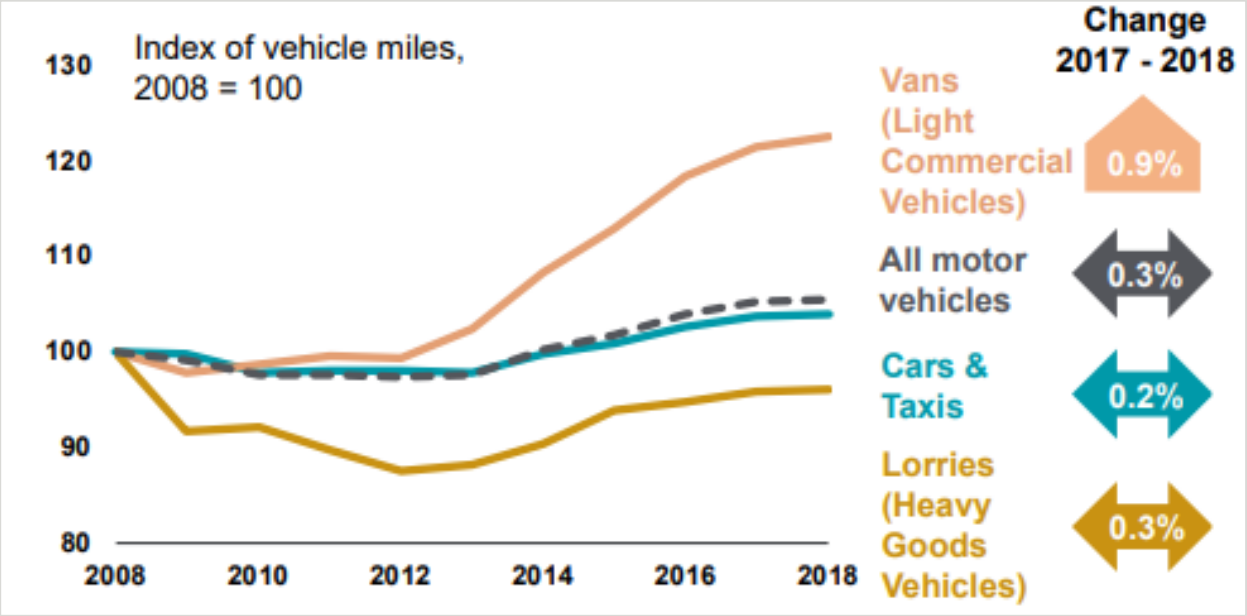
- Peak Period Reliability (for AM and PM peak periods)
  - *95th percentile journey time in the peak period / free flow journey time* classified in 10% quantiles for each period and vehicle class.

## 3.2. GENERAL 2016 TRAFFIC CONDITIONS

### By Vehicle Type

An estimated 323.7 billion vehicle miles (bvm) were driven on Great Britain's roads in 2016, a 2.2% increase from the previous year[17]. **Figure 4** shows 2016 vehicle miles by vehicle type in context of the ten-year trends from 2008 to 2018.

**Figure 4 - Vehicle Miles Travelled by Selected Vehicle Types in Great Britain (2008 - 2018)**




*Source: Road traffic estimates in Great Britain: 2018 report (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/808555/road-traffic-estimates-in-great-britain-2018.pdf)*

Car traffic grew by 2% from 2015 to 252.6 bvm; the highest annual estimate ever. The fastest growth in car traffic (in percentage terms) over the last 10 years has occurred on rural minor roads, whereas there has been an overall fall in car traffic on urban roads[14].

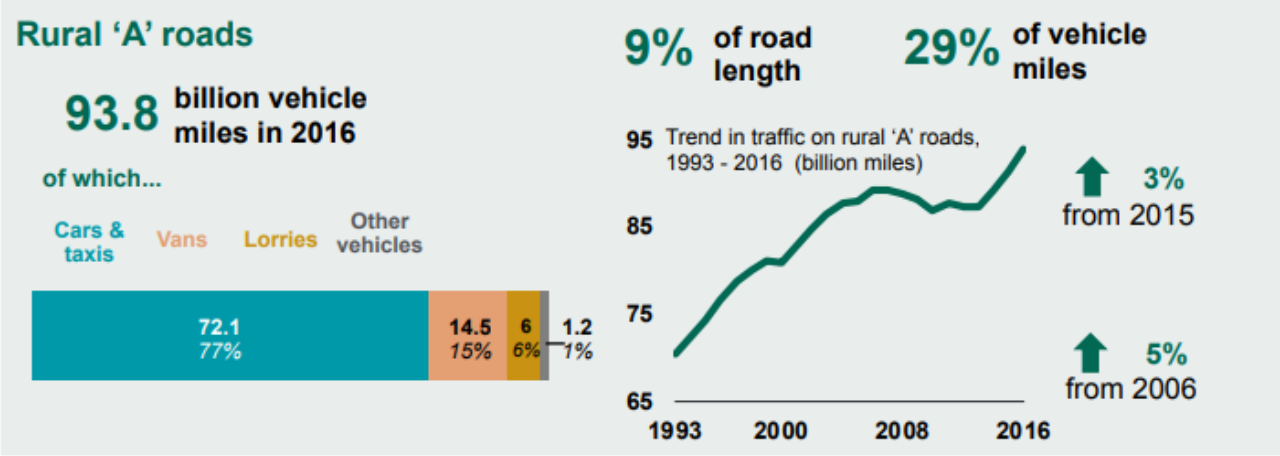
Light commercial vehicle traffic continued to grow more quickly than any other vehicle type, rising 4.7% from 2015 to 49.1 bvm. In 2016 heavy goods vehicle traffic showed little change from 2015, after having grown steadily for the previous three years[14].

[17] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/611304/annual-road-traffic-estimates-2016.pdf

## By Road Type

In 2016 traffic increased by 3% on rural 'A' roads and by 2% on rural minor roads compared to the previous year, with traffic reaching new record levels on both road types. **Figure 5** shows the profile of traffic on rural 'A' roads and trends of usage since 1993.

**Figure 5 - Rural A Road Traffic Estimates in Great Britain**




*Source: Road traffic estimates in Great Britain: 2016 report (DfT, https://www.gov.uk/government/statistics/road-traffic-estimates-in-great-britain-2016)*

The overall figure for lorry traffic comprised a small rise on motorways and rural 'A' roads, offset by decreases on other road types. This continued a general trend of higher growth rates on motorways and rural 'A' roads seen over the last 20 years. In 2016 there were 7.7 billion lorry miles on motorways. This equals the previous high seen in 2007. Together, motorways and rural 'A' roads carry 82% of lorry traffic.

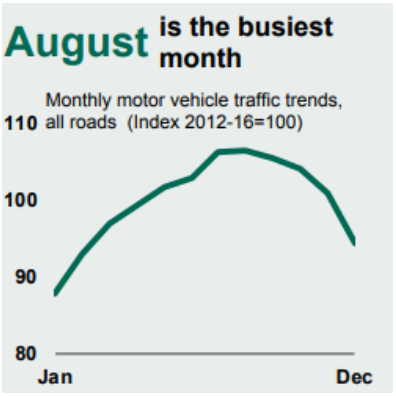
## Seasonality

On average between 2012 and 2016, vehicle flow was lowest in January on all road types. Flow was highest on motorways in August, and highest on rural roads in July[18].

February, June and August for Trafficmaster data provides evidence which includes a:

- a low traffic, term-time, no bank holiday month (Feb);
- a mid-year, term-time, no bank holiday month (June); and
- a peak, full summer holiday month (August).

Averaging these months aims to present a general picture of annual traffic conditions - capturing the characteristics of The Marches and Mid Wales area – as described earlier in this report – throughout the year.




*Source: Road traffic estimates in Great Britain: 2016 report*

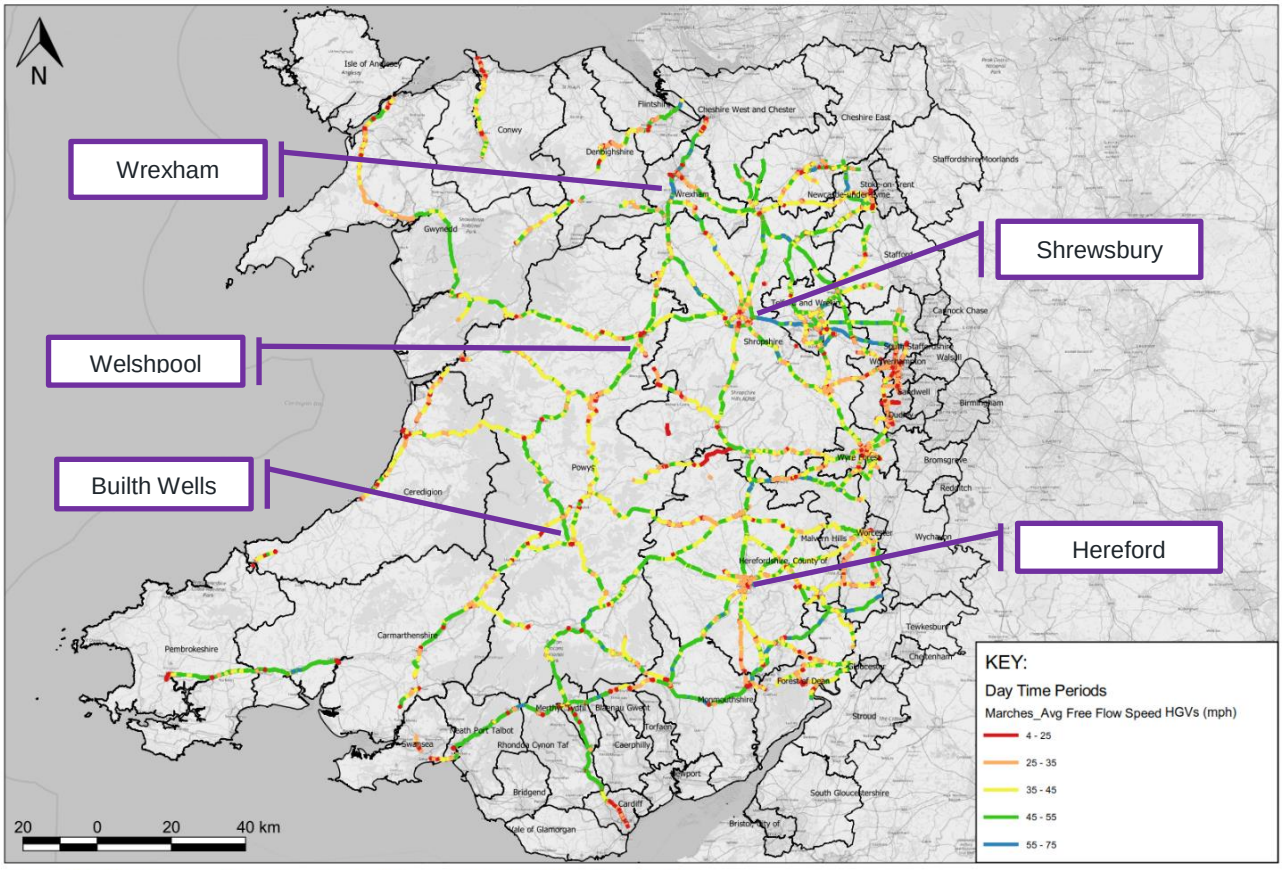
[18] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/611304/annual-road-traffic-estimates-2016.pdf

## 3.3. JOURNEY TIMES

Average free-flow speeds of HGVs across the study area, derived from the 2016 Trafficmaster dataset, is shown in **Figure 6**, with more detailed mapping is provided in **Appendix B**. This shows that there are several sections with speeds below 45mph (shown on red, orange or yellow), where there are the lowest average speeds along sections of routes, within the study area including the A4113 between Bromfeld and Lentwardine, roads around Shrewsbury and Hereford, A5156 from Wrexham, A483 south of Newtown, A466 between the A49 and Monmouth.

Our analysis of the data has taken an approach which separates HGVs to disaggregate the vehicles using the network for analysis. The resulting network journey time data set enabled areas of slow journeys to be cross referenced with free flow journey times to identify locations of potential congestion. This evidence informed scoring of interventions so that those on roads with slower speeds would score more highly against the relevant connectivity conditional outputs.

**Figure 6 - Trafficmaster Network Freeflow Speeds (HGV)**





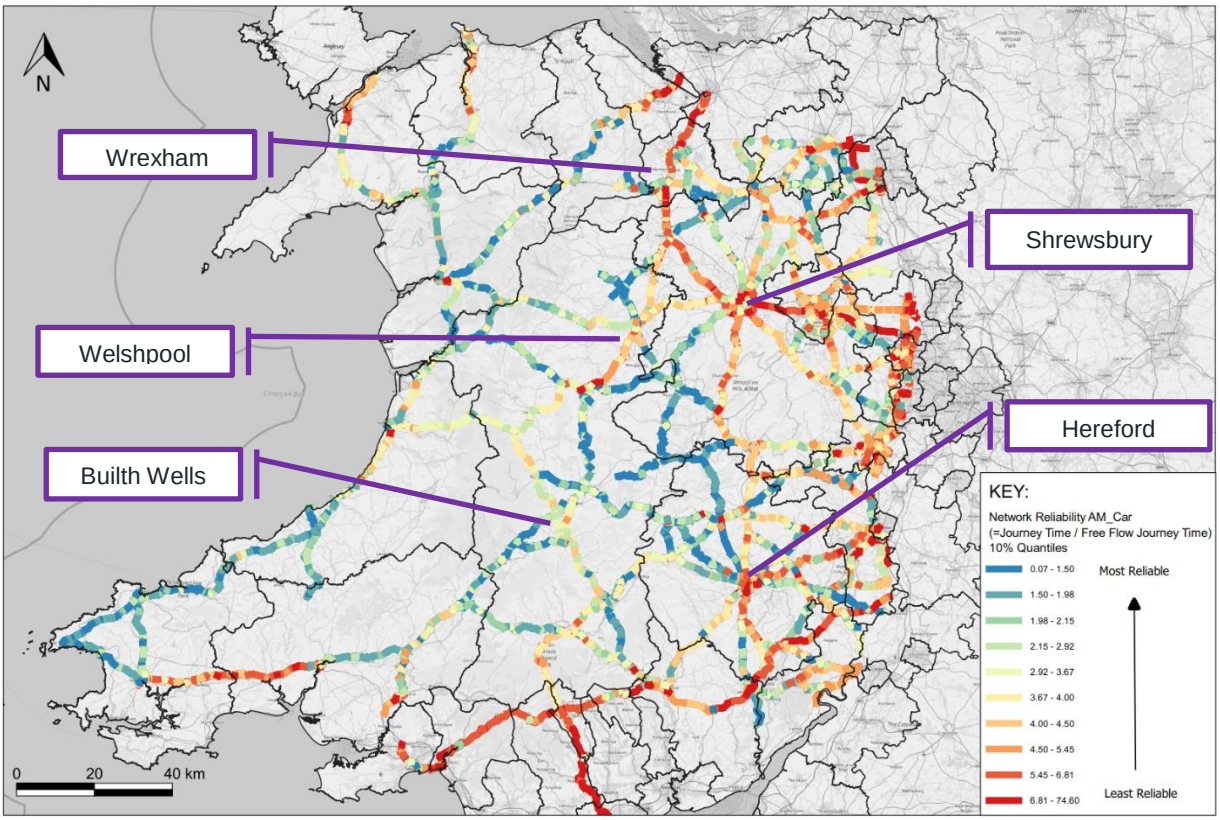

## 3.4. JOURNEY TIME RELIABILITY

Reliability maps show the result of comparing peak time speeds with free-flow speeds derived from the 2016 Trafficmaster data. Morning peak period results shown in **Figure 7** illustrate that the least reliable sections of road network include the A5 (Shrewsbury, Oswestry, Wrexham), M54 west of Wolverhampton, A40 between Carmarthen and Haverfordwest as well as A40 Ross-on-Wye to Abergavenny. The maps also show significant unreliability around centres such as Hereford and Shrewsbury. Trafficmaster data presents average speed across all lanes of a road so sample bias may

result in an overestimation of unreliability on dual carriageways and motorways such as the M54 where fleet vehicles tend to concentrate.

Our analysis of the data has taken an approach to separate HGVs to disaggregate the vehicles using the network for a more bespoke analysis. This network reliability data informed scoring of interventions so that those interventions in areas with poor peak reliability would score more highly against the relevant peak conditional outputs.

**Figure 7 - Trafficmaster Network Reliability (AM peak period)**





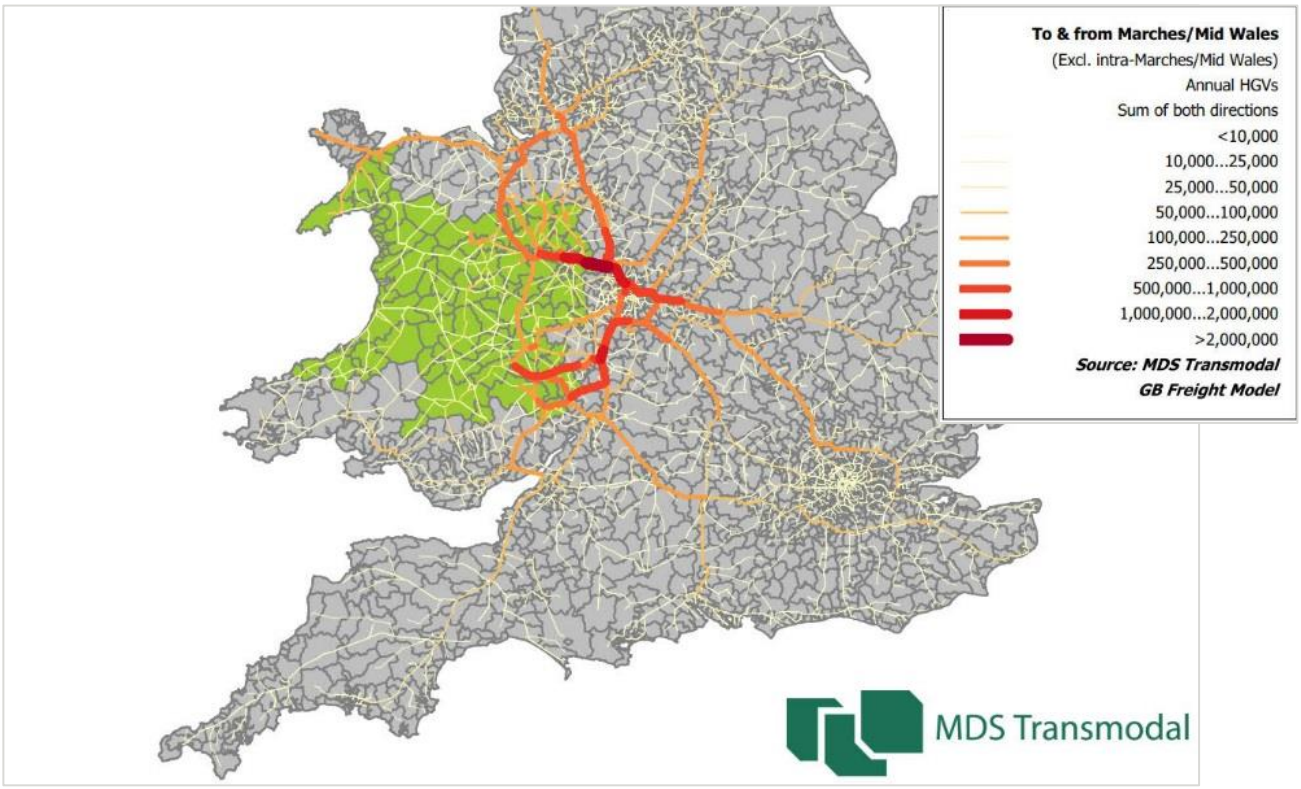

## 3.5. FREIGHT VEHICLES

Understanding the impact and usage of freight in the area is key to JAF performance. While the objectives consider all modes, freight traffic is a key consideration since the interventions were originally developed as part of the Freight Strategy.

MDS Transmodal data gathered as part of this study identifies routes of traffic travelling to and from The Marches and Mid Wales area (**Figure 8**). It demonstrates that there are high volumes of HGV traffic (between 1,000,000 and 2,000,000 HGVs annually) travelling to and from The Marches and Mid Wales to core cities such as Birmingham, Stoke-on-Trent, Chester, Coventry, Cheltenham and Gloucester. HGV traffic is generally travelling to and from the Midlands, with a significantly lower proportion travelling further afield.

Understanding popular origins and destinations as well as primary freight routes enabled scoring of interventions to be based on their location in relation to these key freight corridors and destinations. It highlights where route improvements might provide the most benefits to heavy vehicles and value for money. Where these routes are also single carriageways, high levels of freight traffic are more likely to negatively influence speeds for other vehicles.

**Figure 8 – Annual HGV flows to and from the Marches and Mid Wales (MDS Transmodal Data)**




## 3.6. SUMMARY

The Trafficmaster dataset inherently reflects all the study area characteristics set out as significant transport barriers to road travel. The datasets used as evidence reflect dispersed population, distinctive topography, road works, collisions, extreme weather and level crossings along with seasonal impacts.

Understanding the existing traffic situation in the study area is a key stage in TAG, WelTAG and the business case development process. Having a robust and consistent dataset, which shows particularly low speeds and poor journey time reliability, demonstrates the need for intervention. It has been used as evidence to support assessment and recommendations that form the study outcomes.

# 4. AIMS OF INTERVENTION

## 4.1. OBJECTIVES

The JAF Phase 1 Study undertook a review of The Marches and Mid Wales Freight Strategy objectives in line with wider national and regional Marches and Mid Wales strategy and policy. This review looked to widen the focus of the Freight Strategy objectives so they apply to all road users, as well as providing measurable outputs for monitoring and evaluation of interventions in the future.

Phase 1 considered strategy and policy documents at the national and regional level in the objectives review including:

- Wales Transport Strategy (2008);
- Draft Wales National Transport Plan 2015 – Consultation Document ;
- Mid Wales Joint Local Transport Plan (2015);
- Well-being of Future Generations (Wales) Act 2015;
- Highways England Strategic Business Plan (2015-2020);
- Investing in Strategic Transport Corridors in The Marches (May 2016);
- The Marches Strategic Economic Plan Refresh (2016);
- Midlands Connect Strategy (March 2017);
- Midlands Engine Strategy (March 2017);
- Transport Investment Strategy (July 2017);
- The Marches and Mid Wales Freight Strategy (2018); and
- Midlands Connect Our Routes to Growth (July 2018).

The Marches and Mid Wales **JAF Phase 1 Report** provides further details of the review of these documents.

The policy review, including that of the Freight Strategy objectives, informed development of the JAF objectives used to assess each of the interventions. The agreed JAF objectives are:

- To reduce the cost of and **increase the journey time reliability** of transport movements to, from within and through The Marches and Mid Wales, in particular for the freight and logistics industry;

- To **support the economic growth and prosperity** of The Marches and Mid Wales by stimulating new (and safeguarding existing) inward investment, providing employment and opportunities for increased productivity and growth;

- To **increase the safety** of the transport network in The Marches and Mid Wales thereby reducing the cost of collisions/incidents on the economy, health and well-being;

- To **reduce emissions**, particularly greenhouse gases, particulate matter and nitrogen dioxide thereby reducing the environmental and social cost of congestion and pollution; and

- To **minimise as far as possible the other negative impacts of freight transport** on residents of The Marches and Mid Wales, such as the contribution that freight transport makes to levels of congestion and noise and intimidation of vulnerable road users thereby reducing the economic and social costs on other road and non-road users.

## 4.2. CONDITIONAL OUTPUTS & OUTCOMES

The conditional outcomes and outputs follow development of the Freight Strategy objectives. Objectives set out what is trying to be achieved, conditional outputs define what could be achieved and conditional outcomes define what is gained from achieving the objectives.

**Table 3** summarises the conditional outputs and outcomes used to assess schemes within the JAF, established following review of the objectives and consideration of Midlands Connect conditional outputs and outcomes.

**Table 3 - Summary of the objectives, conditional outputs and conditional outcomes**

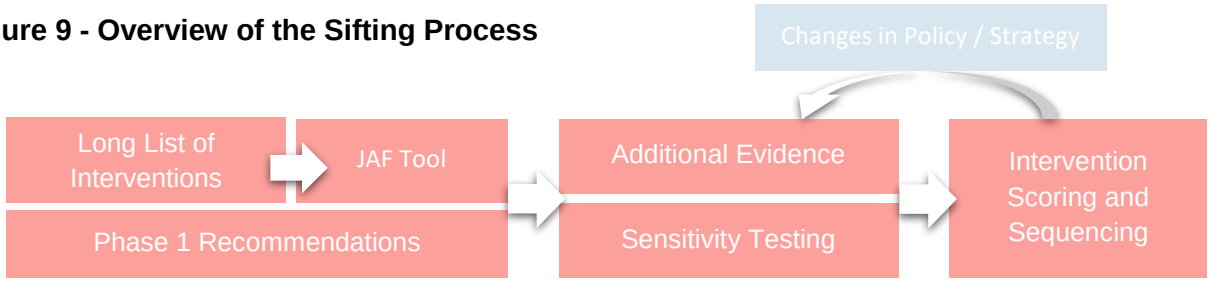
| Objectives | | Conditional Outputs | Conditional Outcomes |
|---|---|---|---|
| O1 | **To reduce the cost of and increase the journey time reliability of transport movements to, from, within and through The Marches and Mid Wales; in particular for the freight and logistics industry** | Increase peak time journey time reliability of transport movements in The Marches and Mid Wales for freight transport (and other road users) | Reduce the cost of transport movements in The Marches and Mid Wales |
| | | Increase peak time journey time reliability of transport movements on '**A' roads and trunk roads** in The Marches and Mid Wales for freight transport (and other road users) | Reduce the cost of transport movements on **'A' roads and trunk roads** in The Marches and Mid Wales |
| O2 | **To support the economic growth and prosperity of The Marches and Mid Wales by stimulating new (and safeguarding existing) inward investment, providing employment and opportunities for increased productivity and growth** | Improves accessibility and journey times between economic/employment centres in The Marches and Mid Wales | Increase productivity and the number of employment opportunities in The Marches and Mid Wales |
| O3 | **To increase the safety of the transport network in The Marches and Mid Wales thereby reducing the cost of collisions/incidents on the economy, health and well-being** | Reduce the number and severity of incidents in accident hot spots in The Marches and Mid Wales | Reduce the cost (in terms of humanity and also disruption/resilience)/number of incidents on the transport network in The Marches and Mid Wales |
| O4 | **To reduce emissions, particularly greenhouse gases, particulate matter and nitrogen dioxide thereby reducing the environmental and social cost of congestion and pollution** | Reduce vehicles flow in AQMAs in The Marches and Mid Wales and reduce delay caused by slow moving traffic in congested areas | Support the improvement of air quality and public health in The Marches and Mid Wales AQMAs and support the reduction of $CO_2$ by improving network efficiency |
| O5 | **To minimise as far as possible the other negative impacts of freight transport on residents of The Marches and Mid Wales, such as the contribution that freight transport makes to levels of congestion and noise and intimidation of vulnerable road users thereby reducing the economic and social costs on other road and non-road users** | Decrease journey times for other road users in built up areas in The Marches and Mid Wales | Reduce congestion and improve travel by all modes in built up areas in The Marches and Mid Wales by reducing the number of HGVs travelling in these areas |
| | | Reduce HGV flows in built up areas in The Marches and Mid Wales | Improve public health and wellbeing, reduce severance and reduce noise levels in built up areas by reducing the number of HGVs travelling through them in The Marches and Mid Wales |

# 5. INTERVENTION ASSESSMENT PROCESS

## 5.1. INTRODUCTION

This chapter presents the assessment methodology and outputs for the Freight Strategy long list sifting. **Figure 9** outlines an overview of the assessment process. **Appendix C** shows the scores for each intervention against each criterion. The scoring allows the identification of better performing interventions and informed recommendations for next steps.

**Figure 9 - Overview of the Sifting Process**




### Use of Evidence

Intervention assessment used a combination of transport planning judgement, previous stakeholder engagement from the Freight Strategy, and quantitative evidence in the form of 2016 Trafficmaster and freight origin and destination data (outlined in **Chapter 3**).

As some criterion require qualitative assessment and transport planning judgement, several assessors review the criteria scores to reduce potential subjectivity. Interventions score relative to each other and to the study area for a balanced view based on the best evidence available. Furthermore, Phase 1 undertook several sensitivity tests of the assessment criteria weighting to review any bias in the results. This assessment process has delivered a transparent and objective assessment of each intervention without considering political will towards any individual intervention. The assessment can reliably inform a future investment programme for The Marches and Mid Wales area.

### JAF Tool continual development

The tool is a live process which should be revisited when new information and updates become available. For example, since the Freight Strategy was published in 2018 and during the development of this study the Dyfi bridge in Mid Wales has received funding although the business case presented a low benefit to cost ratio and the intervention scored low in the JAF, including for value for money.

The Pont-ar-Dyfi bridge is not designed to carry the current volume of traffic, and so is a pinch point on the A487. The road is often closed due to frequent flooding causing traffic to take a diversion of up to 30 miles. The existing bridge is Grade II* listed and a Scheduled Ancient Monument and the scope of alterations are restricted. A new bridge will improve resilience and transport links[19].

Dyfi bridge demonstrates the issue facing rural funding justification and the need for a bespoke assessment to highlight the importance of such interventions where traditional assessment processes

[19] https://gov.wales/a487-new-dyfi-bridge-overview

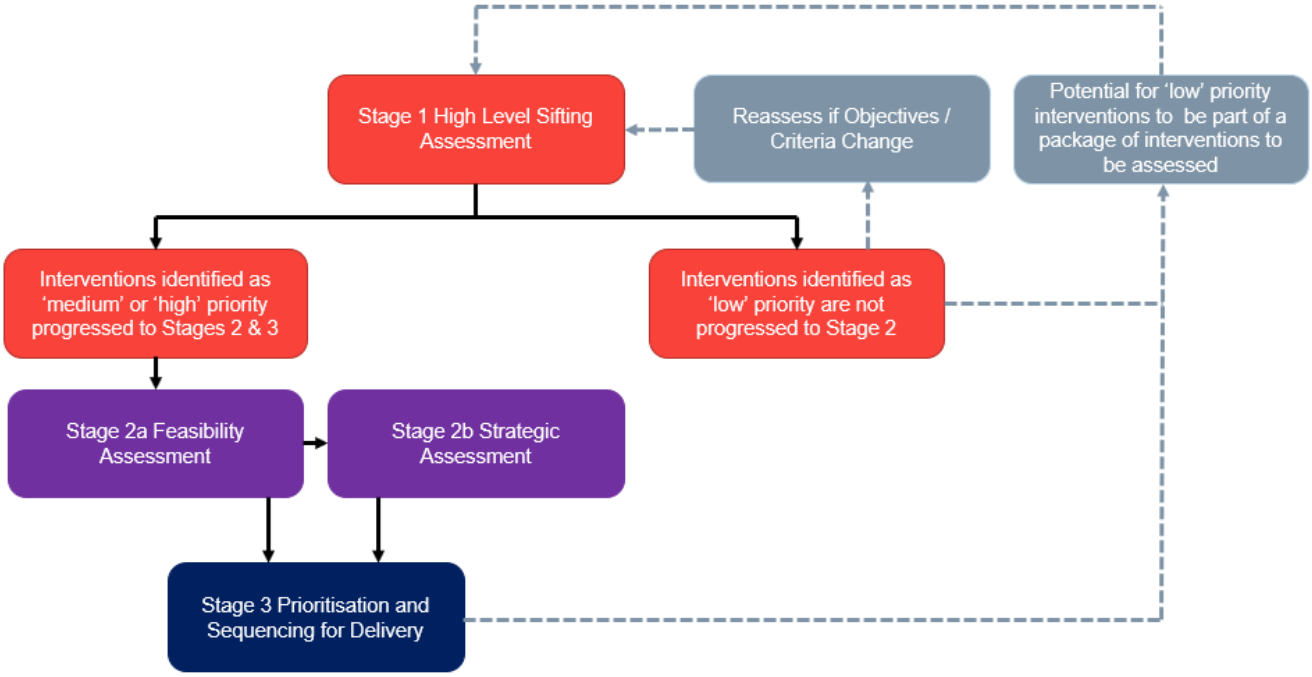
may not support rural area needs. This funding decision also highlights that the JAF is not a fixed assessment process – it is a live tool which can be revised to accommodate new interventions and emerging strategic priorities.

## 5.2. JOINT APPRAISAL FRAMEWORK

In line with the Midlands Connect Common Appraisal Framework (CAF), the JAF has a three-stage process:

- Stage 1 – High Level Sifting Assessment;
- Stage 2 – Strategic Feasibility Assessment; and
- Stage 3 – Sequencing for Delivery.

**Figure 10 - Joint Appraisal Framework (JAF) Process**




Stage 1 (High Level Sifting) assesses all interventions and ranks them. It provides an initial assessment across strategic, economic, affordability and acceptability criteria. The best performing interventions in Stage 1 (identified as 'medium' or 'high' priority) are then progressed to Stage 2a (Feasibility Assessment) and 2b (Strategic Assessment). Stage 3 calculates the combined score from ranking Stages 2a and 2b results. Interventions not progressed to Stage 2 are retained and can be re-assessed if objectives and criteria change in line with emerging strategic priorities. There is also an opportunity to re-visit low performing interventions at Stage 1 should they contribute to a package of supporting measures.

This approach supports TAG and WelTAG appraisal processes, as well as The Marches LEP Accountability and Assurance Framework (2017). The tool provides a bespoke assessment to justify progression of interventions in the rural area. It captures the wider reasoning behind promotion and funding of rural transport schemes that may not offer justified results through more traditional assessment processes. It supports a strategic, economic (value for money), deliverability and feasibility assessment of interventions while reflecting the distinctive study area characteristics through strategic assessment of the conditional outcomes at both Stages 1 and 2.

## THE MARCHES LEP ACCOUNTABILITY AND ASSURANCE FRAMEWORK

The Marches LEP Accountability and Assurance Framework (2017) sets out that prioritisation should be undertaken before interventions are taken forward for business case development and delivery. Criteria should reflect LEP Partnership Board requirements around:

- Delivery of Strategic Economic Plan (SEP) priorities / cross cutting themes;
- Economic growth potential (including jobs, housing and private sector leverage) and relevant Treasury or other Government departmental requirements;
- Project delivery analysis;
- Deliverability assessment; and
- Value for money assessment.

The relationship between economic performance and journey time in terms of the extent to which a scheme improves journey time outcomes are essential to the prioritisation criteria. Interventions identified in the Freight Strategy that improve journey times should be prioritised.

**Appendix A** sets out the full framework for the prioritisation of transport interventions ahead of taking an intervention forward to business case development and delivery.

## 5.3. CRITERIA AND WEIGHTINGS

### STAGE 1 - HIGH LEVEL SIFTING

The criteria and weighting for Stage 1 is shown in **Table 4** with four categories of conditional outcomes, economic, affordability and acceptability each with their own set of sub-criteria. At this stage, the seven conditional outcomes have equal weighting and collectively make up 40% of the Stage 1 assessment. Economy, affordability and acceptability each have 20% of the Stage 1 weighting.

**Table 4 - Stage 1 Criteria and Weighting**

| | Criteria | Weighting |
|---|---|---|
| Conditional outcomes | Reduce the cost of transport movements in The Marches and Mid Wales to support economic growth | 5.7% |
| | Increase network resilience on A roads and trunk roads in The Marches and Mid Wales | 5.7% |
| | Increase productivity and the number of high skilled employment opportunities in The Marches and Mid Wales | 5.7% |
| | Reduce the cost (in terms of humanity and disruption/resilience) / number of collisions on the transport network in The Marches and Mid Wales | 5.7% |
| | Support the improvement of air quality and public health in The Marches and Mid Wales AQMA and support the reduction of $CO_2$ by improving network efficiency | 5.7% |
| | Reduce congestion and improve travel by all modes in built up areas in The Marches and Mid Wales | 5.7% |
| | Improve public health and wellbeing, reduce severance and reduce noise levels in built up areas in The Marches and Mid Wales | 5.7% |
| | **Sub-Total** | **40%** |
| Economy | Reduction in business travel costs (including journey time and fuel savings, reliability improvements) | 6.67% |
| | Enhance productivity by improving journey times and access to jobs | 6.67% |
| | Enhance reliability and support housing growth in The Marches and Mid Wales | 6.67% |
| | **Sub-Total** | **20%** |
| Affordability | Affordability | 6% |
| | Capital cost | 7% |
| | Revenue cost | 2% |
| | Overall cost risk | 5% |
| | **Sub-Total** | **20%** |
| Acceptability | Aligns with wider strategic objectives and local plans | 4% |
| | Supports strategies of key regional stakeholders | 5% |
| | Acceptable to the public | 5% |
| | Practical acceptability | 6% |
| | **Sub-Total** | **20%** |
| | **Total** | **100%** |

## STAGE 2A - FEASIBILITY ASSESSMENT

The criteria and weighting for Stage 2a is shown in **Table 5** with four categories including deliverability, critical dependencies, risks and constraints (with sub criteria covering their range), and value for money. At this stage these categories all represent a quarter of the weighting. With seven identified risk / constraint criterion equally weighted within the 'risks and constraints' area.

**Table 5 - Stage 2a Criteria and Weighting**

| Criteria | | Weighting |
|---|---|---|
| **Deliverability** | Implementation Timescales | 25% |
| **Critical Dependencies** | Relating to other schemes, major development, etc. | 25% |
| **Risks and Constraints** | Environmental constraints | 3.6% |
| | Engineering | 3.6% |
| | Technology | 3.6% |
| | Development consent | 3.6% |
| | Funding | 3.6% |
| | Availability of resources | 3.6% |
| | Policy | 3.6% |
| **Value for Money (VfM)** | Initial Value for Money | 25% |
| | **Total** | **100%** |

## STAGE 2B - STRATEGIC ASSESSMENT

This stage focuses on the performance of interventions against identified objectives. The Conditional Outcomes set out in **Table 3**, link to the objectives and provide measurable criteria against which interventions are assessed by qualitative scoring.

The weightings for each conditional outcome for Stage 2b are equivalent to those established in Stage 1. Stage 2b differs by adopting a 5-point scale assessment against the Conditional Outcomes (Stage 1 is on a 3-point scale) allowing for more definition between interventions.

**Table 6 - Stage 2b Criteria and Weighting**

| Criteria | Weighting |
|---|---|
| Reduce the cost of transport movements in The Marches and Mid Wales to support economic growth | 14% |
| Increase network resilience on A roads and trunk roads in The Marches and Mid Wales | 14% |
| Increase productivity and the number of high skilled employment opportunities in The Marches and Mid Wales | 14% |
| Reduce the cost (in terms of humanity and disruption/resilience) / number of collisions on the transport network in The Marches and Mid Wales | 14% |
| Support the improvement of air quality and public health in The Marches and Mid Wales AQMA and support the reduction of $CO_2$ by improving network efficiency | 14% |
| Reduce congestion and improve travel by al modes in built up areas in The Marches and Mid Wales | 14% |
| Improve public health and wellbeing, reduce severance and reduce noise levels in built up areas in The Marches and Mid Wales | 14% |
| **Total** | **100%** |

### STAGE 3 - PRIORITISATION AND SEQUENCING

Stage 3 provides weighted scores (in percentage terms) for each intervention at each stage of the assessment process and the average of the Stage 2a and 2b scores. This calculates an overall rank for interventions used in prioritisation and delivery at Stage 3.

Those interventions performing well in Stage 3 are a high priority and are brought forward within a sequenced strategy. Low performing interventions present a lower level of priority at the time of assessment, but could still be considered in further programme reviews.

## 5.4. INTERVENTIONS

The 34 interventions in The Marches and Mid Wales Freight Strategy were collated and grouped into the following categories as defined in the Strategy:

- **Highways management and maintenance**: defining for planning purposes a Freight Route Network (FRN) on which strategic freight movements are likely to concentrate and upon which infrastructure enhancements focus. This also includes interventions on the FRN to maintain the existing highway network and ensure that it is fit for purpose for freight movements.
- **Highways enhancements**: specific schemes on the FRN that would reduce journey times and increase journey time reliability for the freight and logistics industry and their customers.
- **Planning and regulation**: interventions to ensure that development opportunities take account of associated freight movements and reduce emissions from HGVs and LGVs in areas of poor air quality.
- **Rail freight**: potential interventions to encourage a switch of some traffic to rail.
- **Dissemination and liaison**: provision of accurate information to users of the road network to facilitate informed decision-making by transport operators and encourage behavioural change.

The interventions are shown by category in **Table 7**, with suggested locations where not already specified, and highlighting associated wider strategy interventions.

**Table 7 - Intervention Long List**

| ID | Intervention |
|---|---|
| | **Highways Management and Maintenance** |
| S1 | **Definition of FRN for Transport Planning purposes**<br>The key highways planning concept is the development of the FRN. The definition would be informal and would be for the purpose of transport planning only, consisting of the Strategic Road Network (SRN) and selected additional county roads which could accommodate significant volumes of HGVs in absolute and relative terms. Developing the FRN would allow available resources to be focused on key freight routes in The Marches and Mid Wales.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456, A40, A494, A53, A41, A4103 and A442* |
| S2 | **Signing of access between the FRN and key attractors and generators of freight**<br>Physical signage needs to be reviewed to ensure that HGVs are encouraged to use suitable routes between the FRN and key freight generators and attractors of freight.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456, A40, A494, A53, A41, A4103 and A442* |
| S3 | **Review of HGV parking provision of the FRN**<br>There needs to be a review of the supply and demand for HGV parking in The Marches and Mid Wales, with a focus on the provision of sufficient parking spaces on the FRN and close to industrial estates and warehousing. This review should lead to the development of additional overnight parking facilitates in a number of key locations. |

| ID | Intervention |
|---|---|
| S4 | **30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages**<br>Local Authorities could introduce speed limits and traffic calming interventions in selected locations to slow HGV and other traffic in sensitive locations. The schemes should be developed for the particular circumstances of the location. *Potential locations have been informed by accident data and include:*<br>• *A483 between Newtown and Welshpool and at the junctions with the B4393 and B439*<br>• *A5 between Llangollen and Berwyn, the section around the Queen's Head*<br>• *A479 Pengenffordd*<br>• *A470 south of Brecon Aberhonddu and Bwlch-y-garreg*<br>• *A487 Derwenlas to Glandyfi and around Bow Street*<br>• *A44 Dyffuryn-castell and Pant Mawr*<br>• *A470 / A483 Builth Wells* |
| S5 | **Improved maintenance of the FRN, including through the use of highways maintenance panning tools**<br>The existence of the FRN would encourage a strong focus on the maintenance of the highways which are most important for the circulation of HGVs by Highways England, the Welsh Government and Local Authorities. The use of highways maintenance planning tools such as the Highways Maintenance Assessment Tool (HMAT) can assist in the maintenance and allows councils to develop investment strategies that assess the contribution of highways maintenance to economic efficiency and economic growth.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456, A40, A494, A53, A41, A4103 and A442* |
| | **Highways Enhancement** |
| S6 | **Sections of 2 on 1 roads (online enhancements)**<br>Short sections of carriageway of at least 13.5 metres in width will allow overtaking in one direction for a stretch of the highways for at least 600 metres and up to 2,000 metres. Overtaking opportunities should be available in both directions alternately and in reasonable proximity to each other and should be at least 2km from the nearest dual carriageway and 500 metres from an access point to the road.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456 and A40*<br>*Existing locations: A486 Llandysul south Ceredigion*<br>*Potential locations: A41 Newport, A44 Aberystwyth and Llangruig* |
| S7 | **Differential acceleration lanes (DALs)**<br>Provided on the exit from roundabouts to enable vehicles leaving the roundabout to overtake slower-moving vehicles.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456 and A40*<br>*Potential location: A4169 in the South of Telford and Wrekin* |
| S8 | **Crawler lanes**<br>An additional lane added to a single carriageway to improve capacity and/or safety because of the presence of the steep gradient. A climbing lane can be considered on single carriageway roads with gradients greater than 2% and longer than 500 metres.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456 and A40*<br>*Existing: A479 Talgarth Bypass*<br>*Potential: A5 at Redhill* |
| S9 | **On line enhancements to the trunk road network**<br>Such as straightening, removing bends and widening of narrow sections at selected locations to allow HGVs to pass one another would also increase the safety of the network and reduce journey times.<br>*Relevant to: A49, A483, A470, A5, A487, A458, A44, A438, A456 and A40*<br>*Existing: A487 Bangor to Fishguard at Glandyfi*<br>*Potential: Sections of the Trunk Road Network* |
| S10 | **Hereford Bypass and Southern Link**<br>Bypass to the west of the city with a new crossing of the River Wye, with the objective of removing north-south strategic traffic from the city. As stated in 'Investing in Strategic Transport Corridors in The Marches'. |
| S11 | **M54 Link to northbound M6/M6 Toll**<br>New motorway link to provide northbound traffic on the M54 access to the M6 directly rather than via the A449; the scheme would also provide a direct link between the M54 and the start of the M6 Toll Road.<br>As stated in The Marches Strategic Economic Plan and Investing in Strategic Transport Corridors in the Marches Policy Document. |

| ID | Intervention |
|---|---|
| S12 | **A49/A5 Dobbies Island Junction Improvement**<br>Enhancements to the junction between the A49 north south route and the A5 Shrewsbury Ring Road to the south of Shrewsbury. As stated in The Marches Strategic Economic Plan and Investing in Strategic Transport Corridors in The Marches Policy Document. |
| S13 | **Leominster Bypass**<br>A Bypass to the southwest of Leominster allowing east-west traffic on the A44 to avoid the town centre. As stated in 'Investing in Strategic Transport Corridors in The Marches'. |
| S14 | **New Dyfi Bridge on the A487**<br>A scheme to replace the bridge across the River Dyfi on the A487 to the north of Machynlleth. As stated in Draft Wales National Transport Plan. |
| S15 | **A483 Pant to Llanymynech Bypass**<br>Bypass of two villages on the A483 between Welshpool and Oswestry, which will reduce journey times between Mid Wales and Deeside and the North West of England. As stated in The Marches Strategic Economic Plan. |
| S16 | **A458 Buttington Cross to Wollaston Cross**<br>Scheme to improve 9km of sub-standard trunk road, which will reduce journey times between Mid Wales and the West Midlands via Shrewsbury. |
| S17 | **Shrewsbury North West Relief Road**<br>A scheme to complete the final section of the ring road around Shrewsbury to link the A49/A53 at Battlefield to the A5/A458 at Bicton Heath, which will reduce journey times between the west and the north of Shrewsbury. As stated in The Marches SEP and Investing in Strategic Transport Corridors in The Marches Document Report. |
| S18 | **Dualling or partial dualling of the A5/A483**<br>A scheme to provide a dual carriageway route from the end of the A5 Shrewsbury Bypass to the start of the dualled A483 at Ruabon. |
| | **Planning and Regulation** |
| S19 | **Review of the development control process**<br>There should be a review of the development control process by Local Authorities in relation to access to the key route network from developments which generate additional HGV traffic. |
| S20 | **Require adequate off-road parking for HGVs making deliveries and collections at development sites**<br>The development control process should also take into consideration the need for off-road parking for HGVs when making (or waiting for) deliveries and collections to prevent HGVs parking on the public highway. |
| S21 | **Support the Midlands Connect and Transport for the North (TfN) freight strategies**<br>The Marches and Mid Wales Freight Strategy supports the Midlands Connect Freight Strategy and its focus on securing additional strategic road capacity through the Midlands. It also supports the results from the Transport for the North Freight Study which focuses on interventions which will lead to a reduction in the volume of road freight movements which transit the Midlands on the north-south axis. |
| S22 | **Review of freight deliveries and collections in the centre of Shrewsbury, Bridgnorth, Hereford and Leominster**<br>There needs to be a review of freight movements, deliveries and collections in Shrewsbury, Hereford, Leominster and Bridgnorth to establish the extent to which freight activity is a major contributor to poor air quality and what local interventions could be introduced to reduce the impacts. |
| S23 | **'Unsuitable for HGVs' signs on certain routes**<br>'Unsuitable for HGVs' signs should be used by Councils to encourage freight vehicles over a certain weight or size from using particular routes because they would not be able to be accommodated safely on the route.<br>*Potential routes where this should be focused have been informed through MDS Transmodal data and include:*<br>• *A456 connecting Leominster, Kidderminster and Birmingham*<br>• *M50 / A40 Ross-on-Wye connecting to Worcester and the Midlands*<br>• *A438 Earisley, Hereford to the A4103 Worcester and the M5*<br>• *A483 Chester / Wrexham / Oswestry to the A5 Shrewsbury and key corridors at the M54 / M6 / Birmingham motorway box*<br>• *North Wales route – A55 Holyhead to Chester* |

| ID | Intervention |
|---|---|
| S24 | **Restrict movements of freight vehicles over 7.5 tonnes gross vehicle weight using Transport Regulation Orders (TROs)**<br>TROs can be introduced in some locations to restrict access by freight vehicles and to increase use of 'except for loading' restrictions.<br>*Potential routes where this should be focused have been informed through MDS Transmodal data and include:*<br>• *A456 connecting Leominster, Kidderminster and Birmingham*<br>• *M50 / A40 Ross-on-Wye connecting to Worcester and the Midlands*<br>• *A438 Earisley, Hereford to the A4103 Worcester and the M5*<br>• *A483 Chester / Wrexham / Oswestry to the A5 Shrewsbury and key corridors at the M54 / M6 / Birmingham motorway box*<br>• *North Wales route – A55 Holyhead to Chester* |
| | **Rail Freight** |
| S25 | **Feasibility study for a 'supermarket train' between the Midlands area and Shrewsbury and Machynlleth or Newtown**<br>The 'supermarket train' would carry retail goods in containers between the Midlands and Shrewsbury, Machynlleth and Newtown. |
| S26 | **Increased loading gauge from Shrewsbury to Birmingham via Donnington**<br>The attractiveness of Telford International Rail Freight Park at Donnington could be enhanced by increasing the loading gauge for intermodal traffic between Shrewsbury and Birmingham via Donnington. As stated in Investing in Strategic Transport Corridors in The Marches. |
| S27 | **Marketing study for Donnington rail freight terminal**<br>Marketing study to identify new markets and additional traffic which could use Telford International Rail Freight Park at Donnington. |
| S28 | **Review of potential railheads for key shippers of freight**<br>There should be a review of potential opportunities for major manufacturers located in The Marches and Mid Wales to use local railheads for the inbound distribution of raw materials and the outbound distribution of products. |
| | **Dissemination, liaison and behavioural change** |
| S29 | **Contribute data to the Ordnance Survey National**<br>Local Authorities in The Marches and Mid Wales should contribute up-to-date data on structures and regulations affecting the highway network at a local level to the Ordnance Survey National Digital Road Map Database. This is necessary to make information available to the major satellite navigation system manufacturers. |
| S30 | **Digital Road Map database and private sector web-based portals**<br>Local Authorities should contribute up-to-date data on structures and regulations affecting the highway network to the Ordnance Survey National Digital Road Map Database. In addition to this, Local Authorities should also provide the same information to private sector freight transport planning portals, such as Freight Journey Planner. |
| S31 | **Developing local freight partnerships for specific communities**<br>There is also scope for the development of local freight partnerships, coordinated by Local Authorities, to raise awareness of the needs of local businesses in relation to freight movements and the impacts of the movement on local communities.<br>The partnerships could be used to:<br>• Bring businesses and residents together to increase mutual understanding and reach agreement on future actions<br>• Allow Local Authorities to establish and explain the most appropriate routing for HGVs to local businesses and their hauliers to avoid the application of a Transport Regulation Order or other regulatory measure |
| S32 | **Communities campaign for the driver of slow-moving agricultural vehicles**<br>There should be a communications campaign, in collaboration with the National Farmers Union and the police to encourage the drivers of slow-moving agricultural vehicles behind which queues of traffic have formed, to pull off the public highway into laybys where it is safe to do so and allow faster-moving traffic to pass. |

| ID | Intervention |
|---|---|
| S33 | **‘No idling – please switch off your engines’ signs at relevant junctions in towns and cities where there are air quality issues**<br>At relevant junctions in towns and cities in The Marches where there is known to be relatively poor air quality, ‘no idling – please switch off your engines’ signs should be installed at the appropriate height for HGV cabs to encourage drivers to switch off their engines when they are waiting at junctions.<br>*To be focused on areas with Air Quality Management Areas (AQMAs):*<br>• *Shrewsbury (A458/B4386, A528/A5191 and A458/Abbey Foregate)*<br>• *Leominster (A44/B4386)*<br>• Hereford (A438/A49, A49/A465, A49/Priory Road, A49 Newtown Road/Edgar Street/Farriers Way and A438/Commercial Road) |
| S34 | **Slow moving agricultural vehicles – ‘Please pull over’ signs on relevant stretches of single carriageway network**<br>Intervention 33 should be accompanied by the installation of ‘slow moving agricultural vehicles – Please pull over’ signs a short distance before laybys where slow-moving agricultural vehicles might be able to safely pull off the road.<br>*Locations to include: the town of Newport and North of Telford and Wrekin Council Area,* |

# 6. ASSESSMENT RESULTS AND SENSITIVITY TESTING

This chapter presents the results of the JAF. It sets out the rank and weighted score of each intervention at each stage of the assessment process. Stage 3 forms the final outputs of the tool and these top performing options (**Table 11**) will feed into a sequenced strategy.

The second half of this chapter presents some sensitivity tests undertaken as per the recommendations of Phase 1.

## 6.1. FINAL RESULTS

### STAGE 1 - HIGH LEVEL SIFTING RESULTS

At Stage 1 (High Level Sifting) all proposed interventions in The Marches and Mid Wales are assessed and ranked. **Table 8** summarises the Stage 1 results.

Six of the 34 interventions scored lower than 50% and were therefore categorised as 'low priority' at this stage. These interventions will be reconsidered as part of packages where applicable to be progressed to the next stage.

**Table 8 - Stage 1 Results**

| Rank | ID | Intervention | Stage 1 weighted score |
|---|---|---|---|
| 1 | S1 | Definition of Freight Route Network for Transport Planning purposes | 82% |
| 2 | S2 | Signing of access between the FRN and key attractors or generators of freight | 81% |
| 3 | S10 | Hereford Bypass and Southern Link | 77% |
| 3 | S13 | New crossing of the River Dyfi on the A487 | 77% |
| 5 | S11 | M54 Link to northbound M6/M6 Toll | 73% |
| 5 | S15 | A483 Pant to Llanymynech Bypass | 73% |
| 7 | S17 | Shrewsbury North West Relief Road | 72% |
| 8 | S14 | Leominster Bypass | 70% |
| 9 | S6 | Sections of 2 on 1 roads (online enhancements) | 69% |
| 10 | S8 | Crawler lanes | 66% |
| 11 | S19 | Review of development control process | 66% |
| 12 | S25 | Feasibility study for a 'supermarket train' between the Midlands area and Shrewsbury and Machynlleth or Newtown | 66% |
| 13 | S26 | Increased loading gauge from Shrewsbury to Birmingham via Donnington | 64% |
| 14 | S9 | On-line enhancements to the trunk road network | 63% |
| 15 | S12 | A49/A5 Dobbies Island Junction Improvements | 62% |
| 16 | S34 | Slow moving agricultural vehicles - please pull over' signs on relevant stretches of single carriageway network | 62% |
| 17 | S5 | Improved maintenance of the SRN, including through the use of highways maintenance planning tools | 61% |

| Rank | ID | Intervention | Stage 1 weighted score |
|---|---|---|---|
| 18 | S7 | Differential acceleration lanes (DALs) | 60% |
| 19 | S20 | Require adequate off-road parking for HGVs making deliveries and collections at development sites | 58% |
| 20 | S23 | Unsuitable for HGVs' signs on certain routes | 58% |
| 21 | S27 | Marketing study for Donnington rail freight terminal | 56% |
| 22 | S4 | 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages | 56% |
| 23 | S29 | Contribute data to the Ordnance Survey National | 54% |
| 23 | S30 | Digital Road Map database and private sector web-based portals | 54% |
| 25 | S3 | Review of HGV parking provision on the Freight Route Network | 53% |
| 26 | S18 | Dualling of the A5/A483 between Shrewsbury and Ruabon | 51% |
| 27 | S28 | Review of potential railheads for key shippers of freight | 51% |
| 27 | S32 | Communications campaign for the drivers of slow-moving agricultural vehicles | 51% |
| 29 | S24 | Restrict movements of freight vehicles over 7.5 tonnes gross vehicle weight using Transport Regulation Orders | 49% |
| 30 | S31 | Developing local freight partnerships for specific communities | 49% |
| 31 | S33 | No idling - please switch off your engines' signs at relevant junctions in towns and cities where there are air quality issues | 49% |
| 32 | S21 | Support the Midlands Connect and Transport for the North freight strategies | 48% |
| 33 | S22 | Review of freight deliveries and collections in the centre of Shrewsbury, in Bridgnorth, Hereford and Leominster | 48% |
| 34 | S16 | A458 Buttington Cross to Wollaston Cross | 46% |

## STAGE 2A - FEASIBILITY RESULTS

Following Stage 1 assessment, all 'high priority' and 'medium priority' interventions are assessed in Stage 2a. **Table 9** outlines the Stage 2a feasibility results.

### Table 9 - Stage 2a Assessment Results

| Stage 2a Rank | ID | Intervention Type | Stage 2a score |
|---|---|---|---|
| 1 | S27 | Marketing study for Donnington rail freight terminal | 91% |
| 2 | S28 | Review of potential railheads for key shippers of freight | 88% |
| 3 | S1 | Definition of Freight Route Network for Transport Planning purposes | 85% |
| 4 | S4 | 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages | 83% |
| 5 | S32 | Communications campaign for the drivers of slow-moving agricultural vehicles | 82% |
| 6 | S20 | Require adequate off-road parking for HGVs making deliveries and collections at development sites | 81% |

| Stage 2a Rank | ID | Intervention Type | Stage 2a score |
|---|---|---|---|
| 7 | S34 | Slow moving agricultural vehicles - please pull over' signs on relevant stretches of single carriageway network | 80% |
| 8 | S2 | Signing of access between the FRN and key attractors or generators of freight | 78% |
| 9 | S25 | Feasibility study for a 'supermarket train' between the Midlands area and Shrewsbury and Machynlleth or Newtown | 78% |
| 10 | S29 | Contribute data to the Ordnance Survey National | 77% |
| 11 | S30 | Digital Road Map database and private sector web-based portals | 77% |
| 12 | S5 | Improved maintenance of the SRN, including through the use of highways maintenance planning tools | 76% |
| 13 | S7 | Differential acceleration lanes (DALs) | 75% |
| 14 | S8 | Crawler lanes | 74% |
| 15 | S3 | Review of HGV parking provision on the Freight Route Network | 74% |
| 16 | S23 | Unsuitable for HGVs' signs on certain routes | 73% |
| 17 | S9 | On-line enhancements to the trunk road network | 72% |
| 18 | S19 | Review of development control process | 71% |
| 19 | S6 | Sections of 2 on 1 roads (online enhancements) | 71% |
| 20 | S26 | Increased loading gauge from Shrewsbury to Birmingham via Donnington | 71% |
| 21 | S18 | Dualling of the A5/A483 between Shrewsbury and Ruabon | 64% |
| 22 | S14 | Leominster Bypass | 62% |
| 23 | S12 | A49/A5 Dobbies Island Junction Improvements | 53% |
| 24 | S17 | Shrewsbury North West Relief Road | 44% |
| 25 | S10 | Hereford Bypass and Southern Link | 42% |
| 26 | S11 | M54 Link to northbound M6/M6 Toll | 41% |
| 27 | S15 | A483 Pant to Llanymynech Bypass | 41% |
| 28 | S13 | New crossing of the River Dyfi on the A487 | 41% |

## STAGE 2B - STRATEGIC RESULTS

Following Stage 1 assessment, all 'high priority' and 'medium priority' interventions are assessed in Stage 2b. **Table 10** outlines the Stage 2b strategic results, showing the performance of each intervention in relation to the conditional outcomes of this study.

### Table 10 - Stage 2b Assessment Results

| Stage 2b Rank | ID | Intervention Type | Stage 2b score |
|---|---|---|---|
| 1 | S10 | Hereford Bypass and Southern Link | 89% |
| 2 | S11 | M54 Link to northbound M6/M6 Toll | 89% |
| 3 | S15 | A483 Pant to Llanymynech Bypass | 79% |
| 4 | S1 | Definition of Freight Route Network for Transport Planning purposes | 75% |
| 5 | S17 | Shrewsbury North West Relief Road | 71% |
| 6 | S2 | Signing of access between the FRN and key attractors or generators of freight | 68% |

| Stage 2b Rank | ID | Intervention Type | Stage 2b score |
|---|---|---|---|
| 7 | S5 | Improved maintenance of the SRN, including through the use of highways maintenance planning tools | 64% |
| 8 | S18 | Dualling of the A5/A483 between Shrewsbury and Ruabon | 64% |
| 9 | S14 | Leominster Bypass | 61% |
| 10 | S8 | Crawler lanes | 50% |
| 11 | S9 | On-line enhancements to the trunk road network | 46% |
| 12 | S12 | A49/A5 Dobbies Island Junction Improvements | 46% |
| 13 | S19 | Review of development control process | 46% |
| 14 | S13 | New crossing of the River Dyfi on the A487 | 43% |
| 15 | S4 | 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages | 39% |
| 16 | S6 | Sections of 2 on 1 roads (online enhancements) | 36% |
| 17 | S7 | Differential acceleration lanes (DALs) | 32% |
| 18 | S3 | Review of HGV parking provision on the Freight Route Network | 32% |
| 19 | S20 | Require adequate off-road parking for HGVs making deliveries and collections at development sites | 29% |
| 20 | S23 | Unsuitable for HGVs' signs on certain routes | 25% |
| 21 | S34 | Slow moving agricultural vehicles - please pull over' signs on relevant stretches of single carriageway network | 21% |
| 22 | S32 | Communications campaign for the drivers of slow-moving agricultural vehicles | 18% |
| 23 | S25 | Feasibility study for a 'supermarket train' between the Midlands area and Shrewsbury and Machynlleth or Newtown | 18% |
| 24 | S26 | Increased loading gauge from Shrewsbury to Birmingham via Donnington | 18% |
| 25 | S27 | Marketing study for Donnington rail freight terminal | 14% |
| 26 | S28 | Review of potential railheads for key shippers of freight | 11% |
| 27 | S29 | Contribute data to the Ordnance Survey National | 7% |
| 28 | S30 | Digital Road Map database and private sector web-based portals | 7% |

## STAGE 3 - OVERALL RESULTS

The results of The Marches and Mid Wales JAF ranking tool, in order of priority are detailed in **Table 11**. Stage 3 provides an overall rank, based on the sum of results in stages 2a and 2b.

### Table 11 - Stage 3 Final Results

| Rank | ID | Intervention Type | Stage 2a Score | Stage 2b Score | Total Score |
|---|---|---|---|---|---|
| 1 | S1 | Definition of Freight Route Network for Transport Planning purposes | 85% | 75% | 80% |
| 2 | S2 | Signing of access between the FRN and key attractors or generators of freight | 78% | 68% | 73% |
| 3 | S5 | Improved maintenance of the SRN, including through the use of highways maintenance planning tools | 76% | 64% | 70% |
| 4 | S10 | Hereford Bypass and Southern Link | 42% | 89% | 66% |

| Rank | ID | Intervention Type | Stage 2a Score | Stage 2b Score | Total Score |
|---|---|---|---|---|---|
| 5 | S11 | M54 Link to northbound M6/M6 Toll | 41% | 89% | 65% |
| 6 | S18 | Dualling of the A5/A483 between Shrewsbury and Ruabon | 64% | 64% | 64% |
| 7 | S8 | Crawler lanes | 74% | 50% | 62% |
| 8 | S4 | 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages | 83% | 39% | 61% |
| 8 | S14 | Leominster Bypass | 62% | 61% | 61% |
| 10 | S15 | A483 Pant to Llanymynech Bypass | 41% | 79% | 60% |
| 11 | S9 | On-line enhancements to the trunk road network | 72% | 46% | 59% |
| 12 | S19 | Review of development control process | 71% | 46% | 59% |
| 13 | S17 | Shrewsbury North West Relief Road | 44% | 71% | 58% |
| 14 | S20 | Require adequate off-road parking for HGVs making deliveries and collections at development sites | 81% | 29% | 55% |
| 15 | S7 | Differential acceleration lanes (DALs) | 75% | 32% | 54% |
| 16 | S6 | Sections of 2 on 1 roads (online enhancements) | 71% | 36% | 53% |
| 16 | S3 | Review of HGV parking provision on the Freight Route Network | 74% | 32% | 53% |
| 18 | S27 | Marketing study for Donnington rail freight terminal | 91% | 14% | 53% |
| 19 | S34 | Slow moving agricultural vehicles - please pull over' signs on relevant stretches of single carriageway network | 80% | 21% | 51% |
| 20 | S32 | Communications campaign for the drivers of slow-moving agricultural vehicles | 82% | 18% | 50% |
| 21 | S12 | A49/A5 Dobbies Island Junction Improvements | 53% | 46% | 50% |
| 22 | S28 | Review of potential railheads for key shippers of freight | 88% | 11% | 49% |
| 22 | S23 | Unsuitable for HGVs' signs on certain routes | 73% | 25% | 49% |
| 23 | S13 | New crossing of the River Dyfi on the A487 | 41% | 43% | 42% |
| 24 | S25 | Feasibility study for a 'supermarket train' between the Midlands area and Shrewsbury and Machynlleth or Newtown | 78% | 18% | 48% |
| 25 | S26 | Increased loading gauge from Shrewsbury to Birmingham via Donnington | 71% | 18% | 44% |
| 27 | S29 | Contribute data to the Ordnance Survey National | 77% | 7% | 42% |
| 27 | S30 | Digital Road Map database and private sector web-based portals | 77% | 7% | 42% |

## 6.2. SENSITIVITY TESTS

Sensitivity tests provide greater certainty and confidence in the JAF tool results and include the following, a s recommended in Phase 1:

- Increase weighting of the journey time and journey time reliability conditional outcomes
- Rank Stage 3 by total weighted score as oppose to total rank

## JOURNEY TIME AND JOURNEY TIME RELIABILITY WEIGHTING

The study identifies the importance of providing journey time and reliability savings. Weightings of the following conditional outcomes are increased to 20% (overall weighting at Stage 1 of 8% each):

- Reduce the cost of transport movements to support economic growth;
- Increase network resilience on A roads and trunk roads; and
- Reduce congestion and improve travel by all modes in built up areas.

The remaining conditional outcomes have a weighting of 10% (overall weighting of 4% each). This adjustment applies to conditional outcomes in stages 1 and 2b.

**Table 12** outlines the Stage 3 results, showing the difference between the evenly weighted conditional outcomes and increased weightings for the journey time and reliability.

**Table 12 - Sensitivity Test Results**

| ID | Intervention Type | Sensitivity Test | | Original (Table10) | | Scoring Difference |
|---|---|---|---|---|---|---|
| | | Score | Rank | Score | Rank | |
| S1 | Definition of Freight Route Network for Transport Planning purposes | 80% | 1 | 80% | 1 | - |
| S2 | Signing of access between the FRN and key attractors or generators of freight | 74% | 2 | 73% | 2 | +1% |
| S5 | Improved maintenance of the SRN, including through the use of highways maintenance planning tools | 70% | 3 | 70% | 3 | - |
| S10 | Hereford Bypass and Southern Link | 67% | 4 | 66% | 4 | +1% |
| S11 | M54 Link to northbound M6/M6 Toll | 67% | 5 | 65% | 5 | +2% |
| S18 | Dualling of the A5/A483 between Shrewsbury and Ruabon | 66% | 6 | 64% | 6 | +2% |
| S8 | Crawler lanes | 66% | 7 | 62% | 7 | +4% |
| S15 | A483 Pant to Llanymynech Bypass | 63% | 8 | 60% | 10 | +3% |
| S9 | On-line enhancements to the trunk road network | 62% | 9 | 59% | 11 | +3% |
| S14 | Leominster Bypass | 61% | 10 | 61% | 8 | - |

Sensitivity tests result in the removal of (S4) 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages from the top-ten list. The change of conditional outcome weightings also moves (S9) On-line enhancements to the trunk road network into the top-ten list.

## TOTAL WEIGHTED SCORE VS TOTAL RANK

Stage 3 results, using 'sum of the ranks' method, are shown in red in **Table 13,** along with original results using 'sum of the scores' (from **Table 11**) are shown in black for comparison.

**Table 13 - Stage 3 Rank Results (sum of ranks and sum of scores comparison)**

| ID | Intervention Rank | Stage 2a | Stage 2b | Sum | Sensitivity Test | Previous |
|---|---|---|---|---|---|---|
| S1 | Definition of Freight Route Network for Transport Planning purposes | 5 | 4 | 9 | **1** | **1** |
| S2 | Signing of access between the FRN and key attractors or generators of freight | 13 | 6 | 19 | **2** | **2** |

| ID | Intervention Rank | Stage 2a | Stage 2b | Sum | Sensitivity Test | Previous |
|---|---|---|---|---|---|---|
| S4 | 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages | 7 | 16 | 23 | 3 | 8 |
| S5 | Improved maintenance of the SRN, including through the use of highways maintenance planning tools | 17 | 7 | 24 | 4 | 3 |
| S8 | Crawler lanes | 20 | 10 | 30 | 5 | 7 |
| S20 | Require adequate off-road parking for HGVs making deliveries and collections at development sites | 10 | 21 | 31 | 6 | 14 |
| S10 | Hereford Bypass and Southern Link | 31 | 1 | 32 | 7 | 4 |
| S27 | Marketing study for Donnington rail freight terminal | 2 | 30 | 32 | 7 | 18 |
| S9 | On-line enhancements to the trunk road network | 22 | 11 | 33 | 9 | 11 |
| S11 | M54 Link to northbound M6/M6 Toll | 32 | 2 | 34 | 10 | 5 |
| S18 | Dualling of the A5/A483 between Shrewsbury and Ruabon | 26 | 8 | 34 | 10 | 6 |
| S17 | Shrewsbury North West Relief Road | 30 | 5 | 35 | 12 | 13 |
| S28 | Review of potential railheads for key shippers of freight | 4 | 31 | 35 | 12 | 22 |
| S19 | Review of development control process | 23 | 13 | 36 | 14 | 12 |
| S15 | A483 Pant to Llanymynech Bypass | 34 | 3 | 37 | 15 | 10 |
| S14 | Leominster Bypass | 28 | 9 | 37 | 15 | 8 |
| S34 | Slow moving agricultural vehicles - please pull over' signs on relevant stretches of single carriageway network | 12 | 25 | 37 | 15 | 19 |
| S32 | Communications campaign for the drivers of slow-moving agricultural vehicles | 8 | 29 | 37 | 15 | 20 |
| S7 | Differential acceleration lanes (DALs) | 18 | 20 | 38 | 19 | 15 |
| S3 | Review of HGV parking provision on the Freight Route Network | 19 | 19 | 38 | 19 | 16 |
| S12 | A49/A5 Dobbies Island Junction Improvements | 29 | 12 | 41 | 21 | 21 |
| S6 | Sections of 2 on 1 roads (online enhancements) | 24 | 17 | 41 | 21 | 16 |
| S25 | Feasibility study for a 'supermarket train' between the Midlands area and Shrewsbury and Machynlleth or Newtown | 14 | 27 | 41 | 21 | 24 |
| S23 | Unsuitable for HGVs' signs on certain routes | 21 | 23 | 44 | 24 | 22 |
| S13 | New crossing of the River Dyfi on the A487 | 33 | 15 | 48 | 25 | 23 |
| S29 | Contribute data to the Ordnance Survey National | 15 | 33 | 48 | 25 | 27 |
| S30 | Digital Road Map database and private sector web-based portals | 16 | 34 | 50 | 27 | 27 |
| S26 | Increased loading gauge from Shrewsbury to Birmingham via Donnington | 25 | 28 | 53 | 28 | 25 |

# 7. SUMMARY & RECOMMENDATIONS

## Scope and Objectives

The Marches and Mid Wales Joint Appraisal Framework (JAF) fits with DfT's Transport Analysis Guidance and Welsh Transport Appraisal Guidance (TAG and WelTAG respectively). The framework aims to identify a prioritised road investment programme for The Marches and Mid Wales area and to refresh the programme set out in Investing in Strategic Corridors in The Marches (2016).

The Marches is one of the largest LEP areas in England, it includes administrative areas of Herefordshire Council, Shropshire Council and Telford and Wrekin Council. The Growing Mid Wales Partnership area includes administrative areas of Ceredigion County Council, Powys County Council and southern area of Gwynedd County Council.

The identified objectives align with The Marches and Mid Wales Freight Strategy:

- To reduce the cost of and **increase the journey time reliability** of transport movements to, from, within and through The Marches and Mid Wales; in particular for the freight and logistics industry;
- To **support the economic growth and prosperity** of The Marches and Mid Wales by stimulating new (and safeguarding existing) inward investment, providing employment and opportunities for increased productivity and growth;
- To **increase the safety** of the transport network in The Marches and Mid Wales thereby reducing the cost of collisions/incidents on the economy, health and well-being;
- To **reduce emissions**, particularly greenhouse gases, particulate matter and nitrogen dioxide thereby reducing the environmental and social cost of congestion and pollution; and
- To **minimise as far as possible the other negative impacts of freight transport** on residents of The Marches and Mid Wales, such as the contribution that freight transport makes to levels of congestion and noise and intimidation of vulnerable road users thereby reducing the economic and social costs on other road and non-road users.

## Intervention Prioritisation and Sequencing

The JAF was used to objectively sift a long list of 34 Freight Strategy interventions using a robust evidence base

JAF considers the distinctive rural needs of the network compared to other areas of the UK and reflects the study area transport characteristics. It includes criteria covering all areas of the 'five cases model': conditional outcomes, economic, affordability, acceptability, management (risk & constraints) and environmental considerations.

The JAF has a three-stage process:

- Stage 1 – High Level Sifting Assessment;
  Provides an initial high level sift of a long list of interventions against criteria covering objectives, economy, affordability and acceptability. Stage 1 filters out lowest scoring interventions.
- Stage 2 –Feasibility & Strategic Assessments;
  Takes the sifted interventions through an examination of their feasibility. The assessment process draws on existing evidence and knowledge of the interventions and location.

- Stage 3 – Prioritisation and Sequencing for Delivery.

  Combines the scores of the feasibility and strategic assessments to provide a total score for the sifted interventions. Those interventions performing well in Stage 3 are a high priority and are brought forward within a sequenced strategy. Low performing interventions are not necessarily disregarded in a strategy but present a lower level of priority at the time of assessment

### Results

Those interventions that passed the initial Stage 1 sift were ranked based on their Stage 2 total scores. This gave a set of 28 interventions that are medium or high priority. The top 10 of these interventions are:

- (S1) Definition of Freight Route Network for Transport Planning purposes;
- (S2) Signing of access between the FRN and key attractors or generators of freight;
- (S5) Improved maintenance of the SRN;
- (S10) Hereford Bypass and Southern Link;
- (S11) M54 Link to northbound M6/M6 Toll;
- (S18) Dualling of the A5/A483 between Shrewsbury and Ruabon;
- (S8) Crawler lanes;
- (S4) 30mph speed limits with warning signs and traffic calming interventions in selected 'sensitive' towns and villages;
- (S14) Leominster Bypass; and
- (S15) A483 Pant to Llanymynech Bypass.

### Next Steps and Recommendations

The outcomes of this study will enable a refresh of the prioritised road investment programme set out in The Marches and Mid Wales Freight Strategy (2018) and the Investing in Strategic Transport Corridors in The Marches Report (2016). Following a refresh of those programmes, the interventions progress to the next stage of development as funding opportunities arise.

**Recommendation 1:** The JAF is not a one-time application. Regular reviews and updates of the intervention long list is recommended. The refresh should encompass alternative modes and innovative technology.

**Recommendation 2:** Since The Marches and Mid Wales Freight Strategy publication there have been developments in the political sphere in line with the increasing importance of the climate and decarbonisation agenda. Future iterations of JAF should reflect developments in policy and strategy. The intervention objectives as well as criteria weighting and scoring should be updated to reflect these developments.

# Appendix A

## THE MARCHES LEP ACCOUNTABILITY AND ASSURANCE FRAMEWORK - PRIORITISATION, APPRAISAL AND BUSINESS CASE FOR TRANSPORT SCHEMES

| Prioritisation, appraisal and Business Case for transport schemes | |
|---|---|
| Option appraisal and prioritisation | • The LEP Partnership Board, supported in some areas by the Sub-Groups, sets the strategic priorities for the SEP Work Programme, identifying issues to be addressed and the outcomes to be achieved through programme delivery<br>• These decisions are used by the LEP Management Team to oversee the development of projects and programme to achieve the Board's desired outcomes<br>• Projects may be commissioned through an open call/tender process or in the case of a public infrastructure project, a project promoter may be identified to develop the proposal e.g. the Local Transport Authority will identify a project manager and take responsibility for procuring contractors through open tender or established frameworks |
| Project / programme commissioning | • Project development work is undertaken by groups of public, private and VCSE sector local and national partners with knowledge and expertise around the issues and areas of work to be addressed<br>• They are brought together as a 'Commissioning Group' to design a project/tender specification for the area of work and criteria against which tender responses will be judged<br>• A group member would have no subsequent involvement in delivering the work<br>• Criteria to be evaluated as part of any appraisal will be specified in the tender brief |
| Project Appraisal and Prioritisation | • Criteria set by the Commissioning Group is used to appraise tenders<br>• The criteria reflect LEP Partnership Board requirements around the delivery of SEP strategic priorities/cross cutting themes, economic growth potential (jobs, housing and private sector leverage) and relevant Treasury or other Government departmental requirements<br>• It will also include a project delivery options analysis, an assessment of deliverability on the preferred delivery option and an assessment of value for money<br>• In the case of transport infrastructure schemes, use of 'TAG' for value for money and assurance is mandatory but does not preclude use of other assessments or dictate the weighting given to TAG or any other assessments used<br>• The LEP Partnership Board will consider all proposed projects and programme developed through the SEP and is required by Government to prioritise these proposed activities<br>• The LEP Partnership Board will consider each scheme in terms of a written business case (evidence base supporting the needs for intervention, the strategic economic impact of all proposed interventions and outcomes, an options and value for money analysis and deliverability<br>• The Board will consider the performance of the proposed project against the five case models and the achievable number of jobs, houses and private investment |

# Appendix B

## ADDITIONAL EVIDENCE

# Appendix C

## JAF TOOL SCORES

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