

Major Road Network Review – Technical Report

Transport for the South East

December 2017

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This document has 35 pages including the cover.

Document history

Document ref: TfSE_MRN_Draftv1.1

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	First draft before review	TM				22/12/17
Rev 1.1	Reviewed draft	TM	TM	AC	AC	04/01/18

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0. Executive summary

0.1. Overview

This report has been produced to support Transport for the South East's response to the DfT consultation on the Major Road Network (MRN). The MRN is described by DfT as 'a middle tier of our busiest and most economically important local authority A roads, sitting between the national SRN and the rest of the local road network'. The concept was derived from a report produced by the Rees Jeffreys Fund in 2016¹, as summarised in Chapter 1.

This report summarises stakeholder engagement and analysis undertaken to:

- Summarise TfSE's Transport Strategy Working Group's views on revisions to the Rees Jeffreys indicative MRN that would improve the extent to which it supports the South East's economy; and
- Identify possible developments to the MRN definition approach that would allow more consideration of the potential economic role of links with the intention of defining a MRN that fits more closely with the South East's economic requirements, as defined by the Working Group's review.

0.2. Review of Rees Jeffreys MRN

The Rees Jeffreys indicative MRN was defined through three steps (described in more detail in Chapter 3)

- Identification of links meeting **added value criteria** i.e. exceeding identified traffic flow and freight proportion criteria, used as a proxy for economic value;
- Manual identification of links meeting **connectivity criteria** i.e. those links required to ensure connectivity to key urban areas, ports and airports; and
- manual **rationalisation** to produce a logical, coherent network from the links identified in the first and second steps. This was a significant step in the process, resulting in a net reduction in the identified network of about 30% in the TfSE area after adjustments to:
 - o Infill missing links to complete corridors;
 - o Remove hanging/isolated links and those accounting for less than half a corridor between urban areas; and
 - o Remove parallel routes that were considered duplicative of SRN routes.

The final network defined in the Rees Jeffreys report includes approximately 500 miles of local A roads in the TfSE area. Working from this network as a starting point, the TfSE Transport Strategy Working Group identified a number of revisions to the network that they felt would help it to better support the economy through the potential roles of:

- 1) Supporting economic hubs by improving connectivity to:
 - a. Existing economic centres;
 - b. Support economic growth in identified growth areas and in peripheral areas to reduce economic inequalities.
- 2) Supporting the region's gateway to UK plc function by providing connectivity between gateways and the rest of the South East and supporting SRN connectivity between gateways, the South East and rest of the UK; and
- 3) Improving resilience and reliability through: responses to incidents, provision of diversionary routes, integration with the SRN and potential road quality improvements.

¹ A Major Road Network for England, a Rees Jeffreys Road Fund Study, October 2016

The Working Group's suggested link additions (and a small number of removals) produced a network of just over 700 miles in the TfSE, as described in Chapter 2. This is approximately 40% longer than the original Rees Jeffreys network for the area. However, it is only approximately 10% longer than the SRN in the region and therefore the extent is still broadly in keeping with the national average MRN/SRN balance of the Rees Jeffreys network (for which the MRN is 5% shorter than the SRN across the country).

The case for identifying an increased length of MRN within the TfSE area is also strengthened by the fact that the SRN in the region is proportionately less extensive and more heavily used than in other regions (as discussed in Chapter 5).

0.3. Review of Rees Jeffreys MRN definition approach

The Rees Jeffreys MRN definition approach was reviewed during this study to identify potential revisions. The intention was to identify changes that could be applied nationally to help to broaden the consideration of economic functionality when identifying links for inclusion in the MRN. This would help to identify the full range of economically important links in the MRN and thereby incorporate some of the missing links identified as economically important by the TfSE Transport Strategy Working Group (as well as impacting on the network defined across the rest of the country).

The added value criteria used by the Rees Jeffreys approach were reviewed first, leading to the suggestions that:

- Traffic flow analysis to identify relevant links should use either:
 - o 5-year average observed annual average daily flow (AADF) figures to remove potential inconsistencies associated with single year counts; or
 - o short term forecasts of 5 (or potentially 10) years from the Highways England Regional Traffic Models to account for near term committed changes (rather than using generalised growth factors and trying to forecast further ahead);
- Flow criteria should be applied in a graduated manner rather than as sharp cut-offs. This means that those links that are approaching the thresholds on all three of the criteria considered (flow, HGV% and LGV%) are included in the MRN (as they are considered as relevant as links that have a high score that exceeds the threshold for one criteria but have low scores against the others).

The review of flow criteria and suggested changes are described in more detail in Chapter 4.

The Rees Jeffreys connectivity criteria were also reviewed and no suggestions made in terms of the identification of locations to be directly linked into the MRN. However, as outlined below, it is suggested that additional mapping is undertaken to assess links against a wider definition of connectivity to inform the rationalisation step in the network definition process.

The changes in approach to application of flow criteria help to produce an interim network that incorporates many of the links suggested for addition by the Working Group. However, it is important to note that many of the links were also included in the Rees Jeffreys interim network produced by the added value and connectivity criteria and were then removed by the rationalisation process that was undertaken to produce a logical, coherent network².

Given the significance of impact of the rationalisation step in the form of the MRN, a key part of the review of the definition approach for this study was to identify realistic ways in which additional wider views of economic functionality could inform the rationalisation process. The intention was to increase the information available to inform the decisions as to whether each link would have economic value and should be retained, whilst recognising that local knowledge and judgement would also need to remain a key part of the definition process.

The approach adopted was to identify a small number economic datasets that could be mapped nationally (in addition to the urban areas of over 25,000 population and ports and airports mapped in the Rees Jeffreys

² The Working Group were not aware of the links that had been removed during the rationalisation process during the workshop and independently identified that the links should be added

approach). The datasets were viewed in conjunction with the SRN and interim MRN to help interpret the potential for each link to support each of the potential economic roles of the MRN.

The datasets identified are listed in Table 0-1 **Error! Reference source not found.**below. The columns identify each potential economic role for the MRN and whether each dataset would help to improve understanding of the extent to which each link would help to support that role for the MRN. Chapter 4 includes mapping of each dataset and more details on their contents.

Table 0-1 Additional datasets mapped

Criteria	Potential MRN Roles			
	Existing economic centres	Economic growth/ inequality	Gateways	Resilience/ reliability
<i>Rees Jeffreys: Urban connections</i>	✓	✓		
<i>Rees Jeffreys: Port/ airport connections</i>			✓	
a) Employment areas/hubs connections	✓			
b) Opportunity area connections		✓		
c) Connectivity of adjacent economic centres	✓	✓		
d) Diversion routes	✓	✓	✓	✓
e) Performance of SRN	✓	✓	✓	✓

0.4. Implications for TfSE network

Applying the revised flow criteria and then reviewing the interim network in conjunction with these datasets helped to understand the case for each of the additions proposed by the TfSE Transport Strategy Working Group. The links can be divided into three broad (but not mutually exclusive) categories, defined on the basis for the main case for inclusion:

- Parallel routes;
- Direct connections between adjacent centres; and
- Completion of economic connections.

Each group is summarised in the following sections and described in more detail in Chapter 5.

0.4.1. Parallel routes

The Working Group suggested adding in the A23, A2 and the A259/other route sections parallel to the A27/A259 along the south coast.

Many of the links on these sections had met the Rees Jeffreys flow criteria (and a slightly increased proportion meet the revised application of the criteria). However, in the Rees Jeffreys approach they had been removed as part of the rationalisation process as they were considered to be too close and parallel to existing SRN links (i.e. M23, M2 and A27/A259 respectively).

This review suggested there is a strong case for including these links because:

- They have large flow volumes and/or high freight proportions despite the parallel SRN route, suggesting that they serve their own economic function. The review of mapped economic indicators suggests this function is likely to involve providing more direct local links between the economic centres along the route; and

- They provide resilience for busy sections of the SRN. This is a key issue for the A27/A259 which is particularly sensitive to incidents as it is operating near capacity and for many stretches has only single lane provision.

The Working Group also identified the need for the addition of links along parallel routes on the A4 and A25 (parallel to the M4 and M25 respectively). Although the flow on the identified links did not necessarily meet flow criteria (and they therefore did not appear in the interim network), they are located in dense economic areas and provide additional connectivity to and between existing economic centres. However, the primary reason for the addition of links on the A4 and A25 was the resilience they provide to sections of the SRN (M4 and M25 respectively) which has significant economic value given the level of traffic on the network on those sections.

0.4.2. Direct connections between adjacent centres.

The Rees Jeffreys review focussed on ensuring economic centres were connected to the MRN but did not prioritise inclusion of links between adjacent centres. However, the speed and quality of connection between economic centres are key influences in generating economic value, suggesting that links that provide direct connections should gain additional priority in consideration for inclusion in the MRN.

The A320 between Guildford, Woking and northwards falls in this category, providing a direct link between economic centres, reflected in high flows which meet the flow criteria for most of the route length.

Three other links have been included in this category, the A281 between Horsham and Guildford and A28 between Canterbury and Ashford and A260 between Folkestone and Canterbury in Kent. Although some sections of these routes meet the flow criteria, not all do.

Nonetheless the additional review of economic data suggested that they would be worthwhile for inclusion in the MRN because they provide direct connectivity. Although the economic centres affected are served by other sections of the MRN, these links provide the most direct connection between important economic centres.

The fact that current flows are below the thresholds could reflect current constraints on the route that MRN status could help to alleviate. The case for inclusion is based on their potential for increased economic importance by virtue of the areas they serve and potential quality of the links they provide. For the A28 and A260, this case is reinforced by the fact that the roads directly serve economic opportunity areas identified by Highways England.

The A281 also brings the additional benefit of providing potential for additional resilience for a very busy section of the M25 by providing an additional orbital route.

0.4.3. Completion of economic connections

A number of the suggested additions (listed in Chapter 5) were simply intended to complete connections between the SRN or MRN and economic centres. These adjustments are in line with the Rees Jeffreys approach of ensuring key economic centres are connected to the network.

0.5. Other issues for consultation response

The focus of this study was on reviewing the Rees Jeffreys indicative MRN and an economically focussed approach to definition of the MRN. However, the TfSE Transport Strategy Working Group raised a number of other issues in relation to MRN definition that have potential relevance for the consultation response, including:

- Treatment of future change;
- Consideration of environmental issues;
- Maintenance funding;
- Implications of MRN status; and

- Roles and responsibilities.

Whilst detailed consideration of the issues is beyond the scope of this study, Chapter 6 provides a brief summary of each one.

0.6. Summary

This review has suggested that the indicative Rees Jeffreys MRN defined for the TfSE area should be expanded to fit better with the views of the TfSE Transport Strategy Working Group on the network required to support the economy.

The following revisions to the network definition approach would help to produce a network that fits well with the Working Group's suggestions.

- A graduated approach to applying flow criteria (and adjusted source for the flows used);
- An expanded definition of connectivity in considering economic value of links, including considering:
 - o Connections to economically dense areas (not necessarily captured by the population based measure used by Rees Jeffreys approach);
 - o Connections to growth areas;
 - o Direct connections between adjacent centres.
- A clear recognition of the economic value of resilience (particularly in areas with heavily use SRN roads).

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1. Context

1.1. Major Road Network

The Transport Investment Strategy published by the DfT in July 2017 stated that there would be a consultation in late 2017 on the introduction of a national Major Road Network (MRN). The strategy identifies the MRN as ‘a middle tier of our busiest and most economically important local authority A roads, sitting between the national SRN and the rest of the local road network.’

The MRN concept was derived from a report produced by the Rees Jeffreys Road Fund in 2016³, although the DfT have altered the definition from the original report in which the MRN also included the SRN, rather than sitting alongside it. The case made in the Rees Jeffreys report for the introduction of the MRN includes the need to recognise that the SRN alone is not enough to provide the connectivity required to support the country’s economic activity and that many of England’s local A roads play a strategic economic role for the nation. The report included the identification of an initial network based on traffic levels and composition and additional adjustments to create a coherent and logical network. This approach identified 3,800 miles of local A roads for inclusion in the MRN, almost equal to the existing length of the SRN.

The report maintains that, to support continued national economic growth, it will be important to improve the level and certainty of funding, planning and management applied for these strategic A roads. This would build on the considerable improvements in the level and certainty of funding and long-term planning that have been introduced for the SRN in recent years through the Road Investment Strategy approach. Improved certainty (and prioritisation) of funding towards the major local authority A roads with a strategic economic function would be a significant improvement from the current situation in which proposed investments need to compete with other local transport schemes for inconsistent and variable funding sources.

The DfT’s Transport Investment Strategy picked up on these themes, stating that the consultation on the MRN will include consideration of allocation of part of the new Vehicle Excise Duty funded National Roads Fund to investment in improvements of the MRN. The stated aim is to allocate dedicated funding and management activity to the MRN to support economic growth, including supporting agglomeration and housing development and thereby the delivery of the government’s Industrial Strategy at the regional and national level.

Both the Transport Investment Strategy and Rees Jeffreys report identify a key role for STBs in the creation of the MRN and ongoing future investment and performance management. The proposed consultation will include discussion of management arrangements, including roles for STBs and local authorities. The underlying assumption is that local authorities will retain the highway authority responsibility for the MRN and that there will be a need for strong collaboration between Highways England and the local authorities to ensure integration in the planning and operation of the SRN and MRN.

The Rees Jeffreys report identified that the MRN is only indicative of the scale and role that is needed for the MRN and that it would be necessary to apply local knowledge across the country to validate the routes selected and propose inclusion of others. A recent interview for Transport Network with Tricia Hayes, DfT’s director general for roads, motoring and devolution also refers to some potential for revisions but makes it clear that it is relatively minor. She highlighted that DfT sees the definition of the MRN being based around a principle based approach such as the Rees Jeffreys approach with ‘a little bit of flexibility around the edges’ to ensure a sensible, coherent network.

In this context, it will be useful for TfSE to identify not only changes to the MRN in the South East that they would like to see to better represent the needs of the region’s economy, but also ways in which the national principles applied to define the network could be developed to define an MRN that fits more closely with the South East’s preferred network.

³ A Major Road Network for England, a Rees Jeffreys Road Fund Study, October 2016

1.2. Scope for this report

This report is intended to support TfSE's response to DfT's consultation on the MRN by:

- Summarising the Transport Strategy Working Group's views on revisions to the Rees Jeffreys indicative MRN that would improve the extent to which it supports the South East's economy; and
- Identifying possible developments to the MRN definition approach that would allow more consideration of the potential economic role of links, with the intention of defining a MRN that fits more closely with the South East's economic requirements.

The analysis and engagement undertaken by Atkins on behalf of TfSE, and summarised within this report, involved the following stages:

- Gathering stakeholders' views on the Rees Jeffreys MRN by:
 - i. Holding a workshop with the TfSE Transport Strategy Working Group on 13/10/17 to obtain the attendees' views on the Rees Jeffreys MRN, and their suggestions for road links to be added to or removed from the network so that the revised network would better support the potential economic roles of the MRN;
 - ii. Speaking to Medway and Berkshire representatives on the Working Group, who were not able to attend the workshop, for their equivalent views.
- Obtaining and reviewing the GIS dataset used to underpin the Rees Jeffreys definition of the MRN;
- Undertaking analysis to identify potential developments to the Rees Jeffreys definition approach that, if applied nationally, could better identify the links that would support the MRN's potential economic roles and produce an MRN for the South East that relates more closely to its economic requirements, as reflected in the revisions suggested at the workshop and in subsequent feedback. In line with the brief, the analysis focussed on approach developments associated with economic connectivity and functionality

1.3. Structure of this report

The remainder of this report consists of six further sections:

- Overview of the Transport Strategy Working Group workshop and feedback on the indicative Rees Jeffreys MRN;
- Review of the Rees Jeffreys approach to network definition;
- Suggested potential developments to the network definition approach to produce a network that would better serve the South East economy;
- Review of the implications of the suggested developments for the TfSE network;
- Summary of other issues identified to be considered in the consultation response; and
- Concluding summary.

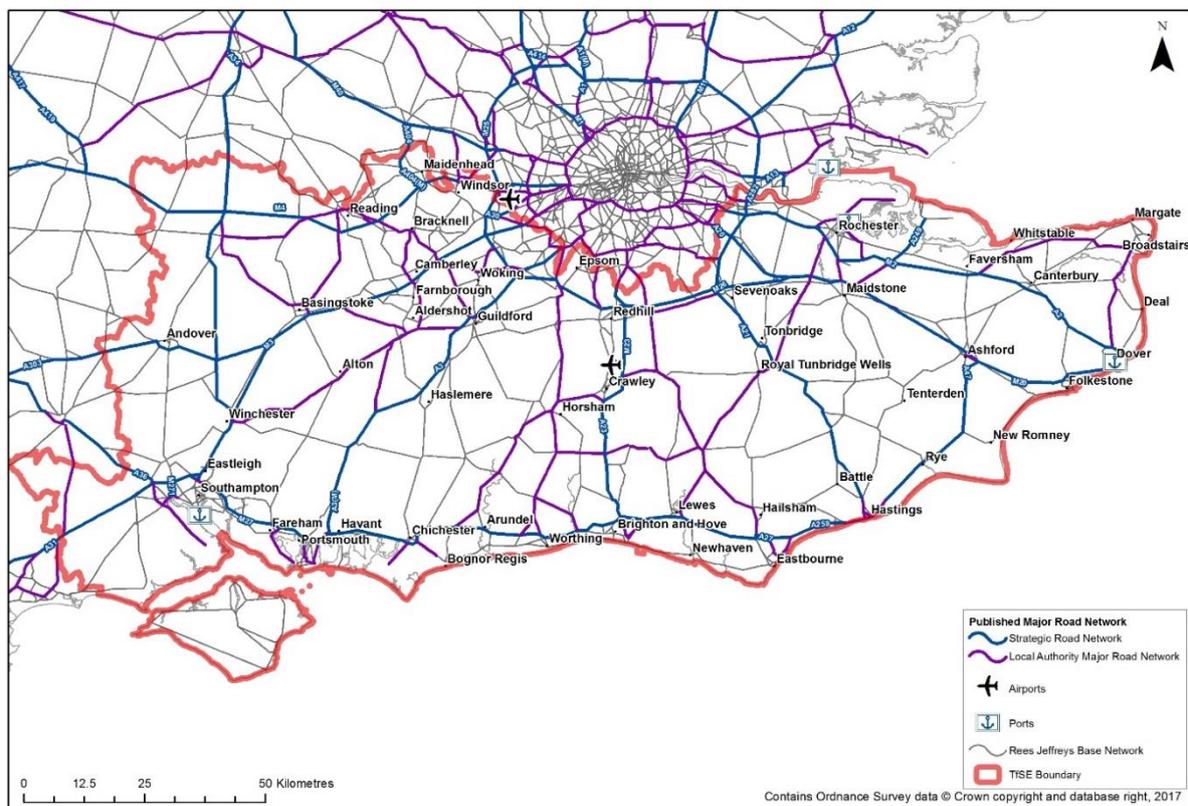
2. MRN review workshop

2.1. Structure of workshop

Members of the TfSE Transport Strategy Working Group were asked to review maps of the indicative MRN as set out in the Rees Jeffreys Fund report (as shown in Figure 2-1). The review was undertaken in the context of the attendees' local knowledge and their views on the extent to which the network would contribute to the following three key potential roles of the MRN in supporting the South East's economy:

- 1) Supporting economic hubs by improving connectivity to:
 - a. Existing economic centres;
 - b. Support economic growth in identified growth areas and in peripheral areas to reduce economic inequalities.
- 2) Supporting the region's gateway to UK plc function by providing connectivity between gateways and the rest of the South East and supporting SRN connectivity between gateways, the South East and rest of the UK; and
- 3) Improving resilience and reliability through: responses to incidents, provision of diversionary routes, integration with the SRN and potential road quality improvements. The MRN's resilience role is likely to be particularly important in the South East where the SRN is proportionately less extensive and more heavily used than in other regions, including for access to important international gateways (discussed further in Chapter 5, section 5.3).

Figure 2-1 Rees Jeffreys Indicative MRN



On the basis of this review, the attendees were asked to identify links that should be added to or removed from the indicative Rees Jeffrey’s MRN to produce a network that would better support the South East’s economy.

2.2. Outcome

The Working Group (at the workshop and in subsequent feedback) suggested a number of extra road links to add to the network and a small number to remove. The changes are summarised in Figure 2-2 and in more detail in Table 2-1 and Table 2-2.

Figure 2-2 Working group’s suggested additions and removals to the MRN

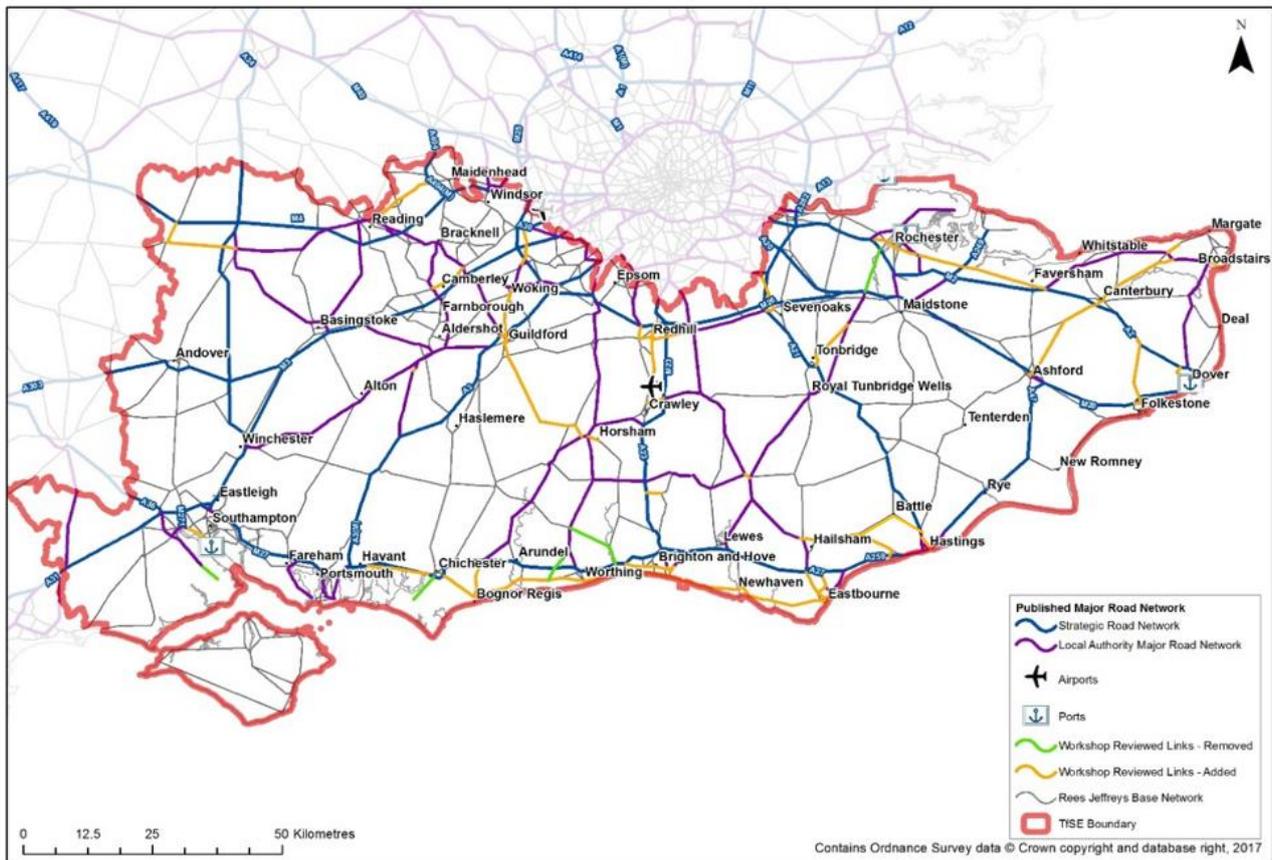


Table 2-1 Working group’s suggested removals from the MRN

No.	Removal	Reason from workshop
1	A283 (Washington to Shoreham)	Flows are only high due to rat-running resulting from the poor performance of the SRN on the A24
2	A280 Long Furlong NW of Worthing	As above
3	A286 south west of Chichester	Serves limited locations
4	A326 south of Hythe	Serves limited locations beyond Hythe
5	A228 from M2 (near Chatham) to M20	Not suitable for heavy traffic

Table 2-2 Working group's suggested additions to the MRN⁴

No.	Addition	Reason from working group
1	A4 from Reading to A404	Resilience for busy section of M4
2	A4/A338 from A34 to M40	Resilience for busy section of M4
3	A320 North and South of Woking	Direct linkages between economic centres
4	Camberley to the A30	Link between the economic centre of Camberley of the SRN
5	A25 diversion routes	Resilience for the M25 and linkages between economic centres along the route
6	A281 Guildford to Horsham	Additional network resilience – provides orbital connectivity across the region and linkages between Brighton and the Thames Valley
7	A2011 to Crawley	Link between the economic centre of Crawley and SRN
8	A23 between Horley and M25	Resilience for the M23 and linkages between economic centres along the route
9	A2300 linking Burgess Hill to SRN	Link between the economic centre of Burgess Hill and the SRN
10	Western Approach into Southampton Dock Gate 4	Connection to Southampton port
11	A259 Havant to Brighton	Resilience for A27 and linkages between economic centres along the route
12	A270 joining the A27 through Brighton	Resilience for A27 and linkages to Brighton economic centre
13	A259 Brighton to Seaford	Resilience for A27 and linkages between economic centres along the route
14	A259 Seaford to Eastbourne	Resilience for A27 and linkages between economic centres along the route
15	A22/A2280/A2021 in Eastbourne	Busy roads providing links within Eastbourne that should meet flow criteria (of >20,000)
16	A283 (between A27 and A259)	Link to Shoreham port
17	A271/A269 Hailsham to Bexhill	Resilience for A27/A259
18	Bexhill-Hastings Link Road between A259 and A21	Resilience for A259
19	A28 Ashford through Canterbury to A299	Link between economic centres
20	A28 to Ramsgate	Link to Ramsgate port
21	A260 from A2 to A20 (north of Folkestone)	Link between economic centres
22	A26 from A228 to A21 (near Tonbridge)	Link between economic centres
23	A2 joining up SRN section of A2 and M2 through Medway towns	Resilience for A2 and link between economic centres of Medway towns

⁴ Note that four suggestions made in the workshop are not included in the map and tables. Two related to diversion routes that are yet to be identified (for Chichester and the A2), one was based on a misalignment of the map shown at the workshop which appeared to show the A325 between the M3 and A31 near Frimley and Farnham as being in the MRN rather than the A331 just to the east. The A331 was actually in the Rees Jeffreys definition (and was requested by the workshop attendees). The fourth suggestion was to accommodate future connectivity to the Lower Thames Crossing for which requirements are unknown at this stage. Approaches to dealing with future change are addressed further in later chapters.

3. Rees Jeffreys Fund MRN definition approach

3.1. Overview

The Rees Jeffreys Fund study reviewed a number of possible approaches to defining the MRN nationally. The final approach used to produce the published network reviewed by the TfSE Working Group (as described in Chapter 2) consisted of the following three main steps:

- 1) Identifying relevant links on the basis of traffic flow based **added value criteria**;
- 2) Identifying additional links on the basis of **connectivity criteria**, with relevant links identified visually using GIS; and
- 3) **Rationalising the resultant network** from Steps 2 and 3. This involved making further manual amendments to rationalise and make a coherent, logical network.

Each step is considered in more detail in the following sections.

3.2. Added value criteria

The identification of relevant links on the basis of added value criteria involved using volume of traffic flow and freight traffic proportions as proxies for the economic value of a road.

Table 3-1 summarises the criteria used. The initial criteria were specified on the basis of 2014 annual average daily traffic flows (AADF), but the final MRN reported was defined on the basis of estimated 2040 flows and associated thresholds.

The 2040 flows were estimated by applying traffic growth factors by region and road type derived from the DfT's 2015 National Road Traffic Forecasts. The 2014 traffic thresholds were also uplifted for application to the higher 2040 flows using the national average traffic growth rate (30.65%). The revised criteria are summarised in Table 3-1 (column 2).

Table 3-1 Added value criteria

	Traffic flow thresholds		Freight proportion
	2014 traffic	2040 traffic	Both years
	>20,000 AADF	>26,130 AADF	Any
Or	>10,000 AADF	>13,065 AADF	HGV > 5% or LGV > 15%

3.3. Connectivity criteria

The MRN links identified in the first step using the added value criteria were supplemented by additional links identified on the basis of connectivity criteria. This involved using GIS mapping to visually ensure that all the following key economic centres were connected to the MRN and SRN (by more than one spur if relevant):

- All large towns (defined as >50,000 population in most locations and over 25,00 in peripheral locations);
- All ports with > 2 million tonnes of traffic p.a.; and
- Any airports that fall within the list of the top 20 busiest in England.

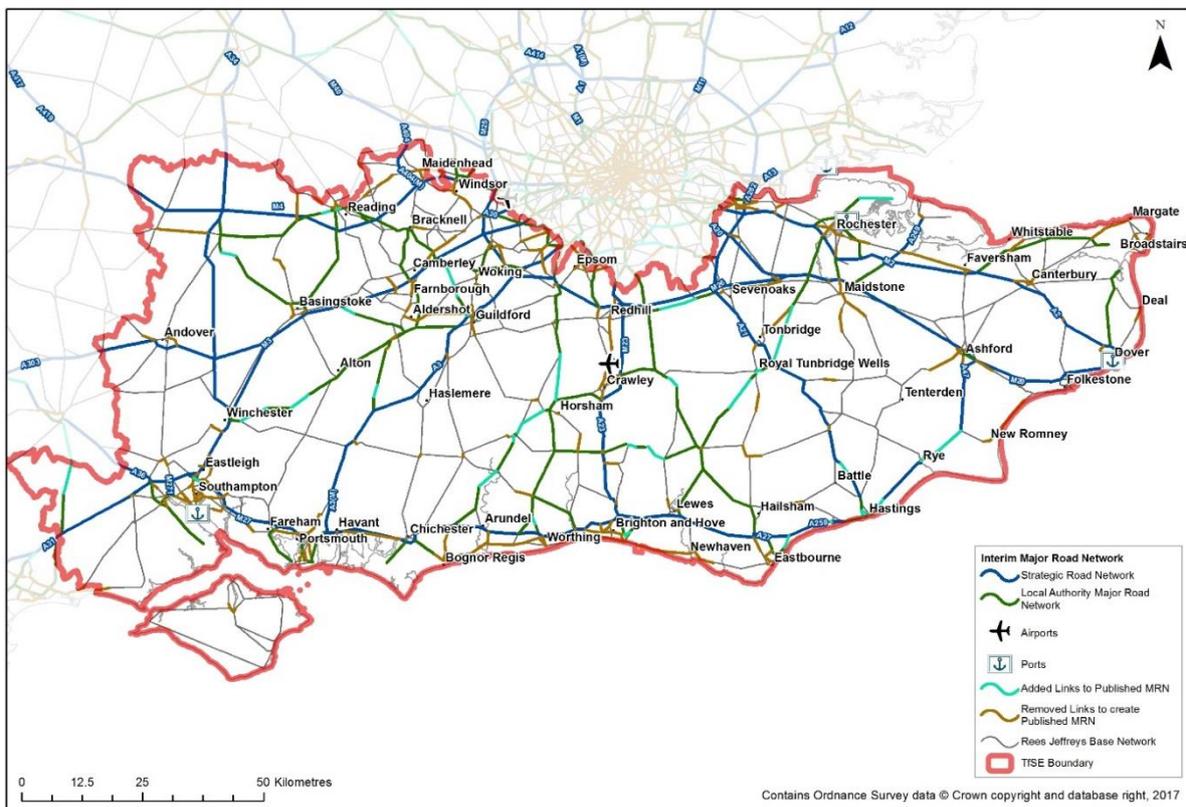
3.4. Rationalising the network

The network produced from the added value and connectivity criteria was then further manually adjusted to rationalise and create a coherent, logical network. The adjustments made included:

- Infilling missing links to complete corridors;
- Removing hanging/isolated links and those accounting for less than half a corridor between urban areas; and
- In some cases, removing parallel routes that were considered duplicative of SRN routes.

This stage was important and had a significant impact on the final form of the network as shown in Figure 3-1, reducing its length by about 30%. Several of the links identified by the TfSE Working Group to be added to the indicative Rees Jeffreys MRN network had actually been within the original Rees Jeffreys interim network (created by the added value and connectivity criteria) and were then removed during this rationalisation stage⁵.

Figure 3-1 Changes between the Rees Jeffreys interim MRN (based on flow criteria) and final published MRN



⁵ The Working Group were not aware that the links had been removed during the rationalisation process during the workshop and independently identified that the links should be added

4. Suggested revisions to MRN definition approach

4.1. Overview

The Rees Jeffreys MRN definition approach outlined in the previous chapter was reviewed to determine potential developments to the approach that could help to identify a network that would more closely match the economic needs of the TfSE area, as identified by the Working Group.

The review of the approach comprised three stages:

- Review of the added value (flow based) criteria;
- Review of the connectivity criteria: and
- Review of the rationalisation stage, including consideration of additional mapped indicators to provide a better understanding of the ways in which links could contribute to the key economic roles of the MRN. In particular, this involved:
 - o Building on the Rees Jeffreys definition of connectivity; and
 - o Considering resilience.

The following sections consider each stage of the review in turn.

4.2. Review of Rees Jeffreys value added criteria

The review of the value added criteria considered two aspects:

- The traffic thresholds and goods vehicles proportions applied and whether any revisions would be more appropriate; and
- The traffic flows used.

The following sections provide more detail on each aspect.

4.2.1. Thresholds applied

A number of different combinations of flow thresholds and freight proportions were tested (using flows ranging from 10,000 to 30,000 with varying combinations of freight proportions).

Consistent with the Rees Jeffreys study, the existing thresholds and proportions were found to work well in producing a network with a reasonable extent and incorporating relevant roads to provide a good basis for subsequent adjustments during rationalisation.

However, applying the thresholds individually as sharp cut-offs does bias against links that have fairly high scores against each of the criteria and in favour of those that have a strong score against one criterion despite relatively weak scores against the others. For instance, a link with a daily traffic flow of 19,000 and LGV proportion of 14% and HGV proportion of 4% would not be included whereas links with a flow of 10,000, HGV proportion of 1% and LGV proportion of 15% or a flow of 20,000 (with a very low LGV and HGV proportion) would be included, even though the first link could be considered equally (or more) economically valuable.

Applying the thresholds in a more graduated way would help to overcome this issue. Therefore, for the analysis reported below, a graduated approach was applied. Relevant links with traffic flows of between 10,000 and 20,000 were identified for inclusion in the MRN using a score calculated as $(A+B+C)/3$

Where:

- $A = (AADF - 10,000) / (20,000 - 10,000)$;
- $B = \text{HGV percentage} / 5\%$ ⁶; and
- $C = \text{LGV percentage} / 15\%$.

Links scoring more than 0.67 (i.e. the equivalent of meeting 2 criteria) were included in the indicative MRN network, thereby allowing those links with moderate scores against each criterion to be included, as well as those with a high score against one criterion.

4.2.2. Traffic flows used

The Rees Jeffreys MRN definition was based on 2014 traffic data from the DfT traffic count dataset, factored up to represent 2040 traffic using growth factors from the DfT's 2015 National Road Traffic Forecasts (varying by region and road type).

The use of a single year traffic count brings some vulnerability to individual counts potentially being unrepresentative, (e.g. due to equipment faults or temporary local activity, such as development, changing traffic flows), particularly as some are recorded over relatively short time periods. This limitation could be mitigated through the use of five year averages to smooth out any inconsistencies.

Whilst the 2040 growth factors used vary by region and road type, they do not reflect specific predicted changes (such as the impact of the Lower Thames Crossing). The approach means that each road in each category (e.g. all urban principal roads in the South East) effectively becomes either more or less likely to meet the flow criteria depending on whether forecast growth for that category was above or below the national average growth (of 30.65%) used to increase the flow thresholds from those used for 2014.

For the purposes of defining the MRN, traffic forecasts that vary to reflect specific planned developments and changes to the transport network will be more useful than generalised changes. Highways England's recently developed suite of Regional Traffic Models potentially provides a source of appropriate forecasts. Given uncertainty over change in future years, restricting the forecast to 5 to 10 years is likely to be the most realistic horizon for future consideration.

On the basis of this review, it is therefore suggested that traffic analysis to support the MRN definition is based on either:

- A five-year average of recent observed traffic flows (2012 to 2016) to smooth out any inconsistencies in individual counts; or
- A short-term forecast of traffic flows derived from the Highways England Regional Traffic Models and therefore accounting for specific forecast changes in demand and the network.

The analysis below uses the first of these two options as access to RTM data was not available for this study.

4.2.3. Outcome of revised approach

Figure 4-1 shows the interim network identified using the revised flows and graduated threshold approach outlined above.

Adopting this approach adds approximately one third to the length of roads included in the interim network (nearly 1000 miles in the TfSE area using this approach compared to just over 750 miles in the Rees

⁶ The HGV and LGV thresholds were treated as rounded to the nearest percentage

Jeffreys approach). The additions include a number of stretches that were added as infills for inclusion in the final network in the Rees Jeffreys approach, such as the A31 to Winchester, A24 and A264 North and South of Horsham, the A26 and A228 west and east of Royal Tunbridge Wells, A25 between Sevenoaks and Redhill, A322 towards the M3.

In both the revised and original Rees Jeffreys approach, the interim network produced by the application of the added value/flow criteria was reduced considerably through the rationalisation process. In each case the final suggested network is 30% to 35% shorter than the interim network.

Figure 4-1 Interim road network produced by revised flows and flow criteria

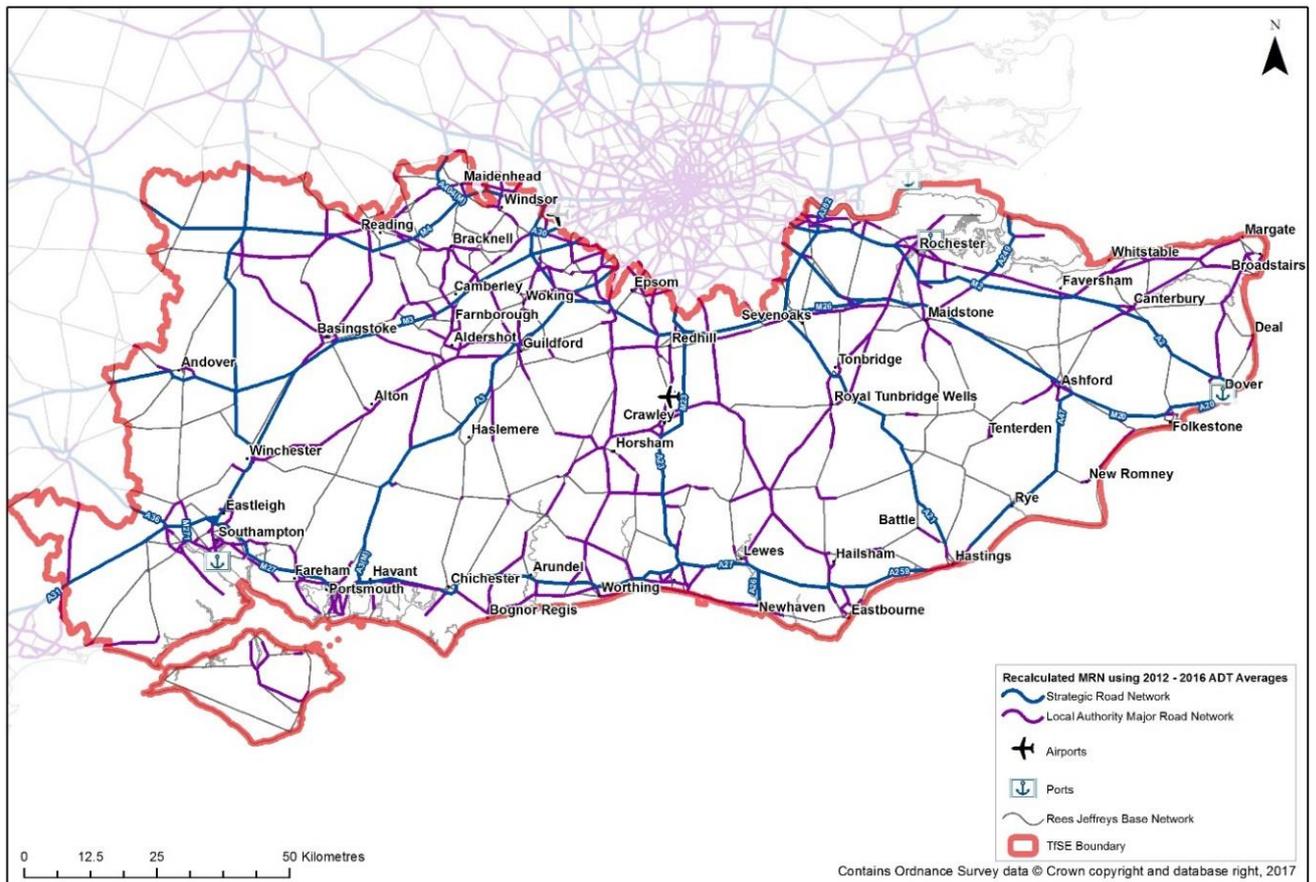
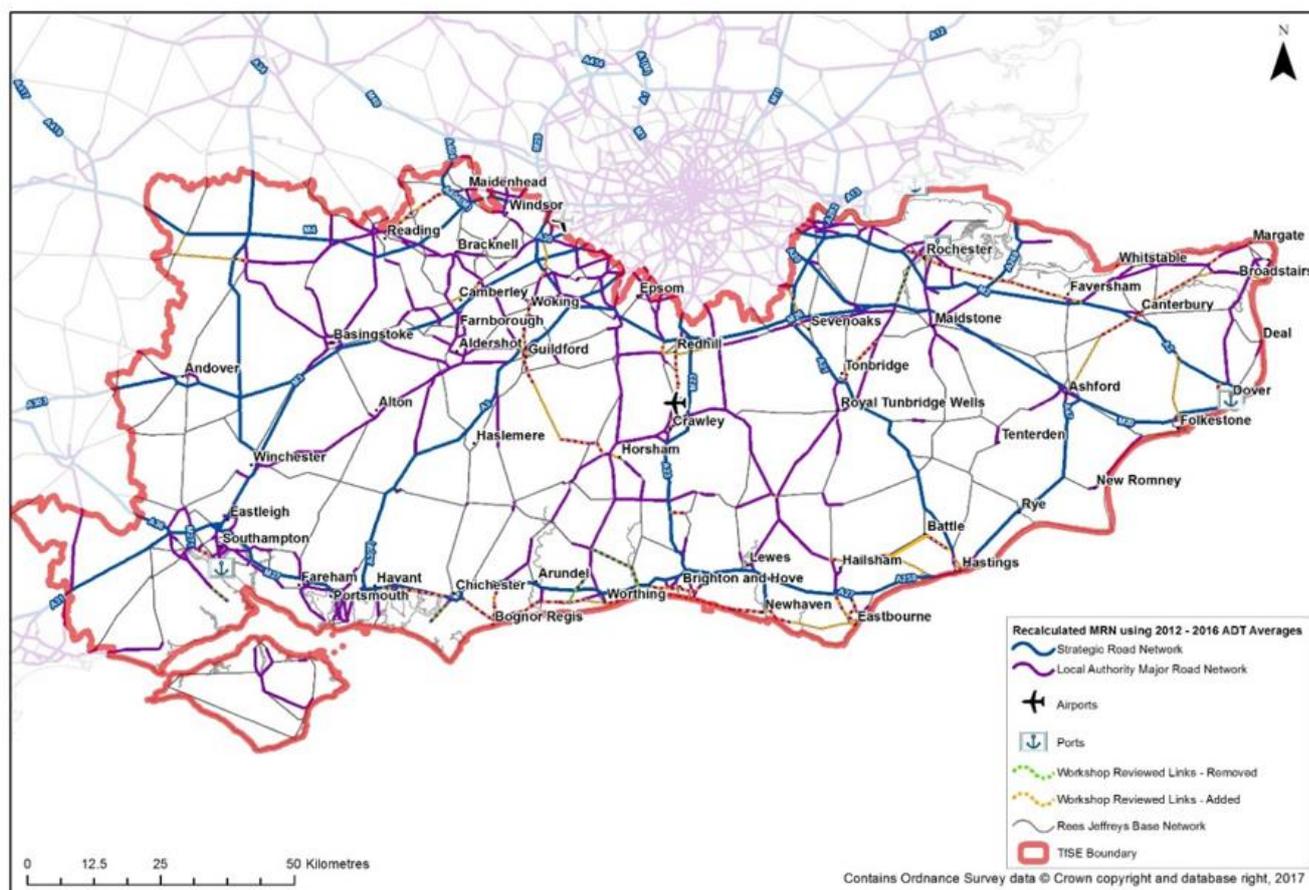


Figure 4-2 shows the revised network alongside the additions and removals to the network suggested by the Working Group. This is intended to provide an understanding of how many of the suggested additional links are identified as part of the network on the basis of the revised flow criteria.

It shows that many of the A259 corridor links and the A23, the A2 and A320 links are identified on the basis of the criteria as well as part of some of the other links suggested for addition by the Working Group, such as the A281. A number of these links were also identified using the flow criteria in the Rees Jeffreys approach, however they were subsequently removed during the rationalisation stage, making the review of this stage (described in section 4 below), particularly important.

Figure 4-2 Interim road network produced by revised flows and flow criteria with Working Group’s suggested added and removed links



- NB dotted lines are used to indicate where two colour categories overlap e.g. purple and orange dotted lines show links that have been identified by the flow criteria and were suggested for addition by the workshop

4.3. Review of connectivity criteria

No revisions are suggested to the Rees Jeffreys connectivity criteria in terms of the identification of locations to be directly linked into the MRN. However, as outlined below, it is suggested that additional mapping is undertaken to assess links against a wider definition of connectivity to inform the rationalisation step in the network definition process

4.4. Review of rationalisation approach

Chapter 3, identified the manual rationalisation approach as a significant stage in the Rees Jeffreys MRN definition process. The stage involved removing a number of links from the interim network that the TfSE Transport Strategy Working Group suggested should be added in to improve the definition of the MRN in the South East⁷.

Given the significance of the rationalisation process, it is suggested that this step is informed by mapping of further economic indicators which will help to understand the contribution of links to the MRN’s potential economic roles⁸. The intention is to provide a relatively straightforward way to consider a wider definition of

⁷ When reviewing the Rees Jeffreys MRN the Working Group were not aware that the links had been removed between the initial interim network and the published network they reviewed. They independently identified that the links should be added.

⁸ In addition to the mapping of large urban areas, ports and airports used to inform the Rees Jeffreys definition of the network

economic functionality in identifying those roads that are likely to have an important economic role and should be retained in the MRN during the rationalisation stage

The approach adopted has been to identify variables that are readily accessible and easily mapped at a national scale and therefore could be applied as part of the national definition process. On this basis, five datasets have been considered:

- Employment areas/hubs – represented by density of employment by MSOA;
- Opportunity areas/enterprise zones - as identified in Highways England’s Mapinsight Mapping Tool;
- Proximity of adjacent economic centres – represented by buffers around main urban centres to help identify centres within close proximity;
- Diversion routes – to indicate routes identified as diversions for SRN roads and therefore providing network resilience;
- SRN performance – to provide an indication of the sections of the SRN closest to capacity and likely to be most susceptible to incidents and in need of resilience. This is currently represented using average speeds and average flows by network section as presented in Highways England’s Strategic Economic Growth although alternative datasets may be available from Highways England.

Table 4-1. summarises the datasets mapped and provides a broad indication of the MRN economic roles that they help to provide improved understanding and context for.

Table 4-1 Additional datasets mapped

Criteria	Potential MRN Roles			
	Existing economic centres	Economic growth/ inequality	Gateways	Resilience/ reliability
<i>Rees Jeffreys: Urban connections</i>	✓	✓		
<i>Rees Jeffreys: Port/ airport connections</i>			✓	
a) Employment areas/hubs connections	✓			
b) Opportunity area connections		✓		
c) Connectivity of adjacent economic centres	✓	✓		
d) Diversion routes	✓	✓	✓	✓
e) Performance of SRN	✓	✓	✓	✓

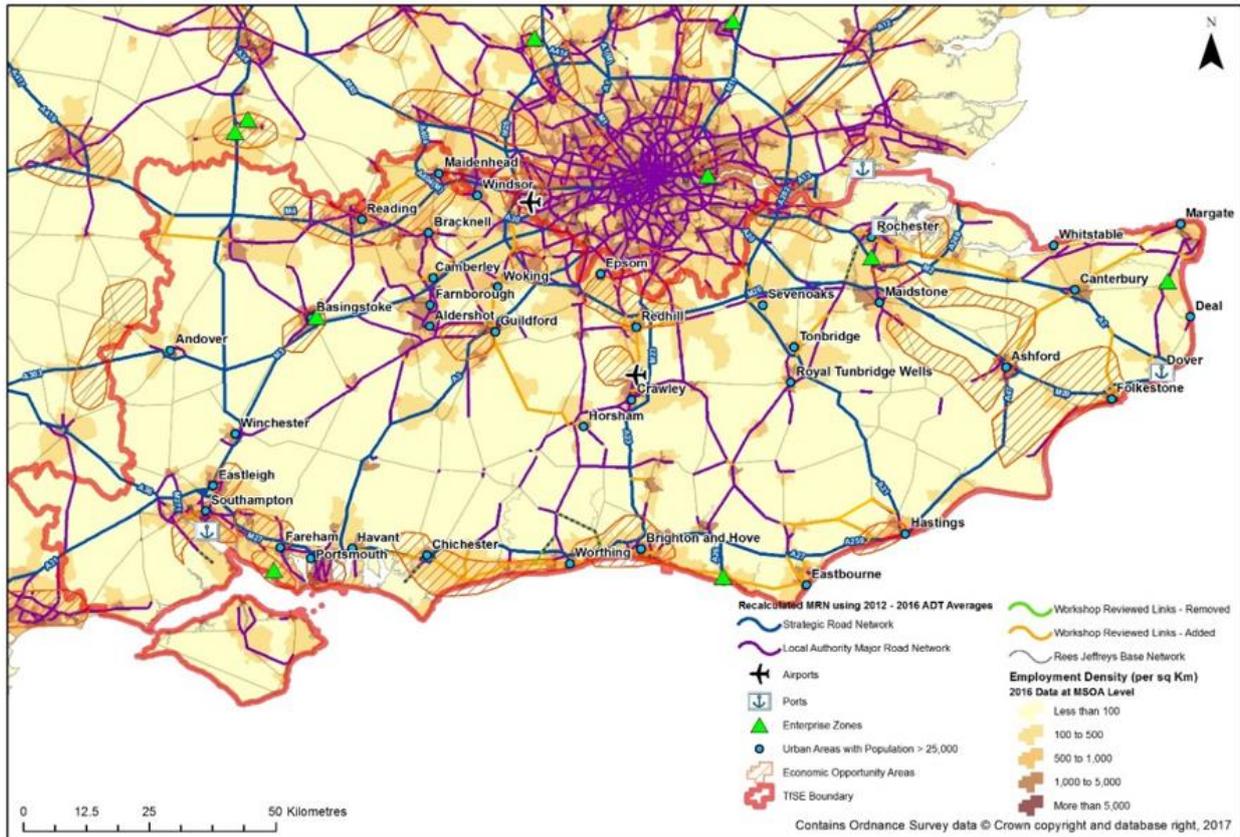
The following sections describe each dataset in turn. The emphasis for this study has been on economic factors, in line with the outlined objectives of the MRN and the requirements of the study brief. However, as outlined in Chapter 6, other issues could potentially be taken into account in defining the MRN, such as environmental constraints and connectivity within urban areas

4.4.1. Employment areas and opportunity areas and enterprise zones

The first two datasets are mapped together in Figure 4-3 as it is useful to understand the linkages between them. The colouring of the maps shows the density of 2016 employment by MSOA and enterprise zones and opportunity areas are show by symbols and hatching.

These datasets are intended to highlight links which might be important in providing connectivity to areas of economic activity (and growth) that are not well represented by the population based approach used in the Rees Jeffreys study (ensuring connections to towns with populations of over 25,000 or 50,000).

Figure 4-3 Employment density, economic opportunity areas and enterprise zones in the TfSE area



* Source: employment data, 2016 data from NOMIS, economic opportunity areas and enterprise zones, Highways England, Mapinsight Mapping Tool

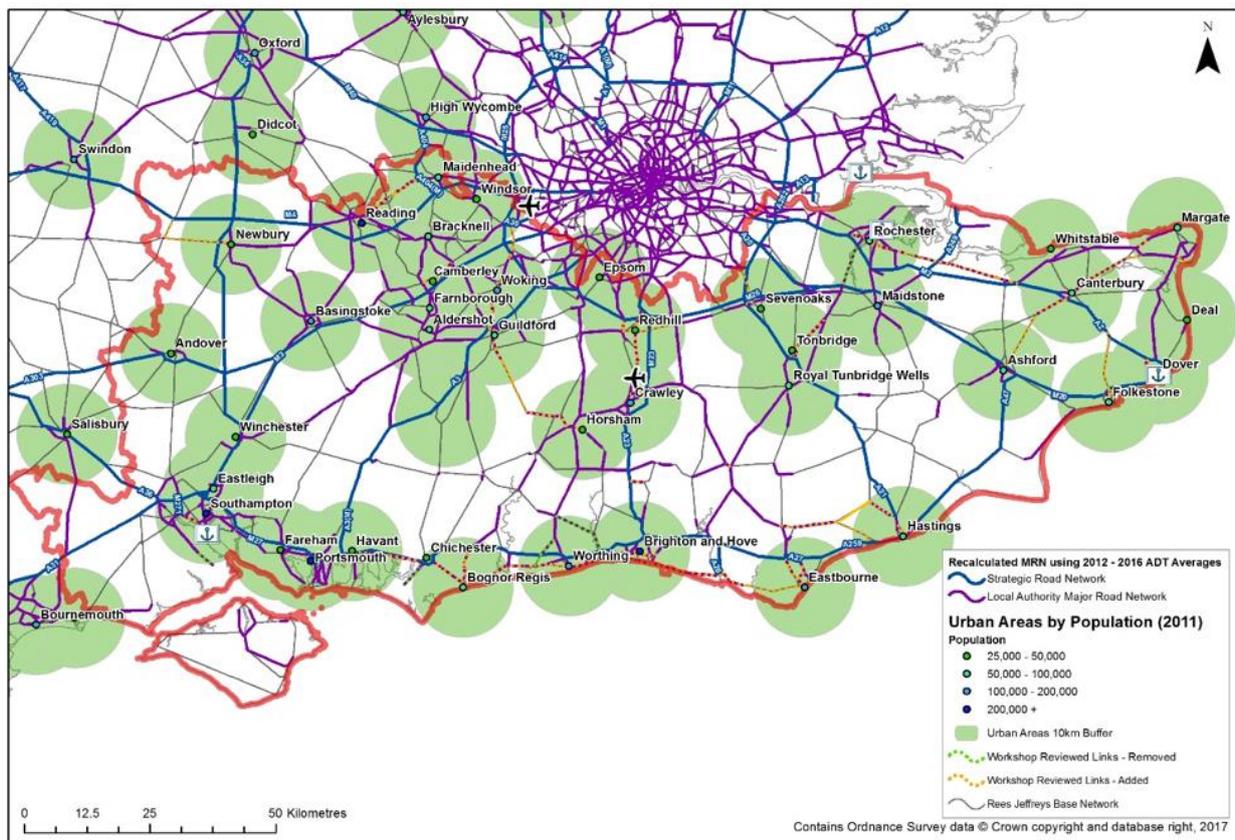
4.4.2. Connectivity of adjacent economic centres

The green shading in Figure 4-4 identifies a 10-kilometre radius around each urban centre with a population of more than 25,000 in 2011. The colouring of the marker for each urban area indicates its size.

10 kilometre buffers were selected as they represent approximately 10 minutes of travel at approximately 40 mph and can be presented clearly on the mapping of a region to provide a clear view of the roads that provide a direct link between neighbouring centres.

This approach builds on the Rees Jeffreys approach to ensuring connectivity through linking urban areas to the MRN by recognising the economic importance of direct links between economic centres even if the centres have other links to the MRN.

Figure 4-4 Connectivity between adjacent economic centres - illustration of distances between main urban areas



* Source: population: ONS 2011 census population for built up areas

4.4.3. Resilience

Figure 4-5 shows the identified diversion route for the SRN to provide a view of which links provide a resilience function. Figure 4-6 supplements this with a summary of average speeds by link across the SRN. This is intended to provide a view of the sections of the network that are operating close to capacity and likely to be most vulnerable to the impacts of incidents and therefore for which the resilience offered by the MRN is likely to be particularly valuable.

Figure 4-7 provides supporting information on average annual flow by link. These indicators provide reasonable proxies for SRN performance but Highways England and/or the ORR are likely to have additional datasets on performance that could be used to support this analysis. Information on the location of single lane sections of the SRN which are particularly sensitive to the capacity reductions associated with incidents would also be valuable.

Figure 4-5 Highways England diversion routes for the SRN

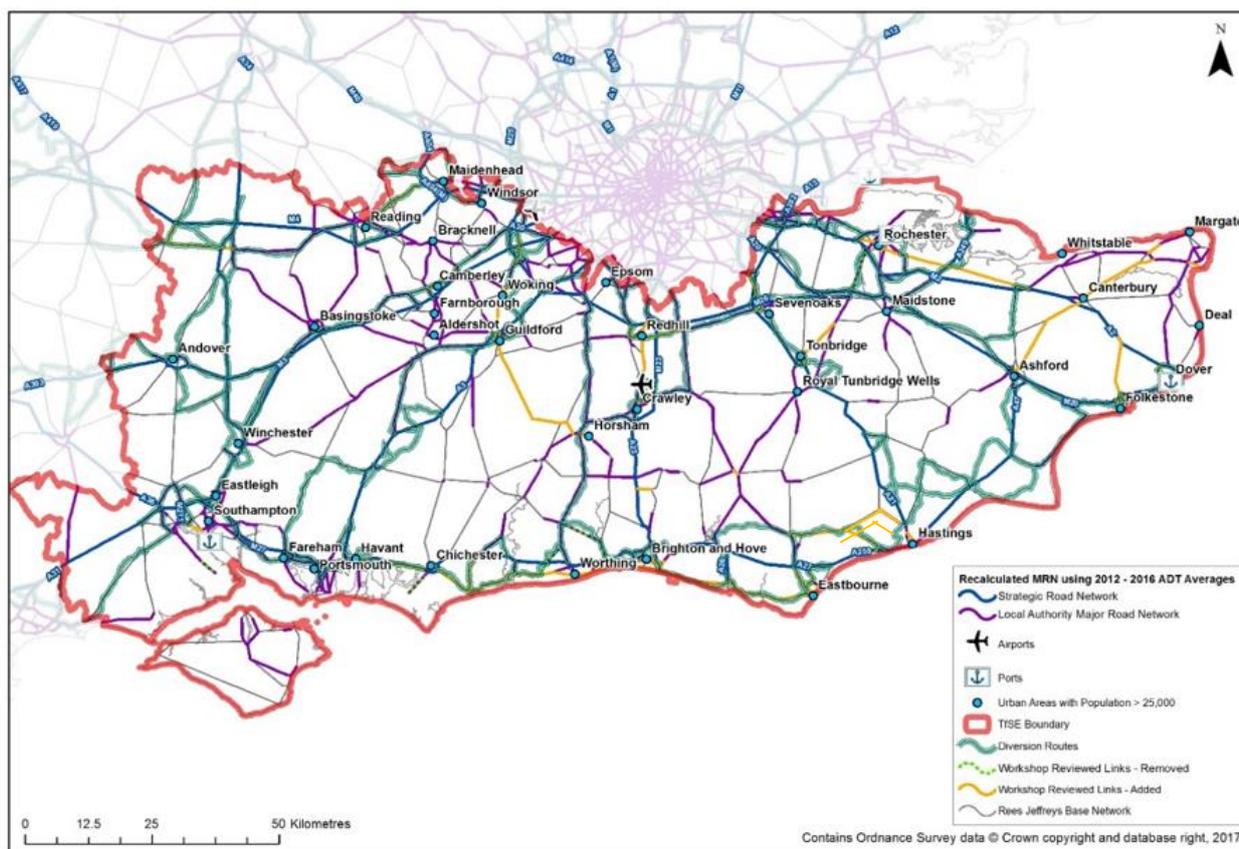
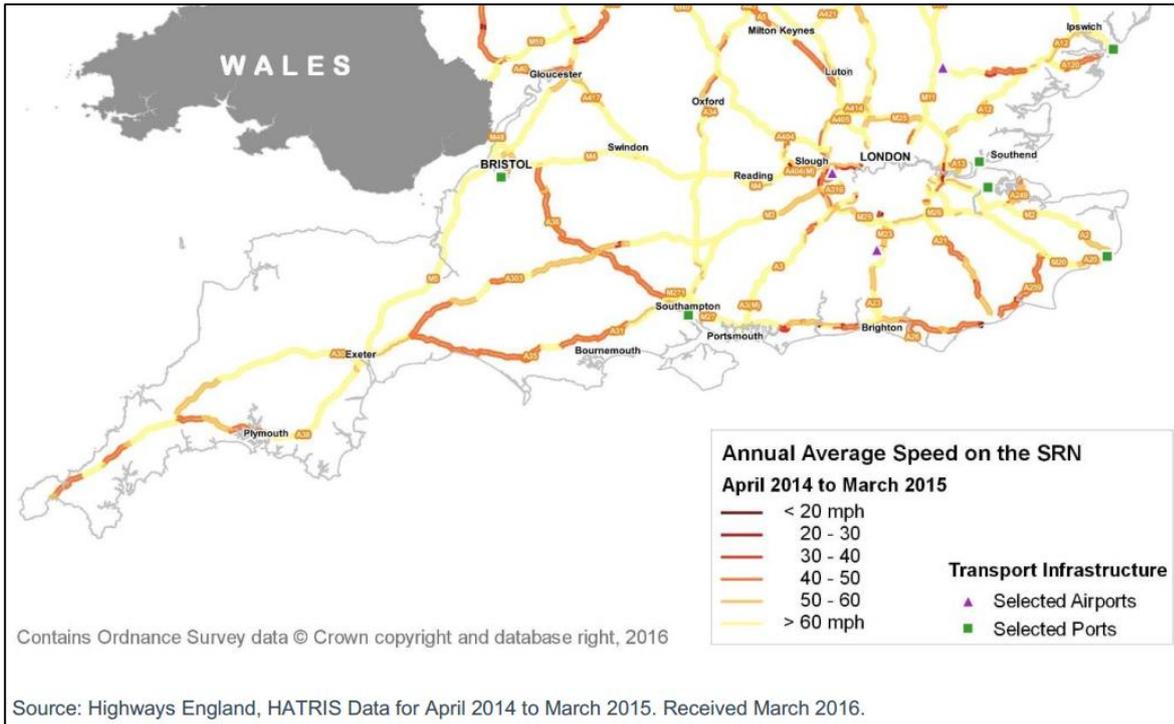
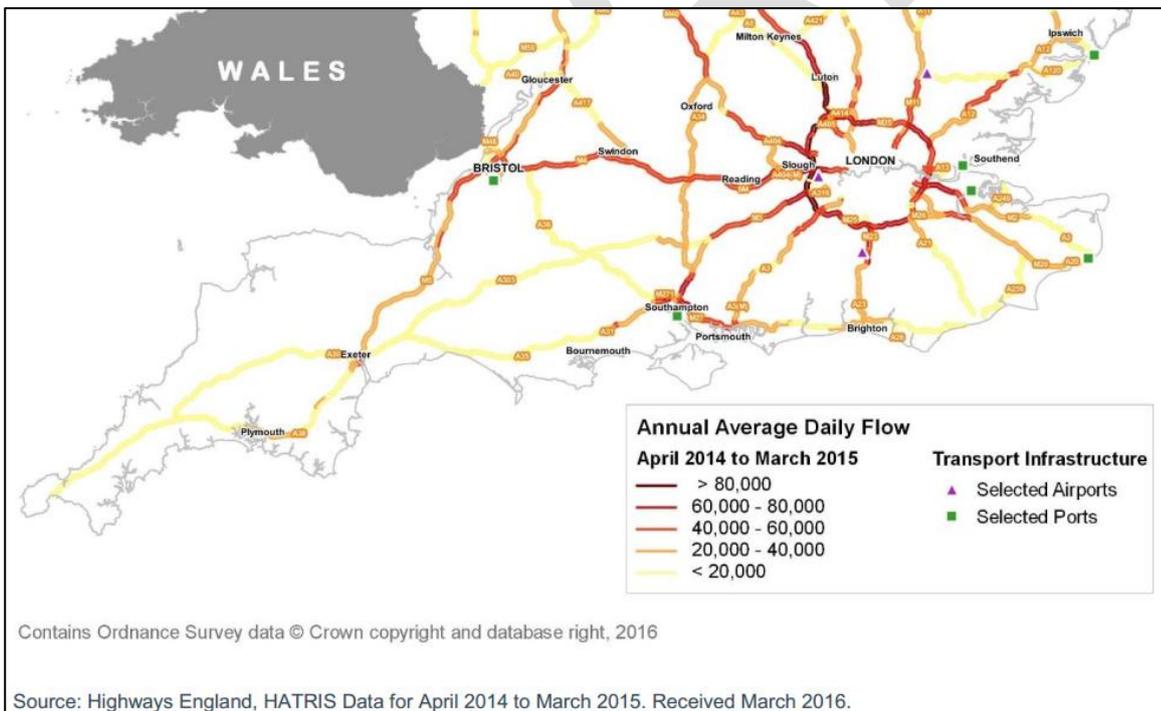


Figure 4-6 Extract from Highways England SEGP map of average speed by SRN link



Reproduced from: *Socio-economic analysis, future forecasts and the strategic road network, support document to the Strategic Economic Growth Plan, Highways England, November 2016*⁹

Figure 4-7 Extract from Highways England SEGP map of average daily flow by SRN link



Reproduced from: *Socio-economic analysis, future forecasts and the strategic road network, support document to the Strategic Economic Growth Plan, Highways England, November 2016*¹⁰

⁹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/600272/SEGP_-_Underpinning_report_-_Socio-economic_analysis_future_forecasts_and_the_SRN.pdf

¹⁰ As previous footnote

5. Implications of suggested revisions to the network definition approach

5.1. Overview

This chapter provides a summary of the implications of the suggested revisions to the MRN definition approach to the network identified for the TfSE area. The review is intended to identify the extent to which the revised network matches with the revisions suggested by the TfSE Transport Strategy Working Group.

5.2. Summary of implications for added links

Table 5-1 summarises the extent to which the suggested revised approach helps to understand the case for the MRN additions suggested by the Working Group. The columns identify whether each link meets the flow criteria for inclusion and whether, on the basis of the economic datasets reviewed, it contributes to each of the economic roles for the MRN summarised in Chapter 2 i.e.:

- 1) Supporting economic hubs by improving connectivity to:
 - a. Existing economic centres;
 - b. Support economic growth in identified growth areas and in peripheral areas to reduce economic inequalities.
- 2) Supporting the region's gateway to UK plc function by providing connectivity between gateways and the rest of the South East and supporting SRN connectivity between gateways, the South East and rest of the UK; and
- 3) Improving resilience and reliability through: responses to incidents, provision of diversionary routes, integration with the SRN and potential road quality improvements

The final column allocates each link to the one of the following three broad categories, defined on the basis for inclusion of the link in the MRN

- Parallel routes (PR);
- Direct connections between adjacent centres (DC); or
- Completing economic connections (C);

These categories provide groupings of links in terms of similarity of the main case for inclusion of the links in the MRN but are not mutually exclusive. For instance, the links in the 'parallel routes' category also provide direct connections.

Table 5-1 Summary of the case for suggested additional links

No.	Addition	Flow	Existing Ec. Hubs	Economic Growth	Adjacent Centres	Resilience	Category
1	A4 from Reading to A404	Y	Y			Y	PR
2	A4/A338 from A34 to M40					Y	PR
3	A320 North and South of Woking	Y	Y		Y		DC
4	Camberley to the A30	Y	Y				C
5	A25 diversion routes		Y			Y	PR
6	A281 Guildford to Horsham	<i>(Partial)</i>	Y		Y	Y	DC+
7	A2011 to Crawley	Y	Y				C
8	A23 between Horley and M25	Y	Y	Y		Y	PR
9	A2300 linking Burgess Hill to SRN	Y	Y				C
10	Western Approach into Southampton Dock Gate 4	Y	Y				C
11	A259 Havant to Brighton	Y	Y	Y	Y	Y	PR
12	A270 joining the A27 through Brighton	Y	Y			Y	PR
13	A259 Brighton to Seaford	Y	Y		Y	Y	PR
14	A259 Seaford and to Eastbourne		Y		Y	Y	PR
15	A22/A2280/A2021 in Eastbourne	Y	Y				C
16	A283 (between A27 and A259)	Y	Y				C
17	A271/A269 Hailsham to Bexhill	<i>(Partial)</i>		Y		Y	PR
18	Bexhill-Hastings Link Road between A259 and A21 (A2690)	<i>(Partial)</i>		Y		Y	PR
19	A28 Ashford through Canterbury to A299	<i>(Partial)</i>	Y	Y	Y		PR
20	A28 to Margate	<i>(Partial)</i>	Y				DC
21	A260 from A2 to A20 (north of Folkestone)		Y	Y	Y		DC
22	A26 from A228 to A21 (near Tonbridge)	Y	Y				DC
23	A2 joining up SRN section of A2 and M2 through Medway towns	Y	Y	Y	Y		PR

Key for last column: PR = Parallel routes, DC = direct connections, C = Completing economic connections, R = additional resilience

5.2.1. Parallel routes

The Working Group suggested adding in the A23, A2 and the A259/other route sections parallel to the A27/A259 along the south coast.

Many of these links on these routes had met the Rees Jeffreys flow criteria (and a slightly increased proportion meet the revised application of the criteria). However, in the Rees Jeffreys approach they had been removed as part of the rationalisation process as they were considered to be too close and parallel to existing SRN links (i.e. M23, M2 and A27/A259 respectively).

The review undertaken using the approach set out in Chapter 4 suggests there is a strong case for including these links because:

- They have large flow volumes and/or high freight proportions despite the parallel SRN route, suggesting that they serve their own economic function. The review of mapped economic indicators suggests this function is likely to involve providing more direct local links between the economic centres along the route (e.g. the Medway towns for the A2, Gatwick, Crawley and nearby industrial areas for the A23 and south coast towns and employment areas for the A27/A259)
- They provide resilience for busy sections of the SRN. This is a key issue for the A27/A259 which is particularly sensitive to incidents as it is operating near capacity and for many stretches has only single lane provision. The M2 and M23 are also relatively busy routes and Figure 4-6 shows that they also experience low average speeds in places, suggesting capacity constraint and vulnerability to incidents.

The Working Group also identified the need for the addition of links along parallel routes on the A4 and A25 (parallel to the M4 and M25 respectively). Although the flow on the identified links did not necessarily meet flow criteria (and they therefore did not appear in the interim network), they are located in dense economic areas and provide additional connectivity to and between existing economic centres. However, the primary reason for the Working Group suggesting the addition of the A4 and A25 links was the resilience they provide to sections of the SRN (M4 and M25 respectively) which has significant economic value given the level of traffic of the network on those sections.

5.2.2. Direct connections between adjacent centres

A number of the links for addition suggested by the Working Group can be identified as providing economic value by providing direct connections between adjacent economic centres.

As outlined above, the Rees Jeffreys review focussed on ensuring economic centres were connected to the MRN but did not prioritise links between adjacent centres. However, speed and quality of connection between economic centres are key influences in generating economic value, suggesting that links that provide direct connections should gain additional priority in consideration for inclusion in the MRN.

The A320 between Guildford, Woking and northwards falls in this category, providing a direct link between economic centres, reflected in high flows which meet the criteria for most of the route length.

Three other links have been included in this category:

- A281 between Horsham and Guildford;
- A28 between Canterbury and Ashford; and
- A260 between Folkestone and Canterbury in Kent.

Sections of these routes meet the flow criteria but not the full length in any of the cases. Nonetheless the additional review of economic data suggested that they would be worthwhile for inclusion in the MRN for a number of reasons:

- Providing direct connectivity. Although the economic centres served by each of the routes are served by other elements of the MRN, these links provide the most direct connection between important economic centres (Guildford and beyond to Woking and Thames Valley and Horsham and beyond to Crawley and down to Brighton for the A281 and between Ashford and Canterbury and Folkestone and Canterbury for the A28 and A260 respectively). The fact that current flows are below the thresholds could reflect current constraints on the route that MRN status could help to alleviate. The case for inclusion is based on their potential for increased economic importance by virtue the areas they serve and potential quality of the links they provide. For the A28 and A260, this case is reinforced by the fact that the roads directly serve economic opportunity areas identified by Highways England.

The A281 also brings the additional benefit of providing potential for additional resilience for a very busy section of the M25 by providing an additional orbital route.

5.2.3. Completing economic connections

A number of the suggested additions were simply intended to complete connections between the SRN or MRN and economic centres including:

- Linking Camberley to the A30;
- A2011 to Crawley;
- A2300 to Burgess Hill;
- Western Approach into Southampton Dock Gate 4;
- A22/A2280/A2021 in Eastbourne;
- A283 (between A27 and A259) – linking to Shoreham port; and
- A28 to Margate.

These adjustments are in line with the Rees Jeffreys approach of ensuring key economic centres are connected to the network.

5.3. Summary of removed links

The reasons for the links suggested for removal broadly fell in two categories:

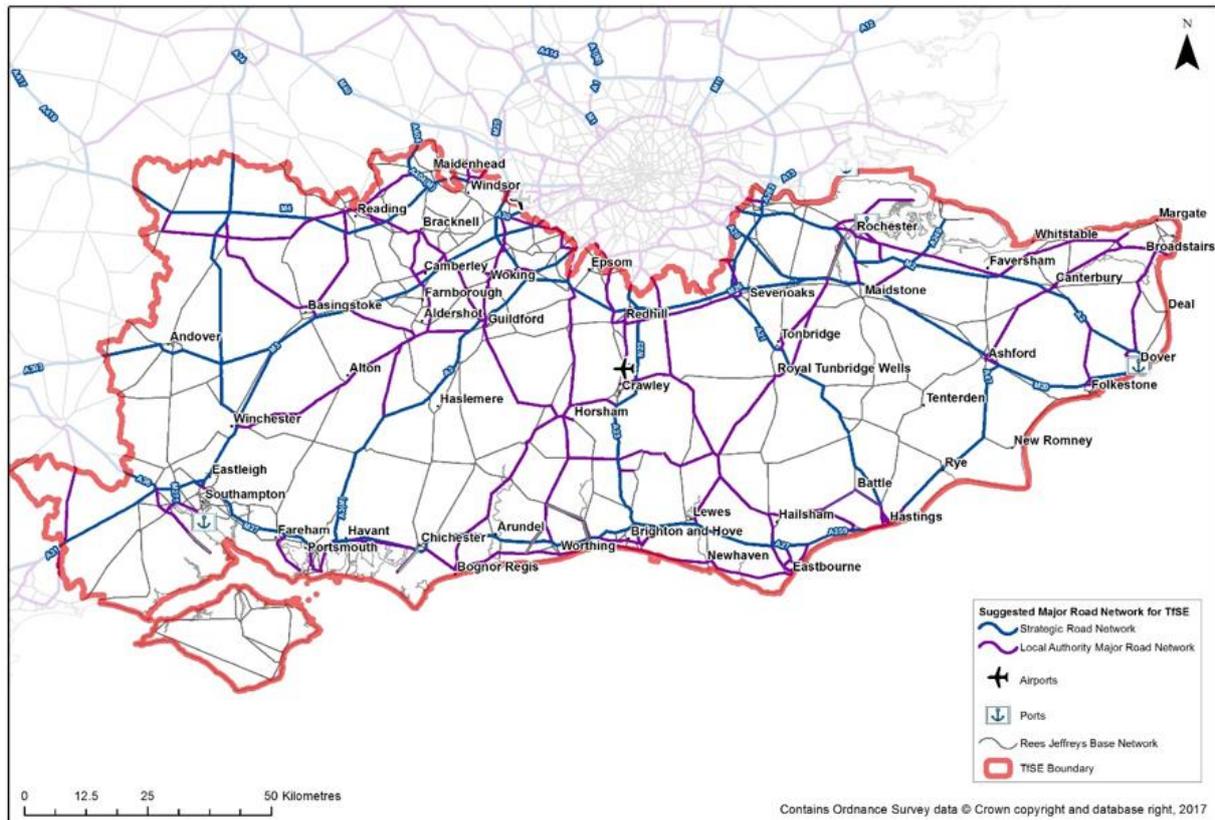
- Limited economic significance of the locations served; and
- Roads unsuitable for heavy traffic (with in some cases the flow largely being the result of the SRN underperforming)

The mapping of economic criteria shown in Chapter 4 helps to identify those routes that do not link to economically significant areas (i.e. not linking to urban areas, dense employment areas or opportunity areas or enterprise zones). However, the mapping cannot help to identify roads considered unsuitable for heavy traffic. It is possible that additional mapping of environmental constraints and local characteristics (which were beyond the scope of this economically focussed study) could help to inform this assessment. However, local knowledge is also likely to be needed, highlighting the need for professional knowledge to inform the finalisation of the network

5.4. Suggested TfSE Network

Figure 5-1 shows the suggested TfSE MRN produced by making the revisions suggested by the Working Group.

Figure 5-1 Suggested TfSE Major Road Network



The suggested resultant network is about 40% longer than the Rees Jeffreys definition for the TfSE area, with a total length of just over 700 miles rather than 500 miles. However, the total is only 10% greater than the 650-mile length of the SRN (compared to the Rees Jeffreys definition which gave an MRN of 75% of the length of the SRN). The length of the revised network therefore remains broadly consistent with the Rees Jeffreys national balance between MRN and SRN (the identified national MRN is 5% shorter than the national SRN).

The case for increasing the length of the MRN in the TfSE area is strengthened by the fact that the region is relatively underserved by the SRN. Table 5-2 provides a summary of regional SRN statistics from the recent ORR Benchmarking Highways England Report¹¹. Noting that their definition of the South East includes Oxfordshire and Buckinghamshire from beyond the TfSE area, the figures show that, along with Yorkshire and Humberside, the South East has considerably fewer route and lane miles of SRN provision per resident than the other regions (approximately 15% below the English average).

The SRN that is in place in the South East is heavily used (unlike in Yorkshire and Humberside) with South East motorways carrying AADFs that are more than 10% greater than the English average whilst dual carriageway SRN roads carry AADFs that are nearly 40% greater than the English average.

Defining a longer MRN for the South East region therefore seems a logical approach to helping to compensate for the relatively low SRN provision in the region and its high usage levels.

¹¹ Benchmarking Highways England, ORR, December 2017

http://orr.gov.uk/__data/assets/pdf_file/0013/26320/benchmarking-highways-England-2017-progress-report.pdf

Table 5-2 ORR regional Highways England SRN statistics¹²

Region	Population (mill)	Total provision		Per mill population		Traffic density (AADF)		
		Lane Miles	Route Miles	Lane Miles	Route Miles	Motorway	Dual Cway	Single Cway
East	6.1	2561	565	420	93	85000	42000	24000
Midlands	10.5	4465	920	425	88	92000	38000	28000
North West	7.2	3199	535	444	74	85000	27000	18000
South East	9	3064	600	340	67	97000	57000	19000
South West	5.5	2356	500	428	91	91000	31000	21000
Yorks & NE	8.1	2476	500	306	62	71000	39000	16000
England	46.4	18121	3620	391	78	87000	41400	21200

Source: ORR Benchmarking Highways England Report December 2017

5.5. Possible additional links

Application of the approach outlined in Chapter 4 suggests a number of other links that were not identified by the Transport Strategy Working Group but could potentially be considered for inclusion in the MRN on similar grounds:

- A longer stretch of the A25 between Guildford and Kent (rather than the current M25 diversion routes between Sevenoaks and west of Redhill). The route meets the flow criteria for most of its length, provides direct connections between economic centres and provides resilience for the M25.
- Resilience routes for the A259 and A2070 between the A21 and M20. Figure 4-6 shows that average speeds along the route are low, suggesting the road operates near capacity and is likely to be susceptible to incidents. Whilst flows are currently relatively low, the road links employment and opportunity areas in Ashford and Hastings.
- Additional links in the Aldershot, Farnborough, Basingstoke area and to the north east of Woking between the M25 and London. These are dense, economically active areas and a number of links meet the flow criteria. Inclusion of some additional links would increase direct connectivity between economic areas.
- Additional connecting links within Southampton and Portsmouth, reflecting high flow roads, similar to those added for Eastbourne.

¹² As previous footnote

6. Other issues for consultation response

The focus of this study was on reviewing the Rees Jeffreys indicative MRN and an economically focussed approach to definition of the MRN. However, a number of other issues in relation to MRN definition were raised by the Working Group that have potential relevance for the consultation response. These are summarised below under the following headings:

- Treatment of future change;
- Consideration of environmental issues;
- Maintenance funding;
- Implications of MRN status; and
- Roles and responsibilities.

6.1. Treatment of future change

The Rees Jeffreys report represented future growth through the use of the DfT's National Traffic Forecast growth factors to 2040. The flow criteria thresholds used to identify links for inclusion in the MRN were also increased by the national average traffic growth between 2014 and 2040.

As outlined in Chapter 4, whilst the growth factors varied by region and road type, they did not reflect specific predicted changes (such as the impact of the Lower Thames Crossing). Instead, the impacts were more generalised with each category of road in each region effectively either becoming more or less likely to meet the flow criteria depending on whether forecast growth for that category was above or below the national average growth used to increase the flow criteria.

More specific, localised impacts of changes such as the Lower Thames Crossing and proposed developments will be more relevant than generalised changes in defining the MRN. However, identifying potential future change is challenging, particularly over timescales as far reaching as to 2040. One potential solution would be to consider the MRN as a dynamic concept that is reviewed on a regular basis (one option would be a five-yearly review in line with the Roads Programme). The review could then take account of forecast change over the short term (of 5 to 10 years) and make any adjustments required.

The Highways England's new suite of Regional Traffic Models could potentially provide the forecasts of traffic required as between them they cover the country and should include committed transport schemes and proposed developments. The use of forecasts could then be followed up with monitoring and observation after opening to ensure observed changes tie in with the forecasts.

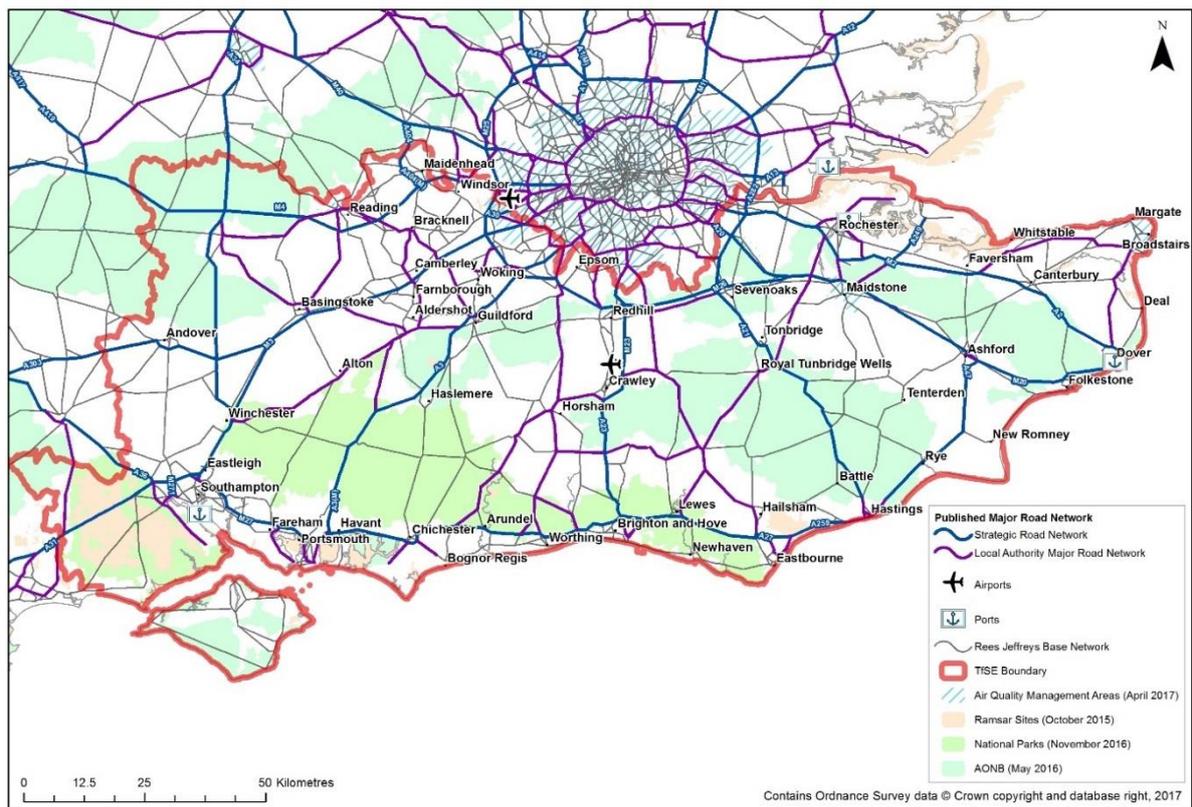
This approach would need to be accompanied by some rules such as a minimum time of inclusion in the MRN or notice period for being removed to help with the certainty of planning and funding that is intended to be a key feature of the MRN status.

6.2. Consideration of environmental issues

This study and reports referring to the MRN published to date have focussed on the economic impacts and role of the MRN. However, as raised by the Working Group, environmental considerations will also be very relevant. Figure 6-1 shows key environmental constraints in the TfSE area, highlighting the scale of the challenge in the area.

One option (beyond the scope of this study) would be to refer to environmental considerations in defining the MRN (e.g. defining routes to draw traffic away from other routes to improve air quality or protect physical environment). Alternatively, different tiers of the MRN could be defined for environmentally sensitive areas, helping to differentiate and potentially apply different standards in different area types.

Figure 6-1 Key environmental constraints in the TfSE area



6.3. Maintenance funding

A number of Working Group workshop attendees highlighted the importance of MRN status being used to confer access to additional funds for highway maintenance as well as for investment in improvement schemes.

The view was that if MRN status brings additional performance requirements and standards without access to additional maintenance funds, it will cause significant strain on already stretched funds. The point was illustrated with reference to bridges on key roads that already need additional urgent maintenance funding to avoid further deterioration.

6.4. Implications of MRN status

A number of workshop attendees also identified that it would be useful to have improved understanding of what MRN status would involve. For instance, questions were raised in terms of the implications for traffic flows and for increased standards and responsibilities and how this might differ by MRN tier.

6.5. MRN status within urban areas

The consensus of workshop attendees was that MRN categorisation should continue into urban areas. This raised the associated issue of what types of measure would be covered by MRN funding. The view was that there should be the opportunity to bid for bus, coach, cycling or non-roads schemes or integration with other modes in the corridor and potentially in parallel corridors if they would help improve conditions on the MRN road.

6.6. Roles and responsibilities

The workshop attendees highlighted that clear definition of roles and responsibilities in relation to the MRN, nationally, locally and across borders, will be very important to its success. The Transport Investment Strategy identified that the consultation on the MRN will cover roles and responsibilities and included the following points in relation to potential roles for Subnational Transport Bodies (STBs):

- *Potential for STBs.... to play a role in the investment and oversight of performance on major roads in their region*
- *Do not plan for STBs to become network operators or highway authorities. In all cases, highway authority responsibility for MRN roads would remain with the existing local authorities*

A number of effective interfaces will therefore need to be established including:

- Between STBs and Local Authorities within an STB area;
- Between Highways England, STBs and Local Authorities; and
- Cross boundaries with neighbouring Local Authorities, STBs and Transport for London.

7. Summary

This review has suggested that the indicative Rees Jeffreys MRN defined for the TfSE area should be expanded to fit better with the views of the TfSE Transport Strategy Working Group on the network required to support the economy.

The following revisions to the network definition approach would help to produce a network that fits well with the Working Group's suggestions.

- A graduated approach to applying flow criteria (and adjusted source for the flows used);
- An expanded definition of connectivity in considering economic value of links, including considering:
 - o Connections to economically dense areas (not necessarily captured by the population based measure used by Rees Jeffreys approach);
 - o Connections to growth areas;
 - o Direct connections between adjacent centres.
- A clear recognition of the economic value of resilience (particularly in areas with heavily use SRN roads).

DRAFT

Tamsin Macmillan

Atkins

Epsom Gateway

2 Ashley Avenue

Epsom. KT18 5AL

Tamsin.Macmillan@atkinsglobal.com

DRAFT