Chichester A27

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BUILD A BETTER A27

Situation Summary, Assessment and Recommendations Final Report



CHICHESTER A27

BUILD A BETTER A27

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KEY REFERENCES

(This is a list of the important documents formally identified by the BABA27 group as most significant for evaluation in this study. These were all reviewed but not all explicitly referenced in this study. BABA27 and other stakeholders provided a number of supplementary documents which were reviewed as part of this report's preparation.)

A27 Chichester Bypass Consultation materials, Highways England, 2016
A27 Chichester Bypass Improvement Scheme Report on Public Consultation, Highways England, February 2017
A New Transport Vision for the Sussex Coast New Transport Strategy Report, South Coast Alliance for Transport and the Environment, December 2017
Chichester Area Transport Model (CATM) and Local Plan assumptions
Manhood Peninsula Destination Management Plan 2011-2015, Sustainable Tourism On the Manhood Peninsula project, 2011
National Networks Planning Policy Statement, Department for Transport, December 2014
South Coast Central Route Strategy, Highways England, March 2017
South Coast Central Route Strategy Evidence Report, Highways England, April 2014
West Sussex Local Transport Plan 2011 – 2026

1. CHICHESTER AND THE A27

The mix of through and local traffic on the A27, and consequential problems of road congestion, unreliable journeys, inappropriate traffic diversions, local severance and vehicle emissions, air quality and noise, are real issues challenging the community and businesses in Chichester and the surrounding area.

1.1.1 The A27 through Chichester, referred to as the Chichester bypass, is a dual carriageway road around 3 miles (5.5km) long intersecting with the local road network at five roundabouts and one signalised junction. The road is designated as a part of the Strategic Road Network (SRN) as a Trunk Road and is managed by Highways England.

1.1.2 Traffic volumes, congestion and journey time uncertainties on the A27 and approach roads generate serious transport, social, environmental and economic impacts[a]. The ability to maintain and grow the economy is threatened by the performance of the transport network, especially in supporting local and regional business, including the important agricultural trade on the Manhood Peninsula, and businesses such as Goodwood and Rolls Royce. The network also supports a strong tourism industry and facilitates on-going residential developments needed to meet local demand. The local road network, and the road-based public transport network it supports, is causing problems for residents, both in accessing jobs, education and other facilities, and in the environmental impacts of traffic congestion and use of inappropriate diversionary routes.

1.1.3 Improvements to the A27 along the south coast have been planned and delivered over many years, with the provision of sections of high capacity and high quality dual carriageways in many locations. There has remained a long-standing aspiration of key stakeholders to continue to improve this key route, which goes back to at least the post-war period, including, in early May 2018, the approval for a bypass of Arundel. A number of proposals to improve the route at Chichester have been developed over the years, but with no firm progress, other than providing marginal improvements to short-term operations of the A27, for example, local widening at the Bognor Road junction.

1.1.4 The desire of the Government to address the problems of the A27 was clear through their commitment to improve the Chichester bypass in the earlier Road Investment Strategy 2015-2020 (RIS1). Following the Secretary of State's decision to cancel the RIS1 scheme, Highways England have continued to engage with West Sussex County Council (WSCC), Chichester District Council (CDC), and the local MP. The Build A Better A27 (BABA27) group shows a continued interest to develop a solution to the issues with the A27 at Chichester. Addressing the A27 is also a priority in the West Sussex Transport Plan 2011-2026, which shares similar objectives to those identified by Highways England to increase capacity, improve reliability and safety to increase local business competitiveness and attract investment.

1.1.5 The following provides a summary of the development work on the A27 Chichester proposals since 2013:

- 2013 – Government commitment to improve the A27 Chichester bypass, and in 2014 to improve four junctions as part of RIS1
- 2016 – extended consideration of wider options for investment, extensive technical work and a formal Public Consultation
- February 2017 – Highways England instructed to stop following serious concerns over community acceptability of any of the present options
- March 2017 – establishment of the Build A Better A27 community group
- December 2017 – SYSTRA commissioned to develop 'long-list' suggestions for addressing the A27 and sift these to identify a preferred scheme(s) to put forward for a formal sign-off by WSCC, CDC and the local MP, and ultimately to the Government and Highways England for potential inclusion in the RIS2 programme.

Notes. a. see https://www.gov.uk/government/consultations/a27-chichester-bypass-improvement-scheme

2. BUILD A BETTER A27 PROCESS

The local consensus that the problems of the A27 need to be addressed fully and thoroughly has been established through the Build A Better A27 group, with on-going community, business and elected official engagement intended to support the development of how the A27 can best be improved.

2.1.1 The BABA27 group was established to identify and prioritise the 'themes' and 'key requirements' to address the problems of the A27 in Chichester and has been instrumental in creating an opportunity for Highways England to consider a new A27 concept, subject to acceptance into the RIS and community consensus.

2.1.2 BABA27 is not a decision-making body, but has, and continues to provide, valuable support to WSCC, CDC and the local MP. This is particularly in respect to clear examination of what the A27 needs to deliver and the key features which would make a new A27 more widely acceptable, not all of which were adequately captured and considered in the earlier work supporting the RIS1 scheme consultation.

2.1.3 It is very clear that there is a strong local consensus that the problems of the A27 in Chichester are real and significant, and affect the community (residents, visitors, businesses, etc.) in their work, in social interactions and in their quality of life.

2.1.4 There was a recognition that an innovative approach and process was required to address the issues which had hindered the many prior attempts to put forward a scheme to improve the A27. Important changes in approach included the very strong leadership sponsorship by WSCC, CDC and the MP for the process, involvement of a very broad and diverse group stakeholders (a representative group is included in Appendix A), and the use of a specialist professional facilitation to change the way of working and to guide the BABA27 process and engagement with Highways England.

2.2 BABA27 Guiding Principles

2.2.1 Ten guiding principles for the operation of BABA27 were developed during a number of well-attended community-led workshops held in the Spring and Summer of 2017:

- Develop a clear and broadly acceptable set of requirements for the group for a better A27
- Take a long-term view to inform a modern and robust transport solution as part of an integrated transport strategy
- Work in the best interests of the local community and regional economy in the Chichester area, not just the City
- Consider all constructive perspectives to create the best possible win for the Chichester area. No options are off the table
- Take decisions informed by solid evidence
- Work together in a calm and respectful way. Agree to disagree and understand that others may have a different point of view
- To the greatest degree possible, take collective responsibility for any decision made

- Be open-minded and encourage creative/innovative thinking and be prepared to compromise
- To the greatest degree possible, hold to decisions take by this group
- Encourage conversations that are open, honest and transparent.

2.2.2 Alongside the guiding principles, BABA27 also identified a set of key themes and supporting success criteria to steer the development of the long-list suggestions for the A27.

2.2.3 The locally derived requirements were developed through the BABA27 meetings and workshops, with success criteria being articulated through a number of key themes:

BABA27 Key Themes developed by the BABA27 group in 2017

- Through and local traffic
- Multi-modal transport
- Environmental factors
- Chichester as a jewel of England
- Landscape and conservation
- Local and regional economy.

2.2.4 In addition, there was a strong interest in the use of innovation and experimental approaches to address the issues of the A27.

2.3 BABA27 Confirmation of Success Criteria

2.3.1 The BABA27 success factors have been used in assessing the performance of the long-list suggestions, but also sit alongside funding agency drivers and a range of delivery considerations. These include:

Highways England aims reported in the A27 consultation leaflet and documents[a]:

- Improve capacity and support the growth of regional economies
- Improve road safety
- Reduce adverse environmental impacts
- Improve journey time reliability
- Enable housing provision
- Improve regional connectivity
- Improve accessibility to tourist areas

Wider delivery considerations defined by the consultant team for this commission

- Policy and planning fit
- Engineering feasibility, including required mitigations
- Acceptability
- Funding potential
- 'Value for Money'.

2.3.2 In taking forward the earlier RIS1 assessment, Highways England worked in partnership with WSCC and CDC to develop a combined set of primary objectives focussed around Transport, Safety, Community and Environment, and Economic factors. These developed further the environment themes, specifically in terms of addressing the Air Quality Management Area (AQMA) issues.

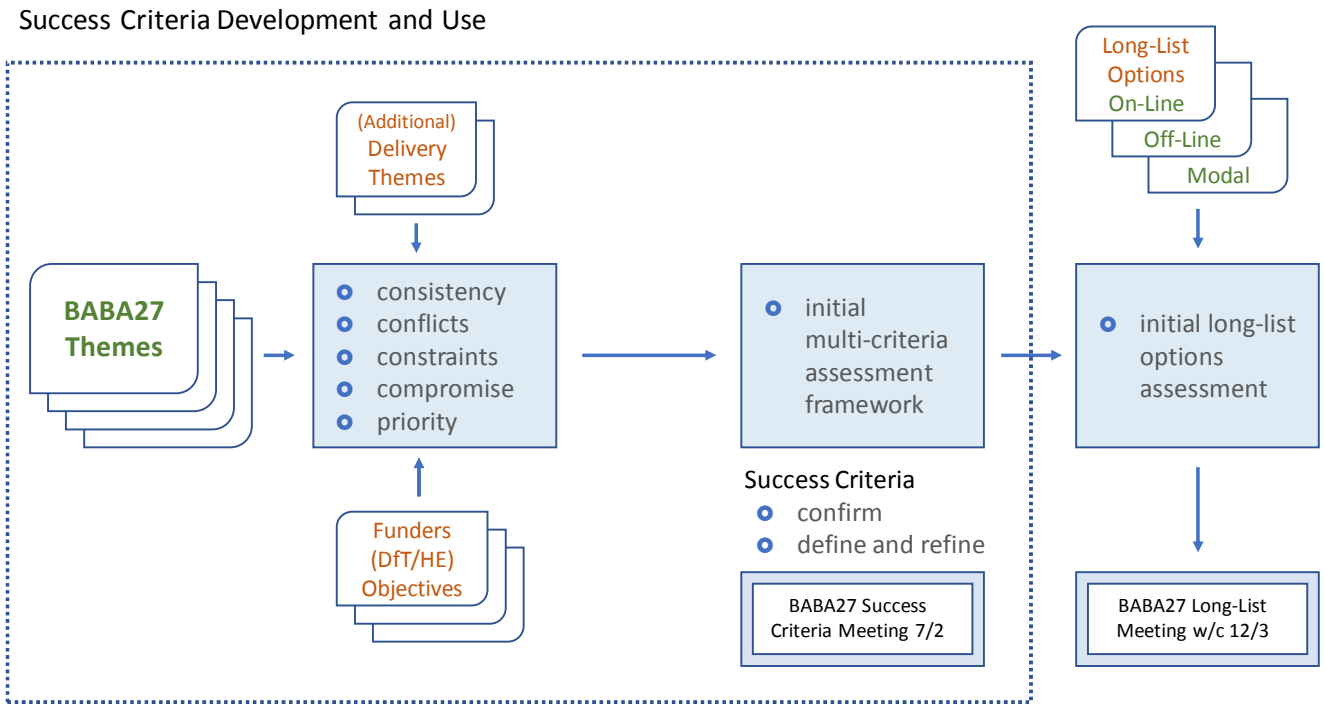
2.3.3 Although there are differences in emphasis between the key stakeholder objectives, aims and wider considerations, all are

broadly aligned. It is, however, noted that some potential conflicts may exist between these themes and aims, for example balancing providing additional capacity with improving economic vitality and protecting the environment.

2.3.4 For this commission the local derived success factors, aims for Highways England and our own wider delivery considerations were reviewed and confirmed by the BABA27 group through the community meeting of 7th February 2018 and subsequent feedback. The study approach is illustrated in Figure 1.

Notes. a. see https://www.gov.uk/government/consultations/a27-chichester-bypass-improvement-scheme

Figure 1. Staged Study Approach – Success Criteria



3. HIGHWAYS ENGLAND AND RIS OPPORTUNITY

Highways England's South Coast Central Route Strategy identifies their interest in shaping 'investment priorities to improve the service for road users and support a growing economy'. The Strategies will help to inform the RIS process and, ultimately, to develop proposals that can help bring the Government's vision for roads to life.

3.1.1 In order to set investment in the SRN, the government publishes a multi-year 'Road Investment Strategy' (RIS). The second RIS (RIS2) will cover the financial years 2020/21 to 2024/25, and as the first step in the process for setting RIS2, Highways England has published its Strategic Road Network initial report, alongside a number of supporting documents.

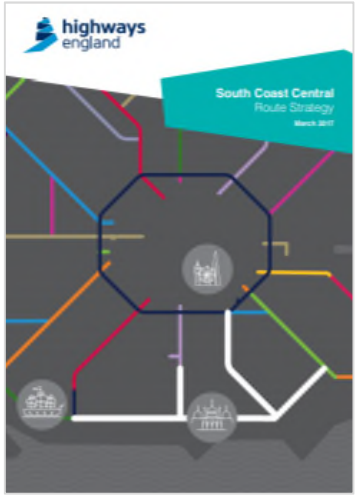
3.1.2 The SRN report identifies Highways England's 18 Route Strategies, including the 'South Coast Central' strategy that covers the A27, as well as the A23, A21 and the A259 east of Eastbourne. The strategies each set out the key route characteristics, the current state of the SRN, its potential future needs and their proposed priorities for RIS2.

3.1.3 As part of the development of the Route Strategies, Transport Focus (the road user and wider transport network watchdog) undertook research into road user priorities and experiences. Of the 18 'routes' identified, the South Coast Central was highlighted as one of the lowest rated of all routes, with 50% of users experiencing problems. Congestion and busy roads/high volumes of traffic were cited as the two main issues.

3.1.4 In managing and further developing the network, Highways England identified a number of common themes across the Route Strategies that would underpin the future network:

- A safe and serviceable network
- A more free-flowing network
- A more accessible and integrated network
- Supporting economic growth
- An improved environment.

3.1.5 In the South Coast Central Route Strategy of March 2017, 'travel speed reduction of the A27 Chichester bypass leading to unreliable journey times' and 'AQMA and Noise Improvement Areas [in Chichester]' were specifically identified alongside a number of key challenges further east on the A27. It was also identified in the South Coast Central Evidence Report of April 2014 that the Chichester A27 bypass has a poor safety record and is in the worse 10% of UK roads for casualty rates.



4. LONG-LIST SUGGESTIONS

The BABA27 guiding principles included a requirement that 'no options are off the table' in considering alternatives for improving the A27, and no suggestions were to be ruled out without due consideration. The long-list of suggestions that emerged included 'on-line', 'off-line' and 'modal' suggestions.

4.1.1 Our initial Long-List Suggestions for improving the A27 were developed from a fresh review of potential highway and wider interventions to fully or partially address the critical success factors identified by the BABA27 group. Although the list was developed largely independent of earlier work, many of the highway improvement suggestions have been considered, in some form or another, during earlier more extensive investigations leading up to the public consultation in 2016. There is an evidence base outlining feasibility, costs and impacts for some of these suggestions, which is based on prior investigation. We accept that the evidence base will need to be updated in due course, but in general it is based on recent surveys and environmental assessments and broadly follows current industry standard approaches. As a result, the evidence base appears to be appropriate for the current stage of the project.

4.1.2 Alongside some new variants and modifications, our review identified and sought to draw in a range of key mitigations to address some of the earlier concerns and critical success factors. Illustrating the potential for well-designed and configured mitigation measures is difficult at this stage in the development process.

4.1.3 The long-list suggestions primarily consisted of:

- 'On-line' improvements to the existing A27 and its junctions
- New 'off-line' routes to the south of Chichester
- New 'off-line' routes to the north of Chichester
- A wider range of supporting 'modal' suggestions to complement investment in the road network.

4.1.4 The intention of 'modal' suggestions was to provide a contribution to addressing the A27 issues, accepting that these measures alone would not be able to fully address all congestion, safety and wider issues. However, they can help to maximise the value of any opportunities, such as released local road capacity being used for pedestrians and cyclists.

4.2 Route Alignments

4.2.1 At this stage in the development process for RIS2, and given timescale and budget constraints, it is not possible nor required for Highways England to generate detailed route alignments. It is accepted that the BABA27 group and the wider community, not unreasonably, would like to understand precise routeings, but these are outside this scope of work. Instead, the work has focused on developing broad 'concepts' for consideration by the BABA27 group, the wider Chichester community, local decision makers and ultimately by Highways England. More detailed route alignments will be developed in due course during the next phases of work.

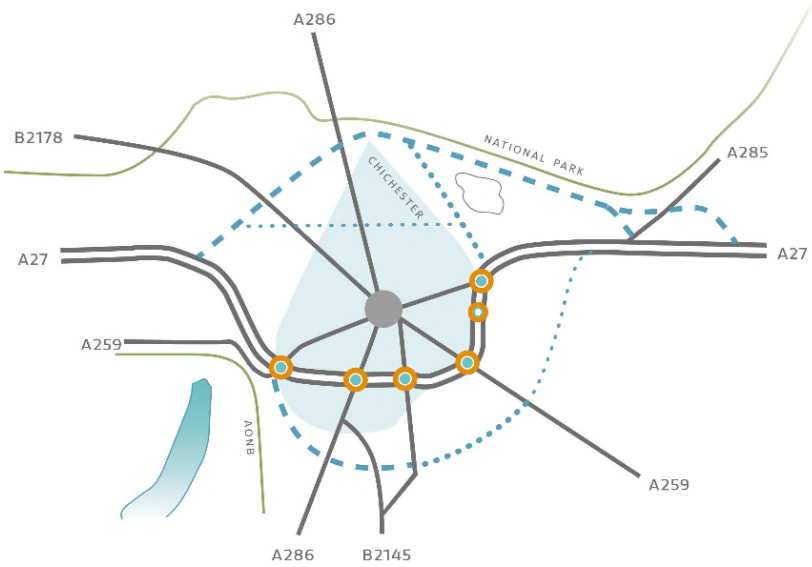
4.2.2 However, the significant amount of earlier work undertaken by Highways England as part of the RIS1 work did identify in some detail more precise and defined routes for:

- Scheme options published for formal consultation in 2016;
- Routes assessed in some detail but dropped before consultation; and
- A much wider range of routes examined earlier in developing those for consultation.

4.2.3 Having reviewed Highways England's technical work, it is clear that routes for some of our suggestions are broadly or fully feasible because, in most cases, the reasons for ruling them out could potentially be overcome; for example if additional funding was available. Therefore, a range of horizontal alignments have been identified in the earlier work that could be followed by our suggestions. Some 'tactical' variations could be possible or desirable to address specific issues and it might be that other different alignments could be feasible that were not considered earlier. Tactical variations could include tweaking where an alignment might work, how the tie-ins to the existing road network might work, some vertical alignments changes, etc. These are minor variants on a concept.

4.2.4 The first three of these suggestions, involving new or improved highway infrastructure, are illustrated in the diagram provided as Figure 2. This illustration is intended to identify the possible broad alignments of any potential concepts to be taken forward into consideration for RIS2.

Figure 2. Illustrative Suggested Route Alignments



4.2.5 In 'alignment' terms, our suggestions shown in Figure 2 comprised in principle of:

- 'On-line' improvements to the existing A27
  - junction improvement and/or relocations, with a range of supporting measures.

  A number of these junction improvements were considered in detail in the earlier RIS1 consultation options and their variants (options 1 and 3, and part of option 2). Our suggestions have considered a wider geographical coverage and using different design concepts.

- New 'off-line' routes to the south of Chichester

- New alignments providing a range of connectivity options to the south of Chichester

Feasible alignments for these suggestions were considered in the earlier RIS1 work, including parts of option 2 and option 6 that was not published for consultation. Therefore, our suggestions could follow these routes or use new alignments if any alternative routeings are feasible.

- New 'off-line' routes to the north of Chichester
  - New alignment to the north of Chichester and the north of the Goodwood motor racing circuit to access the A27 near Tangmere

Feasible alignments for this suggestion were considered in the RIS1 work in options 4 and 5 that were not published for consultation. Therefore, our suggestions could follow these alignments or use new alignments (to the east of Goodwood, and around Tangmere) if such alternative routeings were feasible.

  - New alignment to the north of Chichester and west of the Goodwood motor racing circuit to access Portfield junction

This suggestion was not considered in the earlier RIS consultation options and therefore its feasibility would need confirming through more detailed design work

  - A new alignment, principally in tunnel, underneath the northern part of Chichester

This suggestion was not considered by Highways England in the development of options for the RIS1 scheme and therefore its feasibility would need confirming through more detailed design work

4.2.6 It is also evident that vertical alignment variations to the earlier designs could be made, and as noted later, significantly more supporting mitigation measures are required in taking forward any of our suggestions than were considered in the development of options for the earlier RIS1 scheme.

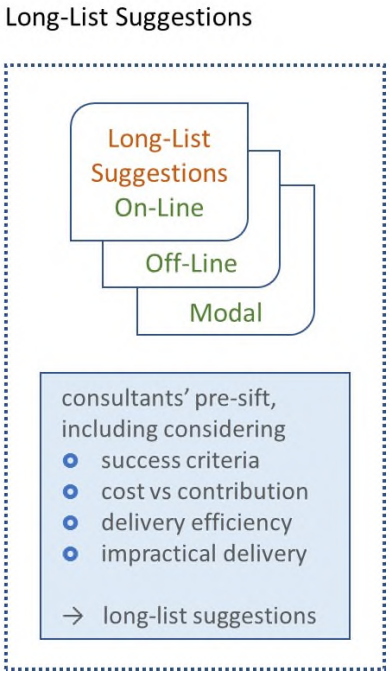
4.3 Long-List Sifting Process

4.3.1 Due to timescale constraints and the need to quickly move through to the assessment stages, the long-list of suggestions were presented to the BABA27 group alongside a number of initial 'considerations' generated by the consultancy team and intended to identify some of the key issues that would need to be examined further in taking forward any of the suggestions.

4.3.2 Also included was a consultants' pre-sift, intended to generate a more manageable number of suggestions. Those suggestions to be considered further were placed 'above the line', with suggestions unlikely to be deliverable or with limited contribution to meeting the A27 success criteria allocated 'below the line', meaning these suggestions were considered only in outline before being rejected.

4.3.3 This process is illustrated in Figure 3 and was the focus for the BABA27 community meeting of 15th March 2018 with direct and subsequent feedback assisting in the process of refining the long-list and the 'considerations'.

Figure 3. Staged Study Approach – Long-List Development



Long-List Suggestions grouped to ease discussions

Long-List Suggestions 'above the line'
- for further consideration

Suggestions	Considerations
New 'X'	major contribution
Improved 'Y'	requires mitigation
Expanded 'Z'	

Long-List Suggestions 'below the line'
- not for further consideration

Suggestions	Considerations
New 'A'	no practical mitigation
Enhanced 'B'	better delivered by 'D'

4.3.4 The following summarises the long-list for the 'on-line' and 'off-line' suggestions, and provides a listing of the 'modal' categories considered. A full copy of the long-list suggestions developed for the BABA27 15th March meeting is included in Appendix B.

'On-line' improvements to the existing A27

'Above the line'

- 'Marginal gains' through small on-line improvements in network operation, such as minor changes to highway alignment and minor junction works
- Packages of individual junction improvements on the existing A27 between Fishbourne and Portfield junctions to handle increased traffic volumes, smooth traffic speeds and flows, and better manage or reduce conflicting traffic movements
  - enhanced roundabouts
  - signalised junctions
  - grade separation: flyovers, underpasses
  - turning restrictions
  - junction widening
  - Junction combinations/relocation
  - other carriageway widening
- 'Smart A/B-road' concept and dynamic variable message signing to improve network efficiency

'Below the line'

- 'On-line fully tunnelled route for all/most of the current A27 from Fishbourne junction to A259 or Portfield junction
- On-line fully elevated route for all/most of the current A27 from Fishbourne junction to A259 or Portfield junction

'Off-line' suggestions

'Above the line'

- New local road to segregate traffic accessing the Manhood Peninsula from A27 'through' traffic from A27 'through' traffic with a new link from the Fishbourne junction, to A286, B2201, or B2145/B2166 (similar to the 'Stockbridge Link Road considered as part of earlier RIS1 options)
- New full southern route between Fishbourne junction and A259 Bognor Road east of the A27, either:
  - Multi-purpose road with local junctions to provide access to the Manhood Peninsula, or
  - Strategic road with no local junctions to segregate 'through' Bognor traffic
- New strategic northern route between A27 west of Fishbourne junction and near to Tangmere, with a junction at the A286 to give access to Midhurst and north Chichester, or no intermediate junction
- New local northern route between A27 west of Fishbourne junction and Temple Bar utilising and improving some existing local roads to limit new construction
- New multi-purpose northern route between A27 west of Fishbourne junction and near to the A27 at Portfield junction providing a stronger local functionality than route variants above, including junctions on B2178 and A286

'Below the line'

- New full southern route between Fishbourne via A259 near to Temple Bar/Tangmere (with/without junctions)
- Upgrading of existing minor routes on the Manhood Peninsula to provide alternative 'east-west' routes onto the A27 east avoiding Stockbridge/Whyke junctions
- New local road to the north from the A27 west of Fishbourne to A286 to segregate traffic accessing the A286 Lavant/Midhurst and north Chichester from A27
- Fully or largely tunnelled route under Chichester between west of Fishbourne junction and east of Portfield without any intermediate junctions
- Use of city centre road capacity for 'through' traffic by not actively discouraging routeings via Avenue de Chartres/Market Avenue/St.Pancras or via Orchard Street/Oaklands Way

'Modal' suggestions

'Above the line' – headline suggestions - further details are provided in Appendix B

- Parking – strategy refinements, improved information, park and ride
- Traffic and safety management measures
- Improved pedestrian and cycle crossings of the A27, new or improved cycle lanes
- Travel planning programmes and improved real-time and other transport information
- Land-use and planning focused on public transport corridors and reduced car use
- Improved bus priorities and reliability, delivered through new technologies
- HGV and goods vehicle priorities

‘Below the line’ – headlines

- Road user charging or workplace parking levies
- A27 high occupancy or HGV/goods vehicle lanes
- Strong ‘containment’ strategy to planning on the Manhood Peninsula i.e. planning for the provision of local facilities and services as part of future development to reduce the need to travel
- Bus subsidies to reduce fares
- Bus rapid transit, tramway, light rail and similar schemes.

4.3.5 The BABA27 group reviewed the long-list suggestions as considered in the following chapter.

5. LONG-LIST COMMUNITY FEEDBACK

5.1.1 Community feedback has been an integral part of the BABA27 process, including during the development of the success criteria as reported above.

5.1.2 The BABA27 Group has been the primary mechanism through which this feedback has been received but a business briefing and wider community feedback exercise have also taken place.

5.1.3 As with all qualitative research, it should be noted that:

- The views and opinions reported are the views and perceptions of respondents and are not necessarily factually correct;
- It is standard practice not to provide numeric values within qualitative research. This is because they can easily be misinterpreted. Qualitative research, such as this, does not provide a statistically representative sample; instead it ensures the views and opinions of different types of people are heard;
- We have, however, considered how frequently a particular view has been expressed and used consistent language when reporting this.

5.1.4 This engagement process cannot not be seen as 'vote', and we do not attempt to draw conclusions about what the 'best' suggestion might be based on the number of people offering positive or negative comments about a particular suggestion.

5.1.5 No single source of feedback provides a comprehensive view of long-list feedback, but all have offered useful indicators of key themes, a useful understanding of important mitigation measures and improvements that can help to shape these suggestions into concepts and the direction of community and business thought. And whilst no suggestion received outright support or opposition, some were clearly not well supported and would suggest that, in some cases, even substantial mitigation or improvement would not lead to an acceptable level of community consensus on these suggestions.

5.2 BABA27 Group

5.2.1 The BABA27 meeting of 15th March reviewed the long-list suggestions and our initial considerations, with feedback provided at the meeting and immediately afterwards, with an opportunity to provide written feedback on behalf of the organisation or group they represent up to two-weeks later. A business briefing was also held to collect any specific business-related feedback.

5.2.2 Twenty seven written responses were received and are reported on in full in the separate BABA27 Group Feedback Report. The following summarises the key feedback themes from the BABA27 meeting and these written responses:

'On-Line' Suggestions

- A full package of junction improvements could have some merit with a 'smart A road' concept of using technology and signage to improve traffic conditions

- Any on-line improvements should avoid flyovers (to maintain place and setting) and turning restrictions (to maintain functionality of the area and local accessibility) but the separation of through and local traffic is important
- There were considerable concerns over the impacts of disruption during construction (especially to local businesses), particularly for on-line suggestions

'Off-Line' Suggestions

- Southern off-line routes have little support and were considered challenging to deliver because of limited land availability and negative environmental impacts, particularly on Chichester Harbour AONB
- There were split views on Northern off-line routes
  - A 'local' route was seen as being particularly difficult due to conflict with proposed housing developments and the impact on Portfield junction and local villages
  - Strategic northern routes are acknowledged to provide capacity and separation of through/local traffic, but would require significant mitigation of environmental and business impacts; there was some strong support and some strong opposition

'Modal' Suggestions

- The modal measures were generally supported as a vital part of the wider strategic solution as local traffic makes up a significant proportion of the traffic on the A27, but it was felt they will not address the issues of A27 on their own.

5.2.3 In considering any of the suggestions put forward, the key factors that stakeholders most frequently mentioned were:

- The separation of through and local traffic;
- Cost;
- Environmental impacts (including pollution and land take);
- Construction impacts;
- Accessibility; and
- Future proofing.

5.3 Other long-list community feedback

5.3.1 To check the acceptability of these long-list suggestions, a wider feedback exercise was also initiated via the Chichester Observer, the WSCC website, email response to the BABA27 inbox and collation of hard copy feedback.

5.3.2 The specific objective of this work was to get a broad community view on the long-list suggestions, particularly on the levels of support and suggestions for improvements or mitigations that might change that level of support.

5.3.3 In total, 3,798 responses were received via the Chichester Observer and WSCC online response forms, email and hard copy through the Chichester Observer. Responses received were checked for duplication by using IP addresses, email addresses and checking for identical text and these were removed from the analysis. The full analysis of this feedback is provided in the separate Community Feedback Report.

5.3.4 The key themes arising were very similar to feedback received from these other engagement exercises, as follows:

'On-line' Suggestions

- Flyovers and underpasses were the most supported on-line suggestions as they would enhance traffic flow and separate through and local traffic
- Underpasses were also seen to provide some environmental benefits in terms of reducing noise and air quality impacts, especially compared to flyovers
- Consideration of landscape and conservation in the design of flyovers and underpasses was seen as an important mitigation measure
- Support for other junction improvements on the current route was more mixed, with turning restrictions and signalised junctions receiving the least support because of their perceived impact on traffic flow and limits to accessibility
- Support for marginal network gains on the current route was also relatively limited, as respondents felt they would not be a long-term solution and would not fully address the problems of the A27
- Technology improvements on the current route were well supported because of their potential to enhance traffic flow and several respondents suggested they could be packaged with junction improvements to enhance their benefits
- The primary reasons for not supporting on-line suggestions were concerns about disruption during construction and that these suggestions would not offer a long-term solution to the issues on the A27

'Off-line Suggestions'

- Although there were divided opinions on the various new route suggestions that were put forward, there was marginally more support for a multi-purpose or strategic route to the north of the city because these would offer a long-term solution, separating through and local traffic and improving traffic flow. Many also commented that they would be easier and less disruptive to construct than improvements on the current A27
- However, many respondents expressed concerns about the negative impacts of northern routes in general, particularly on landscape and conservation. Many also expressed concern about environmental impacts, especially related to air and noise pollution, impacts on local residents and concerns about the costs of building a new road
- It was suggested that a new route could be cut-in to help mitigate landscape and environmental impacts. Many also made general comments about the need to consider landscape and the environment in the design and construction of these off-line suggestions
- New southern off-line routes were not well supported, with respondents expressing concern about environmental and residential impacts and the disruption during construction, cost of construction and negative landscape impacts
- A new local route to the north of the city received the least support because it was not felt to represent a long-term solution or offer separation of through and local traffic

'Modal Suggestions'

- Modal measures were generally supported as part of the wider strategic solution, but will not address the issues of A27 on their own
- Some felt modal measures could be packaged with other suggestions, such as a strategic bypass
- Of the modal measures, walking and cycling improvements were particularly well supported, as was encouraging the use of walking, cycling and public transport by working with schools, colleges, businesses and developers
- Bus and HGV priority at A27 junctions were the least supported of the modal suggestions. Respondents were concerned about the impact on the flow of general traffic and felt these measures would not be required if the overall issues of the A27 were addressed

5.3.5 In considering any of the suggestions put forward, the key factors that were most frequently mentioned were:

- The separation of through and local traffic;
- Enhancing traffic flow;
- Environmental impacts (including pollution and land take);
- Construction impacts;
- Landscape and conservation impacts;
- Feasibility and cost; and
- Delivering a long-term solution.

6. SIFTING TOWARDS A SINGLE OR LIMITED NUMBER OF PREFERRED CONCEPTS

Sifting from the 'long-list' towards a 'short-list', and ultimately to a single or limited number of 'concepts' has been based on our judgement of potential feasibility, the ability to address the critical success factors, Highways England's objectives, wider delivery challenges and community feedback, especially from the BABA27 group.

6.1.1 The long-list sifting focused on identifying those suggestions that we consider as offering the greatest delivery potential in meeting the key BABA27 requirements, and in principle meeting Highways England's objectives and wider delivery considerations.

6.1.2 Following the assessment, we have concluded that all interventions would have some challenges in meeting many or all of the requirements and that some could only progress with very strong environmental and wider mitigation measures in place.

6.1.3 The principal sifting out of the long-list suggestions included:

'On-Line' Suggestions

- 'Marginal gains' – this suggestion is unable to address the problems of the A27, other than in the immediate short-term, but considered in our 'scale-check' exercise noted below
- HGV priority – this suggestion was sifted out due to the inability to deliver additional physical space for HGV priority, and because it would be unwelcomed by the community if this would result in road space for other users being reduced. The application of 'Smart A-road' and new technologies may allow some virtual priority to be delivered in due course but this would rely on new technology being introduced
- Combined A27 junction to replace the Fishbourne and Stockbridge junctions and/or Stockbridge and Whyke junctions, including dumbbell arrangement linked to local distributor roads south of the new junction – this suggestion was sifted out due to land take requirements, environmental and visual issues and difficult 'tie-ins' with the existing road network
- Fully tunnelled alignment – this suggestion was sifted out due to very challenging engineering and because it is likely to be fundamentally unaffordable
- Fully elevated alignment – this suggestion was sifted out due to significant environment challenges with limited scope for mitigation, and because it is likely to be fundamentally unaffordable

'Off-Line' Suggestions

- New local 'south' route to the serve the Manhood peninsula (similar to the earlier Stockbridge Link Road) – considered to offer some reasonable transport benefits, but requiring funding that could otherwise be used to provide enhanced improvements on the A27 itself. This suggestion would help mitigate construction impacts on traffic to/from the Manhood Peninsula. The environmental impacts on Chichester Harbour AONB

would also be challenging as they would affect the setting of the AONB

- New 'south' route between near Fishbourne junction and the Bognor Road junctions, with possible extensions to near Tangmere – considered to offer some strong transport benefits, but at a much higher cost than other suggestions providing similar benefits, and with some significant engineering and environmental challenges. Based on the earlier RIS1 option 6 assessment, a relatively poor benefit to cost ratio, and 'value for money' case
- New 'north' route for local traffic (including part provision both to the east and west of the Lavant Road) – this suggestion was assessed as not addressing the key requirements of separating through and local traffic, adding significant pressures at the Portfield junction and/or other local routes, and conflicting with the development proposals to the north-east of Chichester
- Upgrading of existing minor routes on the Manhood Peninsula – this suggestion was considered as not addressing any of the main challenges of the A27 and potentially having significant adverse impacts on local communities, especially in encouraging use of goods vehicles
- Active use of city centre road capacity – this suggestion was considered as unacceptable in policy terms, being contrary to the protection of the historic city centre, the established road hierarchy and the AQMA designations. It was considered to generate significant adverse transport and congestion impacts both around the city centre and on all approach routes
- Fully or largely tunnelled route - this suggestion was considered very challenging in engineering terms, potentially in environmental terms in any above-ground approach routes, and also considered to be fundamentally unaffordable. But we have considered it in our 'scale-check' exercise below

6.1.4 In sifting our suggestions further, we are clear that our 'modal' suggestions can only make a contribution to addressing the problems of the A27, and this view was general shared by the community through BABA27 group and wider feedback.

6.1.5 Delivery of a range of these modal suggestions, considered in detail in Appendix B, is strongly recommended, in part to maximise the benefits created by changes in traffic flows and congestion and because a significant proportion of traffic is 'local'. The development of a wider Chichester Transport Package is considered in further detail later in this report, noting that delivery would be largely dependent on funding sources other than Highway England's RIS2 programme.

6.1.6 Many of the issues we identified in our sifting assessments were confirmed through the 'long-list' feedback provided through the BABA27 group and with supplementary stakeholder engagement routes, including the business briefing and wider community feedback exercise.

6.1.7 This sifting led to two preferred suggestions emerging – one in the 'north' using a new off-line route and the other based on significant improvements to the existing A27 in the 'south'.

6.1.8 Both were considered to be deliverable and would meet most of requirements of the BABA27 group, accepting that unanimous community consensus would be unlikely. Both suggestions, in 'concept' form, were also considered to deliver against Highways England's objectives and our wider delivery considerations.

6.1.9 Given the timescale pressures, it must be acknowledged that these concepts would, by necessity, require significant further work to confirm alignments, detailed engineering and mitigation provision, as well as an option-specific economic assessment. As noted above, Highways England were content with considering this 'concept' level of detail at this time in advance of finalising the RIS2 programme submission requirements, and are fully aware of the requirements for moving from this concept stage through to the level of design work needed to support a funding application and, if approved, to receive planning powers under the Development Consent Order (DCO) processes.

6.1.10 In order to ensure our emerging concepts were to be at the right scale to address the requirements of BABA27 and Highways England, the concepts have been framed within a wider range of short-list suggestions from the less ambitious 'marginal gains' to combined options or tunnelling alternatives.

6.1.11 This relatively simple framing exercise considered the scale of both costs and benefits between the following:

- 'Marginal gains' – largely those enhancements in the network configuration to support the Local Plan developments
- A new strategic 'off-line' route to the north of Chichester to fully separate local and through traffic
- A full set of 'on-line' improvements configured to separate traffic and address earlier concerns with the RIS1 consultation options
- Combined investment in both 'off-line' routes to the north and significant improvements on the existing 'on-line' A27 in the south
- Very ambitious tunnelling options to separate through and local traffic and limit environmental and landscape impacts.

6.1.12 This review process confirmed that the measures supporting the delivery of the Local Plan lack the ambition of BABA27 and ability to address the problems of the A27, other than in the immediate short-term. It was noted that any 'marginal gains' are only focused on mitigating any impacts of additional development pressures, rather than attempting to address any of the underlying traffic issues on the A27 and wider networks.

6.1.13 At the very ambitious end of the framing exercise, a combined investment in both 'north' and 'south' concept proposals would significantly improve capacity of the transport network, for businesses, private vehicles and use by buses, cyclists and pedestrians. Whilst providing opportunities to significantly mitigate long-term traffic impacts and support to additional development pressures and the local economy, this 'double' investment would be fundamentally unaffordable.

6.1.14 Similarly, the more ambitious full tunnelling suggestion would address the key through traffic success factor and potentially reduce some of the environmental impacts of the other suggestions, though would potentially create other

environmental and heritage issues, and would again be fundamentally unaffordable.

6.1.15 Therefore, we have focused our more detailed assessment on two ‘concepts’ - a new strategic north ‘off-line’ route and a full set of improvements to the ‘on-line’ route of the existing A27.

7. PREFERRED CONCEPTS

Highways England has advised that for a scheme to be successful in securing a place in RIS2, any new concepts would need to be different from the options presented for consultation in 2016 and also that there is local consensus on the way forward. This is challenging as no single suggestion from our short-list can address all the local and wider requirements for investment, and within the timescale constraints for consideration in RIS.

The very tight window of opportunity to get an A27 scheme into the RIS2 programme is challenging, and has meant that full details of the alignments, routes and design for our concepts is not available. Our concept specifications have, however, moved the earlier RIS scheme options significant forward by addressing many of the community concerns expressed earlier, and thereby helping to meet Highways England's requirement for the proposals to be 'different' from RIS1.

7.1.1 Highways England has been clear that any new scheme for the A27 needs to be 'different' from earlier RIS1 proposals, primarily in what is to be delivered and to address community consensus. The strong suggestion for a different 'concept' and the RIS2 timescales provides a real challenge in further sifting from the short-list suggestions.

7.1.2 As noted above, through our assessments of the short-list suggestions across the wide range of success factors, wider considerations and community feedback, we have not been able to develop a single concept that we can recommend to WSCC, CDC and the local MP. Whilst the lack of a single concept to emerge may be seen as somewhat disappointing, each of the two concepts carry different risk profiles, including engineering, cost and mitigation uncertainties, compliance to the BABA27 guiding principles and wider community feedback.

7.1.3 Our two concepts are configured to significantly progress the options developed for RIS1. They address many of the key concerns with both the options set out in the formal RIS consultation and the earlier routes that were assessed as part of this RIS1 process but not taken forward into the consultation. Our two preferred concepts are:

- **'Mitigated North' Concept**. A new strategic 'off-line' route to the north of Chichester to fully separate local and through traffic, and delivered with a strong focus on mitigating visual, environmental and business impacts as much as possible through innovative engineering and environmental solutions, and ways of working to reduce business disruption during construction
- **'Full South' Concept**. A full set of 'on-line' improvements configured to separate traffic and address earlier concerns with the RIS1 consultation options, including a strong focus on mitigating visual and environmental impacts, maintain accessibility and connectivity, and to reduce community severance, again drawing in innovative engineering solutions and ways of working to partially mitigate disruption during construction.

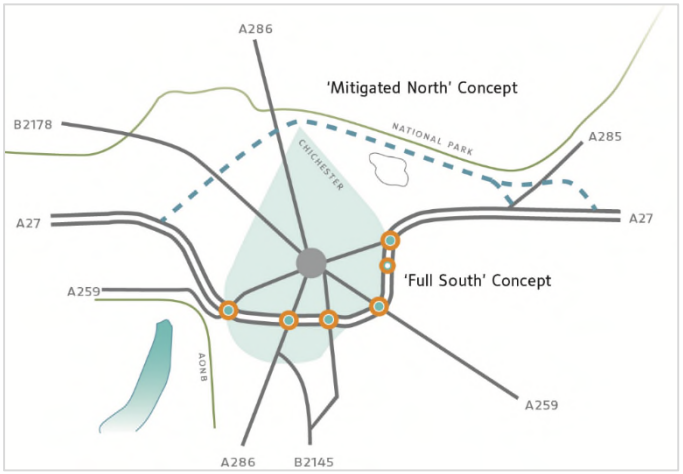
8. TWO CONCEPTS – 'MITIGATED NORTH' AND 'FULL SOUTH'

The two concepts for a 'mitigated' northern route and a 'full' improvements to the existing A27 both have strong merits in some areas, but a range of real challenges in key delivery areas. By being more ambitious than the earlier RIS1 scheme options, both have increased costs, but will deliver increased benefits.

8.1 Concept Specification Summary

8.1.1 Figure 4 provides a summary of the outline route alignment for our 'Mitigated North' and 'Full South concepts.

Figure 4. 'Mitigate North' and 'Full South' Concept Route Alignments



8.1.2 The following summary specification sets out the key 'design' components of each concept. We consider that both are feasible, although they have some key engineering, environmental and wider challenges to overcome. The concepts can be delivered with significant mitigation measures; indeed, mitigation measures are essential to address many of the concerns expressed by the community with the earlier RIS1 proposals.

8.1.3 Whilst we believe both concepts lie within a reasonable funding envelope for the scale of the benefits, both will cost more than the earlier RIS1 proposals and will require a larger funding allocation in the RIS2 funding round than was allocated in RIS1. The additional funding is needed to deliver the outcomes that Highways England are seeking in an environmentally sensitive (both natural and built environment) location where a high standard of design and environmental mitigation is necessary to make the scheme acceptable. However, despite potential increases in costs, increases in benefit delivery and the strengths of the underlying economic cases suggest that both concepts will maintain benefit to cost ratios that support a value for money case that meets or exceeds Highways England's minima.

8.1.4 Following a summary of the concept specifications, we provide additional detail on key elements of the concept specifications, including both mitigations and engineering issues. These sections of the report provide a review of potential design issues that will need to be addressed through more detailed work. This does not provide a full engineering or environmental design specification, but highlights a number of areas where the earlier RIS1 work could be developed further in response to specific issues raised through the RIS1 consultation and the BABA27 process.

‘Mitigated North’ Concept

New strategic northern route with free-flow junctions with the existing A27 and significant mitigation of environmental impacts

‘Mitigated North ‘Concept - specification

- Feasible dual carriageway routes following the RIS1 routes (Highways England options 4 and 5) exist, with the potential for tactical variants or alternative routeings to be considered, including the main route and at the ‘tie-in’ points with the existing A27
- Principle of using vertical alignments to sink carriageways below ground level in sensitive locations. Extensive use of ‘green bridges’ to maintain views, place and setting, especially around Lavant and the Goodwood Estate
- Strong use of other mitigations, including ‘living walls’, noise barriers, noise reducing road surfacing, and low level and directional lighting
- Consideration of a junction at A286. Not providing a junction will allow better opportunities for mitigation and avoid major changes to access routes into the city, but would limit some local connectivity
- Provision of ‘smart A-road’ technology and variable message signing to provide driver information and maximise operational efficiencies, including advice on use of diversionary routes, including the existing A27
- Local road closures, primarily New Road
- Need to maintain Goodwood operations and strongly mitigate impacts of construction works on day-to-day operations, events and the setting of the estate.

‘Full South’ Concept

Major works at all six junctions on the A27 reducing potential visual impacts and maintaining connectivity

‘Full South’ Concept - specification

- Provision of ‘through’ dual carriageway route following the A27 and building on some of the components of the earlier RIS1 options at junctions. Refinements and/or new junction designs to address key concerns identified during the RIS1 consultation process and through BABA27
- Underpasses at Fishbourne and Stockbridge and landscaping to reduce visual intrusion and severance, whilst maintaining full connectivity and turning movements
- Flyovers at Whyke, Bognor Road, maintaining most/all turning movements
- Partial closure at Oving (cf Shopwyke development)
- Flyover and remodelling at Portfield to allow free-flow ‘through’ movements (cf Shopwyke development)
- Provision of ‘smart A-road’ technology and variable message signing to provide driver information and maximise operational efficiencies
- Engineering challenges may require land take for slip-roads to maintain local connectivity. Likely need for works on the canal (move or sink)
- Maintain connectivity, journey times and reliability as best as possible to minimise impacts on businesses, residents and tourist accesses, including to the Manhood Peninsula
- Tactical realignment of carriageways may help in long-term and in mitigation of construction impacts

8.2 Potential Impact Mitigations

Strong mitigation measures are essential components of our concepts. But mitigation can be costly and there is a risk of 'value engineering' to save money. This cannot happen with our concepts, although some compromises below 'gold-standards' may warrant consideration in some of the less sensitive locations with either concept.

8.2.1 Mitigation of key visual, noise and wider environmental impacts is an essential and integral part of our concepts, in part to address some of the key concerns raised during the earlier RIS1 processes, including at formal consultation stage.

8.2.2 In the context of the A27, these integral mitigation measures will be required to primarily offer a retention of 'place and setting'. This applies both for elements of the 'Mitigated North' concept in looking to protect the views and sense of place for countryside and setting of the National Park north of Chichester, and for the 'Full South' concept in ensuring the visual impacts of improvements at the Fishbourne junction do not impact on the setting of the Chichester Harbour Conservancy Area of Outstanding Natural Beauty (AONB) and in the community setting at Stockbridge junction to avoid visual and physical severance.

8.2.3 There are numerous mitigation measures that could be used to address these impacts, and in the following section we provide a number of examples that could be deployed, particularly in respect of our 'Mitigated North' concept. Alongside these examples, we have provided an indication of where these techniques could be deployed as part of our concept alignments, although detailed engineering and environmental design and feasibility work would be required to confirm applicability.

8.2.4 Although some mitigations may be costly to deliver, the strong mitigation of key environmental and wider impacts is essential to progress with our concepts. 'Value engineering', a systematic method to improve 'value' relative to 'cost' , may be a useful check on whether opportunities exist for improving the function of the mitigations identified relative to cost, but should not be used to merely save money by downgrading the value of any potential mitigations.

8.2.5 Our examples here comprise of:

- 'Green land bridges' (with or without sunken carriageways)
- Cut and cover tunnelling (extended green bridges)
- Living walls and vertical gardens
- Noise barriers and bunds
- Noise reducing road surfaces
- Low profile and directional lighting.

Green Land Bridges

8.2.6 Of key interest in respect to 'green land bridges' is the A21 Lamberhurst Bypass. This is a 40m wide 'green bridge' approach to the National Trust's Scotney Castle over the A21 dual carriageway along the ridge stretching east-west across the AONB.

8.2.7 The land bridge has successfully maintained the Scotney Castle access along its historical line as well as visually linking retained woodland planting and providing a wildlife corridor over the bypass. However, it has been acknowledged (in the Highways England Post Opening Project Evaluation) that within an AONB, there has been an adverse impact on the area's high quality landscape, noting that earth mounding and new planting provided will, in time, screen vehicles using the bypass.

8.2.8 Applicability – Mitigated North Concept - around A286 Lavant (especially applicable if no intermediate junction is provided) and on the Goodwood estate, especially in maintaining place and setting between Goodwood House and Motor Racing Circuit.

Figure 5. Lamberhurst Bypass Green Bridge (Fira Landscape Architecture)

Figure 6. Lamberhurst Bypass Green Bridge (Fira Landscape Architecture)

Figure 7. Lamberhurst Bypass Green Bridge (Fira Landscape Architecture)

8.2.9 The Bell Common Tunnel on the M25 was built in cut-and-cover technique and has been restored to maintain wildlife and other connectivity, including providing a restored cricket pitch.

Figure 8. M25 Bell Common Tunnel – Costain (CIHT Award for Major Projects)

Green Bridges and Sunken Roads

8.2.10 Other non-UK green bridges include examples from Holland, such as the use of sunken carriageways, similar to those that could be used to mitigate impacts around Lavant and immediately to the north of the Goodwood Motor Racing Circuit in maintaining place and setting. These examples are configured to maintain an eco-corridor route in North Brabant Province, Holland, and using an 'eco-aqueduct' over a 'sunken' motorway on the new A4 in Holland.

Figure 9. Eco-corridor route in North Brabant Province, Holland (Google)

Figure 10. 'Eco-aqueduct' over 'sunken' motorway on the new A4 in Holland (Google)

Living Walls and Vertical Gardens

8.2.11 In additional to horizontal green mitigations, vertical designs can be used to improve visual impacts as well as having secondary benefits in reducing noise transfers and improving air quality; one of the key drivers for the Mexico City 'vertical gardens'.

8.2.12 Three examples are provided below: Brisbane Airport Link Green Wall (Deicke Richards), Willmot Dixon, Southampton (Biotecture), and alongside the 'Via Verde' initiative in Mexico City that features around 60,000m^2 of vertical gardens to address pollution and visual impacts of overpasses (New Civil Engineer).

8.2.13 Applicability – Mitigated North and Full South Concepts where retaining walls and overbridges or/flyovers are required.

Figure 11. Brisbane (Deicke Richards) & Southampton (Biotecture)

Figure 12. Overbridges Example (New Civil Engineer)

Noise Barriers and Bunds

8.2.14 A range of readily available commercial noise barriers are available, including two examples here; the EcoSoundBlok® noise barrier - earth bund alternative and GreenSoundBlok® - acoustic barrier.

8.2.15 Applicability - Mitigated North and Full South Concepts – where noise and headlight mitigations are required

Figure 13. Noise Barrier and Bund Examples (Gramm Barrier Systems)

8.2.16 In addition to these noise barriers, there are examples of combining barriers with photovoltaics to provide screening and a local power generation source. Although one of the first applications of this technology was in 1989, enhancements in technology have increased the efficiency of electricity generation via solar sources.

8.2.17 The photovoltaic noise barrier used alongside the A13 motorway was recently renewed with three times original output and the 800m^2 barriers provides power for 92 homes.

8.2.18 Traditional wooden, concrete or planted noise barriers are available, although various suppliers offer a range of clear acrylic, polycarbonate or similar noise barriers that can be finished in a number of ways, including coloured, translucent, inclined or wrapped styles.

Figure 14. Clear Acrylic and Photovoltaic Noise Barrier Examples (Gramm Barrier Systems Fanzun, Architects and Engineers)

8.2.19 In addition to the potential visual and noise reducing properties of these mitigation measures, thy can have direct air quality benefits with the absorption properties of planting being able to reduce near-road concentration of pollutants. However, care needs to be taken in implementation to ensure barrier design does not result in road surface pollutant levels being too concentrated.

8.2.20 There has been much interest in developing innovative and creative design solutions, including using new materials. The following two examples are design concepts from the Open Hong Kong Government International Competition for Noise Barrier/ Enclosure, with designs from the two finalists shown; BREAD Studio and ESKYIU architecture.

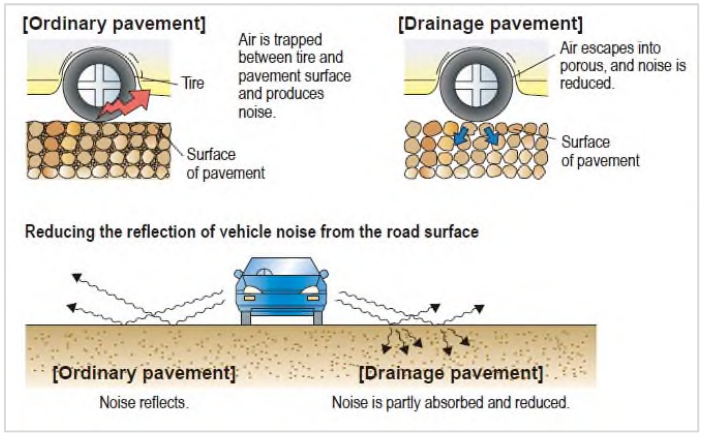
Figure 15. Hong Kong Forest Corridor Design - BREAD Studio

Figure 16. Hong Kong Forest Corridor Design - ESKYIU architecture

Noise reducing asphalt

8.2.21 The interface between vehicle tyres and the road surface generates noise, with the properties of the surface impacting the extent of noise generation. A number of low-noise road surfaces are available in the UK market based around porous or permeable asphalt. However, these products tend to have higher on-going maintenance costs that will also need to be considered alongside the benefits.

Figure 17. Noise Reducing Asphalt



Source: https://www.hyd.gov.hk/en/publications_and_publicity/publications/technical_document/guidance_notes/pdf/gn011c.pdf

8.3 Concept Design Issues

8.3.1 This commission was not intended to develop detailed designs for our concepts and Highways England is comfortable that the level of detail being considered is acceptable for the current development stage for any RIS2 proposals.

8.3.2 However, it is accepted that both concepts need to be deliverable in engineering terms. Based on much more detailed work supporting the RIS1 assessments, it is known that engineering feasibility exists for our concepts, either in full or in part.

'Mitigated North' Concept

8.3.3 For our 'Mitigated North' concept, the earlier RIS1 work developed a feasible design for a dual carriageway route to the north of Chichester, including free-flow junctions with the existing A27 west of the Fishbourne junction and around Tangmere.

8.3.4 Therefore, we know that, in engineering terms, a route for our concept exists. The work underpinning the RIS1 assessments was extensive and, in addition to design work, also included economic and environmental appraisal and other supporting information required for public consultations. This work included route alignments considered as the RIS1 options 4 and 5 that were not taken forward to consultation, but also earlier work in developing these preferred routes.

8.3.5 Our 'Mitigated North' concept could, therefore, follow either option 4 or 5, or some other earlier Stage 1 options A to D. Other 'tactical'/minor variants or alternative routeings could be undertaken in some locations to maximise the opportunities to mitigate impacts and/or trade-off engineering feasibility, designs and costs.

8.3.6 Alternative routeings may also existing at the 'tie-in' points with the existing A27. For the RIS1 options 4 and 5, free-flow designs were developed and would be feasible. Whilst these free-flow junctions are considered as an integrated component of our concepts, it is possible that alternative lower cost solutions may need to be considered during further RIS2 development in assessing 'next-best' or 'lower cost' alternatives to the preferred concept.

8.3.7 Integral to this concept is a presumption that, where possible, and especially in the open vistas around the Lavant Road and the Goodwood Estate, the vertical alignment for any road carriageways is reduced below ground level. This broadly follows the assumption of the RIS1 options (for example to reduce the road level 6-metres below ground at the Goodwood Motor Racing Circuit), but we suggest the opportunity is taken in further design work to demonstrate that this would adequately mitigate the effects on landscape and the Goodwood estate by screening the road from view. Through added use of 'green bridges', 'living walls' and noise barriers, human and wider ecological connectivity can be maintained, with the 'sense of place' and views being retained.

8.3.8 Other mitigation measures may be required elsewhere on the alignments, depending on the alignment adopted, for example in reducing the impacts on the Sennicotts estate to west of Chichester were a more developed route to follow the earlier RIS1 option 4.

8.3.9 In the following sections, we identify a number of key engineering or design considerations relating to the concept, and in particular to new junction provision and potential mitigation measures.

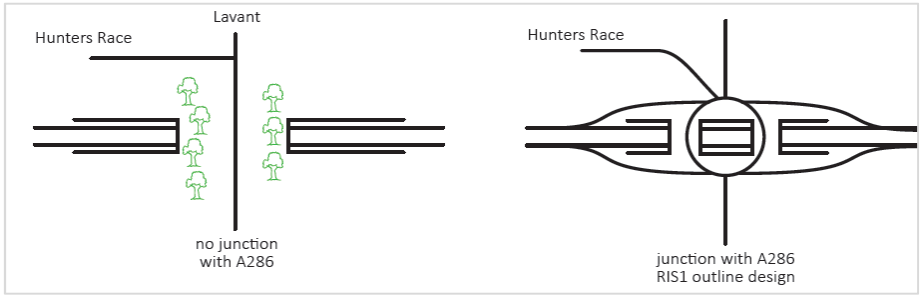
8.3.10 **A286 Junction**. The earlier RIS1 work assumed that a junction would be provided on the A286 north of Chichester. For our concept, it is not clear whether a junction should be provided in this location. Careful consideration should be given to understanding the balance between transport connectivity benefits (and potential traffic redistribution impacts), environmental impacts and potential cost savings by not providing the junction.

8.3.11 In transport terms, a junction with the A286 would provide some enhanced connectivity between the A286 (Midhurst)/B2141 (Petersfield) and the A27 for both eastbound and westbound traffic allowing such journeys to avoid travelling through Chichester. This would also allow those in the north of city to access the A27 more easily. However, a junction would also provide a new route into Chichester and could result in fundamental changes to access routes into the city, which itself could put some different and challenging pressures on the local road network, particularly the Northgate gyratory, and potentially on Spitalfield Lane in accessing the commercial activity to the east of the city.

8.3.12 The environmental challenges associated with the provision of a junction on the A286 are linked to the land take required for the footprint of the junction, including; slip roads, the need for lighting, and, as mitigation in such circumstances is very difficult, to the impact on the setting of Lavant and views both to and from Chichester and the South Downs.

8.3.13 The use of a lowered vertical alignment for the concept route with a green bridge on the A286, rather than a junction itself, is illustrated in concept terms in Figure 18. Here, it should be possible to maintain the sense of place of Lavant and retain the north-south views along this ridge.

Figure 18. 'Mitigated North' concept with and without A286 junction



8.3.14 Whilst both the 'with junction' or 'no junction' would be likely to have an impact on the Centurion Way footway/cycleway, the 'no junction' green bridge configuration would provide an opportunity for a car/junction free routeing, albeit at an elevated level compared to the current former rail alignment (which itself varies in height from the original trackbed south of Hunters Race). We note that other sections of Centurion Way are subject to

potential re-location due to Local Plan developments at Whitehouse Farm.

8.3.15 Our suggestion is therefore that no junction is provided. This will allow for a fuller environmental mitigation of the main concept alignment, using a suitable 'green bridge' to maintain the setting and views to/from Lavant, potentially saving some engineering costs and avoiding the potential impacts of major re-routeing of traffic accessing Chichester centre (and eastwards towards Portfield junction via Spitalfields Lane).

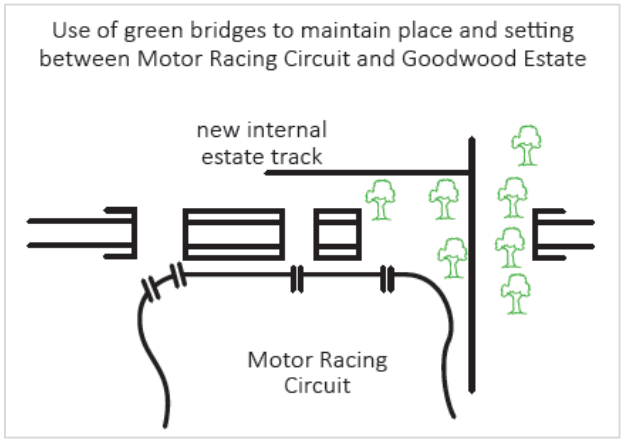
8.3.16 **Goodwood Estate 'Green Bridge' mitigation measures**. It is clearly essential to maintain connectivity with the Goodwood estate. This is both in terms of physical connectivity, during event set-up, whilst events are taking place, and in 'take-down' phase, but also in the sense of place and experience of the wider Goodwood environment.

8.3.17 An un-mitigated ground level major road being developed through the estate would be clearly unacceptable to the business, with major impacts on the environment, the estate and the 'Goodwood experience'. A part-mitigated approach may reduce some of the business impacts, but central to this mitigated concept is retaining the sense of place for the key part of the estate and connections between the Motor Racing Circuit and Goodwood House, the Goodwood Hotel and other facilities.

8.3.18 Extensive use of green bridges in the vicinity of the Goodwood Estate should maintain the sense of place and experience of the estate by providing desire lines, sight lines and views and retaining key links. Using the existing or new internal estate tracks, connectivity should be maintained (to replace any use of New Road between Claypit Lane and Fordwater Road).

8.3.19 With New Road closed, a green bridge running between Gate 12 and Claypit Lane (around 300m wide) could improve north-south connectivity between the estate and circuit by reducing some of the current barrier imposed by New Road. Similar green bridges could be provided to maintain access to Gate 11 and Gates 9/10 (or ordinary bridges where access gates are purely for servicing), for Westhampnett bridleway and further east to maintain the views to New Barn Hill in accessing the Goodwood Hotel. The use of green bridges in this vicinity is illustrated in concept terms in Figure 19.

Figure 19. Green Bridge Mitigations on the Goodwood Estate



8.3.20 **Goodwood Motor Racing Circuit Junction**. Although not part of the RIS1 route options, the feasibility of providing a new junction to directly serve the Goodwood Estate may initially appear to be

feasible (and was suggested through the BABA27 process). This is not recommended as part of this concept.

8.3.21 A new junction to serve the Goodwood estate would require additional land-take, generate adverse environmental impacts in providing slip roads and associated lighting, and would significantly increase delivery costs. The provision of a 'full-time local' junction in the area would not be desirable to handle the very low local traffic flows during non-event periods, and could be challenging to handle major event flows as there would be limited opportunities to manage and distribute visitor traffic to parking locations. A 'local' junction would potentially generate safety concerns related to queueing traffic accessing the area backing up and interfering with 'through' traffic.

8.3.22 **Impacts during construction**. In developing a new off-line improvement, the potential transport disruption to the existing A27 will be small, and generally limited only to the works required at the 'tie-ins' with the existing road. Some further relatively minor local disruption would occur to B2178 near Broyle, the A286 Lavant Road and the A285 near Tangmere, as well as local issues with Hunters Race depending on route alignments, and New Road which would need to be closed permanently. Construction Management Plans will be required to manage any disruption, with an assessment of the economic costs integrated into the cost benefit assessment, although earlier RIS1 work suggests this would be very small in relative terms.

8.3.23 It is inevitable that some environmental impacts of construction works will be apparent to local residents and others in the immediate vicinity. Issues could include visual, noise and other impacts such as dust, however, with carefully configured Construction Management Plans, and specifically Construction Environmental Management Plans, significant mitigation should be possible.

8.3.24 Business disruption of construction works could be possible during the build period. Concerns have been expressed by the Goodwood Estate, on behalf of themselves and others, that access restrictions and the impact on construction works on the 'setting' of the Goodwood operations, could compromise their operations.

8.3.25 It is inevitable that some impacts of construction works will be apparent in affecting the 'sense of place' for the Goodwood Estate and specifically the linkages between the motor racing circuit and Goodwood House. However, with carefully configured management plans, significant mitigation should be possible, including innovative ways of working in, for example, the delivery of a sunken carriageway on the northern edge of the circuit.

8.3.26 The proposed use of wide green bridges along the alignment route should allow ways of working that provide for continued access to be maintained throughout, for example progressing moving temporary access roads whilst the main carriageways are built. Also, with careful scheduling of works in between the Goodwood events (allowing for set-up, the event itself and take-down) it should be possible to mitigate physical impacts on business operations allowing full calendars to be maintained.

8.3.27 **'Next Best' or 'Lower Cost' scenarios**. As part of any further RIS2 assessment work required on this concept, lower cost variants

will need to be developed to test the robustness of the case for the 'core' scheme and to provide a view of feasibility for alternative scheme variants if the funding envelopes suggest the 'core' proposals are unaffordable.

8.3.28 We are clear that some 'value engineering' may be possible to reduce scheme costs in identifying any lower cost variants. However, reducing the scope or effectiveness of the strong mitigation measures essential to this concept cannot happen as they are core requirements for this concept to be accepted. It may be necessary to make some compromises below 'gold-standard' for some of the possible mitigations, and innovation may help, but the green bridges and other mitigations are essential to reduce the otherwise potentially significant environmental impacts of this concept.

8.3.29 Although there is limited scope for significant reductions in the costs of this concept, some opportunities do exist, primarily around junction provision:

- No provision for a A286 junction on Lavant Road (as above)
- Value engineering the A27 tie-ins, including lower speed designs to reduce engineering requirements
- Reduced speed alignments, primarily in vertical alignment terms although some slower-speed horizontal alignment changes may be feasible.

8.3.30 Further, much more extensive, work will be required for the development of the 'Mitigated North' concept through to detailed design, including to confirm both horizontal and vertical alignments and the extent and nature of possible mitigations.

'Full South' concept

8.3.31 Our 'Full South' concept is based on the premise of addressing many of the key concerns expressed of the earlier RIS1 options that were consulted on by Highways England, including both the formal consultation feedback and through the BABA27 processes.

8.3.32 The primary components of the 'Full South' concept are junction improvements along the current A27. In addition, some realignment or new construction of the road links between junctions may be necessary to obtain suitable alignments as well as some changes on the access roads.

8.3.33 In principle, the concept will reduce the visual intrusion and severance of junction improvements at Fishbourne and Stockbridge, maintain local connectivity throughout, and expand works to the Oving and Portfield junctions to cover the full route of the A27 around Chichester, rather than the four junctions that were considered in the RIS1 consultation.

8.3.34 In the following sections, we identify a number of key engineering or design considerations relating to the concept, in particular some of the challenges in both mitigating visual impacts and severance, whilst also maintaining connectivity, and in the potential impacts during construction.

8.3.35 In this review of potential engineering feasibility, we can draw on individual components of the earlier RIS1 options 1, 2 and 3, and their variants. At the Bognor Road junction some of the RIS1

designs are suitable for our 'Full South' concept, including the flyover designs for Options 1, 1A, 2, 2A and 3A.

8.3.36 **Fishbourne junction**. The concept for this junction is to provide an underpass to minimise the potential visual impacts of the earlier RIS1 flyover options (1, 1A and 2) whilst also maintaining full connectivity to all current access links and turning movements.

8.3.37 The RIS1 proposals identified at least one feasible flyover option, using retaining structures to provide the elevation for the A27 to pass over a remodelled roundabout, including some small realignment of the A259 west and diverting Terminus Road onto Cathedral Way.

8.3.38 At this stage in the development of this concept, it appears that a underpass variant of the RIS1 design could be feasible in this location requiring broadly the same footprint for the junction. It is possible that there could be some issues with the underlying water levels that may affect engineering designs and longer-term maintenance that may require pumping. In taking the A27 alignment under current ground level, there may be an opportunity to improve the horizontal alignments by slightly moving the main carriageways, in part to mitigate construction work (as considered in outline later in this section).

8.3.39 The resulting underpass design for the Fishbourne junction would therefore mitigate all or most of the visual impacts of the earlier RIS1 proposals, including both the hard engineering of the A27 flyover and any associated lighting on the overbridge. Full connectivity would be maintained, although, as with the RIS1 design options, some changes to the access arrangement on Terminus Road may be required (in part driven by safety concerns with current roundabout arrangements).

8.3.40 **Stockbridge junction**. The concept for this junction is to provide an A27 underpass to separate through traffic whilst also minimising the potential visual and local severance impacts of the earlier RIS1 flyover option 2. The concept will also maintain full connectivity by retaining all turning movements (which were removed entirely in RIS1 option 2 or limited in options 1, 3 and 3A). Addressing these three requirements in this very constrained site will be a significant engineering challenge, especially when combined with the nearby alignment of the Chichester Canal.

8.3.41 For this concept, we are clear that there needs to be a grade separation of the A27 from north-south traffic between Chichester and the Manhood Peninsula, and that this should be done in a way that reduces the visual intrusion to the local community and reduces the potential severance of elevated structures (RIS1 options 2). By doing so, it should be possible to maintain the sense and place and community connectivity to the north and south of the A27. Ideally, this connectivity would be at the current ground level, but, as considered later, some modest elevation may be required due to the constraints of the Chichester Canal.

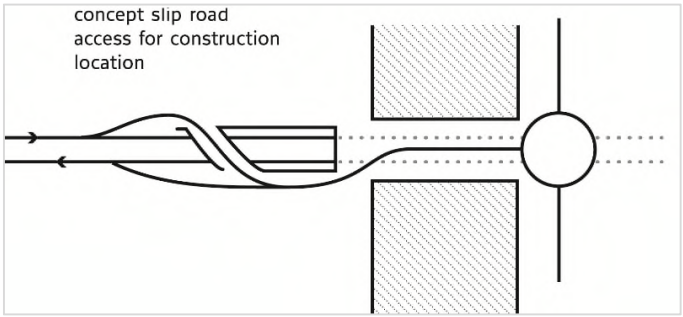
8.3.42 Whilst the Stockbridge roundabout may be relatively large, the A27 and A286 corridors are both constrained and offer limited scope for the provision of a traditional grade separated junction. These constraints are clearly demonstrated in the lack of earlier

RIS1 option for such a configuration. However, it is clear from the responses to the RIS consultation and through BABA27 that maintaining turning movements is a key requirement at this junction as this is a major access point from the Manhood Peninsula for agricultural traffic and for tourism. To maintain all turning movements will require compromises, with some land-take most likely to provide sufficient space for access slip roads.

8.3.43 In concept terms we have identified two potential approaches to maintaining full connectivity that we believe could be deliverable, as shown in Figure 20 and Figure 21. Further outline design will be required to confirm that such arrangements could be feasible at Stockbridge junction, including firmer alignments and other design issues, such as perhaps lowering design standards, in terms of number of lanes on slip roads. In both of these cases, and with any other alternative concept design that could be developed, costs are likely to be significantly higher than those considered in RIS1, though with higher benefits as connectivity is maintained.

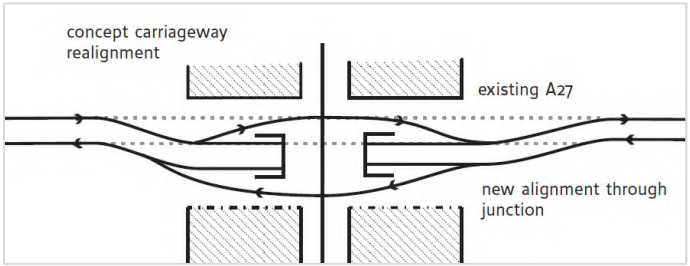
8.3.44 The first of these concepts is based around minimising land-take at the Stockbridge junction but would requiring widening of the A27 alignment away from the junction to provide slip roads. This concept may not be a feasible approach to the east due to constraints with the Chichester Canal.

Figure 20. Stockbridge Junction – Concept Junction and Slip Road Approaches (1)



8.3.45 For the second concept it is most likely that some land-take will be required to enable slip roads to be provided, either to the north, south or both north and south; our figure illustrates a carriageway realignment to provide slip road access.

Figure 21. Stockbridge Junction – Concept Junction and Slip Road Approaches (2)



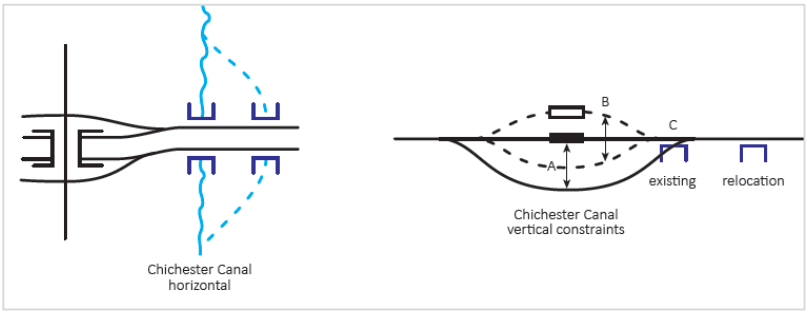
8.3.46 A further complication at Stockbridge is the proximity of the Chichester Canal being just over 200m from the junction. This could place some constraints on the vertical alignment through the junction that could require some variations in alignments of both the concept A27 underpass and the A286, and/or movement

of the canal further east or lowering the level of the canal. The challenges and potential approaches are illustrated in Figure 22.

8.3.47 The first diagram identifies the location of the A286 and the A27 crossing the canal. The second shows the potential conflict between an underpass at Stockbridge and the location of the canal. Outline and detailed engineering design work needs to be undertaken to determine if height 'A' under the A286 can be achieved to meet the required design standards in the distance available between the junction and the canal. If not, it might be possible to slightly elevate ground levels around Stockbridge (without losing the sense of place and community connectivity required by this concept) to provide sufficient height for the A27 underpass.

8.3.48 Alternative approaches could include relocating the canal further east or reducing the canal level through a double lock approach. The latter, not favoured approach, could potentially impact on the recreational amenity of the canal, particular for boat operators and other watersport users.

Figure 22. Stockbridge Junction – Issues with Road Levels and the Chichester Canal



8.3.49 In removing the though traffic on the A27 from Stockbridge, an opportunity will be created to enhance north-south cycling and pedestrian connectivity by reducing traffic levels in the area and permitting a newer, safer roundabout or traffic signals designs to manage slip road flows accessing the A286.

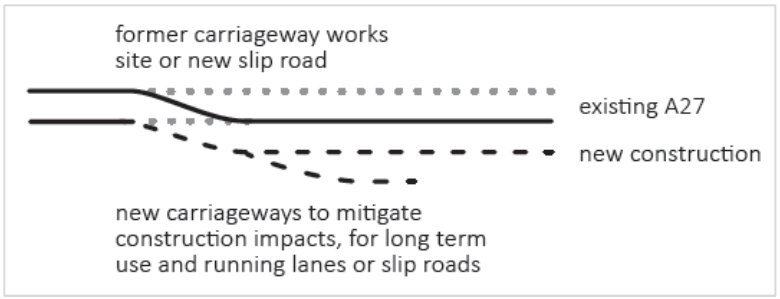
8.3.50 **Whyke Junction**. The concept for this junction is to provide an A27 flyover to separate through traffic whilst also maintaining full connectivity through retaining all turning movements, which were removed entirely in RIS1 option 2 or limited in options 1, 3 and 3A. As with the Stockbridge junction, addressing these requirements will be a significant engineering challenge, especially given the proximity of nearby properties to the north and Ivy Lake to the south-east.

8.3.51 For this concept, we are clear that there needs to be a grade separation of the A27 from north-south traffic between Chichester and the Manhood Peninsula, and maintenance of all turning movements to, from and across the A27. Similar to Stockbridge, the constraints make providing both separation and connectivity challenging.

8.3.52 Ideally, to maintain connectivity and ease of access for pedestrian and cyclists, particularly to the new Chichester Free School, level access would remain feasible (noting that at present pedestrians can use the new elevated footbridge over the A27) suggesting that the A27 is elevated at this junction, although engineering feasibility may suggest that best solution is for the B2145 to be elevated.

8.3.53 Whilst elevation of the B2145 would be similar to the RIS1 option 2, the need to maintain turning movements will require design changes, including potentially relocating the main A27 carriageway slightly south of the existing alignment, as illustrated in Figure 23, but also with some additional land take in providing slip roads and requiring some encroachment into Ivy Lake.

Figure 23. Carriageway Realignments to Provide Space for Slips Roads/Works Sites



8.3.54 In due course, a fuller assessment of the engineering feasibility, costs and accessibility trade-offs of providing east-facing slip roads at the Whyke junction is required given the constraints and challenges posed by Ivy Lake.

8.3.55 **Bognor Road junction**. Due to the proximity of the railway and less environmentally sensitive area around this junction, the full grade separation offered by the RIS1 designs (for all except option 3) would meet the requirements of this concept. The earlier designs included new pedestrian and cyclist facilities and a realignment and safer access onto Vinnetrow Road.

8.3.56 Alternative junction arrangement could be considered, but at this stage in the development of this concept, there is a feasible engineering solution for this key junction on the A27 that meets the requirement to segregate through and local traffic and in an area with fewer wider environmental constraints.

8.3.57 **Oving junction**. Our concept for Oving junction recognises that there are works planned for this junction linked to the consented Shopwyke development, and with further proposals as part of the RIS1 options (1, 1A and 2) the junction would have been partially closed with the Highways England proposals modifying the developer's scheme.

8.3.58 Whilst it is desirable to maintain connectivity in general, the Shopwyke development will provide 'left-in' and 'left-out' access to the site just slightly north of the Oving Road (east) junction, and so our concept retains the planned closure of the RIS1 options where access to/from the A27 at Oving Road (east) is removed.

8.3.59 For Oving Road (west) we can see merits in retaining the Highways England RIS1 options (1, 1A and 2) to maintain a 'left-in' and 'left-out' arrangement to the A27 north/eastbound. However, this arrangement will need to be considered in more detail in due course in light of our concept for the larger and more complex Portfield junction; the concept of providing a grade separated eastbound movement at Portfield junction may compromise road safety were an access from Oving Road onto the A27 to be maintained.

8.3.60 **Portfield junction**. Our 'Full South' concept includes extending the coverage of the A27 junctions to include the Portfield roundabout. This is a very busy junction serving four dual

carriageway arms, but with 'through' traffic flows on the A27 taking an oblique route through the junction; south to east and vice versa.

8.3.61 Apart from minor 'white-lining' operating, the RIS1 proposals did not consider improvements at the Portfield junction, in part linked to the earlier RSI1 statement to address only the four junctions from Fishbourne through to Bognor Road, but ruled out for later investigation during the consultation due to cost and geometry issues (the oblique angle for through movements on the A27).

8.3.62 In addition to the geometry issues identified by Highways England, the Shopwyke development is likely to have restricted the opportunities to more readily adapt this junction for westbound segregation of the 'through' movements from those turning into Chichester or onto the old Chichester Bypass north. The new access arrangements for this development may also add some further design challenges in handling westbound 'through' traffic in this vicinity.

8.3.63 Whist at this concept stage, it is possible to envisage a full remodelling of the junction to provide a free-flow at-grade westbound A27 movement, alongside a grade separated eastbound movement. However, addressing both flows appears to be very challenging. In part constrained by the Shopwyke development, a flyover alignment and new roundabout for circulating traffic would only appear to be feasible by taking land from the car parks of the retail units to the west and north of the junctions (Portfield Retail Park and McDonalds respectively) and building over or into a small part of the Westhampnett Lake used for watersport activities.

8.3.64 In traffic terms, lower-speed design standards may be needed to limit maximum speeds through the junction, and some selective widening of carriageways on the A27 may also be required to maintain safe operation in handling any 'near-side' fast merges with 'off-side' traffic emerging from a remodelled roundabout.

8.3.65 If a feasible grade separation solution cannot be developed, a fuller remodelling of the current junction would be required, aiming at providing free-flow westbound movement, but with eastbound flows onto the A27 conflicting with westbound flows into Chichester. Various junction designs are available to handle this scenario, including traditional roundabouts, signalised 'hamburger' arrangement and full signalisation. With the remainder of the route adopting some forms of 'Smart A road' technologies in managing traffic flows, it is likely that part or full signalisation would offer the greatest potential for managing traffic flows.

8.3.66 **Impacts during construction**. In developing an on-line solution to the A27, it is clear that the potential transport and wider environmental disruption during construction would be significant. The potential impacts on nearby residents, and on travellers on the A27 and the wider network, whether using car, bus, walking or cycling, and on business are likely to be substantial.

8.3.67 Early high level analysis underpinning the RIS1 economic assessment identified an outline construction schedule for each

of the consultation options. Much more detailed Construction Management Plans will need to be developed to set out how to best manage disruption during construction, with any detailed plans developed during the RIS2 processes being further developed and refined by the delivery contractor at a later stage.

8.3.68 At a headline level, the outline construction schedule for the most ambitious RIS1 option (option 2) had disruption of some form lasting for around 41 months, although with individual works scheduled for no more than 22 months at Fishbourne and 25 months at Bognor Road. The schedule also ensured works were not undertaken at all junctions at the same time, with those at Stockbridge and Bognor Road only starting after completion at Fishbourne, and Whyke only being dealt with after completion at Stockbridge.

8.3.69 The RIS1 economic assessment also generated a monetised economic cost of the delays to the transport network arising during construction, taking these into account in the benefit for cost ratio. For RIS1 option 2 the impacts were large in relative terms (~4.8% of all quantified user benefits over the appraisal period).

8.3.70 For the 'Full South' concept, we would expect similar careful scheduling of works to manage potential impacts, but being more ambitious, and having a wider scope than the RIS1 options, we might expect some additional disruption during construction across all the junction of the A27 being improved. However, the expanded scope may not necessarily significantly increase the delay impacts. Compared to the RIS1 option 2, our concept does not include the Stockbridge link road, and therefore does not have an alternative route onto the Manhood Peninsula from the west whilst construction works at Stockbridge and Whyke are completed.

8.3.71 Although strong Construction Management Plans (and associated Construction Environmental Management Plans) can be used to assist in mitigating impacts, and there may be opportunities created by the provision of additional slip roads and some parallel construction works (as considered in outline in Figure 23 above), the residual impacts will be significant.

8.3.72 The residual impacts on local residents and commuters of the disruption during construction will be significant, but particular attention may be needed to address local business impacts where the additional costs of extended journey times and potential losses in trade may be of critical importance for the viability of some businesses. It may be appropriate for the local authorities to consider ways to support vulnerable businesses in some sectors and locations where they are particularly impacted by construction works.

8.3.73 **'Next Best' or 'Lower Cost' scenarios**. As with the 'Mitigated North' concept, as part of any further RIS2 assessment work, lower cost variants will need to be developed to test the robustness of the case for the 'core' scheme and to provide a view of feasibility for alternative scheme variants if the funding envelopes suggest the 'core' proposals are unaffordable.

8.3.74 It is possible that 'value engineering' could reduce scheme costs in identifying any lower cost variants, say, by using slower speed design standard and building less operational redundancy into

the engineering designs. Significant downgrading of the concept at any one junction will compromise delivery against the core success factor of separating 'through' and 'local' traffic.

8.3.75 Whilst not desirable for the concept as a whole, the necessity to consider lower cost scenarios could include forgoing some turning movement, especially where the engineering feasibility is particularly challenging, including potentially at Whyke, and in grade separating eastbound movements at Portfield. Beyond reducing the scope of the concept in addressing the key community concerns of the RIS1 proposal, the options that were previously consulted on provide an obvious set of lower cost alternative against which the 'Full South' concept could be assessed.

8.3.76 Further much more extensive work in developing the 'Full South' concept through to detailed design is considered later in this report, including confirming engineering feasibility and the trade-off with the strong requirement to maintain full connectivity, and how to handle and mitigate disruption during construction.

9. CONCEPT PERFORMANCE SUMMARY

The two concepts for a 'Mitigated North' and 'Full South' improvements to the A27 both have strong merits in some areas, but a range of real challenges in key delivery areas, and by being more ambitious than the earlier scheme options, increased costs and increased benefits.

9.1.1 A qualitative assessment of the performance of our two concepts has been undertaken with reference to the key success criteria considered earlier. As discussed in Section 2.3, while the BABA27 themes and Highways England aims all broadly align, potential conflicts exist in delivery between different criteria, such as providing additional capacity, maintaining and improving economic vitality and protecting the environment.

9.1.2 A summary of the headline performance, grouped into 'positives' and 'negatives' for each our of two concepts is provided on the following page.

9.1.3 Table 1, following our summary, provides a headline assessment of the performance of each concept against the BABA27 Success Factors, the Highways England project aims and our wider delivery considerations. Each criteria has been allocated a qualitative impact score using the following scale:

- Major beneficial
- Very large beneficial
- Large beneficial
- Moderate beneficial
- Slight beneficial
- Neutral
- Slight adverse
- Moderate adverse
- Large adverse
- Very large adverse
- Major adverse

9.1.4 These summary assessments are expanded further in Appendix C that sets out a more detailed review of the key performance points for both concepts against each of the success factors, Highways England aims and wider considerations.

‘Mitigated North’ Concept

New strategic northern route with free-flow junctions with the existing A27 and significant mitigation of environmental impacts

‘Mitigate North ‘Concept – performance and issues summary

Positives

- Strong separation of ‘through/local traffic’
- Significant increase in capacity for long-term growth
- Released capacity can support wider benefit delivery
- Strong network resilience in providing an additional route and reduced use of inappropriate diversionary routes, maximising the value of ‘Smart A road’ technologies
- Engineering feasibility has been established through the earlier RIS1, although opportunities may exist to refine the horizontal route alignments and vertical alignment to drive enhanced mitigations

Negatives

- Significant environmental impacts with land-take, introducing new noise, air quality and visual intrusion in some residential and rural settings. Strong mitigation possible, but key residual impacts
- Potential policy/delivery conflicts due to SDNP
- Potential for disruption to Goodwood and other business operations during development
- Mitigation costs could be significant, potentially reducing the BCR in the RIS1 Economic Assessment Report. Changes are unlikely to materially affect any wider ‘value for money’ assessment

‘Full South’ Concept

Major works at all six junctions on the A27 reducing potential visual impacts and maintaining connectivity

‘Full South’ Concept – performance and issues summary

Positives

- Separation of ‘through/local traffic’, maintaining local connectivity relative to earlier RIS1 schemes options
- Modest capacity increases to support growth in the medium to long-term
- Modest network resilience benefits in separating through traffic and in the use of ‘Smart A road’ technologies
- Limited visual impacts in some locations, reduced local severance and some emissions and air quality benefits
- Engineering feasibility established in part through earlier RIS1 work, including at the Bognor Road junction and in some other locations

Negatives

- Challenging engineering, likely to include land-take
- Marginal impacts on setting of Chichester Harbour AONB
- Significant challenges on the existing A27 during construction impacting on businesses, residents and tourists, especially on the Manhood peninsula
- Engineering solutions and mitigation could be significant. Increased costs, but alongside increased benefits are likely to alter the BCR from the earlier RIS1 assessment, but are unlikely to materially change the wider ‘value for money’ assessment

Table 1. Concept Performance Summary – 'Mitigated North' and 'Full South'

	'Mitigated' North Concept		'Full South' Concept	
BABA27 Themes				
Through and local traffic	Strong separation of 'through and local traffic', especially without an intermediate A286 junction	Major Beneficial	Separation of 'through/local traffic', but with some interactions between junctions	Large Beneficial
Multi-modal transport	Indirect benefits through increased network capacity, reduced congestion and potential re-use of road space	Slight Beneficial	Direct benefits through engineering solutions and removal of conflicts between strategic and local cross-A27 traffic	Moderate Beneficial
Environmental Factors	Strong mitigation to reduce impacts, but some residual direct impacts. Wider benefits for those on/near the current A27	Moderate Adverse	Significant adverse impacts during construction. In operation improved noise and air quality due to reduced congestion	Neutral
Chichester as jewel	Strong mitigation to maintain 'setting' but some residual impacts. Reduced use of diversionary routes will be beneficial	Neutral	Reduction in use of inappropriate diversionary routes will improve 'setting'. Mitigations will avoid some of the visual impacts of RIS1 options 1, 1A and 2	Slight Beneficial
Landscape and conservation	Route will be in an area of high landscape value, with substantial mitigations to limit impacts; much greater than the RIS1 options 4 and 5	Moderate Adverse	Using underpasses will avoid key issues of RIS1 options 1, 1A and 2, but some impacts at junction and due to carriageway re-alignments	Slight Adverse
Local and regional economy	Very strong benefits from increased capacity and network resilience. Limited direct support to housing development	Very Large Beneficial	Significant adverse impacts during construction. New capacity to support medium-term developments, but limited resilience	Moderate Beneficial
Highways England Project Aims				
Improve capacity to support growth	Significant increase on capacity and network resilience to support long-term economic growth	Very Large Beneficial	Modest increase on capacity to support medium to long-term economic growth	Moderate Beneficial
Improve road safety	Strong separation of 'through and local traffic' and reduced congestion on the existing A27 will deliver improved safety	Very Large Beneficial	Segregation of through traffic and reduced congestion will deliver benefits, but with residual 'weaving' between junctions	Moderate Beneficial
Reduce adverse environmental impacts	Strong mitigation to reduce direct environmental impacts, but some residual impacts. Wider benefits on the current A27 route	Moderate Adverse	Significant adverse impacts during construction. In operation improved noise and air quality due to reduced congestion	Neutral
Improve journey time reliability	Increases in network resilience and direct journey time benefits will drive long-term reliability benefits for business/individuals	Very Large Beneficial	Modest increases in capacity will improve medium to long-term reliability. Significant adverse impacts during construction	Moderate Beneficial
Enable housing provision	Indirect support to housing development through increased network capacity, reduced congestion and enhanced resilience	Slight beneficial	Support to short-medium term developments to the south in Arun/Bognor, but with questions over long-term capacity	Moderate Beneficial
Improve regional connectivity	Strong separation of 'through and local traffic' and increased network resilience will provide for long-term regional growth	Very Large Beneficial	Some separation of 'through and local traffic' and improved travel conditions will provide for medium to long-term growth	Moderate Beneficial
Improve accessibility to tourist areas	Benefits through increased network capacity, reduced congestion and network resilience, and during seasonal peaks	Moderate Beneficial	Adverse impacts during construction, but longer-term direct benefits due to improved junctions and travel conditions	Large Beneficial
Wider Delivery Considerations				
Policy and planning fit	Potential compliance risk with range of environmental policies, including SDNP links. Support to transport and planning policy	Moderate Adverse	Support to transport policy and direct support for development planning policy. Some environmental policy concerns	Neutral
Engineering feasibility	Establish engineering feasibility, but with extensive mitigations. Some adverse environmental impacts during construction	Slight Adverse	Significant adverse impacts during construction. Challenging engineering solutions at some junctions to expand benefits	Very Large Adverse
Acceptability	Concepts shaped by community feedback. Major environmental mitigations intended to assist in generating consensus	Slight Adverse	Concepts shaped by community feedback. Connectivity and visual drivers intended to assist in generating consensus	Slight Adverse
Funding potential	Potential cost of £350m-£400m likely to be a top end of any funding envelope	Very Large Adverse	Potential cost of £300m-£350m likely to be a top end of any funding envelope	Large Adverse
'Value for Money'	Strong benefit delivery commensurate with high costs. Likely to deliver a value for money above minimum requirements	Large Beneficial	Strong benefit delivery commensurate with high costs. Likely to deliver a value for money above minimum requirements	Large Beneficial

10. OUR RECOMMENDATIONS

Our analysis and professional judgement indicate that both the 'Mitigated North' and 'Full South' concepts are deliverable, but with different cost, benefit and risk profiles, and reliance on strong mitigation measures to address community concerns. With the RIS2 opportunity being time limited, pragmatism may be needed to drive, or firmly assist, in political decision making.

10.1.1 In working towards a decision on how to proceed with the RIS2 submission for a Chichester scheme, we see three over-arching concerns that could materially affect further progress:

- **Highways England stated desire to see a 'different concept'** – this suggests that WSCC, CDC and the local MP need to consider whether the two concepts that we have identified are sufficiently different from the previous RIS options. Each of the two concepts has different delivery and risk profiles. In addition to further extensive work supporting the development if the preferred concept, experience from the RIS1 development work suggests that further technical work will also be required on the 'other' concept to enable a full consultation exercise to be undertaken including both 'north' and 'south' options and to support the requirements of the DCO process to show that all viable alternatives have received sufficient evaluation.
- **the need to address the earlier lack of community consensus** – whilst it is accepted that a unanimous consensus is unlikely to emerge for a single preferred concept, it is more likely that, by addressing many of key concerns identified during the RIS1 consultation process and through the BABA27 process, sufficient consensus can be reached.
- **the need to meet RIS2 timescales for delivery** – the timescales for a RIS2 submission are exceptionally tight, and as noted above ordinarily significantly more technical work would have been undertaken on both concepts before looking to establish a Chichester scheme in the RIS2 programme. However, there is still a short window of opportunity to do so, and Highways England has accepted the level of data and analysis is sufficient for it to consider a Chichester A27 scheme for potential inclusion in RIS2. This will require a degree of pragmatism in responding to our qualitative assessment reported above in order to meet the RIS timescale, as, if there is no submission in this round, there is no certainty of a concept for Chichester being considered for the next Highways England investment round (RIS3) intended to cover the five years from 2025/26 to 2029/30.

10.2 'Mitigated North' Concept – New strategic northern route with free-flow junctions with the existing A27

'Mitigate North 'Concept – our view

- A new Mitigated Northern Bypass offers the best long-term transport solution to problems of the A27. It adds capacity and resilience to maintain long-term economic vitality, and provides opportunities to maximise wider benefit delivery.
- The environmental impacts will be significant, even with carefully configured mitigations [that are difficult to illustrate at this development stage], and there may be some challenging business impacts. There may be conflicts with national and local policies.
- Mitigations are likely to increase costs compared to the RIS1 schemes to around £350-400m, with additional uncertainties over land and business impact costs. Benefits remaining broadly similar.
- There is unlikely to be a material change in the value for money from the earlier RIS1 assessment

We consider this concept to offer the best long-term solution for the A27 in best fitting with the Success Criteria and wider considerations. We are also of the view that the environmental and business impacts can be largely mitigated, but with a risk of compliance with planning and policy fit. We recommend WSCC, CDC and the local MP consider whether the 'mitigated north' concept offers enough to build community consensus for the promoters and HE to invest 'capital' in taking this concept forward now and to later development phases.

10.3 'Full South' Concept – Major works at all six junctions on the A27 including Fishbourne and Portfield

'Full South' Concept – our view

- A fuller development of the on-line improvements to address key transport concerns of some of the less ambitious RIS1 options. Engineering mitigation may reduce the adverse impacts during construction, but residual impact will remain. Network resilience will improve to support medium- to long-term economic vitality.
- Key environmental issues affecting the Chichester Harbour AONB can be largely addressed.
- Challenging engineering and mitigations are likely to increase costs compared to RIS1 schemes to around £300-350m, with additional uncertainties over land/ business impact costs. With expanded scope, benefits will increase.
- There is unlikely to be a material change in the value for money from the earlier RIS1 assessment

We consider this concept provides a medium- to long-term solution addressing all key concerns raised with earlier 'south' RIS1 options and many of the Success Criteria and wider considerations, but not fully. We believe this concept to be deliverable, but with some difficult and costly engineering challenges to overcome. We recommend WSCC, CDC and local MP consider whether the 'full south' concept is now sufficiently different from RIS1 to build community consensus and for HE to take forward now and to later development phases.

11. CHICHESTER TRANSPORT PACKAGE

Significant investment in the A27 corridor will provide an opportunity to deliver a range of complementary measures to maximise the value of the investment and potentially widening delivery benefits.

The majority of funding for any agreed A27 improvements will be forthcoming from Highways England. To widen the benefits of their investment, it is likely that local funding will be required to contribute to or deliver complementary measures to support this investment and maximise local benefits - a Chichester Transport Package.

11.1.1 Significant investment in the A27 corridor will provide an opportunity for complementary measures to maximise the value of the investment and potentially widening delivery benefits. The direct investment in the A27 will deliver, for example, reduced use of informal diversionary routes, reductions in local severance (especially north-south separation across the existing A27) and better air quality.

11.1.2 Taking forward a number of the 'modal suggestions' a part of a wider Chichester Transport Package offers the area an opportunity to build on any investment in the A27:

- maximise the use any released road space for vulnerable road users or environmental gain
- further mitigate any delivery impacts
- further improve conditions for pedestrians and cyclists
- to improve bus service reliability, to enhance the urban environment
- better manage traffic on alternative routes - through the centre of Chichester, to the north via Lavant.

11.1.3 Whilst most of the funding for the main A27 improvements works will be expected to be provided by Highways England, including potentially for some of these complementary measures, it is most likely that other funding sources will be required to deliver a fuller and wider transport package.

11.1.4 A 'funding cocktail' could be developed to deliver elements of any package drawing in contributions from a range of sources, including local authorities, specifically targeted Government grants/funding and private sector contributions. A key challenge will be to 'locking in' elements of the package though any disparate funding channels.

12. NEXT STEPS AND FURTHER DEVELOPMENT TO SUPPORT A RIS2 SUBMISSION

In taking forward one/both concepts and a supporting package into the RIS2 programme, significant further work will be required beyond this commission, both in terms of scope and timescales.

The ultimate reward of the BABA27 process and our work is a place in RIS2 and potential delivery of significant improvements to transport infrastructure in and around Chichester.

12.1.1 Whilst Highways England has indicated that the BABA27 approach and level of detail in the current work is reasonable at this stage in scheme development, significant further work will be required to take any proposals forward for formal inclusion as a RIS2 scheme. It is likely that most work over the following two to three years will be covered by Highways England's development budgets, though there may be an expectation that local contributions are made, including in working up a wider Chichester Transport Package. This will involve a real commitment, financial and political support, to support key development tasks, including:

- very close working with Highways England, including local support
- on-going stakeholder engagement, including the BABA27 processes and with key and statutory stakeholders, ultimately leading to a full public consultation
- concept development work, particularly mitigation measures for construction and delivery phases
- development of 'lower cost' concept variants
- further work on any 'other' concept to support consultation
- engineering design and costing work, including detailed alignments, opportunities and constraints
- traffic, transport and environmental forecasting work
- economic, social and environmental appraisal and business case development
- consideration of potential funding opportunities for a Chichester Transport Package – the 'funding cocktail'.

Highways England engagement

12.1.2 Highways England's engagement in the A27 in Chichester has been considered in some detail earlier. It is clear that very close working with Highways England will be required following any decision by WSCC, CDC and local MP to proceed with a RIS2 submission. Consideration should be given to the role that this collaborative way of working could play in developing a future RIS2 scheme.

Stakeholder engagement

12.1.3 On-going work with key stakeholders will be a key part of any RIS2 submission. Highways England has suggested that they would

value continued working with BABA27 to maintain community engagement.

12.1.4 Wider stakeholder engagement will be required through the further development processes, working with both statutory consultees and other key organisations, including re-establishing links with the South Downs National Park Authority and others such as Natural England.

12.1.5 In time, developing a Stakeholder Management Plan would be a useful mechanism to manage this engagement and identify content, timing and stakeholders to be included at various stages of the scheme development.

Concept development, design and costings

12.1.6 Through this commission we have established two concepts that we believe can be delivered and could be considered for taking forward to Highways England for their RIS2 programme, subject to funding availability.

12.1.7 As noted above, there is a need to confirm the deliverability and concept specification in working up initial feasibility, including but not limited to, routeings, vertical alignments, junction arrangements, the 'tie-ins' with the existing A27, construction management plans, mitigations and outline costings. However, significant work has been done previously, especially on the 'northern' concept routes and some of 'southern' junction options, though our concept introduces some significant concept design changes.

12.1.8 Further more detailed design and costing work will need to follow over the next two to three years to support formal planning and funding approvals and public inquiry processes. Following any approvals processes, contractors' design work will be required to drive delivery, with particular emphasis on Construction Management Plans and Construction Environmental Management Plans for handling the challenging construction period.

Traffic forecasting work and business case development

12.1.9 Whilst no additional substantive modelling work has been undertaken for this commission, the transport models underpinning the RIS1 work were reviewed in outline to identify whether they would be fit for purpose for more detailed analysis and forecasting work in due course.

12.1.10 Our initial review suggested that the transport model underpinning the RIS1 assessment, the Chichester Area Transport Model (CATM), would be broadly fit for purpose for immediate use. It was accepted that for any early use some selective updating and revalidation would be desirable, including updating of the 'Uncertainty Log' developed as part of the earlier work and intended to highlight local and external uncertainties and factors that could affect forecast demand and benefit delivery. This could include reviewing key changes in travel demand and planning assumptions since the 2014 update undertaken to support the RIS1 development.

12.1.11 However, in taking either or both of our concepts through to a RIS2 submission, potentially involving forecast work over the next

two to three years and a final approvals process perhaps starting in 2022/23, it is likely that a fuller and more formal updating of the underlying transport models will be required as the underlying data is now four years old and would be seven years old when final approvals are given.

12.1.12 As some of the underlying travel demand data used in CATM will be becoming older than is normally acceptable for an investment of this magnitude, current Highways England and West Sussex County Council data will need to be included, and there is also likely to be a need to draw in new data, including latest technologies such as Bluetooth recording and automatic number plate matching (ANPR). Traditional data sources such automatic traffic counts data are likely to be required, although use of Roadside Interviews (where traffic is stopped for a 'census' interview) is most unlikely.

12.1.13 Alongside the further development of the concepts through design and costing work, an updated transport model will permit the updating of the economic and wider appraisals required to support the Development Consent Order planning approvals process, funding approvals and the formal public consultation processes. This work will include, by necessity, extensive and detailed work on the preferred concept, lower cost variants of this single concept, and on 'other' concepts to be considered for Development Consent Order and consultation purposes.

Development of a Chichester Transport Package

12.1.14 We have considered the potential for a Chichester Transport Package to be delivered alongside either of our concepts set out in the previous chapter. The steer from the BABA27 group and wider feedback will be valuable in looking to develop a suitable package of investments that can complement the investment, primarily by Highways England, in improvements to the A27.

12.1.15 Further technical work will be required to establish the best performing elements of any transport package, including identifying any components that may directly assist in meeting the delivery aims of the A27, as well as desirable intervention that could go some way to meeting local aspirations. This will need close partnership working across a number of delivery agencies in identifying schemes to be taken forward, potential funding sources (over and above any Highways England funding for the A27 works) and in determining governance arrangements for delivery.

12.1.16 There needs to be a firm link between any transport package and the delivery of on-going residential and commercial developments, suggesting that WSCC, CDC and developers should be heavily involved. Similarly, the operators of the existing transport networks have a key role to play, and whilst rail service delivery is strongly managed by government through the franchise process, there are opportunities to improve local integration with the wider transport network. There is also value in drawing in local interest groups, including, for example, the Chichester and District Cycle Forum, to ensure that measures such as walking and cycle interventions are appropriately configured and, where possible, expanded to address wider needs.

12.1.17 Delivering the integrated transport network improvement that the BABA27 group clearly aspire to will be very challenging given the diverse range of delivery responsibilities and difficult funding environment, but through a combination of close partnership working, creative approaches to scheme identification and delivery, and the catalyst of the major investment in the A27, progress should be possible.

12.2 Support to a RIS2 Submission

12.2.1 Establishing a Chichester scheme in RIS2 will be a major achievement given the previous history of A27 proposals and the exceptionally tight timescale to respond to cancellation of the RIS1 scheme.

12.2.2 The level of detail of this assessment may not seem ideal, with at least two to three years more work required before the start of any formal consultation. But, it is sufficient, the short RIS2 window is open now, and Highways England are content to take forward a concept based on our assessment if it is different from RIS1 and has sufficient community consensus.

12.2.3 If we fail to meet the RIS2 timescales there is no certainty that a Chichester concept will be considered for RIS3 (2025/26 to 2029/30). The problems of the A27 will remain, albeit with marginal gains linked to Local Plan developments.

Appendix A – BABA27 Stakeholder Group

STAKEHOLDER ORGANISATION
Apuldram Parish Council
Arun District Council
Bignor
Birdham Parish Council
Bognor Town Council
Bosham Parish Council
Boxgrove Parish Council
Bunn Leisure
Canal Residents Association
Chambers Of Commerce
Checkatrade
Chi Cycle/ 20's Plenty
Chichester Archers
Chichester Bid
Chichester City Council
Chichester College
Chichester Convas
Chichester Deserves Better
Chichester District Council
Chichester District Cycle Forum
Chichester Harbour Conservancy
Chichester Moves On
Chichester Society

STAKEHOLDER ORGANISATION
Chichester Society And Southern Gateway Residents Association
Chichester Visitors Group
Chidham And Hambrook
Coastal West Sussex Partnership
Covers Timber And Builders Merchants
Campaign To Protect Rural England (CPRE)
Donnington Parish Council
Duncton
Earnley Parish Council
East Boyle Residents' Association
East Dean Parish Council
East Wittering And Bracklesham
Evans
Federation Of Small Business
Fishbourne District Council
Fishbourne Parish Council
The Goodwood Group
Green Party
Hunston Parish Council
Kelda Technology
Kingsbridge Estate And Natures Way
Lavant Parish Council
Lavant Residents/ Chichester Deserves Better
Manhood Partnership

STAKEHOLDER ORGANISATION
Mayoress
May's Butchers Stockbridge
Member For Bosham Ward
MP For Chichester
Mulberry Drivers
National Farmers' Union (NFU)
No Option Is Still An Option
North Mundham Parish Council
Northlands Residents Group
Oceania Marina
Oving Parish Council
Pagham Parish Council
Parklands Residents Association
Reynolds Funeral Services
Road Haulage Association
Rolls Royce
Rotary International
Runcton And Mundham Residents' Association
Rural West Sussex Partnership
Selsey Business Partnership
Selsey Press Printers
Selsey Town Council
Sidlesham Parish Council
Singleton Parish Council
South Downs Society

STAKEHOLDER ORGANISATION
Southbourne Parish Council
Southern Gateway Residents' Association
Summersdale Residents' Association
Tangmere
Tangmere Airfield Nurseries
Tangmere Parish Council
Tawny Nurseries
The West Wittering Estate
The Wood Company
Tristram Plants / The Farplants Group
Trotton - Chithurst Parish Council
University Of Chichester Business School
Visit Chichester
West Itchenor Parish Council
West Sussex County Council
West Sussex Growers' Association
West Wittering District Council
West Wittering Parish Council
Westhampnett Parish Council
Whyke Residents' Association
Whyke Residents' Association & Chi Moves On
Wicks Farm
Woods Travel

Appendix B – Long-List Suggestions

The following tables provide a listing of suggestions, with some of our initial considerations in allocating these 'above' or 'below the line', including technical details where appropriate, and, based on our professional judgment and experience, an assessment the likely 'A27 Transport Impacts' intended to provide an indication of how the suggestions may contribute to addressing the transport related success-criteria and the traffic and environmental impacts of congestion on the A27 and wider transport network through Chichester. This uses an indicative six-point scale of 'ticks', and intentionally these are not necessarily linear nor additive.

'On-Line' Suggestions -

'Above the Line'

Marginal network gains through small on-line improvements in network operation

Packages of individual junction improvements on the existing A27 between Fishbourne and Portfield junctions to handle increasing traffic volumes, smooth traffic speeds and flows and better manage or reduce conflicting movements

'Smart A/B-road' concept and/or dynamic variable message signing to improve network efficiency

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'Below the Line'

On-line fully tunnelled/'cut and cover' route for all/most of the current A27 from Fishbourne junction to A259 Bognor Road or Portfield junctions, with or without out intermediate junctions

On-line fully elevated route for all/most of the current A27 from Fishbourne junction to A259 Bognor Road or Portfield, with or without out intermediate junctions

'Off-Line' Suggestions

'Above the Line'

New local road to segregate traffic accessing the Manhood Peninsula from A27 'through' traffic from A27 'through' traffic with a new link from the Fishbourne junction, to A286, B2201, or B2145/B2166

New full southern route between Fishbourne junction & A259 Bognor Road east of the A27

- ***Multi-purpose road*** with local junctions to access to the Manhood Peninsula
- ***Strategic road*** with no local junctions to segregate 'through' Bognor traffic

New *strategic* northern route between A27 west of Fishbourne junction and near to Tangmere, with a junction at the A286 to give access to Midhurst and north Chichester, or no intermediate junction

New *local* northern route between A27 west of Fishbourne junction and Temple Bar utilising and improving some existing local roads to limit new construction

New *multi-purpose* northern route between A27 west of Fishbourne and near to the A27 at Portfield providing a stronger local functionality than route variants above, including junctions on B2178 and A286

'Below the Line'

New full southern route between Fishbourne via A259 to the east to near Temple Bar/Tangmere (with/without junctions)

Upgrading of existing minor routes on the Manhood Peninsula to provide alternative 'east-west' assess/egress routes onto the A27 east avoiding Stockbridge/Whyke junctions

New *local* road to the north to A286 from the A27 west of Fishbourne to segregate traffic accessing the A286 Lavant/Midhurst and north Chichester from A27 'through' traffic

Fully or largely tunnelled route under Chichester between west of Fishbourne junction and east of Portfield without any intermediate junctions

Use of city centre road capacity for 'through' traffic by not discouraging routeings via Avenue de Chartres, Market Avenue and St.Pancras or via Orchard Street and Oaklands Way

'Modal' Suggestions

- Parking and Traffic Management
- Walking and Cycling (Active Travel Modes)
- Behaviour Change
- Land-Use Planning
- Technology
- Public Transport Modes
- Freight

Build A Better A27 Long-List Suggestions – Session 1

'On-Line' Suggestions - Consultants' Initial Considerations – 'Above the Line' – for further consideration and sifting

These suggestions are primarily configured to reduce the impacts of traffic volumes on the existing A27 and associated traffic in Chichester city centre and the surrounding district by improving the efficiency and operation of the existing network and/or providing additional highway capacity 'on-line' using the current alignment of the A27

Suggestion - Description	Considerations			A27 Transport Impacts
Marginal network gains through small on-line improvements in network operation	Measures can include revised signal settings, dynamic signal management, white-lining changes and marginal widening	Some interventions will be delivered over time linked directly with new residential and commercial developments	Some interventions will be delivered over time linked directly with further deterioration of network operation driven by HE and/or WSCC	√√
Packages of individual junction improvements on the existing A27 between Fishbourne and Portfield junctions to handle increasing traffic volumes, smooth traffic speeds and flows and better manage or reduce conflicting movements	A range of approaches to improving junction operation, with and without additional land-take - enhanced roundabout, inc 'hamburgers', signalisation - signalised junctions - grade separation (using flyovers or underpasses) - turning restrictions - selective widening on the approaches to junctions - other carriageway widening	Combinations of different arrangements may perform differently in transport terms from others. Opportunities may exist to 'downgrade' some junctions, but this may need 'upgrades' elsewhere. Full signalisation of junctions may allow more active or dynamic management of flows, including 'platooning' traffic flows	Range of transport benefits possible, as well as some adverse impacts if restricting turning movements. Some environmental impacts, especially where grade separation is used. Land take issues. Construction works along the existing A27 alignment could be very challenging, both in extent and duration, and on potential diversionary routes	√√√
'Smart A/B road' concept and/or dynamic variable message signing to improve network efficiency - considered further under the Modal Suggestions: Technology	Range of interventions for messaging users on tactical traffic routeings and to actively manage traffic flows to 'platoon' vehicle flows and adjust junction and signal timings	Likely to deliver efficiency and traffic related environmental benefits.		√√√
On-line and approach road HGV and goods vehicle priority to minimise the impacts of congestion for local business in the city, on the Manhood and to east of Chichester	Delivering priority measures to improved goods vehicle access to the A27	With limited road space availability technology-based priority using selective vehicle detection may provide an opportunity to focused benefits on local freight users	Opportunities may be maximised when sitting alongside the 'Smart A/B Road' concept considered above	√

Suggestion - Description	Considerations			A27 Transport Impacts
On-line fully tunnelled/'cut and cover' route for all/most of the current A27 from the Fishbourne junction to A259 Bognor Road or Portfield junctions, with or without out intermediate junctions	Engineering feasibility and costs for a fully/largely tunnelled route likely to rule this out, but selected provision may be possible. Ongoing additional maintenance and pumping due to being below water table on flood plain land.	Provision of intermediate junction may require significant land-take and/or very challenging engineering works	Delivery feasibility of construction works along the existing A27 alignment would be exceptionally challenging	√√√√
On-line fully elevated route for all/most of the current A27 from the Fishbourne junction to A259 Bognor Road or Portfield, with or without out intermediate junctions	Environmental impacts for a fully/largely elevated route may be significant, although some mitigation may be possible. More limited grade-separation may be possible in some current locations as considered above	Provision of intermediate junction may require significant land-take and/or very challenging engineering works	Delivery feasibility of construction works along the existing A27 alignment would be exceptionally challenging	√√√√

Build A Better A27 Long-List Suggestions – Session 2

'Off-Line' Suggestions - Consultants' Initial Considerations – 'Above the Line' – for further consideration and sifting

These suggestions are primarily configured to reduce the impacts of traffic volumes on the existing A27 and associated traffic in Chichester city centre and the surrounding district by providing additional highway capacity 'off-line' away from the current alignment of the A27

Suggestion – Description	Considerations			A27 Transport Impacts
New *local* road to segregate traffic accessing the Manhood Peninsula from A27 'through' traffic with a new link from the Fishbourne junction, to A286, B2201, or B2145/B2166	Strategically similar scheme was considered previously as the Stockbridge link road. Variants to provide this route in full or in part	Potentially large environmental impacts. Route should only progress with strong mitigation, including landscaping and limited or no lighting.	Strong transport benefits: congestion relief, network resilience. Likely traffic volumes suggest this route could be configured as a single carriageway	√√√
New full southern route between Fishbourne junction & A259 Bognor Road east of the A27 - ***Multi-purpose road*** with local junctions to access to the Manhood Peninsula - ***Strategic road*** *with no local junctions* to segregate 'through' Bognor traffic	Potentially significant environmental impacts. Route should only progress with strong mitigation, including landscaping and limited or no lighting.	Additional environmental impacts possible with a strategic road due to 'grade separation' when crossing radial routes. Potential differences in land requirements (junctions/or elevation).	Significant transport benefits: congestion relief, network resilience, released capacity and mitigation of 'induced traffic'. Traffic volumes may allow these route variants to be configured as a single carriageway	√√√√
New *strategic* northern route between A27 west of Fishbourne junction and near to Tangmere, with a junction at the A286 to give access to Midhurst and north Chichester, or no intermediate junction	Potentially significant environmental impacts, including on the National Park. Route should only progress with strong mitigation, including landscaping and limited or no lighting.	'Tie-in' to existing A27 both east and west of Chichester may be challenging, although opportunities may exist to use the existing Temple Bar junction. Provides 'northern' access to city centre from the A27	Significant transport benefits: congestion relief, network resilience, released capacity and mitigation of 'induced traffic'. Traffic volumes may allow this route to be configured as a single carriageway	√√√√√
New *local* northern route between A27 west of Fishbourne junction and Temple Bar utilising and improving some existing local roads to limit new construction	Potentially large environmental impacts in places. Route should only progress with strong mitigation, including landscaping and limited or no lighting	'Tie-in' to existing A27 west may be challenging. Existing roads/junctions will need significant upgrading to meet design standards and capacity requirements. Provides 'northern' access to city centre from the A27	Strong transport benefits: congestion relief, network resilience. Likely traffic volumes suggest this route could be configured as a single carriageway	√√√√
New *multi-purpose* road northern route between A27 west of Fishbourne and near to the A27 at Portfield providing a stronger local functionality than route variants above, including junctions on B2178 and A286	Potentially significant environmental impacts. Route should only progress with strong mitigation, including landscaping and limited or no lighting.	'Tie-in' to existing A27 west may be challenging. Access at Portfield may be also challenging. Provides 'northern' access to city centre from the A27 and to/from A259 Bognor Road	Significant transport benefits: congestion relief, network resilience, released capacity and mitigation of 'induced traffic'. Traffic volumes may allow this route to be configured as a single carriageway	√√√√√

Suggestion – Description	Considerations			A27 Transport Impacts
New 'off line' full southern route between Fishbourne via A259 to the east to Temple Bar/Tangmere (with/without junctions)	Extended version of the full southern route variants considered above to provide an outer bypass for A27 east-west movements and vice versa	Not to be taken forward due to expected marginal benefits over the Fishbourne-A259 route relative to expected environmental impacts and costs		√√√√
Upgrading of existing minor routes on the Manhood Peninsula to provide alternative 'east-west' assess/egress routes onto the A27 east avoiding Stockbridge/Whyke junctions	Use if existing roads to provide a more formal route for access to the A27 east, including alignment and junction works and safety mitigation	Upgrading routes and junctions through Hunston, North Mundham and Runcton, and on Vinnetrow Road may be challenging, especially to handle increased HGV flows	Acceptability issues of increased traffic flows, including HGVs, through village communities. Potential junction capacity issues on the A27, A259 Bognor Road junction	√√
New 'off line' *local* road to the north to A286 from the A27 west of Fishbourne to segregate traffic accessing the A286 Lavant/Midhurst and north Chichester from A27 'through' traffic	Potentially major environmental impacts. 'Tie-in' to existing A27 east and west of Chichester may be challenging	Access to Chichester city centre via B2178 and A286 from the north, but could generate undesirable 'through' routes east of the A286/onto A286 towards/from Bognor	Limited transport contribution relative to potential environmental impacts suggest insufficient value to take forward relative to the full route from A27 west to A27 east	√√
'Off-line' fully or largely tunnelled route under Chichester between west of Fishbourne junction and east of Portfield without any intermediate junctions	Engineering feasibility and costs for a fully/largely tunnelled route across part of Chichester urban area and likely to rule this out. NB selected 'on-line' provision of a tunnelled/ 'cut and cover' route may be possible as considered above	Delivery feasibility of largely tunnelled route under Chichester and the River Lavant would be exceptionally challenging. Ongoing maintenance and pumping cost likely due to being below the water table. Archaeology under historic City is also a likely significant constraint.	'Tie-in' to existing A27 both east and west of Chichester may be challenging and disruptive during construction	√√√√√
Active use of city centre road capacity for 'through' traffic by not discouraging routeings via Avenue de Chartres, Market Avenue and St. Pancras or via Orchard Street and Oaklands Way	At times, road capacity exists in Chichester centre that does offer an alternative route for some congested journeys on the A27.	Routes through the city centre are often shown on Google Maps and GPS systems as quicker than the A27, both at off-peak times, and especially when the A27 is heavily congested	Supporting use, or not discouraging use of city centre routes, runs counter to local policy and objectives and is potentially damaging to urban environments and local residents. Would have adverse road safety impacts including for vulnerable and non-motorised road users. Would also impact reliability of local bus services.	-/=

Build A Better A27 Long-List Suggestions – Session 3

'Modal' Suggestions: Parking, Traffic Management - Consultants' Initial Considerations – 'Above the Line' – for further consideration and sifting.

These suggestions are primarily configured to assist in managing and reducing the impacts of traffic flows, both in accessing and parking in Chichester

Suggestion - Description	Considerations			A27 Transport Impacts
Parking information strategy, including enhanced signage and real-time parking space availability and routeing information	Strategy could reduce 'parking search times' and encourage access to avoid the A27 and/or congested routes	Links to the Road Space Audit proposals of August 2017	Opportunities for new technology to increase benefits; dynamic variable message signing, parking space occupancy via smartphone apps etc	√
Refined parking management strategy to further optimise short-stay vs long-stay usage and off-street and on-street provision.	Minimise impacts of on-street parking, e.g. on highway link capacity and on bus stop usage	Building on WSCC Integrated Parking Strategy. Links to the Road Space Audit proposals of August 2017	Long-term strategy could increase availability of 'short-stay' parking to support retail /leisure vitality	√
Park and ride as part of a strategy to reduce long-stay parking in central Chichester and short journeys on the A27	Requires land for parking and a reliable public transport route to serve key central area locations	Can reduce traffic flows into central area, but possibly with wider traffic impacts in accessing P&R site	Could increase availability of 'short-stay' parking to increase retail and leisure access and vitality	√
Complementary traffic management strategy configured alongside any new road infrastructure provision to manage and optimise opportunities arising from changes in traffic flows on the wider network and to mitigate 'induced' traffic	Interventions to reuse released road capacity. Development of on-going traffic management measures to make 'marginal' gains to the existing road network. Specific interventions could road space reallocation (for walk, cycle or urban realm), HGV routeing and timing restrictions and 20 mph zones	Supporting technology driven interventions, including dynamic variable message signing to divert traffic onto alternative routes depending on traffic conditions and selective vehicle detection to prioritise buses and goods vehicles.	Links to the Road Space Audit 'To, Not Through' proposals of August 2017 to reduce the attraction of the Chichester Inner Road as a way of passing through the city (itself potentially conflicting with reducing local traffic on the A27)	√√
Safety management measures focused on reducing accident exposure and severity for motorists and other road users	Opportunities through a range of measures, including design changes, visibility and lighting, drainage improvements and improvements in maintenance	Accidents/incidents on the A27 currently reduce network capacity considerably due to lack of alternative routes. Reducing these incidents would improve network performance.		√

Suggestion - Description	Considerations			A27 Transport Impacts
Charging: Road User Changing or Workplace Parking Levy to provide a funding stream and a direct or indirect encouragement for modal switch from car to public transport and walking/cycling/active modes	Both charging mechanisms provide a 'carrot' by way of a funding stream for improved local transport delivery, and a 'stick' by encouraging, through a cost mechanism, direct modal shift from car. Developing	Road charging would need to be focused on the access into the city centre, and although modal shift could be useful in reducing the reliance on the car, road user changing could result in increased use of the A27 adding t congestion and associated problems		-/√√
'High Occupancy' lanes on the A27 and approach routes to prioritise vehicles with more than one occupant and to encourage multiple occupancy and car sharing	High occupancy lanes can work well to 'reward' drivers with passenger, but they can impact on bus services if shared with bus lanes,	In the Chichester context, there is insufficient road-space to deliver any meaningful high occupancy lanes without adverse impacts on general traffic flows and congestion	See also HGV lanes (considered under 'Freight')	=
Vehicle fleet management to encourage take up of low emission vehicles to reduce emission on A27, in Chichester and wider area	Additional measures to those emerging at a national level to support move to low emission vehicles, including supplementary local scrappage scheme, electric vehicle charging point availability etc	Locally driven regulatory measures linked to encourage a move to low emission vehicles, for example, Air Quality Management area restrictions, parking enforcement, taxi licensing	Although this would contribute to air quality objectives, it won't tackle congestion issues	√

‘Modal’ Suggestions: Walking and Cycling (Active Travel Modes) - Consultants’ Initial Considerations – ‘Above the Line’ – for further consideration and sifting

These suggestions are primarily configured to increase walking and cycling for relatively short journeys to, from and around Chichester and, where possible, reduce the number of short-distance car journeys in the city and specifically crossing or using the A27

Suggestion - Description	Considerations			A27 Transport Impacts
‘Cycle Super-Highways’ - full corridor high-quality routes - E-W and N-S into Chichester to create direct largely segregated routes, including transferring road space and introducing cycle signal phases	Transformational change to significantly expand on the existing inconsistent provision in some corridors,	Wider benefits beyond transport into health and economy/tourism		√
Improved pedestrian and cycle crossings of the A27. This intervention could also be extended to other junctions and road crossings	Would be a key component of any north-south ‘Cycle Super-Highways’ cycle routes, but also as stand-alone provision	Could conflict with A27 highway capacity if provided at grade, but will be unattractive if grade separated	Design will be critical to success… waiting times, gradients, safety etc. Links should be at grade and direct	√
Major improvements in pedestrian and cycle routes where possible - high quality attributes, including standards or widths, surfaces, signage, lighting, ramps and cycle parking and pedestrian seating	Review opportunities for new links and/or creation of traffic free or low-traffic routes	‘Active’/bike hubs and improved facilities at destinations (lockers, showers, cycle parking) could be part of these infrastructure improvements.		√
Improved use of public space for pedestrian circulation, improved bus stops, improved signing and wayfinding, urban realm	General opportunities to enhance use of public space	Doesn’t really address congestion issues although indirectly encourages more walking and contributes to maintaining Chichester’s architectural, heritage and landscape qualities		=

Suggestion - Description	Considerations			A27 Transport Impacts
Cycle hire scheme in Chichester primarily to target on short-distance urban usage	Could provide some marginal gains, especially following delivery of wider infrastructure improvements	Limited commercial potential in a Chichester context with small scale transport benefits, although there may be some leisure potential, as identified in the Manhood Peninsula Destination Management Plan		=
Moving walkways or travellators to improve pedestrian circulation between key city centre locations	Possible short link from railway station to bus-station	Minimal transport benefit and challenging delivery		=

‘Modal’ Suggestions: Behaviour Change Initiatives - Consultants’ Initial Considerations – ‘Above the Line’ – for further consideration and sifting

These suggestions are primarily configured to encourage travellers, especially those ordinarily using cars, to consider changing their travel patterns – to change mode to public transport or walking/cycling/active modes, to delay their journeys to less busy periods or to make shorter journeys to local facilities

Suggestion - Description	Considerations			A27 Transport Impacts
Travel Planning Programmes through schools, colleges, the University and workplaces and potential for personalised travel planning	Focus on peak-spreading and mode shift to reduce demand on A27, particularly at busiest times. Link in with taxi and school travel services (and potentially other social service providers)	Potential to link with Access Fund and other sources of funding available to support these measures	Most effective when considered alongside associated infrastructure improvements as part of a package of measures	√
Travel Demand Management Marketing campaigns linked to Travel Plans, to include traditional and new media	Important to link with technology e.g. journey planning apps, opportunities for ‘gamification’ e.g. active travel challenges and ‘Better Points’ rewards and sustainable travel incentives	Most effective when considered alongside associated infrastructure improvements as part of a package of measures		√

‘Modal’ Suggestions: Behaviour Change Initiatives – Consultants’ Initial Considerations – ‘Below the Line’ – not to be taken forward for further sifting

Suggestion - Description	Considerations			A27 Transport Impacts
Home/remote working – support for remote working to reduce need to travel, particularly in peak periods	Requires supporting infrastructure e.g. fibre optic broadband, VPN connections etc. Could also include local office hub and co-working locations	Challenging delivery for local authority partners. Also requires culture shift in some organisations that might not be supportive of remote working		=
Car clubs and car sharing (car pooling) schemes – extend scheme usage through increase availability and promotion	Current car club scheme operates from four sites in Chichester (operated by Co-Wheels)	Car sharing (operated by LiftShare) via WestSussexCarShare.com includes local employer groups such as Rolls Royce, the University, Manor Royal Industry Estate, Sussex Fire and Rescue, and County Council	Both schemes have some part to play in trying to manage the growth of car ownership and usage, but with limited impact likely on the A27	=

‘Modal’ Suggestions: Land-Use Planning - Consultants’ Initial Considerations – ‘Above the Line’ – for further consideration and sifting

These suggestions are primarily offer long-term influences on travel demand through managing the availability and use of land, especially for new developments, use of ‘brown-field’ sites and in changing the use and densities of existing land uses

Suggestion - Description	Considerations			A27 Transport Impacts
Sustainable focus for land-use developments to minimise the requirement for residents or employees to travel by car/and via the A27	Focus key development sites in and around Chichester on transport corridors served by public transport and walking/ cycling/active modes and/or in locations where highway demand is less likely to use the A27 around Chichester	Limited numbers of development site are likely to mean that availability of sites will be main driver of development, although pre-existing or committed public transport and walking/cycling provision may allow earlier or more intense development at some site	Some transport network interventions will be delivered over time linked directly with new residential and commercial developments to address direct development-related travel demand	√
Planning conditions to reduce residential site car park allocations associated with new or redeveloped residential sites	Potential to introduce stricter planning conditions on car parking allocations	Stricter planning conditions could reduce site attractiveness	Could result in adverse impacts for nearby on-street residential parking, itself generating servicing and congestion challenges	√
Planning conditions to encourage or mandate reduced car access to new or redeveloped commercial sites and other trip attractors, including schools	Potential to introduce planning conditions, including stricter limits on car parking, support to sustainable travel modes (infrastructure/revenue support), limits on hours of operation.	Stricter planning conditions could reduce site attractiveness	Could result in adverse impacts of displaced workplace parking onto nearby residential locations, potentially mitigated by residents parking schemes	√

‘Modal’ Suggestions: Land-Use Planning – Consultants’ Initial Considerations – ‘Below the Line’ – not to be taken forward for further sifting

Suggestion - Description	Considerations			A27 Transport Impacts
Strong ‘containment’ strategy configured to provide full range of facilities on the Manhood Peninsula to reduce extent of travel into and beyond Chichester	Potentially useful long-term contribution to reducing traffic, but practically and financially this is likely to be undeliverable	Reduced travel demand could threaten viability of existing public transport services		√√

‘Modal’ Suggestions: Technology Initiatives - Consultants’ Initial Considerations – ‘Above the Line’ – for further consideration and sifting

These suggestions are primarily configured to reduce the impacts of car usage and increase the use of public transport and sustainable modes, both through improving the efficiency of the transport network and improving information available to residents and travellers to the area covering travel choice and availability

Suggestion - Description	Considerations			A27 Transport Impacts
‘Smart A/B-road’ concept, comprising a range of technologies currently being rolled out in the ‘Smart Motorways’ programme to deliver capacity and operational traffic flow benefits	Range of technology drivers to actively manage traffic flows to ‘platoon’ vehicle flows and adjust junction and signal timings, to deliver traffic flow priorities, maximise network efficiencies.	Interventions package could include - Queue detection - Incident detection - Routeing and journey times using ANPR/Bluetooth - Bus detection and priority	Likely to deliver efficiency and traffic related environmental benefits. Concept may work best with the availability of suitable diversionary route to handle traffic flow/delay perturbations	√√√
Dynamic variable message signing for road users, including vehicle routeings, car park availability and other messaging	Potentially valuable tool for messaging users on tactical traffic routeings under both normal and disrupted conditions	Increasing availability of in-car/ personal information could reinforce effectiveness of messaging, but needs to be fully or largely consistent		√√
Improved real time passenger information for bus and rail, including extended functionality and availability	Indirect impact on congestion through improved public transport service quality and awareness. Extend provision to all public transport stops	Provision could be extended to key central area locations away from the transport network, including shopping centres and other local attractions		√
Availability of local transport information through technology (and traditional dissemination) routes to deliver comprehensive real-time information on local transport conditions and choices	Coordination of disparate real-time and live information sources to provide a single accessibly area-wide source to assist in determining local travel choice	Various ‘push’ or ‘pull’ technologies available, but likely to require some active management to ensure credibility. Traditional marketing (radio etc) social media, mobile apps		√
Electric vehicle charging infrastructure to encourage reduced emissions	Provision of appropriate charging points - car parks (fast/slow chargers, supermarkets (fast), service stations (rapid) etc to encourage increased local take up of electric vehicles	Could be linked to developing a fleet of electric taxis and/or buses both for positive messaging and as a delivery springboard to improve local emissions	Further development likely through the Sussex Air partnership working with District and Borough Council partners to develop a network of charge points at local authority owned car parks	=

Suggestion - Description	Considerations			A27 Transport Impacts
Autonomous vehicles may provide a range of opportunities for the transport network into the longer-term in the way cities function and transport network is managed. But, whilst the technology may be developing quickly, it is not yet clear how autonomous vehicles will interact with society in general with different functions and governance models possible	The potential functions and impacts of autonomous vehicles (AVs) are not clear at present. AV's may offer increased road capacity and an ability to reduce both home and destination parking requirements by acting like taxis, but safety and other considerations may require road networks re-engineering	Early consideration would be useful by the planning and transport authorities as to whether any investment in the A27 and supporting package of interventions needs to include 'passive provision' and 'future proofing' for the large-scale take-up of autonomous vehicle, and of so what can be done and when		??

‘Modal’ Suggestions: Public Transport Modes - Consultants’ Initial Considerations – ‘Above the Line’ – for further consideration and sifting

These suggestions are primarily configured to increase the use of public transport and directly reduce car travel, especially for access to Chichester. All ‘above the line’ suggestions offer some potential to encourage modal shift, but this is likely to be modest even with a package of improvements measures in place

Suggestion - Description	Considerations			A27 Transport Impacts
Bus infrastructure improvements to deliver improved reliability, including bus priority, shelters and facilities at all stops etc	Network reliability may be constraining demand and increasing operating costs	Delivering improved crossing of the A27 could conflict with highway capacity. Road space limitations may suggest technology-driven priority rather than physical segregation	Improved waiting facilities, including stop facilities – cover, seating, (real time) passenger information etc	√
Bus service improvements providing enhanced frequencies and network coverage	Current network offers relatively high levels of service during core daytime hours. Improvements possible during evenings/off-peak	Opportunities to increase service levels further will be driven by demand or subsidy increases	Challenges on bus network viability are likely to continue into the medium and longer term	=
Park and ride to serve Chichester centre to avoid ‘last mile’ car access to the city	Requires land for parking and a reliable public transport route	Can reduce traffic flows into central area, but possibly with wider traffic impacts in accessing P&R site	Could increase availability of ‘short-stay’ parking to increase retail vitality	√
Demand response transport (DRT)– with opportunities for ‘town’ and/or ‘corridor’ initiatives	Consider potential for technology to drive an alternative, but enhanced, public transport network structure	A ‘total transport’ offering DRT, bus and other service providers (health and education) could improve service levels or reduce delivery costs		=
Rail and bus timetable integration including coordinated services and interchange	Not practical to divert all buses into station forecourt. Improved links to bus station useful?	Problems with impacts of congestion. High bus service frequencies limit opportunities	But potentially useful coordination at start and end of services when both rail and bus frequencies are low	=
Rail and bus ticketing integration to increase ease of use and potentially reduce fares	PlusBus available, but only in Chichester… extend coverage?	Widening smartcards or contactless payment may provide some benefits		=
Taxis – improved vehicle standards and waiting facilities	Measures could include improved waiting facilities	Consider electric taxis to deliver environmental benefit, messaging and drive local charging provision		=

Suggestion - Description	Considerations			A27 Transport Impacts
Extensive subsidy to the bus network to enhance service level or reduce fares	Maintaining current service levels may be challenging given funding constraints and industry issues	Legality of subsiding fares would need to be considered. Challenges in funding support over the short- to medium- to long-term		√
Bus rapid transit network - unguided/guided - kerb, wire or optical guidance	New network of new high quality and largely segregated network to drive modal shift	Delivery challenges in reallocating road space, and key benefits can be delivered using lower cost alternatives	But, some of guided technology could deliver benefits in selected constrained locations	√
Seasonal park and ride to the Witterings and Selsey from the A27 near Chichester to reduce traffic accessing the Manhood Peninsula from the A27 or crossing the A27	Requires land for parking and a reliable public transport route, itself a real challenge given the constraints of the road network and seasonal traffic flows	Limited viability; high operating costs due to route length and low ridership as survey work for Project STOMP suggested majority of visitors would not consider using public transport under almost any circumstance	Potential for shared park and ride and existing bus service to reduce delivery costs, but journey times and service reliability are likely to remain relatively unattractive for 'seaside' bound visitors arriving by car	=
Rail rolling stock improvements to offer enhanced quality of service	Specified through the franchise agreements, franchise timetables and consultation processes	Improvements will be made as the Coastway East trains, some of the oldest on the network, are replaced		=
Rail service frequencies and journey time improvements	Specified through the franchise agreements, franchise timetables and consultation processes	'Local' frequency changes improve journey times are unlikely to be a high priority for the rail industry	Short-term changes on Coastway East from Spring 2018	=
Tramway, light rail or ultra-light rail routes to Selsey, the Witterings, Bognor or elsewhere	Limited economic and commercial viability given potential demand flows and significant capital/operating costs	Current alternative bus services deliver relatively high frequencies but are constrained by congestion	Key benefit of segregated crossing of A27 could be delivered through high quality bus-based interventions	√
Cable car, Monorail, Personal Rapid Transit ('Heathrow Pods') or similar 'bespoke' segregated transport modes	Needs strong 'point-to point' demand to be viable. Could work with P&R, but potentially costly for this function	Cable car scheme delivery can be relatively rapid and with little disruption during construction	Environmental impacts, primarily visual	=
Hyperloop – passenger/cargo transport operating at airline speeds, and claimed to be at a fraction of the cost of air travel.	Ultra-high-speed intended for long-distance travel. Not appropriate for Chichester	Potential for significant townscape, landscape and wider environmental impacts		=

‘Modal’ Suggestions: Freight - Consultants’ Initial Considerations – ‘Above the Line’ – for further consideration and sifting

These suggestions are primarily configured to provide enhanced facilities and management of freight to mitigate the impacts of congestion on the A27

Suggestion - Description	Considerations			A27 Transport Impacts
HGV and goods vehicle priority to minimise the impacts of congestion on business dispatch and delivery on the Manhood Peninsula and to the businesses east of Chichester	Delivering physical segregation and priority measures to improved goods vehicle access to the A27 could conflict with highway capacity	With limited road space availability technology-based priority using selective vehicle detection may provide similar benefits to dedicated HGV lanes and could be focused on local freight users	Opportunities exist alongside the ‘Smart A/B Road’ concept considered under ‘Traffic Management’	√
HGV access and routeing restrictions to physically manage timing and routeings of goods vehicles	Mandating restrictions on freight operators may generate opposition, but could deliver wider traffic flow and environmental benefits	Timing and routeing restrictions may require mitigation measures, including provision of waiting areas, driver facilities etc	Provision of new off-line highway capacity allowing alternative goods vehicle routes may offer opportunities for more extensive HGV access and routeing restrictions	=/√
Delivery and serving plans for freight companies and users to encourage or manage timing and routeings of goods vehicles and to minimise freight contribution to congestion, and the impacts of congestion on operations	The freight industry is diverse with differential requirements across own account users, freight forwarders and distribution companies etc, requiring bespoke servicing plans	Mandating delivery and serving plans and consequential restrictions on freight operators may generate opposition, but could deliver wider traffic flow and environmental benefits	Timing and routeing restrictions may require mitigation measures, including provision of waiting areas, driver facilities etc	=
Electric vehicle charging infrastructure to encourage freight users to switch in part of full to electric vehicles to reduced vehicle emissions	Provision of appropriate charging points could assist local operators to consider moving to electric vehicles, at least for small servicing vehicles operating largely within local catchments	Further development in public charging points through the Sussex Air partnership. Potential to extend partnership working with commercial fleet operators to understand if any local benefits can be realised		=
Business to Customer (B2C) deliveries using home shopping/home delivery or ‘locker-box’ delivery strategies	Extensive home delivery opportunities exist from major retailers and internet suppliers potentially reducing home-based car journeys, but generating delivery vehicle trips	Development of a ‘locker box’ strategy, including central area pick-up points, such as at Chichester station, could reduce delivery vehicle circulation into residential areas, but impacts would relatively small		=

Suggestion - Description	Considerations			A27 Transport Impacts
'HGV and goods vehicle' lanes on the A27 and approach routes to prioritise freight vehicles over other vehicles	HGV or goods vehicle lanes can work well to address particular access issues where goods vehicle flows warrant any loss of road space for general traffic. Is not problematic; may be shared facilities with bus lanes where bus and HGV flows permit	Limited road space on the A27 and approach roads suggests technology-based priority may be offer more potential than physical segregation on both the A27 and approach roads		-/√
Freight hub or consolidation centres to reduce HGV flows in sensitive areas, including Chichester centre and on the narrow roads on the Manhood Peninsula	Concept may be suitable for large urban areas where there are real challenges of central area HGV servicing	Single freight hub or consolidation centre could generate additional freight movements on the A27 in accessing a single site. Increases in light goods vehicle flows are likely in handling local distribution	Freight industry does not, generally, welcome consolidation centres due to the need for 'doubling handling' of goods impacting on delivery efficiency and costs	-
Freight tramway to the Manhood Peninsula to reduce goods vehicle flows on the local road network, which itself is not well engineered to handle HGVs (linked to passenger tramway)	Concept could potentially work with strong 'origin point' to freight hub/consolidation centre goods flows, but would require 'double handling' impacting on delivery efficiency and costs	Locational diversity of the Manhood Peninsula growers' production sites likely to limit value for any fixed route freight tramway. As above, freight hub/consolidation centre viability issues	Additional tramway infrastructure, bespoke vehicles and operating costs over and above any passenger tramway are likely to be prohibitive relative to the benefits in the Chichester context	=
Drone delivery for small packages to reduce delivery van circulation	Technology still at early testing stage, and only likely to offer marginal benefit in reducing light good vehicle deliveries in city centre (cf existing multiple drop off deliveries can be 'efficient'	Visual and noise intrusion impacts may not be welcomed locally		=

	'Mitigated' North Concept	assessment	'Full South' Concept	assessment
BABA27 Themes				
Through and local traffic	O Strong separation of through and local traffic. Offering all E-W A27 through movements a faster, fully segregated alignment away from local traffic to and from Chichester, including N-S access from the Manhood Peninsula and Bognor. RIS1 forecasts for the northern options 4 and 5 suggested eastbound journey times in 2035 between a point 4.2km west of the Fishbourne roundabout and the Boxgrove roundabout of around 6 minutes compared to a 2014 journey time of 12.5 minutes and a 2035 'do minimum' of over 15 minutes. O Without a junction on the A286, we would expect this concept route to reduce the inappropriate diversionary use of local roads for E-W movements in the north, including Hunters Race, Spitalfield Lane and through Lavant/New Road. O The provision of a junction with the A286 may also be expected to reduce the use of these inappropriate diversionary routes to the north, but in our view would generate much more significant changes in access routes into Chichester centre, which itself could put some pressures on the local road network, particularly the Northgate gyratory and routes further east, such as Spitalfield Lane. This variant will need careful consideration due to both these traffic issues and wider impacts considered elsewhere in this assessment. RIS1 Journey Times Source: A27 Chichester Bypass Traffic Forecasting Report July 2016 - section 6.12	Major Beneficial	O Separation of through and local traffic, offering all E-W A27 movements a fully segregated alignment through junctions but with interactions with local traffic on A27 links, including 'weaving' (i.e. changing lanes) between junctions. RIS1 forecasts for the south options 2 suggested eastbound journey times in 2035 between a point 4.2km west of the Fishbourne roundabout and the Boxgrove roundabout of just over around 11 minutes compared to a 2014 journey time of 12.5 minutes and a 2035 'do minimum' of over 15 minutes. This concept also provides full segregation for N-S access from the Manhood Peninsula and Bognor Regis. Maintaining local connectivity is an integral part of this concept, although a fuller assessment trading off engineering feasibility, costs and acceptability may been required in very constrained locations, particularly in considering east-facing slip roads at the Whyke junction. RIS1 Journey Times Source: A27 Chichester Bypass Traffic Forecasting Report July 2016 - section 6.12	Large Beneficial
Multi-modal transport	O Significant additional network capacity will result in changes in traffic flows and reduce conflicts between through and local traffic. This should provide opportunities for re-allocating 'released' road space in the city, including opportunities for improving connectivity across the existing A27, due to reduced traffic flows. These opportunities would need to be considered as part of a wider Chichester Transport Package and may not be fully funded through RIS2. Limited wider opportunities for integration with other public transport and sustainable modes.	Slight Beneficial	O Additional network capacity will result in reduction in traffic on local roads in south of Chichester City and south of A27 and the reduced conflicts between through and local traffic should provide some opportunities for re-allocating road space in the city centre and particularly N-S routes crossing the existing A27 for cyclists and pedestrians. Improved pedestrian and cycle connections form part of the concept, with full segregation of the current junctions reducing the current severance of the A27 and significantly increasing the quality of walking and cycling network in accessing the city from the south. The bus network will also benefit through improved reliability avoiding direct interactions with the A27, potentially improving service levels and reducing operating cost. Further enhancements to capitalise on walking and cycling network benefits may be possible and could be developed as part of a wider Chichester Transport Package, although these additional elements would not be funded through RIS2. O Improved public transport service reliability arising from reduced 'north-south' congestion on the A286 and B2145 should allow for better integration of the bus and rail network in serving the Manhood Peninsula, including improved interchange reliability and active consideration of closer timetable integration (accepting there are wider network reliability issues, especially during the seasonal peaks)	Moderate Beneficial
Environmental Factors	O This concept can only progress with significant mitigation of environmental issues. O With respect to air quality there is potential for some local adverse impacts during construction at nearby properties but with mitigation possible, to be detailed in a Construction Environmental Management Plan. Previous assessment was that the impact would be a Not Significant Adverse effect. During operations, the previous RIS1 work for the 'north' options 4 and 5 assessment work s identified a significant beneficial impact at Stockbridge and St Pancras AQMAs from changes in traffic flow, although these would still exceed limits. However, an increase in NO_2 could occur at Stockbridge AQMA, although the impacts are not considered to be significant. O With respect to noise, construction activities could generate significant adverse effects at some locations. With mitigations it is possible to reduce the impacts using enclosures, screening and access routes for plant. During operation, previous assessments identified that the SDNP would potentially have increases in noise of up to 5db in some locations. Mitigations possible include living walls, other noise barriers and quiet road surfaces.	Moderate Adverse	O With respect to air quality there is potential for some local adverse impacts during construction at nearby properties but with mitigation possible, to be detailed in a Construction Environmental Management Plan. Previous assessment work undertaken for the RIS1 submission, suggested that during operations for option 2, reduced congestion and consequential improved traffic flows would generate beneficial impacts on local air quality along the existing A27 and particularly around Stockbridge AQMA where there will be significant reductions in queuing traffic. There will also be air quality benefits in the city centre, including the St Pancras AQMA, as a result of reduced diversionary traffic. Overall, the previous assessment work undertaken for the RIS1 submission, for all 'south' options was the air quality impacts would be 'Not Significant Beneficial'. O With respect to noise, construction activities could generate significant effects at some locations, particularly residential areas around Stockbridge. With mitigations it is possible to reduce the impacts using enclosures, screening and access routes for plant. During operation, previous assessments identified neutral to slightly beneficial impacts depending on the balance of traffic flow changes and mitigation measures. Mitigations possible include living walls, other noise barriers and quiet road surfaces. RIS1 Air Quality impacts: A27 Chichester Bypass Environmental Study Report (Summary) July 2016 - sections 3 and 14	Neutral
Chichester as jewel	O Introducing a new major highway route to the north of Chichester will impact on the setting of the city from the north, and could be seen to encourage infill development up to the alignment of the new route. However, some of the key strategic development sites in Chichester are already earmarked and are not dependent on the introduction of a northern route or a junction at the A286. O The 'Mitigated North' concept would have an impact on the setting of Lavant were a junction at the A286 to be provided; without a junction the use of 'green bridges' could significantly mitigate setting impacts. Without a junction, this concept would also be expected reduce inappropriate diversionary traffic currently experienced through the village. O The increased highway capacity will reduce congestion and the use of alternative diversionary routes through the city centre and other sensitive local areas, thus helping to protect the character of the city.	Neutral	O The existing A27 is an established part of the transport network in Chichester but with significant congestion issues, it is apparent, and has been widely accepted, including by BABA27 group, that this has resulted in increased use of inappropriate diversion routes through the city for both normal and disrupted traffic flows. The improved travel conditions for through journeys and reduced congestion arising from junction improvements will reduce the use of alternative diversionary routes through the city centre and other sensitive local areas, thus helping to protect the character of the city. O The earlier RIS1 options that provided grade separation at the Fishbourne junction (options 1, 1A and 2) in trying to address transport problems would have also increased the visual presence of the A27, particularly in terms of views from the south. This new concept addresses many of these key concerns through use of adjusted vertical alignments.	Slight Beneficial

	'Mitigated' North Concept	assessment	'Full South' Concept	assessment
Landscape and conservation	O This concept can only progress with significant mitigation to address key landscape and conservation issues. However, there are likely to remain some significant adverse impacts on landscape character and visual amenity. These impacts will be worse during construction due to temporary works, although the Construction Environmental Management Plan should reduce these impacts. Earlier assessments suggest the most significant impacts are on the Broyle Earthwork Scheduled Monument and properties in Fishbourne and Chichester. Chichester Dyke may or may not be impacted depending on detailed design. Enhanced mitigations are required to address community concerns, and could include engineering solutions such as reducing visual impacts through lowering vertical alignments, innovative screening including living walls, with use of 'green bridges' and directional lighting at a reduced height. O As above, this concept would have an impact on the landscape around Lavant were a junction at the A286 to be provided; without a junction the use of 'green bridges' could significantly mitigate landscape and setting impacts by providing direct visual landscape sight-lines; the requirements for slip roads and lighting with a junction would have direct landscapes impacts. O Also as above, in providing additional highway capacity and avoiding use of inappropriate diversionary routes there is an opportunity to reduce traffic in the city centre and therefore improve the setting of the city centre Conservation Areas.	Moderate Adverse	O The existing A27 is an established part of the transport network in Chichester and the landscape to the south of the city. There will be some temporary adverse impacts during construction of on-line improvements with the Construction Environmental Management Plan aiming to reduce these impacts. In providing underpasses at Fishbourne and Stockbridge, this concept reduces the visual impacts of the grade-separated junctions to the Fishbourne Conservation Area and Chichester Harbour Conservancy AONB compared to some previous RIS1 options (1, 1A and 2). It is possible that engineering solutions involving some limited elevation may be required at Stockbridge to address the specific challenge of crossing the nearby Chichester Canal, though other solutions exist to do so. The concept will have visual impacts at Whyke, Bognor Road and Portfield where flyovers are used to separate through and local traffic, though these are less sensitive locations in terms of landscape. O As above, in providing additional highway capacity and avoiding use of inappropriate diversionary routes there is an opportunity to reduce traffic in the city centre and therefore improve the setting of the city centre Conservation Areas.	Slight Adverse
Local and regional economy	O In building largely off-line, this concept has limited impacts on the existing transport network during construction, except in tying in with the existing A27 and crossing the A286 and A285. Therefore, the disruption to existing travellers will be relatively limited. Previous assessments suggested the monetised economic transport impacts during construction were negligible compared to the long-term benefits. However, there may be some localised business impacts, particularly affecting the Goodwood Estate, in both working operations and customer access with works potentially severing the link between the Estate and motor racing circuit and airfield. With careful construction management planning, we believe much of the impact can be mitigated. O Once operational, this concept delivers a significant increase in highway network capacity that will reduce journey times and congestion to provide more travel certainty for commuters, business and visitors, and will offer long-term support for local and regional economic growth. The provision of a new route strongly increases network resilience by providing an opportunity to divert traffic away from the existing A27 in the event of major disruption or an unplanned closure, or during routine maintenance works, and will therefore also reduce the use inappropriate diversionary routes at time of disruption. The additional 'off-line' capacity provides for a diversionalry route around Chichester, specifically identified as missing in Highways England's South Coast Central Route Stategy. O Current congestion and journey time variability on the A27 is limiting economic growth and adds to business and tourism industry costs. The provision of additional bypass capacity will unlock some on the local constraints on business both in the city centre and particularly on the Manhood Peninsula, sustaining the economic vitality of the area.	Very Large Beneficial	O In building largely along the existing alignment, this concept will have significant impacts on the existing transport network during construction for commuters, business and visitors to the area. Some mitigation will be possible, which would be commensurate with the scale of this scheme (of a scale significantly different to the recent small-scale Stockbridge footbridge works). This may include measures such as parallel construction, temporary roadways, and quick removal barriers. However, there will be some significant residual impacts. This concept is more ambitious in some locations than previously presented RIS1 options and an integral part of this concept is the need to focus on mitigation construction impacts through a comprehensive Construction Management Plan. O Once operational, this concept delivers a modest increase in highway network capacity with some reduction in journey times and congestion to provide more travel certainty for commuters, business and visitors, to support medium to long-term local and regional economic growth. Although the additional 'on-line' capacity of this concept does not explictiy provide for a new diversionalry route around Chichester, specifically identified as missing in Highways England's South Coast Central Route Stategy, the additional separation of through and local traffic provided will provide a modest increase in network resilience (i.e. the ability to respond to unplanned incidents). O Current congestion and journey time variability on the A27 is limiting economic growth and adds to business and tourism industry costs. The provision of a modest increase in capacity will unlock some on the local constraints on business both in the city centre and particularly on the Manhood Peninsula, sustaining the economic vitality of the area.	Moderate Beneficial

	'Mitigated' North Concept	assessment	'Full South' Concept	assessment
Highways England Project Aims				
Improve capacity to support growth	See above - 'through and local traffic' and 'local and regional economy'	Very Large Beneficial	See above - 'through and local traffic' and 'local and regional economy'	Moderate Beneficial
Improve road safety	In building largely off-line, this concept has limited impacts on road safety during construction. In operation, by separating through and local traffic and building to current design standards, with limited/no junctions, this concept has the potential to significantly reduce accident exposure for travellers both on the A27 and elsewhere in the area. Previous assessments identified significant monetised benefits arising from reduced numbers of accidents, valued over the appraisal period as between £61m and £73m in 2010 present value terms. RIS1 Accident Benefit impacts: A27 Chichester Bypass Economic Assessment Report - options 4 and 5, appendix A (monetised benefits)	Very Large Beneficial	In building largely along the existing alignment, this concept potentially has some impacts on road safety during construction, with Construction Management Plans focusing on minimising accident risk. With the scheme in place, the removal of at-grade junction arrangements has the potential to reduce accident risk and the impact of accidents on travellers on the A27. However, whilst current design standards may improve safety, 'weaving' between junctions and demand changes may erode some of the potential benefits. Previous assessments underpinning the RIS appraisal identified only small monetised benefits arising from reduced numbers of accidents, valued over the appraisal period as between £61m and £73m in 2010. RIS1 Accident Benefit impacts: A27 Chichester Bypass Economic Assessment Report - sections 5.4 (outline text and monetised benefits)	Moderate Beneficial
Reduce adverse environmental impacts	See above - 'environmental factors', 'Chichester as a jewel', and 'landscape and conservation'	Moderate Adverse	See above - 'environmental factors', 'Chichester as a jewel', and 'landscape and conservation'	Neutral
Improve journey time reliability	See above - 'through and local traffic' and 'local and regional economy'	Very Large Beneficial	See above - 'through and local traffic' and 'local and regional economy'	Moderate Beneficial
Enable housing provision	There are significant pressures on the local area to deliver additional housing growth. Whilst this concept delivers significant increases in strategic highway capacity, it will not act as a local distributor road and will only indirectly support housing growth and delivery for those sites in Chichester itself as it creates highway capacity rather than providing access to land for development. These key strategic development sites in Chichester (North-East of Chichester, West of Chichester, Tangmere and Shopwyke Lakes) are already earmarked and are not dependent on the introduction of a northern route or a junction at the A286. With much of the development in the medium to longer term expected to be to the south of Chichester, particularly in Arun and Bognor Regis, this concept provides some capacity relief but does not address capacity at key junctions on the existing A27, where much of this development traffic is going to access the strategic road network. Additional development on the Manhood Peninsula might not be fully supported by this concept.	Slight beneficial	There are significant pressures on the local area to deliver additional housing growth, with much of the development in the medium to longer term in Arun and Bognor expected to the south of Chichester. This concept delivers modest increases in strategic highway capacity at key junctions in the medium to long-term to provide access to these development sites. Additional development on the Manhood Peninsula might not be fully supported by this concept as there may be insufficient network capacity on the A286/B2145 approaches and junctions with the A27.	Moderate Beneficial
Improve regional connectivity	See above - 'local and regional economy'	Very Large Beneficial	See above - 'local and regional economy'	Moderate Beneficial
Improve accessibility to tourist areas	In building largely off-line, construction of this concept has limited impacts on access to tourist areas, such as Chichester centre, the Manhood Peninsula and the resorts on the A259. In operation, by transferring through traffic from the existing A27 and reducing traffic flows and congestion at Stockbridge, Whyke and Bognor Road junctions, this concept is expected to offer strong indirect support to key local tourist areas, including Chichester centre, Goodwood, the Witterings, Selsey and Bognor Regis.	Moderate Beneficial	In building largely along the existing alignment, construction of this concept will have some significant impacts on access to key tourist areas, specifically to the Manhood Peninsula whilst works take place at Stockbridge and Whyke and for access to Bognor and the A259 resorts whilst work takes place at Bognor Road. Care will need to be taken, managed through the Construction Management Plans, in ensuring alternative minor road route diversions are controlled. With the scheme in place and with full turning movement and grade separation at junctions, this concept with will offer strong direct support to access to tourist areas, including Chichester centre, Goodwood, the Witterings, Selsey and Bognor Regis. By addressing many of the connectivity concerns of the earlier RIS1 scheme options. Walking and cycling are seen as important aspects of tourist access to the Manhood Peninsula, and improved connectivity across the existing A27 provided by this concept can play a part in supporting tourist access.	Large Beneficial

	'Mitigated' North Concept	assessment	'Full South' Concept	assessment
Wider Delivery Considerations				
Policy and planning fit	O A fuller assessment of the policy and planning fit of this concept will need to be undertaken in the course of later assessment work, including, but not limited to, transport, land-use, economic and environmental policies and plans. O In transport policy terms there is a strong alignment of this concept in supporting national, regional and local objectives for transport, with a widespread consensus that there is a need for intervention on addressing the problems of the A27 in Chichester, with the policy fit here being illustrated in the earlier assessments. O The 'Mitigated North' concept introduces a compliance risk with a range of environmental legislation, including i) the duty to have regard to the twin purposes of the National Park, under Section 62 (1) of the Environment Act (1995); ii) the 'National Networks Planning Policy Statement', which has a presumption against building of roads in National Parks; and iii) DEFRA's 'English national parks and the broads: UK government vision and circular 2010', which states that 'Any investment in trunk roads should be directed to developing routes for long distance traffic which avoid the Parks'. The impacts of this concept, with strong mitigation, need to be tested further with the statutory bodies to amend or confirm their views developed during earlier engagement through the RIS1 processes in respect of a northern bypass route. Although not a precedent, the recent decision to progress with A27 Arundel Bypass is a local example of decision making in similar circumstances. O In respect of planning policies, whilst this concept delivers significant increases in strategic highway capacity, it will not act as a local distributor road and only indirectly support housing growth. The key strategic development sites in Chichester (North-East of Chichester, West of Chichester, Tangmere and Shopwhyke Lakes) are already earmarked and are not dependent on the introduction of a northern route or a junction at the A286. With much of the development in the medium to longer term expected to be to the south of Chichester, particularly in Arun and Bognor Regis, this concept provides some capacity relief but does not directly address capacity at key junctions on the existing A27.	Moderate Adverse	O A fuller assessment of the policy and planning fit of this concept will need to be undertaken in the course of later assessment work, including, but not limited to, transport, land-use, economic and environmental policies and plans. O In transport policy terms there is a strong alignment of this concept in supporting national, regional and local objectives for transport, with a widespread consensus that there is a need for intervention on addressing the problems of the A27 in Chichester, with the policy fit here being illustrated in the earlier assessments. O With respect to environmental policy, with construction works on and immediately adjacent to the existing A27 corridor, the impacts of the 'Full South' concept need to be tested further with the statutory bodies. This will include considering the close proximity of works to the Fishbourne and Chichester Conservation areas and the Chichester Harbour Conservancy AONB. A full reassessment of statutory bodies' views set out in the earlier engagement through the RIS1 processes will need to undertaken, including in response to the mitigation proposed as an integral part of this concept, particularly at the Fishbourne and Stockbridge junctions. O In respect of planning policies, the Full South concept is consistent with the WSCC Transport Plan 2011 – 2026 that refers to improvement of the A27 junctions. With much of the development in the immediate vicinity of Chichester arising from the Local Plan already earmarked, on-going 'marginal gains' or 'Local Plan' improvements will be forthcoming on the existing A27. None of these developments are dependent on further major investment in the existing A27. However, with much of the medium- to longer-term development areas in the area are in Arun and Bognor Regis, to the south of Chichester, additional investment in capacity is required. This concept delivers modest increases in strategic highway capacity at key junctions to support medium to long-term development in these locations. Additional development on the Manhood Peninsula might not be fully supported by this concept as there may be insufficient network capacity on the A286/B2145 approaches and junctions with the A27.	Neutral
Engineering feasibility	O The engineering feasibility of a general 'North' concept has been established previously during the extensive work associated with the RIS1 optioneering, including sifting down to the earlier Options 4 and 5 (from the initial Stage 1 options A to D). Whilst feasible engineering routes for this concept therefore exist, some further work will be required to confirm feasibility were any variations to the earlier horizontal alignments to be considered or newly developed alternatives to emerge. O For the 'Mitigated North' concept it is essential that a full mitigation package is put in place to address key environmental concerns of developing a new alignment. Again, earlier work in developing the RIS1 specification (specifically including environmental mitigations) established that some general mitigation would be possible using vertical alignments to lower road surfaces, in part addressing both visual and noise issues, and especially in the close proximity to the Goodwood motor racing circuit and SDNP. Other mitigation measures identified in earlier work and confirmed as being mandatory here, included low level lighting and the use of noise barriers, such as earth bunds. O It has been assumed that additional or higher quality mitigation, including further lowering of the road surface, sections of 'cut and cover' or 'green bridges', and the use of 'living walls' and noise reducing g road surfaces will be essential to further reduce any adverse impacts of this concept. The potential for adverse business impacts on the Goodwood estate suggests a further enhancement to the earlier 6m deep cutting design, including extensive use of the 'green bridge' concept and imaginative boundary treatments to maintain the character of the estate and full operational flexibility. These mitigations are feasible, and our assessment has assumed that additional costs will be incurred relative to the RIS1 scheme specifications for options 4 and 5. O To mitigate land-take and wider environmental impacts around Lavant and potentially reduce costs it is possible this concept could be delivered without a junction on the A286. This variant will need careful consideration as it is not clear whether the direct transport benefits of increased connectivity will outweigh the opportunity for better mitigation of environmental impacts and avoid any fundamental changes to access routes into Chichester centre, which itself could put some different and challenging pressures on the local road network, particularly the Northgate gyratory. O Whist a new junction to directly serve the Goodwood Estate may initially appear to be feasible, this would require additional land-take and generate adverse environmental impacts in providing slip roads and associated lighting etc, and with limited opportunities to manage and distribute visitor traffic to parking locations, there could be safety concerns related to queueing traffic accessing the area backing up and interfering with 'through' traffic. Such a 'local' junction would not be recommended as part of this concept. RIS1 Option 4 and 5 mitigations and impacts: A27 Chichester Bypass Environmental Study Report Options 4 and 5 (discounted) - July 2016	Slight Adverse	O Although the engineering feasibility for a range of junction improvements for a general 'South' concept has been established previously during the extensive work associated with the RIS1 optioneering, the 'Full South' concept has been developed to be more aspirational and address the key transport connectivity and environmental concerns of some of the earlier options. It is acknowledged that the current A27 alignment is in close proximity to properties and business throughout its route in Chichester, but particularly at Stockbridge junction. Both the built environment and natural environments act as constraints on engineering feasibility. O The disruption during construction along the existing A27 alignment will have some significant impacts on all road users travelling along or crossing the A27, including motorists, bus users, cyclists and pedestrians. The impacts will include commuters, business users and visitors, specifically those accessing the Manhood Peninsula whilst works take place at the Stockbridge and Whyke junctions, and for access to Bognor Regis and the A259 resorts whilst works take place at the Bognor Road junction. Care will need to be taken, managed through the extensive and carefully configured Construction Management Plans, in mitigating as much as possible construction impacts and in ensuring use of alternative diversionary routes are controlled. However, significant residual impacts will remain and this will be one of the most challenging elements of the 'Full South' concept. O For our 'Full South' concept the built and natural environment constraints will result in some very challenging engineering solutions to be adopted that will be both costly and risky. In order to mitigate visual impacts on the Chichester harbour Conservancy AONB at Fishbourne and visual and local connectivity/severance issues at Stockbridge, the use of underpasses will require some potentially difficult engineering to manage the water environment and, specifically the Chichester Canal. Providing underpasses in these locations and aiming to retain all turning movements through the A27 junctions is particularly challenging and will involve widening the current footprint of the A27 involving land-take and in possible acquisition of properties and/or direct business impacts, for example by through losses or car parking or other operational land/buildings. Difficult engineering will also be required at Whyke in providing grade-separation and retaining full turning movement due to Ivy Lake and a Portfield where the junction geometry and the Westhampnett Lake add to the engineering challenges. The feasibility for grade separation to meet the requirements of the 'Full South' concept at Fishbourne and Bognor Road junctions has been established through the RIS1 designs, although at the Fishbourne junction the earlier RIS1 options included an overpass solution.	Very Large Adverse

	'Mitigated' North Concept	assessment	'Full South' Concept	assessment
Acceptability	O The development of the 'Mitigated North' concept has been founded on the premise that, from a local community perspective, additional strong and focused mitigation would be locked into the concept in working towards addressing the key concerns relating to the earlier RIS1 options. This will include significant work during construction and delivery to reduce the environmental impacts through engineering and visual and noise mitigation measures. Business impacts, particularly for the Goodwood estate, will also need addressing, including reducing any connectivity impacts of their operations by varying the vertical alignments and addressing setting/visual/noise intrusion. There will remain some potential issues with the setting of the South Downs National Park and how national and local policies relate to the Park. Although not a precedent, the recent decision to progress with A27 Arundel Bypass is a local example of decision making in similar circumstances. O Community feedback through BABA27 and wider channels has assisted in developing the tactical specifications for our concepts. One of the key questions arising from our wider assessment is whether the mitigations specified for inclusion with this concept offer enough to build sufficient community consensus for the promoting authorities and local MP, and then Highways England, to take this concept forward into the RIS2 programme and then through the statutory development processes towards delivery.	Slight Adverse	O The development of the 'Full South' concept has been founded on the premise that, from a local community perspective, the key shortcomings of the earlier RIS1 scheme options would be addressed, including local connectivity and visual intrusion issues. This will include challenging engineering works that could involve significant land-take, and significant disruption during construction even with strong mitigation and construction management planning. O Community feedback through BABA27 and wider channels has assisted in developing the tactical specifications for our concepts. One of the key questions arising from our wider assessment is whether the expansion of the earlier RIS1 scheme options to cover all six A27 junctions, to maintain local connectivity, and to provide underpasses rather than flyovers in sensitivity locations, is now sufficiently different from RIS1 to build sufficient community consensus for the promoting authorities and local MP, and then Highways England, to take this concept forward into the RIS2 programme and then forward through the statutory development processes towards delivery.	Slight Adverse
Funding potential	O Potential cost of £350m-£400m is likely to be at the top end of any funding envelope, but transport benefits will also be high and, in monetised terms are likely to exceed the value required for central Government investment, as expressed though a benefit cost ration (and resulting value for money assessment). The magnitude of costs may make a 'competition' with other RIS2 scheme challenging. This is limited scope of significant reductions in costs, especially as the strong mitigations underpinning this concept are an integral part of the concept and need protecting. However, opportunities may exist for reducing costs by not developing a A286 intermediate junction and some value engineering (a systematic method to improve 'value' relative to 'cost' by using an cost examination of function relative to costs), including potentially such trade-offs at the A27 'tie-ins'. Some key cost uncertainties remain over land costs and potential business impacts; ; these uncertainties are normal at this stage in the project/concept development and are ordinarily handled through contingency and optimism bias uplifts to costs.	Very Large Adverse	O Potential cost of £300m-£350m is likely to be at the top end of any funding envelope, but transport benefits will also be high and, in monetised terms are likely to exceed the value required for central Government investment, as expressed though a benefit cost ration (and resulting value for money assessment). The magnitude of cost may make a the 'competition' with other RIS2 scheme challenging. There is significant scope for reductions in costs, but this will compromise benefit delivery though reducing transport benefits (reducing the scope of improvements at junctions) or removing some of the (challenging engineering) mitigations required at some junctions to meet the BABA27 critical success factors, but these are an integral part of this concept. Some key cost uncertainties remain over land costs and potential business impacts; these uncertainties are normal at this stage in the project/concept development and are ordinarily handled through contingency and optimism bias uplifts to costs.	Large Adverse
'Value for Money'	O In a standard transport appraisal, where the majority of impacts are measured in monetary values, the value for money category is primarily informed by one of two metrics: the Benefit Cost Ratio (BCR) and the Net Present Value (NPV). However, a value for money assessment includes wider considerations, including non-monetised impacts and risks and uncertainties. O Extensive further work is required to confirm both costs and benefits of our 'Mitigated North' concept. However, the earlier RIS1 work suggested that whilst the costs for the northern bypass options were high, the benefits were commensurate with the costs and provided a strong quantified BCR (of 2.7 to 2.9) and NPV (around £440m PV). Our 'Mitigated North' concept is likely to deliver similar benefits to the earlier assessments, although additional costs associated with enhanced mitigations will be incurred. Nevertheless, it is unlikely that these changes will materially affect any wider value for money assessment. RIS1 BCR/NPV Source: A27 Chichester Bypass Economic Assessment Report July 2016 - 'Core' Scenario, 'Current' Values of Time.	Large Beneficial	O In a standard transport appraisal, where the majority of impacts are measured in monetary values, the value for money category is primarily informed by one of two metrics: the Benefit Cost Ratio (BCR) and the Net Present Value (NPV). However, a value for money assessment includes wider considerations, including non-monetised impacts and risks and uncertainties. O Extensive further work is required to confirm both costs and benefits of our 'Full South' concept. The extended scope of this concept compared to the earlier RIS scheme options, including particularly the Portfield junction and in retaining full local connectivity and turning movements at Stockbridge and Whyke, is most likely to increase the magnitude of the transport benefits, although also significantly increasing the scheme costs. The earlier RIS1 assessments suggested the 'south' options delivered NPVs of between £140m PV and £340m PV with BCRs varying between 2.3 and 2.7 (4.1 for the very low-cost option 3). It is likely that the benefits of our 'Full South' concept will be towards or beyond the top end of this benefit range, with the increased benefits commensurate with the increased costs, and thereby retaining a strong quantified BCR and NPV. It is, therefore, unlikely that these changes will materially affect any wider value for money assessment. RIS1 BCR/NPV Source: A27 Chichester Bypass Economic Assessment Report July 2016 - 'Core' Scenario, 'Current' Values of Time.	Large Beneficial

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