



Department
for Transport

A27 CORRIDOR

Feasibility Study Summary

March 2015

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1. Introduction

- 1.1 The A27 corridor feasibility study was one of six studies undertaken by the Department for Transport to look at problems and identify potential solutions to tackle some of the most notorious and long-standing road hot spots in the country.
- 1.2 The commitment to the studies was part of the biggest ever upgrade of the strategic national roads network, announced by the Government at the time of the 2013 Spending Review.
- 1.3 The studies have been progressed alongside the Highways Agency's Route Strategy programme, which is considering the current and future performance of the entire strategic road network, in order to inform future investment decisions.
- 1.4 This summary document for the A27 corridor feasibility study outlines: the study's aims and objectives; the current and likely future problems along the routes; the development and assessment of potential investment options; the assessment of business cases for prioritised investment options; and the investment decisions and outcomes announced by the Government in its Road Investment Plan¹.

¹ <https://www.gov.uk/government/collections/road-investment-strategy>

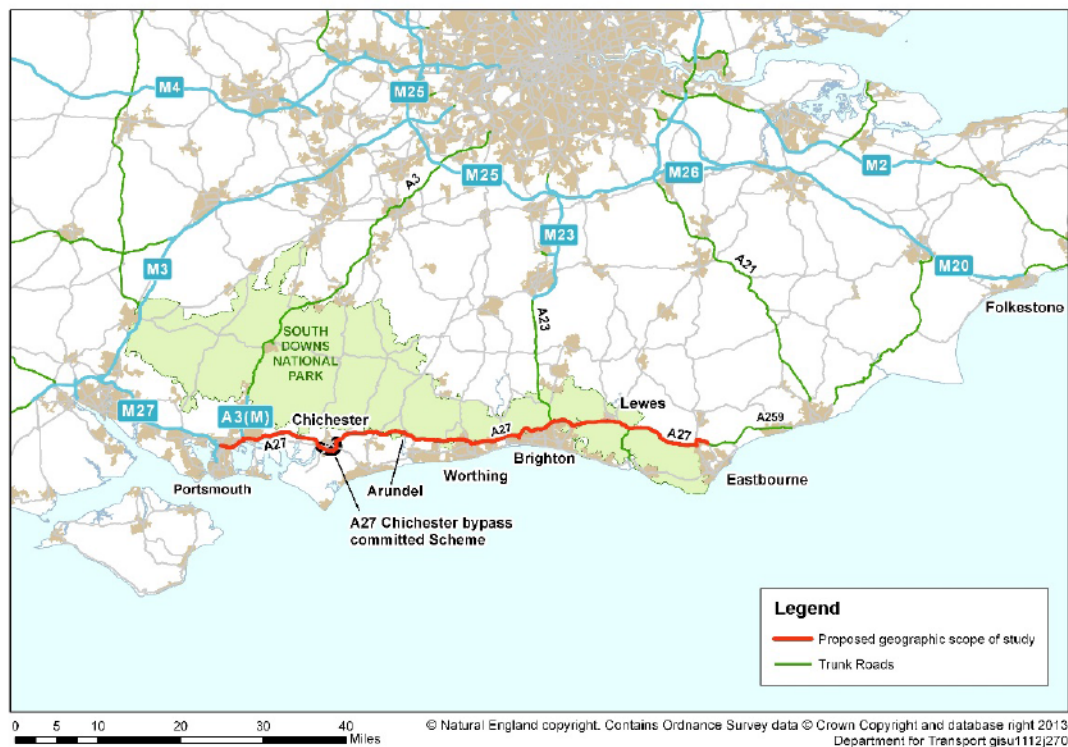
2. Context

- 2.1** The A27 is the only east-west strategic road to the south of the M25. It links cities and towns along the south coast which accommodate over three quarters of a million people, including Portsmouth, Havant, Chichester, Arundel, Worthing, Brighton and Hove, Lewes and Eastbourne. The A27 also enables access to Bognor Regis and the ports of Portsmouth, Shoreham and Newhaven, and provides businesses and residents in this corridor with access to the rest of the strategic road network.
- 2.2** The local economy has strengths in advanced engineering and tourism and has accommodated substantial population and household growth over the past decade, particularly in the urban areas. The A27 corridor runs alongside and through the South Downs National Park but is constrained by the urban centres and the sea to the south.
- 2.3** There have been long-standing calls to improve the A27 corridor. Enhancements along the A27 and beyond were previously considered as part of the South Coast Multi Modal Study (SoCoMMS) which reported in 2002. The study concluded that there was little justification for a long distance strategic south coast route between Southampton and Margate. It did, however, identify the need for a number of investments along the A27. Only some were progressed due to the difficulties of delivering major road schemes in environmentally sensitive locations.
- 2.4** Further studies have since been undertaken by the Highways Agency and local authorities. Transport improvements have also been developed by the Highways Agency (for example, between Southerham and Beddingham) and local authorities (for example, the Bexhill to Hastings link road).
- 2.5** As part of the outcomes of the 2013 Spending Review, Government committed to investment for major improvements to the A27 Chichester bypass as part of its pipeline of future major road schemes, subject to value for money and deliverability.

3. Study aims and objectives

- 3.1 The aim of the A27 feasibility study was to identify the opportunities and understand the case for future investment solutions on the A27 corridor, particularly at Arundel and Worthing, that are deliverable, affordable and offer value for money.
- 3.2 In terms of geographic scope, the study considered the A27, from its junction with the M27 in the west (between Cosham and Portsmouth), and its junction with the A259 at Pevensey in the east.

Figure 1: The geographic scope of the A27 corridor feasibility study



- 3.3 The modal scope of the study was predominantly road-based, taking into consideration potential investment proposals on both the strategic and local road networks. The study also considered the availability of rail and local public transport services, and the contribution that current public transport investment plans would bring.
- 3.4 The objectives of the study were to:
 - identify and assess the case, deliverability and timing of specific infrastructure investments that best address existing and future priority problems on the A27 corridor;
 - understand the balance of benefits and impacts from potential individual investment proposals and any additional benefits or impacts

from potential packages of investment in the national and local transport networks; and

- evidence, where possible, the wider economic impacts from the transport investment in the corridor.

3.5 The study took place from spring to autumn 2014 and was undertaken by the Highways Agency and its consultants. The study process followed that in the Department for Transport's guidance (WebTAG) for such studies and a Stakeholder Reference Group was formed to ensure effective external involvement. This Reference Group acted as a sounding board and allowed the views of stakeholders to be captured and considered during the study process. The organisations represented on the group are listed in the Annex.

4. Current and future situation

- 4.1** The first part of the study reviewed evidence from relevant studies and undertook analysis of current and future performance on the A27 corridor. It also established the availability of current transport modelling tools for the A27 and supporting data.
- 4.2** Analysis of 2001 and 2011 Census Journey to Work and historic roadside interview data (supporting the SoCoMMS study) shows that there are a variety of short and long distance trips made along the A27, with little change in travel patterns between 2001 and 2011:
- a high proportion of work-related journeys in the coastal area are made by road. For example, over 60% of commuter trips are by car (either as driver or passenger), less than 10% by public transport and up to 15% by walking or cycling;
 - over 60% of trips along the coastal area were estimated to be journeys made entirely within the counties of West and East Sussex; and
 - goods vehicles represent more than 15% of the daily traffic flows along the A27 and a third of this is heavy goods traffic.
- 4.3** The coastal area is served by a number of rail routes running parallel to the A27, including the west and east Main Line routes and the west and east Coastway routes. These also cater for local stopping stations, thus providing good rail accessibility for shorter journeys and lengthier journey times for longer distance journeys.
- 4.4** For most of its 67 mile length the A27 is dual carriageway. Four stretches of road remain single carriageway, namely at Arundel, Worthing, and along two stretches between Lewes and Eastbourne. Such sections of road tend to experience peak hour congestion and poor time reliability.
- 4.5** These single carriageway sections are further constrained by congestion resulting from limited capacity at at-grade junctions at Ford Road Roundabout, Crossbush Junction, Offington Corner and Grove Lodge Roundabout.
- 4.6** The study found that Annual Average Daily Traffic flows (AADT) on specific single carriageway links were close to, or above, the theoretical capacity of the road. A single carriageway is expected to accommodate AADT flows up to 13,000 vehicles. For example, AADT flows in 2013 were around 15,300 at Arundel, over 17,800 at Worthing and around 11,400 on the stretch between Lewes and Polegate.

- 4.7** Conversely AADT flows on most sections of the dual carriageway along the A27 are within the theoretical road capacity. A dual carriageway can accommodate up to 39,000 AADT. For example, the link north of Shoreham had an AADT flow of around 25,400 in 2013.
- 4.8** The analysis of available reliability and delay data indicates problems along the route that impact on the efficient and safe movement of people and goods and have consequential effects on the environment and local communities.
- 4.9** Congestion is a problem at a number of locations including Chichester, Arundel, Worthing and between Lewes and Polegate resulting from a reduction in carriageway standard from dual to single, which results in increased journey times and low traffic speeds. For example, there are regularly delays on the section between Grove Lodge Roundabout in Worthing and the A2025 in Lancing.
- 4.10** The route runs through, and close to, settlements causing severance issues at Arundel, Worthing, Lancing and villages east of Lewes.
- 4.11** Traffic and congestion affect air quality and there is an Air Quality Management Area (AQMA) in Worthing. There is another AQMA at Storrington along the A283 north of the A27, which is affected by traffic re-routing off the A27 in order to bypass Arundel and Worthing.
- 4.12** The study found that accidents are significant along certain links, with incidents leading to issues for journey-time reliability. Analysis shows that the A27 junction with the A2025 near Lancing is one of four locations on the A27 that are within the top 250 collision locations on the strategic road network.
- 4.13** The study also identified a range of environmental challenges. The route passes along and through the South Downs National Park and north of the coastal floodplains of the River Arun and River Adur. A number of areas are protected by environmental designations including Ramsar Sites, Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest and National Nature Reserves.
- 4.14** The cities and districts continue to plan for significant growth. Over 60,000 new homes and substantial employment development are already expected within the coastal area over the next decade and beyond. There may be additional growth pressures in the longer term subject to future investment decision making, for example, regarding development of Gatwick airport and growth in the wider Gatwick Diamond area.
- 4.15** The capacity of the transport system to support any future growth is, however, constrained by the capacity of the A27, the capacity of the local road network and the junctions linking the routes. It is also constrained by limitations on rail and other public transport modes to significantly improve their offer of an alternative choice of travel, other than in the larger urban areas.
- 4.16** High level traffic modelling undertaken as part of the study indicates that congestion is expected to worsen in future, particularly along the single carriageway sections and narrow lane dual carriageway sections.

4.17 The evidence and analysis of identified problems and issues were used to prioritise three locations or 'hotspot areas' for targeting interventions. These were:

- Arundel;
- Worthing and Lancing; and
- East of Lewes - specifically the stretch of road between Lewes and Polegate.

4.18 The analysis was also used to define a set of intervention-specific objectives to be used in identifying and assessing potential investment options. The objectives established were:

- **Connectivity and Capacity** - reduce travel time and improve journey time reliability in the key hotspot area;
- **Societal** - reduce severance and pollution impacts and provide opportunities for improved accessibility for all users;
- **Economy** - enable local planning authorities to manage the impact of planned growth and in doing so support the wider economy;
- **Safety and Resilience** - provide safer roads which are resilient to delay and which are able to adequately cater for the impacts of adverse weather; and
- **Environmental** - minimise impacts on the natural environment and optimise environmental opportunities and mitigation.

5. Investment options

- 5.1** Following the identification of the current and future situation, the study reviewed previous work to identify investment proposals that could address the issues and problems. The study considered a range of individual investment proposals, as well as combinations of investment propositions. This approach looked to build on work done to date, rather than completing a fresh identification of investment proposals.
- 5.2** The study drew upon a range of completed or recent related work including the South Coast Multi Modal Study (SoCoMMS, 2002), the Bullens studies (undertaken post-SoCoMMS for the Highways Agency, 2004), the West Sussex Delivering a Sustainable Transport System study (DaSTS 2009), and the West Sussex County Council A27 study 2013.
- 5.3** The option generation process identified a long list of discrete interventions at each of the three prioritised locations. Over 40 interventions - comprising a variety of online and offline solutions - were considered at a high level. Only those which met most of the intervention objectives and appeared deliverable and feasible were taken forward.
- 5.4** The shortlisted options were then assessed using the Department's Early Assessment and Sifting Tool. The following options were assessed in this way:

At Arundel:

- three new bypass options - (a) partly through the National Park, (b) avoiding the National Park or (c) closer to the town through the National Park;
- online dualling of the existing road including a 250 metre tunnel and a short stretch of bypass; and
- online improvements.

At Worthing and Lancing:

- tunnels throughout;
- combinations of tunnel, bypass and dualling;
- online dualling throughout;
- online junction improvements; and
- travel demand management and public transport.

East of Lewes:

- two versions of a new offline route: (a) single carriageway and (b) dual carriageway;
- bypasses at (a) Selmeston and (b) Wilmington;
- new link road at Folkington; and

- low cost online improvements including junction improvements at Polegate, the introduction of a quality bus corridor between Hailsham and Eastbourne and the extension of shared space cycleway from Lewes to Polegate.
- 5.5** Following this, the online improvement option at Arundel and travel demand management/public transport option at Worthing were not assessed further as these did not sufficiently address the intervention objectives of the study. In particular the objective of "reducing travel time and improving journey time reliability in the key hotspot area" was not met. Instead the study assumed that sustainable transport measures would be pursued but could only make a limited contribution.
- 5.6** Five of the options considered east of Lewes were prioritised for further assessment. The online improvements were not considered further by the study because any benefits were too localised. In addition, it was expected that the Polegate junction improvements and quality bus corridor would be brought forward as part of local development planning.
- 5.7** The prioritised options were then further assessed using the DfT's Option Assessment Framework, with evidence presented against two of the Treasury's five-case model (the strategic, economic, financial, management and commercial cases). As this was an early stage of assessing possible solutions, the study focussed on the strategic and economic cases.
- 5.8** The strategic case considered the strategic fit with national and local policy and the study objectives. The economic case considered economic, environmental and social impacts as well as a high level assessment of potential value for money (VfM).
- 5.9** Options which indicated strategic fit and/or potential VfM were prioritised for further consideration. The study prioritised:
- two of the Arundel bypass options;
 - three different tunnel and online improvement options for Worthing/Lancing; and
 - all five options for the section east of Lewes.
- 5.10** The following options were not prioritised for further assessment:
- At Arundel: bypass option (c) was not prioritised because it was considered too similar to bypass options (a) and (b) for the purpose of investment case development. In addition the online/tunnelling option was not prioritised because the relatively high cost of tunnelling indicated the likelihood of poor value for money; and
 - At Worthing: options comprising combinations of tunnelling and online or bypass improvements were not prioritised as they indicated the likelihood of value for money similar to that for a full tunnelling option.

6. Investment cases

- 6.1 The affordability, value for money (VfM) and deliverability of the prioritised proposals were then assessed. The study used the Department's transport appraisal guidance and considered the benefits and business cases for each of the transport investment proposals, as well as the cumulative or additional benefits and impacts from investment in the corridor as a whole.
- 6.2 Traffic modelling was used to make forecasts and assessments to support the environmental and VfM assessments within these business cases. This used amended versions of the models developed by the local highway authorities: West Sussex County Model in relation to Arundel, Worthing and Lancing, and the South Wealden and Eastbourne Transport Study Model in relation to the area east of Lewes.
- 6.3 The appraisal conducted is appropriate to the early stage of development of the proposals and will be further developed to ensure a full understanding of the impacts of the proposals and value for public money. Explanation of the way DfT assesses VfM can be found in the VfM note².

West Sussex

- 6.4 **A27 Arundel bypass** - the analysis showed that a new bypass at Arundel could generate journey time and accident savings and could have beneficial impacts on journey time reliability. In terms of air quality and noise levels, there could be adverse impacts owing to traffic increases, but beneficial impacts including in villages such as Storrington which are currently affected by traffic diverting to avoid the problems on the A27. All bypass options would have adverse impacts to varying degrees on environmental assets, existing communities, landscape, biodiversity and the floodplain south of Arundel.
- 6.5 Of the two bypass options evaluated:
 - a. *Option A*, based on the previous preferred route announced in 1993, would directly affect land designated as part of the South Downs National Park. The assessment indicated a good strategic fit against the intervention specific objectives and medium VfM.
 - b. *Option B*, to avoid land designated as National Park as far as possible, would have less adverse impact on the National Park and sensitive habitats within the park. This option would adversely impact the landscape and heritage of Binsted and Walberton which is valued

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/255126/value-for-money-external.pdf

by local communities. The assessment indicated a good strategic fit but low VfM owing to the higher cost of this option.

- 6.6 A27 Worthing and Lancing improvements** - the analysis showed that the prioritised interventions at Worthing and Lancing could generate journey time and accident savings and have a beneficial impact on journey time reliability and air quality as a consequence of reducing congestion. The different options would - to varying degrees - impact on small areas of the South Downs National Park adjacent to the A27 route as well as the townscape in Worthing.
- 6.7** Of the alternative improvement options evaluated:
- *Option A*, based on maximising tunnelling through both Worthing and Lancing, would require tunnel portals and junctions within Worthing to accommodate the interaction with north-south traffic flows via the A24. The assessment indicated a good strategic fit but poor to low VfM.
 - *Option F*, based on a previous on-line dualling proposal, would be challenging to deliver due to the requirement of online construction within the urban area. The assessment indicated a good strategic fit and very high VfM.
 - *Option G*, based on localised widening and junction improvements, could be less challenging to deliver than option F. The assessment indicated a good strategic fit and very high VfM.
- 6.8 West Sussex combined A27 investment case** - the study also assessed the case for combining both the A27 Arundel Bypass Option A and A27 Worthing online Option F. This demonstrated journey time savings, with benefits and adverse impacts as described above. The assessment indicated good strategic fit and high VfM.
- 6.9** On the evidence available, initial business cases were prepared for a dual carriageway bypass at Arundel - based on the previous preferred route - and online improvements at Worthing.

East of Lewes:

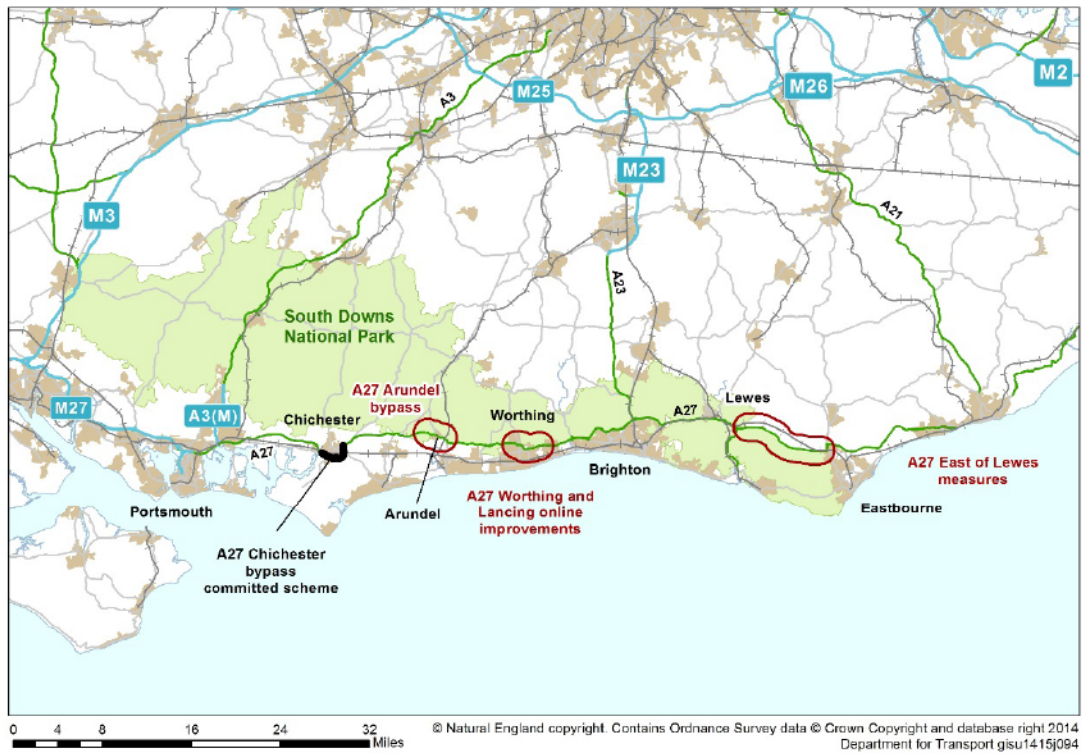
- 6.10** The analysis indicated that the options for a new off-line road to the north of the existing A27 could provide a good strategic fit with the objectives but were unlikely to be value for money. Conversely options for online improvements and short bypasses - including those which indicated high value for money - fell short of meeting the objectives. As no option satisfied both the objectives and value for money considerations, no initial business cases were subsequently prepared.
- 6.11** Of the options evaluated:
- *Option A*, based on a dual carriageway off-line new road between Lewes and Polegate, could generate journey time and accident savings and could have beneficial impacts on journey time reliability and network resilience. In terms of air quality and noise, there could be beneficial impacts along the existing A27 but adverse impacts along the new road. There could also be adverse impacts on landscape and biodiversity. The assessment indicated a good strategic fit but low VfM;

- *Option B*, based on a single carriageway new road between Lewes and Polegate, could have a similar range of impacts as identified for option A and cost less. The assessment indicated a good strategic fit but low to medium VfM;
- *Option C*, based on on-line improvements with a bypass at Wilmington, could particularly improve the section between Wilmington and Cophall. The assessment therefore indicated only a medium strategic fit albeit a high VfM;
- *Option D*, based on online improvements with a short bypass at Selmeston, could address local safety and severance issues. This option would not by itself, however, achieve benefits beyond Selmeston and therefore the assessment indicated poor strategic fit and poor VfM.
- *Option E*, based on a new link road at Folkington, could generate journey time savings at a lower cost than any of the other options, yet achieve only localised benefit. The assessment therefore indicated poor strategic fit but high VfM.

7. Study outcomes

- 7.1** Following completion of the study work and consideration of the potential investment options, the Government has committed to take forward an overall investment package of around £3.5 billion for the six feasibility studies.
- 7.2** The A27 is the only east-west trunk road south of the M25 and it links the key coastal urban areas between Portsmouth and Eastbourne. Over 60% of the 67 miles length of road is dual carriageway, with four stretches of single carriageway at Arundel, Worthing and east of Lewes.
- 7.3** There is a variety of short and long distance trips along the route, but few travelling end- to-end along the A27. The towns and cities attract additional traffic during the morning and evening peak hours and there are also seasonal increases in traffic. So, our aim is to address congestion at key hotspots, the delays for road users, separation of communities – notably in Arundel, Worthing and Lancing – air pollution, and an above average number of accidents.
- 7.4** In relation to the A27 corridor feasibility study, the Government announced investment worth around £350 million as part of the Road Investment Strategy in December 2014. This consists of the following:
- *A27 Arundel bypass* - a new dual carriageway bypass to link together the two existing dual carriageway sections of the road. The starting point will be the previous preferred route, subject to consultation with the National Park Authority, local government and the public on this, and alternative options.
 - *A27 Worthing and Lancing improvements* - improvements to the capacity of the road and junctions along the stretch of single carriageway in Worthing and narrow lane dual carriageway in Lancing. The extent and scale of the improvements, including the option of full dualling, are to be agreed in consultation with West Sussex County Council and the public.
 - *A27 East of Lewes* - funding set aside pending further work on capacity increases following review of long term growth plans in light of any recommendation made by the Airports Commission.
 - Development of sustainable transport measures at Arundel, Worthing, Lancing and East of Lewes.
- 7.5** These proposals in this investment package will require further work, engagement and consultation in order to reach agreement on the specific details of the proposals. Delivery will require the successful completion of the necessary statutory planning process and the continued development of business cases and demonstration of value for money.

Figure 2: Outcomes from the A27 corridor feasibility study



Annex: Reference Group Members

Local Highway and Planning Authorities:

Arun District Council
Brighton & Hove City Council
Eastbourne Borough Council
East Sussex County Council
Hampshire County Council
Lewes District Council
Portsmouth City Council
Wealden District Council
West Sussex County Council
Worthing District Council

Local Economic Partnerships:

Coast to Capital LEP
Solent LEP
South East LEP

Statutory Bodies:

Natural England
South Downs National Park Authority

Other organisations:

Alliance of Chambers in East Sussex
Campaign for Better Transport
Campaign to Protect Rural England
Eastbourne Chamber of Commerce
South Downs Society
Surrey and Sussex Association of Local Councils
The Wildlife Trusts

Members of Parliament:

Stephen Lloyd MP
Nick Herbert MP
Tim Loughton MP
Norman Baker MP