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A27 Route Strategy

Plan Design Enable

Introduction

This presentation covers

- Study objectives
- Guiding Principles
- Initial options sifting
- Three package assessment
- Preferred package assessment
  - Description
  - Cost
  - Cost benefit analysis
- Wider impacts
- Complementary strategy
- Delivery plan
- Conclusions

Study Objectives

Specific objectives for the schemes were defined that reflected challenges and opportunities in the study area:

- Improve journey times and journey time reliability for strategic (longer distance traffic) on the A27, whilst ensuring the dual function of the A27 as a longer distance strategic route and a local access route is maintained;
- Improve access by private and public transport to key employment and regeneration areas within Coastal West Sussex;
- Enable proposed housing, employment and retail growth to take place within Coastal West Sussex without undue congestion;
- Improve connectivity to/from the Manhood Peninsula (including Selsey and the Witterings).

A set of guiding principles were developed to steer decision making.

Guiding Principles

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Strategic:

- Study objectives need to fit with wider transport and government objectives, including those of WSCC and the Highways Agency;
- Interventions should be affordable and achievable in the short term, but should not prejudice longer term aspirations for the route (considered at this stage to be the Chichester fly-overs, Arundel By-pass and Worthing by-pass);
- Complementary local transport strategies will be required for Chichester, Arundel, and Worthing / Lancing to lock in the benefits of the identified strategy, and address residual problems on the network;
- Wider impacts on local traffic will need to be considered alongside improvements for strategic traffic on the A27 itself. *E.g. Options such as closing of roundabouts or banning right turns, which benefit through movements on the A27, may have significant adverse impacts on access to urban areas or use of other local routes.*

Guiding Principles

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Economic / Value for Money:

- Interventions need to represent good value for money in an economic, environmental and social context;
- The junctions within particular sub-corridors are in close proximity to each other, typically between 0.4 and 0.7 miles apart. Solutions will need to work collectively across each set of junctions, and recognise limitation in the adjoining link, so as to optimise route standard and performance in terms of reliability and consistency and to prevent passing the problem from one junction to another.

Financial:

- Interventions need to be affordable and financially sustainable in the short-term. An indicative package cost, in the order of £150m to £250m has been identified. Investigations of more expensive full bypass options are therefore excluded from this study, although remain as long term aspirations;
- Options which attract developer or other sources of third party funding will be assessed more favourably from a financial perspective;
- Scheme costs will need to consider wider impacts on utilities.

Guiding Principles

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Management:

- The package must be acceptable and deliverable in the short-term;
- It must be capable of phased implementation in response to funding availability;
- Designs need to be consistent with the Design Manual for Roads and Bridges, with details of any known departures from standards clearly set out.

Commercial:

- The strategy must be based on clear mechanisms for enabling delivery;
- The Highways Agency (as the responsible authority for the A27 trunk road) needs to approve the overall strategy (and key deliverables) to enable scheme implementation to progress with minimal further work as funding opportunities arise.

Initial Options Sifting

Atkins reviewed previous studies undertaken to identify proposals at the junctions Chichester, Arundel and Worthing.

A total of 43 potential options were identified across the study area and reduced to 33 options.

An initial sift of potential options was undertaken in accordance with the proportionate Option Assessment Framework, based on the Treasury's 5 Cases Model for business cases, as follows:

- **Strategic (why is the scheme needed?):** impact on the primary objectives for the A27; fit with wider transport and government objectives; impact on long term aspirations for the route; relationship with other junctions.
- **Value for money (is the scheme good value for money?):** Economic growth, carbon, local environment, social and well-being, benefit cost ratio.
- **Financial (is the scheme affordable and financial sustainable?):** Affordability, potential for third party funding.
- **Management (is the scheme deliverable?):** Public / stakeholder acceptability, practical feasibility, timescale, other key risks.
- **Commercial (can the scheme be procured and constructed?):** Commercial viability

Three package assessment

Combine the 33 options into three packages/scenarios for each location

Junction	Scenario 1	Scenario 2	Scenario 3
Chichester	Prioritising key local access	At-grade with signalisation	At-grade with lower cost options and fewer restrictions
Arundel	Minor Improvements and Do Nothing	Signalised Junctions	Signalising and increased capacity
Worthing	High Impact Options	Moderate Impact Options	Lower Cost Options

Test the 9 packages using the Highway Assignment Model of the WSCC Traffic Model and LinSIG junction software

Appraisal summary table produced, including: traffic, environmental, economic and social indicators.

Three package assessment

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Chichester

- Scenario 1 – looks at options that offer the most in support of prioritising Fishbourne, Bognor and Oving as local access and maintaining those junctions as roundabouts to allow u-turns for traffic where movements at adjacent junctions are restricted. It is dominated by the flyover option at Fishbourne with signalisation at all junctions;
- Scenario 2 – looks at the lower cost variation with a Hamburger Junction at Fishbourne and maintains the theme of signalisation with the same restrictions at junctions as Scenario 1 at non-key junctions but with no restriction at Oving and no signalisation at Bognor;
- Scenario 3 - looks at lower cost options across the route with fewer restrictions at minor access points of Stockbridge and Whyke. Bognor Roundabout will be tested as a signalised junction and Oving Junction will retain restrictions as proposed under the Shopwhyke Lakes development also reflected in the Portfield Roundabout improvements.

Three package assessment

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Arundel

- Scenario 1 – combines lower cost options with some modification to the layout at Crossbush with no change at Causeway and no change over the pinchpoint funded scheme for Ford;
- Scenario 2 – is based on the option at Crossbush that improves eastbound movements and also adds control and capacity at Causeway with a signalised junction and Ford with signalised roundabout;
- Scenario 3 – combines the more ambitious scheme of increasing capacity at both Ford and Crossbush by extending the overbridge at the A27 to accommodate direct north and south movements with increased capacity and control with a signalised junction at Causeway and the Hamburger junction proposal under consideration by the HA.

Three package assessment

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Worthing

- Scenario 1 – combines more major signalisation and capacity improvements with a fully signalised junction at Offington, a signalised junction at Grove Lodge and optimised signals and improved merge facilities at Lyons Farm/Sompting Road;
- Scenario 2 – represents schemes that whilst not ruled out are not expected to have a major impact including a Hamburger Junction at Offington, layout and signal improvements at Grove Lodge and signal optimisation at Lyons Farm/Sompting Road;
- Scenario 3 - looks at lower cost options across the route with flared entries at Offington Roundabout, minor junction improvements at Grove Lodge but the signal optimisation and improved merge at Lyons Farm/Sompting Road to remove blocking back across the junction.

Preferred Package Assessment

Combine best performing elements into a preferred package for each location

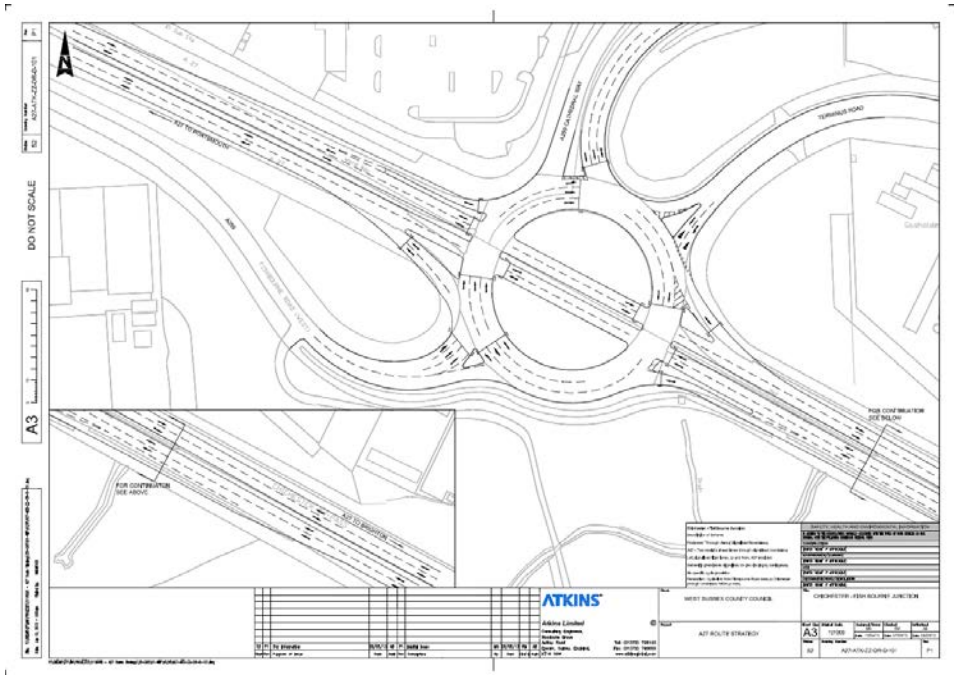
Assessment approach

- Feasibility design
- Model using Highway Assignment Model of the WSCC Traffic Model and LinSIG junction software
- Feedback traffic impacts to improve design
- Final model run using Highway Assignment Model of the WSCC Traffic Model and LinSIG junction software
- Economic appraisal

Preferred Package - Chichester

Fishbourne - 'Through About' Signalised Roundabout

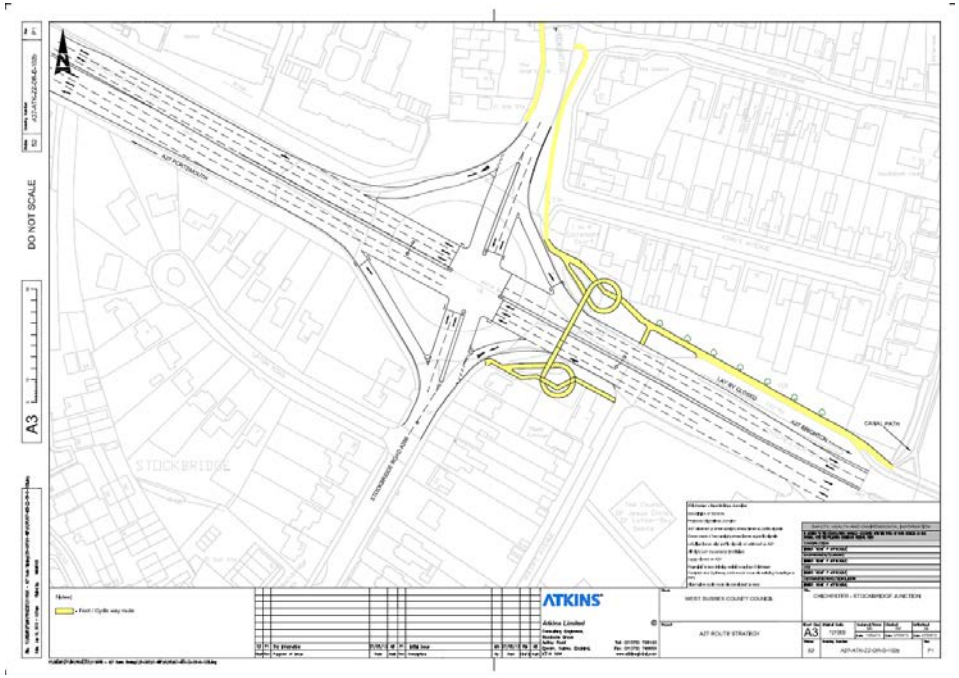
- A27 straight ahead two lanes through signalised roundabout
- Left signalised filter lanes, to and from, A27 provided
- Generally 3 lanes signalised on the circulatory carriageway
- No specific cycle provision



Preferred Package - Chichester

Stockbridge - Signalised Junction

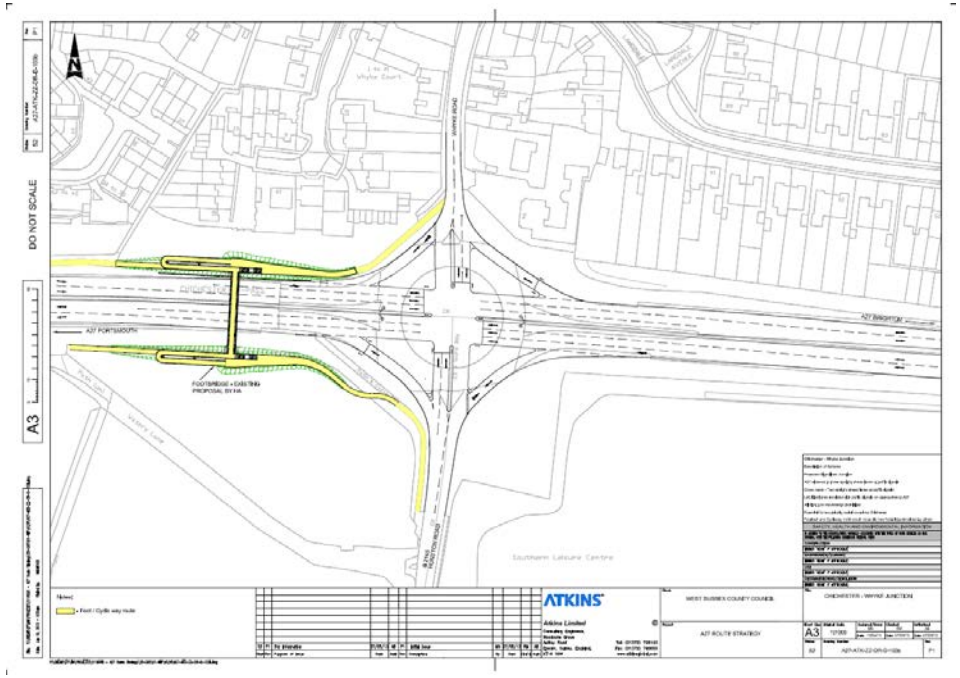
- A27 widened to three straight ahead lanes at traffic signals
- Cross roads - straight ahead lanes at traffic signals
- Left filter lanes with traffic signals on approach to A27
- All right turn movements prohibited
- Potential for bus priority radial route into Chichester
- Footpath and Cycleway north-south route via existing footbridge to east
- Alternative cycle route via canal path to east



Preferred Package - Chichester

Whyke - Signalised Junction

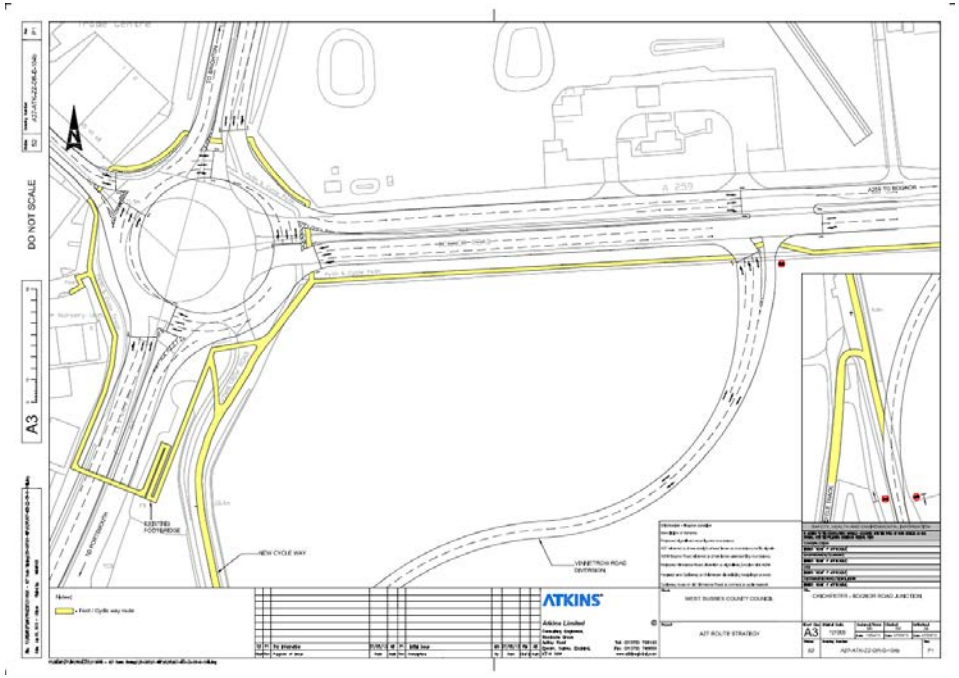
- A27 widened to three straight ahead lanes at traffic signals
- Cross roads - Two straight ahead lanes at traffic signals
- Left filter lanes provided with traffic signals on approaches to A27
- All right turn movements prohibited
- Potential for bus priority radial route into Chichester
- Footpath and Cycleway north-south route via new footbridge provided by others to west



Preferred Package - Chichester

Bognor - Signalised reconfigured roundabout

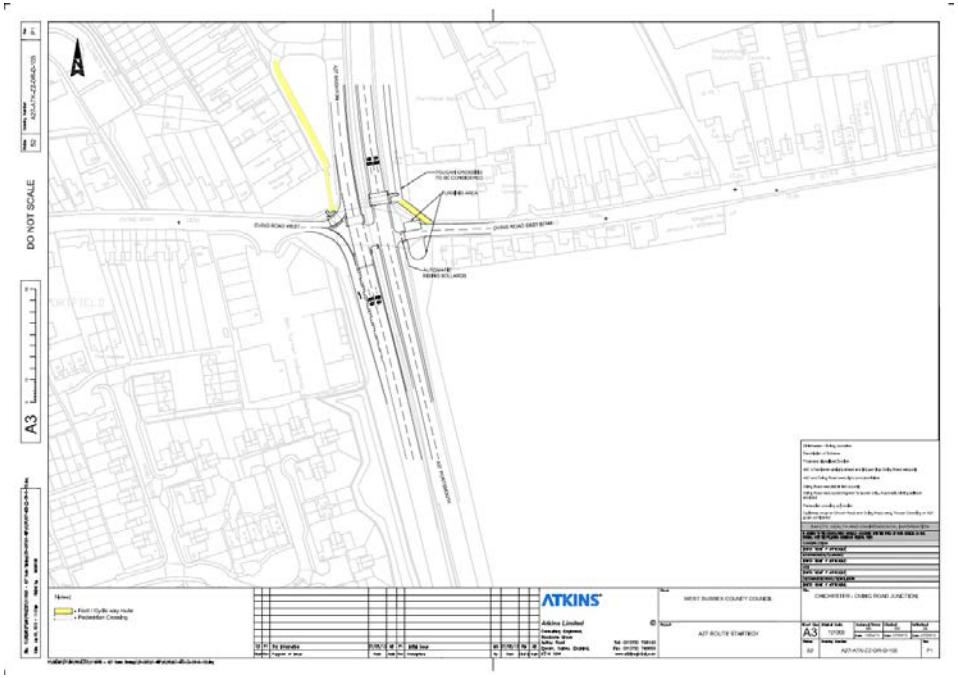
- A27 widened to three straight ahead lanes at roundabout traffic signals
- A259 Bognor Road widened to three lanes approaching roundabout
- Vinnetrow Road diversion to signalised junction with A259
- Footpath and Cycleway to Chichester via existing footbridge to south
- Cycleway route on old Vinnetrow Road to connect to cycle network



Preferred Package - Chichester

Oving - Signalised Junction

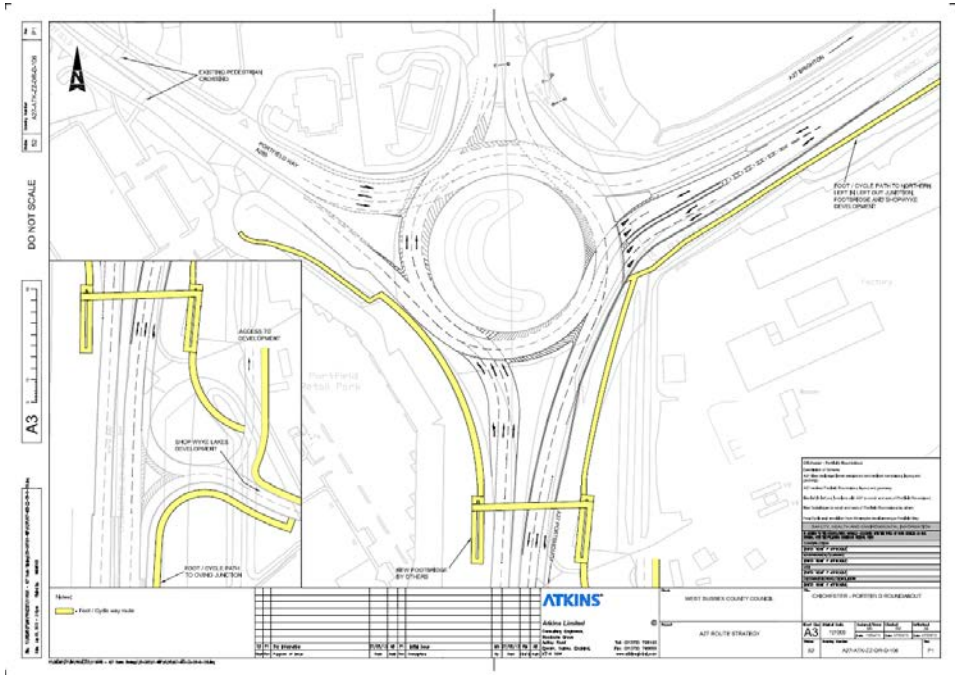
- A27 - Two lanes straight ahead and left turn into Oving Road west only
- A27 and Oving Road west right turns prohibited
- Oving Road west left in left out only
- Oving Road east right turn bus exit only. Automatic raising bollards provided
- Pedestrian crossing at junction
- Cycleway route on Church Road and Oving Road west. Toucan Crossing on A27 to be considered
- *Note: Assume Shopwhyke Lake development arrangements in place*



Preferred Package - Chichester

Portfield - A27 New dedicated lanes westbound and revised roundabout layout and geometry

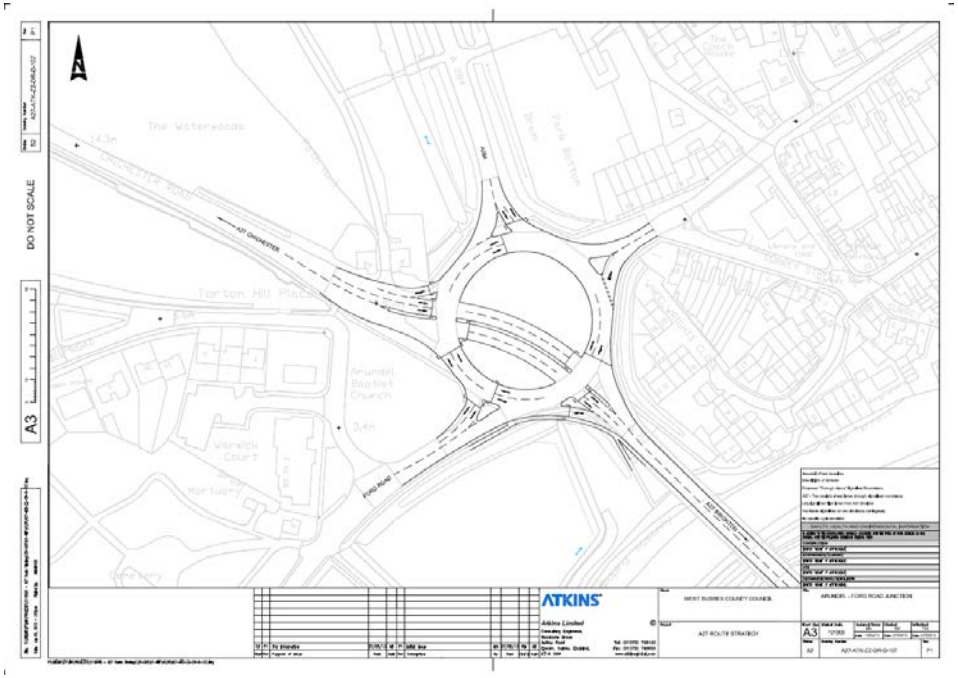
- A27 revised Portfield Roundabout layout and geometry
- New left in left out junctions with A27 to south and east of Portfield Roundabout
- New footbridges to south and east of Portfield Roundabout by others
- Foot/Cycle path provision from Shopwyke development to Portfield Way
- *Note: Assume Shopwhyke Lake development arrangements in place*.



Preferred Package - Arundel

Ford - 'Through About' Signalised Roundabout

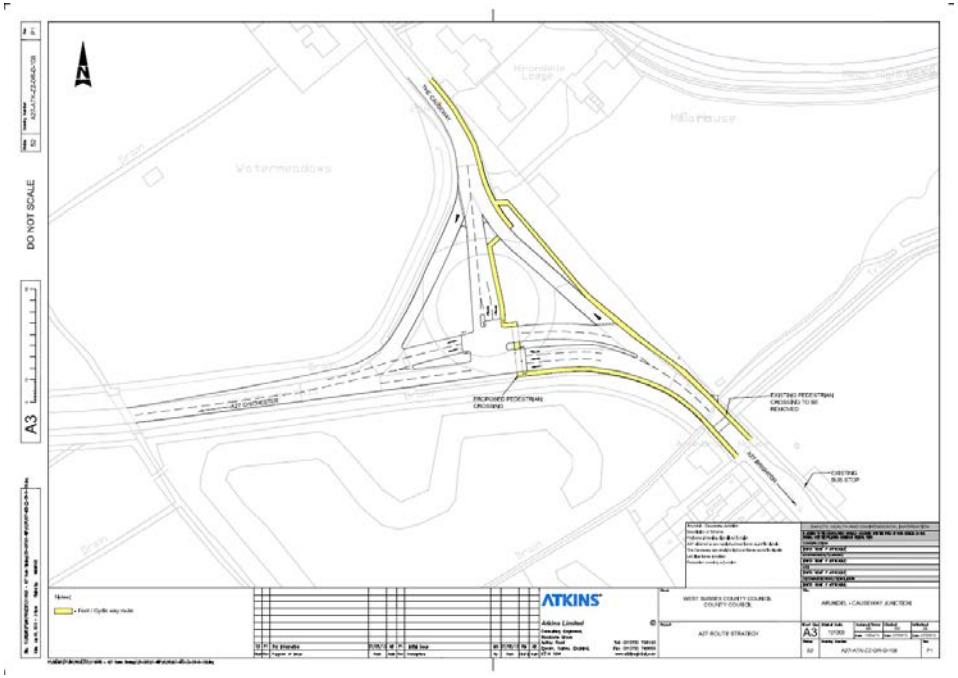
- A27 – Two straight ahead lanes through signalised roundabout
- Left signalised filter lanes from A27 provided
- Two lanes signalised on the circulatory carriageway
- No specific cycle provision



Preferred Package - Arundel

Causeway - Three-leg signalised junction

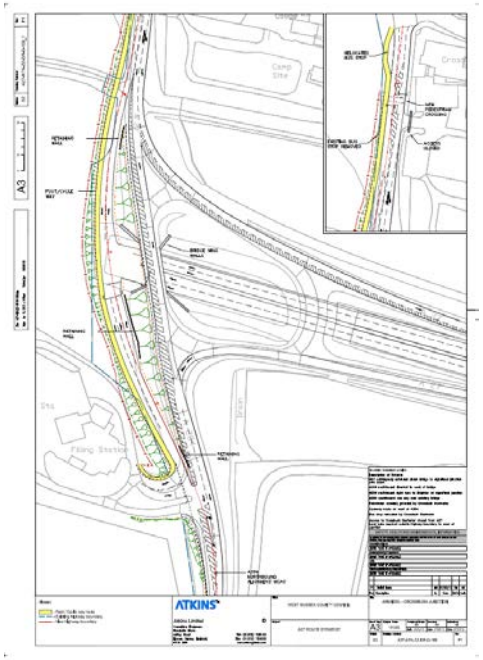
- A27 widened to two straight ahead lanes at traffic signals
- The Causeway two right turn lanes at traffic signals
- Left filter lanes provided
- Pedestrian crossing at junction



Preferred Package - Arundel

Crossbush - A27 carriageway extended under bridge to signalised junction with A284.

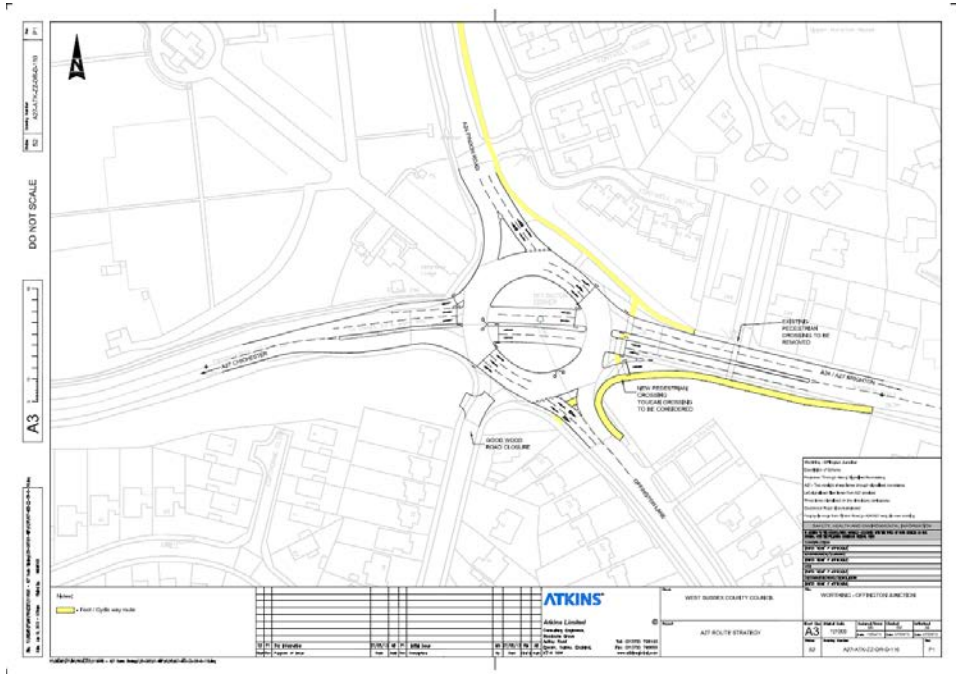
- A284 northbound diverted to west of bridge
- A284 northbound right turn to Brighton at signalised junction
- A284 southbound one way over existing bridge
- Pedestrian crossing provided by Crossbush Beefeater
- Cycleway route on west of A264
- Bus stop relocated by Crossbush Beefeater
- Access to Crossbush Beefeater closed from A27
- Land take required outside highway boundary to west of junction



Preferred Package - Worthing

Offington - 'Through About' Signalised Roundabout

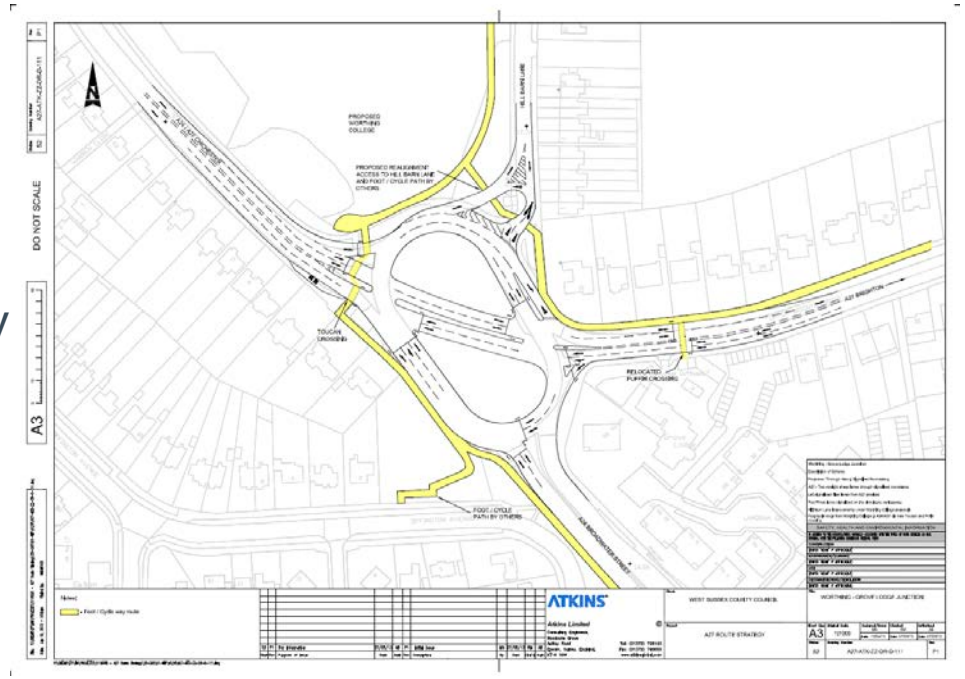
- A27 - Two straight ahead lanes through signalised roundabout
- Left signalised filter lanes from A27 provided
- Three lanes signalised on the circulatory carriageway
- Goodwood Road closure proposed
- Foot/cycle route from Findon Road to A24/A27 east via new crossing



Preferred Package - Worthing

Grove Lodge - 'Through About' Signalised Roundabout

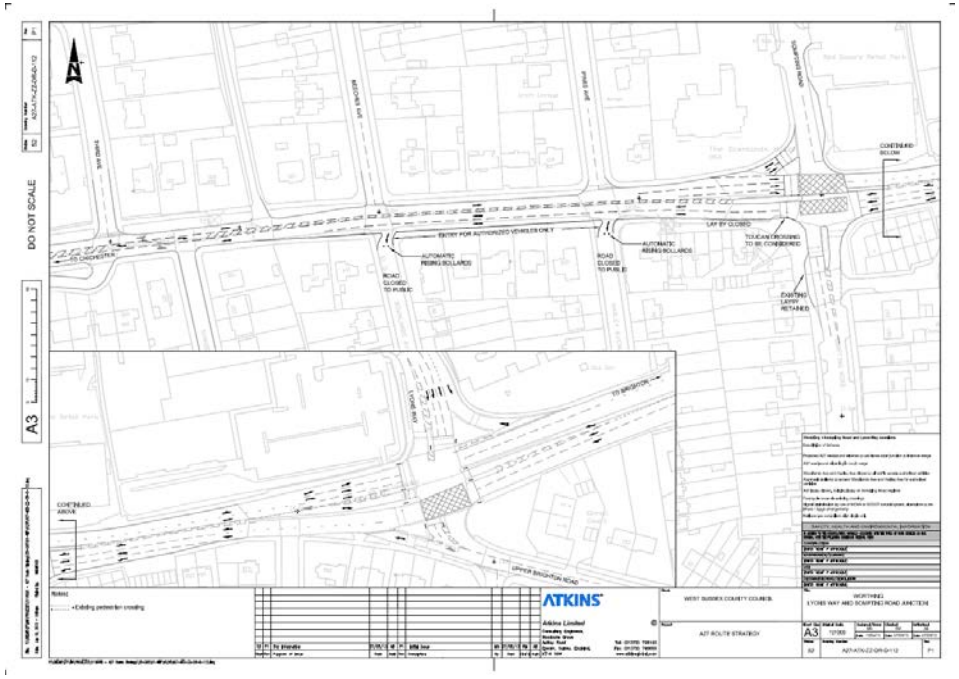
- 'Through About' Signalised Roundabout
- A27 - Two straight ahead lanes through signalised roundabout
- Left signalised filter lanes from A27 provided
- 2/3 lanes signalised on the circulatory carriageway
- Hill Barn improvements under Worthing College proposals
- Foot/cycle route from Worthing College to A24/A27 via new Toucan and Puffin crossing



Preferred Package - Worthing

Lyons Farm - A27 westbound two lanes after junction to improve merge

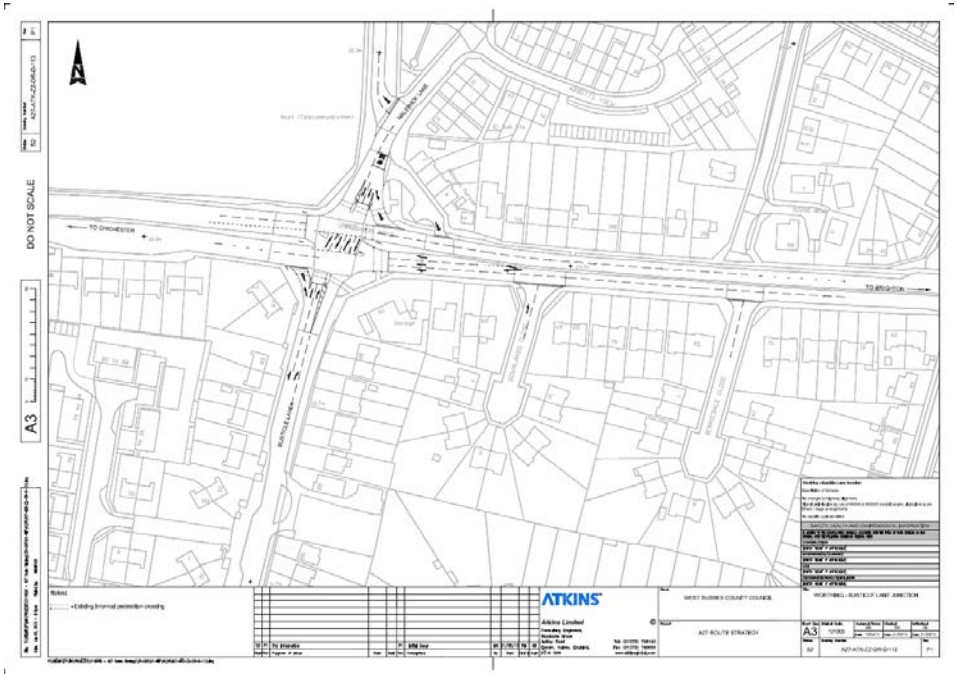
- A27 westbound widening in south verge
- Woodlands Ave and Hadley Ave closed to all traffic except authorised vehicles
- Automatic bollards to access Woodlands Ave and Hadley Ave for authorised vehicles
- A27 layby closed. Existing layby on Sompting Road retained
- Foot/cycle route via existing crossings
- Signal optimisation by use of MOVA or SCOOT control system, alterations to the phase / stage arrangements.



Preferred Package - Worthing

Busticle Lane - No changes to highway alignment and signal optimisation

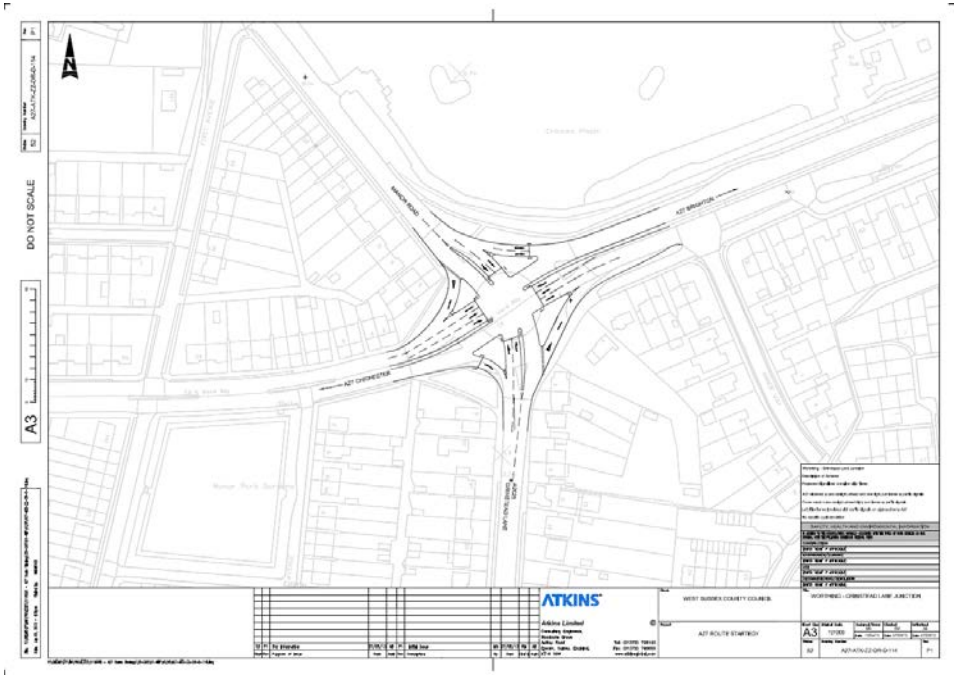
- By use of MOVA or SCOOT control system, alterations to the phase / stage arrangements
- No specific cycle provision



Preferred Package - Worthing

North Lancing - Signalised Junction with flares

- A27 widened to two straight ahead and one right turn lanes at traffic signals
- Cross roads - two straight ahead/right turn lanes at traffic signals
- Left filter lanes provided with traffic signals on approaches to A27
- No specific cycle provision

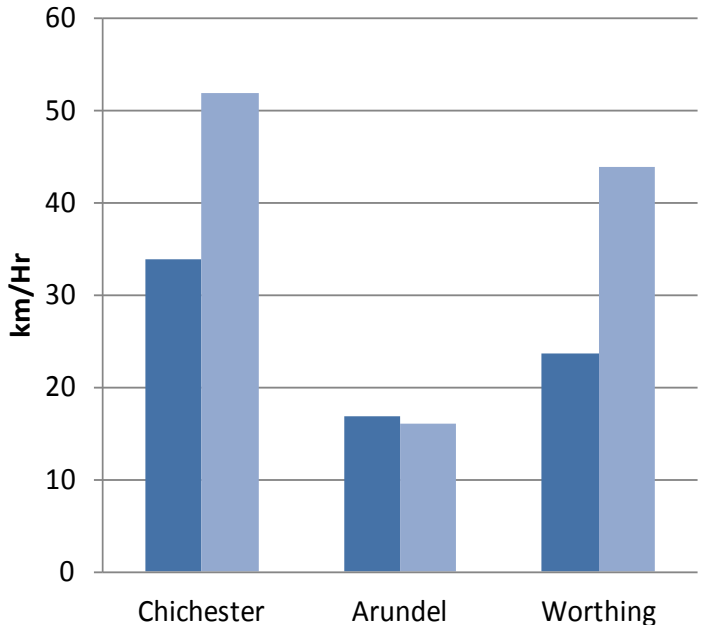


Preferred Package Cost

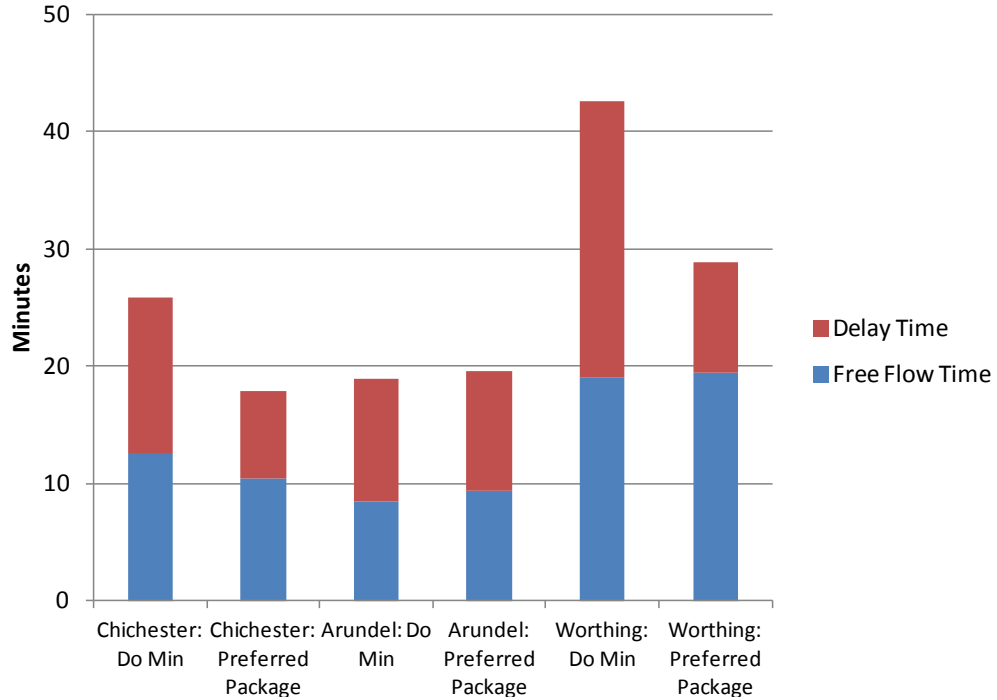
Chichester		Arundel		Worthing and Adur	
Fishbourne 'Through About' Signalised Roundabout	£5.8m	**Crossbush** A27 carriageway extended under bridge to signalised junction with A284.	£8.0m	**Offington** 'Through About' Signalised Roundabout	£3.6m
Stockbridge Signalised Junction	£5.6m	**Causeway** Three-leg signalised junction	£3.6m	**Grove Lodge** 'Through About' Signalised Roundabout	£4.5m
Whyke Signalised Junction	£5.3m	**Ford** 'Through About' Signalised Roundabout	£3.8m	**Lyons Farm** A27 westbound two lanes after junction to improve merge	£1.0m
Bognor Signalised reconfigured roundabout and Vinnetrow Road diversion to signalised junction with A259	£10.5m			**Busticle Lane** No changes to highway alignment and signal optimisation	£0.2m
Oving Signalised junction	£0.2m			**North Lancing** Signalised Junction with flares	£3.3m
Portfield A27 New dedicated lanes westbound and revised roundabout layout and geometry	£4.2m				
Area Cost	**£31.6m**		**£15.4m**		**£12.6m**
Total Cost			**£59.6m**		

Preferred Package Appraisal

Average Speed



Journey time reliability

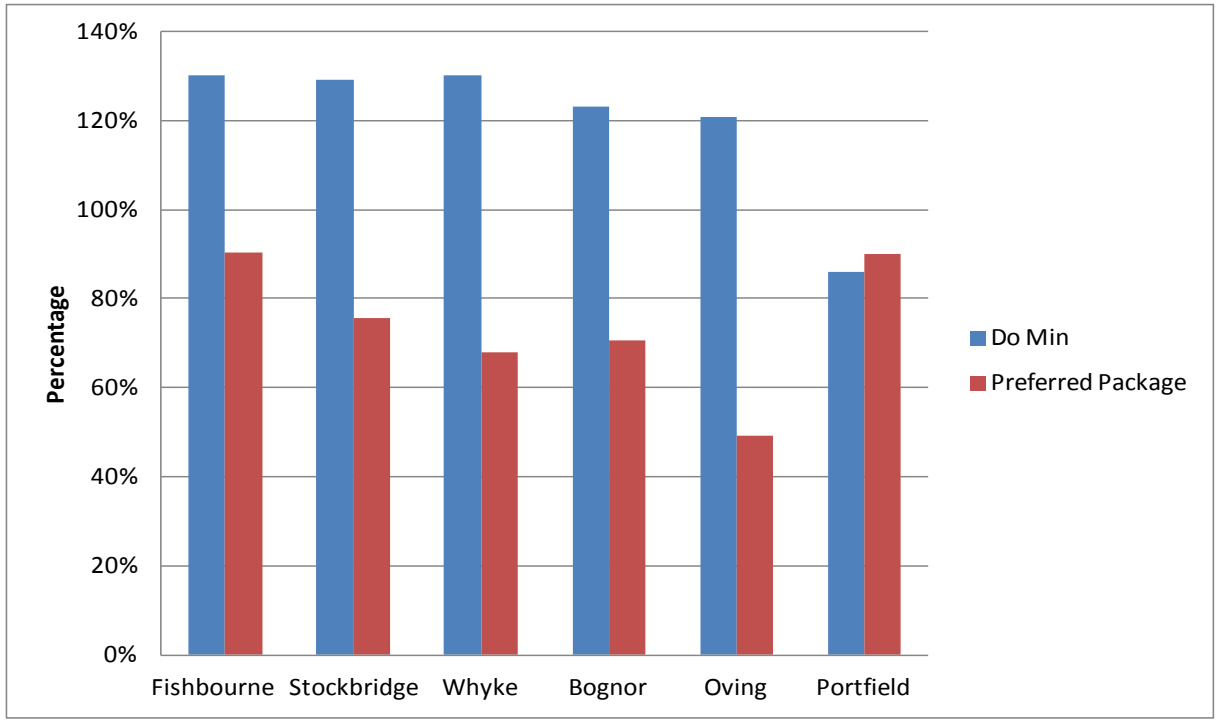


Preferred Package Appraisal

- In Chichester the preferred package results in some changes in routing between the Manhood Peninsular and the A27; with the preferred package resulting in more traffic travelling between the Manhood Peninsular and the A27 via the routes to Stockbridge rather than via the route to the Whyke Junction. Overall flow between the Manhood Peninsular and the A27 is similar for the two scenarios;
- Flows through the main central routes of Market Road, Market Avenue and Via Revenna all show considerable reductions in flows of up to around 500 pcu's per hour;
- In Arundel outside of the main arms of each junction there is some increase likely around the town centre particularly along the London Road southbound from the A284 with flows increasing up to around 280 pcu's per hour;
- In Worthing there is a slight increase in traffic Southbound along Broadwater Road and Eastbound along Richmond Road but decreases on Poulters Lane (A2032), Terringes Avenue, South Farm Road, Tarring Road and Dominion Road of around 300 pcu's per hour.

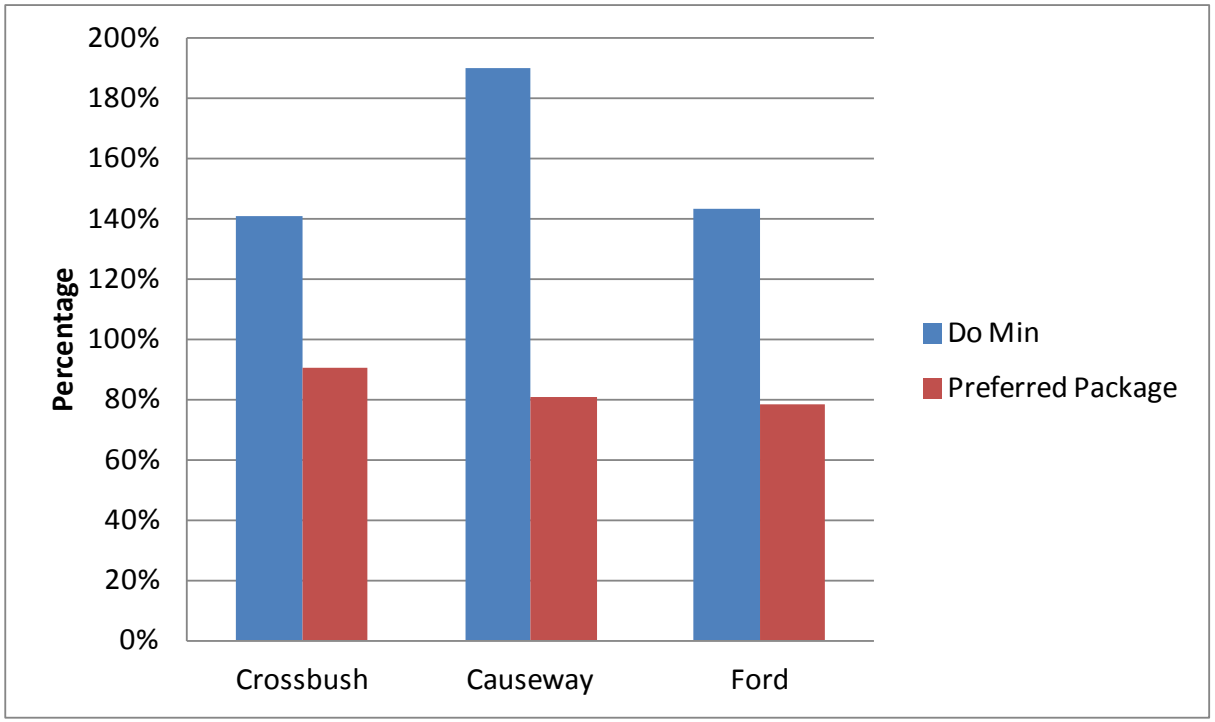
Preferred Package Appraisal

Chichester - Volume over Capacity



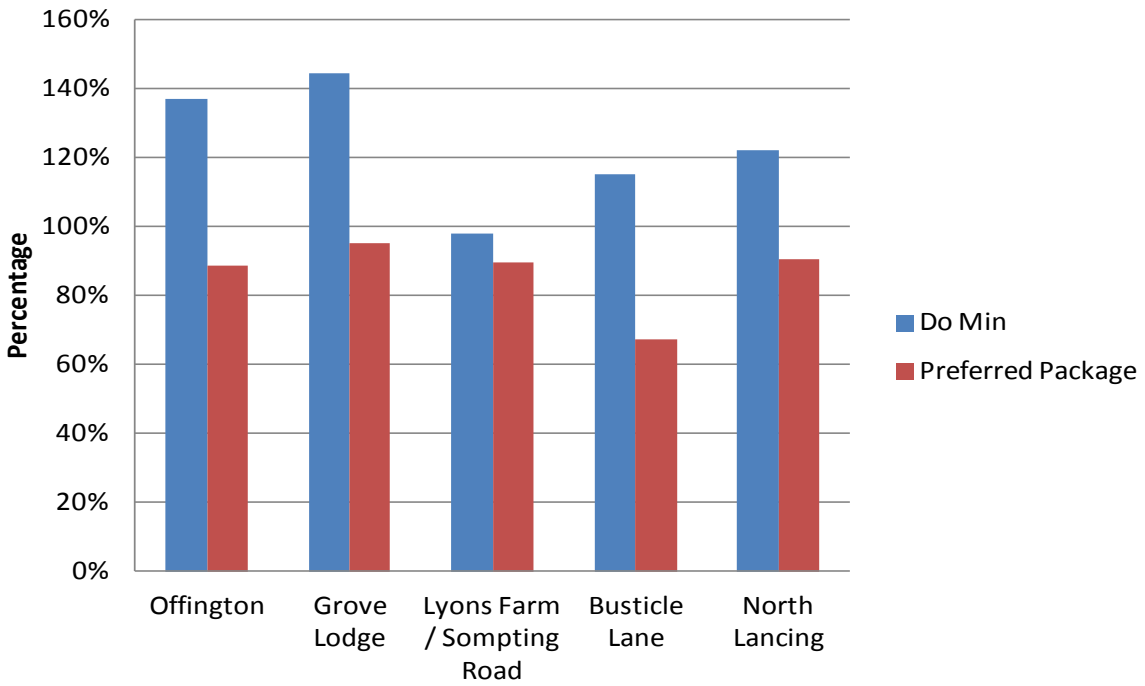
Preferred Package Appraisal

Arundel - Volume over Capacity



Preferred Package Appraisal

Worthing - Volume over Capacity



Preferred Package Appraisal

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Cost benefit analysis

Element	Present Value (£m)
Estimated Cost (C)	£61.3
Present Value of Benefits (B)	£309.0m
Net Present Value (B-C)	£247.6m
Benefit to Cost Ratio (B/C)	5.0

Wider Economic Impacts

There is anecdotal evidence that the A27 acts as a constraint on economic and development activity.

Congestion and slow and unpredictable journey times make the corridor a less attractive place to live, work and do business.

Through improvements to the corridor local opportunities to grow the economy should emerge and improvements to other areas of the economy.

- between 5,770 and 9,265 housing units could currently be considered dependant on improving these junctions on the A27;
- such improvements would release employment and mixed use development land that would have the potential to create 1000 to 2000 jobs; and
- generate a further £30.9m - £61.7m to the wider economy over 60 years.

Complementary Strategy

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Area-wide measures:

Identified problems	Proposed complementary measures
Insufficient driver information on A27 and insufficient capacity at junctions	Making better use of interventions to maximise capacity available
Lack of public transport routes for E-W traffic	High quality Bus Rapid Transit-style service serving the A27 corridor, with appropriate bus priority measures and bus stop improvements
	Measures to encourage greater rail use for trips to and from the study area, including improvements to the West Coastway rail service between Brighton and Chichester
Rat running through unsuitable and rural roads	Soft demand management measures to discourage use of unsuitable and rural roads
Poor perception of bus service, and pedestrian / cycle network contributes to high car dependency	Local bus improvements
	Improvements in pedestrian and cycling networks in urban areas
	Marketing and promotion initiatives
	Work with developers to encourage use of sustainable modes
Air quality impacts	Electric vehicle charging infrastructure
	Local Air Quality Action Plans
Noise issues	Noise mitigation measures

Urban area specific measures also proposed

Delivery Action Plan

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Funding options reviewed

- Existing developer commitments (towards Portfield and Oving Junctions) of £5m and additional grant funding to be identified of £55m;
- Existing developer commitments (towards Portfield and Oving Junctions) of £5m, WSCC funding of £10m to match Chichester District Council developer contributions of £10m and remaining £35m to be formed of additional grant funding to be identified and as yet uncollected developer contributions;
- Existing developer commitments (towards Portfield and Oving Junctions) of £5m, WSCC funding of £10m to match Chichester District Council developer contributions of £10m and remaining £35m to be sourced through PWLB loan, likely be financed through a combination of revenue sources

Pre-construction and construction programmes presented

Conclusions

Across the whole of the preferred package there are some generalities that can be picked out to define the improvements:

- Type of improvements - generally at-grade solutions, incorporating additional control through signalling and increasing capacity through additional lanes at junctions where possible;
- Dual function of strategic and local traffic – have generally sought to optimise all movements through signal control and reduce most significant delays, with strategic movements prioritised;
- Buses/Cycling/Pedestrians – considered on a junction by junction basis and generally maintaining existing facilities;
- Scale of Cost - considered to be relatively affordable solutions (£60m) compared to target price range identified at inception (£150m - £250m);
- Likely Timescale – fit with short term implementation design, schemes are relatively uncontroversial and straightforward, should be able to be completed within 4 to 5 years.

Conclusions

- The benefit to traffic travelling across Worthing and Chichester is clear with significant improvements in average speed and reductions in travel time as a result of less delay. A clear recommendation would be to proceed with options for improvements at Worthing and Chichester.
- Whilst in Arundel the benefits of the proposals are less clear. The proposals do improve junction performance and allow for the forecast increase in traffic to be accommodated yet the wider benefits in improved average speed and reduced delays across the Arundel A27 corridor as experience elsewhere are not realised.

Recommendations

- A review of the model performance in Arundel and a small data collection and validation exercise in this area which will either provide greater confidence in the model results for the Arundel elements of the scheme or lead to alternatives solutions being proposed in Arundel;
- Full application of strategic model, with due consideration to the development of an evening peak hour model, which will shed further light on the operation of scheme;
- With the desire for implementation in the short term the package of schemes as a whole should still be taken forward for implementation whilst parallel work can be undertaken reviewing the case for Arundel and any subsequent recommendation incorporated at a later date;
- Prioritise a review of financing possible loan repayments. This will need to be led by the Finance team within WSCC so strong relationships need to be developed between the Transport and the Finance teams. A review should consider potential CIL contributions in more detail and the opportunities within the County Council to meet the likely shortfall in relation to loan repayments;
- Explore the development and implementation of CIL schemes across the four district councils. This should lead to discussions and drafting of potential agreements with the four district councils relating to future contributions;
- Establish the A27 Project Framework and identify individuals for key roles in Project Board as set out by HA PCF. Ongoing responsibilities for specific tasks can then be allocated.

Q&A

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