

September 2018

Appendix A

A249 Grovehurst Junction Improvement Options Development



SYSTRA

A249 Grovehurst Junction Improvements – Options Development



SYSTRA scope:

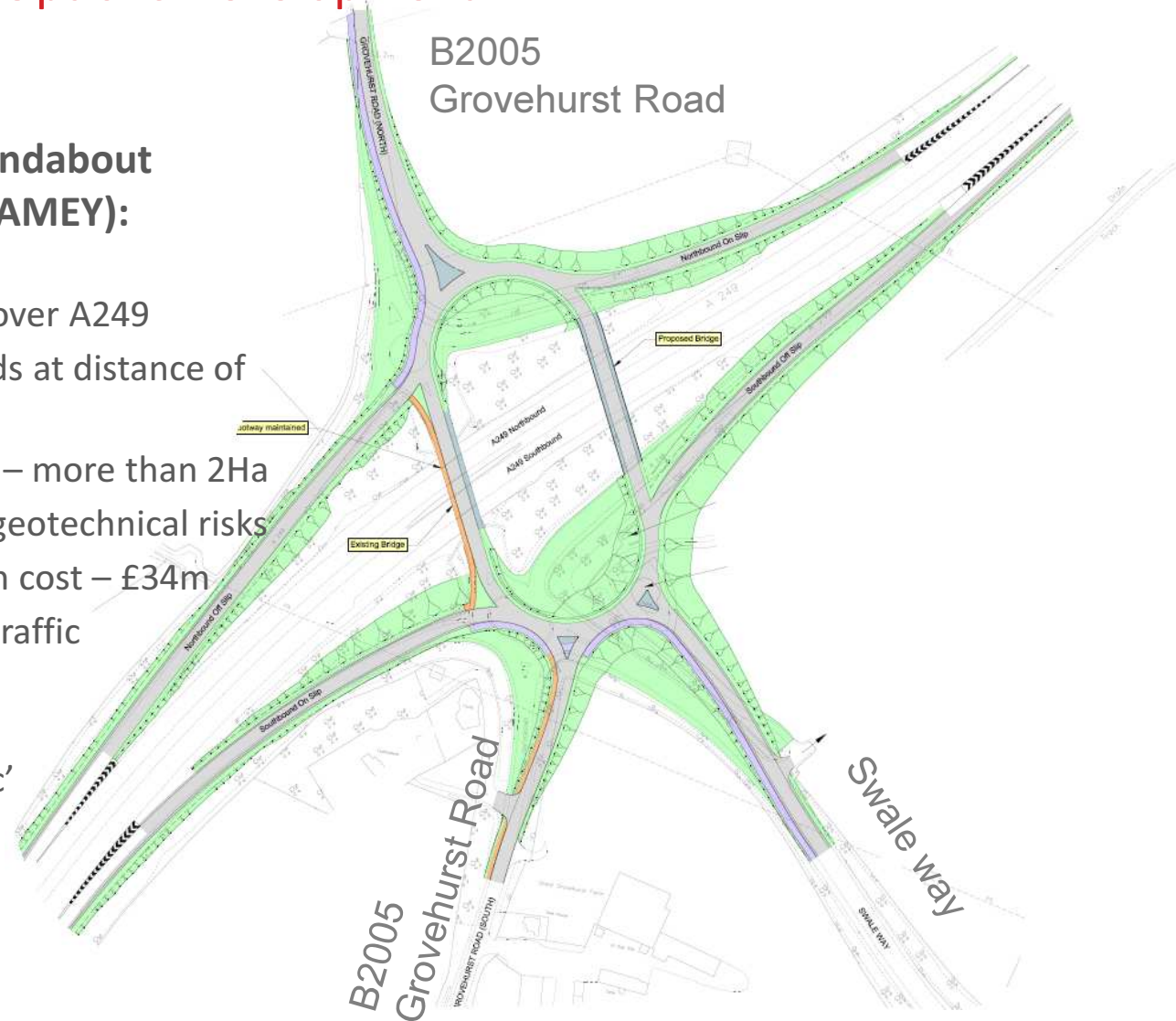
- Task 1 – Optioneering
 - Two more options to be developed in addition to Grade-Separated Roundabout layout, developed by AMEY
 - Option 1 – modification of existing dumbbell RB junction, adding extra bypass lanes
 - Option 2 – Diamond interchange - signalised junctions
- Task 2 - Traffic Modelling
 - VISSIM micro-modelling – baseline coding
 - Calibration & validation of baseline model
 - Micro-modelling of three alternatives, including signal coordination
- Task 3 - Submission of appraisal package to Kent CC and obtaining approval for preferred option
- Task 4 - Outline Design of preferred option – highway, pavement, drainage, street lighting & structure
- Task 5 - Utilities, C3 enquiries
- Task 6 - Stage 1 Road Safety Audit
- Task 7 - Cost Estimate and submission of final package
- Principal Designer under CDM

A249 Grovehurst Junction Improvements – Options Development



Grade-Separated Roundabout (Feasibility layout by AMEY):

- New bridge structure over A249
- Re-location of slip roads at distance of more than 200m
- Considerable landtake – more than 2Ha
- High embankments – geotechnical risks
- Estimated construction cost – £34m
- Considerable cost for traffic management
- Junction capacity only assessed using a ‘static’ model - ARCADY

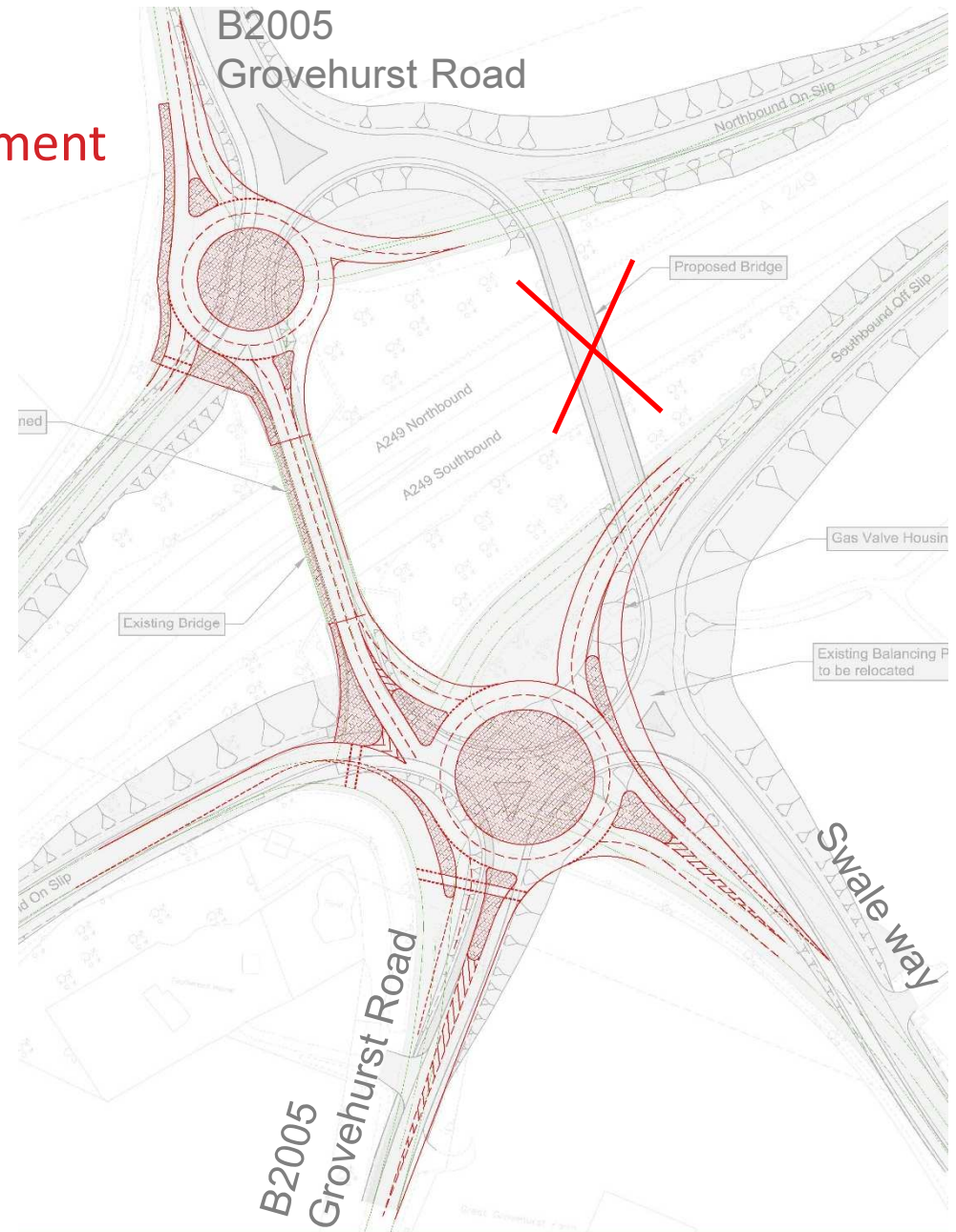


A249 Grovehurst Junction Improvements – Options Development



Option 1 – Dumbbell Roundabout Key Geometric Elements:

- Re-location of circulatory carriageways
- Increased size of roundabouts
- Additional bypass lanes
- Re-arrangement of traffic lanes along A249 bridge (from 2 to 3)
- Existing slip roads are maintained
- Wide lanes to ease HGV manoeuvring
- Shared cycle/pedestrian provided through the junction and along bridge structure
- No extra bridge structure is required over A249

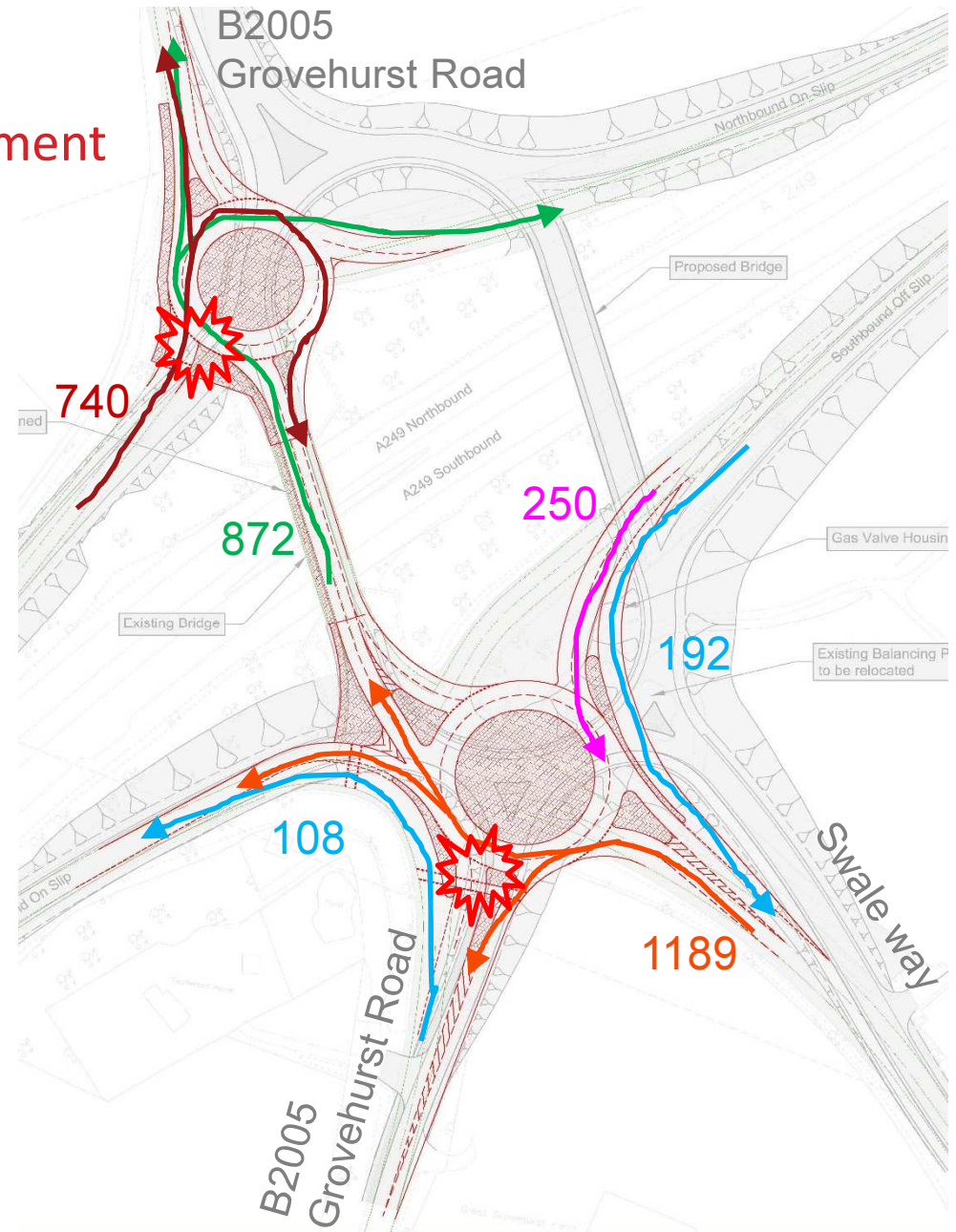


A249 Grovehurst Junction Improvements – Options Development



Option 1 – Dumbell Roundabout Traffic flows and capacity considerations:

- 2022 traffic - PM peak 17.00-18.00 is heaviest
- Northbound off-slip is heavily trafficked, with more than 500 veh/h towards Swale Way
- Relatively Light traffic on Southbound off-slip lane
- Swale Way approach is busiest, entering traffic is not impeded by circulating traffic thus preventing vehicles from other approaches to enter
- Introduction of bypass lanes – will reduce queues on RB approaches
- Unbalanced traffic flows are considered as a major contribution factor to capacity problems

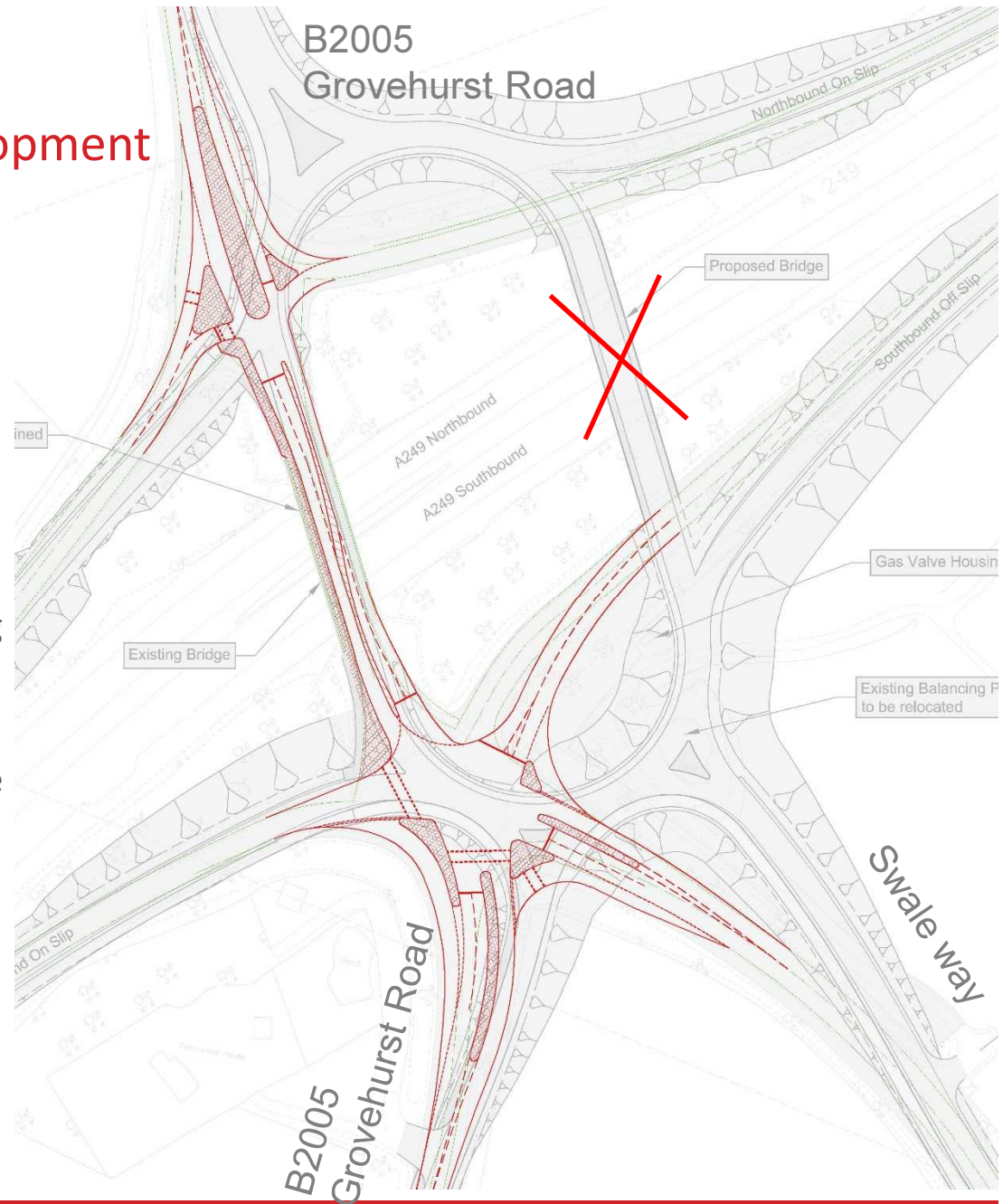


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Option 2– Signalised Junctions Key Geometric Elements:

- Requires re-arrangement of traffic lanes on existing A249 bridge (from 2 to 3)
- Segregated left-turn lanes on all approaches
- Signal coordination with signal metering
- Splitter islands to guide drivers and allow safe pedestrian / cyclists crossing
- Alignment of slip roads almost the same
- Minimal landtake
- Swept path for HGVs is checked and confirms suitability of proposed option
- Great reduction of landtake in comparison to grade-separated RB and dumbbell option`

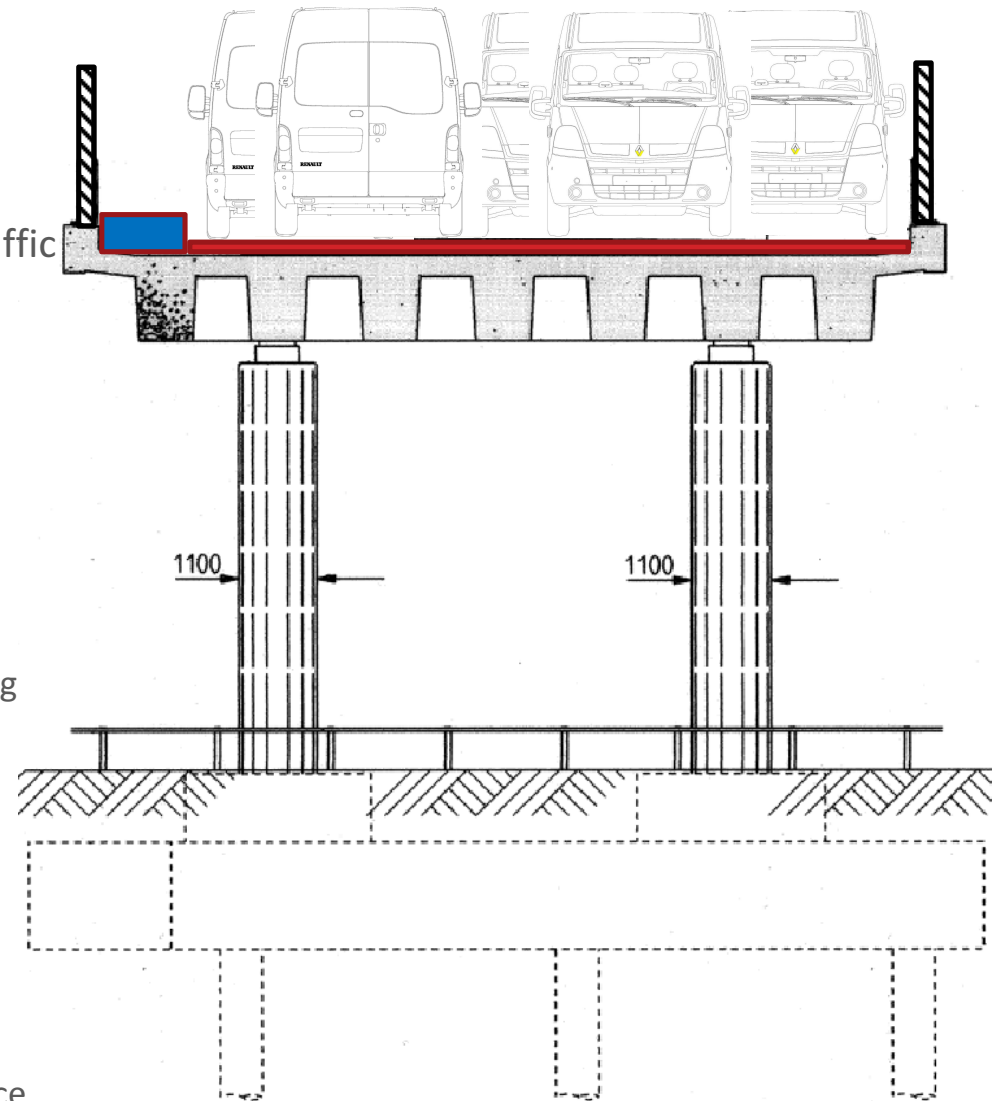


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Structural assessment of existing Grovehurst Road Overbridge, structure No. 1858:

- Option 1 and 2 will require re-arrangement of traffic lanes. Shared pedestrian/cycle footpath will probably be with reduced width (Departure from standards?)
- Bridge parapets will be replaced and bridge deck assessment will be carried on
- Outline structural design will cover:
 - Form of construction of existing bridge
 - Vertical geometry of approaches and tie-ins to existing ground levels
 - Foundations;
 - Aesthetics;
 - Use of material and suitability with surroundings
 - Cost (whole life);
 - Buildability and ease of construction/access;
 - CDM aspects including risk assessment of maintenance



A249 Grovehurst Junction Improvements – Options Development



VISSIM micro-modelling:

- Baseline model - network coding
- Flow matrices - AM and PM peaks
- Route optimisation
- Baseline Model - calibration and validation
- Modelling of proposed options (3 alternatives)
- Reporting
 - Journey time
 - Queue length
 - Options comparison
 - Conclusion and recommendations

A249 Grovehurst Junction Improvements – Options Development



Programme:

- Commission date: 10-Sept-2018
- Selection of preferred option for Business case application: 30-Nov-2018
- Project completion date: 08-Feb-2019 (Outline design)
- Total working days for completion: 109



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