

ECONOMIC CASE STUDY

DRAFT SUMMARY



SYSTRA

M25 M26 CONNECTIVITY

ECONOMIC CASE STUDY

IDENTIFICATION TABLE	
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SUMMARY

This summary reports the main tasks and outcomes for each part of the study. The headings reflect the report chapters which themselves are related to the Tasks in the study tender documents and the technical proposal.

1. Background and Existing Studies

Kent County Council (KCC), Tonbridge & Malling Borough Council (TMBC) and Kent Association of Local Councils (KALC) required the provision of consultancy services to establish whether a robust economic case can be made for new east facing slip roads at an appropriate location in the vicinity of Junction 5 of the M25/M26 to improve connectivity to West Kent and provide congestion relief and wider benefits.

The previous study in 2009 by Parsons Brinckerhoff (PB) considered the potential economic benefits of improved transport connectivity by using a cut-out or cordoned version of the Highway Agency's (now Highways England) M25 SATURN Highway Model and the Department for Transport's (DfT) Transport User Benefit Analysis (TUBA) software to assess the economic case. This approach identified transport user benefits, largely time savings that could be valued, which when set alongside the scheme costs generated a monetised BCR (Benefit to Cost Ratio) of 2.23.

The current study provides a detailed review and, where possible, an update of the elements of the earlier PB model and the associated economic TUBA assessment. We have also considered a number of further qualitative and quantitative analyses and undertaken an assessment of the potential wider economic benefits, including residential development benefits, direct employment benefits and the scope for greater labour market integration.

2. Highway Model Review

In accordance with Department for Transport good practice, as set out in the WebTAG guidance, we have attempted to ensure the robustness of the transport model and economic analysis outputs. However, we need to acknowledge that the modelling tools available to us have their limitations, in part due to the age of the models, but more importantly due to their coverage which is limited in the area to the area west of the A21 and Sevenoaks.

Our work has included detailed reviews and improvements of the cordoned (SATURN) highway network model with sensitivity tests where appropriate, including:

- assignment parameters including values of time and fuel and model convergence;
- accuracy of model flows and travel times;
- inclusion of inter-peak and AM peak models;
- realism of the routes and locations (origins and destinations) experiencing congestion.

The review of the underlying model identified a number of enhancements and corrections to the model, including improved model convergence, improved representation of time periods (expanding from PM peak only to other periods) and a small but significant correction to the representation of network distances.

In addition to using the highway model with its pre-existing representation of the east-facing slip roads at the A21/M25/M26 intersection (Option 1A), we have coded a representation of slip roads at the A225 at Otford (Option 2C). This has allowed us to consider the potential differences in traffic impacts between the (strategic accesses) onto the A21 and the (more localised access) to the A225.

As the underlying model does not cover the area to the west of the A21 we have not been able to quantify the potential traffic impacts of the option of east-facing slip roads near Westerham.

3. Highway Outcomes

Following the review of the underlying model and resulting enhancements and corrections, the forecasting model and DfT TUBA software were used to estimate the transport benefits of the slip road options. The benefit estimates are primarily driven by the highway outcomes, with re-routeing of traffic and journey time savings generating key economic benefits.

Highway Outcomes (A21 slip roads, Option 1A)

- some localised movements along the A25 between Borough Green and Sevenoaks and the A21/A225 in Riverhead transfer to the M26 to access west Kent providing localised congestion relief, primarily along the A25 but also on some of the local roads around Stone Street and west towards the A21/A225 junction.
- some journeys from the Orpington area could be attracted to divert from routeings using M25 Junctions 3-4 and M20 Junction 1-3 to a route using M25 Junctions 4-5 and M26 by undertaking a u-turn movement at the M25/A21/A25 junction.
- Potential for some localised disbenefits due to changes in traffic flows at the A21/A25 junction that may require localised mitigation works to reduce or eliminate any impacts.



Highway Outcomes (A225, Option 2C)

- some localised movements along the A25 between Borough Green and the A225 at Bat & Ball transfer to the M26 providing localised congestion relief again, principally along the A25, with net reductions in traffic flows slightly higher east of Bat & Ball than in Option 1A due to easier access into Sevenoaks itself from the M26.
- Potential for some localised traffic disbenefits due to changes in flows at the Bat & Ball junction that may require localised mitigation works to reduce or eliminate any impacts.

4. Economic Outcomes

An indicative economic appraisal has been developed using an updated set of TUBA economic appraisal parameters with a number of sensitivity tests undertaken around key parameters where these can be varied, such as annualisation assumptions that translate single period forecasts from the transport models into annualised benefit estimates.

The table below shows a summary of the economic analysis based on our revised forecasts of the traffic impacts of the scheme and on a simple price-base update of the scheme costs used to underpin the 2009 study (capital costs of ~£77m (assumed to be in 2008 prices)); the underlying costs have not been reviewed or revised during this study. However, we provide a sensitivity for a higher scheme cost for Option 1A at the A21 (+15% to represent a possible unit cost premium in addition to any price based change). For Option 2C at Otford we have used a simple assumption that the costs of the slip roads in this vicinity (as well as works to the A225 and potentially the Bat & Ball A25/A225 junction) would be half of the cost of the M26/A21 works which are likely to be far more complex.

Further consideration of the scheme will require a detailed analysis of the construction costs, updating the Option 1A A21 costs and estimating costs for Option 2C at Otford and for any Westerham options.

The table shows (for Option 1A) high and low benefit assumptions. The ‘high benefits’ include annualisation factors that assume a significant level of benefits will be experienced outside of the weekday peak periods. This is a reasonable assumption, given that the key re-routeing impacts and travel time savings will occur throughout the evening and at weekends. The ‘low benefits’ assume these are restricted to weekdays (in-line with the PB study) together with a 15% uplift on construction costs.

The analysis also includes a calculation of potential economic savings as a result of accident reductions based on reduced travel distance in Option 1A in particular. The BCR with and without this impact is shown.

Indicative Economic Appraisal Summary

VALUE	2009 STUDY		2016 STUDY			
	Scheme:	Option 1A	Option 1A	Option 1A	Option 2C	Westerham
High or Low Estimate of benefits or costs		High Benefits	Low Benefits Higher Costs	High Benefits		
Present Value of Benefits (PVB)		119	97	69	52	n/a
Present Value of Costs (PVC) (£m)		53	58	67	29	n/a
BCR		2.23	1.66	1.03	1.79	n/a
BCR (including accident savings)		n/a	1.76	1.13	1.79	n/a
Price base		2002	2010	2010	2010	2010

Outcomes

The appraisal shown in the table clearly identifies a significant reduction in the present value of the benefit stream for Option 1A, primarily due to the small but significant correction to the underlying network model used in the 2009 study which alone reduces the apparent scheme benefits by just under 30%.

The Option 1A high benefit assumption generates a BCR of 1.76 which would represent ‘medium value for money’ according to DfT guidance before any wider economic or non-monetised benefits are considered. The low benefit assumption reduces the BCR to 1.13.

The Option 2C analysis, which uses the high benefit assumptions generates a BCR of 1.79. This result is similar to Option 1A because although the construction cost based PVC is halved, the PVB is also approximately halved due the reduced traffic flow impacts, limited as noted above to primarily local traffic flows. The Westerham option could not be assessed due to the model coverage limitations.

In addition to the monetised transport benefits, primarily arising from travel time savings, there will be a number of environmental impacts of each of the scheme options. For all options these will consist of changes in traffic-related noise and emissions arising from alterations in traffic routings. The impacts will be primarily reductions in noise and emissions on the A25 between Wrotham and Sevenoaks for the Junction 5 and Otford slip-road options, though with some small localised adverse impacts arising from use of new slip-road infrastructure in the vicinity of the Chevening Estate (Junction 5 slips) or modest increases in traffic flow on the A225 between Otford and Bat & Ball (Otford slips).

5. Wider Economic Benefits

The study considered three sources of wider economic benefits, namely dependent housing, use of employment land / employment generation and improved labour market connectivity. Where a transport scheme enables housing development to take place that would not otherwise happen because of the impacts of the development on the transport network, the planning gain from such ‘dependent’ housing development can now be included in the wider economic appraisal.

An analysis of the potential value of any significant ‘dependent’ development, for example of a large scale development of say 2,500 housing units, suggests that, providing a ‘dependency case’ can be made, then the value of these benefits could be around £70m (PV in 2010 prices). However, we understand that at present there is a scarcity of known major housing sites in the Sevenoaks, Tonbridge & Malling, Tunbridge Wells areas that could accommodate any significant development volumes.

Given the lack of identified housing sites of any significant scale that are considered well enough developed to be eligible for a ‘dependency test’, we can conclude this source will not contribute any value to an appraisal of the east facing slips, at least at present.

However, whilst there may be some sites that could be considered as ‘emerging’, these have no status beyond that of a ‘Call for Sites’ exercise, with local authorities such as Tonbridge & Malling undertaking an assessment, concurrent with this study, to examine whether the locations identified have any development potential based on their suitability, availability and achievability during the current Local Plan period. In due course, if such sites become available, and the scale or value of

development is enhanced by the provision of the slip roads, then the potential magnitude of any planning gain could fundamentally change the value for money assessment of the slip road options.

Similarly, the assessment of employment land did not establish any links between east facing slips and the scale or timing of development on any employment sites in Kent. There are possible wider benefits associated with better access to Biggin Hill Airport; development scenarios suggest these benefits could be worth between £4m and £8m (in 2010 prices). However, this development and the potential use of the Moorhouse/Redland Tile Works site for distribution and storage activities are subject to planning consents which are not dependent on access considerations. East facing slips would, however, make both locations more accessible to Kent residents, and would also mitigate any increase in goods traffic on the A25 that would follow should consent be granted for distribution development at the Moorhouse/Redland Tile Works site.

Analysis of travel to work patterns and modelling to identify ‘missing’ work trips in the A25 corridor did not indicate that accessibility has much effect on where people go to for work. Rather, socio-economic characteristics and access to London by rail exert a much greater effect on work travel patterns, especially in the Sevenoaks area.

6. Overall Value for Money Case

In addition to the economic analysis reported above this considered a set of additional quantitative indicators as recommended in WebTAG. Chapter 6 of the report includes the full appraisal table in the format recommended by the DfT including both qualitative and quantitative assessments.

Condensed Appraisal Summary Table

The table below is reduced version of the full appraisal showing key economic, environmental and social indicators, in qualitative form and with supporting quantitative evidence.

M25 M26 Connectivity	
Economic Case Study	103712
DRAFT SUMMARY	12/06/2016

Table 1. Condensed Appraisal Summary Table

Qualitative and Non-Monetary Quantitative	Junction 5 Slips (Option 1A)	A225 Otford (Option 2C)	A233 Westerham
ECONOMIC			
Connectivity / Travel Time	✓ Slips provide good direct access to Sevenoaks, Maidstone and employment opportunities.	✓ Slips provide good direct access to Sevenoaks	* Little or no expected benefit for access to Sevenoaks from the east ✓ Access to Biggin Hill / Oxted
Change in PM Peak Vehicle Hours	✓✓✓ -118 -0.21%	✓✓ -64 -0.11%	
ENVIRONMENTAL			
Noise and Air Quality	✓ Reduced traffic flows on A25 may improve local noise/ air quality east of Sevenoaks	✓ Reduced traffic flows on A25 may improve local noise/ air quality east of Sevenoaks	* Limited local noise and air quality impacts expected on A25
Change in PM Peak Vehicle Flow on A25	✓✓ -110 -7%	✓✓ -105 -7%	
SOCIAL			
Quality of Life	✓ Potential benefits in Seal, Borough Green on A25 * Very localised impacts possible near to J5 affecting Chevening and local area	✓ Potential benefits in Seal, Borough Green on A25 * Local impacts possible on the A225	* Limited local noise and air quality impacts expected on A25 * Local impacts possible in Westerham
Severance	✓ Reduced local severance in Seal, Borough Green on A25	✓ Reduced local severance in Seal, Borough Green on A25	* Potential for increased severance around Westerham
Safety and Accidents	✓ Likely decrease in vehicle-km on local road network	✓ Likely decrease in vehicle-km on local road network	= Limited impacts of vehicle-km across the road network
Change in PM Peak Vehicle Kilometres	✓✓✓ -1967 -0.07%	= -16 0.00%	

7. Local Stakeholder Consultation

In partnership with Kent County Council and the Kent Association of Local Councils (KALC) a round of stakeholder consultation was undertaken with all local Parish and Town Councils in the Sevenoaks, Tonbridge & Malling, Tunbridge Wells and Maidstone areas to understand the different perceptions of the proposed scheme. .

KALC initiated the consultation sending out a letter and questionnaire in December 2015 and January 2016 with 13 council’s responding to the consultation, and through these contacts two responses were received from political parties. The consultation questions focused on the three specific areas:

1. Journeys that people would like to make, but do not because of the time / inconvenience the journey would involve;
2. Sites that could be developed or existing sites in the area, that have been hampered by a lack of access to the motorway network; and
3. Traffic congestion, network resilience, accessibility or safety issues for motorists, pedestrians and cyclists that could arise if there is a new motorway access to the M25 and M26. ‘

While many of the responses received did not provide specific answers on a question by question basis, relevant comments received have been collated from the responses and summarised against each of the three questions stated in the consultation.

- **Six** Parish and Town Councils responses indicated **general support** for a new east facing slip;

- A total of **three consultees** confirmed their **opposition** to a new east facing slip; and
- **Six** responses neither confirmed support or opposition to a new east facing slip.

8. Conclusions

Our review of the transport and wider economic benefits for the east-facing slip roads suggests some changes in emphasis from the earlier study in 2009.

The transport journey time case for either of the options considered using the transport model, is weaker than initially set out in the 2009 report, with only modest localised benefits being apparent from either option, as opposed to some on-line benefits to M26 motorway users apparent in the earlier appraisal. Based on current travel patterns, there will be some net congestion relief on the local road network, primarily on the A25, although flow changes will be modest relative to the wider congestion issues in and around Sevenoaks.



The localised transport benefits will include modest environmental benefits through reduced

traffic growth on the A25, although the opportunity to introduce improved pedestrian crossings and cycle facilities, itself a benefit, could erode some of these environmental benefits through impeding free-flow traffic on the core section of the A25 west of Borough Green.

For Option 1A with slip roads at the A21, the economic value of the key transport benefit streams generate a present value of around £70-95m (PV 2010 prices) relative to the present value of the engineering cost of £50-65m (PV 2010 prices) depending on the movement of underlying costs since their initial development as part of the 2009 study [note these figures are present values discounted to 2010]. This modest performance reflects the fairly limited and local catchments for the east-facing slip roads and modest traffic flows arising. Both benefits and costs of Option 2C at Otford are expected to be lower, but generating a similar monetised benefit to cost ratio.

At present it has not be possible to undertake a similar monetised analysis for the Westerham option due to the coverage of the transport model. A detail enhancement of the model, to the west in particular, would enable a comparative assessment across all options, as well as moving towards a WebTAG compliant model that will be required to meet later scheme appraisals and funding approval requirements. In the shorter term some expansion of the existing model could be undertaken to monetise the transport benefits of the Westerham option, as well as testing other options such as Dunton Green and providing more detail of the transport impacts of the existing options considered to date.

The additional network capacity will however provide the potential to support some development growth. The increasing emphasis on transport to facilitate additional housing and employment growth is helpful for supporting the case for investment with methodologies now becoming established to assessing the benefits.

Our review of the case for development support has included dependent housing and commercial sites, direct employment impacts, and greater labour market integration.

As there is a lack of identified housing sites of any significant scale that are considered well enough developed to be eligible for a 'dependency test', we can conclude that there are no dependent housing benefits associated with any of the slip road options, at least present. Other potential developments are far more modest, or for example, at Fort Halstead, and these have their own challenges over viability and are clearly not reliant on the east-facing slip roads.

In due course new significant sites may become available, and if the scale or value of these development is enhanced by the provision of the slip roads, as assessed through a 'dependency test', then the value of the 'dependent' housing could fundamentally change the value for money assessment of the slip road options.

In respect of employment land, there are few potential sites available and pressure exists to convert sites from employment to residential use to meet housing targets. Our assessment suggests that better access to the M26 would have little impact on the demand for employment land in Tonbridge & Malling or Sevenoaks. However, east-facing slips around Westerham could support larger scale development over the Kent county boundary at Biggin Hill and the Moorhouse/Redland Tile Works sites, both developments are, however, subject to planning consents being granted.

Overall, there appears to be an economic case for investment in the east-facing slip roads, but this is relatively weak, and with some key risks around scheme costs. The case as it stands relies largely on monetised transport benefits arising from journey time savings and reductions in accidents, alongside some modest localised environmental and other amenity benefits for residents living in the A25 corridor. Due to the lack of any significant housing developments in the area, at least sufficiently developed in planning terms, the scale of any monetised wider economic benefits will be limited.

The study has reported on an initial consultation with the relevant local authorities, suggesting a range of responses from guarded support to local opposition, with some awaiting indications of potential performance from this study. Further consultation is clearly required if the proposals are to be developed further, and we suggest this is done in a structured way through a consultation strategy, particularly given some apparent opposition to the proposals, especially for residents and landowners in locations immediately adjacent to the new slip road locations.

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