

Funding for Local Transport: Safer Roads Fund



Department
for Transport

Application Form

The level of information provided should be proportionate to the size and complexity of the scheme proposed. As a guide, we would suggest around 10 to 15 pages including annexes would be appropriate.

A separate application form should be completed for each scheme.

Applicant Information

Local authority name: Oxfordshire County Council

Bid Manager Name and position:

Llewelyn Morgan, Service Manager – Localities, Policy & Programme

Contact telephone number: 07881 268208

Email address: llewelyn.morgan@oxfordshire.gov.uk

Postal address: Communities, Oxfordshire County Council, County Hall, New Road, Oxford, OX1 1ND

When authorities submit a bid for funding to the Department for Transport, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within two working days of submitting the final bid to the Department for Transport. The Department for Transport reserves the right to deem the business case as non-compliant if this is not adhered to.

Please specify the web link where this bid will be published:

www.oxfordshire.gov.uk/saferroadsfund

SECTION A - Scheme description and funding profile

A1. Scheme name:

A361 Chipping Norton to Banbury Safer Roads Project

A2. Headline description:

A programme of key improvements to enhance the safety of this important route which has a very poor safety record. A variety of measures that will make a difference to the accident risk of the road and which take into account its rural setting have been developed.

The programme includes: carriageway resurfacing with improved delineation (associated with drainage improvements and vegetation clearance), footpath upgrades, junction improvements speed limit reductions and selective new safety measures.

The specific works planned along the route are set out in Appendix B.

A3. Geographical area:

The A361 is a single carriageway road in West Oxfordshire and Cherwell districts to the south of the Cotswolds Area of Outstanding Natural Beauty. It runs through open countryside except where it passes through the outskirts of Chipping Norton and Banbury, and through the villages of South Newington and Bloxham.

See Plan in Appendix A.

Length of eligible road section: 21.4 km

OS Grid Reference:	Minimum easting	431709
	Minimum northing	227550
	Maximum easting	445502
	Maximum northing	241802

Postcode: OX15 4LJ (Bloxham) OX15 4JW (South Newington)

Appendix: A

A4. Equality Analysis

Has any Equality Analysis been undertaken in line with the Equality Duty?

Yes, attached as Appendix C.

SECTION B – The Business Case

B1. The Scheme – Summary/History (Maximum 200 words)

The scheme covers a length of the A361 mostly comprising rural single carriageway (13km) except as it passes through the villages of Bloxham and South Newington. The village sections are subject to a 30mph speed limit, with the remainder of the route currently being national speed limit other than the 2.3km section between Banbury and Bloxham which has a 50mph limit. The daily flow on the road varies from 6300 vehicles south of South Newington to 12,600 on Bloxham Road, Banbury (both 2015 AADT).

In the 5-year period 2012-2016, 66 injury accidents (comprising 1 fatal, 15 serious and 50 slight injury accidents) were recorded on this section, with there being no pronounced trend either up or down in the annual totals.

The proposed scheme aims to reduce the risk of future accidents by a combination of area-wide measures (resurfacing, speed limit reductions, improved drainage, vegetation removal) and site specific measures (junction improvements, improved delineation of bends and junctions, safety barriers and cycle facilities) which have been tailored to the types of accidents which have been recorded on this section of road and have a proven record in reducing the risk of accidents.

B2. The Strategic Case (Maximum 350 words)

Looking at the accident records in more detail:

- 60% of the accidents in the 2012-2016 period were recorded away from junctions, with single vehicle loss of control (19 accidents), head on (9 accidents, two of which involved overtaking manoeuvres) and shunts (7 accidents) being the dominant accident types.
- 40% of the accidents were at junctions, with shunt type accidents behind vehicles turning right off the A361 being the single most common junction accident type (11 accidents).
- 15% of the accidents resulted in injuries to vulnerable road users (2 pedestrians; 6 pedal cyclists and 7 motor cyclists).
- 30% of the accidents were recorded in darkness, and a similar proportion was recorded in wet conditions.

While there are clusters at some junctions and bends, the majority of the accidents are dispersed along the route, though the accident frequency is lower on the c 5km length northwest of the A3400 roundabout as compared to the rest of the route.

The options considered included those identified in the Safer Roads Investment Plan (SRIP) generated by the ViDA software, and were refined after a careful consideration of local data and local professional knowledge including that on the skid resistance, noting that quite a high proportion of the route currently shows deficiencies in this respect and that remedying such deficiencies has been found to be an effective way of reducing accident risk. The major changes in the programme proposed from that in the original SRIP are shown in Appendix D.

The programme in this bid is predicted to reduce the number of people killed or seriously injured by **46** in 20 years. Of these 18 are attributed to the speed limit reduction, 8 to improved skid resistance and 6 to improved curve delineation.

B3. The Financial Case – Project Costs

Please complete the following tables. **Figures should be entered in £000s** (i.e. £10,000 = 10).

Table A: Funding profile (Nominal terms)

£000s	2017-18	2018-19	2019-20	2020-21	Total
<i>DfT Funding Sought</i>	223	2643	1269	0	4135
<i>LA Contribution</i>					
<i>Other Third Party Funding</i>					

Notes:

(1) Department for Transport funding will not be provided beyond 2020/21 financial year.

B4. The Financial Case – Local Contribution / Third Party Funding

No direct third party or local contribution is proposed, however the sections of road between Chipping Norton and A3400 and within the built up area of Banbury are scheduled for improvement in conjunction with planned development and are considered to provide a match funding element to this scheme. However, as they have a different delivery timescale they have not been included in the programme. Further details on programme and cost can be provided if required.

B5. The Financial Case – Affordability and Financial Risk (maximum 300 words)

- a) Each of the elements has been costed according to the scale of charges agreed with our contractors. Where elements are subject to design before a final costing is known then the estimate reflects this uncertainty. A Quantified P50 Risk Allowance of £401,476 has been included within the bid as an allowance for potential known project risks coming to fruition.
- b) The focus of our Project Governance procedures as set out in Section B9 is to identify and deal with potential risks for cost overruns before they occur. If they do occur we will seek to identify cost savings elsewhere in the programme which can be made without significantly reducing the benefits of the programme as a whole. We will also be using a form of contract for the project which offers an incentive to the Contractor for controlling costs due to a pain/gain sharing mechanism on any variation from the agreed target cost.
- c) The top five risks to progress on the scheme are given in Appendix E. Each of these risks is considered small but has been allowed for within the contingency risk allowance included in the programme cost estimate.

B6. The Economic Case – Value for Money

The value of the benefits of this proposal have been calculated using ViDA using the methodology set out in Appendix J. The results of this analysis are shown in Appendix H.

The programme is estimated to produce a reduction in fatalities and serious injuries (FSIs) of 46 over 20 years. The average cost per FSI is £70,021.

The Present Value of the Do Minimum Costs is estimated to be £2.273 million.
The Present Value of the Do Something Costs is estimated to be £5.374 million.
The Present Value of Costs for the programme is therefore £3.200 million.

The Present Value of the Safety Benefits of the scheme is £16.660 million. This would give a Safety Benefit Cost Ratio of **5.21**.

However, perversely, the speed limit reduction which leads to improved fewer accidents also leads to increased travel times. This increase is estimated to have a present value of benefits of -£11.520 million. This reduces the overall Present Value of Benefits to £3.409 million and the overall Benefit Cost Ratio of **1.07**.

If the speed limit reduction element were to be removed from the programme then the total number of FSIs saved would be reduced from 46 to 28 over the 20 year assessment period. The average cost per FSI saved would increase to £111,021. The Present Value of Benefits would be reduced to £9.431 million while the Present Value of Costs would be reduced to £3.128 million. This would give a Benefit Cost Ratio of **3.02**.

Although the removal of the speed limit reduction would improve the overall BCR it is the opinion of the County Council that this would seriously compromise the effectiveness of the programme as a whole in reducing accident risk. The predicted number of FSIs saved would be reduced by nearly 40% and the cost per accident saved would increase by nearly 60%. In addition the lower speeds are likely to re-enforce the accident risk reduction which the other elements of the programme are likely to achieve.

The road is currently rated overall as iRAP 1 Star Rating (“High Risk Roads”). As shown in Appendix I (Iterations 0 and 1) which show the current situation, this is the case for much of the route with the exception being the sections from Chipping Norton to Coldharbour Farm (2 Star), within the villages of South Newington (2 Star) and Bloxham (3 Star) and in the built up area of Banbury (2 Star).

The impact of the programme (shown in Iteration 5) is that only one section remains as 1 Star (the section between Coldharbour Farm and Swerford Turn). The rest of the route would now be 2 Star, with 3 star sections in South Newington and Bloxham. If the Speed Limit reduction were not to be included (as shown in Iteration 4) then more of the route would remain as 1 Star with the section through South Newington remaining as 2 Star.

B7. The Commercial Case (Maximum 300 words)

Oxfordshire County Council has an approved procurement strategy for all major projects or programmes to be delivered either through the Midlands Highway Alliance’s Medium Schemes Framework or through utilising of our term contract (Skanska). Both routes provide a quick route to delivery through established and strong relationships.

It is currently intended to deliver this major programme of works through our term contract with

Skanska. Skanska are already engaged and have already provided support in producing this proposal. Skanska have confirmed that they have the resources available to be able to deliver the proposed programme and are building the potential programme into their forward resource plan.

For the highway maintenance elements the proposed work in the 2017/18 programme comprises vegetation clearance, drainage, signing and lining. These will be procured and delivered through our existing term maintenance arrangements.

The design of the following 2 years work will be undertaken mostly during 2018/19, within the contractual arrangements the Council has established with its delivery partners.

B8. Management Case – Delivery (Maximum 300 words)

An outline project plan is shown in Appendix F. As this is a programme of a number of measures that can be implemented in parallel there is no single critical path. This provides flexibility and also means there is minimal programme delivery risk for the overall programme.

Measures at the southern end of the scheme are scheduled for 2017/18; measures in the northern section, and also measures along the entire length of road, are mostly scheduled for 2018/19; and measures in the central section are mostly scheduled for 2019/20. Detailed programming of individual items to co-ordinate between maintenance and improvement work in each section will be carried out as the project progresses.

It is not envisaged that there will be any land requirement for the proposals, nor that any planning permissions will be required for them.

Traffic Regulation Orders will be needed for the speed limit reductions. These are scheduled for publication in Autumn 2018.

A letter in support of this bid from Susan Halliwell, Director for People & Place is attached as Appendix K.

B9. Management Case – Governance (maximum 300 words)

This project will be run in accordance with the methodology specified within OCC's Transport Asset Management Plan. It will be managed on a day to day basis in accordance with PRINCE2 principles tailored to meet the corporate governance and decision making processes of Oxfordshire County Council.

The governance and overall accountability of the project will be overseen by OCC's Section 151 officer and Strategic Director Communities, whose remit includes all Major Infrastructure Development, and who will report to Oxfordshire County Council's Cabinet. The governance structure for major projects is set out in Appendix E.

The Major Projects Board is a strong officer group with a clear remit and function to manage the council's major transport projects. Escalation is to the Strategic Director Communities in liaison with the Director for Finance through the Highways Operation Board if appropriate.

The Senior Responsible Officer for this project will be Paul Fermer, Service Manager Major

Infrastructure Delivery.

The management and quality control of the project comes through a system of 6 Gateway checks in the lifecycle (project initiation, feasibility, preliminary design, final design, procurement and construction) and a 4-stage approval process for the developing business case (Concept Development/Commit to Investigate, Project Development/Commit to Invest, Project Delivery/Commit to Spend, and Project Closure/Client Acceptance).

B10. Management Case – Risk Management

OCC has a clearly defined Risk Management Strategy which details how we will meet our risk and assurance management objectives by undertaking the following actions:

- Providing and using a robust and systematic framework for identifying, managing and responding to strategic and operational risks in line with external benchmarks of good practice.
- Providing and using a robust and systematic framework for identifying sources of assurance at different levels within and outside the organisation and the level of confidence that provides to management about the effectiveness of controls.
- Establishing clear roles, responsibilities and reporting lines for risk management and assurance.
- Demonstrating a commitment to risk management and assurance through the actions and behaviours of the County Council Management Team in their decision making. We will also understand our risk appetite and the level of risk we are prepared to accept in different activities and service areas.
- Reinforcing the value of risk management by integrating it within the Council's (and partnerships') project management, performance management and procurement processes.
- Establishing effective processes for oversight of the Council's risk exposure and monitoring both internal controls and external influences to understand changes in that exposure.
- Increasing understanding and expertise in risk management through targeted training and sharing of good practice

To reduce the chance of risks maturing and therefore potential cost over-run, a robust framework will be implemented:

- On-going Value Engineering to eliminate scope creep and ensure that costs contribution to the achievement of tangible benefits
- Robust risk management, identifying risks and risk owners to ensure that mitigation measures are fully and robustly developed and implemented from the start.
- Early engagement of our term consultants in the development of the scheme design with thorough and robust investigations to eliminate unknowns.
- Implementing a robust procurement strategy with a sensible balance of risk to ensure confidence in the out-turn price without incurring excessive contractors risk allowances.

A Risk Register is included as Appendix G.

SECTION C – Monitoring, Evaluation and Benefits Realisation

C1. Benefits Realisation (maximum 250 words)

The main benefits for this scheme will be reduced accident numbers and casualties. These will give personal benefits to the people involved but also wider societal benefits through reduced medical and police costs and the additional economic value of reduced fatalities.

The main elements of the bid programme will deliver the following benefits:

Highway resurfacing plus drainage and vegetation removal – the principal benefit of this work will come from the improvement of skid resistance, particularly in the wet. This will lead to a reduction in single vehicle loss of control (currently 19% of accidents) and accidents in wet conditions (currently 30% of accidents) where road condition is likely to be a major factor in accident causation.

Junction Improvements – this will result in a reduction in the number of rear end shunt accidents at junctions (15% of accidents) by providing better awareness of junctions for approaching vehicles a safe provision for vehicles waiting to turn right.

Reduced Speed Limits – this will lead to a reduction in speeds which will have both a direct impact on the numbers of accidents, particularly loss of control, but also have an indirect impact through improving the recoverability once minor mistakes have been made.

Convert Footway to shared use – cycle accidents comprise nearly 10% of accidents on this section. Providing a high quality off-road alternative to sharing the carriageway will reduce the opportunities for cycle/vehicle conflict on the section of road with the highest cycle numbers.

C2. Monitoring and Evaluation (maximum 250 words)

Police accident records will be the principal means to assess the impact of the scheme. These will be recorded on an annual basis for at least the first five years after completion of the scheme in order to allow a fair comparison with the already collected “before” data (2012-2016).

As well as the total number of accidents the monitoring will consider:

- accident severity and casualty numbers
- type of accident
- vehicle types involved in accidents
- numbers of accidents involving more vulnerable road users
- location of accidents
- road conditions

The monitoring will also need to take account of the traffic flow on the road. There are five monitoring stations on the section of A361 covered by this bid:

- CP148 on Western approach to A3400 roundabout
- CP147 on eastern approach to A3400 roundabout
- CP153 between B4031 and B4022 junctions
- CP43 South Newington
- CP147 north of Wykham Lane junction

The monitoring of the impact on road safety will be reported annually on the road safety pages of the County Council website along with the Council’s annual Casualty Data Summary Report.

If this submission is successful then the before monitoring will be added to this website in Autumn 2017. Interim reports will be produced to cover the period during which the scheme is being implemented (2017-2020) and the “after” monitoring will take place over the following five years (2021-2025). A final before and after summary will be published at the end of this period.

SECTION D: Declarations

D1. Senior Responsible Owner Declaration

As Senior Responsible Owner for A361 Chipping Norton to Banbury Safer Roads Project I hereby submit this request for approval to DfT on behalf of Oxfordshire County Council and confirm that I have the necessary authority to do so.

I confirm that Oxfordshire County Council will have all the necessary powers in place to ensure the planned timescales in the application can be realised.

Name: Paul Fermer

Signed:

Position: Service Manager – Major Infrastructure Delivery, Traffic , and Countryside



D2. Section 151 Officer Declaration

As Section 151 Officer for Oxfordshire County Council I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that Oxfordshire County Council

- has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution
- will allocate sufficient staff and other necessary resources to deliver this scheme on time and on budget
- accepts responsibility for meeting any costs over and above the DfT contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties
- accepts responsibility for meeting any ongoing revenue requirements in relation to the scheme
- accepts that no further increase in DfT funding will be considered beyond the maximum contribution requested
- has the necessary governance / assurance arrangements in place
- has identified a procurement strategy that is legally compliant and is likely to achieve the best value for money outcome
- will ensure that a robust and effective stakeholder and communications plan is put in place.

Name: Rob Finlayson

Signed:



Submission of bids:

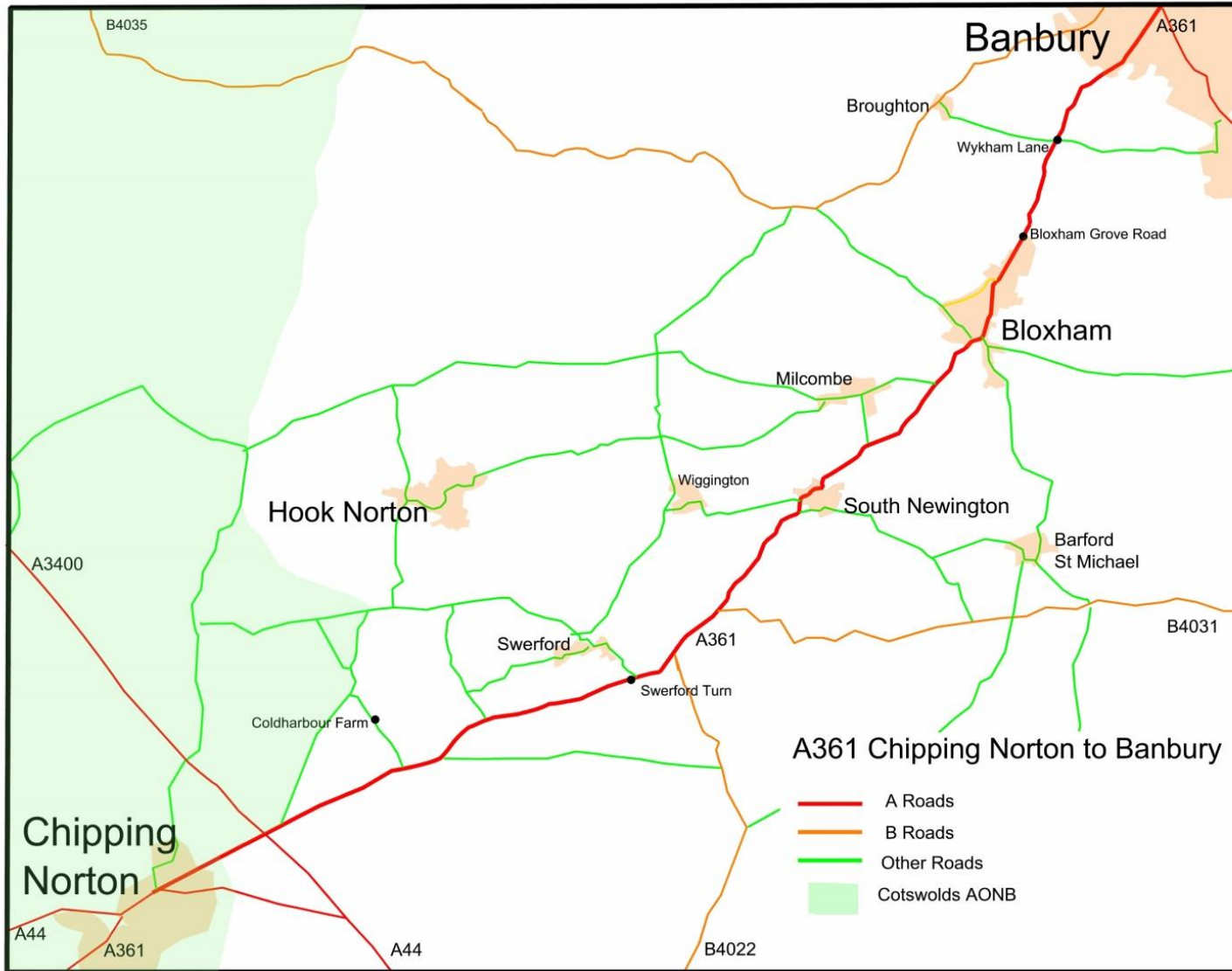
An electronic copy only of the bid including any supporting material should be submitted to:

saferroadsfund@dft.gsi.gov.uk

APPENDICES

- A – Map of Study Area
- B – Cost of Proposed Programme
- C – Equality Analysis
- D – Amendments from the ViDA SRIP
- E – Delivery Organogram
- F – Outline Project Plan
- G – Risk Register
- H – BCR Calculation based on ViDA SRIP
- I – Star Rating Maps
- J - Application of ViDA

APPENDIX A - PLAN OF STUDY AREA



APPENDIX B – PROPOSED PROGRAMME

Section	Treatment	Total Cost (£)	2017/18	2018/19	2019/20
TOTAL		4,135,582	223,164	2,643,447	1,268,971
Banbury to Bloxham	Carriageway resurfacing	804540		804540	
	Upgrade drainage/clear vegetation	60000		60000	
	Upgrade footway to shared use cycle track	325000		325000	
	Wykham Lane junction improvement	100000		100000	
	40mph speed limit	5000		5000	
	Delineation s of Wykham Lane	25000		25000	
	Lighting at Wykham Lane Junction	45000		45000	
Bloxham	Carriageway resurfacing	613440		613440	
	Ells Lane/Bloxham Grove Rd junction improvement	30000		30000	
Bloxham to South Newington	Carriageway resurfacing	694120			694120
	Upgrade drainage/clear vegetation	45000			45000
	Delineation of bends	50000			50000
	50 mph speed limit	10000		10000	
South Newington	Carriageway resurfacing	273845		273845	
	Clear vegetation	5000		5000	
	20 mph speed limit and solar studs	20000		20000	
South Newington to Swerford Turn	Carriageway resurfacing	281661			281661
	Delineation of bends and junctions	75000			75000
	Safety Fence	50000		50000	
	50 mph speed limit	10000		10000	
	Rumble Strips on carriageway edge	31046	31046		
Swerford Turn to Coldharbour Farm	Clear vegetation	10000	10000		
	Delineation of bends and junctions	75000	75000		
	50 mph speed limit	10000		10000	
	Rumble Strips on carriageway edge	31046	31046		
Coldharbour Farm to A3400	Improve drainage/clear vegetation	45000	45000		
	Rumble Strips on carriageway edge	9408	9408		
Risk Allowance	P50	401476	21664	256622	123190

APPENDIX C – EQUALITY ANALYSIS

EQUALITY ANALYSIS

Stage 1 – About the Proposal

Name of the Project	A361 Chipping Norton to Banbury Safer Roads Project
Name and job title of the Senior Responsible Officer / Project Manager	Paul Fermer, Service Manager – Major Infrastructure Delivery
Name and job title of the Project Sponsor	-
Is this a new or revised project	New

Stage 2 – Relevance of Proposal to Equality

What impact is the proposal likely to have on people? Major – complete all stages, including consultation Minor – Consultation not essential None – no further analysis required – move to Stage 6	Minor
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Stage 3 – Evidence and Consultation

What internal data has been used to inform this analysis?	-
What external data has been used to inform this analysis?	-
Has consultation informed this analysis?	No

Stages 4 & 5 – Identifying adverse impacts and mitigation

	Identified adverse impacts	Possible mitigation	Opportunities to address under-representation	Opportunities to address prejudice or promote understanding
Age	May have positive impact from speed reduction and improved delineation			
Caring & dependency	None			
Disability – physical/mobility	May have positive impact from speed reduction and improved delineation			
Disability – mental health	None			
Disability – Sensory impairments	None			
Disability – learning difficulties	None			
Disability – other	None			
Marital status	None			
Pregnancy/maternity	None			
Race/ethnicity	None			
Religion or belief	None			
Sex (Gender)	None			
Sexual Orientation	None			
Gender Re-assignment	None			

Stage 6 – Action Plan, Monitoring & Sign Off

Actions Proposed	Responsibility (job title)	Date
None		

Following implementation of the project, will any equality monitoring be carried out to determine the actual impact of the project on different protected characteristics?	No
If yes, give details of monitoring frequency and reporting	

Name and job title of person completing this analysis	Roger O'Neill Strategic Highways Appraisal & Development Officer
Date of Completion	25 April 2017
Name and job title of person who has approved the analysis	Paul Fermer Service Manager – Major Infrastructure Delivery
Date of authorisation	26 April 2017

APPENDIX D – Amendments from the ViDA SRIP

The SRIP prepared by Road Safety Foundation was considered and a number of elements were omitted from the programme. These were:

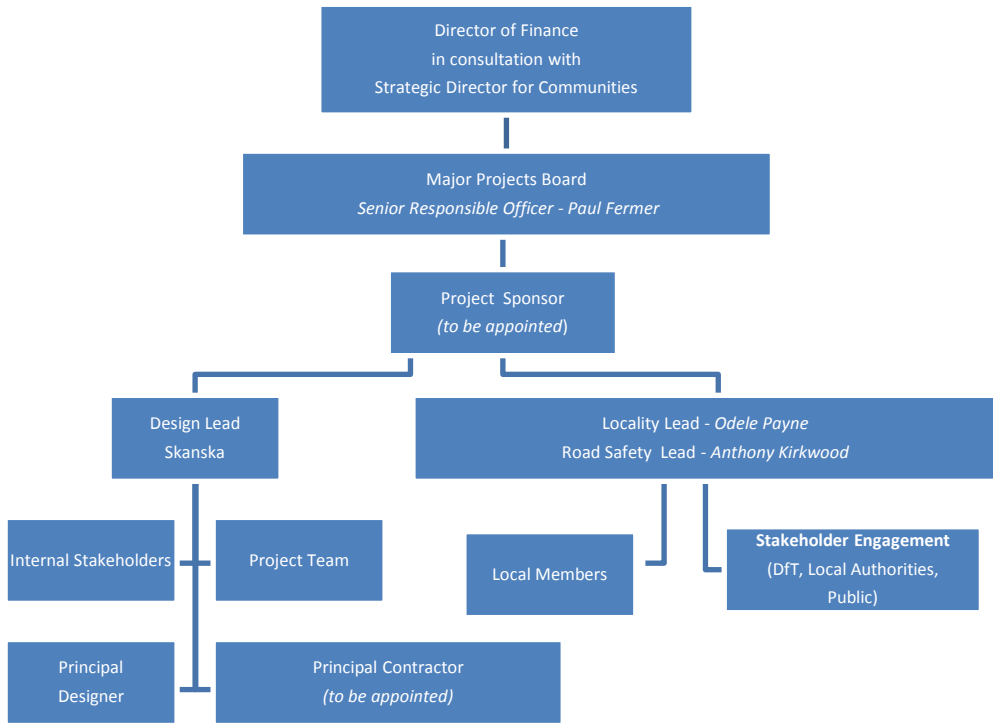
- roadside barriers and shoulder sealing – these were not considered generally appropriate given the open, high quality landscape that the road passes through; roadside barriers are included at specific locations.
- cycle lane on road – at the southern end of the scheme this was not considered appropriate because it would not link in with other cycling facilities, between Bloxham and Banbury a conversion of the footpath to a shared cycle/footway was considered a better, safer option.
- shoulder rumble strips – this was not considered appropriate because of the limited road width between edge markings and verge which would make it difficult provide the recommended recovery space.
- central hatching – there is not considered sufficient road width to allow this to be included.
- footway provision (South Newington) – the road is deeply incised as it passes through the village with properties close to the highway boundary which would make this impractical.

In addition the sections between Chipping Norton and A3400 and between Banbury and Saltway are to be improved in association with Local Plan developments and consequently it would not be appropriate to include in this programme.

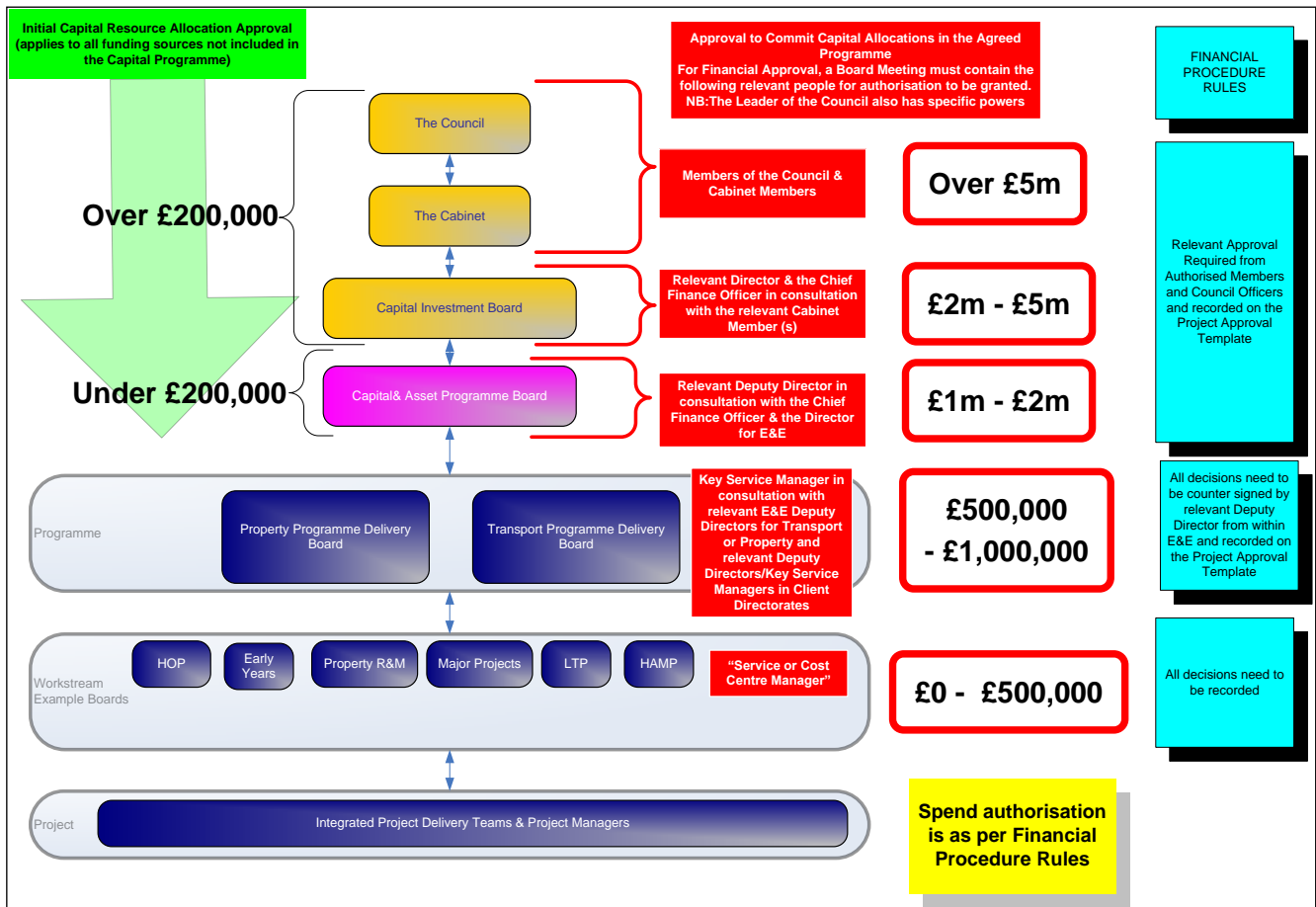
The following have been added to the suggested programme:

- carriageway resurfacing/drainage improvement/vegetation clearance – this is considered a major factor in accident risk along the road.
- speed limit reductions – reduced to 50mph on rural sections, 40mph on section between Bloxham and Banbury and 20mph through South Newington.

APPENDIX E – DELIVERY ORGANOGRAM



OCC's governance procedures for major projects is set out below:



APPENDIX G - RISK REGISTER

The top 5 risks for the project are identified as:

1	Negative response from stakeholders and/or public during consultation and design workshops requires significant design changes
2	Changes to fiscal constraints (e.g. landfill tax and disposal costs) or to design standards.
3	Laying of tarmac cannot be laid when too cold. Work cannot be progressed in heavy rain or flooding.
4	RSA4 requires changes
5	Ground conditions

The Quantified Risk Assessment is summarised below to show the range of risks considered and which will need to be included in the project risk register.

It should be noted that subsequent to the QRA being carried out, the programme was adjusted and the programme cost estimate was reduced. This amendment would not affect the project risks. This means that the calculated risk allowance included in the scheme bid cost may be marginally high.

No.	Risk Description	Likelihood (%)	Minimum Cost (£)	Most Likely Cost (£)	Maximum Cost (£)
1	Worker involved in an accident	10.0%	£5,000.00	£100,000.00	£225,000.00
2	Lighting / Electrical Installation costs are more complexed than expected	30.0%	£5,000.00	£60,000.00	£75,000.00
3	Unplanned impact from other projects / developers delays works	10.0%	£5,000.00	£40,000.00	£75,000.00
4	TTROs & TROs not obtained on time	10.0%	£10,000.00	£60,000.00	£75,000.00
5	HE intervene in TM	10.0%	£5,000.00	£120,000.00	£225,000.00
6	TTROs & TROs do not meet objectives	30.0%	£10,000.00	£60,000.00	£75,000.00
7	Skanska not ready to start construction	10.0%	£5,000.00	£60,000.00	£75,000.00
8	Highway boundary requires significant additional construction	40.0%	£5,000.00	£40,000.00	£75,000.00
9	TM impact on A361 worse than expected	10.0%	£5,000.00	£80,000.00	£120,000.00
10	Insufficient comms done with stakeholders	10.0%	£5,000.00	£40,000.00	£75,000.00
11	Negative response from stakeholders and/or public during consultation and design workshops requires significant design changes	50.0%	£15,000.00	£130,000.00	£210,000.00
12	Changes to fiscal constraints (e.g. landfill tax and disposal costs) or to design standards.	10.0%	£5,000.00	£100,000.00	£225,000.00
15	Laying of tarmac cannot be laid when too cold. Work cannot be progressed in heavy rain or flooding.	40.0%	£5,000.00	£30,000.00	£50,000.00
16	RSA1-3 requires changes	20.0%	£15,000.00	£120,000.00	£225,000.00
17	RSA4 requires changes	20.0%	£15,000.00	£120,000.00	£150,000.00
18	Unexpected impact on hedgerows and trees	30.0%	£5,000.00	£60,000.00	£75,000.00
19	Bird nesting season delays works	30.0%	£5,000.00	£100,000.00	£215,000.00
20	Materials cannot be sourced on time	30.0%	£5,000.00	£60,000.00	£90,000.00
21	Ground conditions	20.0%	£50,000.00	£300,000.00	£375,000.00
22	Unidentified Stats	10.0%	£5,000.00	£60,000.00	£150,000.00
23	Structural integrity worse than expected	40.0%	£5,000.00	£80,000.00	£100,000.00

24	Contaminated land	10.0%	£5,000.00	£15,000.00	£20,000.00
25	Topo survey is inaccurate	10.0%	£5,000.00	£60,000.00	£300,000.00
28	OCC Staff time not accurately forecast	20.0%	£5,000.00	£60,000.00	£150,000.00
29	Ustats impact on services and ducts	20.0%	£5,000.00	£40,000.00	£75,000.00
30	Harvest season reduces capacity for TM due to wide loads and field gates being used	20.0%	£5,000.00	£100,000.00	£150,000.00
31	Material failure/weak or shallow construction (pavement or road surfacing) worse than expected	25.0%	£25,000.00	£70,000.00	£90,000.00
32	Requirement to resurface more carriageway than originally planned due to structural weakness	25.0%	£25,000.00	£70,000.00	£105,000.00
33	Construction traffic causes unforeseen costs	20.0%	£10,000.00	£30,000.00	£37,500.00
34	Environment Agency consent required for any changes	10.0%	£10,000.00	£40,000.00	£52,500.00

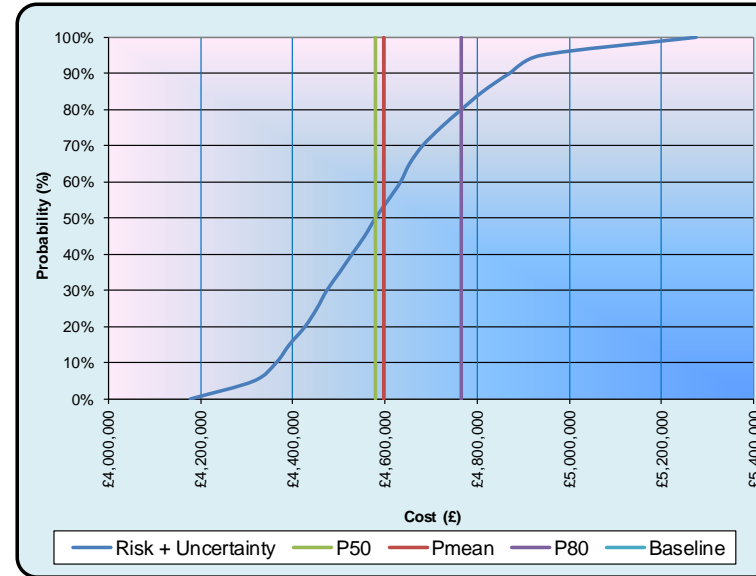
Risk Profile - 1000 Iterations

@Risk Output

Statistics	Output
Minimum	£4,177,961.61
Maximum	£5,274,632.59
Mean	£4,597,473.69
Std Deviation	£193,641.52
Variance	£37,497,040,000.00
Skewness	£0.47
Kurtosis	£2.90
Median	£0.00
Mode	£4,481,770.65

Percentile	Output
5% Perc	£4,316,173.77
10% Perc	£4,364,025.84
15% Perc	£4,392,751.66
20% Perc	£4,426,752.21
25% Perc	£4,452,380.76
30% Perc	£4,473,927.02
35% Perc	£4,501,650.89
40% Perc	£4,528,509.85
45% Perc	£4,555,856.11
50% Perc	£4,579,437.11
55% Perc	£4,607,094.34
60% Perc	£4,633,851.40
65% Perc	£4,653,295.65
70% Perc	£4,681,474.76
75% Perc	£4,720,855.47
80% Perc	£4,765,527.21
85% Perc	£4,812,235.23
90% Perc	£4,869,645.42
95% Perc	£4,938,138.84

Probability	Risk Value
P100	£5,274,633
P80	£4,765,527
P50	£4,579,437
Pmean	£4,597,474
P100 - Pmean	£677,159



Probability	Risk + Uncertainty	Risk	Uncertainty	Baseline	P50	Pmean	P80
0%	£4,177,962	£25,556	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
5%	£4,316,174	£163,768	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
10%	£4,364,026	£211,620	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
15%	£4,392,752	£240,346	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
20%	£4,426,752	£274,346	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
25%	£4,452,381	£299,975	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
30%	£4,473,927	£321,521	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
35%	£4,501,651	£349,245	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
40%	£4,528,510	£376,104	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
45%	£4,555,856	£403,450	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
50%	£4,579,437	£427,031	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
55%	£4,607,094	£454,688	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
60%	£4,633,851	£481,445	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
65%	£4,653,296	£500,890	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
70%	£4,681,475	£529,069	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
75%	£4,720,855	£568,449	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
80%	£4,765,527	£613,121	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
85%	£4,812,235	£659,829	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
90%	£4,869,645	£717,239	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
95%	£4,938,139	£785,733	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527
100%	£5,274,633	£1,122,227	£4,152,406	£3,734,106	£4,579,437	£4,597,474	£4,765,527

APPENDIX H - BCR CALCULATION BASED ON BCR SRIP

A361_BCR Calc_v1.0 [A361 SRIP]

Oxfordshire County Council
A361 Safer Roads Fund Bid
A361_BCR Calc_v1.0.xlsx

A361 SRIP

Safer Roads Investment Plan Updated - Based on ViDA SRIP

Countermeasure	Length / Sites	FSIs saved	PV of Safety Benefit		PV Other Benefits		PV Do-Min Safety Benefits	PV Estimated Cost	PV Do-Min Costs	Cost per FSI saved	Program BCR
			Do-Something	Do-Something	Do-Something	Do-Something					
Skid Resistance (paved road)			8	£ 5,014,917	£ -	£ -	£ 1,731,184	£ 3,174,450	£ 2,250,428	£ 114,728	3.55
Improve curve delineation	3.40 km		6	£ 1,885,884	£ -	£ -	£ -	£ 370,723	£ -	£ 61,787	5.09
Delineation and signing (intersection)	10 sites		5	£ 1,574,075	£ -	£ -	£ -	£ 108,674	£ -	£ 21,735	14.48
Shoulder rumble strips	7.60 km		5	£ 1,465,963	£ -	£ -	£ -	£ 85,086	£ -	£ 17,017	17.23
Improve Delineation	0.50 km		1	£ 225,069	£ -	£ -	£ -	£ 32,300	£ -	£ 32,300	6.97
Bicycle Lane (off-road)	2.40 km		1	£ 307,167	£ -	£ -	£ -	£ 386,751	£ -	£ 386,751	0.79
Protected turn lane (unsignalised 4 leg)	1 sites		1	£ 273,792	£ -	£ -	£ -	£ 119,000	£ -	£ 119,000	2.30
Roadside barriers - passenger side	0.40 km		1	£ 293,292	£ -	£ -	£ -	£ 59,500	£ -	£ 59,500	4.93
Street lighting (intersection)	1 sites		0	£ 122,863	£ -	£ -	£ -	£ 53,550	£ -	£ -	2.29
Speed Limit Reduction	10.9km		18	£ 5,497,623	£ -11,520,154	£ 11,520,154	£ -	£ 53,550	£ -	£ 3,033	-112.47
Contingency			0	£ -	£ -	£ -	£ -	£ 444,359	£ -	£ -	-
Maintenance Costs - Speed Limits			0	£ -	£ -	£ -	£ -	£ 72,892	£ -	£ -	-
Maintenance Costs - Other			0	£ -	£ -	£ -	£ -	£ 613,027	£ 122,601	£ -	-
Total			46	£ 16,660,644	£ -11,520,154	£ 11,520,154	£ 1,731,184	£ 5,573,862	£ 2,373,029	£ 70,021	1.07

Safer Roads Investment Plan Summary

	Total FSIs Saved	PV Safety Benefits	PV Other Benefits	PV Costs	Cost per FSI saved	Program BCR
Full Programme	46	£ 14,929,461	£ -11,520,154	£ 3,200,833	£ 70,021	1.07
Excluding Speed Limit Reduction	28	£ 9,431,838		£ 3,127,941	£ 111,497	3.02

Notes

1 Costs have been factored up by 19% to market costs. This factor is applied in this table but not inside ViDA 2 No growth with GDP is assumed for costs over time - consistent with ViDA

3 Benefits are assumed to grow with GDP over time to allow comparison with disbenefits calculated in TUBA for speed limit reduction. This calculation is undertaken outside of ViDA 4 Travel time disbenefits in TUBA assume average 47.7seconds of additional travel time for vehicles travelling the full length of the study area (20km), based on mean speeds

5 Do-Minimum costs and Benefits assume resurfacing is undertaken in year 10

APPENDIX I _ STAR RATING MAPS

Iteration 0 Baseline

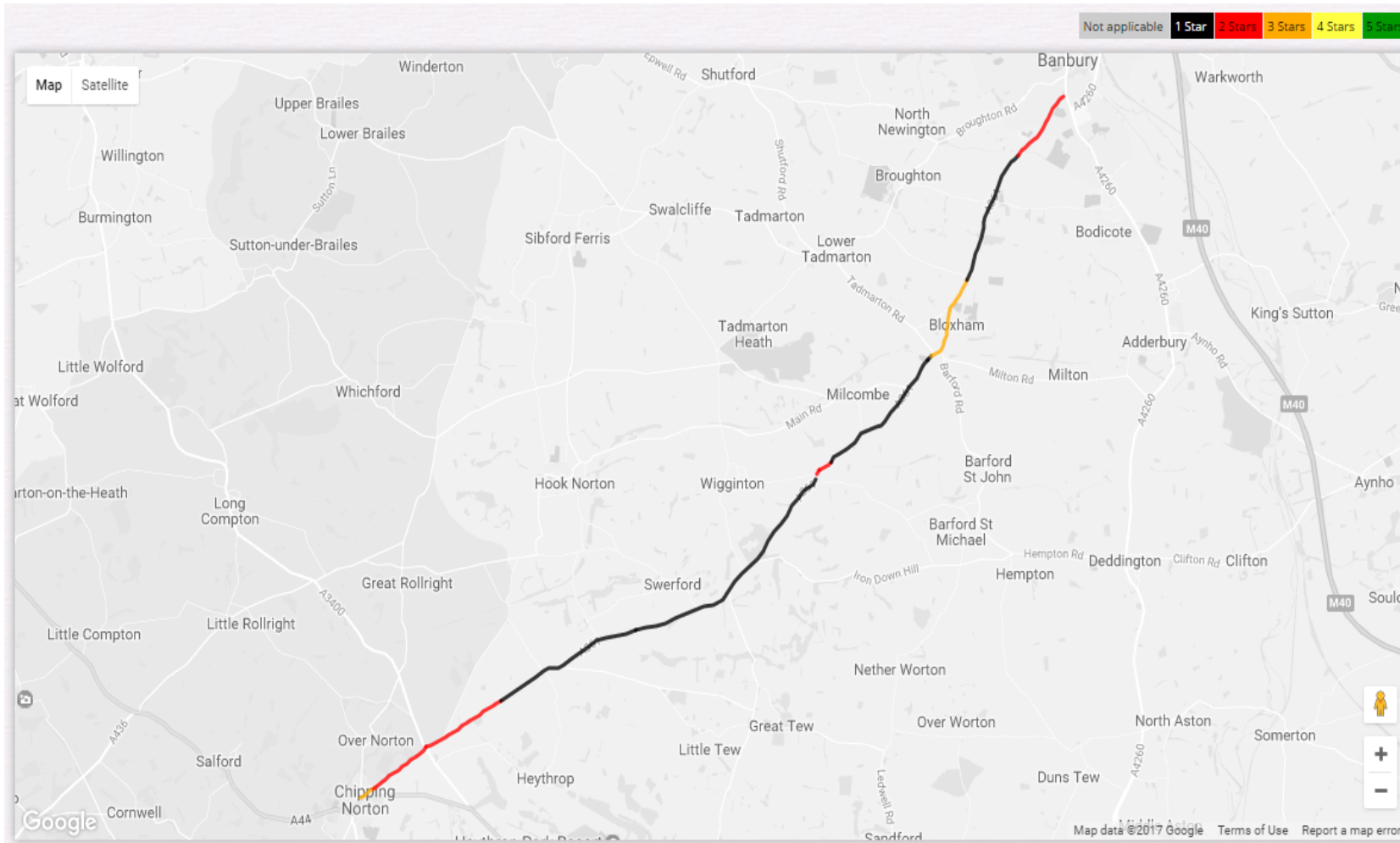
Original Dataset from iRAP

Not applicable 1 Star 2 Stars 3 Stars 4 Stars 5 Stars



Iteration 1 Adjusted Baseline

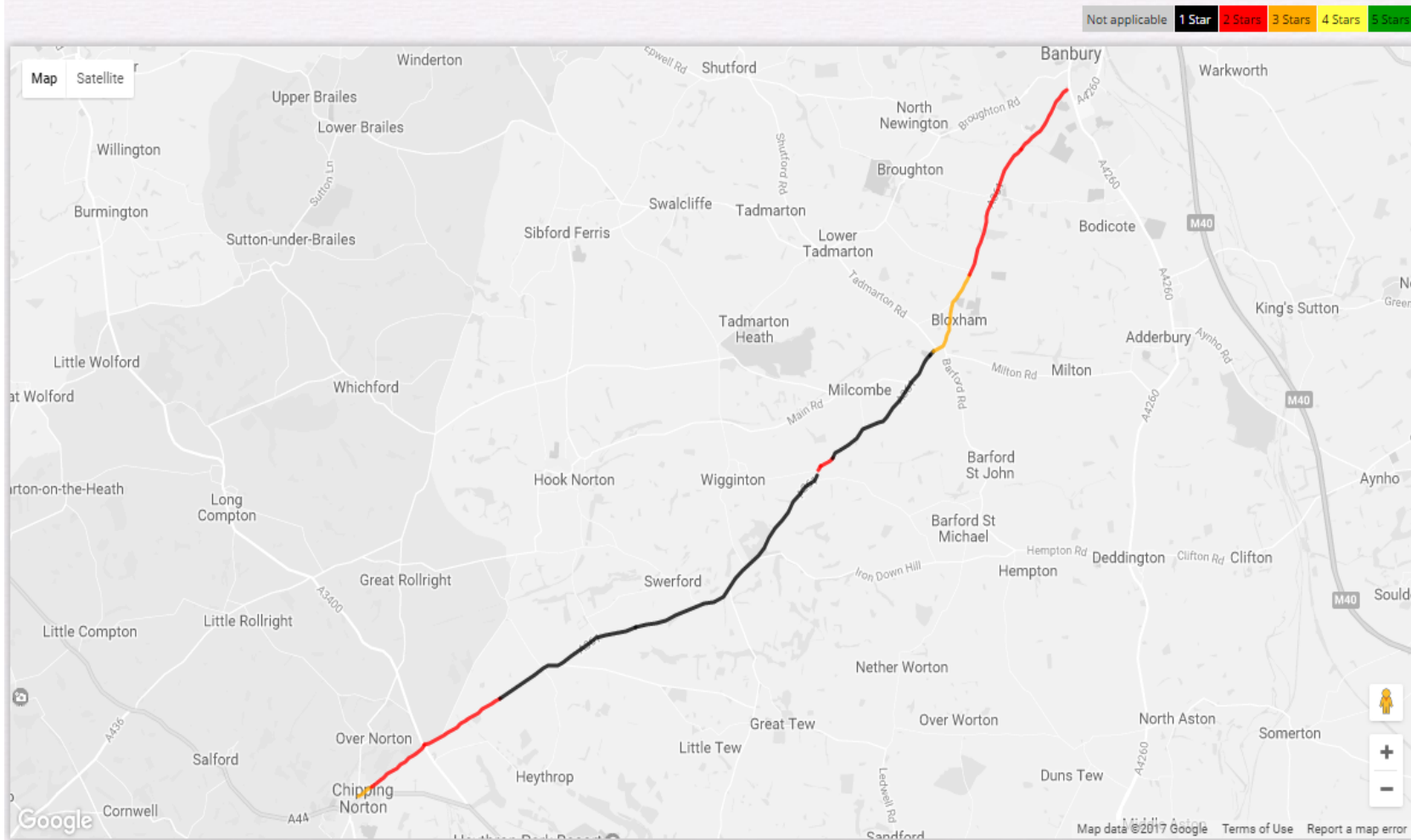
Skid resistance adjusted to medium from adequate for 100m sections where SCRIM data is orange/red. Peak Cyclist volumes adjusted to 5-26 per hour in section H. Peak pedestrian crossing values adjusted to 5-26 per hour at Ellis Lane Junction. This Data Set is used as the basis for the do-minimum



Iteration 2/3

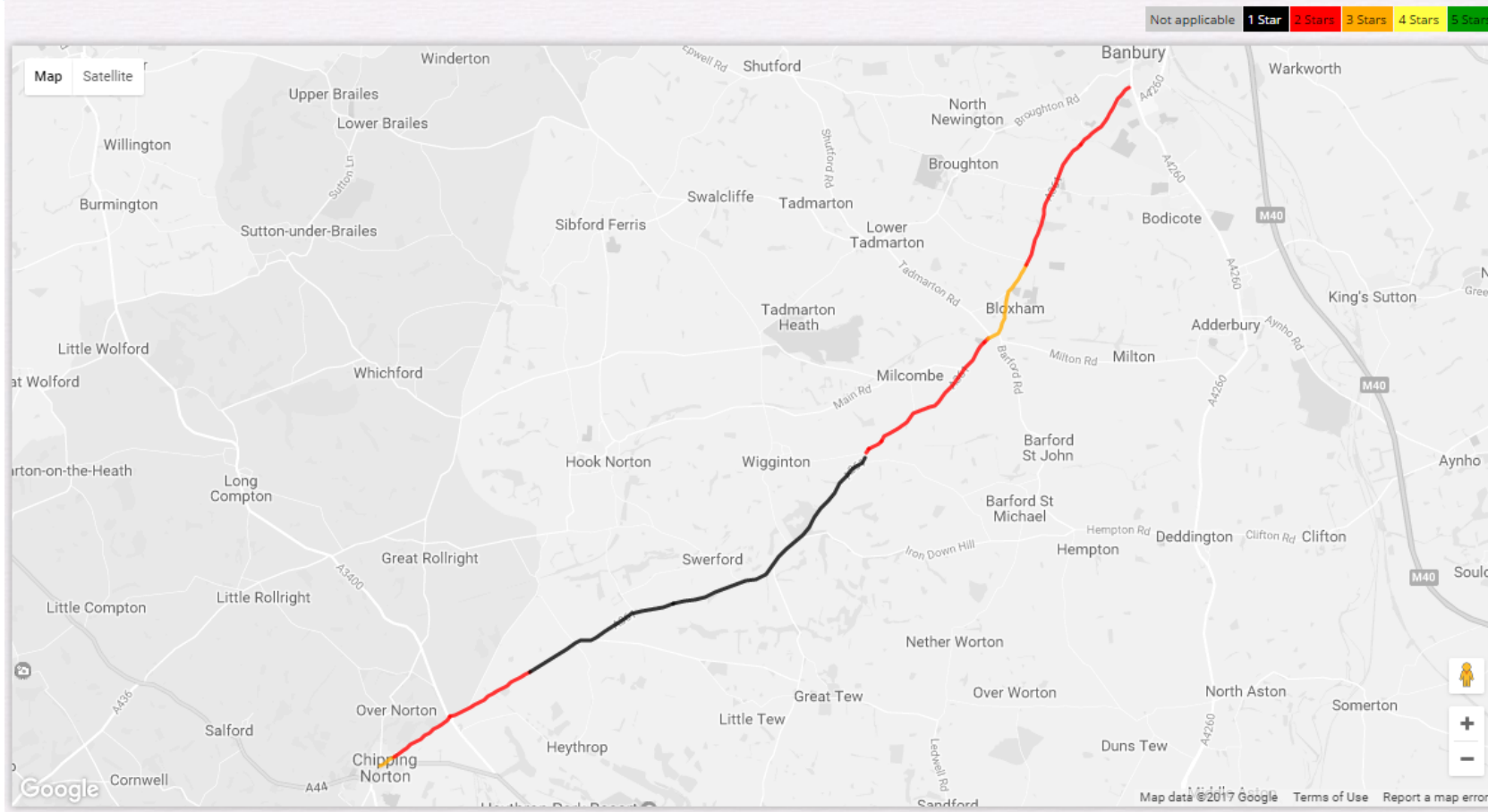
Incorporate ViDA Countermeasures by Section

Incorporate countermeasures as described in 'Individual Treatments'. Separated into sections to allow for different treatment costs and to ignore countermeasures where they are not proposed in a given section. Combine core data-after from all sections in iteration 2 to allow calculation of smoothed SRS.



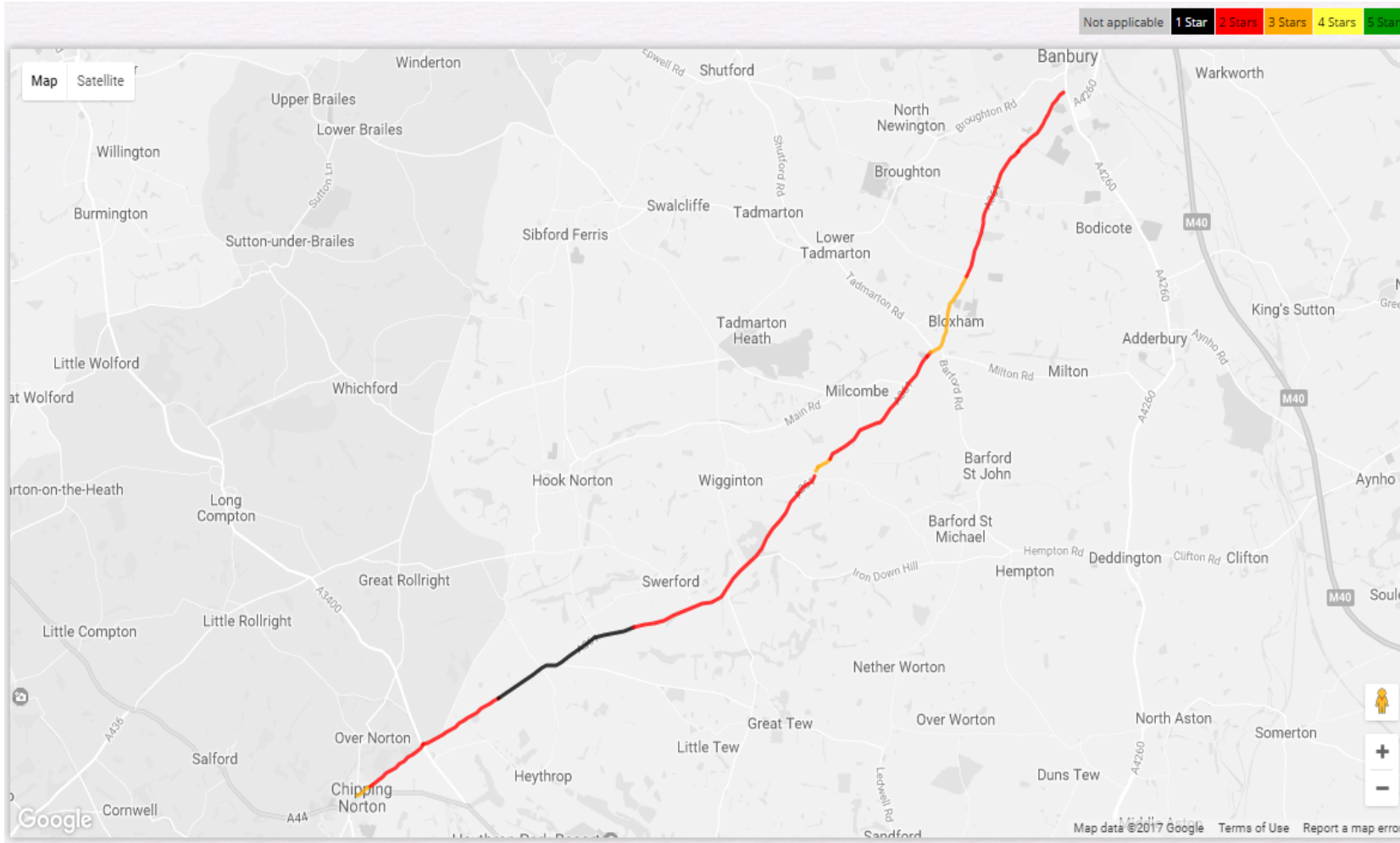
4 Incorporate additional skid resistance and refuge

Update core data to include additional treatments where not triggered by ViDA in interaction 2



5 Reduced Speed Limits

Update core data with reduced speed limits. In sections where speed limit reduces by 10mph, mean speed assumed to reduce by 5mph and 85th percentile speed also assumed to reduce by 5mph



Appendix J - Application of ViDA to Safer Roads Fund Bid for A361

Technical Note

This technical note summarises the application of the IRAP ViDA tool to the Safer Roads Fund Bid for the A361. ViDA was used to assist with generating countermeasures (in combination with Oxfordshire County Council local knowledge and expertise) and as a tool to generate costs and safety benefits for inclusion in the benefit cost ratio calculation.

Overview of Approach

All safety benefits included in the benefit cost ratio are based on FSI calculations by ViDA. In order to allow these benefits to be calculated the proposed countermeasures have been entered into ViDA through five steps based on advice from James Bradford, IRAP. An overview of the iterations is provided in Table 1. Note that ViDA baseline data was updated in Step 1 to reflect measured values of skid resistance and observed cyclist and pedestrian volumes in some sections based on local knowledge and SCRIM data.

Table 1: Steps taken to incorporate proposed countermeasures into ViDA

	Summary	Description	ViDA Dataset
0	Baseline	Original Dataset from iRAP	PFI A361 - Baseline
1	Adjusted Baseline	Skid resistance adjusted to medium from adequate for 100m sections where SCRIM data is orange/red. Peak Cyclist volumes adjusted to 5-26 per hour in Banbury to Bloxham Section. Peak pedestrian crossing values adjusted to 5-26 per hour at Ells Lane Junction. This Dataset is used as the basis for the do-minimum.	PFI A361 - Adj Skid Resistance
2	Incorporate ViDA Countermeasures by Section	Incorporated proposed countermeasures separated into 9 sections to allow for different treatment costs and to ignore countermeasures where they are not proposed in a given section. Benefits calculated in the SRIP fed into further analysis. Further detail provided in subsection below. <i>To view overall in ViDA select all datasets and view concurrently.</i>	PFI A361 - 2A_AdjBase PFI A361 - 2B_AdjBase PFI A361 - 2C_AdjBase PFI A361 - 2D_AdjBase PFI A361 - 2E_AdjBase PFI A361 - 2F_AdjBase PFI A361 - 2G_AdjBase PFI A361 - 2H_AdjBase PFI A361 - 2I_AdjBase
3	Combined results from Step 2	Combine core data-after from all sections in step 2 to allow calculation of smoothed SRS. No changes to data or benefits calculated.	PFI A361 - 3_AdjBase
4	Incorporate additional skid resistance and refuge	Update step 3 core data-after to include additional treatments where not triggered by ViDA in step 2. No additional countermeasures included. Compare fatalities download to step 3.	PFI A361 - 4_AdjBase
5	Reduced Speed Limits	Update step 4 core data with reduced speed limits. In sections where speed limit reduces by 10mph, mean speed assumed to reduce by 5mph and 85th percentile speed also assumed to reduce by 5mph. 5mph assumption is conservative to ensure safety benefits are not overstated. No additional countermeasures included. Compare fatalities download to step 4.	PFI A361 - 5_AdjBase

All countermeasures proposed along the A361 were incorporated in step 2 except;
 Skid resistance improvements on straights (only bends and junctions triggered in step 2)
 (incorporated in step 4).
 Pedestrian refuge at Ells Lane Junction (incorporated in step 4).
 Reduced speed limits (incorporated in step 5).
 Improve drainage/clear vegetation between Coldharbour Farm and A3400 (incorporated as cost only
 – no benefits calculated).

All benefits calculated in step 2 are based on the safety benefits calculated by ViDA in the SRIP. Benefits calculated in steps 4 and 5 are based on a comparison of the predicted fatalities ViDA download with the previous step based on updated core data. The annual predicted FSIs calculated by ViDA for the length of the study area are summarised in Table 2.

Table 2: Annual Predicted FSIs in the study area calculated by ViDA

Step	Total Fatality Estimation per year	Total serious injuries per year	Total Fatal and Serious Injury Estimation per year
0	0.680	6.800	7.480
1	0.680	6.800	7.480
2	0.537	5.375	5.912
3	0.537	5.375	5.912
4	0.516	5.164	5.681
5	0.436	4.362	4.798

Step 2 values applied in ViDA

Countermeasure costs in Step 2 were updated on a section-by-section (sections defined by Oxfordshire County Council) basis to reflect the capital cost estimates. All ‘treatment lives’ were updated to 20 years and maintenance costs applied externally of the tool. Unit costs applied in Step 2 are calculated to produce the correct total cost where applied over the treatment lengths recommended by ViDA.

Within the core data the ‘upgrade cost’ field is adjusted to prevent the application of certain countermeasures in ViDA where they are not proposed. For example a 100m section is set to ‘high’ upgrade cost and the treatment cost is set to £10,000,000,000 in the ‘high’ unit cost field. This treatment would be overridden due to a low BCR in this 100m section.

To match the methodology applied by ViDA fatality and casualty values in ViDA were updated to 2017 costs and prices using values in sheet A4.1.1 of the WebTAG databook v1.7.

Completion of Benefit Cost Ratio Calculation

Following the ViDA analysis the final benefit cost ratio was calculated external of the online tool. The following adjustments were made:

- Inclusion of maintenance costs.
- Uplift of all costs (capital and maintenance) to reflect market prices.
- Alteration of the do-minimum to include carriageway resurfacing (and associated skid resistance benefits) in year 10.
- Calculation of safety benefits attributable to steps 4 and 5 based on FSI reduction calculated by ViDA.
- Calculation of user and CO₂ emission benefits/disbenefits attributable to speed limit reduction in DfT’s TUBA software (subsequently adjusted to ViDA comparable discount year and price base).
- Inflation of all safety benefits with GDP over time to allow comparison with TUBA results.

APPENDIX K



**Communities
County Hall
New Road
Oxford OX1 1NE**

**Susan Halliwell
Director for Planning & Place**

8 April 2017

Department for Transport
Great Minster House
Horseferry Road
London

Dear Sir or Madam

Safer Roads Fund - A361 Chipping Norton to Banbury

Improving safety on Oxfordshire's roads is a priority for Oxfordshire County Council. We are therefore grateful for the opportunity to bid for funding to reduce the risk of accidents on the A361.

This section of road has had a poor accident record in recent years. This has been highlighted by its 1 Star status in the iRAP assessment and its naming as one of the 50 highest risk sections of road in England.

We have put together a programme in this bid which deals with many of the factors which are seen as causes of this record: poor carriageway conditions, high speeds, poor road delineation and sub-standard junction designs. I am sure that if implemented, these will lead to a substantial reduction in the accidents recorded.

If this bid is accepted and the funds for the scheme made available then this will be a top priority for the Council over the next three years and all the necessary resources will be made available for its timely and cost-effective delivery.

Yours faithfully

A handwritten signature in blue ink that reads "Susan Halliwell".

Susan Halliwell
Director for Planning & Place

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www.oxfordshire.gov.uk