

A34 Safety Review

Project Summary

September 2017

1 Introduction

1.1 Project background

An in-depth safety review of the A34 was announced by the minister John Hayes in order to identify incident 'hot spots' and whether the incidents that took place during 2016, many involving HGVs, could be happening due to the current road conditions.

Highways England recognises that the route requires some improvement work to help tackle congestion, particularly between the M4 and M40 and that a larger investment to the A34 will be needed in the future.

As found in the Project Status Report, the A34 performs within the national averages for safety. This was also documented by the BBC who stated "Road Safety Analysis found the A34 is 30% safer than similar roads" after carrying out their own independent review of the road. <http://www.bbc.co.uk/news/uk-england-oxfordshire-39182703>

Notwithstanding that finding, we continued with the Safety Review. This report contains recommendations for a number of proposed schemes to achieve the desired safety benefits. It should be noted that the suggested improvements have not been assessed for feasibility or performance and do not have committed funding.

Following the Project Status Report which provides a summary of the collision data analysis, this document will provide a summary of the recommendations made in the A34 Safety Review.

1.2 Purpose of this document

The purpose of this document, as outlined in the Project Status Report, is to:

- Determine why collisions are happening in the identified Focus Areas (see figure 1) and identify packages of improvements that could be delivered in response to this review
- The packages will be identified by assessing the condition of the carriageway against the current standards.
- This is extracted from the A34 Safety Review, which is a technical report and the following is a non-technical summary.

1.3 Focus Areas for further investigation

Focus areas were identified in the Project Status Report by analysing the collision data along the A34. Not all of the areas identified were taken forwards for review against the current standards and recommended improvements. Focus Areas were identified by looking at areas where collisions occurred in 'clusters' and seeing if there were any patterns that could be identified.

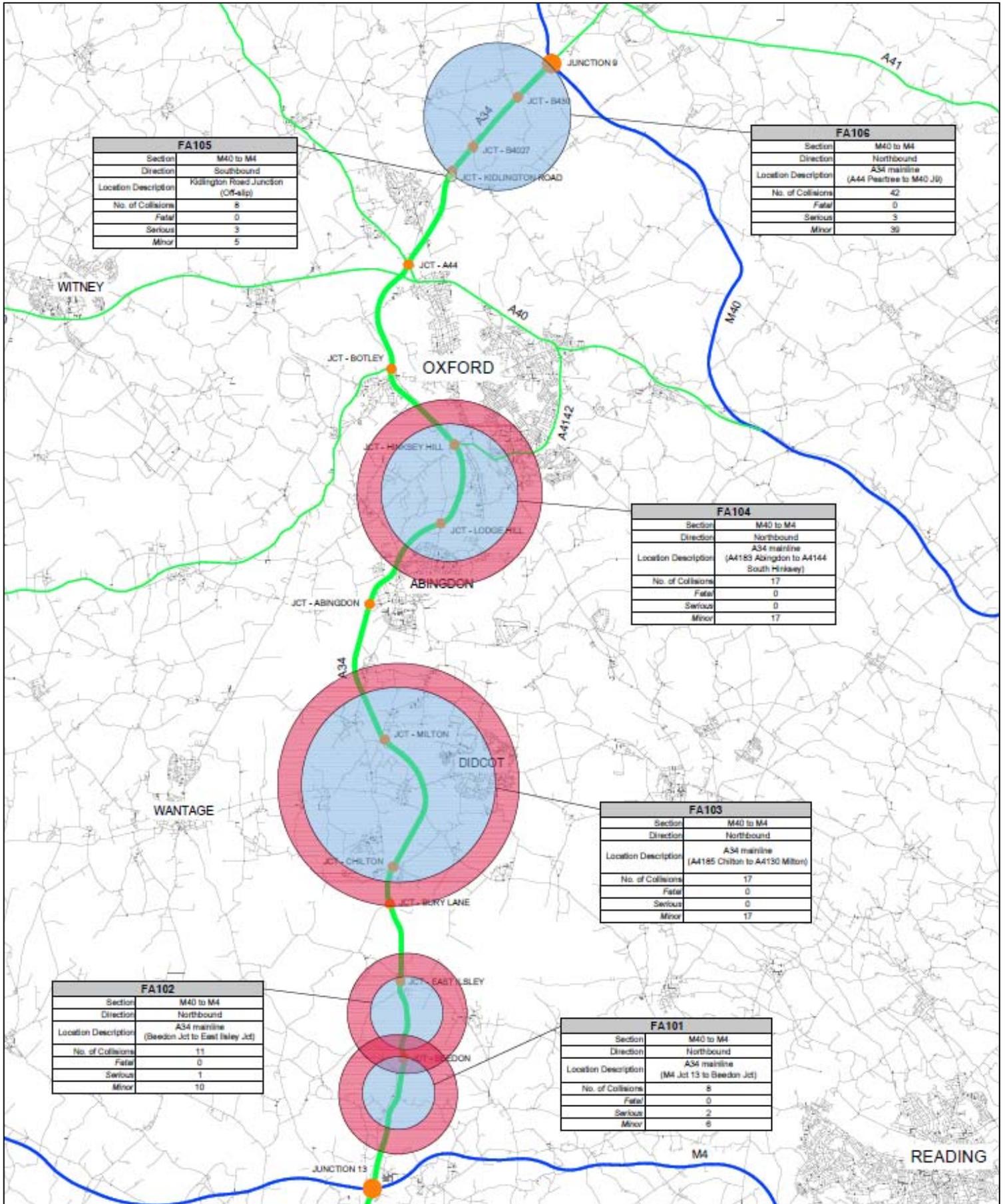
- Section M3 – M4

A low number of collisions have been identified in the southern cluster. Therefore they have not been taken forwards for further review as they do not provide a clear pattern of an ongoing trend.

- Section M4 – M40

7 focus areas were identified in this section of the route. The Focus Area at M40 Junction 9 was not taken forwards as it has previously undergone improvement works. Six were taken forwards further in the review, to explore any relationships between cluster areas and carriageway compliance. The six Focus Areas, shown in Figure 1, will inform any recommendations for improvements to the A34. Five of the focus areas were identified on the northbound carriageway and one on the southbound carriageway at Kidlington junction.

Figure 1 – Focus Areas



2 Relationship between Collision Analysis and compliance to Standards

2.1 Focus Area 101 - M4 J13 to Beedon Junction Northbound

Analysis

Collision analysis

- All collisions – ‘Loss of control’
- Severity of collisions were two ‘serious’ & six ‘slight’
- There have been two collisions in the last three years which represents a downward trend in incidents

Review against Standards

- Overgrown vegetation obstructs forward visibility and clear visibility to traffic signs in a number of locations
- Merging junction at Beedon is not the right length
- Two lay-bys are non-compliant in spacing and layout

Conclusion

It is unclear why this collision trend is occurring. Lay-by compliance is the main concern regarding two facilities. Two collisions were identified in connection with vehicles exiting the parking provisions, nonetheless do not form part of the collision trend.

Suggested improvements

1 - Lay-by Improvements and closures

- Closure of the lay-by near Cross Lanes Farm is recommended. This is because there is sub-standard spacing with the following lay-by near Beedon Hill.
- Two collisions were recorded by the Cross Lanes Farm lay-by, where vehicles pulled out of the lay-by without warning. This may have been a consequence of the sub-standard geometry.
- If monitoring of this temporary closure proves that motorists can still seek refuge despite the reduced parking, this lay-by should be converted into an Emergency Refuge Area, which would require minimal modification.
- Upgrade the lay-by near Beedon Hill to improve the layout and increase the length of the lay-by. The lay-by would be widened and a segregation island introduced.

2.2 Focus Area 102 – Beedon to Bury Lane Junction Northbound

Analysis

Collision analysis

- Majority of collisions were ‘rear end shunts’ (9)
- Severity of collisions were one ‘serious’ & ten ‘slight’
- The number of collisions each year has remained constant with two in the last year (2016)

Review against Standards

- The road is steeper than the recommended gradient for a dual carriageway
- Ashridge Farm Cottage has direct access to the A34 which is non-compliant with this type of road
- The junction merge at East Ilsley should be longer
- There is one lay-by in this area and it is the wrong type of lay-by for this road

Conclusion

'Rear end shunts' are thought to be caused by the steep uphill gradient at Gore Hill. Whilst monitoring has not been done on Heavy Goods Vehicles (HGVs) in lane 2, it is widely thought that the ban in lane 2 is ignored, increasing queuing and congestion upstream. The East Ilsley junction merge compromises the safe exit of vehicles as the entry point is on the approach on Gore Hill. CCTV surveys are recommended to better understand the HGV ban before any improvements are made.

Suggested improvements

2 – Improve signage at Gore Hill

- Reinstall previously removed signage and introduce supplementary sign 'slow lorries for 1 mile' which warns of the steep gradient at the junction of East Ilsley. This will provide clear reasoning for the HGV ban in lane 2 ahead for motorists.
- This intervention was also identified by the Thames Valley Police report in 2016, produced following fatal collisions in the area.
- Provide another sign in advance of the Gore Hill lane 2 ban indicating which vehicles can use the lane. It is considered that abuse of the existing lane 2 weight restriction is because the current sign is not fully understood.
- It is suggested that a unique sign, subject to approval by the DfT, could be used to better convey the lane 2 HGV ban.



Figure 2 – Proposed signage at Gore Hill

3 – Vehicle Activated Sign with Automatic Number Plate Recognition (ANPR) technology

- Install innovative Vehicle Activated Signs (VAS) in the nearside and offside verge through Gore Hill.
- In the event of an abuse of the HGV ban VAS would have the ability to trigger a message such as "Get in Lane" in addition to highlighting the offender's vehicle registration number.
- The proposal looks to expand on pre-existing technology and explore an innovative version of it.



Figure 3 – Example of a Vehicle Activated Sign with ANPR

4 - Improvements to the East Ilsley Junction

- The proposal is to reconfigure the junction arrangement to standardise the merge layout so that it is the correct length.
- Minimal carriageway widening would be required. This will allow vehicles to build up speed to match the speed of traffic on the A34.

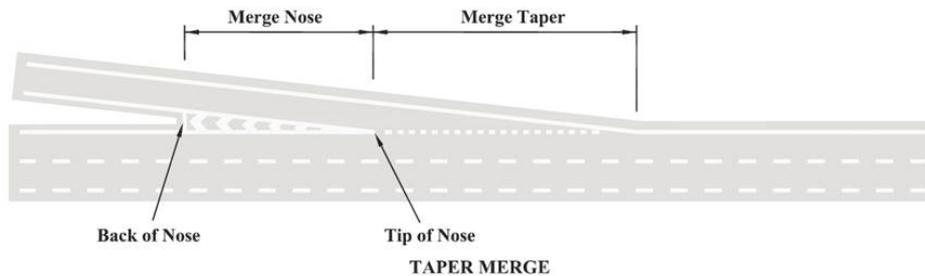


Figure 4 – Proposed junction layout

5 - Dedicated climber/ crawler lane

- Introduce a climbing lane, due to the steep gradient between East Ilsley junction and Bury Lane junction, for approximately 2km. The East Ilsley merge could be converted to a lane gain arrangement so that the joining traffic creates a third lane.
- This would increase overtaking capacity and safer exit of traffic at East Ilsley.
- However it should be noted that the traffic remerging back from lane 3 to lane 2 could pose an issue at the end of the climber lane, which would require further investigation into the safety benefits.
- This intervention was also identified by the Thames Valley Police report in 2016, produced following fatal collisions in the area.
- It should be noted that there is potential for adverse environmental impacts including sensitive noise and air receptors.

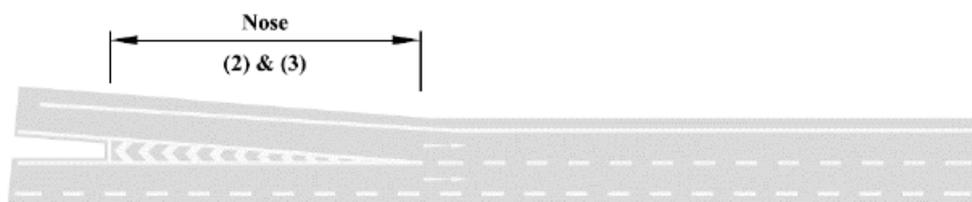


Figure 5 – Lane gain arrangement for climber lane

2.3 Focus Area 103 – Bury Lane to Abingdon Junction Northbound Analysis

Collision analysis

- The majority of collisions (14) were 'rear end shunts'
- Severity of all collisions were 'slight'
- In the last twelve months there have been no collisions on this section of road.

Review against Standards

- Issues at all four parking lay-bys, including visibility and spacing
- Disused slip-road at Drayton being used as an unofficial lay-by

Conclusion

There is no evidence to indicate that this section suffers from high congestion or queuing. Two collisions were directly caused by vehicles exiting parking provisions, with another two braking in the vicinity of lay-bys. Lay-by compliance is the main concern.

Suggested improvements

6 - Lay-by Improvements and closures

- Convert the existing lay-by just before the A417 bridge to the correct layout with additional parking which will compensate for the recommendation of closing three lay-bys in the area.
- Closure of three lay-bys (one prior to the Cow Lane bridge, one prior to the Milton Interchange and one after Drayton) should be monitored to assess the impact of motorist's ability to seek refuge; especially HGVs.
- Consideration should be given to converting them into Emergency Refuge Areas.
- Closure of these lay-bys would eliminate issues of forward visibility due to two of the lay-bys being located on bends.
- 2 collisions were recorded in the vicinity of the lay-by after Drayton which relate to vehicles exiting the lay-by.
- In addition, 2 collisions were caused by braking vehicles on the A34, which could be attributed to manoeuvres in and out of this lay-by.
- Conversion of former Drayton slip to a fully compliant lay-by as proposed in the previous study conducted 2010 to look at the Drayton slip.
- This slip is used already as an unofficial parking area so it would formalise the situation. This proposal would require closure of the lay-by after the slip as the distance between them would not be long enough.
- Consultation with the police would be necessary to see if an observation platform is required within the proposed lay-by.

2.4 Focus Area 104 – Lodge Hill to Botley Junction Northbound Analysis

Collision analysis

- The majority of collisions were 'rear end shunts' (16)
- Severity of all collisions were 'slight'
- A decreasing trend with 1 incident in the last year

Review against Standards

- Six lay-bys have incorrect layout for this road and are non-standard
- A high number of traffic signs overloads the user with information

Conclusion

Rear end shunts are caused by traffic queuing back from the congested and built-up section of the A34, near Oxford. There is a detrimental effect of the 50mph speed limit in the area that motorists brake suddenly when entering this area, which creates a 'shock wave' effect generating congestion and queuing upstream of the 50mph regulations. The short distances between lay-bys and junctions contribute to this as it generates more lane changing by motorists joining and leaving the A34. Lastly, traffic sign compliance issues are noted throughout the area. In particular there is contradictory information on 3 consecutive directional signs which could cause late lane changing.

Suggested improvements

7 - Progressive speed limit change

- The proposal is to introduce a progressive speed limit change from 70mph to 60mph in advance of the 50mph limit near Oxford circa 5km upstream, in the vicinity of the A4183 Lodge Hill junction.
- The intention is to reduce the risk of sudden braking, which causes a 'shock wave' like effect upstream, which potentially increases the risk of 'rear end shunts' and lane changing collisions.

8 - Install Digital Enforcement Camera System (DECS)

- Average speed camera systems are a digital technology that utilise a system with Automatic Number Plate Recognition (ANPR) which assists in the enforcement of speed restrictions.
- It is recommended that this be installed in area that is restricted to 50mph in Oxford.
- This should regulate the traffic flow better by enforcing speed compliance.
- This will allow users to join the mainline more safely by regulating the flow of traffic, as well as potentially reducing the severity of collisions by improved reaction times with shorter stopping distances.

9 - Variable Message Sign (VMS) Installation

- Install VMS that displays messages such as 'keep your distance'
- This would enable safer merging and exiting of the A34 as there are a high number of accesses and junctions on the Oxford section of the A34.
- This should be trialled to see if it has a beneficial impact, and whether the sign should react to live traffic.
- Discussions should be held with Oxford County Council to see if this should be linked to the local road work and used to inform about local events in non-peak times.

10 - Bus stop relocation/closures and the improvement of junction layout

- Investigate the closure of three bus stops in the area, two of which are located within or near to junctions.
- Bus services are infrequent so should be monitored to determine usage.
- Should the use be low, an investigation should be sought, in collaboration with the bus company, to see about closure or relocation of the stops.
- This is a proactive measure that should eradicate conflict and enable refinement of the junction layouts improving safety for road users.

2.5 Focus Area 105 – Kidlington Road Junction Southbound Analysis

Collision analysis

- The cluster involved vehicles on Kidlington Road failing to give way and colliding with vehicles on the A35 southbound off-slip
- A key contributing factor to collisions in this area are related to vehicles giving way
- Severity of collisions were three 'serious' and five 'slight'
- Decreasing trend with one collision in the last year

Review against Standards

- A tree and other vegetation contribute to poor visibility at this location
- Traffic signs could be improved at this location for advanced warning

Conclusion

Although a decreasing trend – vehicles travelling along Kidlington Road are failing to give way at the intersection with the A34 southbound off-slip. Poor advance warning signage and forward visibility have been identified as the fundamental issues which could leave users unaware and unsighted of the impending junction.

Suggested Improvements

11 - Improve intervisibility and signage in the vicinity of the junction

- Removal of vegetation to improve the visibility of the junction.
- Provide advanced warning signs and carriageway markings at the correct distance in advance of the Kidlington junction.
- Install 'GIVE WAY' signs to increase warning to drivers and 'SLOW' painted on the road. Making signs larger and more prominent – including the deviation signage.

12 - Closure of the Kidlington Road link

- In the event that proposal #11 is unsuccessful this could be implemented as an alternative and would remove the conflicting movements completely.
- This is a potentially sensitive solution with local traffic diverted to the B4027 junction.
- This would need trialling and appropriate consultation with the residents and Parish Councils.

2.6 Focus Area 106 – Kidlington Junction to M40 Junction 9 Northbound Analysis

Collision analysis

- 84% of vehicles involved in collisions were cars
- Severity of collisions were 'slight' with an increasing trend predominantly in 'rear end shunts' (both 39 of 42)
- PM peak accounts for 57% of collisions indicating queuing on the approach to M40 junction 9

Review against Standards

- The close proximity of junctions and lay-bys is an issue.
- Junction layout is sub-standard at Family Farm service area
- Parking laybys have compliance issues
- Minor sign compliance issues
- Inconsistencies in the road surface have been identified

Conclusion

The main issue is 'rear end shunts', caused by queuing traffic from the motorway junction. Recent works that introduced signals have introduced stop/start movements which have appeared to have a 'shock wave' effect upstream on the A34.

Spacing between junctions and lay-bys impacts congestion as road users will too often change lanes. Lay-by compliance will compromise the safety of road users seeking refuge. The inadequate 'queue ahead' warning signs mean that motorists do not have enough warning of potential queuing.

Suggested improvements

13 - Remove existing signage and replace with Queue Activated Signs

- Remove the current 'Queues likely' sign in the lead up to the M40 junction and replace it with queue activated signs.
- These signs are not required and visibility is good on this section of the A34.
- There is often queuing beyond these signs - it could be used as an informative measure.

14 - Remove statutory speed limit and enforcement

- The proposal is to extend the 50mph limit from the Oxford section already in place to the M40 motorway junction.
- The intention is to better regulate the traffic flow on the approach to the motorway junction and mitigate the acceleration of traffic hitting queues in the peak period.
- A benefit of this speed reduction means that 3 of the 4 lay-bys that are not to standards in this area would then conform, with an anticipated improvement in safety.
- An alternative to this would be to use Variable Mandatory Speed Limit (VMSL) signs to account for the different in peak and off-peak periods.
- This would decrease driver frustration; however the benefit to the lay-bys would be lost with the variable speed limit.
- To supplement this Digital Enforcement Camera System would be recommended.

15 - Lay-by improvements and closures

- It is recommended that the lay-by in advance of the B4027 bridge be upgraded to a longer lay-by so that vehicles can build up speed before re-joining the A34. In addition to this the width of the passing lane should be reviewed and increased to enable a clear path for through vehicles.
- Due to sub-standard spacing between the two other lay-bys in this area, it is recommended that the lay-by after the B4027 bridge be closed.
- By upgrading the existing lay-by following the Middleton exit the sub-standard spacing to the merge slip at Weston-on-the-Green (B430) will be addressed and provide compliant lay-by and parking area for vehicles joining the M40.
- This lay-by is viewed as a key lay-by as the next parking opportunities are:
 - M40 northbound at Cherwell Valley Services - 9km
 - M40 southbound at Oxford Services - 18km
 - A41 towards Bicester - 3km
- The closure of the lay-by after the B4027 bridge should be monitored to assess motorist's ability to seek refuge. As stated above, consideration should be given to turning this into an ERA. If this is not possible then the parking provision should be removed.

16 - Improve junction On-slip layout at service area (pro-active measure)

- Make the length of the joining slip at the Family Farm service area compliant to allow vehicles re-joining the mainline to build-up speed and join the traffic safely.
- Physical carriageway widening will be required, optimising the use of the hard-shoulder.
- Consultation with the relevant stakeholders will be required

3 General route proposals

Educational initiatives

The collision analysis highlighted that driver behaviour is a significant contributing factor in the majority of collisions. Further educational campaigns could be adopted to improve driver behaviour, such as radio campaigns, port campaigns and statistical signage.

Enhanced road markings and intelligent road studs

Three locations have been identified where the use of enhanced road markings, which uses reflective paint to improve wet night visibility, has been recommended. This is a heavy duty and environmentally friendly solution. Intelligent road studs are also recommended, which increase visibility further than conventional 'cat eyes' by using solar energy to power an LED to mark the road layout.

The locations are:

- East Ilsley to Bury Lane Junction
- Chilton to Milton Junction
- Hinksey Hill to Botley Junction

Review HGV parking facilities

Drivers on the A34 rely heavily on lay-by provisions for lorry parking, some of which are earmarked for closure. Parking facilities exist at service areas such as; Sutton Scotney, Tot Hill, Chieveley and Peartree however the existing provisions are insufficient for the volume of HGVs on the A34. Upgrades could be made to the existing formal service areas to alleviate parking on the mainline.

4 Remedial measures

A number of remedial measures were identified that have been sent on to the maintenance team to address. These can be found on pages 151 – 159 of the A34 Safety Review.

5 Further work

Whilst this study has identified potential works to be undertaken, there is no commitment from the Government at this time to take forward any of the above proposals.

This report is to be shared with interested parties so that comments can be received and stakeholder views can be taken into account. Highways England will then issue the full A34 Safety Review to the Department for Transport and the Secretary of State for Transport. Highways England will take no further action unless directed by the Secretary of State to do so.

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