

Introduction

Roadworks are an integral part of how we improve our roads for our customers but we know that they can be a frustration. We are committed to improving the experience of our customers while ensuring that safety is never compromised.

Our customer insight told us customers want fewer restrictions. The National Road User Satisfaction Survey (2015-2016) demonstrated that “customers wanted to see less speed restrictions during roadworks if no road workers are working”.

Transport Focus, in their report ‘Incidents and Roadworks – A road user perspective’ (November 2016) state that:

‘Highways England should set speed limits in roadworks no lower than is required to maintain safety, and should encourage compliance by explaining why a limit is required’.

So we committed to testing the potential for higher speed limits where they could be safely implemented, through a series of trials.

Aim of this report

We employed independent experts to carry out various aspects of these trials, which included:



To carry out a safety risk assessment of the concept and the eventual rollout of how *perceived normal speed* through roadworks can be increased (Mouchel - now known as WSP)



To understand customers' views & behaviour in differing speed limits through roadworks (TRL & Atkins)



To monitor and evaluate the trials (TRL)

The aim of this summary is to highlight the key findings from all of the trials and to explain our next steps.

Summary of work completed to date

We carried out simulator trials using an advanced driving simulator (DigiCar) to understand the likely impact of the alternative speed limits on safety, compare driver behaviour, track eye movements to check drivers weren't distracted by their speedometers, and gather people's first opinions of different speeds.

This was followed by on-road trials which involved monitoring driver behaviour before and after the speed limit change. The aim was to understand what impact the 60mph speed limit had on driver speed, close following behaviour and the number of breakdowns and road traffic collisions. The data was also used to understand the potential impact on road user and road worker safety as a result of the increase in speed limit.


We defined three specific scenarios to test:

- Scenario 1** Implementation of a higher speed limit (55mph or 60mph) on lead-in and exits to/from the works
- Scenario 2** Changing the speed during the operational testing (or 'pre-commissioning') phase of Smart Motorway schemes
- Scenario 3** Changing the speed limit throughout the works during a period when there were no road workers present

Prior to each scenario being trialled, each project prepared a detailed risk assessment. Once this had been agreed individual scenarios were trialled. These were specifically selected in order to reduce risk to road workers, as well as drivers. Road worker safety could not be measured directly, as there weren't any relevant road worker incidents, so proxy measures consisting of incursions and Traffic Management maintenance were used to assess this.

In addition to the quantitative data, feedback from stakeholders was sought at a series of focus groups to determine whether there were any concerns for the future implementation of these scenarios.

Speed Trials at 60mph - Monitoring and evaluation

Monitoring and evaluation		Findings			
<p>On-road trials of 60mph were carried at:</p> <ol style="list-style-type: none"> 1. Trial of Scenario 2 at the M1 junction 32-35a scheme in late 2016 2. Trial of Scenario 3 at the A1 Leeming to Barton scheme during the Christmas embargo period in 2016/17 3. Trial of Scenario 2 at the M5 junction 4a-6 scheme in Spring 2017 	Measure	M1 J34-35A	A1L2B	M5 J4a-6	
	Average Speed	Increased (53mph)	Increased (56mph)	n/a	
	Step up in speed	n/a	Increased (58mph)	increased (58mph)	
	Step down in speed				
	Speed compliance	Not measured	Improved from 57% to 85%	n/a	
	Step up in speed	Not measured	Improved from 43% to 69%	Improved from 46% to 75%	
	Step down in speed				
	Average vehicle headway	No significant change	No significant change	No significant change	
	Close Following				
By cars	Not measured	Not measured	No Change (55%)		
By HGVs	Not measured	Not measured	Decreased from 50% to 35%		
Number of incidents					
Breakdowns	No noticeable change	No noticeable change	No noticeable change		
Road traffic collisions in trial	Four (two in baseline) ¹	None (none in baseline) ¹	None (one in baseline) ¹		
¹ There was no indication that the RTCs were due to the increased speed limit					
Journey Time Reduction					
Step up in speed	34 seconds per driver	30 seconds per driver	Not measured		
Step down in speed	Not measured	40 seconds per driver	30-40 seconds per driver		
Safety		Findings			
As safety of road workers and our customers is paramount, risk assessments were carried out by each project before the trials. Where necessary, mitigations were put in place to reduce risk to road users and road workers. Comprehensive monitoring took place on all trials.	There was no indication that a 60mph speed limit through roadworks had a negative impact on the safety of road users, given the incident and breakdown data.	The increased speed limit was initially perceived as inherently less safe by some road workers, with concerns raised over the potentially increased severity of incidents with vehicles travelling faster through the works.	Existing apprehensions by road workers changed as the benefits of reduced close-following by HGVs were seen on-road.	Road workers reported other benefits such as improved response times to incidents and improved traffic flows.	
Customer and stakeholder engagement		Findings			
In addition to monitoring safety, surveys were carried out with road users to understand the impact of the 60mph speed limit on customer satisfaction. These surveys were carried out at motorway service areas close to the trial and / or through surveys with local business parks to target commuters travelling through the scheme.	Results suggested that changes in speed limit are not the only factors which contribute towards satisfaction levels. Road users cited other factors such as the length of the works, visibility of road workers, journey times, road closures, narrow lanes and safety aspects associated with incidents.	Road workers suggested that more communication was needed with road users. Social media was suggested as the best platform for these communications.	Road users perceived the 60mph speed limit positively, both in terms of journey time and overall satisfaction.	Road users responded positively to a change in speed limit.	
Engagement with key stakeholders (e.g. project representatives, police, traffic officers and free recovery operatives) was also carried out to seek feedback on the trial findings, and to obtain views and perceptions on the 60mph speed limit in order to understand the ways in which it impacted on worker safety and operations.		We carried out a survey with our Customer Panellists on speed restrictions through roadworks in September 2016 which resulted in 471 responses to the survey. The panellists were generally in support of an increase in speed limit through roadworks, provided it was safe to do so. A clear majority (79%) were in support of a variable change to how roadworks are managed on the network, with their preference being that "speed limits should be tailored according to the circumstances of individual roadworks".			

Simulator reports

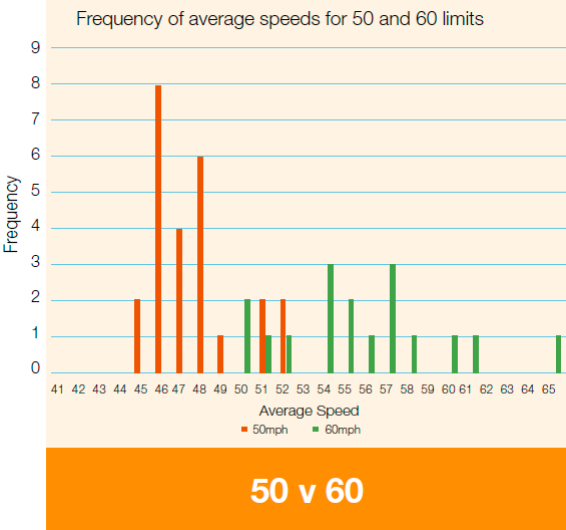
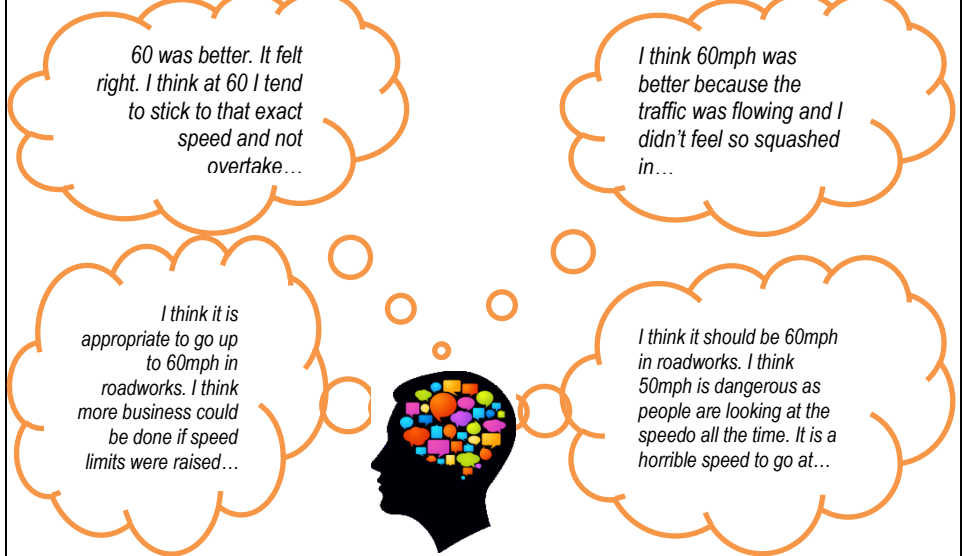
C Wallbank, R Robbins, A Tailor & S Chowdhury. Monitoring and evaluation of the 55/60mph pilots Interim report for the simulator trial of 55 and 60mph through roadworks. CLIENT PROJECT REPORT CPR2384.
 C Wallbank, N Baife & S Chowdhury. Monitoring and evaluation of the 55/60mph pilots Interim report for the simulator trial of 55 and 60mph through roadworks - A follow-on study. CLIENT PROJECT REPORT CPR2416

Monitoring and evaluations reports

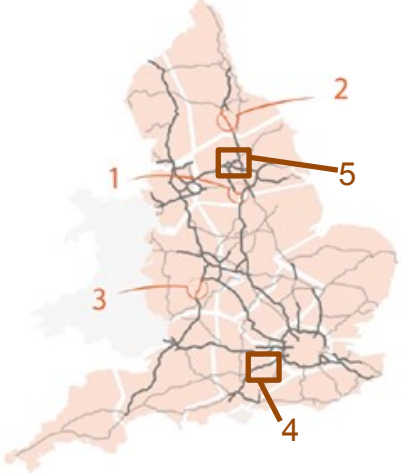
C Wallbank, M Palmer, J Hammond & R Myers. Monitoring and evaluation of the 55/60mph pilots Interim report for the on-road trials of 60mph on the M1 J32-35a scheme. CLIENT PROJECT REPORT CPR2383.
 C Wallbank, J Hammond, R Myers & S Chowdhury. Monitoring and evaluation of the 55/60mph pilots Interim report for the on-road trials of 60mph on the A1 Leeming to Barton scheme. CLIENT PROJECT REPORT CPR2382.
 C Wallbank, S Chowdhury, R Fleetwood & R Myers. Monitoring and evaluation of the 55/60mph pilots Interim report for the on-road trials of 60mph on the M5 Junction 4a to 6 scheme. CLIENT PROJECT REPORT CPR2417.

Stakeholder and engagement reports

A Tailor. Monitoring and evaluation of the 55/60mph pilots Results from stakeholder engagement following the on-road trial of 60mph on the M1 J32-35a scheme. CLIENT PROJECT REPORT CPR2418.
 A Tailor. Monitoring and evaluation of the 55/60mph pilots Results from stakeholder engagement following the on-road trial of 60mph at the A1 Leeming to Barton scheme. CLIENT PROJECT REPORT CPR2414.
 A Tailor. Monitoring and evaluation of the 55/60mph pilots Results from stakeholder engagement following the on-road trial of 60mph on the M5 J4a-6 scheme. CLIENT PROJECT REPORT CPR2449.

Innovative use of biometrics	Findings		What was found
<p>On the M5 J4a-6 trial, we innovated to get an even better understanding of our customers' experience while travelling at 60mph by obtaining biometric data.</p> <ul style="list-style-type: none"> 36 participants were provided with dash cams and watches that incorporated heart rate monitors and GPS trackers, to capture visual and physiological responses through each journey; however data from 29 participants was classified as valid¹. All participants were required to complete a minimum of two journeys, with each journey encompassing the varying speed limits. This provided comparable data for 50mph and 60mph speeds. Post journey activities included focus group sessions, replay of dash cam footage, individual interviews and postcard feedback. Analysis within and across the trial was undertaken, highlighting changes in heart rate and views/feedback across the customer segments. <p>¹ anomalies in data consisted of incomplete or incorrect journey taken and missing data from the devices.</p>	Driver Segment	M5 J4a-6	<ul style="list-style-type: none"> The majority of participants indicated they preferred the higher of the speed limits. Notable reasons included the ability to safely pass HGVs at these higher speed limits. 60% of participants recorded a decrease in average heart rate in the 60mph trial zone. This decrease was consistent across all segments, with the exception of the Respectful segment. Speedy and Steady segments had the highest proportion of participants experiencing a decrease in average heart rate. The findings indicate that heart rate (and therefore potentially stress) does not increase with an increased speed limit. Perceptions were that vehicles were more spaced out, there was an improved flow of traffic and it was easier to maintain the speed limit. Analysis of the qualitative data reinforced the view that HGVs are a significant contributing factor for driver experience on motorways, especially within roadworks, as fear was heightened while travelling through roadworks. The size, number, speed of HGVs and the inability to overtake HGVs was problematic.
	Nervous <i>(Representing 31% of the customer base; typically aged 40+ and have been driving for some time).</i>	Heart rate decreased by 1.40 bpm (1.97%)	
	Respectful <i>(Representing 22% of the customer base; experienced drivers, highly qualified and driving professionally).</i>	Heart rate increased by 3.50 bpm (4.65%)	
	Steady <i>(Representing 25% of the customer base; who are confident drivers and are happy, relaxed and confident).</i>	Heart rate decreased by 2.90 bpm (3.48%)	
	Superior <i>(Representing 9% of the customer base; typically young have limited driving experience).</i>	Heart rate decreased by 0.40 bpm (0.49%)	
Speedy <i>(Representing 13% of the customer base; typically been driving for over 20yrs and demand a high level of driving ability from others).</i>	Heart rate decreased by 4.50 bpm (6.68%)		
Average Speed	General perception of roadworks		Participants comments for preference for 60mph
<ul style="list-style-type: none"> At 50mph speed profile was tightly clustered between 45mph and 52mph (red bars). At 60mph the speed profile was more widely spread out between 50mph and 61mph (green bars).  <p style="text-align: center;">50 v 60</p>	<p>Focus group discussions sought views on roadworks and is summarised below:</p> <div style="display: flex; flex-direction: column; gap: 10px;"> <div style="background-color: #0070c0; color: white; padding: 5px; border-radius: 10px; display: flex; align-items: center;"> <div style="background-color: white; color: #0070c0; border-radius: 50%; padding: 5px; margin-right: 10px;">Strategic response to HE</div> <div style="display: flex; gap: 10px;"> Question HE efficiency Lack of visible workers Lack of related information </div> </div> <div style="background-color: #00a68a; color: white; padding: 5px; border-radius: 10px; display: flex; align-items: center;"> <div style="background-color: white; color: #00a68a; border-radius: 50%; padding: 5px; margin-right: 10px;">Specific response to roadworks</div> <div style="display: flex; gap: 10px;"> Reduced speeds Obstructions (cones) Road changes Narrow lanes Unclear signage Increased risk of problems </div> </div> <div style="background-color: #70ad47; color: white; padding: 5px; border-radius: 10px; display: flex; align-items: center;"> <div style="background-color: white; color: #70ad47; border-radius: 50%; padding: 5px; margin-right: 10px;">Impact on driving</div> <div style="display: flex; gap: 10px;"> I need to be more alert They can make me late They can make me anxious I feel less safe </div> </div> </div>		 <p style="font-size: small;">60 was better. It felt right. I think at 60 I tend to stick to that exact speed and not overtake...</p> <p style="font-size: small;">I think 60mph was better because the traffic was flowing and I didn't feel so squashed in...</p> <p style="font-size: small;">I think it is appropriate to go up to 60mph in roadworks. I think more business could be done if speed limits were raised...</p> <p style="font-size: small;">I think it should be 60mph in roadworks. I think 50mph is dangerous as people are looking at the speedo all the time. It is a horrible speed to go at...</p>

Safety risk assessment	Findings					
<p>Mouchel were tasked with producing a programme level risk assessment with the purpose of independently assessing the safety risk for 60mph within roadworks.</p> <p>The aim of the risk assessment was to answer the following questions:</p> <ol style="list-style-type: none"> 1. Was it acceptably safe to use a 60mph speed limit within the trial scenarios? 2. Is it acceptably safe to roll out a 60mph speed limit within those scenarios? 3. What conclusions can be drawn about the safety of using a 60mph speed limit more widely within roadworks? <p>The safety risk assessment is based on a semi-quantitative assessment of the risk to road users.</p> <p>The table opposite provides the summary of the quantitative assessment of the impact of 60mph speed limit on safety risk and goes towards answering the above questions.</p>	<p>Findings from the trials suggest that the following benefits are likely to be achieved with rollout of the 60mph speed limit:</p> <p>Improvement in customer satisfaction; Improved Heavy Goods Vehicle (HGV) driver behaviour; Journey time benefits; Improved speed compliance.</p>	<p>It was acceptably safe to trial the 60mph speed limit within these scenarios defined.</p>	<p>The trials demonstrated that a 60mph speed limit can be used without significantly increasing the risk to any population.</p>	<p>A site specific safety risk assessment will always be required to confirm that the proposed Temporary Traffic Management (TTM) arrangements and speed restrictions are appropriate for that site.</p>		
	<p>Based on the findings of the trials, it is acceptably safe to roll out a 60mph speed limit within these scenarios whilst maintaining the perception of enforcement.</p>	<p>Risk to the work force and the customer was minimised by only increasing the speed limit in scenarios where there was no significant construction activity taking place in the closed lanes.</p>				
	Population	Scenario 1a – step up in speed	Scenario 1b – step down in speed	Scenario 2a – technology commissioning TTM in place	Scenario 2b – technology commissioning no TTM	Scenario 3 – weekends & public holidays
	Driver	Acceptable	Acceptable subject to suitable signing solutions	Acceptable	Acceptable	Acceptable
	Emergency services	Acceptable	Acceptable subject to suitable signing solutions	Acceptable	Acceptable	Acceptable
	Construction supplier	Acceptable	Acceptable subject to suitable signing solutions	Acceptable	Acceptable	Acceptable
	TOS	Acceptable	Acceptable subject to suitable signing solutions	Acceptable	Acceptable	Acceptable
	Free recovery service	Site specific	Acceptable subject to suitable signing solutions	Site specific	Site specific	Site specific

Monitoring and evaluation for the 55mph trials		Findings		
<p>On-road trials of 55mph were carried at:</p> <p>4. Trial of Scenario 2 at the M3 J3-4a scheme commenced on the 23rd June until the 29th June 2017.</p> <p>5. Trial of Scenario 2 at the M1 Jct 45 improvement scheme commenced on the 30th November until 12th December 2017.</p> 	Measure	M3 J3-4a	M1 Jct 45	
	Average Speed			
	Step up in speed	Increased (53mph)	Increased (53mph)	
	Step down in speed	n/a	n/a	
	Speed compliance			
	Step up in speed	Improved from 56% to 73%	Improved from 79% to 85% (NB) & from 51% to 70% (SB)	
	Step down in speed	Not measured	Not measured	
	Average vehicle headway	No significant change	Not measured	
	Close Following			
	By cars	No noticeable change	Not measured	
By HGVs	No noticeable change	Not measured		
Number of incidents				
Breakdowns	No noticeable change	No noticeable change		
Road traffic collisions in trial	Two (one in baseline) ¹	Three (two in baseline) ¹		
¹ There was no indication that the RTCs were due to the increased speed limit				
Journey Time Reduction				
Step up in speed	20 seconds per driver	6 seconds per driver (NB)	4 seconds per driver (SB)	
Step down in speed	Not measured			
Safety	Findings			
As safety of road workers and our customers is paramount, risk assessments were carried out by each project before the trials. Where necessary, mitigations were put in place to reduce risk to road users and road workers. Comprehensive monitoring took place on all trials.	There was no indication that a 55mph speed limit through roadworks had a negative impact on the safety of road users, given the incident and breakdown data – CCTV data suggested that there was not change in collisions compared with the period before the trial.	The increased speed limit was initially perceived as inherently less safe by some road workers, with concerns raised over works vehicles re-joining live traffic.	No safety concerns were raised in relation to the higher speed limit or reduced working space behind the safety barriers.	
Customer and stakeholder engagement	Findings			
In addition to monitoring safety, surveys were carried out with road users to understand the impact of the 55mph speed limit on customer satisfaction. This survey was hosted online and at MSA with regular commuters through the scheme (recruited from local business parks).	Results suggested that changes in speed limit are not the only factors which contribute towards satisfaction levels. Road users cited other factors such as the length of the works, visibility of road workers, journey times, road closures, narrow lanes and safety aspects associated with incidents.	Stakeholders did not feel sufficiently informed about the trial in advance. Respondents recommended informing stakeholders earlier so that they could plan their workload.	Stakeholders did not make any substantial changes to the way they worked during the trial.	
Engagement with key stakeholders (e.g. project representatives, police, traffic officers and free recovery operatives) was also carried out to seek feedback on the trial findings, and to obtain views and perceptions on the 55mph speed limit in order to understand the ways in which it impacted on worker safety and operations.		Customer feedback indicated 'mixed' feelings about use of 55mph; some drivers felt further change was needed to improve satisfaction.		

Simulator reports

C Wallbank, R Robbins, A Taylor & S Chowdhury. Monitoring and evaluation of the 55/60mph pilots Interim report for the simulator trial of 55 and 60mph through roadworks. CLIENT PROJECT REPORT CPR2384.
 C Wallbank, N Baife & S Chowdhury. Monitoring and evaluation of the 55/60mph pilots Interim report for the simulator trial of 55 and 60mph through roadworks - A follow-on study. CLIENT PROJECT REPORT CPR2416

Monitoring and evaluations reports

C Wallbank, J Hammond, R Myers, F Ognissanto & L Durrell. Monitoring and evaluation of the 55/60mph pilots Interim report for the on-road trials of 55mph on the M3 Junction 2 to 4a scheme. CLIENT PROJECT REPORT CPR2385.
 N Nandhra. Monitoring and evaluation of the 55/60mph pilots Interim report for the on-road trials of 55mph on the M1 J45 scheme.

Stakeholder and engagement reports

A Taylor and J Hopkin. Monitoring and evaluation of the 55/60mph pilots Results from stakeholder engagement following the on-road trial of 55mph at the M3 J2-4a scheme. CLIENT PROJECT REPORT CPR2490.
 L Durrell, C Wallbank, R Ramnath, & E Delmonte. Monitoring and evaluation of the 55/60mph pilots Interim report for the on-road trials of 55mph on the M1 J45 scheme. CLIENT PROJECT REPORT CPR2534.

Innovative use of biometrics	Findings		What was found																
<p>On the M3 J3-4a trial, we innovated to get an even better understanding of our customers' experience while travelling at 55mph by obtaining biometric data.</p> <ul style="list-style-type: none"> 36 participants were provided with dash cams and watches that incorporated heart rate monitors and GPS trackers, to capture visual and physiological responses through each journey; however data from 16 participants was classified as valid¹. All participants were required to complete a minimum of two journeys, with each journey encompassing the varying speed limits. This provided comparable data for 50mph and 55mph speeds. Post journey activities included focus group sessions, replay of dash cam footage, individual interviews and postcard feedback. Analysis within and across the trial was undertaken, highlighting changes in heart rate and views/feedback across the customer segments. <p>¹ anomalies in data consisted of incomplete or incorrect journey taken and missing data from the devices.</p>	Driver Segment	M5 J4a-6	<ul style="list-style-type: none"> The majority of participants indicated they preferred the higher of the speed limits. 56% of participants recorded a decrease in average heart rate in the 55mph trial zone. Participants within the Speedy and Steady segments experiencing a decrease in heart rate, whereas participants in the Nervous, Respectful and Superior segments experienced an increase in average heart rates. The findings indicate that heart rate (and therefore potentially stress) does not increase with an increased speed limit. General perceptions was that journeys felt smoother but a 5mph increase in speed was not enough to make a difference in the drivers' experience. Analysis of the qualitative data reinforced the view that HGVs are a significant contributing factor for driver experience on motorways, especially within roadworks, as fear was heightened while travelling through roadworks. The size, number, speed of HGVs and the inability to overtake HGVs was problematic. 																
	Nervous <i>(Representing 31% of the customer base; typically aged 40+ and have been driving for some time).</i>	Heart rate increased by 0.10 bpm (0.12%)																	
	Respectful <i>(Representing 22% of the customer base; experienced drivers, highly qualified and driving professionally).</i>	Heart rate increased by 6.50 bpm (9.88%)																	
	Steady <i>(Representing 25% of the customer base; who are confident drivers and are happy, relaxed and confident).</i>	Heart rate decreased by 5.40 bpm (7.61%)																	
	Superior <i>(Representing 9% of the customer base; typically young have limited driving experience).</i>	Heart rate increased by 8.70 bpm (11.21%)																	
Speedy <i>(Representing 13% of the customer base; typically been driving for over 20yrs and demand a high level of driving ability from others).</i>	Heart rate decreased by 4.0 bpm (5.78%)																		
Average speed	General perception of roadworks		Participants comments for preference for 55mph																
<ul style="list-style-type: none"> At 50mph speed profile was tightly clustered between 43mph and 51mph (red bars). At 55mph speed profile was similar and tightly clustered between 43mph and 51mph, hence no noticeable (green bars). <p>50 v 55</p>	<p>Focus group discussions sought views on roadworks and is summarised below:</p> <table border="1"> <tr> <td>Strategic response to HE</td> <td>Question HE efficiency</td> <td>Lack of visible workers</td> <td>Lack of related information</td> </tr> <tr> <td>Specific response to roadworks</td> <td>Reduced speeds</td> <td>Obstructions (cones)</td> <td>Road changes</td> <td>Narrow lanes</td> <td>Unclear signage</td> <td>Increased risk of problems</td> </tr> <tr> <td>Impact on driving</td> <td>I need to be more alert</td> <td>They can make me late</td> <td>They can make me anxious</td> <td>I feel less safe</td> </tr> </table>		Strategic response to HE	Question HE efficiency	Lack of visible workers	Lack of related information	Specific response to roadworks	Reduced speeds	Obstructions (cones)	Road changes	Narrow lanes	Unclear signage	Increased risk of problems	Impact on driving	I need to be more alert	They can make me late	They can make me anxious	I feel less safe	
Strategic response to HE	Question HE efficiency	Lack of visible workers	Lack of related information																
Specific response to roadworks	Reduced speeds	Obstructions (cones)	Road changes	Narrow lanes	Unclear signage	Increased risk of problems													
Impact on driving	I need to be more alert	They can make me late	They can make me anxious	I feel less safe															

Safety risk assessment	Findings					
<p>WSP (Mouchel) were tasked with producing a programme level risk assessment with the purpose of independently assessing the safety risk for 55mph within roadworks.</p> <p>The aim of the risk assessment was to answer the following questions:</p> <ol style="list-style-type: none"> 1. Was it acceptably safe to use a 55mph speed limit within the trial scenarios? 2. Is it acceptably safe to roll out a 55mph speed limit within those scenarios? 3. What conclusions can be drawn about the safety of using a 55mph speed limit more widely within roadworks? <p>The safety risk assessment is based on a semi-quantitative assessment of the risk to road users.</p> <p>The table opposite provides the summary of the quantitative assessment of the impact of 55mph speed limit on safety risk and goes towards answering the above questions.</p>	<p>Findings from the trials suggest that only some of the benefits relating to customer satisfaction and journey time benefits would be realised. The increase in speed did not reduce close following or impact on the amount of overtaking and lane changing, compliance in speed was seen; however this may be as a result of not noticing the increase in speed.</p>	<p>It was acceptably safe to trial the 55mph speed limit within the scenario defined.</p> <p>Based on the findings of the trials, it is acceptably safe to roll out a 55mph speed limit within this scenario whilst maintaining the perception of enforcement.</p>	<p>The trials demonstrated that a 55mph speed limit can be used without significantly increasing the risk to any population.</p> <p>Risk to the work force and the customer was minimised by only increasing the speed limit in scenarios where there was no significant construction activity taking place in the closed lanes.</p>	<p>A site specific safety risk assessment will always be required to confirm that the proposed Temporary Traffic Management (TTM) arrangements and speed restrictions are appropriate for that site.</p>		
	Population	Scenario 1a – step up in speed	Scenario 1b – step down in speed	Scenario 2a – technology commissioning TTM in place	Scenario 2b – technology commissioning no TTM	Scenario 3 – weekends & public holidays
	Driver			Acceptable	Acceptable	
	Emergency services			Acceptable	Acceptable	
	Construction supplier			Acceptable	Acceptable	
	TOS			Acceptable	Acceptable	
	Free recovery service			Site specific	Site specific	

Speed Trials – Comparison and recommendations

		60mph	55mph
Monitoring and Evaluation	Average Speed	Improved by an average of 5mph [step up] / 4mph [step down]	Improved by an average of 3mph [step up]
	Speed compliance	Improved by 28% [step up and step down] / easy to enforce	Improved by 14% [step up] / currently unable to enforce
	Headway	No significant change	No significant change
	Close following (HGVs only)	Decreased by 15%	No noticeable change
	Incidents	No noticeable change in breakdowns and collisions recorded	No noticeable change in breakdowns and collisions recorded
	JTR	Improved by 32 seconds [step up] / 37 seconds [step down]	Improved by 20 seconds [step up]
Innovative use of biometrics		A 60% reduction in heart rate recorded was in the Nervous, Steady, Superior and Speedy segments, with a 4.64% increase in the Respectful segment	A 56% reduction in heart rate recorded was in the Speedy and Steady segments with the greatest increase in heart rates recorded in the Nervous, Respectful and Superior segments (0.12% / 9.88% and 11.21%)
Safety risk assessment		There was no indication that a 60mph speed limit through roadworks had a negative impact on the safety of road users, given the incident and breakdown data.	There was no indication that a 55mph speed limit through roadworks had a negative impact on the safety of road users, given the incident and breakdown data
Customer and stakeholder satisfaction		Road users perceived the 60mph speed limit positively, and road user satisfaction was improved	Road users perceived the 55mph speed limit positively, with several commenting that it was better than 50mph. However, some people thought that an increase of 5mph was not sufficient to benefit them or to make a noticeable difference, suggesting that the speed limit should be 60mph or higher

Recommendations	
<p>Following the speed trials, it is recommended that an increase of 60mph is adopted</p>	<ul style="list-style-type: none"> ▪ Just as safe, there was no indication that an increase in speed to 60mph has a negative impact on safety ▪ Better speed compliance at 60mph when compared to compliance at the perceived normal speed of 50mph ▪ Better enforcement, as 60mph is a commonly recognised speed limit, enforcement can be easily maintained. ▪ Reduction in close following, thus providing a better experience for the road user ▪ Improvements in journey time ▪ Improvements in road user satisfaction ▪ Improved HGV driver behaviour
<p>Our customers' preference</p>	
<div style="display: flex; flex-wrap: wrap; justify-content: space-between;"> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>60mph was better. It felt about right. I think at 60mph I tend to stick to that exact amount. There is no reason to overtake.</p> <p style="text-align: right; font-size: small;"><i>Respectful</i></p> </div> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>I think 60mph was better because the traffic was flowing and I didn't feel so squashed in.</p> <p style="text-align: right; font-size: small;"><i>Nervous</i></p> </div> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>The speed limit went up to 60mph and the traffic flowed better. I still stuck to it, but I wasn't struggling to keep to it. I preferred it a lot.</p> <p style="text-align: right; font-size: small;"><i>Superior</i></p> </div> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>50mph was irritating. I did it early morning to cricket training on a Sunday and it was still getting bunched up and still felt trapped in. There was no room for movement.</p> <p style="text-align: right; font-size: small;"><i>Speedy</i></p> </div> </div> <div style="display: flex; flex-wrap: wrap; justify-content: space-between; margin-top: 10px;"> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>I think it is appropriate to go up to 60mph in roadworks. I think more business would be done if speed limits were raised.</p> <p style="text-align: right; font-size: small;"><i>Respectful</i></p> </div> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>I think it should be 60mph in roadworks. I think 50mph is dangerous as people are looking at the speedo all the time. It is just a horrible speed to go at.</p> <p style="text-align: right; font-size: small;"><i>Nervous</i></p> </div> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>It was a lot safer at 60mph because there was room for other people. It felt a lot freer and made me more content. I felt secure safe and a little bit happier.</p> <p style="text-align: right; font-size: small;"><i>Superior</i></p> </div> <div style="width: 25%; padding: 5px; border: 1px solid #ccc; border-radius: 5px; background-color: #e6f2ff;"> <p>I think at 50mph everyone is very close to each other and you can't relax as much. At 60 people were allowed more space and it flowed better.</p> <p style="text-align: right; font-size: small;"><i>Respectful</i></p> </div> </div>	

Findings	
The results from the surveys of drivers during each trial showed that drivers perceived the 60mph speed limit positively, both in terms of overall satisfaction and perceptions of journey time. TIRL	Participants perceived the 60mph limit felt safer in terms of less tailgating, lane changing and braking. mouchel
Other opportunities for 60mph speed limits should be identified; the limited application of the increased speed limit during these trials (in specific scenarios where there was minimal on-road work) could be expanded to other phases of construction. TIRL	Drivers' perceptions were that vehicles were more spread-out, with better flow of traffic and it was easier to maintain the speed limit. ATKINS
Speed compliance improved by an average of 64% from baseline measures. TIRL	Participants perceived the 60mph limit to be a more natural speed, and traffic in general felt more spread out and fluid. mouchel
Majority of participants indicated they preferred the higher of the speed limits. Notable reasons included the ability to safely pass HGV's at these higher speed limits. ATKINS	Majority of participants indicated they preferred the higher of the speed limits as this provided the ability to safely pass HGV's at a higher speed. ATKINS
Analysis of the qualitative data reinforced the view that HGVs are a significant contributing factor for driver experience on motorways, especially within roadworks, issues relating to size, number and speed of HGVs, the inability to overtake is problematic and means people can feel squeezed between two lorries and Car drivers perceive that HGVs are going faster than 50mph. ATKINS	HGVs are a significant factor in reducing the drivers experience on motorways, especially within roadworks. Issues relating to size, number and speed of HGVs, the inability to overtake is problematic and means people can feel squeezed between two lorries. This gives the car drivers the perception that HGVs are going faster. ATKINS
It is acceptably safe to roll out a 60mph speed limit within these scenarios. mouchel	It is safe to have a higher speed limit of 60mph within these scenarios. mouchel
The trials demonstrated that a 60mph speed limit can be used without significantly increasing the risk to any population, when used in scenarios where there was no significant construction activity taking place in the closed lanes. mouchel	The trials demonstrated that a 60mph speed limit can be used without increasing the risk to road workers, when used in these scenarios and where there was no significant construction activity taking place in the closed lanes. mouchel
The findings from the trials suggest that customer satisfaction, improved HGV driver behaviour, improvements to journey time and speed compliance are likely to be achieved with rollout of the 60mph speed limit. mouchel	The findings from the trials indicate that customer satisfaction, improved whilst travelling at 60mph in terms of journey time, speed compliance and HGV driver behaviour mouchel

Recommendations	Our response
TIRL The signing configuration used around step downs in the speed limit should be investigated further, as there was evidence that not all road users noticed the step from 60mph to 50mph. Identifying a signing configuration that maximises road user compliance with minimal impact on road worker safety is imperative to the use of speed limit changes within roadworks.	Each project which implements 60mph will consider the appropriate signing strategy for its local conditions. We are considering whether it is also appropriate to create a common set of guidance.
mouchel Steps down in speed must be supported by an appropriate signing strategy to alert drivers to the reduced speed limit.	
TIRL Communication with road workers around the intended application of the increased speed limit and the importance of their safety is necessary if the implementation of 60mph at other schemes is to be successful.	We've been communicating the results with our supply chain and will continue to do so. Highways UK is part of our communication plan.
TIRL Safety needs to be central to all communications with road users. Key points around the importance of speed compliance, how speed restrictions have a positive impact on journey time and the role road workers play in making the roads a safer and better place for motorists should all be communicated.	
TIRL Increased communication with drivers about changes within the works, especially providing reasons behind the changes, should be considered for all future Major Project Schemes.	
TIRL Schemes should do more at a local level to improve the perception of roadworks, perhaps providing more information to drivers about timescales, long term benefits and progress.	We have plans to continue to better communicate the reasons and benefits of roadworks, and our safety campaigns programme includes roadworks.
TIRL Planning for higher speed limits needs to be done at the design stage of a scheme as there are several specific considerations (outlined within the report) that make it difficult to retrospectively apply increased speed limits to existing Major Projects.	
TIRL Roadworks standards and guidance needs to be updated to cover 60mph.	We will be updating guidance for commissioning technology, so that projects can plan for it from the start.
TIRL A 'Planning for 60mph' toolkit should be developed, to drive the expectation that speed limits other than the blanket 50mph are implemented where practicable.	
TIRL The Temporary Traffic Regulation Order (TTRO) process needs to be overhauled to allow more flexibility in the enforceable speed limit.	We are considering whether there is additional guidance that merits the creation of a 60mph toolkit, in addition to our planned updates about commissioning technology.
TIRL In addition to speed limits, steps should be taken to improve other aspects of the works to improve customer satisfaction. Dynamic roadworks, which are shorter, minimise disruption and are delivered quicker, would help to achieve this.	This recommendation is outside of scope of this specific project.
TIRL	The speed trials are part of a wide programme of initiatives to improve roadworks experience which we are taking forward.