national highways

# A1 Coal House to Metrocentre

## Five-year post-opening project evaluation

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# Foreword

National Highways is the government-owned company that operates, maintains, and improves England's motorways and major A roads. Our roads help our customers get to their destination safely – and in the time they expect to. Safety is our top priority, and we are committed to reducing the number of road users killed or seriously injured on the strategic road network by 50% (from the 2005-2009 baseline) by the end of 2025.

As Chief Customer and Strategy Officer, I want to know that developments on our network are meeting their objectives and are putting the needs of drivers first. Post-Opening Project Evaluations (POPEs) are a vital part of that assessment. POPEs are undertaken for all our major projects to understand how traffic changes, due to a project being in place, the environmental and safety impacts and how a project supports the economy.

We work to a five-year funding cycle, a radical new approach to road investment first introduced in 2015 which saw the government committing £15.2 billion in the period from 2015 to 2021. The A1 Coal House to Metrocentre improvements were officially opened in this period in August 2016.

Before the project was completed, this stretch of the A1 experienced significant congestion, frequent accidents, with the rate of personal injury collisions surpassing the national average in 2014. The evaluation has shown that journey times, reliability and safety have all improved.

Our observations of the environmental impact have highlighted improvements through mitigation planting. Although driver views and the townscape remain worse than expected at the Gateshead Quays junction, once this new planting is fully established, this should allow the project to meet its landscape, cultural heritage, and biodiversity objectives.

The economic benefits remain challenging to quantify due to limitations in the traffic flow data that was available. However, our evaluation confirms this investment is delivering benefits for road users, with improvements in journey times, reliability, and safety.

**Elliot Shaw**
Chief Customer and Strategy Officer
August 2024

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# 1. Executive summary

The A1 Coal House to Metrocentre improvements were completed in August 2016. It implemented a range of measures to increase capacity, reduce congestion and improve safety along a 3.9-mile stretch of the A1 Gateshead to Newcastle Western Bypass.

Before the project was built, two-way average weekly traffic flows on the Lobley Hill to Dunston section of the bypass was over double its theoretical design capacity.[1] This caused stationary or slow-moving traffic in and out of Gateshead and Newcastle at both peak and off-peak times. The congestion was compounded by the road layout, the close spacing of the interchanges and the interaction between strategic, regional, and local traffic. The levels of congestion led to a high number of personal injury collisions, primarily caused by shunts due to slow-moving traffic or by traffic making late lane changes. In 2014, the personal injury collision rate on the route was double the national average.

This report was originally planned to present the evaluation findings of the project in 2021 using five years after opening data. However, the traffic and safety analysis would have been affected by the impact of Covid and the construction of two adjacent road projects on travel patterns and so was brought forward to 2019 to avoid these effects. Analysis for traffic and safety therefore used three years of post-opening data. The environmental analysis was unaffected by Covid or adjacent projects and so was undertaken at five years after as planned.

Overall, our analysis has shown that the project had delivered benefits. The project added capacity along the route including the creation of new parallel link roads for local traffic between the Lobley Hill and Gateshead Quays interchanges. Journey times and journey time reliability had improved along the route and there had been a reduction in the number of personal injury collisions on both the project extent and the surrounding network. We also observed a reduction in the severity of casualties.

It was not possible to evaluate impacts on air quality, noise, or greenhouse gases due to insufficient traffic data. However, our evaluation did identify that there had been improvement in the establishment of the mitigation planting since the one year after evaluation. New tree planting and grasslands were in a much better condition. We considered that as long as maintenance continues landscape, cultural heritage, and biodiversity outcomes should be achieved.

At one year after our evaluation highlighted concerns regarding the visual impacts and increased urbanisation caused by the use of shotcrete at Gateshead Quays. Our five-years after evaluation confirmed that an attempt had been made to soften the impact with new planting but that it remained unlikely that the impacts would reduce noticeably by the design year. Impacts on townscape and journey quality (driver views) remained worse than expected.

We were unable to quantify the economic benefits of the project due to limitations caused by the small number of active traffic counters available. However, our analysis confirmed that improvements to journey times, journey time reliability and safety had all delivered benefits to road users.

[1] A1 Lobley Hill to Dunston Improvement (incorporating Metrocentre to Coal House extensions) Stage 5 Business Case (Highways England, March 2014).

# 2. Introduction

## What was the project and what was it designed to achieve?

The A1 Coal House to Metrocentre improvements were completed in August 2016. The project replaced the earlier A1 Lobley Hill to Dunston project which was smaller in scope. It implemented a range of measures to increase capacity, reduce congestion and improve safety along a four-mile stretch of the A1 Gateshead to Newcastle Western Bypass.

In the years before the project's implementation, congestion had increased on the bypass due to economic regeneration. Very high volumes of traffic and a mixture of local, regional, and strategic movements were observed. In 2011, average weekly traffic flows on the Lobley Hill to Dunston section exceeded 100,000 vehicles – over double its theoretical design capacity. This resulted in stationary or slow-moving traffic in and out of Gateshead and Newcastle daily, at both peak and off-peak times. This section was the third most congested link on the national trunk road network and the most congested regional trunk road link in terms of delay. It resulted in long delays and slower journey times. In 2014, the collision rate on the route was double the national average. Efficient operation of the A1 was deemed a key priority for the future prosperity of the region.[2]

In 2009, the Chancellor of the Exchequer announced a commitment to improve the Lobley Hill to Dunston section of the A1. However, in 2010 the project was deferred pending the results of the Tyne & Wear Delivering a Sustainable Transport System (DaSTS) study. Also, in 2010, a Local Network Management Scheme to ease congestion was implemented on the northbound carriageway between the Dunston and Metrocentre interchanges. It converted around a third of a mile of carriageway from two lanes to three narrow lanes.

In 2012, project development was reactivated as a 'single option scheme' with a fixed route within the highway boundary to allow an accelerated delivery programme. It was not expected to require an Environmental Statement. During the development phase, opportunities were identified to extend the project further, to Metrocentre interchange in the north and to Coal House interchange in the south. The extensions were made possible by savings from the reduced provision necessary for the lower 50mph speed limit introduced in late 2010, and from the accommodation of other changes and improvements to the network in the period after deferral, for example, the LNMS.[3]

The project's key measures were:

- widening of the northbound carriageway within the highway boundary from two to three lanes between the Coal House and Gateshead Quays interchanges with no hard shoulder provision.
- widening of the southbound carriageway within the highway boundary from two to three lanes between the Metrocentre and Coal House interchanges with no hard shoulder provision.

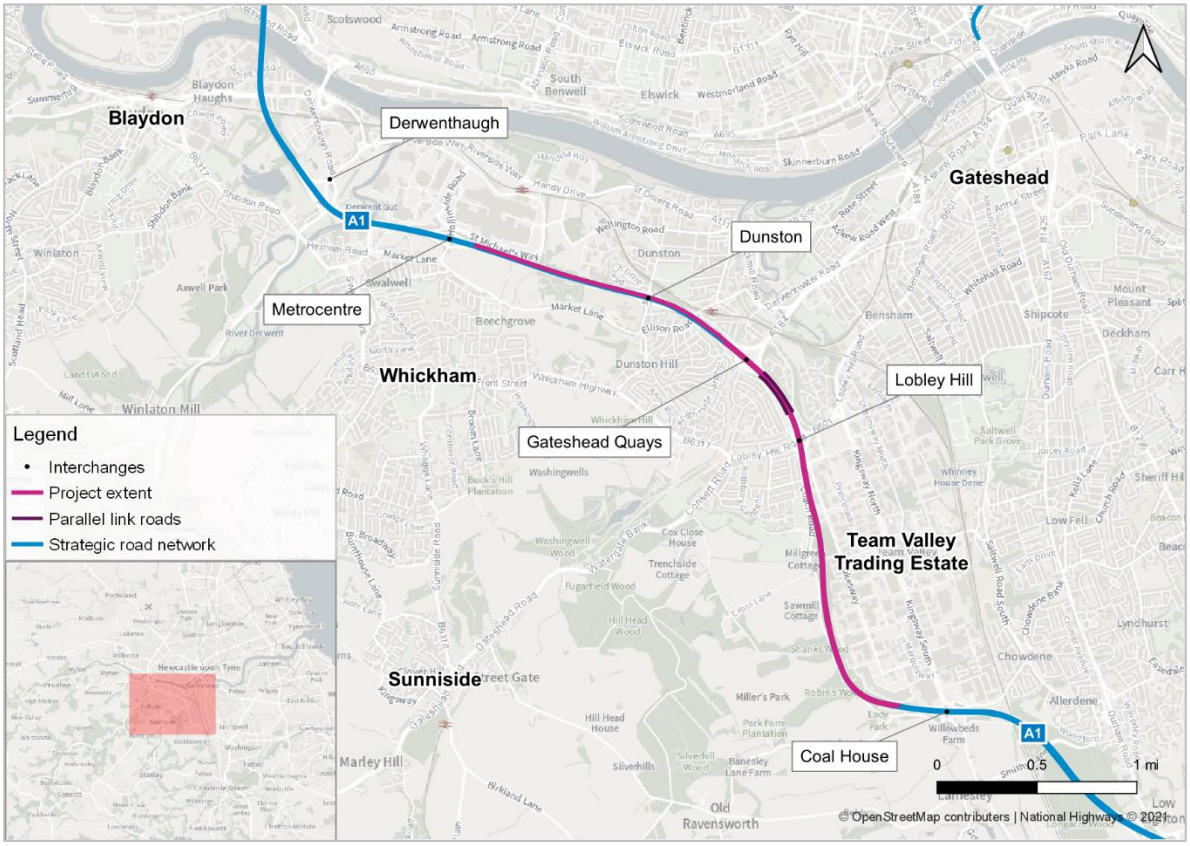
[2] The detail in the section has been taken from the 'A1 Lobley Hill to Dunston Improvement (incorporating Metrocentre to Coal House extensions) Stage 5 Business Case' (Highways England, March 2014).
[3] Local Network Management Schemes.

- creation of new parallel link roads for local traffic between the Lobley Hill and Gateshead Quays interchanges (A184) with provision of hard shoulder and reconfigured merge and diverge arrangements.
- provision of a 0.9 m high concrete barrier on the central reserve; and
- replacement and movement of the street lighting from the central reserve to mainly on the verges (apart from between A184 Gateshead Quays and Lobley Hill interchanges, where lighting columns were placed on the concrete stepped barrier that lay between the link roads and the A1).

## Where is the project located?

The A1 forms the main north-south road link within Tyne and Wear. It is part of the strategically important road link between London, Tyne and Wear and Scotland, and is also important for local journeys. Figure 1 shows the project's location.

**Figure 1 Location of project and interchanges**




Source: National Highways and OpenStreetMap contributors.

## How has the project been evaluated?

Post-opening project evaluations are carried out for major projects to validate the accuracy of expected project impacts which were agreed as part of the business case for investment. They also seek to determine whether the expected project benefits are likely to be realised. They provide opportunities to learn and improve future project appraisals and business cases too. They are also important for providing transparency on and accountability for public expenditure, by assessing whether projects are on track to deliver value for money.

A post-opening project evaluation compares changes in key impact areas[4] by observing trends on a route before a project is constructed (baseline) and tracking these after it has opened to traffic. The outturn impacts are evaluated against the expected impacts (presented in the forecasts made during the appraisal) to review the project's performance. For more details of the evaluation methods used in this study, please refer to the post-opening project evaluation (POPE) methodology manual on our website.[5]

This five-years after evaluation was originally planned for 2021 however both the scope and timing of this project's evaluation had to be revised. This was due to the effect of both COVID and the construction of the adjacent major projects immediately to the north between Scotswood and North Brunton and immediately to the south between Birtley and Coal House. This meant that forecasts for traffic flows, journey times and accidents were not considered representative of normal road conditions for 2020 or 2021. The two major project schemes were not expected to both be open to traffic until 2024 and so traffic was expected to be affected until then. Neither project was included in the appraisal forecasts for Coal House to Metrocentre and so forecast flow comparisons would have had significant limitations. The one-year after traffic evaluation[6] used data from 2018 but was affected by the limited number of functioning traffic counters. Analysis showed this limitation remained and so it was decided that traffic analysis would be limited to reconsidering the journey time issues reported at one year after but using 2019 data. Safety analysis was repeated but using three years of post-opening data (2016-2019).

The absence of representative traffic flow data meant that air quality, noise, and greenhouse gas evaluation, which required this data, could not be undertaken and was scoped out of this five-years after evaluation. The usual environmental site visit went ahead in 2021 but the Transport Analysis Guidance[7] society sub-objectives of physical fitness and severance were scoped out as there were no outstanding issues from one year after. Journey quality, specifically traveller views, was included as there were outstanding issues following the one-year after evaluation that warranted further analysis.

At five years after an evaluation of value for money is usually undertaken, however, there was insufficient journey time data to enable a full analysis to be done. Value for money has focused on costs and safety benefits supported by some qualitative analysis.

[4] Key impact areas include safety, journey reliability and environmental impacts.
[5] https://nationalhighways.co.uk/publications/
[6] A1 Coal House to Metro Centre one-year post-opening project evaluation January 2022
[7] https://www.gov.uk/guidance/transport-analysis-guidance-tag

# 3. Delivering against objectives

## How has the project delivered against its objectives?

All National Highways major projects have specific objectives which are defined early in the business case when project options are being identified. These benefits are appraised to be realised over 60 years. This evaluation, which builds on the one-year after evaluation, provides further evidence to support our understanding of the project's progress. The objectives for the A1 Coal House to Metrocentre are shown below in Table 1.

**Table 1 Project objectives and five-year evaluation summary**

| Objectives | Five-year evaluation |
|---|---|
| Reduce congestion and thereby improve traffic flows. | Achieved - additional capacity had been provided and both journey times and journey time reliability had improved. |
| Improve journey time reliability on the A1. | Achieved - analysis confirmed that journey time reliability had improved in both directions. |
| To maintain and, where possible, reduce current collision and casualty severity rates. | Achieved - we observed a reduction in the frequency of collisions per hundred million vehicle miles.<br>The rate of fatality equivalents had reduced. |
| Accommodate urban local journeys away from the A1 mainline. | Achieved - the local distributor roads now provide alternate routes. |
| Increase capacity within highway boundary. | Achieved - the extra lanes were accommodated within the existing highway boundary. |

# 4. Traffic evaluation

## Summary

The key objective of this project was to provide additional capacity within the highway boundary to reduce congestion and improve journey times. These improvements were anticipated to improve the journey times of the existing road users the most. Our analysis shows that most road users journey times on the A1 were faster and more reliable by 2019.

By 2019, journey times on the A1 had improved in evening peak period in both the northbound and southbound directions. The largest improvement was seen particularly in the southbound journeys of 2 minutes and 26 seconds which was better than what was observed in the one-year assessment and the pre-construction period. For journeys made in the morning peak and interpeak periods, there was minimal change in the journey time in both directions.

In comparison to the one-year after assessment, there was little change in the journey time reliability in the morning peak and interpeak time periods in both directions. Similar to the average journey times, reliability improvements were most noticeable in the evening peak in southbound and northbound journeys.

The scope of the traffic evaluation was limited due to the impact of the small number of active traffic counters available and the timing of construction of two adjacent road projects.[8] Analysis of journey time impacts was undertaken but analysis of traffic volumes was descoped. As a result, the analysis comparing forecast against observed flows and journey times was not undertaken. To avoid the impact of the COVID pandemic on traffic volumes between 2020 and 2022, the post-project period chosen for the evaluation was amended to between 1 January and 31 December 2019.

The routes analysed were the same as those detailed in the one-year after evaluation. Overall significant improvements had been observed in the journey times and reliability particularly in the southbound direction during the evening peak. At one year after they had deteriorated and so this was an improvement.

## Relieving congestion and making journeys more reliable

## Did the project deliver journey time savings?

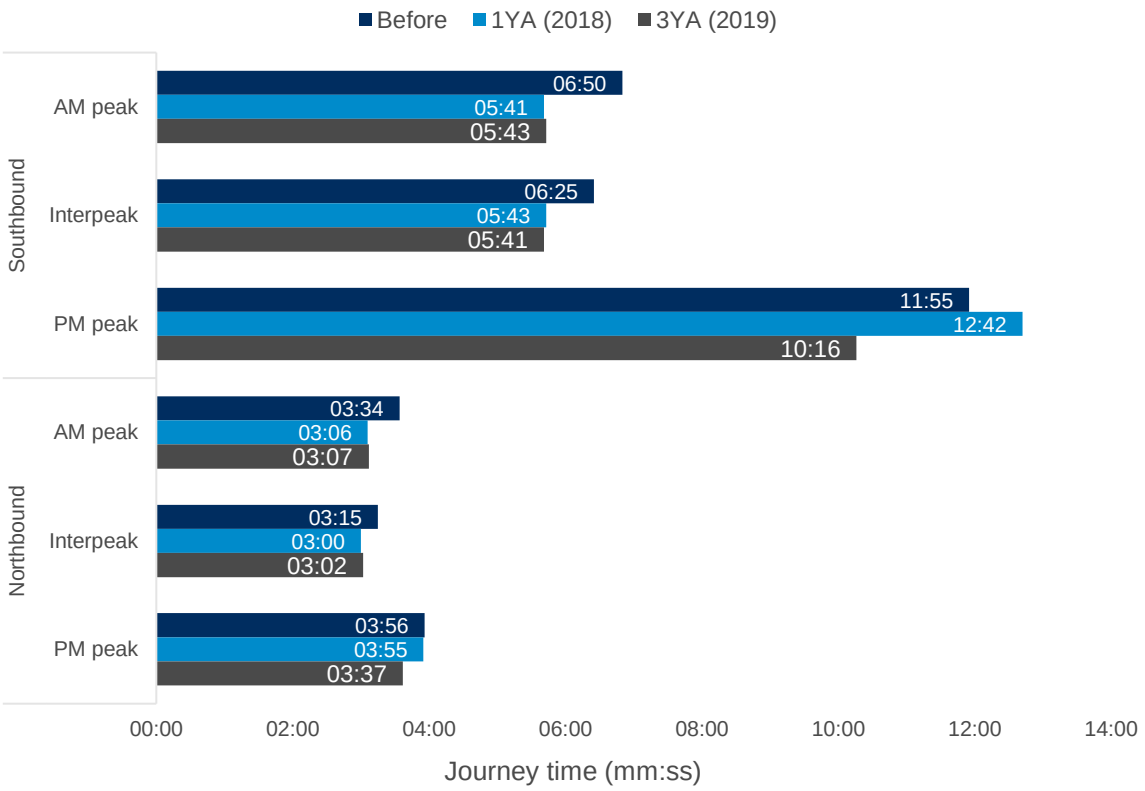
We assessed both average and cumulative journey times along the route on both carriageways between Metrocentre and Coal House interchanges using satnav data. The three years after results were compared against the journey times observed in the pre-construction and one-year after post-opening periods. We looked at three time periods:

- Morning Peak (AM peak): 07:30-8:30
- Interpeak: 10:00 -16:00
- Evening Peak (PM peak): 17:00-18:00

[8] The A1 Scotswood to North Brunton and the A1 Birtley to Coalhouse major projects.

The results are shown in Figure 2. At three years after, there was minimal change in journey times in comparison to one year after period during the morning peak and interpeak and this was consistent in both southbound and northbound directions. Journey times had improved particularly in the evening peak. Southbound journey times during the evening peak improved by two minutes and 26 seconds whereas in the northbound direction the journey times improved by 18 seconds.

**Figure 2 Average journey times**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

## Cumulative journey times and speeds

To better understand the changes in road users' average journey times observed in 2019, we assessed their cumulative average journey times along the route and compared them with those observed in the pre-construction and one year after periods. The results for each time period per direction are shown in Appendix A. We found that the cumulative average journey times in 2019 were similar to those observed at the one-year after evaluation, in the morning and interpeak periods.

However, we observed a substantial improvement in the cumulative average journey times on the southbound and the northbound carriageway in the evening peak. Analysis of the cumulative journey times indicated that improvements were seen along the route, and particularly so from around Metrocentre interchange onwards.

For the southbound carriageway, particularly in the evening peak, analysis of the average speeds over distance indicated road users attained substantially higher speeds in 2019 than those observed previously, from Metrocentre interchange to a point after the Gateshead Quays (A184) interchange. From this point onwards,

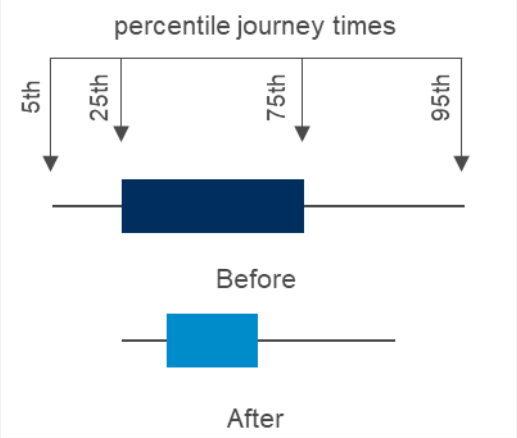
their average speeds fell below those observed pre-construction but remained better than those observed one year after. In the morning peak and interpeak time periods, minimal change was observed on the southbound carriageway in comparison to one year after period.

For the northbound carriageway, minimal change was observed in average speeds in comparison to the one year after period in the morning and interpeak periods. However, in the evening peak, average speeds in 2019 improved slightly in comparison to one year after and pre-construction period between the Coalhouse and Lobley Hill Interchange. However, the average speeds gradually decreased below the pre-construction periods between Lobley Hill and A184 Interchange. The results for each time period per direction are shown in Appendix A. It should be noted that the speed limit along this section is 50 mph.[9]

## Did the project make journeys more reliable?

An objective of the project was to improve the reliability of journeys, making journeys more predictable for customers. If the time taken to travel the same journey each day varies, a customer is less confident in planning how long their journey will take them. If journey times do not vary, the customer can be more confident in the time their journey will take and allow a smaller window of time to make that journey. This analysis used the routes defined for the journey time analysis incorporating the project extent between Metrocentre and Coalhouse interchanges.

**Figure 3 What does this box show?**




The lowest point is the 5th percentile, this means 5% of journeys take less than this amount of time to complete. The highest point is the 95th percentile, this means 95% of journeys take less time than this to complete.
The length of the box shows how the journey times vary between the 25th and 75th percentile (the journey time 25% and 75% of journeys are faster than). The narrower the box the less variable, and hence more reliable, the journey.

### Southbound Reliability

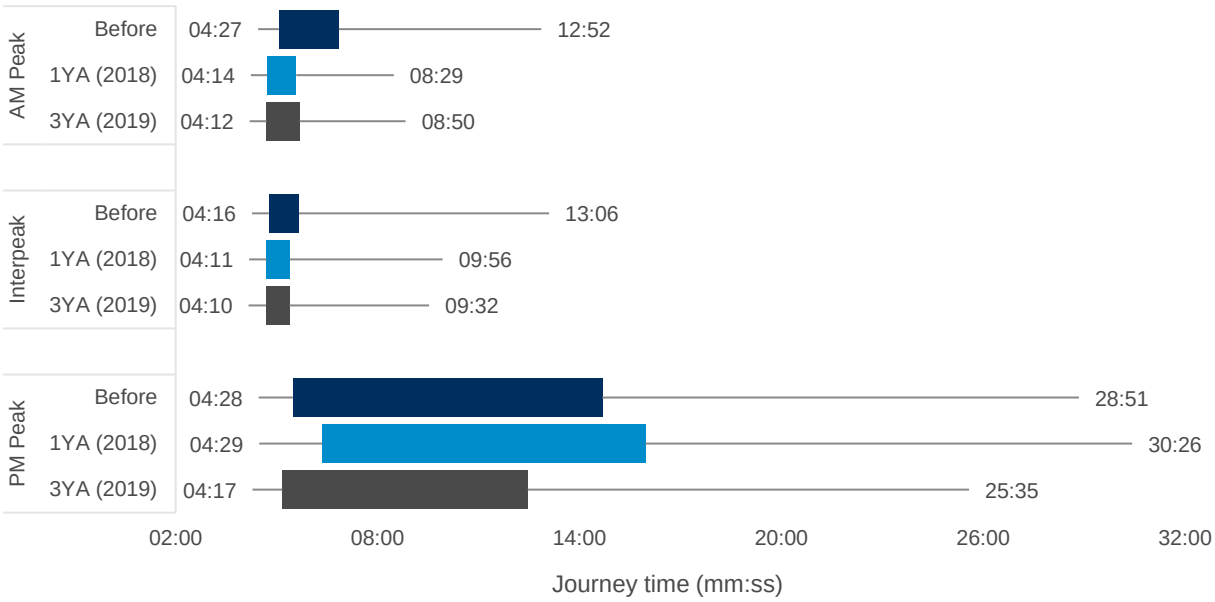
We found that in 2019, for the morning peak period the journey times had become fractionally more variable compared to one year after, but still substantially more reliable than before the project. For journeys made in the interpeak and evening peak period the journeys had become more reliable. In both the interpeak and evening peak time periods, reliability is better than before the project and there was a further improvement in the slowest journeys compared to one year after. In the evening peak the variation in the middle 50% of journeys had also reduced. The results are shown in Figure 4.

[9] Speed limit of 50 miles per hour was introduced on the A1 in 2010 to manage congestion.

## Northbound Reliability

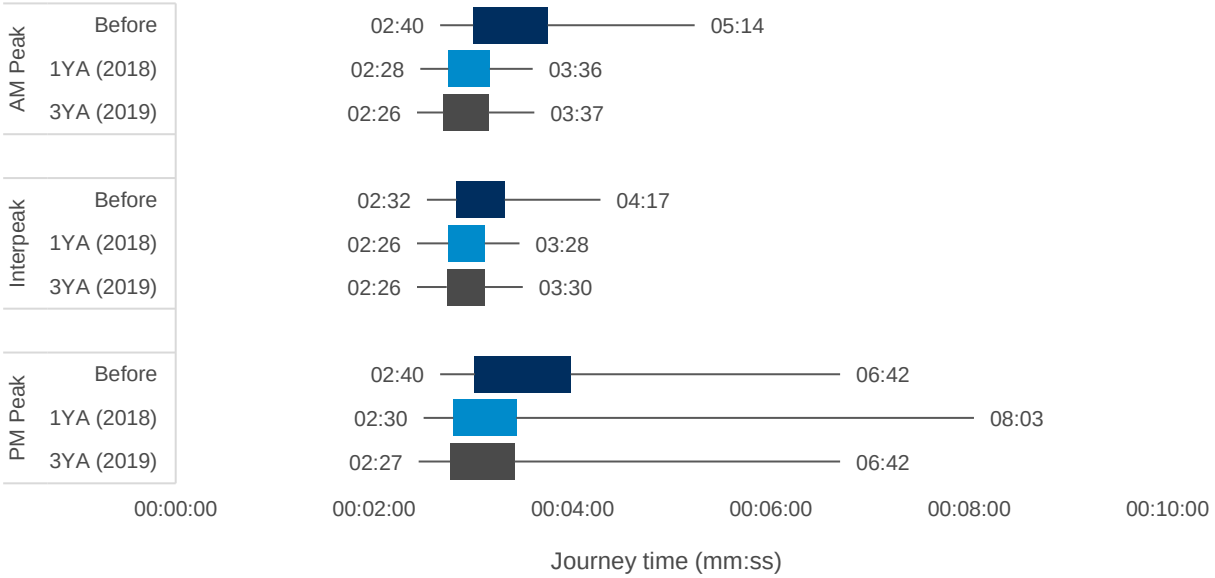
We found that in 2019, for the morning peak and interpeak time periods, there were only slight changes in the reliability as compared to the one year after period, and journeys were still more reliable than before the project. Journey time reliability in the evening peak had improved since one year after and now represents an improvement on the pre-construction situation, as seen in Figure 5.

**Figure 4 Southbound reliability**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 5 Northbound reliability**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

# 5. Safety evaluation

## Summary

The safety objective for this project was to reduce the severity of casualties per year compared to the before project baseline. The number and rate per hundred million vehicle miles of personal injury collisions[10] were analysed to identify a trend over time. The evaluation concluded that the project had met its safety objective.

In the first three years of the project being operational, there had been a reduction in the rate and number of personal injury collisions on both the project extent and the surrounding network. This is compared with the annual average for the five years before the project improvements.

On the project extent there had been an annual average reduction of three personal injury collisions, which was lower than the appraised business case for the project. This was based on an annual average of 22 personal injury collisions after the project was operational compared with 25 before the project. If the road had not been converted to a dual carriageway, we estimate that the number of personal injury collisions would have been between 14 and 36 (Figure 9).

When accounting for the increased volume of customers over this period, the annual average rate of personal injury collisions per million vehicle miles had also improved over time. The average collision rate had decreased to 15 personal injury collisions per hundred million vehicle miles, this equates to travelling seven million vehicle miles before seeing a collision. Before the project, the collision rate was 17 personal injury collisions per hundred million vehicle miles, this equates to traveling six million vehicle miles before seeing an accident. If the road had not been widened, we estimate the collision rate would reduce to 15 personal injury collisions per hundred million vehicle miles.

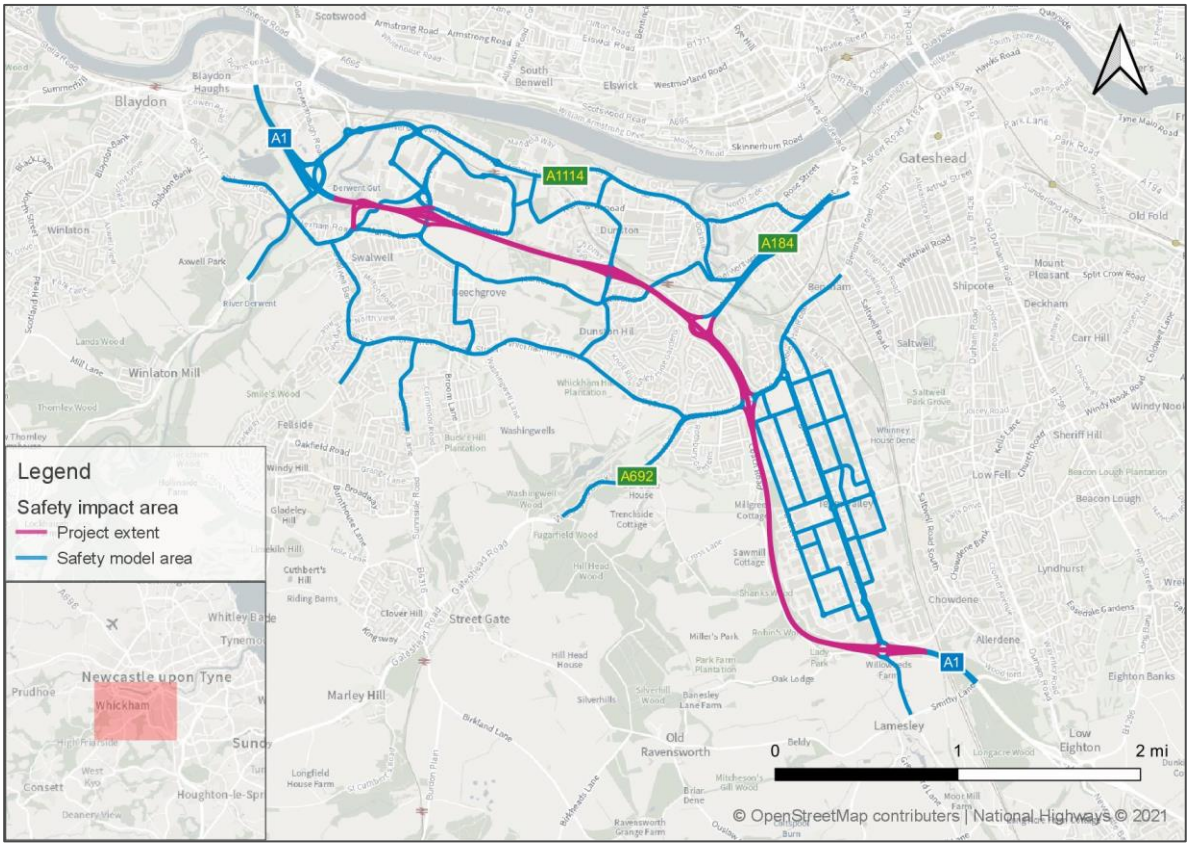
There was an average reduction of 50 personal injury collisions per year in the wider safety study area (based on an annual average of 46 personal injury collisions observed after the project had opened compared with 96 before the project). If the road had not been widened, we estimate that the number of personal injury collisions would have increased to between 79 to 125 (Figure 12).

## Safety study area

The safety study area, shown in Figure 6, was defined as the project extent on the A1, and a wider area including adjacent roads on the local road network. This area was considered to allow us to determine the impacts on safety that the project had on both the project extent and the wider area.

[10] A collision that involves at least one vehicle and results in an injury to at least one person.

**Figure 6 Safety study area**




Source: National Highways and OpenStreetMap contributors.

# Customer safety on the project extent

## What impact did the project have on customer safety?

Safety data was obtained from the Department for Transport road safety data.[11] This records incidents on public roads that were reported to the police. This evaluation considers only collisions that resulted in personal injury via this dataset.

The safety analysis was undertaken to assess changes over time looking at the trends in the five years before the project was operational to provide an annual average. We have then assessed the trends three years after.

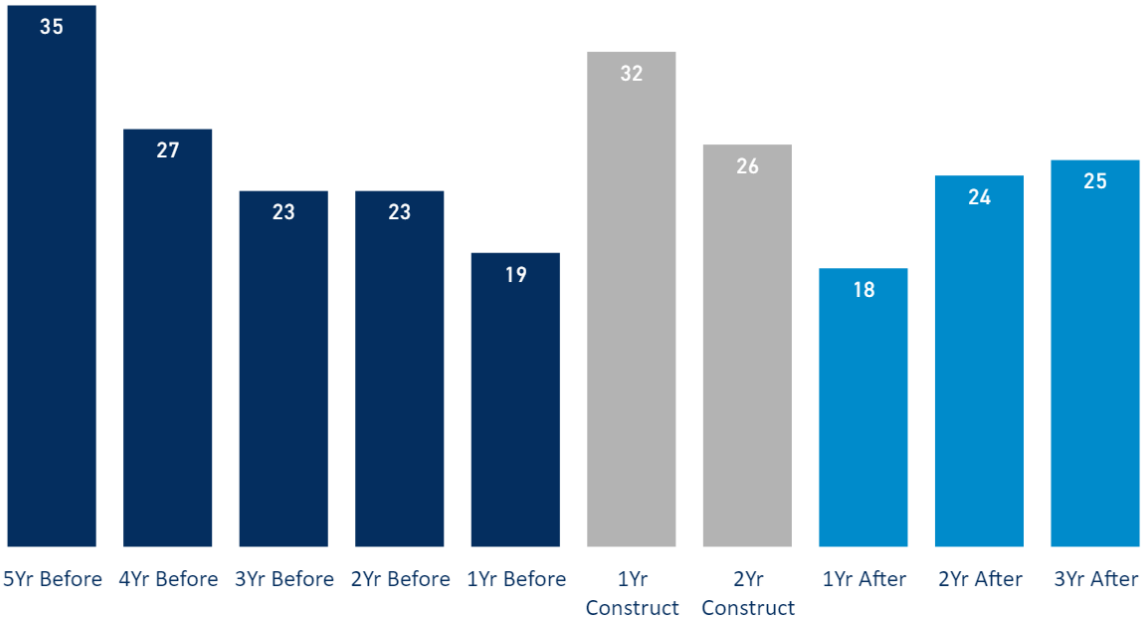
The analysis draws on the following data collection periods:

- Pre-construction: 1 September 2009 to 31 August 2014
- Construction: 1 September 2014 to 31 August 2016
- Post-opening: 1 September 2016 to 31 August 2019

The evaluation found the number of personal injury collisions on the project extent had decreased (impacts on the wider area are discussed later). Over the three years after the project was operational, there were an average of 22 personal injury collisions per year, three fewer than the average 25 per year over the five years before the project was constructed.

[11] https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data

**Figure 7 Annual personal injury collisions**



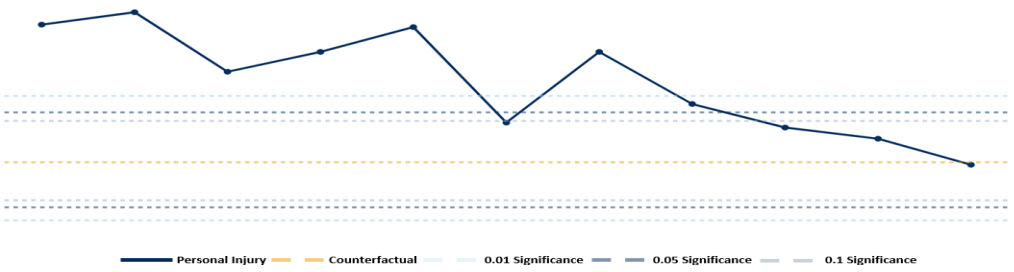

Source: STATS19: 1 September 2009 to 31 August 2019

As part of the safety evaluation, we looked to assess what changes in personal injury collisions might have occurred due to factors external to the project over this period. To do this we estimated the trend in personal injury collisions which might have occurred if the road had not added an extra lane (this is referred to as a counterfactual - see Figure 8 and the POPE methodology manual[12]). This is based on changes in regional safety trends for A Roads with a high volume of roads users. A range of collisions that consider regional trends was calculated.

**Figure 8 What does the counterfactual show?**

The counterfactual is an estimation of what we think would occur without the project taking place. We estimate a range of collisions that follow regional trends. The chart shows:

1. Timeseries of personal injury collisions
2. Estimated counterfactual range, which comes from a $X^2$ hypothesis test on one degree of freedom using a significance level of 0.05. More details can be found in the POPE Methodology Manual.
3. National Highways are developing new statistical methods to compare collision and casualty rates. We anticipate adopting these once the methods are finalised.



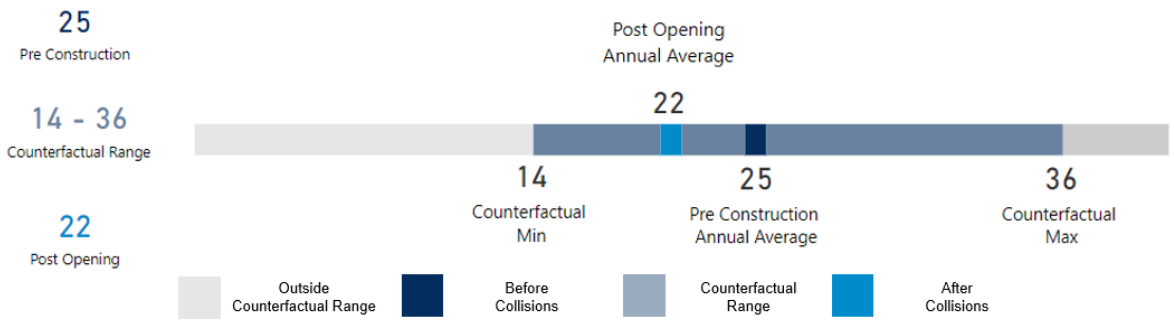

If the observed annual number of collisions is within this range, the project is operating as expected compared to the regional trends. If the number of observed collisions fall under the range the project is outperforming compared to the regional trends. If the observed number of collisions is higher than the range the project is

[12] https://nationalhighways.co.uk/media/exypgk11/pope-methodology-note-2024-v2.pdf

underperforming compared to the regional trends. Based on this assessment we estimate that if the road had not been widened, the trend in the number of personal injury collisions would likely have increased, and collision rates would remain stable.

A range of between 14 and 36 personal injury collisions[13] during the three-year post project period would be expected. An annual average of 22 personal injury collisions were observed over the three-year post-opening period, this falls within the expected range as show in Figure 9 below.

**Figure 9 Observed and expected range of personal injury collisions (annual average)**




Source: STATS19: 1 September 2009 to 31 August 2019

The number of observed personal injury collisions falls within the expected range that could be attributed to regional variation in collisions. The observed changes were insignificant, which means the decline in personal injury collisions cannot be attributed to the project.

## How has traffic flow impacted collision rates?

It is important to contextualise any incidents in the volume of traffic seen on this stretch via a collision rate, the number of collisions per hundred million vehicle miles.

The average collision rate had decreased to 15 personal injury collisions per hundred million vehicle miles, this equates to travelling seven million vehicle miles before seeing a collision. Before the project, the collision rate was 17 personal injury collisions per hundred million vehicle miles, this equates to traveling six million vehicle miles before seeing a collision.

The estimated rate if the extra lane had not been built would reduce to 15 personal injury collisions per hundred million vehicle miles. This counterfactual scenario indicates there would be a reduction in line with what was observed during the after period.

## What impact did the project have on the severity of collisions?

Collisions which result in injury are recorded by severity as either fatal, serious, or slight. The way the police record the severity of road safety collisions changed within the periods of the evaluation, following the introduction of a standardised reporting tool – Collision Recording and Sharing. This is an injury-based reporting

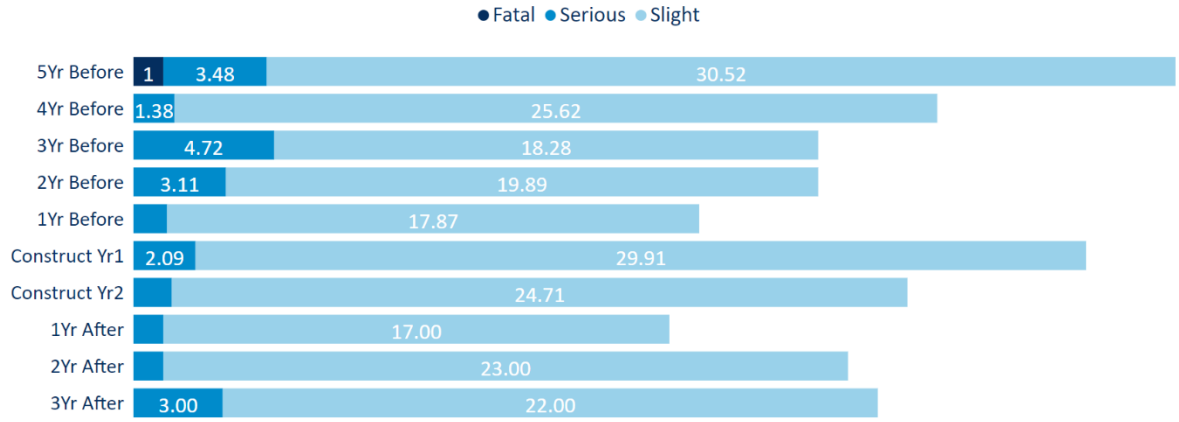
[13] The safety methodology is different from one-year to three-year evaluation. We still have confidence in the accuracy of the previous methodology but have made suitable changes that will ensure a methodology fit for purpose for the future.

system, and as such severity is categorised automatically by the most severe injury. This has led to some disparity when comparing trends with the previous reporting method, where severity was categorised by the attending police officer[14]. Consequently, the Department for Transport have developed a severity adjustment methodology[15] to enable robust comparisons to be made.

For this evaluation, one reporting mechanism was largely used prior to the project becoming operational and another afterwards. The pre-conversion collision severity has been adjusted, using the Department for Transport's severity adjustment factors, to enable comparability with the post-conversion safety trends.[16]

No fatal collisions have been observed after the project became operational. There has been a reduction from two to one serious collision. There has been an average reduction of two collisions that result in slight injuries (before the project became operational the average number of collisions was 22, after the project became operational this had reduced to 20).

**Figure 10 Collisions by Severity on Project Extent[17]**




Source: STATS19: 1 September 2009 to 31 August 2019

## How has flow impacted on collision severity?

Like other transport authorities across the UK the key measure we use to assess the safety of roads is Fatal and Weighted Injuries (FWI). This gives a fatality 10 times the weight of a serious casualty, and a serious casualty 10 times the weight of a slight casualty.[18] In effect, it takes all non-fatal injuries and adds them up using a weighting factor to give a total number of fatality equivalents.[19] This is represented by an annual average rate that standardises casualty severities against flow to show the likelihood of a fatality equivalent occurring per distance travelled.

A reduction of 0.4 fatality equivalents has been observed annually. The severity of casualties occurring after the project became operational had reduced in the project's extent. Before the project, an annual average 0.9 fatality equivalents were

[14] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/820588/severity-reporting-methodology-final-report.odt
[15] https://www.gov.uk/government/publications/guide-to-severity-adjustments-for-reported-road-casualty-statistics/guide-to-severity-adjustments-for-reported-road-casualties-great-britain#guidance-on-severity-adjustment-use

[16] Collision Severities within this report use the 2020 adjustment factor.
[17] As per DfT guidance, adjusted severities are presented with two decimal points.
[18] The FWI weights collisions based on their severity. A fatal collision is 1, a serious collision is 0.1 and a slight collision is 0.01. So, 10 serious collisions, or 100 slight collisions are taken as being statistically equivalent to one fatality.
[19] Casualty Severities within this report use the 2020 adjustment factor.

observed. After the scheme this had reduced to an annual average of 0.5 fatality equivalents.

The combined measure showed an extra 82 million vehicle miles were travelled before a fatality. Before the project, 129 million vehicle miles needed to be travelled before a fatality (0.8 fatality equivalents per hmvm[20]). After the project this increased to 211 million vehicle miles (0.5 fatality equivalents per hmvm).

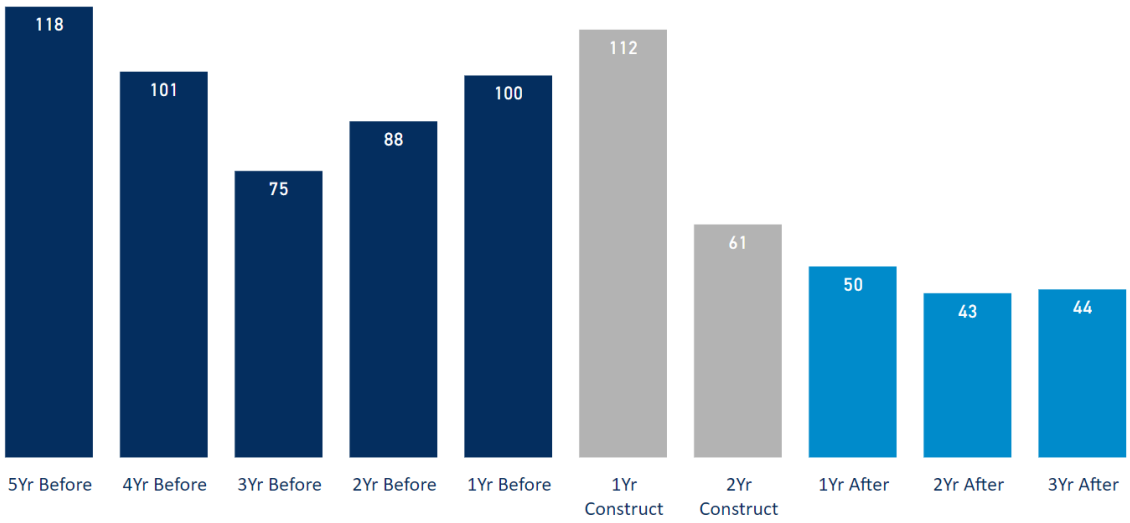
## Customer safety in the wider area

### What impact did the project have on safety for the wider area?

Personal injury collisions were observed for a wider impact area, which was derived from the project's safety appraisal, to observe any potential wider impacts from the intervention.

Before the project, an annual average of 96 collisions were observed within the local area. After the project, the observed collisions had fallen to 46, a reduction of 50.

**Figure 11 Annual personal injury collisions in wider area**

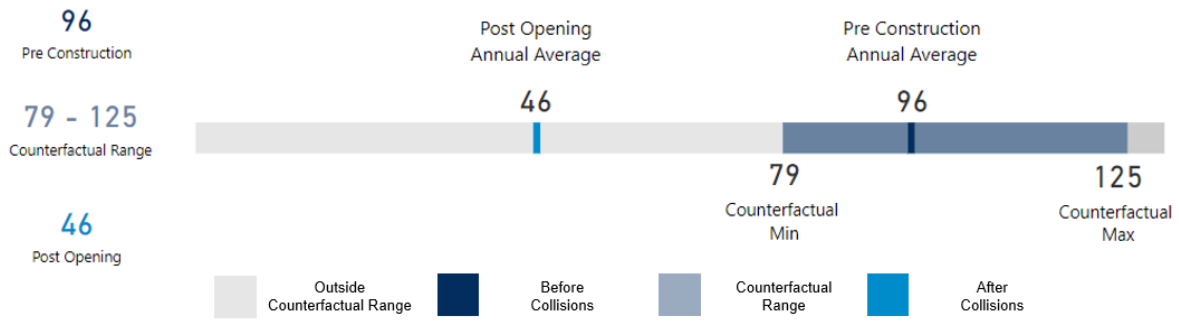



Source STATS19: 1 September 2009 to 31 August 2019

If the A1 had not added an extra lane, the counterfactual estimated the number of personal injury collisions would have been between 79 and 125. The observed annual average of 46 personal injury collisions falls below the expected range as show in Figure 12 below. This suggested that the project was assisting positive safety trends in the wider area.

[20] Hundred million vehicle miles.

**Figure 12 Observed and expected range of personal injury collisions in wider area (annual average)**




Source STATS19: 1 September 2009 to 31 August 2019

## How has traffic flow impacted collision rates for the wider area?

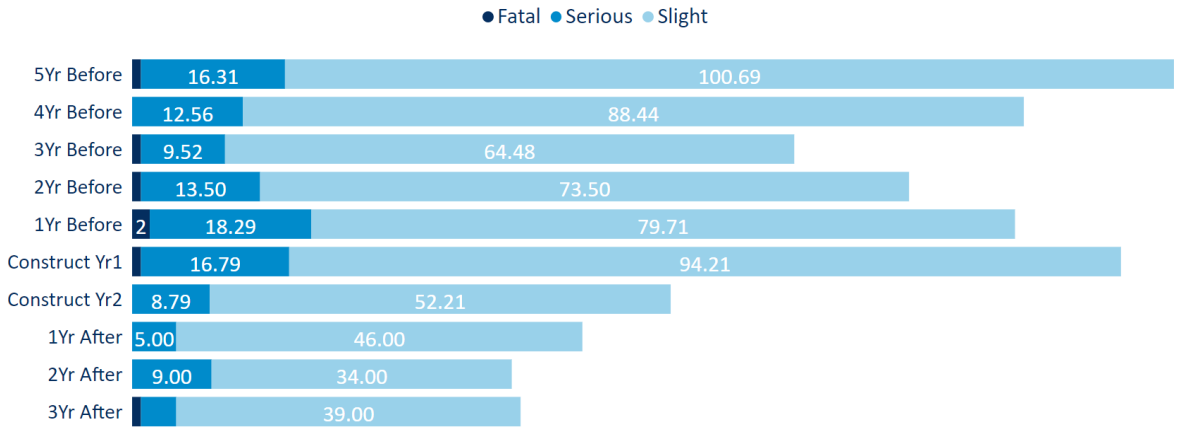
The average collision rate had decreased to 22 personal injury collisions per hundred million vehicle miles, this equated to travelling five million vehicle miles before seeing a collision. Before the project, the collision rate was 48 personal injury collisions per hundred million vehicle miles, this equated to traveling two vehicle miles before seeing a collision. The estimated collision rate would decrease to 47 personal injury collisions per hundred million vehicle miles if the widening had not occurred.

## What impact did the project have on the severity of collisions in the wider area?

Collision severity analysis was undertaken for the wider area using the same method as for the mainline A1.

One fatal collision had been observed after the project became operational compared to a total of five before the project became operational. There has been a reduction from 13 to six serious collisions. There has been an average reduction of 40 collisions that result in slight injuries (before the project became operation the average number of collisions was 74, after the project became operational this had reduced to 34).

**Figure 13 Personal injury collisions by severity in wider area**




Source: STATS19: 1 September 2009 to 31 August 2019

### How has traffic flow impacted casualty severity in the wider area?

A reduction of two fatality equivalents was observed annually. The severity of casualties occurring after the project became operational reduced in the wider area. Before the project, an annual average of four fatality equivalents were observed. After the project this had reduced to an annual average of two fatality equivalents.

The combined measure showed an extra 57 million vehicle miles were travelled before a fatality. Before the project, 48 million vehicle miles needed to be travelled before a fatality (2.1 fatality equivalents per hmvm[21]). After the project this increased to 105 million vehicle miles (1 fatality equivalents per hmvm). The rate of fatality equivalents per hundred million vehicle miles has reduced. This suggested that, considering traffic changes, the project was having a positive impact on the severity of casualties within the wider area.

## Has the project achieved its safety objectives?

The safety objective for this project was to reduce the severity of casualties per year compared to the before project baseline. The analysis showed personal injury collisions and rates had both decreased. Analysis has also shown that the project has had a positive impact on casualties. We can be confident that the project had met its safety objective for the project extent.

Statistical testing of the results for collision reduction and collision rates were significant for the wider impact area. The project appeared to have assisted in improving safety on the surrounding road network.

## How has the project performed compared to expectations?

Initial appraisal for the project estimated that there would be a reduction of six personal injury collisions per year over the appraisal period (60 years) for the project extent. This equated to a decrease of 369 personal injury collisions over the appraisal period.

Analysis showed that the appraisal underestimated the potential safety benefits for this project.

[21] Hundred million vehicle miles.

# 6. Environmental evaluation

## Summary

The evaluation of environmental impacts used information on the predicted impacts gathered from both the environmental appraisal and the environmental assessment report (hereafter simply referred to as the appraisal). This information, along with the observed impacts reported at one year after opening was then compared with findings obtained at five years after the project had opened for traffic. The observed impacts at five years after were determined during a site visit in June 2021 and supported by desktop research. The results of the evaluation are recorded against each of the environmental and society sub-objectives and presented in Table 2.

It was not possible to evaluate noise, air quality and greenhouse gas impacts because the required traffic flow data was unavailable. This was because COVID and the two adjacent major projects meant that that traffic data comparisons for 2021 were not considered representative and 2019 data was of insufficient quality and did not cover the whole route. The society sub-objectives of physical activity and severance were also scoped out as there were no outstanding issues following the one-year after evaluation.

Our evaluation identified that there had been improvement in the establishment of the mitigation planting since one year after. New tree planting and grasslands were in a much better condition, and we considered that as long as maintenance continues landscape, cultural heritage and biodiversity outcomes should be achieved. The new drainage network had been implemented however the maintenance frequencies required to ensure appropriate management of surface water were reported to be higher than anticipated. At five years after this was being investigated to understand if this was a temporary operational issue or a problem associated with the drainage design.

At one year after our evaluation highlighted the visual impacts and increased urbanisation caused by the shotcrete at Gateshead Quays. Our five-years after evaluation confirmed that an attempt had been made to soften the impact with new planting, but it remained unlikely that the impacts would reduce noticeably by the design year. Impacts on townscape and journey quality (driver views) remained worse than expected.

## Landscape

The environmental appraisal predicted that the loss of vegetation within the highway estate caused by the road widening would lead to local changes to landscape character areas and views from local residential areas immediately adjacent to the A1. However, it predicted that in the medium to long term the effects would reduce to neutral as new mitigation planting established.

The evidence gathered as part of the site visit confirmed that the observed impacts were as predicted. Vegetation had been lost from within the highway boundary however the effects of these impacts were localised. The gantry at Lady Park was not built but lighting and the relocated noise barrier meant that the A1 was still a prominent feature. New planting to help mitigate the impacts was in place as expected.

**Figure 14 Offsite plant at Farnacres**

Source: Site visit 2021

At one year after, many of the planting plots were overgrown with weeds widespread. Although the project impacts were broadly as expected, it was considered that poor maintenance could result in the impacts not being mitigated as well as expected. However, at five years after we saw evidence that routine maintenance including weed suppression and restocking had been undertaken and the planting plots were visibly improved. As well as the onsite planting, the offsite planting such as at Farnacres was reviewed and although there were some failed plants, the overall condition was good. It was expected that the new planting should now provide the mitigation predicted. Overall impacts on landscape character and on sensitive visual receptors were considered to be as expected.

## Townscape

The environmental appraisal predicted that the loss of vegetation within the highway estate caused by the widening would lead to local change to adjacent townscape character areas, and the streetscape of residential areas, immediately adjacent to the A1. The most notable changes were predicted to be experienced by residential properties within the vicinity of West Way and Chiltern Gardens and around the A184 Gateshead Quays junction. In these areas vegetation clearance would be extensive.

In most locations it was predicted that it would be possible to mitigate the most significant effects through hydroseeding of steepened slopes, replacement planting and the installation of timber visual barriers. Overtime, it was predicted that the new planting would have established and created a linear landscape feature and visual barrier, similar to the pre-project situation. It was recognised that not all impacts would be fully mitigated, but overall, the impact of the changes would, in the medium to long term, reduce to slight adverse.

The evidence gathered as part of the five years after site visit confirmed that, except for the use of shotcrete, the observed impacts were as predicted. Vegetation had been lost from within the highway boundary especially around the A184 Gateshead Quays junction. However, the effects of these impacts were localised. Mitigation was in place although at five years after some of the hydroseeding had yet to establish. There had been a marked improvement in maintenance since one year after and many of the landscape plots were

developing well. At Gateshead Quays junction the expected vegetation clearance had taken place, but the geotechnical issues encountered during construction meant that the slopes had to be cut steeper to remain within the highway boundary. This meant that the expected replanting using hydroseeding techniques did not take place. Instead, shotcrete was used to stabilise the slopes which, at five years after, had increased the sense of urbanisation and increased the adverse effects. The use of shotcrete was a significant design change and, just as at one year after, it is unlikely that the visual impacts of its use will reduce overtime.

We considered that provided the mitigation planting continued to develop most impacts would be minimised as expected. However, the use of shotcrete at Gateshead Quays had adversely affected the mitigation of the townscape impacts of the project and so overall the impacts were worse than expected.

## Heritage of historic resources

The environmental appraisal predicted that the construction of the project would impact the setting of a small number of cultural heritage sites along the boundary of the project. These impacts would be caused by vegetation clearance opening up new views of the road including the listed buildings near Ravensworth Castle conservation area. New planting would be provided to replace the vegetation lost and to minimise impacts of the setting of the heritage resources. Once the replacement planting matured, it was predicted that the impacts would be nearly completely reversed. Overall impact was predicted to be slight adverse.

The evidence gathered during the one year after site visit had confirmed that as expected a lot of vegetation had been removed from the highway boundary. This included around the listed buildings at South Lodge near the Ravensworth Castle Conservation area. However, replanting had occurred along the highway boundary in front of South Lodge. Our five years after visit confirmed that maintenance had improved, and the condition of the planting was better than that seen at one year. The planting was beginning to filter views of the A1 and as long as it continues to grow it should achieve its intended mitigation function. Overall, the outcome was considered to be as expected.

## Biodiversity

The environmental appraisal predicted that the widening of the A1 would cause the loss of habitats within highway soft estate. This would include impacts on plantation woodland, scrub, and semi-improved grassland. Habitats beyond the highway boundary would not be directly affected. Mitigation measures would be implemented during construction to avoid impacts to nesting birds, badgers, great crested newts, and other species. Following completion, verges would be reinstated, and new planting would be provided to minimise habitat loss. Overall, the effects of the minor loss of habitat would be slight adverse.

Habitat loss was limited to within the highway boundary with plantation woodland, scrub, and grassland most affected. Mitigation planting was undertaken and since our one year after evaluation, maintenance had improved. Gaps in asset data recorded at one year after still remained, and it was not possible to determine if the total area of replacement habitat predicted in the environmental assessment had been provided. The condition of the species rich grassland within the A184 Gateshead quays junction had improved since one year after and a range of wildflowers were seen. This habitat should continue to provide biodiversity benefits.

However, the poor ground conditions reported at one year after remained in some places and the large stones and other debris seen will need to be removed to ensure ongoing maintenance can be done safety. Overall, the mitigation had improved since one year after and so it was concluded that the outcome at five years after was as expected.

**Figure 15 Wildflowers near A184 Gateshead Quays**

Source Site visit June 2021

## Water environment

The environmental appraisal predicted that the key impacts of the project would be increases in routine road runoff caused by road widening. There would also be changes to the risk of spillages from road accidents and changes to flood risk. These impacts would be managed through the road design and additional capacity within the drainage system. A new underground storage tank at Gateshead Quays and new pollution control devices would also be provided. These measures would mitigate the project impacts and overall, the impacts were predicted to be neutral.

A detailed study of the drainage system was not undertaken but instead the evaluation focused on those aspects of the drainage system that were visible during the site visit and the available asset management data. The pumping station and balancing pond at Gateshead Quays had been inspected and the report confirmed that the pumps were working. There were access and maintenance issues along with recommendations for further actions, but the report confirmed that the drainage network around the junction was functioning as expected.

The weather at the time of the site visit was dry and there were no signs of standing water along the project. To understand any performance issues, we reviewed information on the maintenance schedule along the project. Following project opening, construction debris had to be cleared from the gullies and linear drainage system. However, routine cleaning of the drainage network has had to be undertaken at a frequency higher than had been anticipated in order clear debris and to prevent flooding events. Slot drains that run parallel to the central reservation crash barrier do not run beneath structures which the records suggested had led to some ponding beneath them.

The available evidence suggests that the new drainage network was operating broadly as expected but this may only be because of the higher level of

maintenance effort that had been deployed. Further investigations are required to understand if there were defects or issues with the drainage design. Therefore, at five years after it was still too early to say whether the drainage outcomes would be as expected.

## Journey quality

The appraisal predicted that the project would affect driver views by removing woodland planting from along the boundary and by adding new signs and gantries. However, the route is mostly urban, and the enclosed views would gradually return as new planting matures, creating views similar to those before the project. The additional lane would add capacity, improve congestion, and provide some benefits that should reduce driver frustration. Overall, it was predicted that the impacts on journey quality would be neutral.

**Figure 16 Shotcrete at Gateshead Quays junction**

Note: A pre-construction image can be viewed at Google Maps Street View for comparison.
Source: site visit June 2021.

Our five-years after evaluation site visit considered the impact of the project on driver views and the findings reported at one year after. Maintenance had improved, and the new woodland planting was beginning to establish. This planting should recreate the pre-construction views along much of the corridor and over time, drivers should become accustomed to the new signage and gantries. However, the loss of woodland and the use of shotcrete had significantly increased the sense of urbanisation at Gateshead Quays. At one year after, it was considered that this had adversely affected driver views and at five years after this remained the case.

We consider that the use of shotcrete will have a lasting effect on journey quality along the route and so the impacts at five years after were worse than expected.

## Overview

**Table 2 Summary of environment evaluation against objectives**

| Sub-objective | Appraisal Summary Table Score | Five-year Evaluation | Summary |
|---|---|---|---|
| Landscape | Neutral | As expected | The observed impacts were limited to within the highways boundary and the effects localised to areas immediately adjacent to the A1. The planting was establishing well and should over time deliver the expected level of mitigation. |
| Townscape | Slight adverse | Worse than expected | The loss of vegetation was limited to within the highways boundary and the effects were limited to character areas immediately adjacent to the A1. However, the use of shotcrete had caused a greater sense of urbanisation and it was difficult to see how this could be mitigated to achieve the original design outcome. |
| Heritage of historic resource | Slight adverse | As expected | Impacts were limited to the setting of two listed buildings immediately adjacent to the project. Screen planting had been provided and had begun to filter views of the A1. Overtime time we expect the design year outcome to be met. |
| Biodiversity | Slight adverse | As expected | Impacts to habitats were as expected and maintenance had improved since one year after. The condition of the species rich grassland at Gateshead Quays was noticeably better and provided the remaining stones and debris are removed the design year outcome should be met. |
| Water environment | Neutral | Too early to say | The drainage network appeared to have been installed as expected however routine cleaning of the drainage network was at a higher frequency than expected. This may suggest an issue with the drainage performance and should be investigated further. |
| Journey quality | Neutral | Worse than expected | The use of shotcrete at the A184 Gateshead Quays junction had increased the sense of urbanisation leading to a worsening in the predicted views of customers. |

# 7. Value for money

## Summary

As part of the business case, an economic appraisal was conducted to determine the project's value for money. This assessment was based on an estimation of costs and benefits over a 60-year period.

The project was delivered at a cost of £57 million, which was over budget against a forecast cost of £49million.[22] This was principally due to additional engineering works being required when worse than expected ground conditions were encountered. In the first five years, the road provided additional capacity to support more road users, whilst improving the safety of those journeys. If this trend continues, the project is reforecast to deliver £15 million of safety benefits over the 60-year period.[23] Journey times and journey reliability improvements were forecast to present over 90% of the predicted benefits. However, it was not possible to monetise these benefits in this evaluation, but both had improved compared to before the project.

Overall, the evaluation indicates that in the first five years this investment is on track to deliver benefits for road users. However, as we could not evaluate all monetised impacts and outturn benefits, it was not possible to confirm that the predicted high value for money would be delivered.

## Forecast value for money

An economic appraisal is undertaken prior to construction to determine a project's value for money and inform the business case. The appraisal is based on an estimation of costs and benefits. The impacts of a project, such as journey time savings, changes to user costs, safety impacts, and some environmental impacts can be monetised. This is undertaken using standard values which are consistent across government. The positive and negative impacts over the life of the project[24] are summed together and compared against the investment cost to produce a benefit cost ratio (BCR). The monetised impacts are considered alongside additional impacts which are not able to be monetised, to allocate the project a 'value for money' category.

The monetised benefits forecast by the appraisal which supported A1 Coal House to Metrocentre business case indicated that over 90% of the benefits would arise from improvements to journey times and journey time reliability. A smaller amount, 4%, would arise from safety improvements.

[22] Present value of costs in 2010 prices and values.
[23] Based on impacts on the Strategic Road Network.
[24] Typically project life is taken to be 60 years.

**Table 3 Monetised benefits of the project (£ million)**

| | Forecast (£m) | % of forecast monetised benefits | Evaluation approach |
|---|---|---|---|
| Journey times | 294 | 74% | Not evaluated |
| Vehicle operating costs | 9 | 2% | Not evaluated |
| Journey time & VOC during construction and maintenance | -23 | -6% | Not evaluated (assumed as forecast) |
| Journey time reliability | 107 | 27% | Not evaluated |
| Safety | 15 | 4% | Re-forecast using observed and counterfactual safety data |
| Carbon | -2 | -1% | Monetised benefits assumed as forecast |
| Air quality | 0 | 0% | Monetised benefits assumed as forecast |
| Noise | 1 | 0% | Monetised benefits assumed as forecast |
| Indirect tax revenues | -2 | 0% | Not evaluated |
| **Total present value benefits** | **399** | **100%** | |

Note: 2010 prices discounted to 2010. Due to rounding the numbers and percentages may not always add up exactly to the presented totals.

The costs anticipated in the appraisal are set out in Table 4. Based on this information, the project was anticipated to give very high value for money over the 60-year appraisal period.

**Table 4 Cost of the project (£ million)**

| | Forecast (£M) | % of forecast costs | Evaluation approach |
|---|---|---|---|
| Construction costs | 49 | 103% | Current estimate of project cost |
| Maintenance costs | -1 | -3% | Not evaluated (assumed as forecast) |
| **Total present value costs** | **48** | **100** | |

Note: 2010 prices discounted to 2010. Due to rounding the numbers and percentages may not always add up exactly to the presented totals.

## Evaluation of costs

We obtained an up-to-date estimate of the project construction cost which came in over budget at a cost of £57 million.[25]

There was a history of mine workings in the area which meant poor ground conditions had been anticipated. However, the conditions experienced were much worse than expected and extra cost was incurred through extra grouting of mine workings, additional retaining walls and the associated time delays.

The appraisal expected that the project would result in a decrease in maintenance costs over the life of the project. As most of this maintenance is still in the future, the evaluation uses the maintenance costs forecast within the business case.

## Evaluation of monetised benefits

In our five-years after evaluations, we attempt to reassess the project costs and benefits and reforecast these for the 60-year scheme life. Our methods are much simpler than those used in appraisal, so consequently there is a degree of uncertainty around these numbers.

For this project however it was not possible to evaluate traffic flows to enable us to robustly compare forecasted and observed impacts. This has meant we have not been able to estimate what proportion of monetised journey time benefits, which were anticipated at the time of the appraisal, have been realised since the project opened for traffic. As traffic flows along with journey times are the key input for estimating changes in fuel consumption, we have also been unable to evaluate vehicle operating costs and indirect tax revenues. Other aspects of the benefit cost ratio have been assumed as forecast, such as journey time reliability, noise, air quality and greenhouse gases.

### Monetised journey time benefits

Over 90% of the forecasted project benefits were attributed to improvements in journey times and journey time reliability. Our evaluation identified that both journey times (Figure 2) and reliability (Figure 4, Figure 5) had improved compared to before the project. It was not possible to analyse observed flows and so direct comparisons to forecasted journeys and reliability benefits were not undertaken. However, as the analysis showed both journey time and journey reliability improvements, it is expected that the project will have delivered benefits to road users.

### Other reforecast impacts

We forecasted total safety benefits to be £15 million. This figure relates to the benefit on the strategic road network over 60-years. The reforecast is the same as the appraisal forecast.

[25] This is the PVC (present value cost) of the project's construction costs. This means it is presented in 2010 prices, discounted to 2010 to be comparable with the other monetary values presented. The total PVC when accounting for the assumed-as-forecast maintenance cost is £56 million.

## Overall value for money

Our evaluation demonstrated that there had been improvements in journey times and journey time reliability. These had been predicted to contribute over 90% of the project's benefits.

When considering an investment's value for money we also consider benefits which were not monetised in the appraisal. For this project, townscape and journey quality might be relevant considerations.

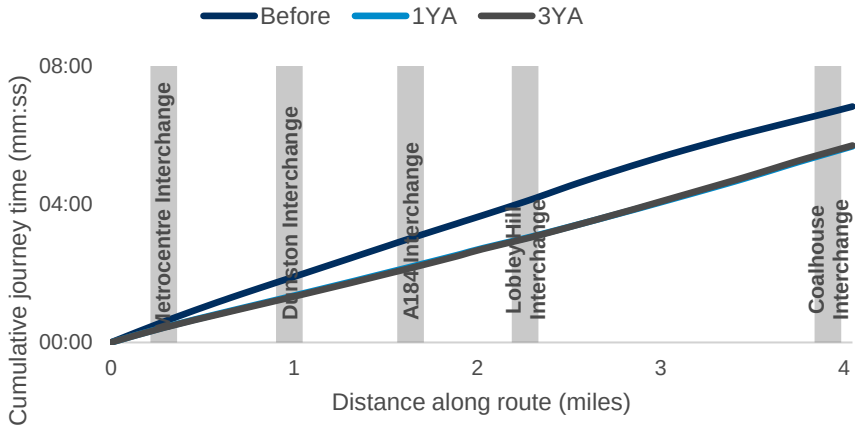
Townscape was forecast to be slight adverse and journey quality was forecast to be neutral. However, the appraised design was changed, and shotcrete was used which we concluded had increased the sense of urbanisation and worsened the views for road users. However, most other environmental impacts were as expected and so we considered that these issues are unlikely to substantially alter the projects value for money.

Overall, the evaluation indicated that in the first five years this investment is on track to deliver benefits for road users. However, as we could not evaluate all monetised impacts and all the outturn benefits, it was not possible to confirm that the predicted high value for money would be delivered.

# Appendix A

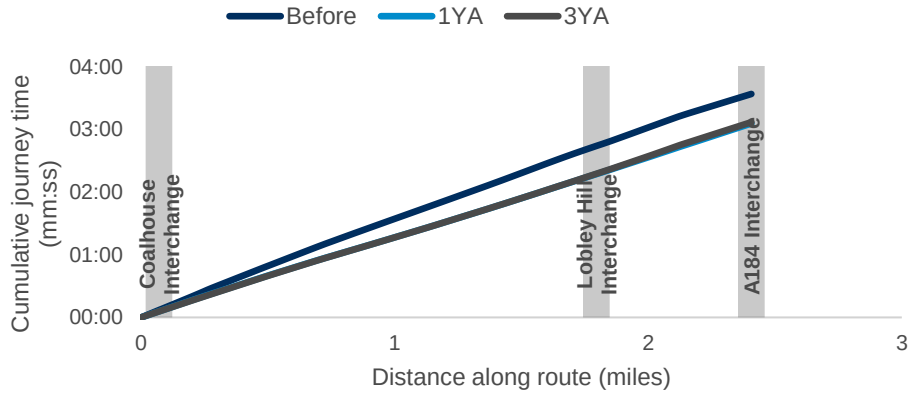
## A.1 Cumulative journey times

**Figure 17 Southbound cumulative journey times (morning peak)**



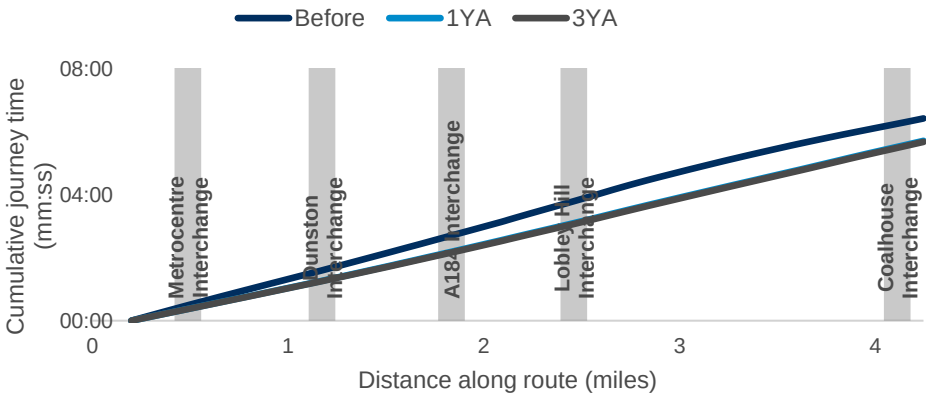

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 18 Northbound cumulative journey times (morning peak)**



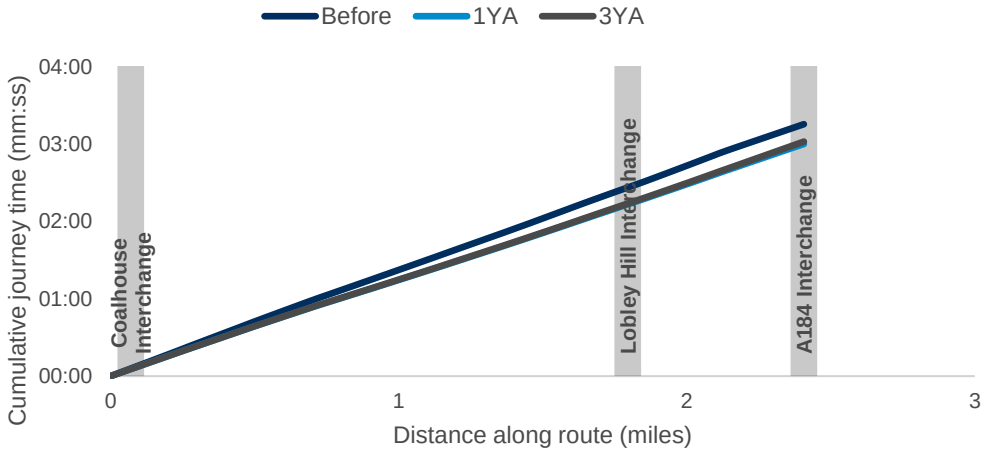

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 19 Southbound cumulative journey times (interpeak)**



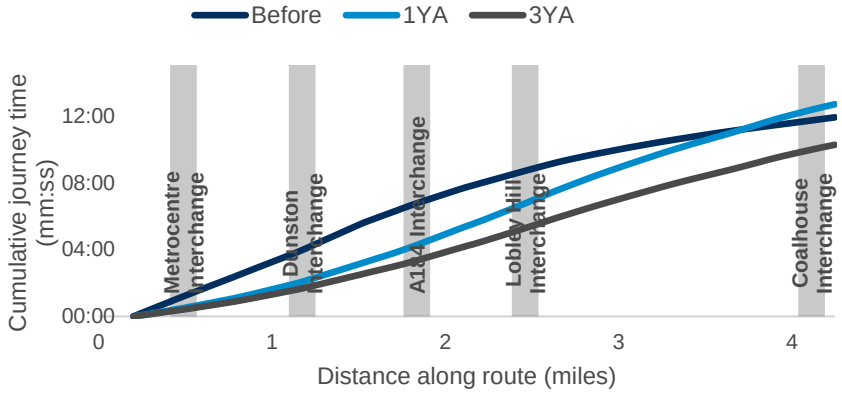

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 20 Northbound cumulative journey times (interpeak)**



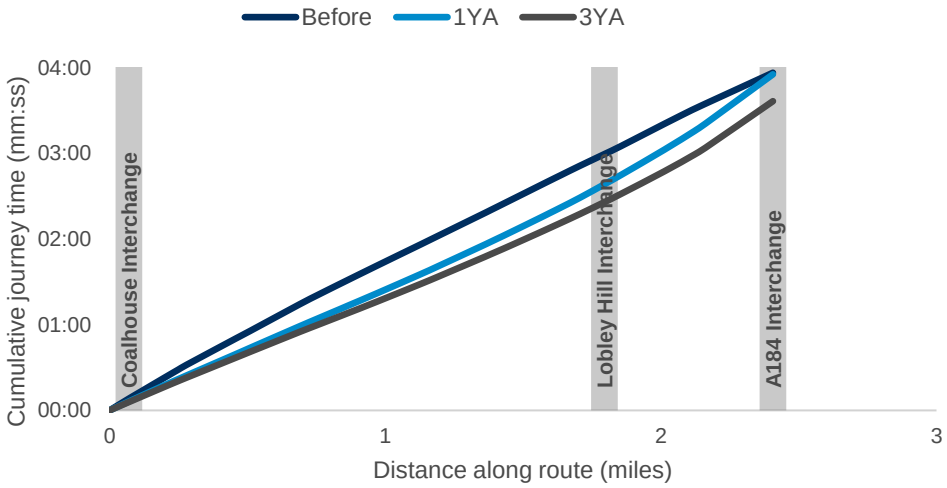

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 21 Southbound cumulative journey times (evening peak)**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

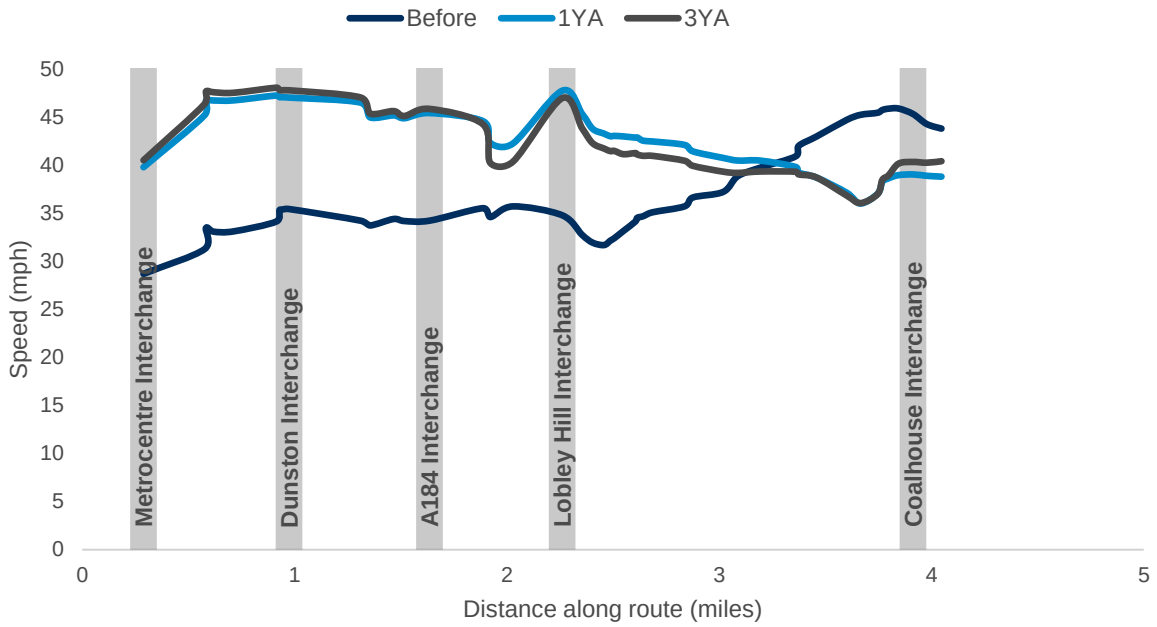
**Figure 22 Northbound cumulative journey times (evening peak)**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

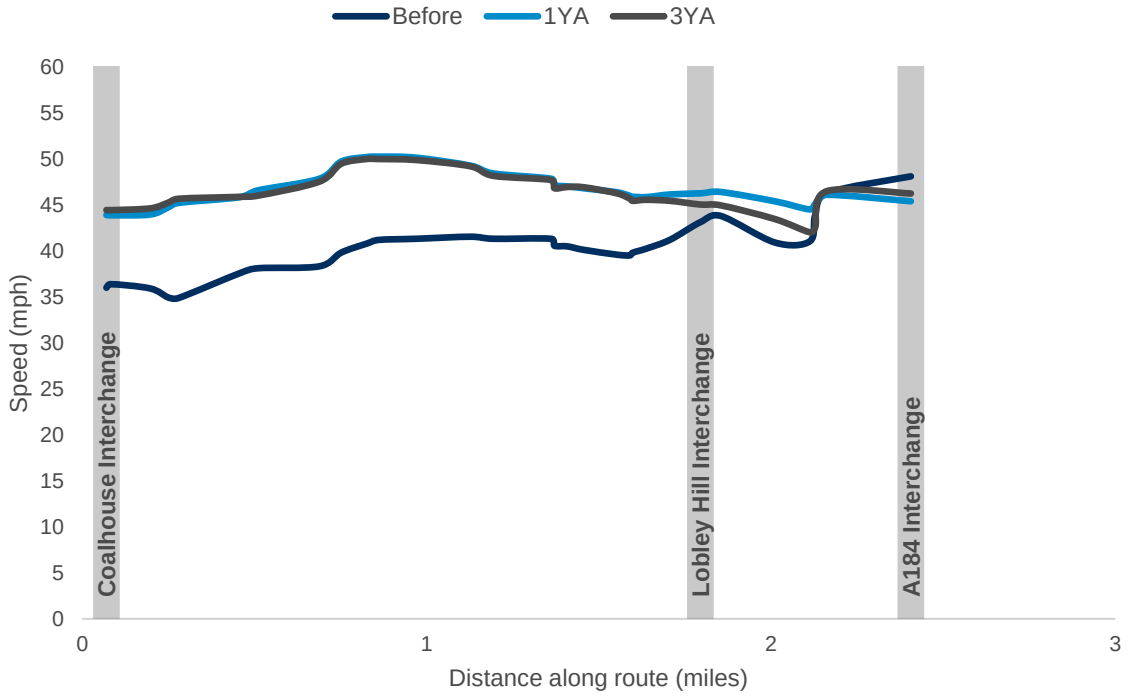
## A.2 Average speeds over distance plots

**Figure 23 Southbound average speeds (harmonic) (morning)**



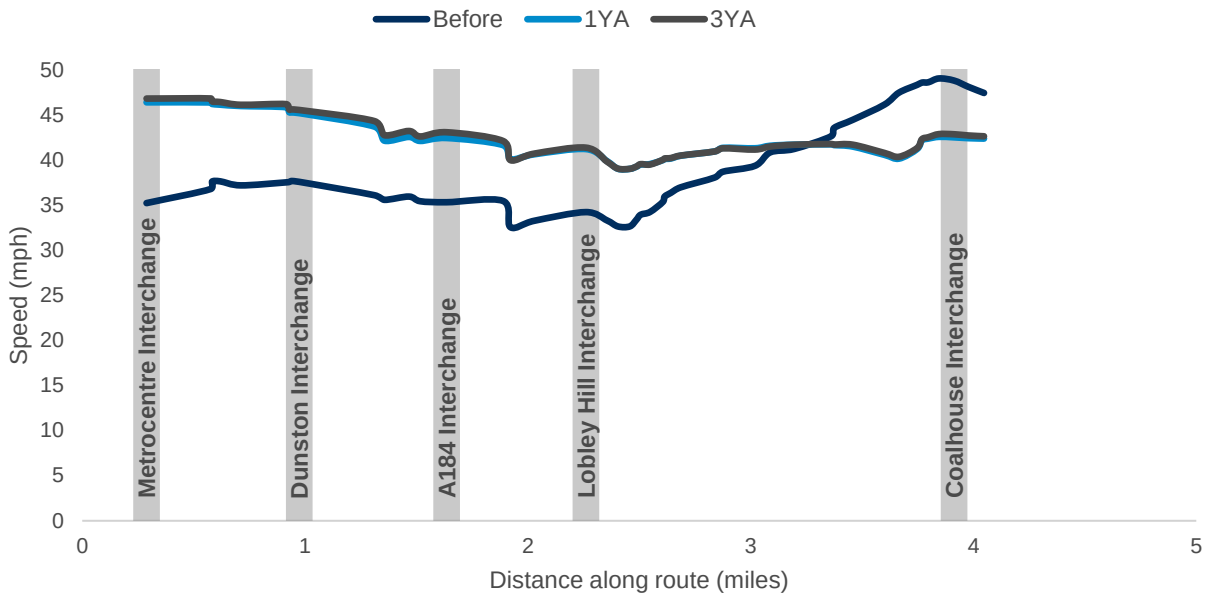

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 24 Northbound average speeds (harmonic) (morning)**



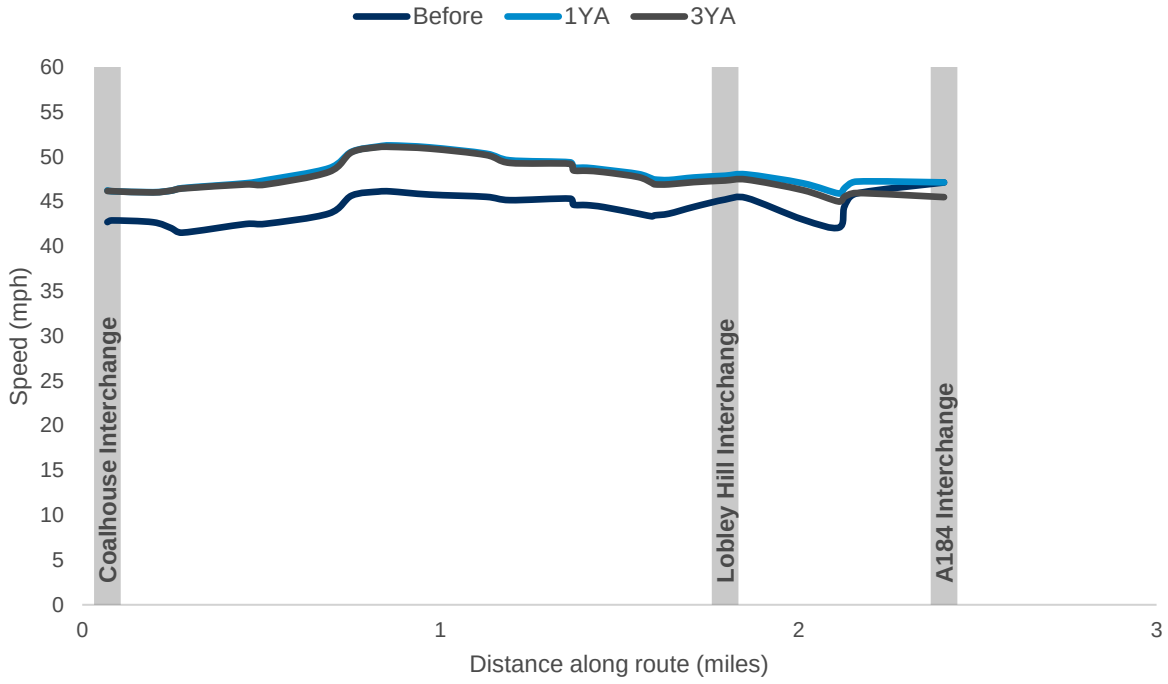

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 25 Southbound average speeds (harmonic) (interpeak)**



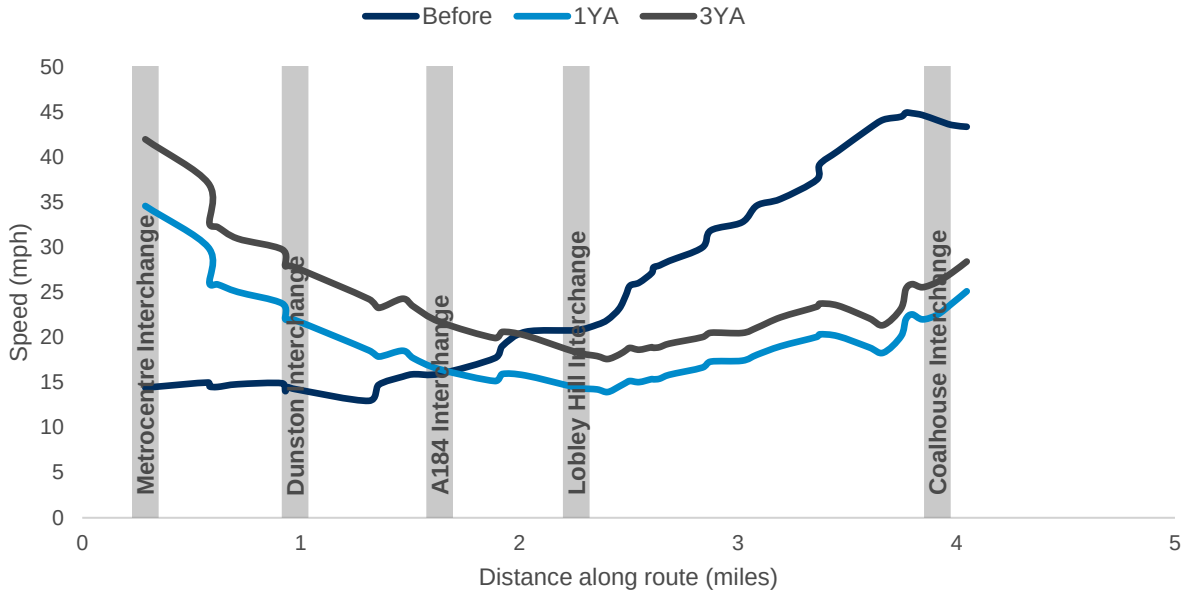

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 26 Northbound average speeds (harmonic) (interpeak)**



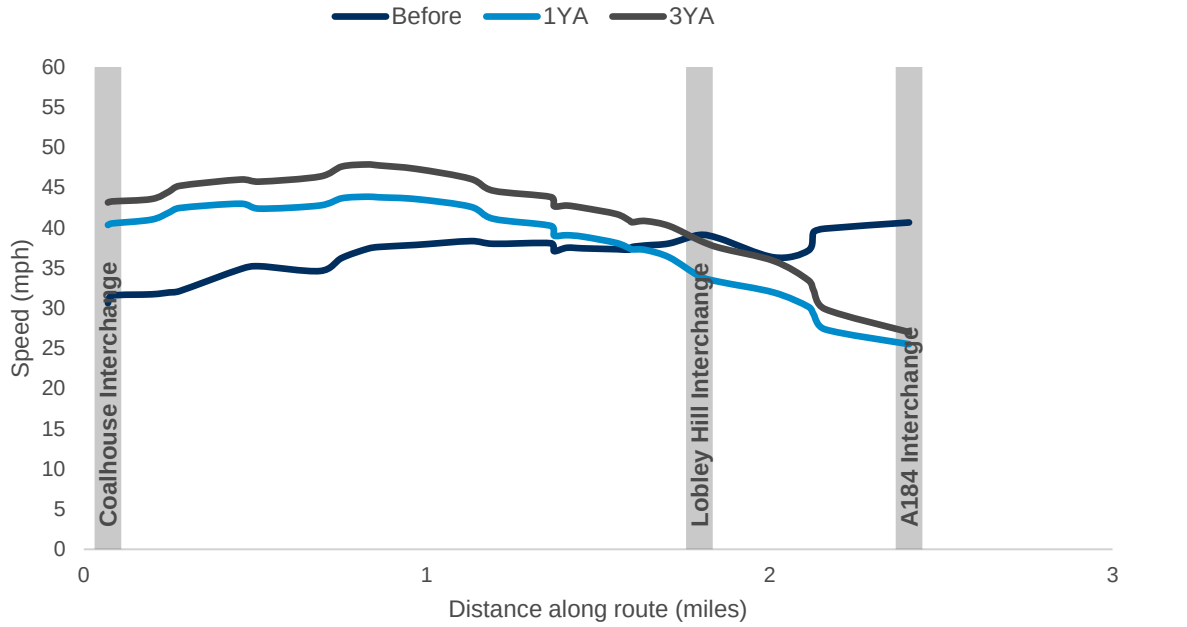

Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 27 Southbound average speeds (harmonic) (evening)**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

**Figure 28 Northbound average speeds(harmonic) (evening)**




Source: TomTom satnav data. Time periods: Before: 1 May 2013 to 20 Apr 2014; Post-opening 1YA: 1 May 2017 to 30 April 2018; 3YA: 1 Jan 2019 to 31 Dec 2019.

# Appendix B

## B.1 Incident reporting mechanisms

Police forces choose how they collect STATS19 data. Some police forces do this electronically, for example using mobile devices, while others complete paper forms which are later digitised. In addition, some collisions are reported by members of the public after the event. Since 2016, new data collection systems (called CRaSH and COPA) have been introduced by some police forces.

Before these new systems, reporting police officers categorised the severity of non-killed casualties as either serious or slight according to their own judgment of the injuries sustained. This was based on information available within a short time of the collision, and often did not reflect the results of medical examination. This sometimes led to casualties being incorrectly classified as slight injuries when they were serious, or vice versa.

In April 2016 Northumberland police constabulary transferred from Stats19 to CRaSH (Collision Recording and Sharing) system for reporting personal injury collisions. In CRaSH reporting, police officers record the types of injuries suffered by the casualty rather than the severity. In previous systems the determination of severity was at the discretion of the reporting police officer. CRaSH automatically converted the injury type to a severity classification. This led to implications for reporting on collision severity as there had been an increase in the number of serious collisions recorded[26].

These changes make it difficult to monitor trends in the number of KSI casualties over time or between different police forces. To help with this, the Office for National Statistics (ONS) has undertaken research to identify methods of estimating and adjusting for the increased recording of serious injuries in the new systems. Based on this work, the Department for Transport (DfT) have published an adjusted time series of KSIs at the national level and statistical adjustments at the record level. These adjustments are based on estimates of how casualty severities may have been recorded had injury-based severity reporting systems always been used.

The adjustments will be reviewed by the ONS and DfT as more data becomes available, and it is possible that further refinements will be made to the adjustment methodology in the future. Currently it is not possible to reliably adjust collision severity information at the granular level required for this project.

[26] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/820588/severity-reporting-methodology-final-report.odt

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