A5-M1 Dunstable Northern Bypass

One-year post-opening project evaluation

05 April 2022

Foreword

National Highways – previously known as Highways England when the A5-M1 Dunstable Northern Bypass project was delivered – is the government-owned company that operates, maintains and improves England's motorway and long-distance trunk road network. This project was delivered under Highways England's remit to make our roads safer and more reliable for the millions who depend on them daily.

We carried out construction of the A5-M1 Dunstable Northern Bypass project as part of our first five-year road investment strategy. The dual-carriageway bypass carries a mixture of local, regional and strategic traffic. Efficient operation of the route is deemed a key priority for the region's economic prosperity. Before the project, very high daily traffic volumes on an out-dated road design produced congestion, long delays and slower journey times on both the strategic and local road network. The project aimed to provide a range of measures to increase capacity, reduce congestion and improve safety.

Our post-opening project evaluations provide us with opportunities to determine how effective we are in delivering improvements against our portfolio of major projects. This report provides an initial indication of the project's performance after the first year following opening to traffic in May 2017. This report forms part of a longer-term evaluation study. We will review the project's performance again at five years after opening.

Our analysis indicated that road users' journey times heading south to M1 junction 9 were quicker and more reliable. Similarly, their journey times heading north to Hockliffe were quicker and more reliable too.

We also found positive signs that the project's safety objective to maintain and, where possible, improve current collision rates was on track to be achieved. We will, however, need more information to be sure.[1] We will review the project's performance again at five-years after opening as part of the long-term evaluation study.

Published monitoring data suggested that the project had had no significant effects on local air quality, as was expected. The outcomes for noise, landscape, townscape and water environment were also as expected.

Elliot Shaw

Executive Director, Strategy and Planning

April 2022

[1] Personal injury collisions on the strategic road network are very rare and can be caused by many factors. Due to their unpredictable nature, we must monitor trends over several years before we can have confidence that real change has occurred.

Table of contents

1. Executive summary

1.1. Background

The A5-M1 Dunstable Northern Bypass is a dual two-lane carriageway creating a new link between the A5 (western end) and the M1 (eastern end) with a new junction at 11A. The project opened to traffic in May 2017.

Before the project, road users used the A5 through Dunstable heading to Milton Keynes to the north and Junction 9 of the M1 to the south. The route was a single lane carriageway through Dunstable. Large vehicles travelling through the town centre caused congestion and created safety and environmental problems.

The project was designed to divert strategic traffic away from Dunstable, the stretch of A5 between the junction with the A505 to the north and the junction with Dunstable Road to the south.

1.2. Evaluation findings

1.2.1. Customer journeys

Before the construction of Dunstable Northern Bypass, the roads around Dunstable town centre were highly congested at most times of the day.[2] One year after the project had opened to traffic, there were fewer instances of congestion on the local roads. We found that the new bypass was carrying large volumes of traffic, with an average of around 28,400 vehicles using it weekly.

The changes in traffic on the roads around Dunstable were accompanied by improvements in journey times and journey reliability for road users on several routes assessed. At one year after, road users' journeys between Hockliffe and junction 9 of the M1 were reliable. Their southbound journeys were on average 13 minutes quicker and their northbound journeys were on average eight more minutes quicker.

Road users' journeys were reliable between Milton Keynes and Luton too. Their northbound journeys were around nine minutes quicker in the morning, and, on average, around 11 minutes quicker in the evening. Road user's journeys southbound towards Luton were around 12 minutes quicker in the morning and, on average, nine minutes quicker in the evening.

Furthermore, most road users' journeys had become more reliable and more consistent too. Road users travelling through Dunstable on Dunstable Northern Bypass experience a more reliable journey in both morning and evening peaks compared to travelling through Dunstable itself. And in most time periods the slowest journeys were reliable.

1.2.2. Safety

Personal injury collisions on the strategic road network are very rare and can be caused by many factors. Due to their unpredictable nature, we monitor trends over many years before we can be confident that a real change has occurred as result of the project.

[2] As shown by an analysis of speeds and journey times.

The case of the dual carriageway included a prediction that high volumes of traffic would use the bypass rather than local roads. In doing so, more road users would be using a safer standard of road. This would reduce the number of personal injury collisions by an average of 12 per year across the entire safety study area.

Within the first year, there have been 13 personal injury collisions (PIC) on Dunstable Northern Bypass.

The findings indicate improved safety trends on Dunstable High Street. The number of PICs has reduced from an average of 32 to 22. The rate of collisions has fallen from a collision every 1.8 million vehicle km to a collision every 1.4 million vehicle km.

Safety trends can change over time due to factors beyond the road layout. The findings indicate that if Dunstable Northern Bypass had not been constructed, the average number of PICs would range from 20-52 personal injury collisions on average per year.

On the surrounding network[3] there was an increase of one personal injury collision (based on 616 personal injury collisions observed in the first 12 months of operation compared with 615 before construction). If Dunstable Northern Bypass had not been constructed, we estimate an annual average of between 629 and 775 personal injury collisions estimated over this time period. This indicates that the surrounding road network might have experienced an increase in personal injury collisions if the Dunstable Northern Bypass had not been constructed.

The analysis will need to be revisited in later years before we are sure that the change is significant. It will require a longer timeframe to determine if these initial positive findings are a real trend or natural fluctuation. An evaluation will be conducted at five-years after opening to establish if early positive findings have continued.

1.2.3. Environment

Our one-year after evaluation highlighted that impacts to most environmental sub-objectives including on landscape, townscape, air quality and the water environment were broadly as expected. For biodiversity and heritage, it was considered too early to determine the outcome as monitoring and survey reports were not yet available.

It was not possible to quantify greenhouse gas emissions but, based on the overall lower than forecast traffic volumes for the A5 bypass itself, it was likely that emissions were lower than forecast. The outcome for noise impacts across the project study area was influenced by whether traffic volumes along the particular road were lower or higher than forecast. However, even for those roads with higher than forecast traffic volumes, the data indicated that the impacts were likely to be lower than had the project not been built.

[3] The road network was determined as part of the appraisal process to understand changes to road safety on the project extent and roads which the project may have an impact.

Introduction

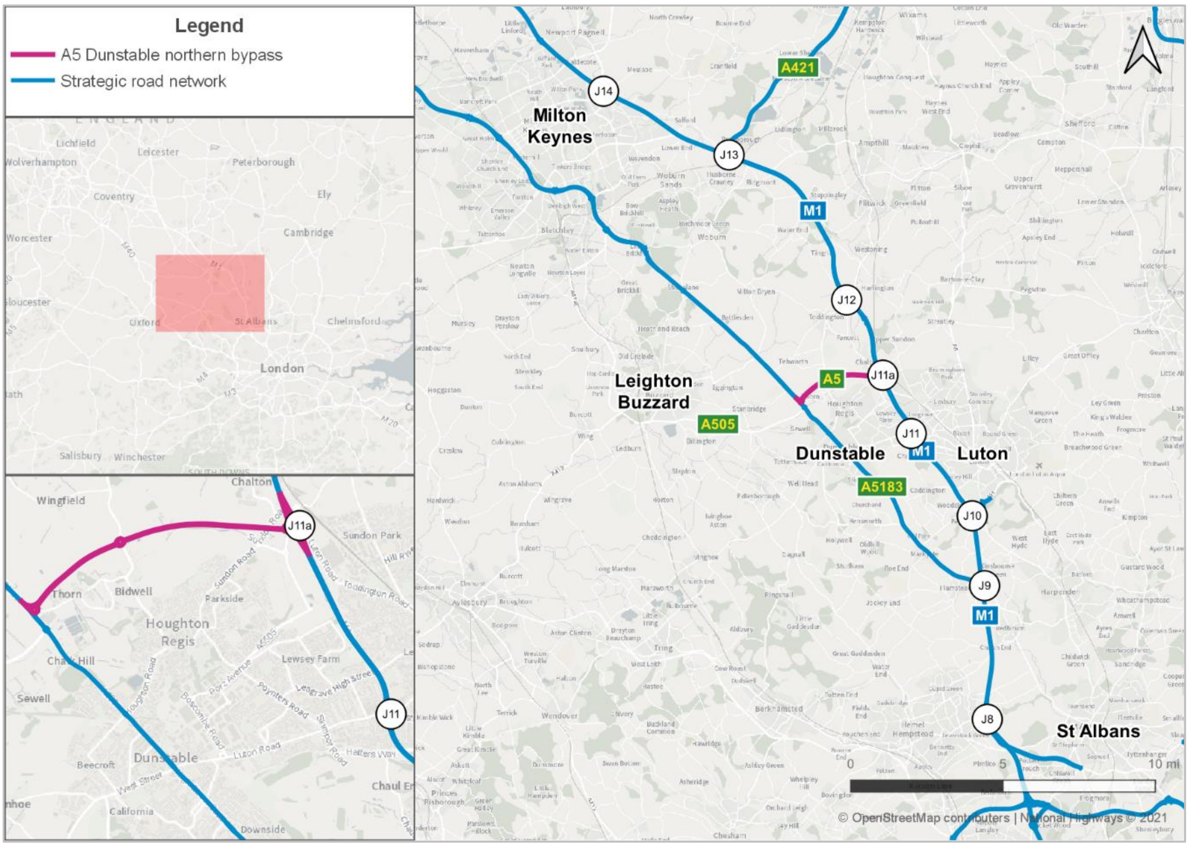
1.3. What was the project designed to achieve?

The A5-M1 Dunstable Northern Bypass was designed to provide an alternative route for road users to access the M1 without travelling through Dunstable. It aimed to make road users' journeys more reliable and safer by removing strategic traffic out of Dunstable. The new route aimed to reduce traffic travelling to junctions 9, 11 and 12 of the M1 from the local road network in Dunstable, Houghton Regis and surrounding areas. Construction of the £2.7 million dual carriageway started in 2015 and opened to traffic in May 2017, linking the A5 to the west and the new M1 Junction 11A to the east.

1.4. Project location

The A5 is a strategic route in England, linking London with the Midlands and the North. The project section is in the county of Bedfordshire to the north of Dunstable and Luton. The location of the project is shown in Figure 1 A5-M1 Dunstable Northern Bypass project location below.

Figure 1 A5-M1 Dunstable Northern Bypass project location



Source: National Highways and OpenStreetMap contributors.

The A5 runs parallel to the M1 and provides an alternative route to the M1 between junction 9 and Milton Keynes. The A5 passes through central Dunstable and intersects the A505/B489. The A5-M1 Link Dunstable Northern Bypass comprised of around 2.7 miles of two-lane dual carriageway running east from the A5 and north of Dunstable, joining the M1 at a new junction 11a. The new junction links to the M1 junctions 10-13 dynamic hard shoulder project. Before this new link, Dunstable was accessed by road users of the strategic road network via junctions 9 and 11 of the M1, and from junction 12 of the M1 via the B5120.

1.5. How has the project been evaluated?

Post-opening project evaluations are carried out for major projects to validate the accuracy of estimated project impacts which were agreed as part of the business case for investment and to measure whether the expected benefits are likely to be realised. This provides lessons learned to improve future project appraisals and business cases.

The evaluation is also important for transparency and accountability of public expenditure by assessing whether projects are on track to deliver the anticipated value for money.

A post-opening project evaluation compares changes in key impact areas by observing trends on the route before the project was constructed (baseline) and tracking these after the opening of the project to traffic. The outturn impacts of the project are evaluated against the expected impacts of the project (presented in the forecasts made during the project planning process) to review the project's performance.

For more details of the evaluation methods used in this study, please refer to the POPE methodology manual. This can be found on the National Highways website.[4]

[4] https://nationalhighways.co.uk/publications/

2. Delivering against objectives

2.1. How has the project performed against objectives?

All our major projects have specific objectives which are defined early in the appraisal process when project options are being identified. The benefits of our major projects are appraised on the assumption that they will be realised over 60 years. The one-year after evaluation provides early indication of progress in achieving the objectives and the realisation of benefits, while the five-years after evaluation gives a more detailed insight. The main objectives for the A5-M1 Dunstable Northern Bypass are summarised below along with our findings:

Table 1 Objectives and Evaluation summary

Objective	One-year evaluation
Provide an alternative to existing A5 and A505 routes through Dunstable Town Centre	Met – An average of 28,400 vehicles use Dunstable Northern Bypass on a typical working day. This has been accompanied by a fall in the numbers of vehicles using the existing A5 and A505.
Provide lower journey times and better journey time reliability	On track to be met – Road users' journey times and speeds on the Dunstable Northern Bypass show improvement compared to those on the old A5 through Dunstable. Journeys using Dunstable Northern Bypass are also more reliable compared to the old A5 through Dunstable.
Contribute to the reduction of strategic traffic movements to/from M1 through Dunstable	Met – Analysis implied that strategic traffic is using Dunstable Northern Bypass with a reduction in the number of road users on surrounding local road network. Traffic counts indicate a reduction in the number of heavy good vehicles traversing through Dunstable Town Centre.
Reduce the number and severity of accidents	Too early to conclude – There has been a reduction in the number of personal injury collisions and collision rate. Based on regional trends, the reduction is consistent with what would have occurred without the project in place. However, it is too early to draw any definitive conclusions.
Enable the connection into J11A of the Woodside Link Road and Luton Northern Bypass which are local authority projects	Woodside Link Road connects to Dunstable Northern Bypass. Junction 11A is enabled for connection to potential A6 Luton Northern Bypass.

3. Traffic Evaluation

3.1. Summary

Before the construction of Dunstable Northern Bypass, the roads around Dunstable town centre were highly congested at most times of the day.[5] One year after the project had opened to traffic, there were fewer instances of congestion on the local roads. We found that the new bypass was carrying large volumes of traffic, with an average of around 28,400 vehicles using it weekly.

The changes in traffic on the roads around Dunstable were accompanied by improvements in journey times and journey reliability for road users on several routes assessed. At one year after, road users' journeys between Hockliffe and junction 9 of the M1 were faster. Their southbound journeys were on average 13 minutes faster and their northbound journeys were on average eight minutes faster.

Road users' journeys were faster between Milton Keynes and Luton too. Their northbound journeys were around, on average, nine minutes faster in the morning, and around 11 minutes quicker in the evening. Road user's journeys southbound towards Luton were, on average, around 12 minutes quicker in the morning and nine minutes quicker in the evening.

Furthermore, most road users' journeys had become more reliable and more consistent too. Road users travelling through Dunstable on Dunstable Northern Bypass experience a more reliable journey in both morning and evening peaks compared to travelling through Dunstable itself. And, in most time periods, the slowest journeys were faster.

3.2. How have traffic volumes changed?

In the following sections we examine whether traffic volumes changed over the evaluation period and to what extent any changes expected in the project appraisal were realised.

3.2.1. National and regional

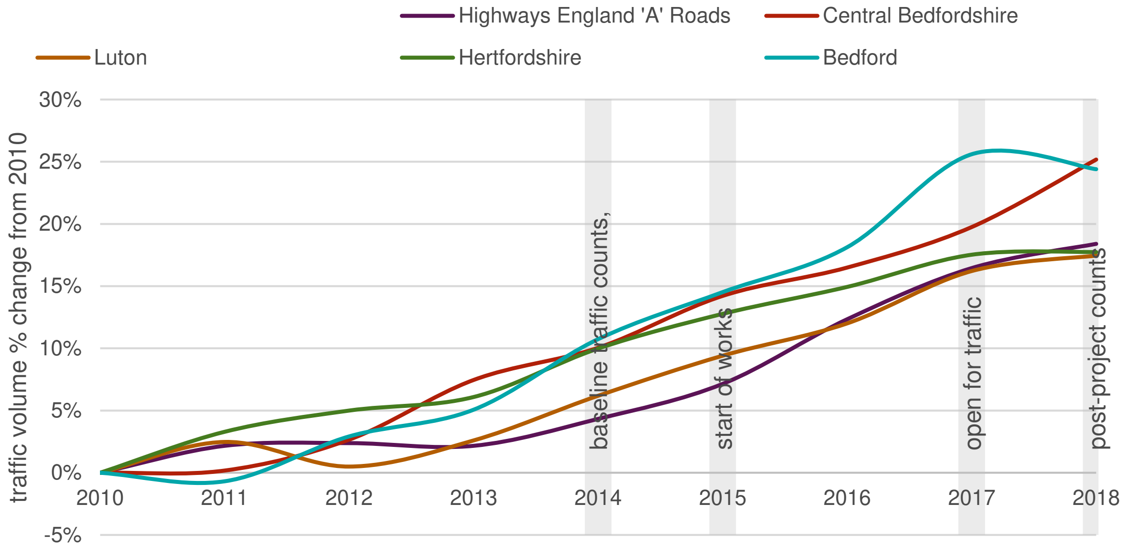
To first get a sense of the background changes in traffic we collated relevant statistics covering the period from the base year of 2010 to 2018, one year after opening.[6] Over the period, traffic volumes increased steadily, as seen in

Figure 2.

[5] As shown by an analysis of speeds and journey times.

[6] The Department for Transport (DfT) annually publishes traffic statistics detailing total numbers of observed million vehicle kilometres (mvkm) travelled. They produce several data tables categorising the statistics by local authority and road type. We used the data table for local authorities, TRA8904.

Figure 2 National, Regional and Local Traffic Growth



Source: Table TRA8904 'Motor vehicle traffic (vehicle kilometres) by local authority in Great Britain', DfT.

The key period of interest is between 2014 and 2018, the respective years of baseline and post-opening traffic counts. Over the period, the amount of distance travelled in the most relevant regions grew by around 15%. The traffic count information discussed in subsequent sections was not adjusted to account for the background traffic trends.[7]

3.2.2. How did traffic volumes change?

We constructed the A5-M1 Dunstable Northern Bypass to provide a better alternative for road users to the existing route through Dunstable town centre (A5-A505) and a redistribution of traffic on the roads around Dunstable was anticipated following the project's completion. On local roads near to the project, volumes were expected to fall. Whereas on the M1 to junction 11a, on the Dunstable Northern Bypass, on the A5 to Milton Keynes and on the A505 towards Leighton Buzzard, volumes were expected to increase. Also, HGV traffic was expected to switch to the SRN too, following the local authority's placing of weight restrictions on the local road network.

At one year after, the evidence suggested the anticipated changes outlined above had generally occurred. (see Figure 3). Road users had re-routed from the local road network to Dunstable Northern Bypass.

[7] A methodology to account for background trends was employed in earlier project evaluations. However, following the economic downturn in 2008, its use was discontinued due to the significant impact the downturn had on road traffic in subsequent years. We now advise that interpretation of traffic volume changes incorporates a qualitative appreciation of the impact of relevant background trends.

Figure 3 Map of traffic counts

Table 2 Changes in traffic volumes

ID	Location	Before AWT	1YA AWT	%Change
1	A5 Watling Street	17,800	22,000	29%
2	Hocliffe Road	6,100	3,400	-44%
3	Tebworth Road	400	400	0%
4	Chalgrave Road	1,400	800	-43%
5	Leighton Road	5,000	2,800	-44%
6	Luton Road	9,900	3,900	-61%
7	A505	15,500	23,700	53%
8	Thorn Road	11,900	3,500	-71%
9	B5120 Bedford Road	13,800	9,000	-35%
10	Sundon Road	10,600	14,200	34%
11	A505 Watling Street	16,600	16,700	1%
12	A5183	23,500	21,000	-11%
13	A505 Dunstable Road	29,100	29,500	1%
14	Dunstable Northern Bypass	-	29,100	-
15	Dunstable Northern Bypass	-	27,700	-
16	M1 Junction 8-9	180,100	192,600	7%
17	M1 Junction 9-10	171,300	186,700	9%
18	M1 Junction 10-11	152,700	168,100	10%
19	M1 Junction 11-11a	152,700	156,400	2%
20	M1 Junction 11a-12	139,600	142,300	2%

Note: Counts are two-way average weekly traffic rounded to nearest 100. Source: Highways England WebTRIS and commissioned counts – Sky High Count On Us (2014 traffic counts); Tracsis (2018 traffic counts).

In the first 12 months after opening, weekday traffic volumes on the bypass averaged 28,400 vehicles. And on the A5 north of the bypass traffic also substantially increased by around 28%. While on the M1 between junctions 9-11a traffic increased by around 11%. These changes indicated road users were now opting to exit the M1 at junction 11a to use the A5. This was corroborated by the 28% growth which occurred on A5 north of the link road, compared with an average annual growth 1% before the project opened, and by the 25% increase on Sundon Road which lies at the exit to junction 11a. There had also been a 34% reduction in traffic volumes on the local road network, adding further support to our hypothesis

And the proportion of HGV traffic on both the A505 Watling Street and A5183 had fallen substantially at one year after, by around 10%. The HGV proportions of the traffic carried by the bypass were around 20% and 55% (see Table in Annex 1: % HGV average weekday traffic).

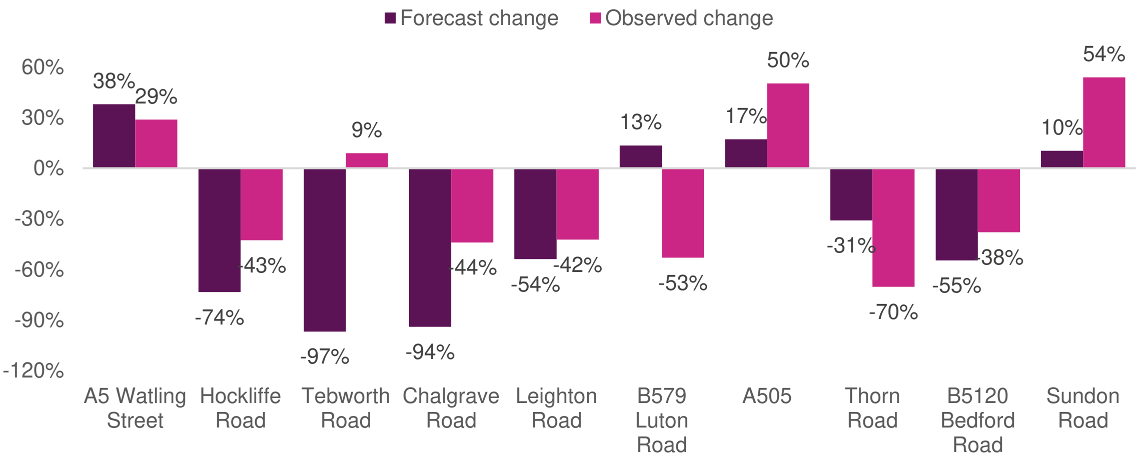
3.2.3. Was traffic growth as expected within the business case?

To understand more about the accuracy of the traffic model and its forecasts, we compared the amounts of change the appraisal expected with the amounts observed at several locations. The results are shown in **Error! Reference source not found.Error! Reference source not found.**.

The comparisons indicated the appraisal's traffic forecasts at the locations evaluated were variable, with many falling outside the accepted ranges.[8] Only the expected increase on the A5 Watling Street was within the accepted range.

The assumptions that underpin a traffic model can be a factor in the forecasts that it produces. The project's appraisal assumed that traffic growth would be higher than that which was observed. Also, the traffic model incorporated assumptions that several housing and employment developments would progress and generate traffic which would use the A5-M1 Dunstable Northern Bypass and surrounding road network. These developments had not been progressed by the time the project opened to traffic.

Figure 4 Forecast and observed change in traffic volumes



Source: Highways England WebTRIS and commissioned counts 2018, A5-M1 Link (Dunstable Northern Bypass) Traffic Forecasting Report, Costain-Carillion Joint Venture (May 2010).

[8] Traffic models are generally deemed acceptably accurate if the forecast flows are within +/- 15% of the observed flows used to validate the model.

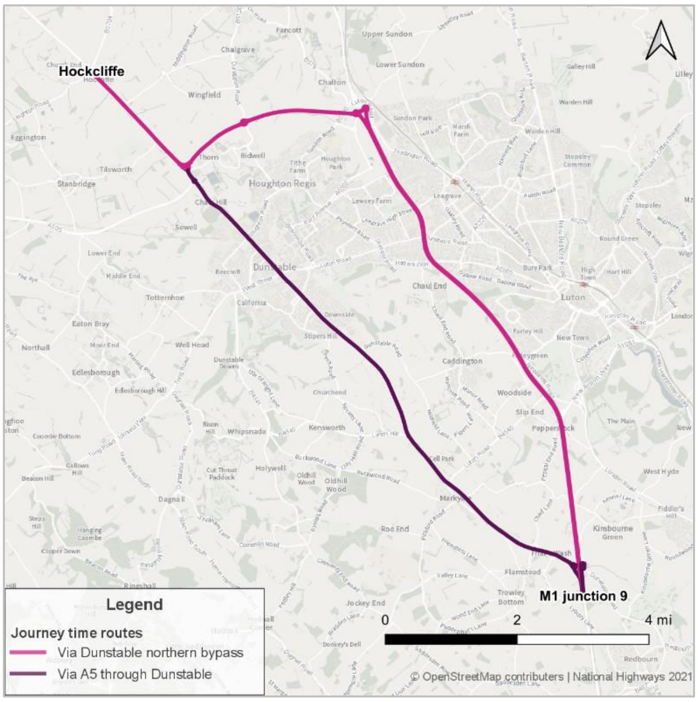
3.3. Relieving congestion and making journeys more reliable

A key objective of the project was to reduce road users' journey times when travelling between Hockliffe and junction 9 of the M1 and to make their journeys more reliable. In this section we evaluate the project's impacts on journey times and the reliability of journeys.[9] We used satnav traffic information to assess the extent to which the journey times observed on the route varied from the average expected journey time. Comparisons of how this variability changes over time can give an indication of how reliable the average observed journeys are. In turn, we can use this information to infer a project's impact on congestion.

3.3.1. Did the project deliver journey time savings?

We compared the changes in average journey times in three key time periods[10] on two routes representing the pre- and post-project alignments of the A5. Both routes ran between a point in Hockliffe north of the bypass and junction 9 of the M1 (see Figure 5 Journey time routes).

Figure 5 Journey time routes



Note: The baseline journey times for 2014 were derived from the old alignment of the A5 though Dunstable. The post-opening journey times for 2018 were derived from the alignment of the new bypass route.
Source: OS Maps; TomTom satnav data.

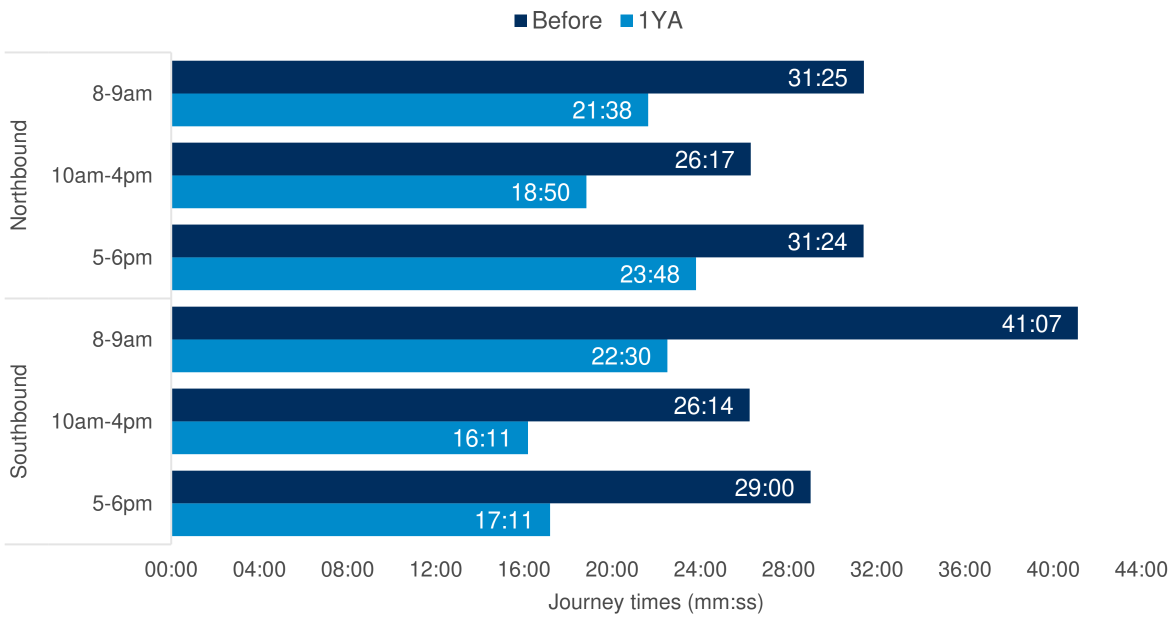
At one year after, we found that road users' average journey times between Hockliffe and the M1 junction 9 via the bypass in the key time periods were substantially faster than those observed via the 'old' route through Dunstable. Their northbound journeys towards Milton Keynes were improved by between nine and

[9] To understand a project's impact on reliability, we compare the changes in the percentile ranges of a large sample of journey times, relative to the median journey time. A percentile represents the value below which a given percentage of data points in a sample lie. For example, the 20th percentile is the value below which 20% of the data points lie. It follows that 80% of the data points lie above the 20th percentile value.

[10] The three key time periods were the same as those of the appraisal: the morning peak (8-9am), inter-peak (IP) (10am-4pm) and the afternoon peak (5-6pm).

12 minutes, while their southbound journeys towards Luton were improved by around 11 minutes. Figure 6 shows the results.

Figure 6 Observed average weekday journey times



Note: Before: 2014, A5 through Dunstable; 1YA: 2018, via Dunstable Northern Bypass
Source: TomTom satnav data.

3.3.2. Were journey time savings in line with forecast?

Journey time forecasts were produced for two scenarios in the project's appraisal. The 'with project' scenario illustrated the changes that were likely to occur if the project was implemented, while the 'without project' scenario illustrated the changes that were likely to occur if the project was not. For each scenario, forecasts were produced for the project's opening year and for a future 'design year'.[11] For this project, the forecasts were produced for an opening year of 2014 and a 'design year' of 2029.

Comparison of the different forecasts showed that the project was expected to reduce the journey times in both directions across all time periods in the opening year, with further reductions being achieved in 2029.

3.3.3. Did the project make journeys more reliable?

The project also had an objective to improve the reliability of road users' journeys by making them more predictable. If the time taken to travel the same journey each day varies, we are less confident in planning how long our journey will take. If journey times do not vary, we can be more confident and allow a smaller window of time to make that journey.

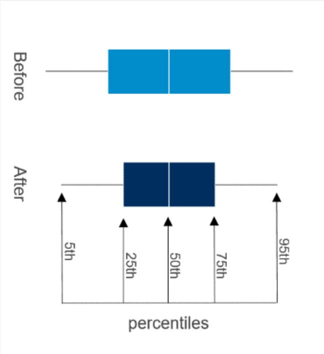
To understand how the project impacted journey reliability, we examined the degree to which observed journey times varied from average journey times. Providing a percentage of journey times above or below the median journey time provides an indication of the variability of journey times.

Comparing the variability of the journey times using both routes shown, there has been an improvement in the variability in journeys, therefore we can conclude that

[11] A project's 'design year' is usually 15 years after opening.

the project is making journeys more reliable. We illustrate the analysis using box plots. Figure 7 What does a box plot show?explains what a box plot shows.

Figure 7 What does a box plot show?

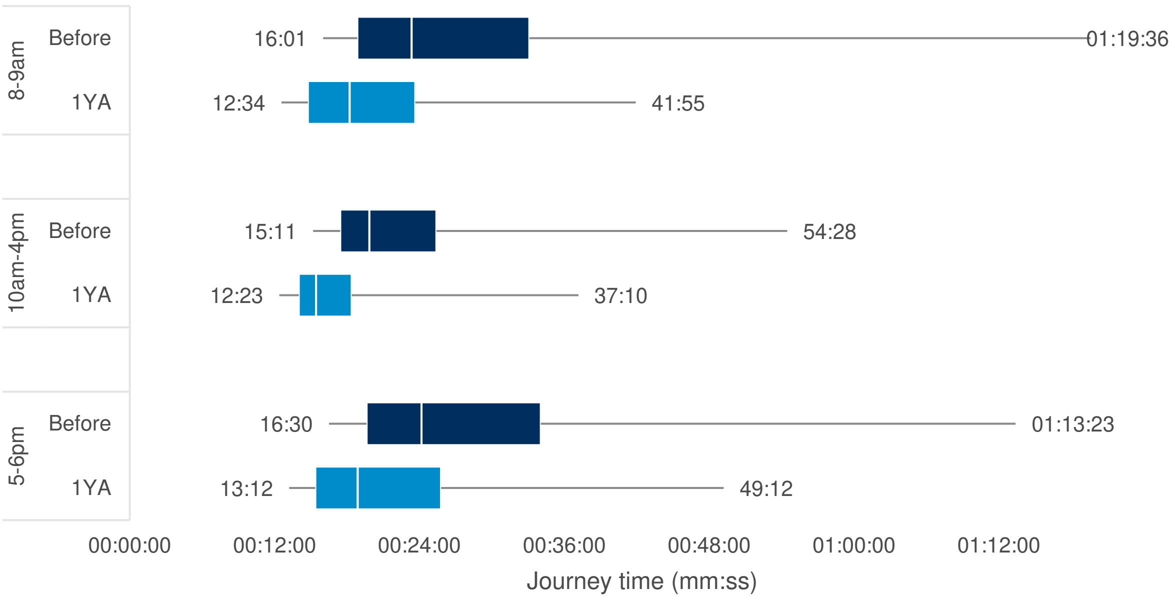


The leftmost point is the 5th percentile of journey times, the point below which just 5% of journeys in the sample are faster. The rightmost point is the 95th percentile, the point below which 95% of journeys are faster. Together, the two points show the difference between the shortest and longest journey times, disregarding outliers.

The width of the block in the middle marks the bulk of journeys, the 50% of journeys lying between the 25th and 75th percentiles. The smaller the block, the less variable average journey times are, and so the more reliable they are.

At one year after the project opened to traffic, the variability of journeys made by the bulk of road users on the routes assessed had reduced.[12] We saw improvements in all time periods and in both directions. This indicated that the reliability of their journeys had therefore improved. Figure and Figure show the results.

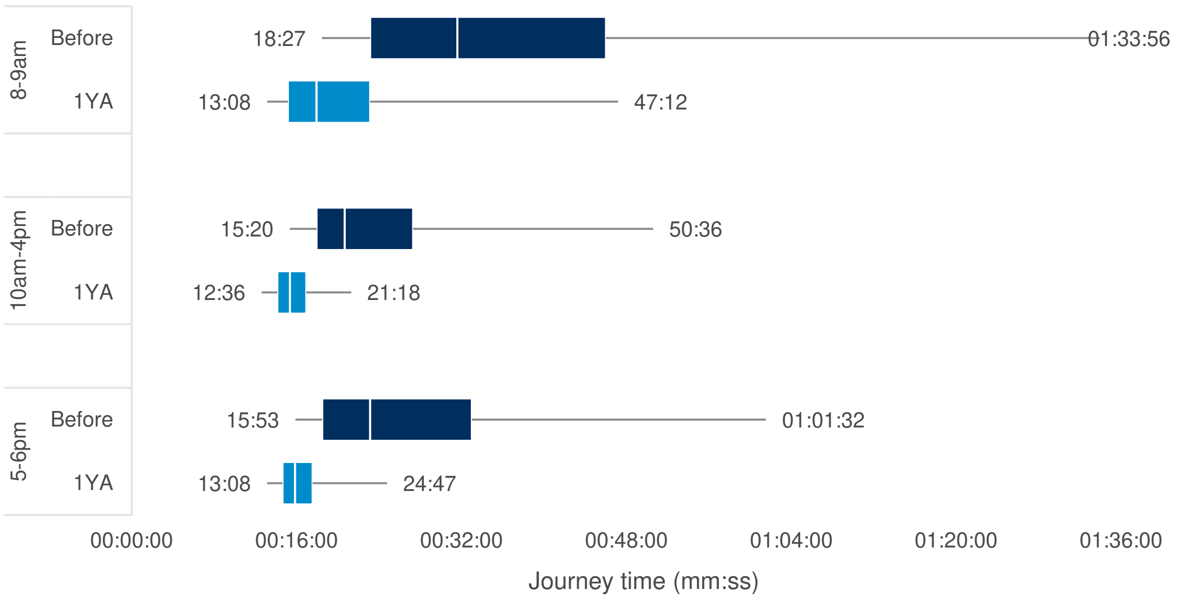
Figure 8: Change in northbound journey time reliability



Source: Satellite navigation (TomTom) 2014 and 2018.

[12] As shown by the range between the 25% and 75% percentiles.

Figure 9: Changes in southbound journey time reliability



Source: Satellite navigation (TomTom) 2014 and 2018.

4. Safety evaluation

4.1. Summary

The safety objective for this project was to reduce accidents by removing conflicting movements between strategic and local road traffic.

For the purposes of this report, we have observed personal injury collisions that have taken place and performed a counterfactual test within Dunstable from the junction of Watling Street with A505 to the junction of A5183 with B4540 Luton Road.

We have observed personal injury collisions that have taken place on Dunstable Northern Bypass since the project opened for traffic. We have also observed personal injury collisions that have taken place and performed a counterfactual test for the wider appraised area which incorporate strategic and local road networks from Milton Keynes in the north to junction 8 of M1 to the south (as shown in Figure 10).

The number and rate per million vehicle kilometres of personal injury collisions have also been analysed to track a change over time. In the first year of the bypass being operational, there has been a reduction in both the rate and number of personal injury collisions compared with the annual average for the five years before the project was built within Dunstable.

In the first 12 months of the project being open, there were 13 personal injury collisions on the bypass itself. In comparison, during the same period, there were 22 personal injury collisions on the original route through Dunstable. This is a reduction compared to the annual average of 32 per year in the five years prior to construction. If the bypass had not been constructed, it is estimated there would have been between 20-52 collisions on the existing road.

The number of personal injury collisions was also lower than forecast within the business case.

Based on these early indications, the safety objective is on track to be achieved. The analysis will need to be revisited in later years before we are sure that the change is significant. It will require a longer timeframe to determine if these initial positive findings are a real trend or natural fluctuation. An evaluation will be conducted at five years after opening to establish if early positive findings have continued.

4.2. What safety improvements were forecast?

The business case for the project predicted that the development of the bypass would reduce the number of personal injury collisions by an average of 12 per year[13] across the entire safety study area.

The forecast predicted that high volumes of traffic would relocate to Dunstable Northern Bypass and would be using a safer standard of road. A reduction of 266 personal injury collisions observed along the route through Dunstable from the new junction with the Bypass to junction 9 (an average of 4 per year).

[13] Based on an increase of 294 collisions on Dunstable Northern Bypass and a reduction of 714 personal injury collisions over a 60-year appraisal period for the entire safety study area as shown in Figure 10.

The appraisal forecasted an average of five collisions per year on Dunstable Northern Bypass.

Another study will be conducted after the project has been open for a longer timeframe, allowing a more representative time period, to determine if the safety objective has been achieved.

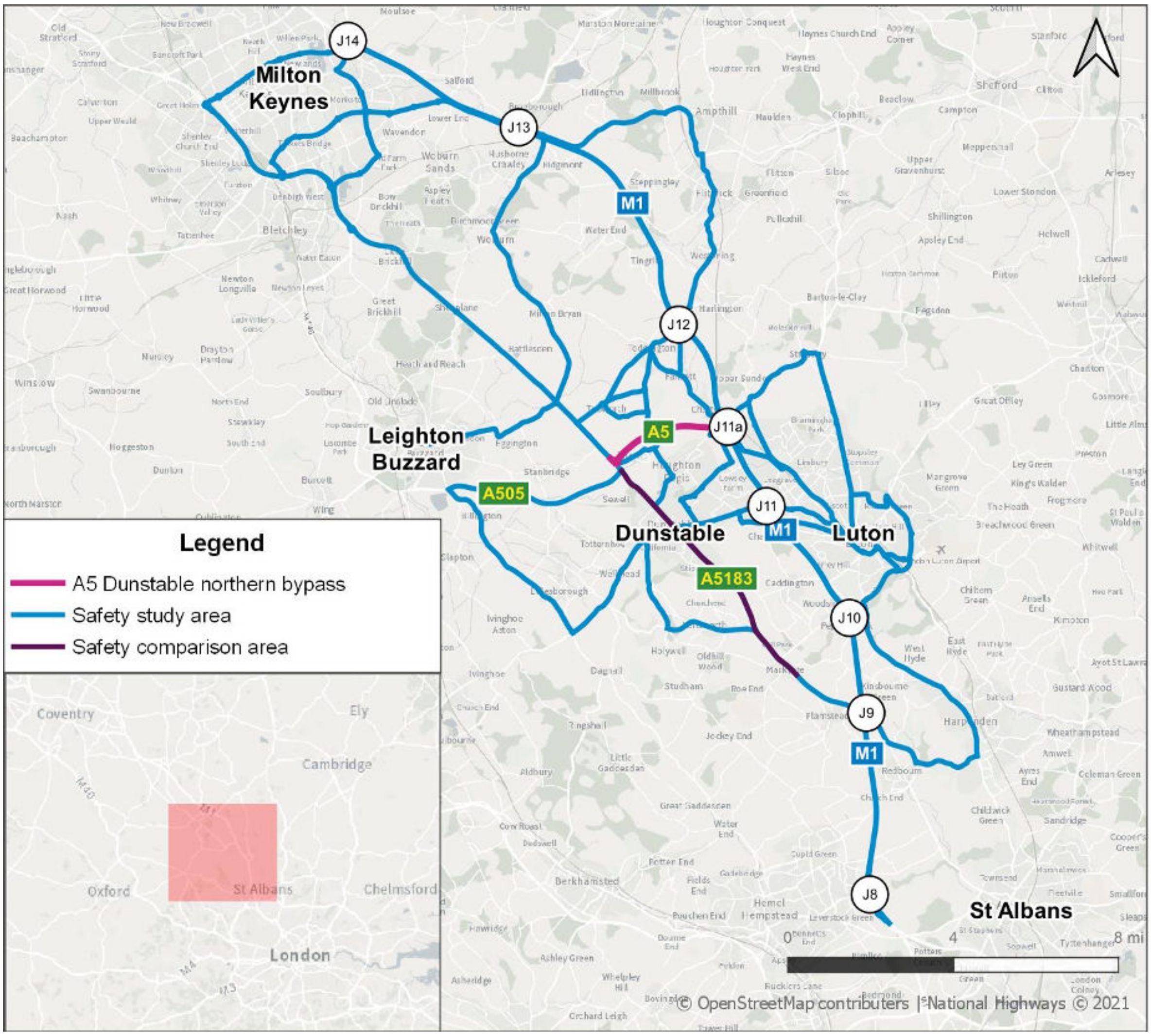
4.3. Safety study area

The safety study area, shown in

Figure comprises the project extent of the Dunstable Northern Bypass. A wider impact area including the route through Dunstable has also been considered to allow us to determine the impacts on safety that the project has had on both the project extent and the wider area.

By comparing the number of personal injury collision (PICs) that occur within the study area before and after the project improvements enables us to evaluate the impact the project had on road safety.

Figure 10 Safety study area



Source: Highways England and OpenStreetMap contributors.

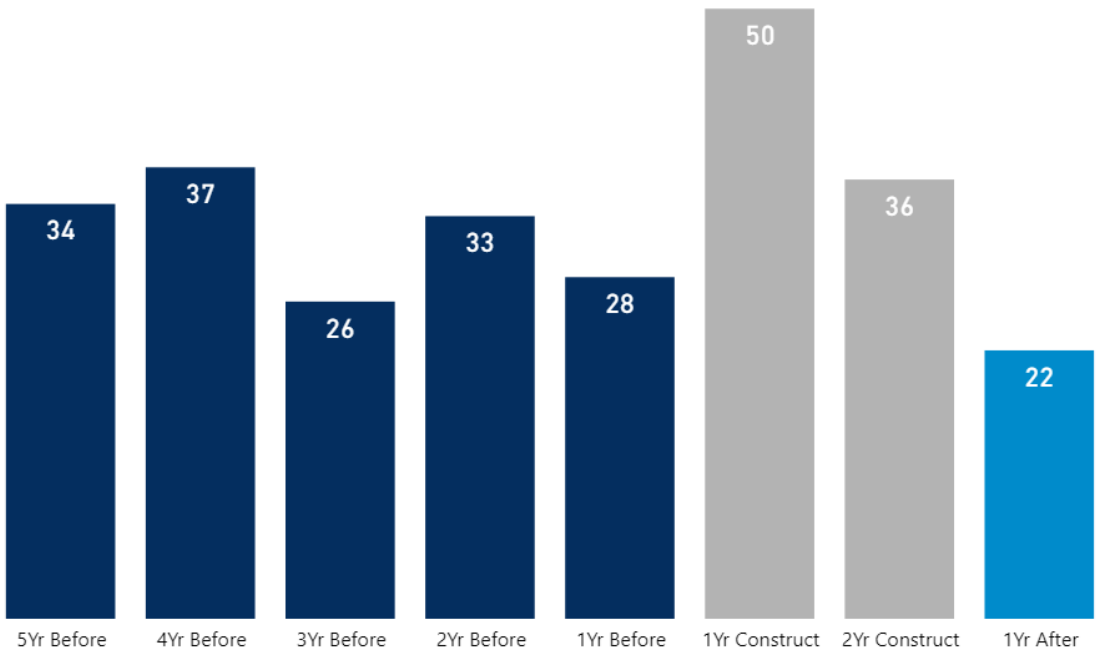
4.4. What are the emerging safety trends within the first 12 months of the project?

We assessed changes in safety over time by looking at the trends in relevant safety data in the five years before the project's construction began, during construction and over the first 12 months after it opened to traffic.[14] We considered only those collisions that resulted in personal injury and produced an average number per year for each of the following periods:

- pre-construction: 28th February 2010-27th February 2015;
- construction: 28th February 2015-10th May 2017; and
- post-opening: 11th May 2017-10th May 2018.

The results provided an early indication of safety trends.[15] We found that in the first 12 months of operation, we observed 13 personal injury collisions on the Dunstable Northern Bypass. The early indications are that for the first 12 months of operation, the number of personal injury collisions within Dunstable are lower than the period before construction began. The number of personal injury collisions has reduced from an annual average of 32 on the route through Dunstable to 22 personal injury collisions during the first 12 months of the project being open to road users.

Figure 11: Observed personal injury collisions



Source: STATS19: 28th February 2010 to 10th May 2018.

As part of the safety evaluation, we look to assess what changes in personal injury collisions might have occurred due to factors external to the project over this timeframe. To do this we estimate the trend in personal injury collisions which might have occurred if Dunstable Northern Bypass had not been constructed (this

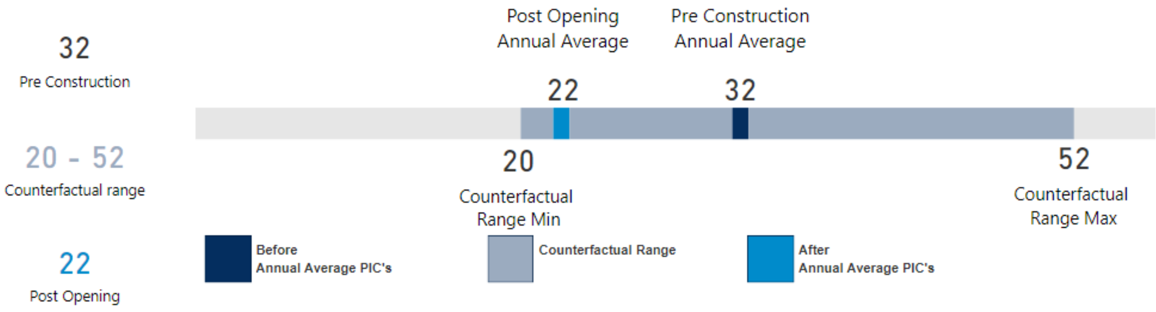
[14] We obtained safety data from Department for Transport Road Safety Data. These data consist of records of incidents on public roads reported to the police.

[15] The results were deemed indicative due to the relatively small amount of data available for the after period. A longer timeframe over which more data can be gathered will be required before firmer conclusions can be drawn. We will carry out a further evaluation to assess long-term impacts.

is referred to as a counterfactual). This is based on changes in regional safety trends with a high volume of roads users.

Based on this assessment, we estimate that if the road had not been constructed, the trend in the number of personal injury collisions would have changed over the time period to within a range of 22 to 52, as shown in Figure 12.

Figure 12 One year after counterfactual test



Source: STATS19: 28th February 2010 to 10th May 2018.

The 22 observed personal injury collisions falls within this range, however safety trends can vary each year and we will monitor this trend over a longer timeframe before drawing conclusions about the safety impact of the project.

The business case for the project predicted that the development of Dunstable Northern Bypass would reduce the number of personal injury collisions within Dunstable by an average of 4 per year.[16] The results indicate that the project is on its way to achieving the objective to improve safety standards. Another study will be conducted after the project has been open for a longer time, allowing for a more representative time period, to determine if the safety objective has been achieved.

4.5. How has traffic flow impacted on collision rates?

As traffic flow does not remain the same each year, it is important to contextualise any incidents in the volume of traffic seen on this stretch. To do so, a collision rate is calculated: the number of collisions per annual million vehicle kilometres (mvkm).

In the first 12 months of operation, a collision rate of 0.11 per million vehicle km has been observed on the Dunstable Northern Bypass.

The average collision rate within Dunstable has decreased to 0.43 collisions per million vehicle km. Before the project, this figure stood as 0.56 per million vehicle km – this equates to travelling almost 1.7 million vehicle km before seeing an incident. The decrease is 0.13 personal injury collisions per million vehicle km.

If the bypass had not been constructed, it is estimated that the collision rate would likely have been 0.62 collisions per million vehicle km in the counterfactual period; above that of the first year after opening the project.

Collision rates are also lower than we would have expected without the project. This is a positive initial indication, but as these are the first year's results, we are not yet confident that these initial indications are enough to form a trend. An evaluation will be conducted at five-years after opening to establish if early positive findings have continued.

[16] Based on a reduction of 266 personal injury collisions within Dunstable over a 60-year appraisal period.

4.6. Why can't we assess the impact of collision severity for this project?

The way the police record the severity of road safety collisions changed within the timeframes of the evaluation. There has been a shift to a standardised reporting tool known as CRASH – Collision Recording and SHaring. CRaSH is an injury-based reporting system and, as such, severity is categorised automatically by the most severe injury. This has led to some disparity with the previous reporting methods, where severity was categorised by the attending police officer.[17]

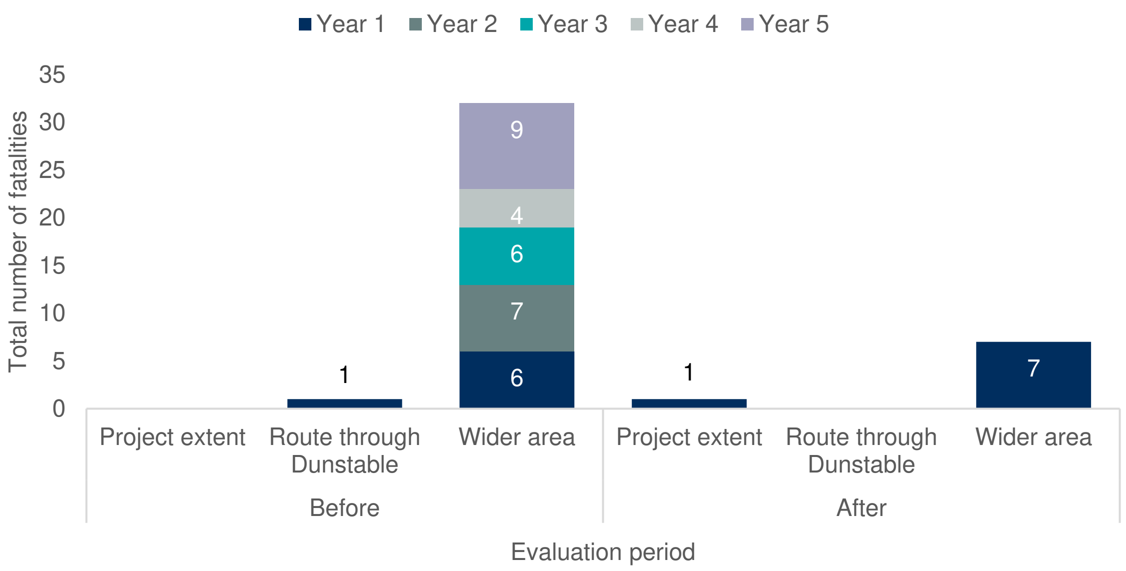
In this instance, one reporting mechanism was largely used prior to Dunstable Northern Bypass and another afterwards. As this will have an impact on severity categorisation for serious and slight collisions that is not attributable to the project, it would produce unreliable results at this stage. For more detail see Annex 3.

Fatal collisions are not affected by the transfer to CRaSH and we are able to report these. In the first year of the bypass being open, there has been one fatal collision on Dunstable Northern Bypass.

In Dunstable, one fatal collision was observed in the before period and none in the first 12 months of operation.

For the wider study area, 32 fatal collisions were observed before the project and seven fatal collisions occurred in the first 12 months of operation, as shown in Figure .

Figure 6 Observed fatal collisions



Source: STATS19: 28th February 2010 to **10th May 2018.**

4.7. Changes in safety trends on other parts of the strategic and local road network

Changes in personal injury collisions in the wider impact area were analysed. The area was defined in the project's appraisal – where the evidence for the value of a

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

project is assessed ahead of a decision to deliver an intervention. The wider study area incorporates strategic and local road network from Milton Keynes in the north to junction 8 of M1 to the south (as shown in Figure 10).

An average of 615 PICs were observed per year in the five years before the project. There is on average one more personal injury collision per year in the wider safety area with 616 observed within the first 12 months.

It is estimated that if Dunstable Northern Bypass had not been constructed, the safety trends across the wider area would have increased to between 629 and 775 personal injury collisions per year.

The average collision rate within the wider area Dunstable has decreased to 0.14 collisions per million vehicle km. Before the project, this figure stood as 0.15 per million vehicle km. The reduction is 0.01 personal injury collisions per million vehicle km. This indicates that we are observing a reduction in the rate of collisions despite traffic growth regionally.

This indicates that the construction of the project could be having a positive impact on the safety of the surrounding road network as anticipated within the project's business case. However, more evidence is required before it is possible to conclude whether the anticipated safety benefits across the wider safety area are likely to be realised.

5. Environmental evaluation

5.1. Summary

The evaluation of environmental impacts uses information on the predicted impacts gathered from the environmental appraisal within the business case, the environmental assessment report (EAR) and in consideration of the findings of the one-year after opening evaluation.

Observed impacts have been determined during a site visit, supported by desktop research. The results of the evaluation are recorded against each of the TAG environmental sub-objectives and presented in Table .

The evaluation after the first year showed that most impacts including on landscape, townscape, air quality and the water environment were broadly as expected. For biodiversity and heritage, it was considered too early to determine the outcome at one year after, as monitoring and survey reports were not yet available. It was not possible to quantify greenhouse gas emissions but, based on the overall lower than forecast traffic volumes for the A5 bypass itself, it was likely that emissions were lower than forecast. The outcome for noise impacts across the project study area was influenced by whether traffic volumes along the particular road were lower or higher than forecast. However, even for those roads with higher than forecast traffic volumes, the data indicated that the impacts were likely to be lower than had the project not been built.

5.2. Noise

The project predicted that a small number of properties close to the route of the new road would experience noise increases as would some properties on the northern edge of Houghton Regis.[18] Properties near Chalton and around the M1 were predicted to experience noise reductions. Across the wider study area, properties adjacent to local roads were predicted to experience a mix of increases and reductions in noise due to changes in the number of road users. To help manage noise impacts, the project proposed that the new road would include a low noise surface along its length and noise barriers, including earth bunds and fences. Overall, the project was predicted to cause a negligible increase in the number of people annoyed by traffic noise.

Our evaluation included a site visit to observe the noise mitigation provided and analysis of the forecast and observed opening year traffic data. Our site visit confirmed that a low noise surface was laid along the new road and new noise barriers were provided. This included new timber noise fences and earth noise attenuation bunds near Thorn Farm and Grove Farm.

Our analysis showed that traffic flows along the new A5 bypass and the A5 Watling Street were more than 20% lower than predicted, suggesting noise impacts along these roads were better than expected. For other roads in the study area, the analysis showed that noise impacts were broadly as expected. The exception was Tebworth Road, Chalgrove Road and Thorn Road, where the observed numbers of road users were more than 25% higher than had been forecast, however they were still lower than the traffic level predictions had the bypass not been built (‘do minimum’). This suggested that noise impacts, though worse than predicted with

[18] The traffic model predictions were based on project design year of 2028.

the new road open, were still better than they would have been had the project not been built.

On Thorn Road, the observed number of road users had reduced since the pre-construction baseline but were higher than the ‘do minimum’ assessment in the appraisal. This suggested that the background growth along Thorn Road had been greater than forecast and, as such, other developments in the area may be influencing the traffic changes observed and likely noise impacts experienced.

5.3. Air quality

The environmental assessment predicted that the construction of the new bypass would reduce the number of road users travelling through Dunstable to access the M1. Instead, road users would use the new bypass to access the M1 at junction 11a. This was predicted to worsen air quality adjacent to the M1 north of junction 10 but would not cause any new exceedances of the air quality standards. In Dunstable, where an air quality management area[19] (AQMA) had been declared, it was predicted that the project would improve air quality removing the two air quality exceedances that the assessment had identified. Outside of the AQMA but within 200m of the new bypass, properties were predicted to experience changes in air quality, but air quality would remain below the standards and the project’s impacts would not be significant. Overall, the project was predicted to produce an overall improvement in air quality within the study area.

Our evaluation examined the forecast and observed number of road users travelling through Dunstable and along and around the new bypass. We also considered air quality monitoring data published by Central Bedfordshire Council in their 2019 Air Quality Status Report (ASR)[20] and, where no monitoring data was available, predicted air quality concentrations in the project’s environmental assessment. Our evaluation itself did not commission any new air quality monitoring.

Our analysis showed that numbers of roads users travelling through Dunstable on the A505 Watling Street between the A5 bypass and Dunstable, A5183 from Dunstable to M1 Junction 9 and also the A505 Dunstable Road to M1 Junction 11 were lower than forecast. This suggests that the project had reduced the number of road users travelling through Dunstable to access the M1. Monitoring data indicated that the two exceedances predicted by the air quality assessment had been removed and that air quality had improved within the AQMA. However, the ASR reported that exceedances still remained within the AQMA. We had insufficient information to determine the factors influencing this.

Outside of the AQMA but within 200m of the new bypass, total emissions from road traffic were likely to be lower than expected along some roads including the new A5 bypass and higher than expected along others. This was due to differences in predicted and observed traffic volumes. This was likely to cause concentrations of nitrogen dioxide (NO_2)[21] to be lower than predicted by the environmental assessment at some locations and higher at others. However, based on the modelled opening year predicted NO_2 changes, these changes in traffic volumes were unlikely to contribute to new exceedances of the air quality objectives or

[19] Air Quality Management Areas are places where a local authority determines that air quality objectives are not likely to be achieved. https://uk-air.defra.gov.uk/aqma/
[20] 2019 Air Quality Status Report.
[21] Nitrogen Dioxide is one of the principal air pollutants associated with road traffic.

changed the outcome of the environmental assessment. The outcome was therefore not significant as expected and, as two exceedences had been removed from within the AQMA, suggested that the project had contributed to improvements in air quality.

5.4. Greenhouse gases

The project was predicted to have a beneficial impact on greenhouse gas emissions. This was because the project was expected to allow vehicles to travel more fuel efficiently, lowering the emissions for each kilometre travelled. In the opening year, emissions were predicted to be reduced by 1,358 tonnes and by 81,804 tonnes over the whole 60-year appraisal period.

The total greenhouse gas emissions of the project were predicted by calculating the sum of all the individual changes in emissions caused by changes in traffic across the entire traffic model study area. Our evaluation approach recognises that it is not possible to make a direct comparison between the greenhouse gas emissions predicted in the appraisal, as all the traffic information is not usually available. Instead, it assesses the forecast and observed traffic data available for the project extent and attempts to calculate a reforecast and an observed carbon emission at one year after opening.

Our analysis of the data showed that observed total annual average traffic flows along the A5 to M1 northern bypass were between 30% and 32% lower than forecast. However, observed HGV flows as a percentage of total flows were between 1% and 8% higher than forecast. We do not have sufficient speed data to be able to quantify what these changes mean but, as observed flows were so much lower than forecast, it was likely that overall greenhouse gas emissions along the new bypass at one year after opening were lower than forecast. We plan to revisit our analysis during our 5-year after evaluation.

5.5. Landscape

The project was expected to have an adverse impact on the landscape character of the area. Farmland, including hedgerows forming field boundaries, would be lost to accommodate the new road. New infrastructure, including the roundabouts at the A5 and A5120 junctions and new overbridges such as those at Sundon Road and Thorn Farm, would all create new prominent features in the landscape. Locally the road and its infrastructure would impact on the views of nearby residential properties and people using footpaths crossed by the road. The majority of the route would not be lit but new lighting at the junctions and car headlights would all add to the nighttime influence of the road.

To minimise the impacts of the project, measures were included within the design to help integrate the road into the landscape. The alignment of the road was designed to minimise the loss of vegetation and new earthworks were provided to help screen views towards the project. New tree and hedgerow planting was proposed to replace those lost. Overall, it was expected that once all the mitigation planting had established, the impact of the project on the landscape and nearby visual amenity would be slight adverse.

Our evaluation confirmed that the predicted impacts had arisen. Farmland had been lost and the roundabouts, overbridges and lighting columns were new, prominent features in the landscape. We did not do a nighttime evaluation, but it is likely that car headlights and new lighting at the junctions will have impacted on the nighttime environment. However, the proposed mitigation had been provided broadly as expected. New earthworks for example near Thorn Park had been created and new hedgerows and tree planting was in place.

Fig 14 Lighting columns near the A5 roundabout

Source; site visit 2018

A landscape and ecological maintenance management plan had been produced and evidence was seen during our site visit of maintenance works. Weeds were present in some of the plots but grass cutting and weed free circles were also seen, confirming maintenance was occurring. Some examples of slow plant growth were seen in some plots but on the whole the planting plots were seen to be establishing well.

Fig 15 New hedgerow planting showing evidence of maintenance and good growth

Source: Site visit 2018.

Based on the observation made during our site visit, we consider that the impacts at one year after were broadly as expected. Ongoing maintenance will, however, be key to ensuring that the long-term design year objectives will be met. We will review the overall effectiveness of the mitigation along with the expected monitoring reports as part of our five-years after evaluation.

5.6. Townscape

The project was in a rural location and did not pass through a townscape setting. However, it was predicted that the project would reduce congestion which would bring some improvements to townscape character on Dunstable High Street.

Overall, the impact of the project on townscape was expected to be slight beneficial.

Our site visit confirmed that the project does not pass through any townscape. The levels of traffic had reduced through Dunstable with direct impacts on Dunstable High Street. It was considered that the effects of the project on townscape were as expected

5.7. Heritage of historic resources

The project was predicted to have an adverse impact on cultural heritage features in the area. This was because the route of the project was understood to contain a number of undesignated archaeological remains which would be disturbed by the construction works. This included remains from the bronze age, iron age, Romano-British, medieval and modern-day periods. There would be no direct impacts on historic buildings, but the proximity of the new road would impact on the setting of some, including the Thorn Spring Scheduled Monument.

The project included a range of measures designed to minimise the impacts. This included a programme of archaeological investigations and reporting intended to either preserve the sites in-situ or capture and record the knowledge learnt. New earthworks and landscape planting would also be provided to help minimise visual impacts on the settings of historic buildings. Overall, it was anticipated that the impacts would be slight adverse.

Our evaluation confirmed that the impacts were broadly as expected. New earthworks and planting were observed during our site visit and, provided maintenance continues, the mitigation should establish and be effective.

At the time of writing no information relating to the archaeological investigations was available and so it was not possible to evaluate this aspect. This will be revisited as part of our five-years after evaluation when this information should be available.

5.8. Biodiversity

The environmental assessment work undertaken for the design of the project predicted that there would be no direct or indirect impacts on statutory or non-statutory nature conservation sites. The construction of the project would however cause the loss of a range of grassland habitats and fragment some foraging routes understood to support a range of species. This included birds, great crested newts and badgers.

A range of measures were proposed to minimise the effects of these impacts. These measures included two new ponds and foraging habitats to minimise impacts on great crested newts and to provide new breeding sites. New and replacement planting was proposed to provide new nesting sites for birds including around the Ouzel Brook. New mammal tunnels along with wildlife fencing were also proposed to help connect habitats severed by the road. The loss of grassland, including some containing important assemblages of scarce arable flora, was recognised as an important impact requiring mitigation. New species-rich grasslands were proposed, and seeds would also be collected from those areas containing scarce arable flora impacted by the project. These seeds would then be reused for reinstatement in an area near Grove Farm.

Once the mitigation had established, it was anticipated that, overall, the impacts of the project would be slight adverse.

Our evaluation, including observations made during our site visit, confirmed that the predicted impacts had occurred, and the proposed mitigation was provided. Ecology ponds, mammal tunnels and wildlife fences were all seen. New grassland, hedgerows and scrub planting was provided and appeared to be establishing satisfactorily.

Fig 16 Chalk slope left for natural regeneration of calcareous grassland

Source Site visit 2018

A landscape and ecology maintenance and management plan (LEMMP) has been produced to ensure the new mitigation measures establish. The plan included measures for both ongoing maintenance and also for surveys of the effectiveness of the species and habitat mitigation measures. Reports of these surveys were not available, and so it was not possible to evaluate the effectiveness of the mitigation including for the new scarce arable flora habitats. This issue will be followed up during our five-years after evaluation, when it is anticipated that the LEMMP will have been updated. For this reason, it was not possible to fully evaluate the outcome of the impacts on biodiversity.

5.9. Water environment

The environmental assessment reported that the project would pass through a greenfield site where surface water runoff from existing local roads flows into the existing drainage network with no attenuation or pollution control measures. The project, therefore, had the potential to impact on surface water and groundwater resources in the area including the underlying chalk aquifer. To manage these risks and to minimise the exposure of the underlying chalk, the project design avoided the use of deep cuttings. The design incorporated new drainage features including carrier drains, lined ditches and lined attenuation ponds. These were designed to prevent infiltration into the chalk aquifer and to manage surface water flows to minimise the risk of pollution and flooding. Overall, the impact on the water environment was predicted to be neutral.

Our evaluation including the site visit and a review of the as built information confirmed that the proposed mitigation was provided. Three of the balancing ponds were visited and no information has been provided to suggest that they were not functioning correctly. Drainage ditches along the route were viewed and appeared to be lined, although some also appeared to be vegetated and so, in time, may need clearing to maintain their performance. The LEMMP identified that routine maintenance and monitoring would be required to ensure that the drainage network continues to operate effectively, however no information on this work was available.

Our evaluation confirmed that the proposed mitigation was in place, but the long-term performance of the drainage network could not be confirmed until evidence of the inspection and maintenance regime had been evaluated. Whilst the impacts at one year after were broadly as expected, this issue will be revisited during the five-years after evaluation.

5.10. Physical activity

The environmental assessment reported that the project would disrupt the existing local public rights of way network. These were used for both recreation purposes and to access community facilities, although usage was reported to be low. A number of footpaths including those linking Chalton and Houghton Regis would be affected and would be diverted from their existing alignment and rerouted to new crossing points over the road. Users of footpaths would also be exposed to new traffic impacts including noise and visual intrusion which would deter use. The project would also provide new combined footpath cycleways and new crossing points over the project including a new Pegasus[22] crossing on the A5120 north of A5/A5120 roundabout. Overall, the impacts on physical activity were predicted to be slight adverse.

Our evaluation, including the site visit, has confirmed that the predicted impacts are likely to have arisen. Rights of way had been diverted but new footpaths, cycleways and crossing points such as the overbridge at Thorn Farm and the Pegasus crossing were provided. The new footpaths provided were in good condition and had signage, although one appeared to direct users to a locked farm gate. One footpath had a deep trench dug through it, but it was assumed that this was a security measure to prevent unauthorised access to adjacent land. Cyclists were observed using the new facilities, but no new surveys were conducted and so the level of use could not be quantified. Overall, the impacts were considered to be as expected although we had no information to quantify any change in the level of physical activity.

5.11. Journey ambience

Journey ambience[23] considers the impact of the project on motorist care (access to facilities such as service stations and information/signage), traveller views and traveller stress. Traveller stress considers drivers' experience of frustration, fear of potential accidents and route uncertainty.

The project was predicted to provider travellers with a quicker, safer route to the M1, reducing stress caused by congestion and fear of accidents. No traveller facilities such as roadside facilities would be provided. Travellers would, over time, have restricted views over new landscape planting and earthworks, however, overall it was predicted that impacts to journey ambience would be neutral.

[22] A signal-controlled crossing point designed for use by pedestrians, cyclists and equestrians.
[23] Journey ambience has since been renamed as Journey Quality in appraisal guidance https://www.gov.uk/government/publications/tag-unit-a4-1-social-impact-appraisal

Our evaluation confirmed that at one year after, driver stress was likely to have reduced due to the improved journey times and lower congestion than the original route through Dunstable. There were no roadside facilities but a layby on either side of the road was seen. Traveller views were restricted by the earthwork and this restriction was likely to increase over time as the roadside landscape planting establishes. Overall, the impacts were as expected.

Table 3: Environmental Impacts update

Sub-Objective	Appraisal Summary Table Score	One-year After Evaluation	Summary
Noise	People annoyed without project in long-term 792 and with project 841	Better than expected for the bypass. Better and worse for local roads	The proposed mitigation was provided. Analysis of the number of road users suggested the overall impact was better than expected for the bypass and worse than expected and better than expected for local roads. For most local roads that were worse than expected, the impacts were still likely to be better than what would have arisen without the project.
Air quality	NO_2 Properties with improvements 11,568 Deterioration 4,088 Negligible change 24,290 Not significant	Not significant as expected	The project has contributed to improvements to air quality within the Dunstable AQMA. Outside the AQMA, emissions are likely to be higher than forecast along some routes and lower along others. However, these changes are unlikely to be significant.
Greenhouse gases	Total change in carbon emissions in Project Opening Year = -1,358 T. Total change in carbon emissions for Whole Appraisal Period = -81,804 T		Greenhouse gas emissions were lower than forecast along the A5-M1 bypass. This was likely to be due to lower than forecast overall traffic flows. A direct comparison with the overall predicted emissions was not possible as there was insufficient traffic data.

Landscape	Slight adverse	As expected	Mitigation planting had been implemented as set out in the environmental design. Screen planting was in place and appeared to be as expected at one year after and should meet longer-term screening outcomes. Maintenance of planting plots was being undertaken. The overall effectiveness of the landscape mitigation should be reconsidered at five years after.
Townscape	Slight beneficial	As expected	Reduced traffic flows along the bypassed route through Dunstable was considered to have resulted in a reduction in congestion and improvement to the townscape character as expected.
Heritage of historic resource	Slight adverse	Too early to say	Impacts broadly as expected but outcome of archaeological studies unavailable at one year after – to be considered further at five years after.
Biodiversity	Slight adverse	Too early to say	Based on the information available and site visit, it appeared that mitigation measures had generally been provided as intended. It was too early in the establishment phase to comment on the effectiveness of habitat creation areas and no post-construction monitoring has been made available to enable habitats and species to be evaluated at one year after. Biodiversity should be reconsidered at five years after.
Water environment	Neutral	As expected	Attenuation and treatment ponds were incorporated into the project. Drainage design appeared to be performing as designed. Further information would be required to confirm long-term performance and so the water environment will be reconsidered at five years after.

Physical activity	Slight adverse	As expected	Improved facilities had been provided, although no information was available to confirm whether physical activity had been encouraged as a result at one year after.
Journey quality	Neutral	As expected	Based on the information available, it was considered that the effects of the project on journey ambience were likely to be as expected in terms of traveller care, traveller views, and traveller stress.

Annex 1: % HGV average weekday traffic

Table 4 %HGV AWT on select roads in study area

ID	Location	Before %HGV	1YA %HGV	Change
1	A5 Watling Street	2.80%	3.30%	0.40%
2	Hockliffe Road	0.90%	0.30%	-0.60%
3	Tebworth Road	3.20%	0.40%	-2.80%
4	Chalgrave Road	0.40%	0.10%	-0.30%
5	Leighton Road	1.10%	0.50%	-0.70%
6	Luton Road	2.40%	0.50%	-2.00%
7	A505	4.80%	5.70%	1.00%
8	Thorn Road	1.20%	0.30%	-0.90%
9	B5120 Bedford Road	0.90%	0.30%	-0.60%
10	Sundon Road	3.20%	1.30%	-1.90%
11	A505 Watling Street	11.30%	1.60%	-9.70%
12	A5183	11.30%	1.00%	-10.30%
13	A505 Dunstable Road	-		
14	Dunstable Northern Bypass	-	20.30%	-
15	Dunstable Northern Bypass	-	55%	-
16	M1 Junction 8-9			
17	M1 Junction 9-10			
18	M1 Junction 10-11			
19	M1 Junction 11-11a			
20	M1 Junction 11a-12			

Note: Refer to counts are average weekly traffic.
Source: Highways England WebTRIS and commissioned counts, 2014 and 2018.

Annex 2: Safety counterfactual methodology

Personal injury collisions (hereafter referred to as collisions) on the strategic road network are rare and can be caused by many factors. Due to their unpredictable nature, we monitor trends over many years before we can be confident that a real change has occurred as result of the project.

To establish whether any change in collision numbers is due to the project or part of wider regional trends we have established a test we call the 'Counterfactual'. The 'Counterfactual' asks the question: What would likely have occurred had the project not been implemented? To answer this question, we estimate the range of collisions that could have occurred without the project in place. Previous post-opening project evaluations answered this question by looking at national trends in collisions. Adjustments have been made to the methodology for estimating the counterfactual. These have been made to address the following areas:

Amended Data Collection Method

- Revised method for identifying collisions that occurred on the network.
- Only validated STATS19 information is used for reporting purposes

Adjusting for Traffic Flows

- Baseline traffic flows are an important factor when determining the counterfactual. We now assume that without the changes made to the network, the trends would follow regional background traffic growth patterns
- We can now calculate the collision rate for the busiest stretches of conventional motorways and dual carriageways.

Better Differentiation between different types of motorway

- The existing methodology only had one definition of motorway
- The new method allows us to differentiate between conventional motorways, conventional motorways with high traffic flows and projects.

Assessing Regional Trends

- The new method uses regional rather than national trends for collision rates and background traffic growth, which provides greater granularity and makes the hypotheses more realistic.

We have found that the adjustments have resulted in a slight change from the previous methodology. We still have confidence in the accuracy of the previous methodology but believe we have made suitable changes that will ensure a methodology fit for purpose for the future.

Annex 3: 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 Bedfordshire 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.

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, 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.

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