

Investing in road building: The Highways Agency's billion pound traffic gamble

The Highways Agency reviews its trunk road schemes, one year and five years after they open, to assess how accurate original forecasts were.

These reviews have shown that forecasts are wrong and forecasting is not being improved. The Agency's forecasts underestimate the effect on traffic, air quality, noise and greenhouse gas emissions. They also fail to predict the economic impact and whether schemes will be good value for money.

Until the Highways Agency makes some major changes, spending on new roads will remain a very expensive gamble.

Executive summary

Road building is a billion pound gamble

Each year the Highways Agency spends around one billion pounds building and widening trunk roads. Ministers decide whether to invest in motorways and A-roads based on the Agency's detailed economic analysis. Their evidence is supposed to spell out what the impact of road building would be: the impact on the economy, on the local environment, on traffic and on greenhouse gas emissions. These forecasts need to be reliable, because of the amount of money being spent and the potential for severe impact on congestion, traffic and the environment.

Unfortunately a number of reports commissioned by the Highways Agency show that these forecasts cannot be relied upon. Instead of accurately predicting what will happen, the Agency's forecasts underestimate the effect on traffic, air quality, noise and greenhouse gas emissions. They also fail to predict the economic impact and whether schemes will be good value for money.

Campaign for Better Transport's recommendations

The Government and Highways Agency should:

- Proactively publish post-opening project evaluation reports, explaining how they will learn from mistakes identified in the reports
- Revise modelling programmes to take account of the higher-than-forecast traffic, CO2 and pollution impacts for major road schemes
- Update the costs, benefits and impacts of all road schemes using these more accurate forecasts
- Announce a moratorium on all major road building projects until the more accurate forecasts are available

This report looks at the Highways Agency's four most recent five year after post-opening project evaluation reports: the A6 Great Glen Bypass, the A650 Bingley Relief Road, the A11 Roundham Heath to Attleborough and the A27 Polegate Bypass. It compares these findings to a study of 28 one year after reports by Atkins, finding similar trends across this larger evidence base.

The Highways Agency has been reviewing past trunk road projects, one and five years after they open, to see how accurate the original traffic, economic and environmental forecasts were. Their post-opening project evaluation reports (POPE) found that overall traffic levels rose significantly as a direct result of each scheme. Two of the three bypasses studied simply moved the congestion elsewhere.

Forecasting was generally inaccurate, especially of future traffic levels, and the economic forecasts did not reflect the actual impact on local businesses. CO₂, air quality and noise impacts are generally worse than expected, and walking, cycling and public transport did not improve, even on local roads where traffic has decreased.

Traffic levels rise significantly after road building

The five year after (5YA) reports found that overall traffic increased substantially once each new road was opened. This was substantially higher than the background level of traffic growth and each report attributed this to new trips generated by road building. Notably, although the general tendency was to underestimate the level of traffic, this was not always the case; in some instances the forecasts overestimated the level of traffic and in one case even miscalculated the level of congestion on a road for which actual, not estimated, congestion data was available.

The reports show that traffic growth was not limited to new road space; while in each case some drivers using local roads switched to the new road (providing limited congestion relief on minor roads), nearby roads tended to see large increases of traffic. After the A11 was widened between Roundham Heath and Attleborough, traffic on nearby Heath Road increased 60% and on Chalk Lane by 137%. Traffic along the A6 corridor increased by 16% in the five years after the Great Glen bypass was built; the Bingley Relief Road saw traffic north and south of the relief road rise by 70% and 27%, respectively.

Rising traffic fuels demand for further bypasses

Local residents' surveys, documented in the 5YA reports, show that two of the three bypasses merely moved congestion away from one community and towards another. People living in towns along the A6 which had not been bypassed were unhappy with the construction of the bypass at Great Glen because their communities now suffered too much traffic travelling too fast. When traffic was moved out of Bingley, nearby Saltaire became congested and real-world journey times did not improve. The reports found that time savings, which make up a sizeable proportion of the economic benefits, were generally very small: often just a couple of minutes off a morning commute which might take half an hour or more.

The Highways Agency's residents surveys reveals that a sizeable percentage of residents remain dissatisfied with traffic speed and volume even after the provision of a relief road. Where traffic levels had fallen, some residents complain that cars now drive too fast; in other cases they complain that the scheme had not reduced congestion enough. A sizeable minority in Great Glen and Polegate felt congestion was no better; three-quarters felt that congestion in Bingley had improved (albeit by moving congestion further along the A650).

“The village used to be a lovely quiet hamlet but since the bypass was built, the main road through has become a rat run.”

*~ Newton Harcourt resident,
Great Glen Bypass residents' survey*

Transport modelling rarely reflects reality

The Highways Agency's reports raise a number of concerns about the accuracy of traffic modelling. Many of the 5YA reports show a marked increase in traffic above the forecast, both on the new road and on the surrounding road network. Not only did this miscalculation of future traffic levels undermine the economic benefits and time savings, it meant that local communities were often affected more severely than they were told they would be.

The Bingley Relief Road was a particularly poor example of forecasting, with the case for the scheme significantly overstated due to over-estimating of the level of traffic and congestion growth. There was "poor correlation" between the forecast and actual traffic levels, attributed to basic modelling flaws, such as including the impact of other traffic-generating schemes which were known to have been cancelled before the evaluation of the scheme took place. The modelling of the A11 at Roundham Heath did not include a number of bypasses on the A11 which were either under construction or planned for the immediate future, underestimating congestion by not including traffic generated by these road schemes. The economic benefits of time savings for the Great Glen Bypass were halved because traffic was so much higher than predicted.

However, even though the Bingley Relief Road 'do minimum' scenario over-estimated traffic levels, it was still used as the baseline for before- and after-scheme comparison, instead of comparing the volume of greenhouse gas emissions post-scheme with the actual level of emissions before the bypass was built. This meant that the level of CO2 emissions was underestimated because any emissions between the pre-scheme level and the much higher forecast baseline were not counted.

More concerning is the Highways Agency's inability to identify how the original forecasts were arrived at. There were far higher levels of traffic in Polegate than forecast, and the 5YA report speculates that there may have been some traffic calming incorporated into the model which was never constructed (but was unable to say for certain whether this was the case). The A11 Roundham Heath economic forecasts included in the Appraisal Summary Table were disregarded because "their basis is unclear".

"I live in Bingley but work in Saltaire – still hit bad traffic all the way into work. It is just on a different road now."

~ Resident, Bingley Relief Road residents' survey

Economic forecasts are unreliable and real-world impacts often negative

The 5YA reports show that the forecast monetised impacts rarely correlate to their outturn values. Benefit-cost ratios (BCRs) are one of the main tools used to assess a scheme's value for money, and play a crucial role in the decision of whether a scheme deserves funding. The 5YA reports show that the estimates are rarely borne out by outturn figures.

Further, the Highways Agency's local surveys show that the real-world impacts on the local economy are not always as positive as the impression given by the broader economic benefits. While notionally each scheme provided significant economic benefits, these were dominated by monetised time savings; meanwhile many local shops and businesses reported a reduction in trade brought about by the new bypass.

The Bingley Relief Road was predicted to have a BCR of 3.6 (meaning that the benefits would be worth 3.6 times the cost of the scheme), but five years after opening this was just 2.5 (up from 2.0 at one year because of an increase in traffic volume). This was described as "roughly in line with expectations".

The BCR for the Great Glen Bypass dropped from 2.2 to 1.8 because time savings halved and safety benefits reduced by a quarter. The BCR for the Polegate Bypass rose from 2.8 to 4.4 because of an increase in journey time savings on routes where the forecasting overestimated the level of traffic growth.

Worryingly, the time savings in the 5YA report attributed to the Roundham Heath widening were achieved by drivers illegally breaking the speed limit. The average speed on the widened section of the A11 were all in excess of 70mph. This breaches Government guidance on calculating scheme benefits, which is clear that enabling the majority of drivers to break the law should not be counted as a benefit.

Despite some major differences between forecasts and actual impacts, BCRs show a remarkable resilience. Even though the volume of traffic turns out to be higher or lower than expected, the benefit-cost ratio of these four schemes stayed remarkably level (or even increased). When halving time savings and reducing safety benefits by a quarter only marginally affects the final BCR of the Great Glen Bypass, it is clear that something is rotten in the methodology of scheme appraisal. While the Department for Transport has made some modifications to the New Approach to Transport Appraisal (NATA) framework, there remains an urgent need for further changes to the appraisal process to reduce the dominance of very small time savings.

Aside from monetised impacts, the impact of these schemes on local economies has been broadly negative. The Great Glen Bypass has caused a number of local businesses in Great Glen which relied on passing trade to close, although the land these once occupied has been redeveloped for housing. Local newspapers, quoted in the 5YA report, said that shopkeepers in Polegate wanted signs to encourage drivers to travel through the town instead of using the bypass because of a marked loss of trade. Just 12% of residents thought that the bypass had brought new development to Polegate, and less than 1% believed that the bypass had improved local amenities.

"There has been a slight shift of 2% from public transport... to car. This change could be seen as the improved highway infrastructure encouraging more residents to use their cars."

~ Polegate Bypass POPE Report

Local and national environmental impacts worse than expected

In each case there was an increase in greenhouse gas emissions, and for the two schemes which gave estimates of actual impact (as opposed to a range of between 0 and 2,000 tonnes in opening year, an older method of calculating CO2 impacts) the increase in emissions was greater than predicted.

The Bingley Relief Road underestimated the scheme's impact by comparing CO2 after the scheme with an artificially high 'do minimum' baseline; the actual increase is therefore unknown, as is whether it was in line with the Highways Agency's predictions.

Except in Bingley, where residents generally felt that air quality and noise had improved, noise levels and other pollutants were worse than expected. This is attributed to traffic levels generally being higher than expected, resulting in more emissions and noise.

Walking, cycling and public transport does not improve

The 5YA reports did not monitor actual levels of public transport or active travel, but asked people whether they walked more often, or felt that the area was now a safer place to cycle. While a small majority felt conditions had improved, few people took advantage of this, with the most people making no additional trips, even where special facilities, such as off-carriageway cycle tracks, were provided.

Similarly public transport was not felt to have improved for a majority of those living in Great Glen or Polegate. Just 10% of Polegate residents thought public transport had improved, although the 5YA report states that the bypass had "facilitated indirect improvements for public transport interchange in Polegate". Further, the survey found that 2% of people had stopped using public transport and were driving instead.

The schemes also impacted negatively on active leisure, with fewer people using the rights of way network than before the schemes were built. 71% of people reported a change in their use of rights of way following the Great Glen Bypass, of which the most common complaint was that the bypass had cut through rights of way without adequate alternative routes being provided. Similarly work on Roundham Heath was supposed to include a new right of way across the A11; this was never provided.

The Highways Agency's reports show that providing traffic relief does not increase walking and cycling by itself. Neither has it been used to free up road space for better public transport. Despite this lack of evidence, the Highways Agency regularly makes statements to the contrary (that road building will improve public transport and increase levels of walking and cycling) as part of its application for funding for road building. Taken together with the marked increase in traffic, it is clear that building new roads results in more trips by car with no increase in public transport usage or active travel, despite the Agency's claims to the contrary.

"Forecasting of economic benefits is generally not accurate"

~ Atkins meta-study of POPE one-year after reports

Findings borne out by further analysis of one-year studies

Viewed in isolation, it is possible that these four studies were exceptions and that forecasting in most instances was accurate. However, in 2008 the Highways Agency commissioned transport consultants Atkins to examine their one year after reports in some detail, and to provide meta-analysis of the results. Their report identified themes across twenty-eight schemes which are very similar to those identified in our analysis of the Agency's 5YA reports.

Firstly, Atkins discovered that traffic levels were unpredictable (especially for bypasses), but were generally higher than forecast:

- "Only 40% of bypass schemes have predicted traffic volumes within 15% of outturn"
- "Over half of the scheme models have under-predicted traffic volumes on the old route and of these 12 under-predictions, 8 are under-predicted by more than 25%"
- "The majority of the schemes that have outturn traffic volumes [on the old, bypassed route] above those predicted are significantly above the 25% threshold"

Secondly, they found that the calculations of economic benefits were unreliable and lower than forecast:

- "Forecasting of economic benefits is generally not accurate"
- "Overall outturn accident savings [on bypasses] are about a third lower than predicted"
- "Only 42% of predicted scheme costs are within 15% of the outturn"
- "Overall, the schemes have achieved a slightly lower average BCR (2.6) than was predicted (2.9)"
- "The variations for individual schemes within this overall average are very large; a very small number of schemes have an outturn BCR that was close to predicted"

"[Great Glen is a] worse place as no parking, too much traffic going too fast, it is not a village more like a small town. There isn't any community spirit anymore."

~ Resident, Great Glen Bypass residents' survey

Conclusion: we cannot keep gambling so much public money on road building

It is clear that the Highways Agency's methodology for appraising the impacts of road schemes leaves a lot to be desired. There is a demonstrable trend, both one year and five years after a scheme has opened, for schemes to have higher levels of traffic, congestion and more detrimental impact on the local environment than forecast. Their calculations of the economic impacts of road building are, to quote their own consultants, "generally not accurate".

This is not a suitable basis on which to decide whether to spend money on a particular project. Decision makers cannot be expected to spend hundreds of millions on projects without having a reasonable idea what the effects are likely to be. Without accurate modelling of impacts, inspectors at public inquiries cannot make objective decisions to grant planning permission, and local residents cannot decide whether to support or oppose a proposed scheme because they cannot know for certain whether the project will improve congestion and traffic or not.

Proponents of road schemes claim to employ tried-and-tested tools which give accurate indications of what the outcomes are likely to be, and argue that alternatives to road building, especially 'smarter choices' programmes, produce questionable results. While 'smarter choices' programmes have to prove their validity over and over (something they are remarkably successful at doing) before receiving any funding, these reports show that the case for road building remains unproven and unpredictable.

The Highways Agency needs to learn from the mistakes documented in its POPE reports. It needs to comprehensively overhaul its traffic modelling procedure, so that basic errors, like omitting the impacts of other schemes already under construction, are not made in future. It is completely unacceptable that after decades of building roads, the Agency cannot say for certain what the impact of a particular road will be.

Decision makers need to be able to trust the Highways Agency's predictions, but the POPE reports show that their forecasting cannot be relied upon. Until they are improved, spending money on road building will be a very expensive gamble.

"Retailers are pushing for signs on the bypass to encourage motorists to shop in the town. (One shop owner said): 'As a resident the bypass has been an improvement.. But as a local businessman, it's been a disaster.'"

~ The Argus, reporting on the Polegate Bypass

The following appendices summarise the findings of the four Highways Agency POPE reports which were considered in this report. Italicised sections are direct quotes from the reports.

These reports are available upon request from the Highways Agency, with summary documents available online from individual scheme pages.

Appendix A

A6 Great Glen Bypass: increased congestion in other villages

Traffic

- Time savings were up to 1.3 minutes on the new A6.
- Old A6 journeys are slower (speed limit is now enforced).
- *It is apparent that traffic now using the combined new and old A6 just south of Great Glen is 2500 vehicles per day (vpd) higher than which formerly used the old A6 alone. This represents a 15.5% increase over five years. Regional background growth would only give a 4.2% increase in this time. Therefore changes in flow which differ markedly from this percentage may be a result of the scheme, and other local developments.*
- There has been an 11% increase in total flow in the [A6] corridor (when background growth is accounted for). The actual values are all lower than predicted, by 34% in the case of the DM, and 26% in the case of the DS.
- Some people in Great Glen were still unhappy about traffic levels. Around 50% of people agreed and 30% disagreed that traffic congestion had improved in Great Glen South and around 40% agreed and 40% disagreed that traffic congestion had improved in Great Glen North.
- Around 45% of people in Great Glen disagreed that speeds had reduced as opposed to 25% who agreed.
- Calculations of 'Route stress' overestimated the extent of congestion on the A6 before the scheme was built. Estimated route stress in the Appraisal Summary Table (AST) was 96%; when calculated with actual flow, this was found to be 60%.
- While many people felt the bypass had improved traffic in Great Glen, common complaints included:
 - Bypass being used as a race track
 - Still too much traffic in Great Glen
 - Great Glen used as a short cut
 - Unwanted development
 - Problems with parking in the village; and
 - No community spirit
- Comments from Kibworth Harcourt residents included:
 - Why hasn't Kibworth Harcourt got its own bypass
 - The bypass has brought unwanted development... to the area which has destroyed the village
 - The village has become a bottleneck and has more traffic in general
 - The speed of traffic is too high
 - Crossing the A6 is more difficult and dangerous
 - Speed controls such as road humps are not working; and
 - More pollution
- Comments from Newton Harcourt were largely negative and included:
 - Newton Harcourt is a rat run
 - More traffic through the village
 - Higher traffic speeds through the village
 - Village is more dangerous
 - Increased noise and pollution
 - Less community spirit

- Adverse effect on the environment

Economics

- The benefit cost ratio dropped from 2.2 to 1.8 as a result of the decrease in accident benefit and time savings.
- Cost was as predicted.
- *Monetary benefit of time savings is re-calculated as £18.5 million, about half that predicted*
- *The accident benefit is £20.0 million, 23% lower than predicted*
- *The bypass has adversely affected a few businesses in London Road which relied on passing trade, e.g. a former pub / steak house has closed and the site redeveloped for housing.*

Local and national environment

- *Local air quality calculations show a fall in carbon monoxide concentration near the old A6, but less than expected.*
- *Greenhouse gas calculations show that the increase in tonnes of carbon over the network has been greater than expected.*

Walking, cycling and public transport

- *The public consultation found that opinion was evenly split amongst respondents in Great Glen, between those who agreed and those who disagreed that crossing roads was safer since the bypass opened. Conflicting comments were received: some saying London Road has become safer for pedestrians, others that Streton Road has become busier and more difficult to cross.*
- *More respondents in Great Glen agreed than disagreed that [cycling] had become easier and safer since the bypass opened. However, for horse riding, more disagreed than agreed that it had become easier.*
- *107 out of 484 respondents in Great Glen said the bypass had changed their walking and cycling habits. Of these, 31 people gave positive comments saying the old A6 was quieter, safer and more pleasant. Some people also said they are willing to walk and cycle more now. 21 people gave negative comments including that the old A6 was more difficult to cross because of parked cars and that the bypass is dangerous to cross.*
- *71 said they had changed how they use rights of way; one common comment was that the bypass had cut off several of these.*
- *The majority of respondents in Great Glen did not agree that public transport had become more reliable since the bypass opened.*

Appendix B

A650 Bingley Relief Road: just moved traffic elsewhere

Traffic

- *Traffic has increased significantly since the scheme opened, both north and south of the Relief Road on the A650, some 70% and 27% higher, respectively.*
- *Growth in many of the locations monitored has been well in excess of growth witnessed locally or nationally*
- *There appears to be new traffic movements not as a result of background traffic growth, but generated as a result of the scheme.*
- *Traffic has fallen by around 50% on the old A650.*
- *Flows on the A650 directly north of the Relief Road have increased 70%.*
- *Comments from the public survey:*
 - *“I agree that the Bingley Relief Road has had a positive impact on Bingley. However, it has shifted the problem elsewhere. Queues running from Saltaire Roundabout back onto the bypass are a frequent occurrence at Peak times.”*
 - *“I live in Bingley but work in Saltaire – still hit bad traffic all the way into work. It is just on a different road now.”*
 - *“You’ve just moved congestion from Bingley to Saltaire!”*
- *Although traffic increased significantly as a result of the scheme, the traffic forecasts substantially over-estimated the volume of traffic on the bypass.*
- *At almost all locations where data was available for comparison there is poor correlation between Do-Something AADTs and observed flows.*
- *Similar discrepancies... can also be seen between the observed ‘before’ 2003 ADTs and the interpolated Do-Minimum (constrained low growth) forecasts. There was little or no relation between the Do-Minimum forecasts and the actual level of traffic before the scheme was built. Generally there were far fewer vehicles on the road than predicted by the Do-Minimum case, up to 41% fewer vehicles.*
- *The interpolated 2008 Do-Something forecast flows for the corridor were approximately 20,000 vehicles higher than the Do-Minimum flows for the old road in 2003 (56,000 compared to 35,000). The observed flows in 2008 show a total of 46,000 vehicles compared to 26,000 on the old road in 2003 before the scheme opened.*
- *Despite this, the POPE report describes the model’s reaction to the new scheme infrastructure as correct.*
- *Reasons for the large discrepancy between the schemes include:*
 - *Base year inaccuracies.* The model substantially over-predicted how many vehicles would be on the road before work began on the scheme.
 - *Different opening year to forecast.* The scheme opened three years later than planned, but the model was not adjusted to take this delayed start into consideration.
 - *Constrained growth south of the relief road at Saltaire.* Congestion at Saltaire meant that did not increase as fast as expected.
 - *Model included other improvement schemes which have not been constructed.* Although these schemes’ cancellation was known about before the relief road was constructed, no effort was taken to integrate this into the modelling.
 - *The model did not include the Bingley Main Street Project, which used traffic calming and a 20mph speed limit to dissuade vehicles from the town centre.*
- *Journey times are significantly shorter – 7-12 minutes northbound, 3-9 minutes southbound. However, residents complained that “Having a bypass where the majority of drivers break the 50mph speed limit has probably done little to improve safety.” On the old road, they comment that “It is a lot safer, but as cars now go faster on the B6265, we pedestrians have to be very careful when crossing.”*

- *The majority (75%) of residents believe that congestion has improved on the old A650 since the Relief Road opened. 49% of residents believe congestion and rat-running has improved on the other local roads in the area. A quarter of residents in the Cottingley area felt that rat-running and congestion had got worse.*

Economics

- The scheme was predicted to have a benefit-cost ratio of 3.6. In practice this was much lower, at 2.0 using one-year after opening journey times, and 2.5 using five-year after opening journey times (the latter is greater because of the larger number of vehicles using the road).
- The report described this as *roughly in line with expectations*.

Local and national environment

- Between 39% and 47% of people felt traffic noise had improved, and between 7% and 30% felt it had worsened. However, just under a quarter felt that there had been no improvement.
- Between 36% and 40% felt air quality had improved, with 4% to 15% thinking it had worsened. 19% felt there had been no difference.
- *The 1998 AST gives the forecast input on CO₂ as 0-2000 tonnes... there has been a total net increase of 3,246 Tonnes of Carbon as a result of building the scheme.* However, this is formulated using an artificially high baseline and as a result underestimates the scheme's impact.

Walking, cycling and public transport

- Although 21% of people made more walking journeys since the scheme opened, 53% recorded no increase (just 3% of people made fewer journeys).
- 7% of people made more cycle journeys, but 38% neither cycled more or less often (51% did not answer the question, which implies that it made no difference to their cycling habits).

Appendix C

A27 Polegate Bypass: hurt local businesses and people switched from rail to car

Traffic

- *Average Weighted Traffic on the A27 Polegate Bypass is now over 30,000 vpd – An increase of 26% since the scheme opened.*
- *Traffic flows on the B2247 through Polegate are 49% lower than pre-opening levels. However, there has been a 7% increase since the scheme opened.*
- *AWT on the A22 Golden Jubilee Way is 30,000 vpd, representing an increase of 26% since opening.*
- *East of the Polegate Bypass, flows on the A27 have increased by 78% from before opening levels. This is due to re-routing from the B2191 and A259 into Eastbourne.*
- *North of Polegate, traffic flows have increase by 18% from pre-opening levels. Traffic on the A22 is up 46% (12,100 extra vehicles) but traffic on the B2104 is down 49% (5,400 vehicles).*
- *Traffic levels in 2007 on Golden Jubilee Way are almost exactly in line with the high growth forecasts for 2010 (i.e. traffic is far higher than predicted, at 2010 levels in 2007). Traffic on the Polegate Bypass is between the high and low growth forecasts.*
- *Traffic flows remaining on the B2247 through Polegate were underestimated. Observed flows in 2007 were 27% higher than the low growth and 10% higher than the high growth forecast. The report states that it is not known from the forecasting report whether the traffic model considered for any traffic calming provision (none was constructed as part of the scheme).*
- *Traffic in the corridor has increased steadily from 50,600 vpd before opening to 66,700 vpd 5 years after opening. This represents an increase of 32%.*
- *Time savings for journeys on the bypass as opposed to the old route are between 1:30 and 2:06; one year after opening this was 1:27 and 3:01. Although there has been no reduction in journey times there has been substantial decrease in eastbound journey time savings as eastbound journeys on the old route have become significantly faster since the bypass opened.*
- *50% of residents thought that vehicles were still using Dittons Road through Polegate rather than the bypass and 42% felt they were still using the A2270 Eastbourne Road instead of the bypass.*
- *29% of residents thought the bypass had improved congestion in Polegate, 15% thought it had improved congestion in Willingdon and 43% thought traffic was now speeding on the old route.*

Local and national environment

- *Noise levels in Polegate are slightly higher worse than predicted.*
- *Carbon emissions in the opening year were slightly higher than predicted. This is an understatement: the impacts were estimated at 0-545 tonnes of carbon but were 2,261 tonnes of carbon in opening year.*

Economics

- *The outturn Benefit-Cost Ratio (BCR) is 4.4 against 2.8 as forecast in the Appraisal Summary Table due to higher than forecast journey times benefits.*
- *The cost of construction was 25% higher than expected (£19.5m as opposed to £15.6m). This is attributed to the increase in land costs.*
- *Users are paying more in fuel costs because the bypass is longer than the old route.*
- *The AST states that the scheme serves the Hastings Regeneration Area. Hastings is located 27km east of the Polegate Bypass. As the Bypass has improved east-west links along the south coast it would be reasonable to assume that it would have assisted the Hastings area. However, the level of benefit obtained from the scheme is difficult to quantify and likely to be small, therefore this has not been assessed any further in this study.*
- *In 2006, Momentum, Eastbourne's regeneration partnership, prepared an economic blueprint for the Eastbourne-Hailsham sub region. Polegate falls within the centre of this study area. One of the visions identified for the area is to be 'a dynamic, attractive and connected subregion, with the*

A27/A22 at its development spine.’ The regeneration areas mentioned above would have been influenced by the improvement in infrastructure resulting from the Polegate Bypass and Golden Jubilee Way. However, it is not possible within the scope of this study to quantify the actual level of benefit or dis-benefit.

- Just 12% of residents thought the bypass had attracted new developments.
- *The East Sussex Business Survey states that the scheme has benefited local Business, but the effect of the A27 and A22 schemes should not be overstated.*
- *There have been concerns, both before and after opening, that the removal of through traffic in Polegate would have a negative effect on the shops and businesses in the town centre.*
- *It is difficult to distinguish the impact of the Bypass opening from other factors affecting trading conditions in Polegate. Therefore a question was included on the residents survey asked whether Polegate town centre amenities have improved since the opening of the Bypass. Less than 1% of residents responded stating that was the case. There were also a number of negative comments made, with a few listed below:*
 - “Feel local amenities have declined”
 - “I see no improvement to Town Centre amenities”
 - “Shopkeepers have lost passing trade”

Walking, cycling and public transport

- Just under one third of people felt it was easier to cross the road, and 17% felt walking and cycling were safer.
- Only 10% felt that public transport was more reliable.
- *Reduced traffic volumes through Polegate have facilitated indirect improvements for public transport interchange in Polegate.*
- Before the bypass, 20% of people travelled to and from Eastbourne by train, and 12% by bus. Following the bypass, 15% went by train, and 14% by bus. *There has been a slight shift of 2% from public transport... to car. This change could be seen as the improved highway infrastructure encouraging more residents to use their cars.*

Amenity and quality of life

- 44% agreed or strongly agreed that the bypass and Golden Jubilee Way had made Polegate a better place to live. However, 24 disagreed or strongly disagreed.
- There is some variation: in North Polegate 31% disagreed or strongly disagreed, with 40% agreeing or strongly agreeing.

Appendix D

A11 Roundham Heath to Attleborough: benefits based on drivers breaking the law

Traffic

- *In the opening year, observed traffic forecasts on the A11 were significantly higher (26,100 compared to 20,500) than forecast.*
- Local roads now carry significantly more traffic. Traffic on the B1111 increased by 48% (1,300 vehicles). Heath Road had 60% more traffic and Chalk Lane 137% more vehicles.
- There are more HGVs on the B1077 and B1111 as side-road orders prohibited them using more local roads. HGVs on the B1111 increased 136%, from 9% of vehicles to 15%. On the B1077 HGVs went from 10% of vehicles to 17%.
- *Outturn flows at the majority of locations... align more closely with the High Growth predictions however, even these are significantly different.*
- *All three locations along the A11 witnessed opening year AADTs between 27% and 29% higher than those forecast.*
- The report attributes this discrepancy to the failure to include the impact of other bypasses in the modelling, even though they were under construction during the appraisal process.
- It also blames extensive development in the industrial zones both north and south of the A11 at Snetterton which was not modelled.

Economics

- Journey times savings and the economic benefits which ensue are based on vehicles breaking the speed limit.
- The average speed on the A11 Roundham Heath to Attleborough ranged between 70.4 and 76.9mph. These average speeds are directly calculated from the journey times savings.
- *Although the scheme AST also gives economic forecasts they have not been used [in the report] because their basis is unclear and the figures do not seem consistent with the more detailed 1989 forecasts.*

Local and national environment

- As traffic was higher, it is *likely that noise in the vicinity of the scheme is worse than expected.*
- Similarly, *air quality in the vicinity of the scheme is also worse than expected.*
- Greenhouse gas emissions increase by 9,175 tonnes over the first five years. There was no evaluation of CO2 impacts of the scheme before construction.

Walking, cycling and public transport

- *A public right of way across the A11 through a gap in the central reserve safety fence was not installed.*

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