Cycle City Ambition Programme

Interim Report - Extended Summary

Report to the Department for Transport, April 2019

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ABOUT THIS REPORT

The Department for Transport (DfT) commissioned Transport for Quality of Life, Sustrans and Technopolis to evaluate the Cycle City Ambition (CCA) Programme.

This Interim Report is the fifth of seven reports as part of the evaluation. It covers:

- The interim impact (up to the end of 2017) of investment in cycling infrastructure in the eight CCA cities, including the increase in cycling along routes that benefitted from capital investment.
- City-wide and programme-level cycling trends.
- Propensity to cycle by gender, age and ethnicity and corroborating evidence on the demographic profile of new and existing cyclists.
- Cyclists' and public perceptions about the safety and quality of cycling facilities in their cities.
- Wider impacts on physical activity, carbon emissions and emissions of local pollutants.

Previous reports were:

Sustrans (2016) Cycle City Ambition Stage 1a Report: Outlined the cities' planned CCA-funded schemes and monitoring plans, and assessed evaluation options.

Taylor I and Hiblin B (2016) Typical Costs of Cycling Interventions: Interim analysis of Cycle City Ambition schemes: Summarised typical costs of cycling interventions and the factors that affected them, during Phase 1 of the CCA programme.

Sloman L, Goodman A, Maia J, Riley R, Dennis S and Farla K (2017) Cycle City Ambition Programme Evaluation Design: Stage 1b / 1c Report: Recommended suitable infrastructure schemes and comparison sites for evaluation; identified comparison local authority areas for city-wide and programme-level evaluation; proposed baselines; and included power calculations to show the magnitude of change in cycling participation that would be detectable.

Sloman L, Goodman A, Taylor I, Maia J, Riley R, Dennis S, Farla K, Hopkinson L and Hiblin B (2017) Cycle City Ambition Programme: Baseline and Interim Report: Reported baseline cycling volumes and initial cycling trends at the infrastructure schemes and comparison sites; reported city-wide trends in cycling volumes, and trends in cycling participation at city and programme level; analysed the propensity of different demographic groups to cycle at baseline; looked at whether increases in cycling led to more physical activity.

The remaining two reports will be:

- An update of the 2016 report on typical costs of cycling interventions: expected to be published in 2020.
- A final evaluation, looking at the outcomes and impacts of the CCA programme up to the end of 2019: expected to be published in 2021.

SHORT SUMMARY

Through the Cycle City Ambition (CCA) Programme, the Department for Transport provided **£191 million capital funding grants** to eight English cities, or groups of cities[1], between 2013 and 2018.

The evaluation of the CCA Programme is focussed on 14 schemes in the eight cities, comprising between 24% and 66% of the DfT grant. The schemes include 'cycle superhighways'; shorter segregated cycle routes; 'mixed strategic cycle routes' that combine quiet roads, routes through green space, and segregated paths; city-centre schemes; improvements on a network of canal towpaths; and junction treatments.

This report provides an **interim assessment** of the CCA Programme. A final evaluation will be undertaken in 2020.

Key findings at this interim stage are as follows:

City-wide trends

- In six of the eight cities[2], city-wide cycling volumes are on a rising trend that pre-dates the start of the CCA Programme. In two cities[3], a rising trend stalled around 2014 / 2015.
- Since the start of the CCA Programme, **city-wide cycling volumes increased** by between +12% and +69%, as measured by automatic cycle counts.
- Some, but not all, of this increase is likely to be attributable to the CCA investment.
- In the three cities for which mode share data have been analysed, there has been an **increase in cycle mode share** of between 0.4%-points and 2.4%-points and a decrease in car mode share of between 0.1%-points and 5.8%-points.
- The proportion of adults cycling in the CCA cities fell by a small (and non-significant) amount, from 15.5% to 14.2% in the three years between baseline and follow-up. This decrease was offset by a small (and non-significant) increase in the number of cycling days reported by cyclists.

Scheme-level trends

- Three of the nine schemes for which evidence was available[4] show large increases in cycling volumes that are likely to be attributable to the new infrastructure[5].

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1 Birmingham; Cambridge; Greater Manchester; Newcastle; Norwich; Oxford; the West of England (Bristol, Bath and North East Somerset, and South Gloucestershire Councils); and West Yorkshire Combined Authority (Leeds, Bradford and neighbouring areas).
2 Birmingham, Cambridge, Greater Manchester, Norwich, Oxford and West of England (Bristol).
3 Newcastle and West Yorkshire (Leeds).
4 In Birmingham, Greater Manchester and Newcastle.
5 The Birmingham scheme showed an uplift of +131%, relative to comparison sites. One scheme in Greater Manchester showed a comparative uplift of +38%. One of the Newcastle schemes achieved an absolute fourfold increase.

- Five schemes show increases in cycling that are smaller, and that may be attributable to CCA investment, but where the evidence is less conclusive.
- For one scheme the evidence is currently inconclusive.
- On average, 4% of cyclists surveyed on the new infrastructure would travel by car if the infrastructure they were using were not available, and 10% would travel by other modes. These figures reflect the incremental effect of individual schemes on mode choice, as opposed to the effect of a whole cycle network, which would be expected to be substantially larger.
- At least 440,000 car trips per year are estimated to have switched to cycle trips as a direct result of CCA-funded infrastructure (across seven of the eight cities for which data are available).

Longevity of effects

Scheme-level measurements[6] show that **cycling volumes may continue to grow for at least 2-4 years** after a scheme is completed. The final evaluation will give a better estimate of how long these trends last.

Profile of new and existing cyclists

There are **marked inequalities in propensity to cycle** in the eight cities. Men and younger people (<50) were around twice as likely to cycle as, respectively, women and older people; and white people were 1.4 times more likely to cycle than non-white people. Cities with lower levels of cycling had larger differences with respect to gender, age and ethnicity.

However, there were some indications from surveys of cyclists that **demographic profiles may be starting to change** and that new cyclists were more likely to be female (43%), and from ethnic minorities (15%), than existing cyclists (33% and 8%, respectively).

Cyclist and public perceptions

Between 28-48% of cyclists in the four cities surveyed, and **22-40% of general public respondents felt that cycling in their city was very or quite safe**. Perceptions of the safety of cycling conditions for children were worse than this. A large majority of both cyclist and general public respondents (78-90% and 68-81% respectively) wanted cycle safety to be improved.

Despite these concerns about safety, **between a third and over half** of both cyclists and the general public **felt that their city was a good place overall to ride a bike**. In

6 From schemes completed early in the CCA period in Birmingham and Greater Manchester.

two of the four cities, perceptions of various aspects of the convenience of cycling and quality of the surroundings improved between 2015 and 2017.

Wider impacts: safety, health and carbon emissions

Analysis of road casualty **statistics did not show programme-level improvements in cycling safety** in the CCA cities.

Scheme-level surveys indicated that new CCA infrastructure resulted in an **increase in physical activity** for around half of existing and three-quarters of new cyclists. This was especially beneficial for the latter group, because they were less likely to report that they met physical activity guidelines.

The *city-wide* increase in cycling volumes in the CCA cities since the start of the CCA Programme was estimated to have resulted in **a reduction in car use of 87 million km per year**, with an associated reduction in annual carbon dioxide emissions of 23 kilotonnes. Only part of this is attributable to the CCA Programme. The increase in cycling volumes *on CCA-funded infrastructure* is estimated to have resulted in a reduction in car use of slightly under 2 million km per year, with an associated reduction in annual carbon dioxide emissions of 0.5 kilotonnes. All of this is attributable to the CCA Programme, and it should be considered a minimum estimate of the carbon impact of the programme because it is based on user surveys which took place before full build-up of use of the infrastructure was likely to have occurred, and because it takes no account of wider effects of the CCA investment.

KEY MESSAGES

This section pulls out a small number of messages from the CCA evaluation that may be of particular interest to national policy-makers, and to local councillors and officers.

Key messages for national policy-makers

1. **Cycling is on a rising trend** in six of the eight Cycle City Ambition cities. This pre-dates the start of the CCA programme. This means that investment in cycle infrastructure is in part responding to growing demand: it is like pushing at an open door.

2. **Investment in cycle infrastructure is effective.** Looking at the nine infrastructure schemes for which enough 'after' data was already available, eight showed increases in cycling. For three of these schemes the increase in cycling volumes was large and unambiguously the result of the scheme (for example, because it was more than growth at 'comparison' sites). For the other five schemes, the increase in cycling volumes is smaller so far, and further data is needed to assess the full effect.

3. **It takes time for the full impact of cycle infrastructure to be achieved**. Cycling volumes on some new schemes were still increasing 2-4 years after the infrastructure had been completed. The final evaluation in 2020 will establish the full impact.

4. **Increases in cycling are associated with reductions in car use and carbon emissions.** As the proportion of trips by bike into city centres has risen, the proportion of trips by car has gone down. This means that increased cycling in the CCA cities is helping to reduce carbon emissions.

5. **New cycle infrastructure increases physical activity.** Amongst cyclists who were surveyed on new cycle infrastructure, about half of existing cyclists and three-quarters of new cyclists had increased their physical activity as a result of the cycle scheme. This was especially beneficial for new cyclists, as they were less likely to already meet physical activity guidelines. Previous evidence[7] confirms that increased cycling does not offset other physical activity (e.g. from walking, sports and recreation).

6. **New cycle infrastructure is attracting a wider range of people.** Across the CCA cities as a whole, men were twice as likely to cycle as women; the under-50s were twice as likely to cycle as the over-50s; and white individuals were 1.4 times more likely

[7] This finding is from Sloman L, Goodman A, Taylor I, Maia J, Riley R, Dennis S, Farla K, Hopkinson L and Hiblin B (2017) Cycle City Ambition Programme Baseline and Interim Report Report for Department of Transport, chapter 15.

to cycle than non-white individuals. However, amongst people using new CCA infrastructure who had recently taken up cycling, the inequalities with respect to gender and ethnicity were less pronounced. For example, 43% of new cyclists using CCA infrastructure were female, compared to only 33% of existing cyclists. This suggests that as cycle facilities improve, a wider range of people is attracted to cycling.

7. **There is significant growth potential for cycling in cities**. For three cities where long-run datasets were analysed (Bristol, Cambridge and Manchester), there has been sustained long-term growth in cycling over 12-18 years. This is of particular interest in Cambridge, as it suggests that continued investment in cycle facilities may deliver continued growth even once levels of cycling are high.

Key messages for local authority councillors and officers

1. **There is strong public support for improving the safety of cycling**. A large majority of the general public (7 or 8 in 10 of those surveyed in four of the CCA cities) believed that the safety of cycling in their city should be improved. Support was even higher amongst people who cycled: 8 or 9 in 10 cyclists wanted safer conditions for cycling.

2. **High quality cycle infrastructure can have a large impact.** Of the cycle infrastructure schemes in the CCA cities that have been evaluated, the ones that have delivered the most dramatic increases in cycling so far are high quality segregated cycle superhighways on main urban corridors and in city centres, and high quality traffic-free routes (e.g. along towpaths). This suggests it is worth investing in ambitious 'flagship' schemes.

3. **This type of cycle infrastructure requires significant investment.** The cost of these types of CCA scheme was about £1.5 million per km for cycle superhighways, and £0.2 million per kilometre for traffic-free towpath routes[8].

4. **Less ambitious schemes may still be worthwhile, but will have a smaller impact**. CCA schemes that have had less impact include cycle paths with 'light segregation'; 'mixed routes' (combining on-road cycle lanes, signed quiet roads and cycle tracks); segregated cycle paths outside urban areas; and isolated junction treatments. These schemes may still be worth doing, but on their own they are unlikely to be transformational.

[8] These figures are from Taylor I and Hiblin B (2017) Typical Costs of Cycling Interventions: Interim analysis of Cycle City Ambition schemes Report for Department for Transport

EXTENDED SUMMARY

This section sets out main findings from the interim evaluation of the CCA Programme. More details are given in the full report. Please email ActiveTravel.PMO@dft.gov.uk for a copy of the full report.

ES1 Cycling volumes and modal shift

Research Question 1:

What impact has the CCA investment had upon levels of cycling in the cities and how these have changed over time? Specifically, what have the impacts been on:

(i) Total levels of cycling in intervention areas and the cities as a whole (including generation of new cyclists/new cycling trips and increased cycling amongst those who already cycled).

(ii) Levels of mode switch from other modes to bicycle, including robust estimations of the number of additional cycle trips that would otherwise have been made by car.

City-wide cycling volumes

Automatic cycle counter (ACC) data and manual count data show an upward trend in cycling volumes in Birmingham, Cambridge, Greater Manchester, Norwich, Oxford and West of England (Bristol), which pre-dates the CCA programme. In Newcastle and West Yorkshire (Leeds), cycling volumes were on a rising trend until 2014/2015, but since then the upward trend has stalled.

City-wide changes in cycling volumes during the CCA period are summarised in Table 1. Increases in city-wide cycling volumes as measured by ACC data lie in the range +12% to +69%. Change as shown by manual cordon or screenline counts is in the range +4% to +41%.

Table 1: 'City-wide' change in cycling volumes in CCA cities, as measured by ACCs and manual cordon and screenline counts

	ACC data *(baseline-interim)*	**Manual count data**	**Relevant section of full report**
Birmingham	**+32%** *(2012-2017)*	No data	*S4.1*
Cambridge	**+40%** *(2012-2017)*	**+27%** *(2012-2017) River Cam Screenline* **+40%** *(2012-2016) radial cordon*	*S5.1*
Greater Manchester	**+37%** *(2012-2017)*	**+14%** *(2012-2016) on cordons around all five district centres*[A] **+27%** *(2012-2017) Manchester cordon* **+21%** *(2012-2016) Stockport cordon*	*S6.1*
Newcastle	**+12%** *(2012-2017)*	No data	*S7.1*
Norwich	**+42%** *(2012-2017)*	No data	*S8.1*
Oxford	**+16%** *(2012-2017)*	**+ 4%** *(2012-2017) inner cordon* **+25%** *(2012-2017) outer cordon*	*S9.1*
West of England (Bristol)	**+69%** *(2011-2017)*	No data	*S10.1*
West Yorkshire (Leeds)	**+16%** *(2013-2017)*	**+24%** *(2012-2017) Leeds cordon; peak period* **+41%** *(2012-2017) Leeds cordon; interpeak period*	*S11.1*

A: Manchester, Salford, Stockport, Tameside, Trafford

City-wide cycling participation

Data from the Active People Survey does not provide convincing evidence of a programme-level increase in cycling participation (i.e. the number of people who cycle).

There are three possible reasons for the inconsistency between this finding and the increase in city-wide cycling volumes described above. First, because of the time-lag in release of APS data, the time period covered by the APS data is about two years shorter than the time period covered by automatic and manual count data. Second, power calculations first reported in the Evaluation Design Stage 1b/1c Report (appended to this report as Appendix G) suggest that APS is not particularly well-powered to be able to detect change in individual cities, although it should be able to detect fairly modest increases at programme level. Finally, the geographical distribution of ACCs and manual counts is non-random, and it may be biased towards areas where there is greater growth in cycling (e.g. inner city areas), whereas the geographical distribution of APS respondents is random and may therefore include areas which are less suitable for cycling and/or have received less cycling investment.

When the cities were weighted by population size, the proportion of people who had cycled in the previous four weeks decreased from 15.5% in 2010/11-2012/13 to 14.2% in 2014/15-2015/16, corresponding to an absolute decrease of 1.3% and a relative decrease of 9% (*S12.2*). This change is not statistically significant and may reflect a chance fluctuation.

Looking at the cities individually, six cities (Birmingham, Greater Manchester, Newcastle, Norwich, West of England (Bristol) and West Yorkshire (Leeds)) showed a modest decrease in the proportion of adults who had done any cycling in the previous four weeks, and two (Cambridge and Oxford) showed a small increase (*S12.2*).

The mean number of cycling days per adult showed very little change across the first three years of follow-up, relative to the previous three years. In other words, the small (and non-significant) decrease in the proportion of adults cycling in the CCA cities was offset by a small (and non-significant) increase in the number of cycling days reported by cyclists (*S12.2*).

During the same time period, cycling levels remained fairly stable in the national and unfunded comparison groups, showed a non-significant increase in the matched comparison group, and a non-significant decrease in London. This was true regardless of whether the level of cycling was measured in terms of the proportion of adults doing any cycling, or the mean number of cycling days. Difference-in-difference analyses and ratio-of-ratios analyses generally indicate a trend towards cycling decreasing in the CCA local authorities relative to these comparison groups, although the differences are not statistically significant (*S12.2*).

Scheme-level cycling volumes

Some of the CCA schemes have now been in place for long enough that it is possible to report their early impacts. These are described in Table 2 and summarised below.

Table 2: Summary of changes in cycling volumes for individual CCA schemes

City	Evidence	Absolute change	Change vs comparison group	Attributable to CCA investment?[A]	Relevant section of full report
Birmingham	Substantial increase in cycling volumes on **upgraded canal towpaths.** Increase recorded by ACCs on upgraded towpaths is much greater than for the city as a whole, and also much greater than the increase for a comparison set of ACCs. Between 2012 and 2017, cycling volumes increased on the canal towpaths by 157%, whereas cycling volumes for a comparison group of six ACCs increased by 26%. The pattern is similar for all four canal towpath schemes, with each one showing markedly greater increases in cycling than for its comparison ACC(s). The timing of the uptick in cycling volumes on the canal towpaths coincides with the timing of completion of each set of canal towpath works, strengthening the conclusion that the uplift in cycling volumes is attributable to the schemes.	Large positive (from ACC data)	+131%	Yes	*S4.2* *S4.3*
Cambridge	No post-intervention results.	-	-	-	
Greater Manchester	Substantial increase in cycling volumes on the **Wilmslow Road / Oxford Road Cycleway** since completion. Pre- and post-scheme manual counts at multiple locations along the cycleway suggest cycling volumes have nearly doubled or tripled at sites within 4km of the city centre (increasing between 85% and 176%). The relative change is smaller further away from the city centre (+42%), where the cycle lane is marked on the road but not physically segregated from traffic. Automatic count data at a location 2km from the city centre shows that between autumn 2016 (post-construction) and autumn 2017, cycling volumes increased by 38%. A comparison group of between 10 and 12 ACCs showed no growth in cycle volumes in the equivalent period.	Large positive (from manual counts and ACC data)	At least +38% (may be considerably more in some locations)	Yes	*S6.2* *S6.4*
	Increases in cycling volumes on the **Broughton Cycleway** since completion. Pre- and post-scheme manual counts at three locations along the cycleway suggest cycling volumes increased by between 13% and 27%. Automatic counters installed after construction show inconclusive evidence at this stage: there is probable growth at one site but little change at the other site in the period since the scheme was completed. A comparison group of between 10 and 12 ACCs showed no growth in cycle volumes in the equivalent period.	Small positive (from manual counts); ACC data inconclusive	Inconclusive	Possibly	*S6.3* *S6.4*

City	Evidence	Absolute change	Change vs comparison group	Attributable to CCA investment?[A]	Relevant section of full report
Newcastle	Modest increases in cycling volumes on the **Gosforth Corridor**. At one ACC site on the corridor that captures the largest volume of cycling in the city, annual usage increased by 3% between 2016 and 2017. The most similar comparison sites for this ACC showed changes of 0% and -20%. At another ACC site on the Gosforth Corridor, annual usage increased by 22%. The most similar comparison sites for this ACC showed changes of +7% and -3%.	Small positive (from ACC data)	At least +3%	Possibly	*S7.2*
	Large increases in cycling volumes on **John Dobson Street,** a street in the city centre where segregated cycle track has been provided over a limited length of about 400m. Pre- and post- scheme manual counts show a fourfold increase in cycling volumes between 2015 and 2017.	Large positive (from manual counts)	Not known	Probably	*S7.3*
Norwich	Evidence inconclusive but suggestive of slightly more growth in cycling volumes on the **Pink Pedalway** than at comparison sites. ACC data shows an increase in annual usage on the Pink Pedalway of 25% (2014-2017), but this is rather similar to the increase for a comparison group of ACCs (21%). Only two out of five ACC sites on the Pedalway show rising volumes. However, manual count data from the Norwich inner and outer cordon shows better performance in the last year at site(s) on the Pink Pedalway than at other sites (inner cordon: Pink Pedalway +17% and other sites -3%; outer cordon: Pink Pedalway -3% and other sites -7%; all between 2016 and 2017).	Mixed picture: medium positive (from some ACC data); small positive (from some manual count data)	+4%	Possibly	*S8.2*
Oxford	Manual count data suggestive of a possible small increase in cycling at **The Plain** roundabout, of about 8%, whereas manual counts elsewhere show no change. Automatic count data shows an increase that coincides with completion of the scheme, although the evidence is not definitive.	Small positive (from manual counts)	+8%	Possibly	*S9.2*

City	Evidence	Absolute change	Change vs comparison group	Attributable to CCA investment?[A]	Relevant section of full report
West of England	Increase in cycling volumes as measured by one ACC on the partially-completed **East-West Quietway** of 37% between 2015 and 2017. There is no data from a comparison group of counters, but the increase in cycling volumes on the Quietway is larger than the city-wide increase in cycling over the same time period, which was 17%.	Medium positive (from ACC data)	No comparison group; but +20% relative to city-wide trend	Possibly	*S10.4*
West Yorkshire	Comparison of pre- and post-intervention manual count data on the **Leeds-Bradford Cycle Superhighway** appears to suggest an increase in cycling, but this is not corroborated by post-intervention ACC data. Weighing the conflicting evidence, conclusion at this interim stage is that cycle volumes have not increased on the cycle superhighway, either in absolute terms or in relation to a comparison group, although there is limited evidence of an increase at some individual sites.	Small positive (at some manual count sites), not confirmed by ACC data	Not known	-	*S11.2*

A: Judgment about the likelihood that increases in cycling were attributable to CCA investment was based on three considerations: whether the cycling growth rate exceeded the growth rate at matched comparison sites; whether its timing was clearly associated with the date of completion of works; and whether its magnitude was sufficiently large that it was highly improbable that it could have been due to chance.

There is strong evidence of large increases in cycling that are likely to be attributable to the CCA investment in Birmingham (upgraded canal towpaths), Greater Manchester (Wilmslow Road – Oxford Road Cycleway) and Newcastle (John Dobson Street).

There are indications of smaller increases in cycling that may be attributable to CCA investment in Greater Manchester (Broughton Cycleway), Newcastle (Gosforth Corridor), Norwich (Pink Pedalway), Oxford (The Plain), and West of England (East-West Quietway).

Evidence is currently inconclusive for West Yorkshire (Leeds – Bradford Cycle Superhighway). Although pre- and post-scheme manual counts show increases in cycling on the superhighway, these are not corroborated by ACC data; and manual counts on a screenline across the superhighway show no change in the proportion of cycle flow that is on the superhighway.

No evidence is as yet available for the three Cambridge schemes or two of the West of England schemes.

City-wide mode switch from other modes to bicycle

Evidence about mode switch from other modes to bicycle at the city-wide level is available from annual all-mode manual cordon and screenline counts in some cities.

Evidence is summarised in Table 3. We have undertaken this analysis for Cambridge, Greater Manchester and Norwich. In all three cities, there is an increase in cycle mode share, of between 0.4%-points and 2.4%-points in 4-5 years, accompanied by a decrease in car mode share. If sustained over a longer time period, changes in cycle mode share at the upper end of this range would result in a sizeable reduction in car use. We plan to repeat this analysis, and undertake equivalent analysis for other cities with suitable data, for the final evaluation report.

Table 3: Changes in cycle mode share at cordons / screenlines

City	Evidence	Attributable to CCA investment?	Relevant section of full report
Cambridge	Cycle mode share at the **River Cam** screenline increased from 24% in 2012 to 26% in 2016 (latest year for which data was available), in the context of rising total flows of all modes. The absolute increase in cycle flows was accompanied by an absolute increase in pedestrian flows and an absolute decrease in car flows.	Possibly in part, but trend towards increasing cycle mode share pre-dates the CCA programme	*S5.1*
	Cycle mode share at the **Cambridge radial cordon** increased from 4.6% in 2012 to 5.8% in 2016, in the context of rising total flows for all modes. The absolute increase in cycle flows was accompanied by an absolute increase in both pedestrian and car flows.		*S5.1*
Greater Manchester	Cycle mode share at the **Manchester** district cordon increased from 5.1% in 2012 to 6.5% in 2017. The absolute increase in cycle flows is comparable to the absolute decrease in car flows.	Possibly in part, but trend towards increasing cycle mode share pre-dates the CCA programme	*S6.1*
	Cycle mode share at the **Stockport** district cordon increased from 1.6% in 2012 to 2.0% in 2016 (latest year for which data was available). The absolute increase in cycle flows is equivalent to slightly under a fifth of the absolute decrease in car flows.		*S6.1*
Norwich	Cycle mode share at the **Norwich inner cordon** increased from 6.2% in 2012 to 7.9% in 2017. Over the same period, car mode share decreased from 77.1% to 75.9%.	Possibly in part, but trend towards increasing cycle mode share pre-dates the CCA programme	*S8.1*

Scheme-level mode switch from other modes to bicycle

Estimates of the effect of CCA-funded cycle schemes in encouraging mode switch from car to cycle were available from Route User Intercept Surveys on new or improved cycle routes, in all cities apart from Cambridge.

At a programme level, an average of 4% of surveyed cyclists reported they would travel by car if the CCA scheme they were using was not available. This proportion varied between 0% (Oxford) and 10% (Birmingham). The proportion who reported they would have used other modes was around 10% (varying from 2% in Oxford to 22% in West Yorkshire). The majority of respondents (82%) reported that if the scheme was unavailable, they would still cycle (*S16.2).*

These rather low figures for modal shift reflect the incremental or marginal effect on mode choice of a single scheme, as opposed to the effect of a whole cycle network on mode choice, which would be expected to be substantially larger.

Estimates of car trips avoided as a direct result of the schemes ranged from around 4,000 in West Yorkshire to 102,000 in Norwich, with a programme total of around 219,000 car trips avoided per year (95% confidence interval of 178,000-267,000). This estimate does not capture the impact of CCA schemes where there was no user survey (*S16.2).*

Based on the fact that schemes with user surveys represent about 50% of overall CCA expenditure we estimate that the CCA programme has resulted in about 440,000 car trips per year switching to cycle trips. These avoided car trips are directly attributable to the CCA investment. This is likely to be a minimum estimate, because in a number of cases route user intercept surveys occurred fairly soon after completion of a cycle scheme, before 'build-up' of use was complete (*S16.2).*

ES2 Growth or decay of effects

Research Question 2:

To what extent do these impacts on cycling rates and car use increase or diminish over time?

At this interim stage only limited scheme-level data is available to assess the extent to which the impacts of the CCA schemes are increasing or diminishing over time. We also have some evidence from three cities of long-term city-wide effects that pre-date the CCA programme.

City-wide growth or decay of effects

Evidence is available from Cambridge and West of England (which were both part of the Cycling City and Towns programme between 2008 and 2011), and Greater Manchester, to examine city-wide effects over an extended timescale.

In Cambridge, analysis of long time-series data from the River Cam screenline manual count shows that the current rising trend in cycling volumes began around 2006. Before that date, cycling volumes had been relatively stable for about 20 years. The growth in cycling volumes (and also cycling mode share) since 2006 has been continuous and relatively steady. The decline in car mode share has also been continuous and steady. While it is not possible to draw firm conclusions about the cause of the growth in cycling since 2006, it may in part be attributable to higher levels of investment in cycling during the Cycling City and Towns programme period between 2008 and 2011, as well as investment

from the CCA programme between 2013 and 2017, and investment from other sources[9]. Cambridge is an interesting and important example, because there are no indications that cycle volumes or cycle mode share have 'peaked', even though this is the city with the highest cycle use in England *(S5.1, S5.6).*

In West of England (Bristol), analysis of long time-series data from ACCs shows that cycling volumes have been increasing since at least 2000 (the first year for which data are available). The growth rate was fairly steady between 2000 and 2010, at around 5%-points per year (relative to our baseline year of 2011=100). From 2010 the rate of growth appears to increase, to an average of 11%-points per year (between 2011 and 2017). Thus the uptick in growth appears to post-date the Cycling City and Towns period, although it is still plausible that it may in part be a consequence of investment at that time[10]. As with Cambridge, there is not yet any evidence of a levelling-off or reduction in the rate of growth of cycling *(S10.1, S10.6).*

In Greater Manchester, analysis of long time-series data from district cordons shows that the current rising trend in cycling volumes (and cycling mode share) began between 2006 and 2009, although it is difficult to be more precise because cordon counts during that period were not undertaken in every year. Since then, the rate of growth has been fairly steady. Greater Manchester was not part of the Cycling City and Towns programme between 2008 and 2011, but it was an unsuccessful bidder for that programme, suggesting that investment in cycling was recognised as a priority at that time *(S6.1, S6.5).*

Scheme-level growth or decay of effects

For the CCA schemes, there is evidence that cycling volumes are continuing to increase on the four Birmingham canal towpaths for which we have data, between two and four years after completion (S4.2, S4.3). In Greater Manchester, the part of the Wilmslow Road / Oxford Road Cycleway that was completed first shows continuing growth in cycling volumes two years after completion, although it appears that the growth during the second year was smaller than the growth during the first year after completion *(S6.2).* In the final evaluation report, we will assess how long these growth trends above background levels (and growth trends for other, more recently implemented, CCA schemes) are sustained.

9 The CCT end-of-programme report from Cambridgeshire (2011, no longer publically available) shows that between 2008 and 2011 there was investment of £7.8 million capital and £1.2 million revenue in Cambridge (including DfT grant and matched funding). The schemes delivered included eight new cycle routes and improvements to another pre-existing eight routes (54km of on- and off-road cycle paths in all); 1900 cycle parking spaces; intensive engagement with 21 employers representing about 10% of the workforce of the city; and Bikeability cycle training for school pupils. Shortly after the end of the CCT programme, a cycle path alongside the Busway between Cambridge and St Ives was completed; this provides a link to Cambridge Regional College and the Cambridge Science Park.

10 The CCT end-of-programme report from Greater Bristol (2011, no longer publically available) shows that between 2008 and 2011 there was investment of £11.3 million capital and £8.4 million revenue in Greater Bristol (including DfT grant and matched funding). The schemes delivered included 36 new or improved cycle routes (53km of on- and off-road cycle paths in all); 8,700 cycle parking spaces; intensive engagement with 12 large employers and about 50 small employers representing about 26% of the workforce of the city; Bikeability cycle training for school pupils and adults; implementation of 20mph zones; and neighbourhood and community cycling projects.

ES3 Profile of new and existing cyclists

Research Question 3:

What is the profile of those who already cycled in the cities, and those who have taken up cycling since the awarding of the CCAG funding? These profiles should consider both key demographics and individuals' current levels of physical activity.

Evidence is available from three sources about the demographic profile of cyclists: the Active People Survey, Route User Intercept Surveys, and Bike Life surveys. Evidence about physical activity levels is available from two sources: the Active People Survey and Route User Intercept Surveys.

Demographic profile of cyclists

Analysis of the **Active People Survey** and 2011 Census at the time of our Baseline Report showed that higher levels of cycling in the CCA cities were associated with being male, younger, white, more educated and more affluent.

Marked inequalities in propensity to cycle remain apparent in the most recently available APS data, which is for the period 2014/15-2015/16. At the programme level, men remain 2.1 times more likely to cycle than women; younger people (<50) are 2.0 times more likely to cycle than older people (>50); and white individuals are 1.4 times more likely to cycle than non-white individuals *(S13.2).*

There was a decrease in age inequality between baseline and follow-up (from 2.6 in 2010/11-2012/13 to 2.0 in 2014/15-2015/16; weakly statistically significant p=0.02), but further years of follow-up will be necessary to see if this trend continues. The weak trend towards a decrease in gender inequality that was noted in the Baseline Report has not been sustained, highlighting the fact that all such findings should be viewed with caution and may be due to chance *(S13.2).*

At the time of the Baseline Report we noted that there were clear differences between the eight cities in the propensity of different demographic and socio-economic groups to cycle, and the low-cycling cities had larger differences with respect to age, gender and ethnicity. This remains the case.

Findings from the **Bike Life** survey (undertaken in four cities only: Birmingham, Greater Manchester, Bristol and Newcastle) are consistent with findings from APS, confirming that women, older people and people from ethnic minorities are under-represented amongst cyclists. The only exception to this is that cyclist respondents to the survey in Bristol were as likely to be from a BME background as for the population of the city as a whole. Between the 2015 and 2017 Bike Life surveys, there was a slight, but not statistically significant, increase in the proportion of female cyclists among respondents in each city (up from 30-31% in 2015 to 31-40% in 2017) *(S17.2).*

Post-scheme **Route User Intercept Surveys** in six cities provide important evidence on the demographic profile of 'new' versus 'existing' cyclists. The proportion of respondents who said that they were new or starting cyclists was around 8%. At programme level, there were clear differences in the gender and ethnicity profile of these new cyclists, compared to existing cyclists. The percentage of new/starting cyclists that were female was around 43% (95% confidence interval of 36-49%) compared to 33% for existing cyclists (95% confidence interval of 31-34%). The percentage of new/starting cyclists that were BME was around 15% (95% confidence interval of 10-21%), almost double that of existing cyclists at 8% (95% confidence interval of 6-9%). Both the gender and ethnicity differences are highly statistically significant (p=0.001). However, perhaps unsurprisingly, new cyclists were *less* likely to be over 65: only 2% of new/starting cyclists were over 65, compared with around 5% for existing cyclists (statistically significant p=0.04) *(S16.3).*

For the two cities that included a question about household income in their user surveys (Birmingham and Cambridge), the proportion of new/starting cyclists with household income less than the median

earnings for the local authority area was higher than for existing cyclists (though based on very low numbers for new cyclists) *(S16.3).*

Physical activity amongst cyclists

Evidence from the **Route User Intercept Surveys** allows us to compare the physical activity profile of new versus existing cyclists. Surveys in two cities (Birmingham and Greater Manchester) asked about number of days of physical activity in the past week *and* type of cyclist. In both cities, the proportion of new/starting cyclists who met physical activity guidelines was lower than for existing cyclists. For the two cities combined, around 51% of new/starting cyclists had done 5+ days/week activity compared with around 68% of existing cyclists *(S16.3).*

For the five cities where the user surveys included a question about change in physical activity (Greater Manchester, Newcastle, Norwich, Oxford and West Yorkshire) the proportion of all cyclists who reported having increased their amount of physical activity due to the presence of the cycle route was between 50 and 67% in four cities and somewhat lower at 21% in Oxford, which is probably due to the more modest nature of the Oxford scheme *(S16.3).*

For the three cities where the user surveys asked about change in physical activity *and* type of cyclist (Greater Manchester, Norwich, West Yorkshire) the proportion of new/starting cyclists who had increased the amount of physical activity they had done due to the presence of the route was much higher compared with existing cyclists. For the three cities combined around 74% of new/starting cyclists had increased their amount of physical activity due to the presence of the route, compared with around 53% of existing cyclists *(S16.3).*

For the three cities where the user surveys asked about change in health and well-being *and* type of cyclist, around 78% of new/starting cyclists agreed the scheme had improved their physical health compared with 69% of existing cyclists; and around 80% of new/starting cyclists agreed the scheme had improved their well-being compared with 55% of existing cyclists *(S16.3).*

ES4 Perceptions of safety and convenience

Research Question 4:

What impacts has the CCAG investment had on the perceptions of cyclists and the public in the cities and how has this changed over time? What specific impacts have been found on:

(i) Perceptions of cycling safety,

(ii) The convenience of cycling,

(iii) Perceptions of public spaces.

Evidence is available from two sources about cyclists' perceptions: Route User Intercept Surveys and Bike Life surveys. Evidence about public perceptions is only available from the Bike Life surveys.

Perceptions of cycling safety

For the two cities (Norwich and West of England) where **Route User Intercept Surveys** asked how safe cyclists felt on the route they were using (post-CCA intervention), a very high proportion of respondents (81% to 88%) felt very safe or fairly safe, with little change in perception over time *(S16.4).*

In five cities (Cambridge, Newcastle, Norwich, Oxford and West Yorkshire), user surveys asked about perceptions of different aspects of safety. All of the cities showed generally high levels of agreement by respondents (around 55-92%) that the post-intervention cycle routes they were using were well-lit, had clear lines of sight and were safe in terms of personal safety and traffic. In some of the cities

there were slightly lower levels of agreement that routes were safe for children, particularly Oxford, which is likely to be because the Oxford scheme is on a busy road route *(S16.4).*

The **Bike Life survey** asked cyclists and the general public in four cities (Birmingham, Greater Manchester, Newcastle and Bristol (West of England)) about their perceptions of safety in the city in general (i.e. not specific to a particular post-intervention cycle route). Cyclist respondents tended to be slightly more positive than general public respondents about the overall safety of cycling in their city, with the proportion considering it to be very or quite good ranging between 28-48% for cyclists and 22-40% for the general public. There was relatively little change in overall perceptions of safety between the 2015 and 2017 surveys *(S17.3).*

Unsurprisingly, and consistent with the user survey evidence, perceptions of the safety of cycling for children were less positive than for cycling in general. Only 22-29% of cyclist respondents and 16-29% of general public respondents in the 2017 Bike Life survey considered the safety of cycling for children in their city to be very or quite good *(S17.3).*

Riding a bike during daylight hours was generally considered to be safer than riding a bike at night. Between 67% and 80% of cyclist respondents, and 54-70% of general public respondents, considered riding a bike during the day to be very or quite safe; whereas the proportions fell to 28-51% and 19-36% respectively for riding a bike at night *(S17.3).*

A large majority of both cyclist respondents and general public respondents wanted cycle safety to be improved. This was supported by 78-90% of cyclist respondents and 68-81% of general public respondents in the 2017 Bike Life survey *(S17.3).*

Convenience and perceptions of public spaces

Evidence from **Route User Intercept Surveys** indicates that convenience, safety and quality of surroundings (i.e. perceptions of public spaces) are all important factors affecting an individuals' decisions to cycle.

Two cities (Birmingham and Greater Manchester) had a question in their surveys about these factors. For both cities the proportion of cyclist respondents in post-intervention surveys who agreed that these factors had influenced their decision to cycle on the route in question was >80% for convenience and >70% for safety. The quality of the surroundings was a factor for >90% in Birmingham and >76% in Manchester *(S16.4).*

There were some interesting indications of cyclists sometimes making trade-offs between safety, convenience, and quality of surroundings in their choice of route. In Birmingham, the proportion of cyclist respondents saying that these factors had influenced their decision to cycle *increased* between pre- and post-scheme surveys (at matched locations) for safety and quality of surroundings, but *decreased* for convenience. However, in Manchester, all three factors were more likely to be identified as having influenced the decision to cycle in post-scheme surveys, relative to pre-scheme surveys. The locations of these surveys were canal or shared use routes in both Birmingham and Manchester, which are likely to be high quality traffic-free environments, but possibly less direct and therefore less convenient for some journeys *(S16.4).*

In the **Bike Life** survey, cyclists tended to be slightly more positive than the general public about whether their city was good overall as a place to ride a bike. The proportion of cyclist respondents considering their city to be good overall ranged from 38-65%, while the proportion amongst general public respondents ranged from 35-56%. Between the 2015 and 2017 surveys, perceptions improved in Greater Manchester and Newcastle, but worsened in Bristol, for both cyclist and general public respondents, although only some of these trends were statistically significant. There was little change in perceptions in Birmingham between the two surveys *(S17.3).*

The Bike Life survey also collected evidence about perceptions of various aspects of convenience and the quality of surroundings: amount of cycle routes, directness of cycle routes, condition of cycle routes and signposting of cycle routes. Between 2015 and 2017, there were statistically significant improvements in perceptions of the amount of cycle routes and directness of cycle routes in Greater Manchester; and the condition of cycle routes and signposting in Greater Manchester and Newcastle. Changes in the other two Bike Life cities were not statistically significant, although it should be borne in mind that changes were more likely to be statistically significant in Greater Manchester because the survey sample size there was larger *(S17.3).*

ES5 Wider impacts of CCA investment

Research Question 5:

What estimates can we generate for the wider impacts of CCAG investment? These include:

(i) Objective measures of cycling safety,

(ii) Road congestion,

(iii) Car km and carbon emissions,

(iv) Overall levels of physical activity, including among new and existing cyclists.

Cycling safety

The CCA local authorities did not see significant improvements in the risk encountered by cyclists (measured as deaths and serious injuries per person-day of cycling, using Stats19 data for number of KSIs and APS data for exposure to cycling). Between 2011-12 and 2015-16, there was little change in this measure of risk. This pattern in the CCA local authorities was similar to the pattern in the national comparison group and unfunded comparison group. By contrast, London and the matched comparison group saw a reduction in risk in this period *(S15.2).*

Measured *per capita,* the number of cyclists who were killed or seriously injured (KSI) in road traffic crashes in the eight CCA cities also remained fairly stable between 2011-12 and 2015-16. This was similar to the pattern in the matched, national and unfunded comparison groups, although London performed better over this time period *(S15.2).*

Road congestion

Following discussion with DfT, a decision was made not to proceed with analysis of congestion effects. This was because the amount of work required by DfT statisticians to prepare data for the research team was large, and it was unlikely that the analysis would yield anything other than a null result.

There were three reasons for this decision:

- CCA schemes have typically involved rather modest (if any) reallocation of road space away from general traffic, and this means that any *negative* effects on congestion due to loss of road space are likely to be minor.
- The short-term scheme-level effects of CCA schemes in terms of modal shift from car to bike have been quite modest (with on average 4% of surveyed cyclists on CCA schemes saying they would have travelled by car in the absence of the scheme, *S16.2*) and this means that any *positive* effects on congestion due to modal shift from car to bike over the timescale of this evaluation are also likely to be minor.
- Other recent evidence (from the Local Sustainable Transport Fund meta-analysis for DfT and from research undertaken by ITP for Transport for London) shows that that there have been quite large increases in congestion (as measured by morning rush-hour traffic speeds) country-wide since 2012. Although it would in theory be possible to 'net out' these changes by comparing pre/post

change at CCA scheme locations with pre/post change elsewhere in the same city, this reduced the likelihood that it would be possible to attribute any change in congestion, whether positive or negative, to the CCA schemes.

Car km and carbon emissions

Across all the CCA cities, an estimated 938 million km per year was travelled by bicycle at baseline. If this travel by bicycle had instead been made by other modes, our model suggests that car mileage would have been greater by an estimated 244 – 385 million km per year, resulting in additional annual CO_2e emissions of 65-102 kT, equivalent to around 2-4% of CO_2 emissions from traffic on minor roads *(S18.2).*

The increase in cycling since the start of the CCA programme is estimated to be 335 million km per year. Only some of this increase in cycling is attributable to the CCA programme itself. It is likely that other investment, shortly before the start of the CCA programme or concurrent with it, will also have contributed to the observed change, and population growth and demographic changes may also have played a role. This increase in cycling has resulted in a reduction in car use estimated at 87 million km per year, with an associated reduction in annual CO_2e emissions of 23 kT, equivalent to slightly under 1% of CO_2 emissions from traffic on minor roads *(S18.3).*

The increase in cycling on CCA-funded infrastructure is estimated to have replaced slightly under 2 million km per year travelled by car. All of this reduction in car use is directly attributable to the CCA programme, and it should be considered a minimum estimate of the reduction in car use as a result of the programme. This is because the estimate is based on user surveys which took place soon after schemes were competed, before the full build-up of use was likely to have occurred, and because it takes no account of possible 'network-level' effects (people taking up cycling because of a specific improvement, such as a canal towpath scheme, but then starting to cycle more often for other trips) and 'social norm' effects (people seeing others cycling, and therefore being more likely to consider cycling themselves, even if not on the new infrastructure). The reduction in car mileage has led to a reduction in annual CO_2e emissions of 0.5 kT, equivalent to 0.02% of CO_2 emissions from traffic on minor roads *(S18.4).*

Overall levels of physical activity

Analysis of **APS** data presented in the Baseline Report suggested that physical activity from cycling did not displace physical activity in other domains. It also pointed to the significant role that cycling played in enabling adults to meet physical activity guidelines: among individuals who had done any cycling in the past four weeks, cycling accounted for on average 33% of their total energy expenditure from walking, cycling, sports and recreation. In all eight cities, the proportion of cyclists who met the World Health Organisation physical activity guidelines was between 77% and 91%, whereas the proportion of non-cyclists meeting the guidelines was between 45% and 57%.

As noted above (section ES4), the new CCA routes resulted in an increase in physical activity for around half of existing cyclists and three-quarters of new or starting cyclists. This increase in physical activity is likely to be particularly beneficial for new and starting cyclists, because they were less likely to report that they met the government's recommended physical activity guidelines of 30 minutes of moderate intensity physical activity on five or more days per week. Only around half of new / starting cyclists met this target, whereas two-thirds of existing cyclists did so. While response numbers were small, there was limited evidence from surveys in one city (Birmingham) that new / starting cyclists also tended to rate their general health less positively than existing cyclists *(S16.3).* A majority of cyclists agreed that the presence of the new CCA routes improved their physical health, with 69% of existing cyclists and 78% of new/starting cyclists agreeing that this was the case. There was also evidence that the presence of the new CCA routes was beneficial to users' mood and wellbeing, and again, the benefits were more evident for new/starting cyclists *(S16.3).*

ES6 Conclusions

At this interim stage, we are able to make the following observations about the effects of the CCA programme.

There are city-wide increases in cycling volumes, as measured by automatic and manual counts, in all eight cities. It is unlikely that the whole of these increases in cycling volumes is attributable to the CCA investment, since in many cases it is a continuation of pre-existing trends. However, scheme-level evidence shows that individual CCA schemes are also showing increases in cycling volumes, which are in a number of cases clearly attributable to the CCA investment (either because the growth rate exceeds the growth in cycling at matched comparison sites, or because its timing is clearly associated with the date of completion of works, or both). This means that it is likely that at least a proportion of the city-wide growth in cycling is attributable to the CCA investment.

In three cities for which we have analysed all-mode cordon or screenline counts, the city-wide increase in cycling volumes is associated with a mode shift from car to bike. There is also evidence of mode shift from car to bike at the scheme level, although the marginal or incremental effect of each individual scheme on mode choice is small.

Although cycling volumes are increasing in all eight cities, there is as yet no convincing evidence of a programme-level increase in cycling participation (i.e. of the proportion of people who cycle).

There is limited scheme-level evidence which suggests that once a scheme is completed, cycling volumes may continue to build-up, or grow at higher rates than the background trend, for periods of at least 2-4 years. We will continue to monitor this, to establish at what point cycling volumes on the CCA schemes stabilise or revert to background trends. There is also limited city-level evidence of sustained, long-term growth in cycling over periods of 12-18 years in three CCA cities for which data has been analysed.

There are some limited indications that the demographic profiles of cyclists in the cities may be starting to change. In particular, new cyclists may be more balanced in terms of gender and ethnicity than existing cyclists. However, the different sources of evidence are not consistent on this and further years of data will be needed to draw firm conclusions.

There are also encouraging signs that new CCA infrastructure resulted in an increase in physical activity for around half of existing cyclists and three-quarters of new or starting cyclists. This is particularly significant in health terms for new or starting cyclists, because they were less likely to report that they met physical activity guidelines.

Taken overall, it is clear that there have already been some significant benefits from the CCA programme. It is unlikely that the full effects of the programme have as yet been realised, since some schemes are still incomplete. In the next stage of the evaluation, we will seek to understand the extent to which the benefits are sustained, or whether benefits grow or decay over the medium term.

Please email ActiveTravel.PMO@dft.gov.uk for a copy of the full report.