transport for quality of life

CWIS Active Travel Investment Models: Model structure and evidence base

Technical appendix 1: Defining local authority baseline data for the models

Sally Cairns

Transport for Quality of Life

September 2019

Document name:	Technical appendix 1: Defining local authority baseline data for the models
Project name:	CWIS Investment Model – Additional analysis and reports WP1-817
Paper number:	Technical appendix 1
Client:	Department for Transport
Date:	September 2019

This report was delivered through the SPaTS Framework Lot 1, by the Arup supplier group.

Contact:

Transport for Quality of Life Ltd
T: 01654 781358
E: info@transportforqualityoflife.com
W: www.transportforqualityoflife.com

Contents

1. Introduction

Each model requires an estimate of the initial level of cycling, walking or walking to school at the beginning of the target period (2013), with individual values for each local authority district (LAD). Metrics need to be specified in a way that is consistent with the CWIS targets, which are derived from National Travel Survey (NTS) data. This appendix describes the process for converting LAD-level estimates of the three forms of travel into a form that is consistent with NTS national-level estimates of cycling, walking and walking to school.

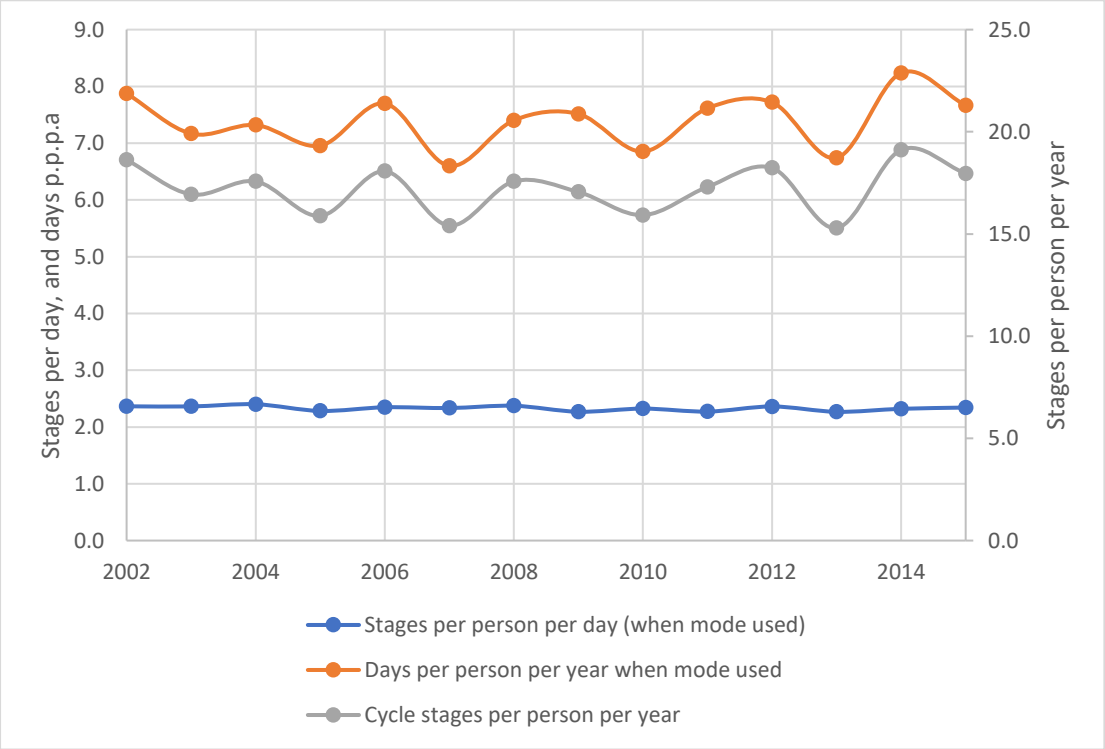
2. Cycle target and NTS data

The CWIS cycling target is:

- To increase cycling, from 0.8 billion journey stages in 2013 to 1.6 billion stages in 2025

The DfT NTS team kindly supplied data showing how days cycled per person, and cycle trip stages per day, have varied over time, as shown in Figure 1, according to results from seven day travel diaries.

Figure 1: Variation in cycling levels over time



Source: NTS travel diary data, as provided by DfT

Data is based on seven day NTS trip diary figures. The grey line is linked to the right-hand axis; the other two lines are linked to the left-hand axis.

The mid-year population estimate for England in 2013 was 53,865,800. With 15.3 trip stages per person per year, this is equivalent to 824,146,740 trip stages p.a. (i.e. the 0.8 billion stages of the target).

3. Possible LAD cycle data to use for the baseline

There are two sources of data that provide information about levels of cycling at LAD level – the Active People Survey (APS, which provides information about cycling levels between 2010 and 2015) and the

Active Lives Survey (ALS), which has replaced it, with the first year of available data being for 2015/16[1]. Both APS and ALS ask separately about cycling for travel and cycling for leisure. Census data (from 2011) also provides a measure of the numbers and proportions of people cycling to work. Assessment of all three data sets shows:

- Broad positive correlations between cycling for travel (APS and ALS) and cycling to work in the Census – indicating that use of a bike on commuting journeys is quite strongly related to use of a bike overall.
- Broad positive correlations between cycling for travel and cycling for leisure – i.e. generally high levels of one are linked to high levels of the other and they do not trade off against each other, although the relationship is not that strong (see Figure 2 and later discussion).

The ALS data (for the earliest year, 2015/16) was used to generate LAD-level cycling estimates for the baseline. This has the advantage over the 2013 APS data that it will be comparable with data collected in future years, hence enabling the baseline data in the models to be updated in future.

Using ALS assumes that *relative* cycling levels in LADs have remained the same between the baseline date and 2015/16.

4. Using ALS data to derive the baseline cycling data

In the ALS, respondents are asked to state the number of days in the past 4 weeks (28 days) that they did a particular cycling activity. All cycling trips (of any length or intensity) are included.

Some respondents appear to do more than 28 days of leisure cycling, because questions about leisure cycling ask about multiple activities (cycling for leisure, BMX, mountain biking etc.) which are then combined. This is not an issue for cycling for travel, because it does not combine categories, although the raw data includes a few cases with >28 days, which are probably due to recording error.

In order to provide a dataset of the average number of days that people in each LAD cycle, the DfT statistics team:

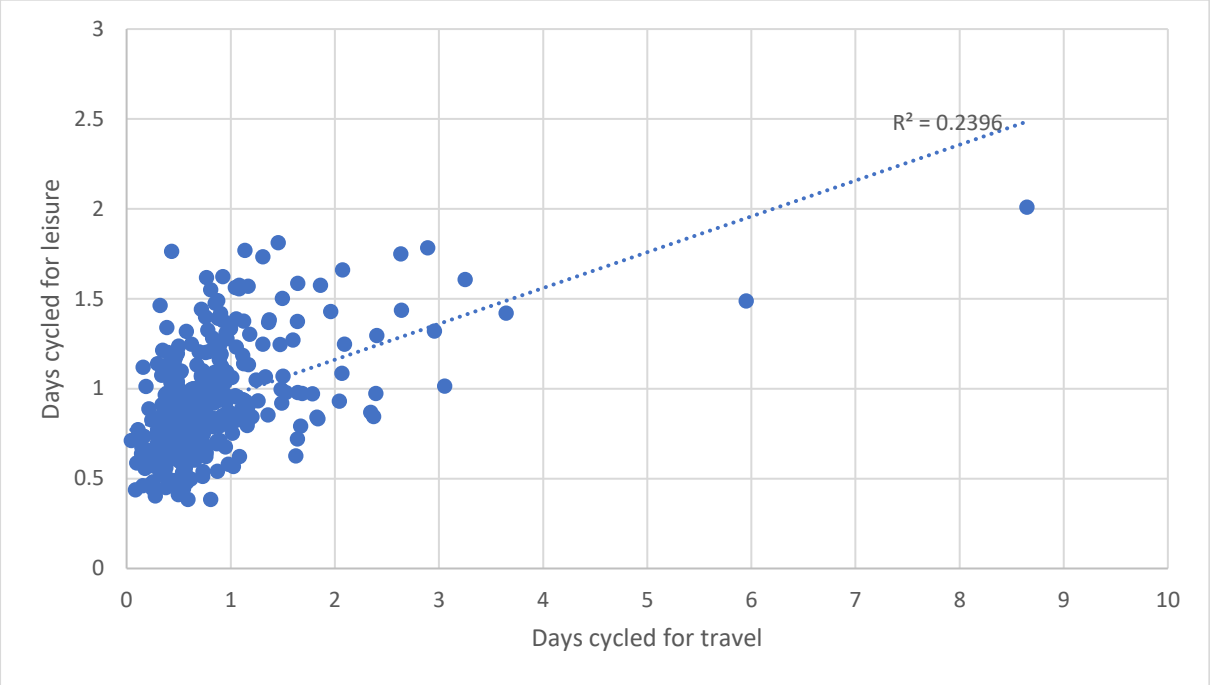
- Capped both the leisure and travel cycling figures for each person at 28;
- Created separate average figures for (a) cycling for leisure and (b) cycling for travel; and
- Created an overall cycling figure by adding together the two figures. This could, in theory, be as high as 56, but was, in practice, never above 28.

Partly due to methodological differences, the NTS and ALS data do not produce cycling estimates of similar magnitude. Specifically, NTS estimates suggest that, on average, people cycle about 7.7 days per year in England, whilst ALS figures suggest an average of 11.4 days cycling for travel; 11.5 days cycling for leisure; and (up to) 22.9 days for any cycling.

Given that the target was defined using the NTS, and that the NTS data is to be used to assess progress towards the target, the ALS LAD-level data was scaled to match the number of cycle stages nationally, as given in the baseline target. It was possible to do this using 'all days cycled', 'days when cycled for travel' or 'days when cycled for leisure'. 'All days cycled' was used, in order to ensure that variation in both leisure and travel cycling was represented, given that the relationship between them is fairly weak, as shown in Figure 2 below.

[1] ALS and APS data are not considered comparable to one another.

Figure 2: Relationship between cycling for leisure and travel at LAD level



Source: Active Lives Survey data, as provided by DfT

Given an average of 22.9 days of 'all cycling' per person per year (ALS), compared with 15.3 cycling stages per person per year (NTS), this required day rates in the ALS to be multiplied by 0.668, to give a number of cycling stages per person per year[2]. This assumes that the number of cycling stages per day is invariant between LADs. This assumption seems valid given that, at the national level, the NTS data shows much less variation in the number of stages per day than in the number of days per year.

5. Walking target and NTS data

The CWIS walking target was originally:

- To increase walking to 300 journey stages per person per year in 2025

However, NTS data on number of walking stages per person has subsequently been revised, and the target is being reconsidered.

There is no baseline date for the walking target, but a 2013 baseline has been used in the walking model for compatibility with the cycling model.

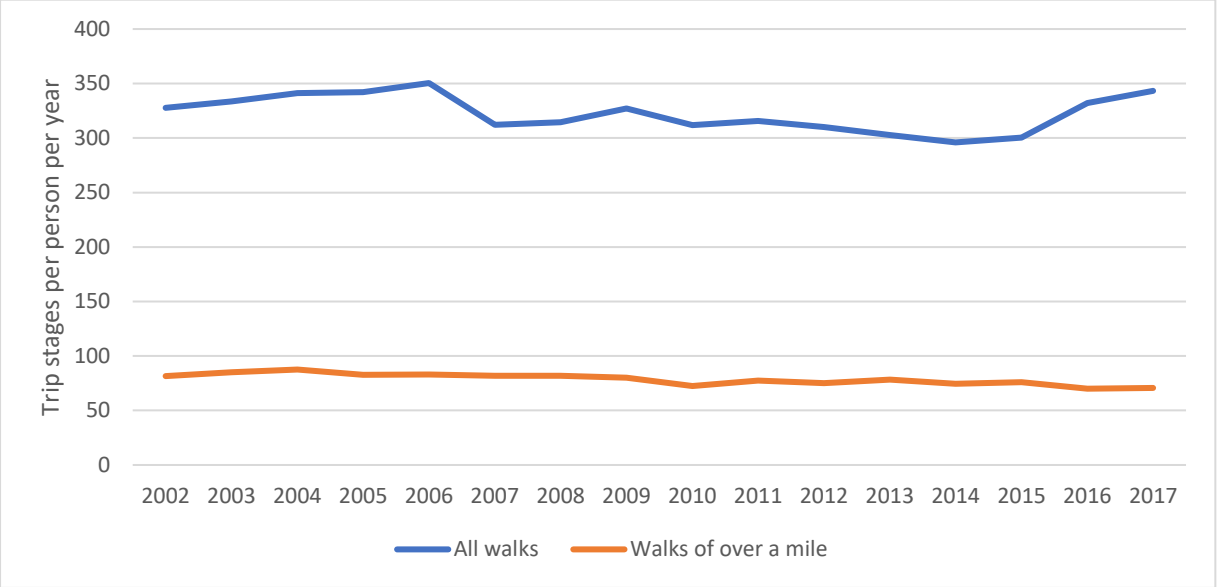
Until 2015, 'short walks' (i.e. walks of between 50 yards and one mile) were recorded on day 7 of the travel diary. (Walks under 50 yards and off the public highway are excluded.) Following experimentation in 2017, the process has now changed so that these walks are recorded on day 1. This has meant estimations of walk trips have increased by 20-25 short walks per person per year (presumably due to a reduction in survey fatigue)[3].

[2] In practice, since the figures from DfT are for the number of days, out of 28 days, when cycling took place, the multiplier is actually 8.7 (365/28*0.668).
[3] DfT (2018) National Travel Survey 2017, pp35-36.

The DfT NTS team kindly supplied data showing how days walked per person, and walk trip stages per day, had varied over time to 2015 (according to day 7 NTS data). As with cycling, the number of trip stages per day, on days when people reported walking, was largely invariant between years (with a value of 2.6 to 2.7 – although this may be different in the revised data). Instead, the variation in total walk trip stages was largely due to changes in the number of days that people reported walking.

Figure 3 shows how the total number of walking trip stages per person per year has varied over time, according to the latest data. (The 2017 NTS report states that the recent uplift is likely to be real, but also that the reasons for it are not clear.)

Figure 3: Variation in walking levels over time



Data taken from NTS table NTS0303.

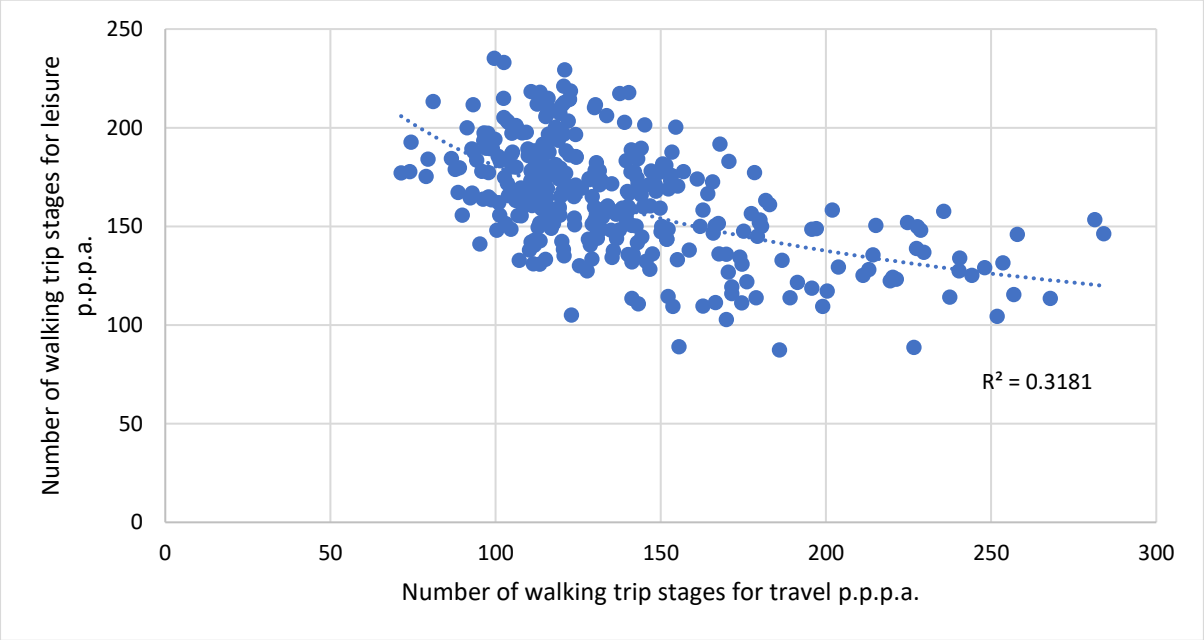
6. Using ALS data to derive the baseline walking data

Reasons for using the 2015/16 ALS data to derive the baseline data have already been set out for cycling in Section 3. As previously, it should be noted that doing this assumes that *relative* walking levels in LADs have remained the same between the baseline date and 2015/16.

However, unlike cycling:

- Correlations between the ALS (or APS) data and the Census are much weaker, with a correlation co-efficient in the order of 0.4 – presumably because levels of walking are less closely related to levels of walking for commuting than they are for cycling.
- Walking for travel and walking for leisure are not positively related, but are, instead, inversely related, as shown in Figure 4.

Figure 4: Relationship between leisure walking and travel walking at LAD level



Source: ALS data, as provided by DfT

In the ALS, respondents are asked to state the number of days in the past 4 weeks (28 days) on which they did a particular walking activity. Walk trips of over 10 minutes only are included, and walking around shops is excluded.

Some respondents appear to do more than 28 days of leisure walking, because questions about leisure walking ask about multiple activities (rambling, Nordic walking, and walking for health, recreation, training or competition) which are then combined. This is not an issue for walking for travel, because it does not combine categories, although the raw data contains a few cases with >28 days, which are probably due to a recording error.

In order to provide a dataset of the average number of days that people in each LAD walk, the DfT statistics team:

- Capped both the leisure and travel walking figures for each person at 28;
- Created separate average figures for (a) walking for leisure and (b) walking for travel; and
- Created an overall walking figure by adding together the two figures. This could, in theory, be as high as 56, but was, in practice, never above 28.

DfT (2018) reports that frequent leisure walks are likely to be associated with dog walking, since the Monitor of Engagement with the Natural Environment survey 2015/16 found that 48% of visits to the outdoors were to walk with a dog[4].

Partly due to methodological differences, the NTS and ALS data do not produce walking estimates of similar magnitude. Specifically, NTS estimates suggest that, in 2013, people made 303 walk trip stages per year in England. Using the previous figure of 2.7 trip stages per day, this implies walking on 112 days per year. Meanwhile, ALS figures suggest an average of 80 days walking for travel; 83 days walking for leisure; and (up to) 163 days for any walking.

[4]DfT (2018) Walking and cycling statistics, England: 2016.

As with cycling, the LAD-level ALS data was scaled to match the number of walk stages nationally, as given in the baseline target.

Given an average of 163 days of 'all walking' per person per year (ALS), compared with 303 walk stages per person per year (NTS), this required day rates in the ALS to be multiplied by 1.85, to give a number of walk stages per person per year[5]. This assumes that the number of walking stages per day is invariant between LADs. This assumption seems valid, given that, at the national level, the NTS data shows much less variation in the number of stages per day than in the number of days per year.

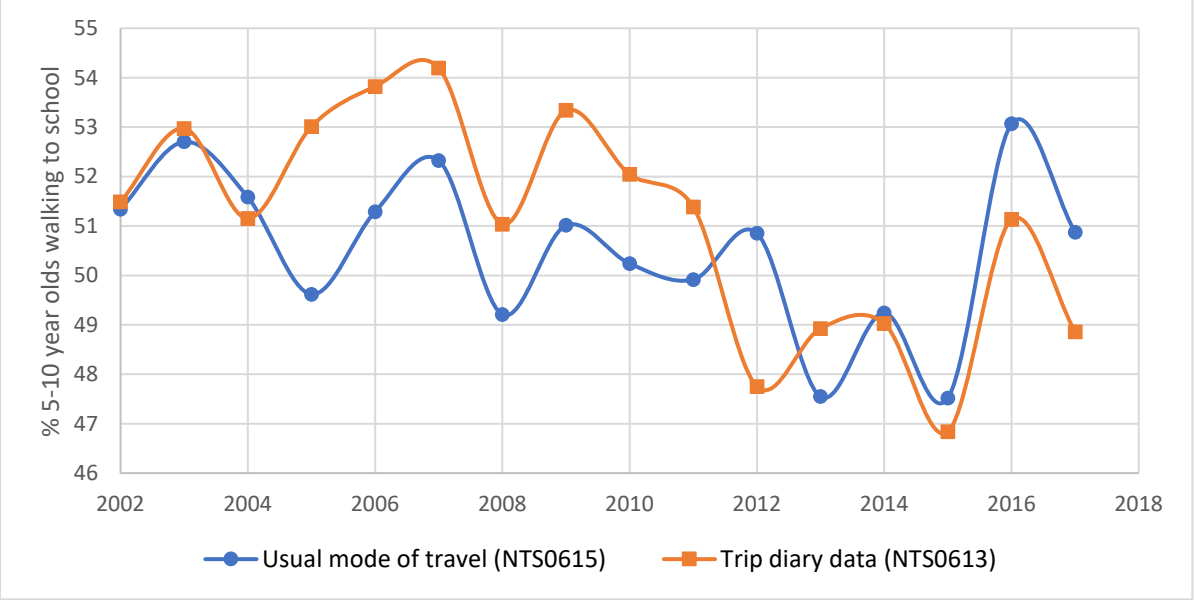
7. Walking to school target and NTS data

The CWIS walking to school target is:

- To increase the percentage of children aged 5-10 that usually walk to school, from 49% in 2014 to 55% in 2025

NTS data shows a downward trend in the proportion of 5-10 year olds walking to school between 2002 and 2015, although this may have reversed in the last couple of years, such that the proportion walking has overall been roughly stable (at around 51%) between 2002 and 2017.

Figure 5: Proportion of 5-10 year olds usually walking to school



Source: NTS data. The NTS publication suggests that the 'usual mode of travel' indicator is the more reliable of the two.

According to NTS[6] data, 97% of primary school pupils are accompanied to school, a figure which has also been broadly stable since 2002. This implies that the majority of pupil journeys will generate additional adult walk trip stages.

Pupils are in school for 190 days per year, so each pupil walking undertakes 380 walk trip stages p.a..

[5] In practice, since the figures from DfT are for the number of days, out of 28 days, when walking took place, the multiplier is actually 24.17 (365/28*1.85).
[6] DfT (2018) National Travel Survey: England 2017, p21.

8. Using School Census data to derive the baseline walk to school data

The only national local-level data on travel to school are from the 2011 School Census, which is published online[7]. Whilst it was possible to obtain details for individual schools, or at local authority county level, the schools were not coded to LADs. Therefore, it was necessary to obtain additional information about school location, with the help of the Department for Education[8]. The oldest version of a local file that they were able to supply was for January 2012.

Consequently, the school travel dataset was created from two source files:

- School Census data on travel to school in 2011 by school (of which there were 16,884 schools classified as primaries, or middle schools deemed to be primaries)
- Data about the location of each school in 2012

LAD codes were added to the travel file, initially matching on URN. This left 451 schools, which were then matched on school name and either county or LAD name, and finally by manual comparisons. In total, only 34 schools could not be allocated to a district.

In total, the 16,884 schools comprised 4,122,105 pupils. Of these, 24,170 pupils had not recorded a travel mode, and an additional 4,982 attended the schools that could not be allocated to a LAD.

For each LAD, the number of pupils walking was divided by the number of children recording a travel mode, to give a percentage that were walking to school.

This gives an average of 59.9% walking to school in 2011. In comparison, the National Travel Survey value is 50-51.5%. This difference is assumed to be due to differences in survey methods.

In order to create a LAD-level baseline that was consistent with the national target, the values from the new LAD-level dataset were scaled, using a linear scaling factor, to produce an average of 49%. These were then treated as the values for the baseline year. This assumes that (a) *relative* walking levels in LADs have remained the same between 2011 and the baseline year; and (b) the differences in survey methods do not lead to distortion in the relative positioning of LADs. The number of walk to school trip stages by pupils was generated by multiplying the number of 5-10 year olds in 2013[9], by the proportion walking, and by 380.

[7] https://www.gov.uk/government/statistics/schools-pupils-and-their-characteristics-january-2011. A question about mode of travel to school was not included in the School Census after 2011.
[8] Grateful thanks to Helen Bray.
[9] 2013 is being used as the baseline year, rather than 2014, for consistency with the other models.