Lambeth Low Traffic Neighbourhood stage 1 data validation report

This report

AUDIT TEAM - the data validation team at Project Centre Ltd.

PROCESS DESIGNER - the team as Systra commissioned to undertake the traffic monitoring and analysis across the Lambeth Low Traffic Neighbourhood programme.

CLIENT: The transport strategy team within Lambeth Council.

1. Introduction and Background Information

AUDIT TEAM REVIEW
3.1 The London Borough of Lambeth (LB Lambeth) has implemented a Low Traffic Neighbourhood (LTN) in the Railton area as part of the borough's COVID emergency transport response. This has affected traffic behaviour in the area; Systra were commissioned to monitor the traffic impacts of Railton LTN and analyse the impacts. 3.2 Project Centre have now been commissioned by LB Lambeth to validate the traffic survey data analysis for the (LTN) Monitoring Study. This technical note will review and validate the Railton LTN Stage 1 Data. 3.3 Railton LTN was delivered to promote a wider shift away from vehicle use towards active travel (walking and cycling) and public transport, improving air quality and safety and reducing greenhouse gas emissions. It stretched between Herne Hill and Brixton and is bounded by Coldharbour Lane to the east and southeast, and the rail line to the west. 3.4 Four modal filters were introduced on July 13th to form the Railton Low Traffic Neighbourhood.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

2. Data calculation

AUDITOR
2.1 Due to the urgency of the emergency response work and the atypical traffic flows because of COVID-19, it was decided to calculate baseline traffic flows using ATC data collected pre-COVID, during 2017 and 2019. The data was adjusted to reflect percentage change reported at nearby permanent Transport for London (TfL) count sites, to understand the impact of the LTNs on different modes during different time periods. 2.2 It is important to understand the calculations prior to the validation process. There are three main equations used to calculate the impact flow from Railton's LTN scheme and these are described below.

Equation 1

$$\text{Baseline Flows} = \text{Historic Flows} * \frac{\text{Stage 1 Background Flows}}{\text{Historic Background Flows}}$$

2.3 Due to the COVID-19 pandemic the baseline flow has been adjusted by applying the proportional change between the *Stage 1 Background Flow* (Post-COVID) and the *Historic Background Flow* (Pre-COVID) to the *Historic Flow* (Pre-LTN). The values used to calculate the proportional change in *Stage 1* and *Historic Background Flows* were extracted from TfL counter site 108 across all calculations.

2.4 Cycle traffic was excluded from the baselining procedure as it was assumed that cyclist behaviour would not have been affected by the changes. There would also have been an increase in leisure cycling during the 2020 lockdown period.

2.5 Historic datasets from the following studies are used to deduce the historic flows used in the equation above. As not all of the Railton LTN sites have an appropriate historic flow data set, each site has a different baseline data source pairing consisting of either:

- Healthy Routes Automatic Traffic Count (ATC) – two rounds of data collection to support the development of Lambeth's Healthy Cycling Routes;
- 20mph Study (ATC) – data collected by LB Lambeth to underpin analysis on the 20mph borough-wide speed limit; or
- The Floow – Telematics data that provides detail on vehicle routing through neighbourhood cells; this data was used indirectly as an adjustment factor to proportionally adjust Healthy Routes data based on flows on relevant roads. The Floow data was adjusted to a nearby TfL Traffic Counter. (Note – "The Floow" is the name of the consultancy that collected the data).

Equation 2

$$\text{Floow Approximation} = \text{Healthy Route Proxy Flow} * \frac{\text{Floow Flow}}{\text{Proxy Floow Flow}}$$

2.6 Similar to the adjusting the baseline flow in equation 1, Floow approximated values are calculated through multiplying a nearby *Healthy Route Proxy ATC flow* with the proportional difference between the values from the *Floow flow* and the *Proxy site flow*.

Equation 3

$$\text{Impact of LTN on Flows} = \text{Stage 1 Flows} - \text{Baseline Flows}$$

2.7 Ultimately the different between *Stage 1 Flow* (Post-LTN) and *Baseline Flows* will produce the values for the impact of LTN on flows.

PROCESS DESIGNER COMMENTS

In response to 2.4, the rationale for cycle flows not undergoing a baselining process is that they are unlikely to follow the same general traffic volume patterns as picked up by the TfL permanent counters on the strategic road network (which is used for baselining of car and goods vehicle data) – this data does not split volumes by vehicle class, so it was therefore not possible to make any meaningful assumptions about volumes of cycle travel that could be applied in a baselining process. Also, whilst cycle flows themselves are not impeded by the modal filters, it is expected

that cyclists would feel more comfortable using roads where modal filters have resulted in decreased traffic flows, and that their volumes would change accordingly.
CLIENT COMMENT

3. Validation Methodology

AUDITOR
3.1 The validation methodology is comprised of two parts: • Logical check validation – a review of the baseline data source choice and a review of the formula used in the calculations. • Accuracy validation – review of values and calculations within the processing spreadsheets. This will determine if there are any anomalies in the data used.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

4. Findings

Calculation review

AUDITOR
4.1 The main concern regarding the calculations is the formula used to produce the Floow approximation (Equation 2). While it is understood that a proportional change factor is applied to adjust the values, the proportional change compares flows from two different sites and therefore may result in inaccuracies. 4.2 Rather than attempting to calculate the proportional difference across different sites, it is recommended to calculate the proportional difference of the data source. Hence, it is recommended to use an equation similar to Equation 4 below: **Equation 4** $$\text{Floow Approximation (Site A)} = \text{Floow Daily Total Flow (Site A)}^* \frac{\text{Healthy Route Flow (Site B)}}{\text{Floow Flow (Site B)}}$$ **Example (Site R9)** *Equation 2* $$\text{HR Site 8 Flow}^* \frac{\text{Floow Regent Road Flow}}{\text{Floow Railton Road Flow}} = \text{Floow Approximation}$$ $$37{,}961^* \frac{390}{2{,}950} = 5{,}019$$ *Equation 4*

$$\text{Floow Regent Road Flow}^{*}\ \frac{\text{HR Site 8 Flow}}{\text{Floow Railton Road Flow}} = \text{Floow Approximation}$$

$$390^{*}\ \frac{37{,}961}{2{,}950} = 5{,}019$$

4.3 Following the procedure, Equation 2 and Equation 4 can obtain the same flow values. However, Equation 4 would represent a more accurate logic for the purpose of understanding.

PROCESS DESIGNER COMMENTS

The above is noted as an alternative method of calculation; however, as back end calculations will result in the same final values and the same assumptions have been used in both equations, it is believed that the methodology used in practice serves the same purpose with equal accuracy.

Equation 4 calculates the same numbers as Equation 2.

CLIENT COMMENT

No comments

AUDITOR

4.4 In addition, it was also noted and confirmed that there were inconsistencies between the value and labels used for sites utilising Floow approximated flows in their baseline calculations. However, this did not affect the values of LTN impact flow.

4.5 It was also noted that many of the ATC datasets from the 20mph study were incomplete and were patched by various methodologies depending on the circumstances of each instance. Hence, ATC datasets from 20mph study were only validated where adjustments were clearly noted.

PROCESS DESIGNER COMMENTS

In response to 4.5, data patching was required in order to maintain as consistent-as-possible an approach for all 20mph sites. However, due to the variation in what data was missing on a site-by-site basis, some judgment was required as to whether patching was preferable to using the 2nd week of data. Where relevant, detail on this has been provided on a site-by-site basis with calculations included in the raw data tab.

CLIENT COMMENT

No comments

Railton LTN site by site review

AUDITOR
4.6 The logical steps and calculations were reviewed for each Railton LTN site. The results from the validation process are summarised into a table and included in Appendix A. 4.7 The observations for each site are noted below for each site – R1 to R17.
PROCESS DESIGNER COMMENTS
It should be noted for any site where a 20mph study and Healthy Route dataset could be used, Healthy Routes have been used due to the smaller time discrepancy between survey periods (historic to stage 1), during which it is less likely wider changes would have impacted road usage (for example the introduction of new developments or changes to travel patterns). This applies to R1, R3, R4, R12 & R14 below.
CLIENT COMMENT
Suggest Systra add detail on proportions of each site type in above

AUDITOR
• R1 Coldharbour Lane – The results from the validation process suggest that the impact flows are logical and accurate, although the nearest historic flow data source for Site R1 is site 36 from the 20mph study. However, because the dataset for site 36 is partially missing and incomplete site 11 from Healthy Routes is used.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

AUDITOR
• R2 Hinton Road – The results from the validation process suggest that the impact flows are logical and accurate. It was noted that data from 20mph study week 1 site 37 was used for this site - where weekday values before 12:45 on Tuesday are patched using the calculated weekday averages. Upon review of the raw data values, the values did not appear to correspond with the raw data values provided by the survey company.
PROCESS DESIGNER COMMENTS
20mph study week 1 was used for R2 Hinton Road, with weekday values before 12:45 on Tuesday patched using weekday averages.
CLIENT COMMENT
No comments

AUDITOR
• R3 Shakespeare Road – The results from the validation process suggest that the impact flows are logical and accurate, although the nearest historic flow data source for site R3 is site 72 from the 20mph study. However, due to incomplete datasets, site 26 from Healthy Routes is used.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

AUDITOR
• R4 Shakespeare Road – The results from the validation process suggest that the impact flows are logical and accurate, although the nearest historic flow data source for site R4 is site 72 from the 20mph study. However due to incomplete datasets, site 26 from Healthy Routes is used.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

AUDITOR
• R5 Milkwood Road – The results from the validation process suggest that the impact flows are logical and accurate.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

AUDITOR
• R6 Railton Road – The results from the validation process suggest that the impact flows are logical and accurate. It was noted that data from 20mph study week 1 site 82 was used for this site -where missing data from 21:30 – 22:00 on Monday was patched with data from 21:00 – 21:30 on Monday. Upon review of the raw data values, the values did not appear to correspond with the raw data values provided by the survey company.
PROCESS DESIGNER COMMENTS
20mph study week 1 was used for R6 Railton Road – there is a 108-vehicle difference with raw data due to there being missing data from 21:30-22:00 on the Monday. This has been patched by copying the 21:00-21:30 data in from the same day.
CLIENT COMMENT

No comments

AUDITOR
• R7 Hurst Street – The results from the validation process suggest that the impact flows are logical. However, the accuracy could not be confirmed. The data source for historic flows used for site R2 was site 76 from the 20mph study. Upon review of the raw data values, the values did not appear to correspond with the raw data values provided by the survey company.
PROCESS DESIGNER COMMENTS
Comment noted and addressed in calculations/reporting – data from the 20mph study has been reviewed and repeat data deleted to correctly reflect that this is a one-way road.
CLIENT COMMENT
No comments

AUDITOR
• R8 Railton Road – The results from the validation process suggest that the impact flows are logical and accurate.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

AUDITOR
• R9 Regent Road – The results from the validation process suggest that the impact flows are logical and accurate.
PROCESS DESIGNER COMMENTS
No comments
CLIENT COMMENT
No comments

AUDITOR
• R10 Dulwich Road – The results from the validation process suggest that the impact flows are logical. However, the accuracy could not be confirmed. Upon review of the pre- LTN raw data values, the values did not correspond with the raw data values provided by the survey company. This was deemed not significant due to the small discrepancy in the number of cars and HGVs (ATC Site 146 Wk1 Cars = 66,710 and HGVs= 10,605, Railton Historical Cars= 67,722 and HGVs= 9,226).
PROCESS DESIGNER COMMENTS

20mph study week 1 was used for Dulwich Road, with weekday values before 7:45 on Wednesday patched using weekday averages. Calculations from existing raw data have now been added to the spreadsheet.
CLIENT COMMENT
Confirmed that comments have been addressed within reporting.

AUDITOR
• R11 Brixton Water Lane – The results from the validation process suggest that the impact flows are logical. However, the accuracy could not be confirmed. Although the nearest historic flow data source for site R11 is site 146 or 106 from the 20mph study, due to incomplete datasets, site 11 from Healthy Routes is used. Upon review of the pre- LTN raw data values, the values did not appear to correspond with the raw data values provided by the survey company.
PROCESS DESIGNER COMMENTS
It was found that due to a coding error, historic data from the incorrect site was drawn in to construct the baseline. This has been amended using data from site 18.
CLIENT COMMENT

AUDITOR
• R12 Barnwell Lane – The results from the validation process suggest that the impact flows are logical and accurate. Although the nearest historic flow data source for site R12 is site 146 from the 20mph study, due to incomplete datasets, site 25 from Healthy Routes is used.
PROCESS DESIGNER COMMENTS
No comment
CLIENT COMMENT
No comment

AUDITOR
• R14 Railton Road – The results from the validation process suggest that the impact flows are logical and accurate. Although the nearest historic flow data source for site R14 is site 151 from the 20mph study, due to incomplete datasets, site 8 from Healthy Routes is used.
PROCESS DESIGNER COMMENTS
No comment
CLIENT COMMENT
No comment

AUDITOR

• R15 Effra Road – The results from the validation process suggest that the impact flows are logical and accurate. A typing error was identified for the proxy site used (proxy site used is not site 25), the proxy site used is site 18. This was confirmed in discussion with the survey company.
PROCESS DESIGNER COMMENTS
Typing error updated.
CLIENT COMMENT
No comment

AUDITOR
• R16 Kellet Road – The results from the validation process suggest that the impact flows are logical and accurate.
PROCESS DESIGNER COMMENTS
No comment
CLIENT COMMENT
No comment

AUDITOR
• R17 Coldharbour Lane – Results from the validation process suggests that the impact flows are logical. However, the accuracy could not be confirmed. The data source for historic flows used for site R17 was site 18 from the Healthy Routes study. Upon review of the raw data values, the values did not appear to correspond with the raw data values provided by the survey company. Although the nearest data source for site R17 is site 333 from the 20mph study, this was not used as it had incomplete datasets.
PROCESS DESIGNER COMMENTS
Upon a more detailed review of data feeding this site, it has been found that in addition to some data missing in the stage 1 counts (due to tampering with the ATC) that was previously captured, several days of historic data seemed to significantly underreport flows, whether due to an ATC issue or resulting from roadworks. Any day of the week with abnormal data has been removed from the comparison, with the average change in flows drawn only from reliable data. It is therefore essential that stage 2 data is collected for the full seven-day period.
CLIENT COMMENT

5. Conclusions and Recommendations

Conclusions

AUDITOR	
5.1	In conclusion the data is consistently logical in the methodology that was used to calculate the impact of the Railton LTN. However, it was noted at several sites that the accuracy cannot be confirmed as it is not known where certain datasets have originated from and thus why they were used.
PROCESS DESIGNER COMMENTS	
No comment	
CLIENT COMMENT	
No comment	

Recommendations

AUDITOR	
5.2	Overall, the quality of calculation was clear and logical, however, there were still many ambiguities in validating the accuracy for sites using ATC data from the 20mph study. Although inputting errors were noted, none were significant.
5.3	It is recommended to perform a more in-depth review on the formula used for Floow approximated values.
5.4	It is recommended that further clarification is required from the survey companies to understand their methodology and logic behind using certain data especially for calculations that used data from 20mph study where inconsistent patching methods were used. (Appendix A).
PROCESS DESIGNER COMMENTS	
SYSTRA can confirm that all points covered in the validation note have been addressed and any necessary changes made.	
CLIENT COMMENT	
Lambeth transport team confirm that where data processing corrections have been recommended, they have also been actioned by the Systra with corrected figures included in the published stage report. Where recommendations were either not possible to follow, or where Systra have decided to take a different approach, this has also been noted.	