

## Appendix 2: Investigating concerns of traffic displacement

The purpose of Bath's Clean Air Zone is to reduce air pollution and improve vehicle compliance in line with minimum emission standards, while minimising the impact of the CAZ on normal traffic flows in and around Bath.

Traffic flows have been substantially impacted by the Covid-19 lockdowns in 2020 and are now returning to pre-pandemic levels and in the case of LGV's and HGV's, exceeding pre-pandemic levels<sup>1</sup>. Data gathered from permanent automatic traffic counts in and around the zone tell us that in the third quarter of the year (July to September 2021), general traffic flows across a 7-day week were down by 2.3% in the urban area outside of the CAZ, and 0.9% in the wider B&NES area, compared with the same quarter in 2017/2018 (our baseline years).

A key commitment for the council is to monitor any concerns arising from the introduction of the CAZ, so we are investigating 18 discrete locations where the public have so far expressed concern over a perceived increase in traffic in their communities since the launch of the clean air zone. In addition, we have provided extra permanent ANPR cameras to monitor traffic flows and fleet composition through Bathampton where the community expressed concerns about displacement during the development of the Full Business Case.

The areas of concern, and what we're doing to log, investigate and monitor these are listed in the figure and table below. The work is ongoing and will be updated in subsequent reports. In parallel to these investigations, data is being retrieved and analysed from ANPR cameras located in Bathampton. This information is presented within the 2021 Q3 Monitoring Report.

In terms of air quality, we report the nearest diffusion tube data for the area in question, to understand the local air quality situation. The legal limit for annual average NO<sub>2</sub> pollution is 40 µg/m<sup>3</sup>. We are generally concerned with any site where NO<sub>2</sub> concentrations are currently over 36 µg/m<sup>3</sup>, to ensure that they don't breach the 40 µg/m<sup>3</sup> limit as an annual mean. All 2021 air quality data is provisional until the release of the annual CAZ report for 2021 in 2022.

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<sup>1</sup> Office for National Statistics. Economic activity and social change in the UK, real-time indicators, 2021.  
<https://www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/economicactivityandsocialchangeintheukrealtimeindicators/23september2021>

Throughout this report we mention the traffic volumes during AM-peak, PM-peak, and inter-peak times. The AM peak refers to the time when the highest volume of traffic occurs during the morning. The PM-peak refers to the time when the highest volume of traffic occurs during the evening, the inter-peak period is between these two times.

Additionally, traffic volumes are often averaged using both a 5-day and 7-day average. A 5-day average has been calculated using the volumes recorded Monday-Friday (weekday). A 7-day average has been calculated using all seven days of the week.

\*Traffic flow data is published in the CAZ Quarterly Monitoring Report, July to September 2021 accompanying this appendix. Due to unprecedented changes in travel behaviour during the Covid-19 lockdowns, we are discounting data from 2020 for comparison purposes, except where stated. In 2019 there was insufficient data collected for comparison purposes, 2017 has also been used where data is unavailable for 2018.

## How we're investigating possible traffic displacement

Since the launch of the CAZ in March 2021, we have logged and investigated all comments from residents about potential CAZ-related impacts. Figure 1 shows the process for following up and investigating these queries.

Figure 1: Process for following up and investigating traffic displacement concern s

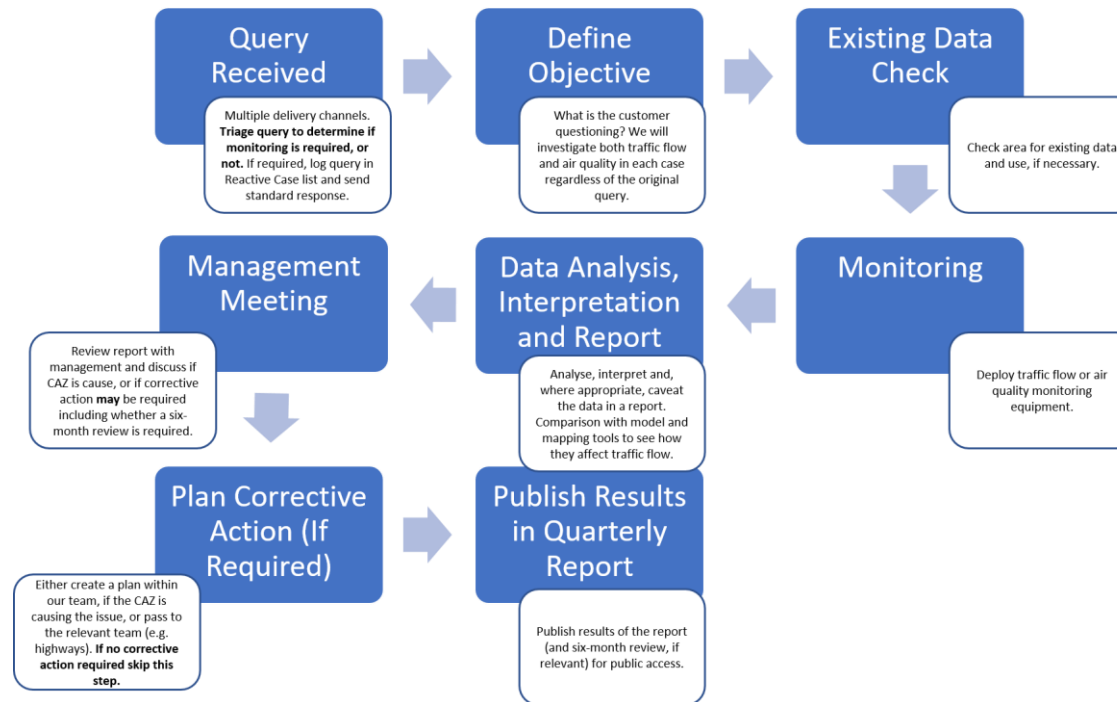


Table 1: Actions taken to investigate areas of concern, with available results and next steps.

Area for investigation	Status	Initial monitoring undertaken	Traffic monitoring results	Air quality monitoring results	Secondary monitoring (if required)	Further review
Colliers Lane	Monitoring complete.	One temporary automatic traffic counter during a 7-day period in April 2021.  Singular diffusion tube air quality monitoring.	During April 2021, data collected shows a 20% increase in traffic volumes compared to January 2021.  However, general traffic levels in January 2021 were 40% lower than pre-pandemic levels.	The nearest available monitoring site from Colliers Lane is at Granville Road. The NO <sub>2</sub> concentration at this location in 2021 Q3 was 5 µg/m <sup>3</sup> compared to 8 µg/m <sup>3</sup> in 2019 Q3.	No further monitoring required at this stage, due to no discernible increase in traffic volumes.  This will be reviewed in 6 months.	Upon reviewing Colliers Lane there have been no further concerns regarding traffic volumes and air quality.  This case will be removed from the appendix in the following quarter.
Charlcombe Lane	Further monitoring in progress.	Three temporary radar automatic traffic counters for a 7-day period in July 2021.  Singular diffusion tube	The 5-day average shows that the morning and afternoon peak flows are significantly lower in 2021 than compared with 2019. Interpeak traffic flows are slightly higher than in 2019, however this is	The post-CAZ NO <sub>2</sub> concentration at Charlcombe Lane measured at 9 µg/m <sup>3</sup> in 2021 Q3 compared to 12 µg/m <sup>3</sup> in 2019 Q3.	At the request of the Parish Council the results of monitoring completed in November 2021 will be analysed and compared with monitoring	Depending upon the outcome of the November 2021 analysis, this maybe reviewed again in 6 months.

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		air quality monitoring.	replicated on other roads since the pandemic, with lower morning peak flows and higher interpeak flows.		completed in November 2019.	
Upper Camden Place	Initial monitoring complete.	One temporary radar automatic traffic counter deployed in July 2021 for a period of 7-days.  Singular diffusion tube air quality monitoring.	The volume of traffic on Camden Road is down 25% in July 2021 compared to June 2021.  On average 2021 daily total volumes on Camden Road are 12% lower compared to 2017.  However, traffic in general was still 8% down on pre-pandemic levels in B&NES when monitoring was carried out.	The post-CAZ NO <sub>2</sub> concentration at Upper Camden Place measured at 20 µg/m <sup>3</sup> in 2021 Q3 compared to 22 µg/m <sup>3</sup> in 2019 Q3.	No further monitoring required at this stage, due to no discernible increase in traffic volumes.  This will be reviewed in 6 months.	Review to be carried out in early 2022.
Southdown Road	Initial monitoring complete.	One temporary radar automatic traffic counter	Comparing 2021 data to 2019 the traffic levels on Southdown Road have dropped 13.4%	The nearest available monitoring site from Southdown	No further monitoring required at this stage, due to no discernible	Review to be carried out in early 2022.

		<p>deployed in July 2021 for a period of 7-days.</p> <p>Singular diffusion tube air quality monitoring.</p>	<p>(5-day average) and 11.4% (7-day average).</p> <p>The AM peak has significantly reduced whilst the PM peak has reduced slightly.</p>	<p>Road was Coronation Avenue. The NO<sub>2</sub> concentration at this location in 2021 Q3 was 15 µg/m<sup>3</sup> compared to 16 µg/m<sup>3</sup> in 2019 Q3.</p>	<p>increase in traffic volumes.</p> <p>This will be reviewed in 6 months.</p>	
Old Newbridge Hill	Initial monitoring complete.	<p>Neo Traffic Data using one automatic tube counter plus one Miovision camera for turning count analysis for a 7-day period during July 2021.</p> <p>Singular diffusion tube air quality monitoring.</p>	<p>Overall traffic volume is lower in 2021 compared to 2019; further analysis is required to understand whether the proportion of HGVs, out of the total traffic using the road, has changed.</p>	<p>The post-CAZ NO<sub>2</sub> concentration at Old Newbridge Hill measured at 30 µg/m<sup>3</sup> in 2021 Q3 compared to 27 µg/m<sup>3</sup> in 2019 Q3.</p>	<p>New weight limit restriction being explored for this location together with further monitoring, if necessary.</p> <p>This will be reviewed in 6 months.</p>	<p>Review to be carried out in early 2022, together with work to explore the introduction of a new Traffic Regulation Order.</p>

<p>Twerton High Street</p>	<p>Initial monitoring in progress.</p>	<p>Singular diffusion tube installed in August 2021 for a period of at least 3-months.</p>	<p>N/A</p>	<p>As this diffusion tube was installed midway through 2021 Q3 the results for the quarter have not been averaged.</p> <p>In September 2021 the NO<sub>2</sub> concentration at Twerton High Street measured at 27 µg/m<sup>3</sup>.</p>	<p>Monitoring will be continued at this site until we can fully understand the trends in this location.</p>	<p>Review to be carried out in early 2022.</p>
<p>Oldfield Park area (Brook Road, West Avenue, Lyndhurst Road, Ringwood Road, Millmead Road)</p>	<p>Further monitoring complete.</p>	<p>Five pneumatic traffic counters were deployed at the following locations during a 7-day period in July 2021: Millmead Road, West Avenue, South Avenue, Brook</p>	<p>Monitoring along Moorland Road during July 2021 showed a potential increase in average weekday larger vehicle (HGVs and buses/coaches) volume when compared to 2019.</p>	<p>The nearest available monitoring site from Brook Road is at Moorland Road. The NO<sub>2</sub> concentration at this location in 2021 Q3 was 16 µg/m<sup>3</sup> compared to 17 µg/m<sup>3</sup> in 2019 Q3.</p>	<p>Further monitoring with temporary ANPR cameras was carried out to understand the compliance split between vehicle types (i.e., are these non-compliant larger vehicles seeking to avoid CAZ charges).</p>	<p>Our previous monitoring at this location identified an issue with increased HGV numbers. However, on further investigation using temporary ANPR cameras in July 2021, we identified that the number of HGVs using the area</p>

		<p>Road and Triangle North.</p> <p>Singular diffusion tube air quality monitoring.</p>			<p>Further observations were carried out in the vicinity of the area to observe the potential sources and routing of vehicles.</p>	<p>was low (less than 10 per day) with high levels of compliance (&gt;85%).</p> <p>LGV numbers were found to be relatively high, with the compliance of these vehicles being lower than that within the CAZ.</p> <p>This location will be reviewed again after the full reopening of Cleveland Bridge to establish whether the non-compliant vehicles are seeking to avoid zone charges.</p> <p>Engagement is taking place with delivery companies</p>
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						observed using HGV's along this route. So far, this has supported the view that it is not being used to avoid the CAZ.
Whiteway Road	Further monitoring complete.	<p>One permanent ATC and two temporary volume and speed counters for a 7-day period in June 2021.</p> <p>Singular diffusion tube air quality monitoring at two locations along Whiteway Road.</p>	<p>Monitoring after the CAZ launch showed a 4.7% increase in rigid HGVs and an 8.3% increase in articulated trucks compared to September 2020. However overall traffic volumes in September 2020 were lower than since the launch of the CAZ.</p> <p>However, a percentage of overall traffic volume, HGVs accounted for 4.5% of all traffic in both September 2020 and for the period since the launch of the CAZ.</p>	<p>Diffusion tubes along Whiteway Road were not deployed until August 2019.</p> <p>However, in 2021 Q3 NO<sub>2</sub> concentrations at Whiteway measured at 19 µg/m<sup>3</sup>* compared to 17 µg/m<sup>3</sup>* in 2019 Q3.</p> <p>Whiteway 2 measured at 22 µg/m<sup>3</sup> compared to 24 µg/m<sup>3</sup>* in 2019 Q3.</p>	<p>Whilst the modelling at FBC stage predicted a slight increase in traffic volumes in this location, monitoring was undertaken with a temporary ANPR camera to understand the percentage of non-compliant HGVs and trucks using this route, to establish whether these vehicles are seeking to avoid zone charges.</p>	<p>During September 2021 ANPR camera data showed a 6% increase in rigid HGVs and a 3% increase in articulated trucks when compared to September 2020. However, national traffic volumes have returned to pre-pandemic levels and in the case of LGVs and HGVs, pre-pandemic levels are being exceeded (Department of Transport).</p>

				<p><i>*Quarterly average derived from two monthly results due to an invalid result.</i></p>		<p>The compliance of these vehicles remains lower than that within the CAZ.</p> <p>This location will be reviewed after the full reopening of Cleveland Bridge to establish whether these vehicles are seeking to avoid zone charges.</p>
Shophouse Road	Initial monitoring complete.	<p>Neo Traffic Data using one tube counter (speed and classification) for a 7-day period in July 2021.</p> <p>Singular diffusion tube air quality monitoring.</p>	<p>Overall vehicle numbers are higher than in 2019.</p> <p>HGV numbers are also higher when compared with the 2019 baseline however, in 2019 HGVs accounted for 8% of all vehicles on Shophouse Road and in 2021 they accounted for 7%.</p>	<p>The nearest available monitoring site from Shophouse Road was The Hollow. The NO<sub>2</sub> concentration at this location in 2021 Q3 was 21 µg/m<sup>3</sup> compared to 19 µg/m<sup>3</sup> in 2019 Q3.</p>	<p>Whilst modelling predicted a slight increase in traffic volumes in this location, monitoring will be reviewed after the full reopening of Cleveland Bridge,</p> <p>This will be reviewed in 6 months.</p>	<p>Review to be carried out in early 2022.</p>

<p>Lansdown Lane</p>	<p>Further monitoring complete.</p>	<p>Two weeks of camera monitoring post-CAZ launch with comparison made to pre-existing data collected in 2018-2019.</p> <p>A manual traffic count occurred in May 2020.</p> <p>Singular diffusion tube air quality monitoring.</p>	<p>During March 2021, data collected shows reduced traffic levels between 12% to 16% over a 7-day period.</p> <p>However, this was in March 2021 when traffic levels were generally around 30% lower than pre-pandemic levels.</p> <p>Post-CAZ HGV numbers were found to be low whereas LGV numbers were higher in March 2021 than in 2018-2019.</p>	<p>The post-CAZ NO<sub>2</sub> concentration at Lansdown Lane was 20 µg/m<sup>3</sup> in 2021 Q3 compared to 17 µg/m<sup>3</sup> in June 2019.</p>	<p>Temporary Automatic Number Plate Recognition (ANPR) cameras were installed to monitor the compliance split of vehicle types to further investigate the reason for the increase in LGV numbers and whether these are non-compliant LGVs seeking to avoid CAZ charges.</p>	<p>During August 2021, ANPR camera data collected showed an increase in traffic volumes of 6-10% across a 7-day average when compared to 2018/19.</p> <p>Post-CAZ LGV numbers have increased compared to the 2018/19 baseline with there being less compliance than those vehicles travelling within the CAZ.</p> <p>This location will be reviewed after the full reopening of Cleveland Bridge to establish whether these vehicles are seeking to</p>

						avoid zone charges.
Rosemount Lane	Initial monitoring complete.	One temporary radar automatic traffic counter deployed for a 7-day period in July 2021.  Singular diffusion tube air quality monitoring.	During July 2021, data collected shows a reduction in traffic volumes of 56% over a 7-day period when compared to a 2016 baseline.  Data shows that most vehicles use the route east (downhill) but very few travel up the steep hill.	The nearest available monitoring site is at Greenway Lane. The NO <sub>2</sub> concentration at this location in 2021 Q3 was 10 µg/m <sup>3</sup> compared to 14 µg/m <sup>3</sup> in 2019 Q3.	No further monitoring required at this stage, due to no discernible increase in traffic volumes.  This will be reviewed in 6 months.	Review to be carried out in early 2022.
Sham Castle Lane	Initial monitoring complete.	One temporary radar automatic traffic counter deployed for a 7-day period in July 2021.  Singular diffusion tube air quality monitoring.	There is no pre-CAZ baseline for Sham Castle Lane, however, by analysing the traffic volumes during peak times an indication of overall volumes can be understood.  The peak of traffic appeared between 1600-1700hr where	The nearest available monitoring site from Sham Castle Lane was North Road. The NO <sub>2</sub> concentration at this location in 2021 Q3 was 12	No further monitoring required at this stage, due to no discernible increase in traffic volumes.  This will be reviewed in 6 months.	Review to be carried out in early 2022.

			21 vehicles were recorded within the hour. The next highest volume was 14 vehicles within an hour.	$\mu\text{g}/\text{m}^3$ * compared to $16 \mu\text{g}/\text{m}^3$ in 2019 Q3.		
Prior Park Road	Initial monitoring complete.	Neo Traffic Data using one automatic tube counter for a 7-day period in July 2021.  Singular diffusion tube air quality monitoring.	Monitoring along Prior Park Road during June/July 2021 showed an increase of 14% in weekday traffic volumes when compared to 2017.	The post-CAZ $\text{NO}_2$ concentration at Prior Park Road measured at $25 \mu\text{g}/\text{m}^3$ in 2021 Q3 compared to $29 \mu\text{g}/\text{m}^3$ in 2019 Q3.	A 6-month review will be carried out after the full reopening of Cleveland Bridge.	Review to be carried out in early 2022.
Bradford Road/ Brassknocker Hill	Initial monitoring complete.	One permanent automatic traffic counter located on both Bradford Road and Brassknocker Hill.  Singular diffusion tube	Data from the permanent ATC at Bradford Road between the months April-September 2021 has shown a 4% increase westbound and a 1% increase eastbound in HGVs when compared to a September 2020	The post-CAZ $\text{NO}_2$ concentration at Bradford road measured at $23 \mu\text{g}/\text{m}^3$ in 2021 Q3 compared to $21 \mu\text{g}/\text{m}^3$ in 2019 Q3.	A 6-month review will be carried out after the full reopening of Cleveland Bridge, as well as investigating those vehicles which are breaking the 7.5t weight restriction	Review to be carried out in mid-2022.

		air quality monitoring at both locations.	<p>baseline (7-day average). HGVs were back to pre-pandemic levels at this baseline period (Department of Transport).</p> <p>Data from the permanent ATC at Brassknocker Hill between the months April-September 2021 has shown a potential increase of 19% northbound and 6% southbound in HGVs when compared to a September 2020 baseline (7-day average).</p>	<p>The post-CAZ NO<sub>2</sub> concentration at Brassknocker Hill measured at 34 µg/m<sup>3</sup> compared to 39 µg/m<sup>3</sup> in 2019 Q3.</p>	on Brassknocker Hill.	
Penn Hill Road	Initial monitoring complete.	One temporary radar automatic traffic counter deployed in August 2021 for a 7-day period.	<p>Monitoring in August 2021 showed a weekday average of 6938 vehicles per day, and a 7-day average of 6399 vehicles per day.</p> <p>Whilst there is no pre-CAZ baseline at</p>	<p>The nearest available monitoring site from Penn Hill Road was Weston High Street. The NO<sub>2</sub> concentration at this location</p>	This will be reviewed in 6 months.	Review to be carried out in early 2022.

		Singular diffusion tube air quality monitoring.	this location, comparing this data to surrounding areas suggests these volumes are as expected. However, this site will be reviewed in 6-months' time.	in 2021 Q3 was 19 $\mu\text{g}/\text{m}^3$ compared to 18 $\mu\text{g}/\text{m}^3$ in 2019 Q3.		
Englishcombe Lane	Initial monitoring complete.	Two temporary radar automatic traffic counters deployed in September 2021 for a period of 7-days.  Singular diffusion tube air quality monitoring.	Monitoring along Englishcombe Lane during September 2021 showed a potential increase in average weekday traffic volumes when compared to a January 2021 baseline. However, this baseline will have seen significantly lower traffic volumes due to the national lockdown.	The post-CAZ NO <sub>2</sub> concentration at Englishcombe Lane measured at 10 $\mu\text{g}/\text{m}^3$ in 2021 Q3 compared to 11 $\mu\text{g}/\text{m}^3$ in 2019 Q3.	This location will be reviewed again after 6 months and the full reopening of Cleveland Bridge to establish whether the non-compliant vehicles are seeking to avoid zone charges.	Review to be carried out in mid-2022.
Norton St Philip	Initial monitoring complete.	One permanent automatic	Monitoring at Norton St Phillip has shown a decrease of 16% in	The nearest available monitoring site	No further monitoring required at this	Review to be carried out in mid-2022.

		<p>traffic counter located on the B3110 north west of Midford.</p> <p>Singular diffusion tube air quality monitoring.</p>	<p>weekday car and light good vehicle volumes when compared to 2017.</p> <p>Heavy vans and minibuses have decreased by 4%, with HGVs and articulated lorries also decreasing by 10% when compared to a 2017 baseline.</p>	<p>from the permanent automatic traffic counter on the B3110 was Bradford Road. The NO<sub>2</sub> concentration at this location in 2021 Q3 was 23 µg/m<sup>3</sup> compared to 21 µg/m<sup>3</sup> in 2019 Q3.</p>	<p>stage, due to no discernible increase in traffic (including car traffic) volumes.</p> <p>This will be reviewed in 6 months.</p>	
Cavendish Road	Initial monitoring complete.	<p>One temporary radar automatic traffic counter deployed for a 7-day period in October 2021.</p> <p>Triplicate diffusion tube air quality monitoring.</p>	<p>Monitoring of traffic volumes along Cavendish Road during October 2021 showed a potential increase of 17% in weekday traffic volumes when compared to 2017.</p>	<p>The NO<sub>2</sub> concentration at Cavendish Road was 14 µg/m<sup>3</sup> in both 2019 and 2021 Q3.</p>	<p>A 6-month review will be carried out after the full reopening of Cleveland Bridge to establish whether the non-compliant vehicles are seeking to avoid zone charges.</p>	<p>Review to be carried out in early 2022.</p>