Characterising changing travel patterns during COVID-19 and beyond

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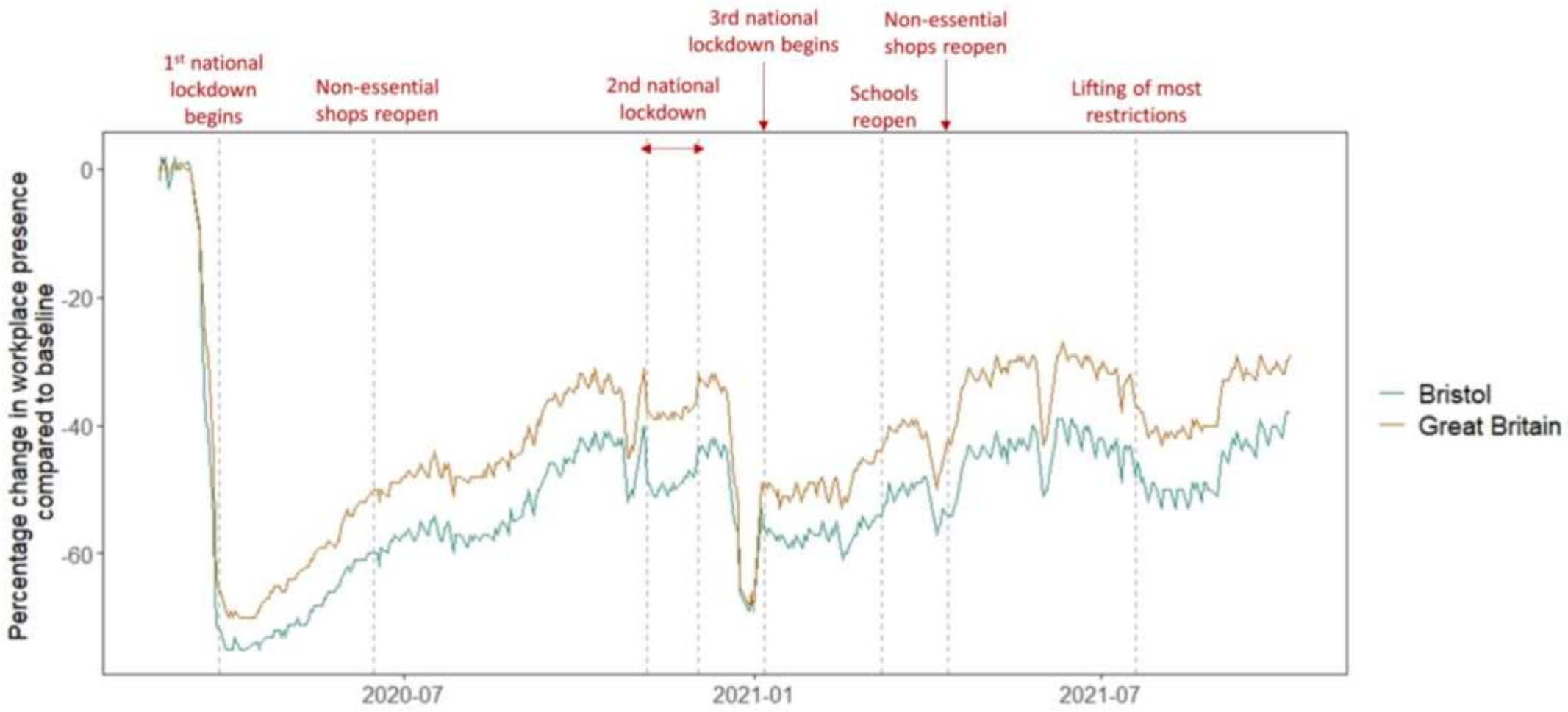
Transport and the Pandemic



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Characterising changing travel patterns during and beyond COVID-19

Aim: To explore the impact of the pandemic on travel behaviour in Bristol to inform policies related to air quality and decarbonisation

Approach: Examined travel behaviour at an aggregate level and at an individual level using Automatic Number Plate Recognition (ANPR) data from Bristol alongside the associated vehicle type and fuel type data

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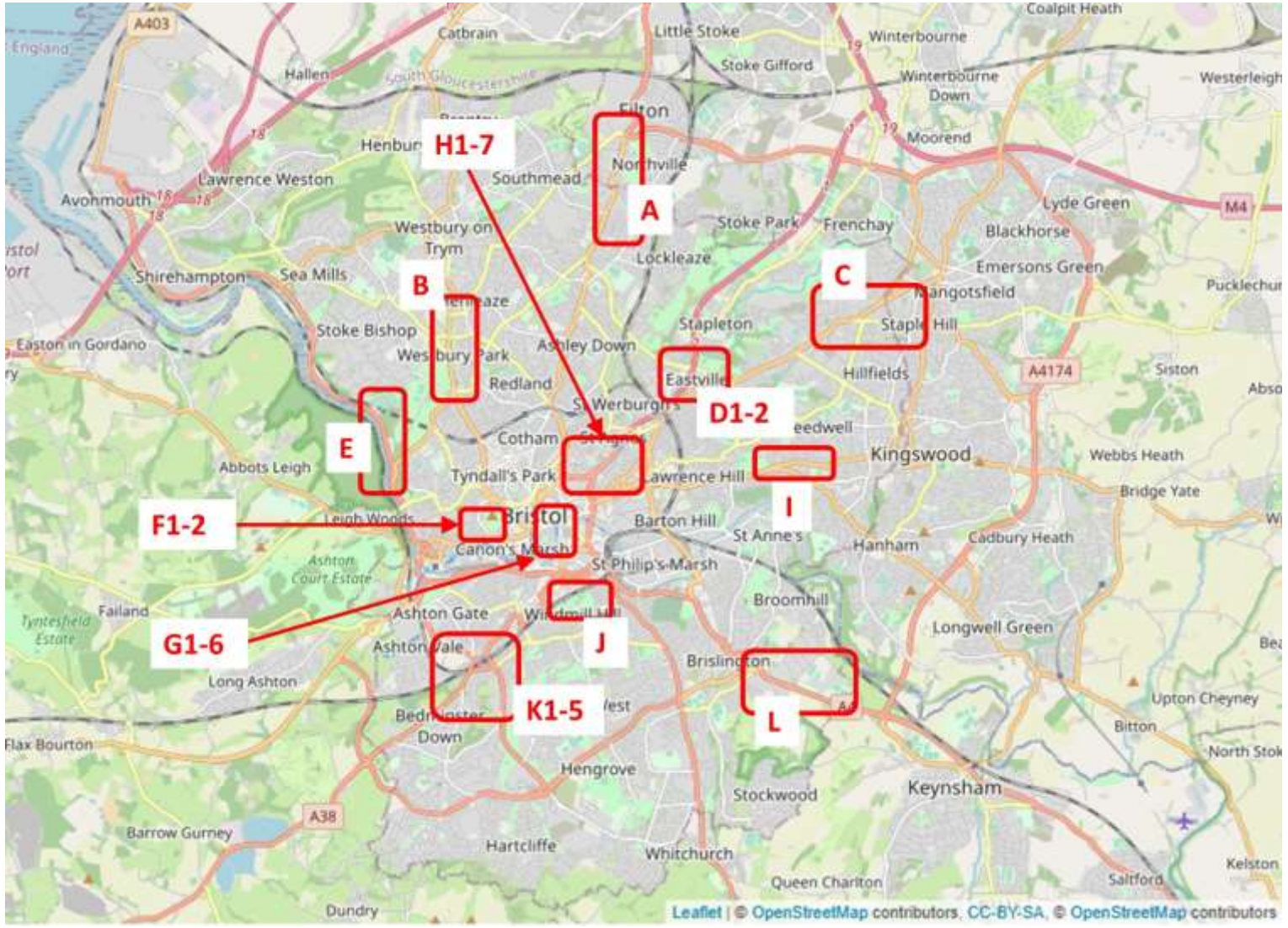
Data from the Automatic Number Plate Recognition Cameras in Bristol

Data from 101 cameras within the Bristol City Council area was obtained for the period from 28/2/2019 to 30/09/2021.

After cleaning, 64 cameras in 29 locations remained.



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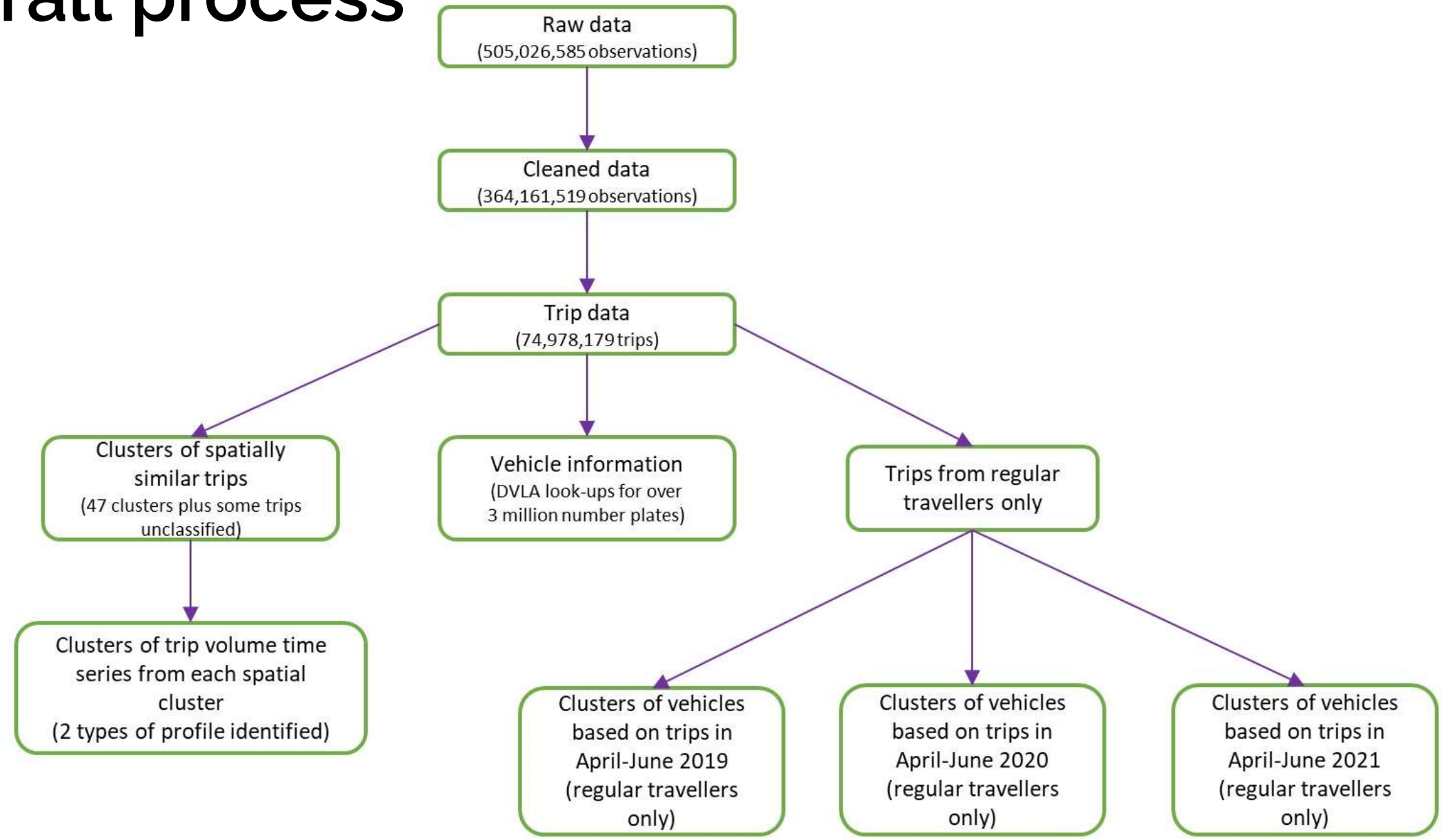
Overall process



Data overview

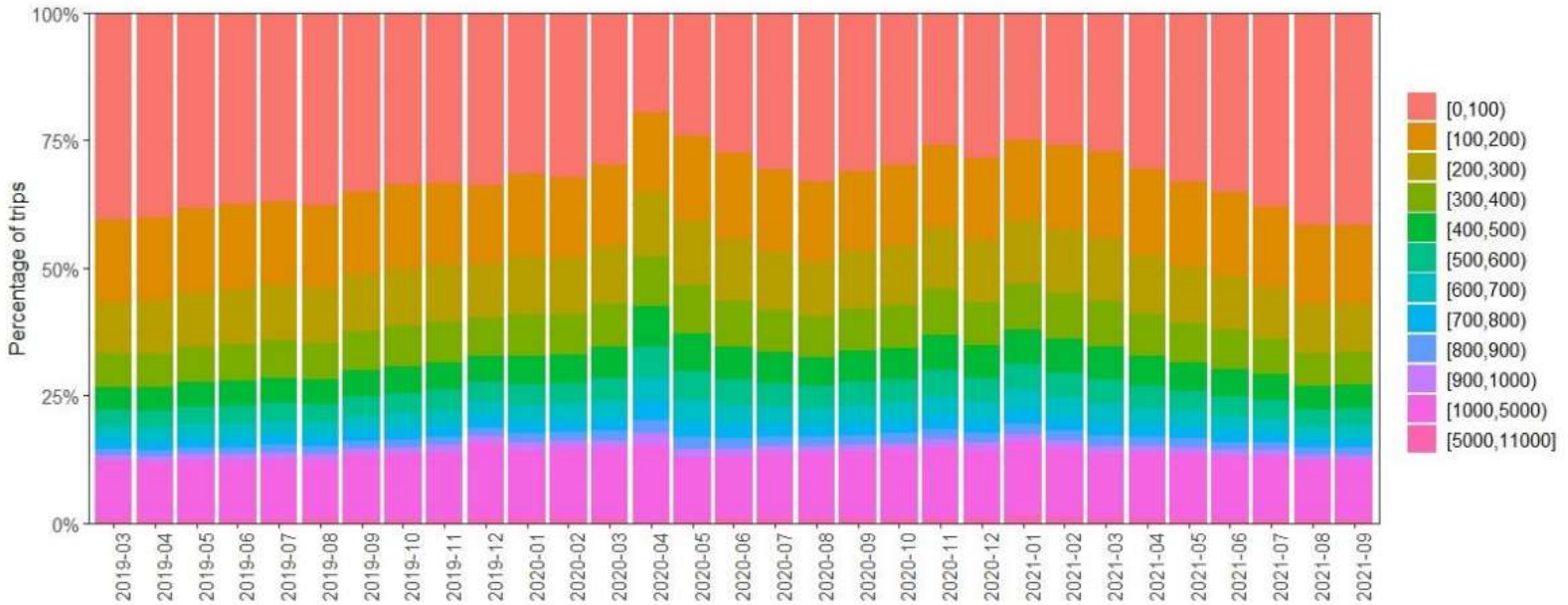


Figure 15: Percentage of trips each month according to the total number of trips recorded by the vehicle

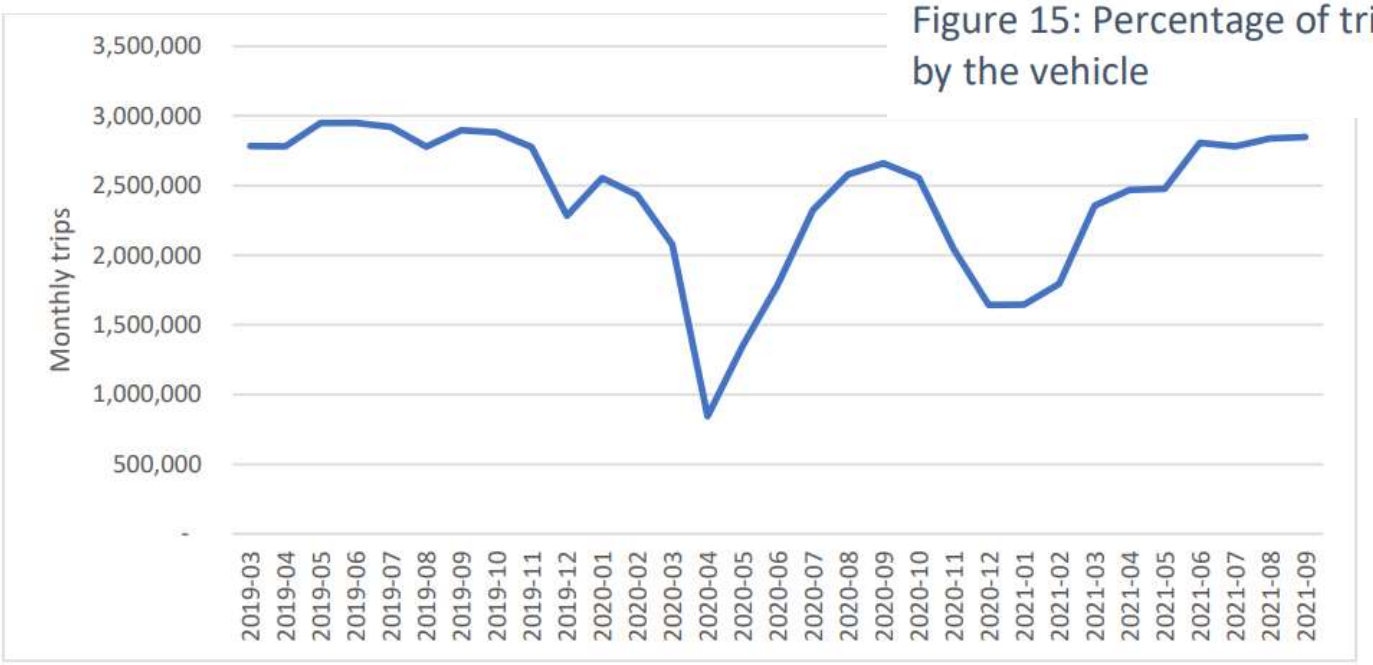


Figure 11: Trips per month in the cleaned data

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Vehicle types

- Over 80% of trips made by cars
- 14% of trips made by light goods vehicles (N1 type)

Of the trips for which a fuel type could be identified:

- Vast majority (96%) were made in petrol or diesel vehicles
- 53% of trips were made in diesel-only vehicles (i.e. excluding diesel hybrids)

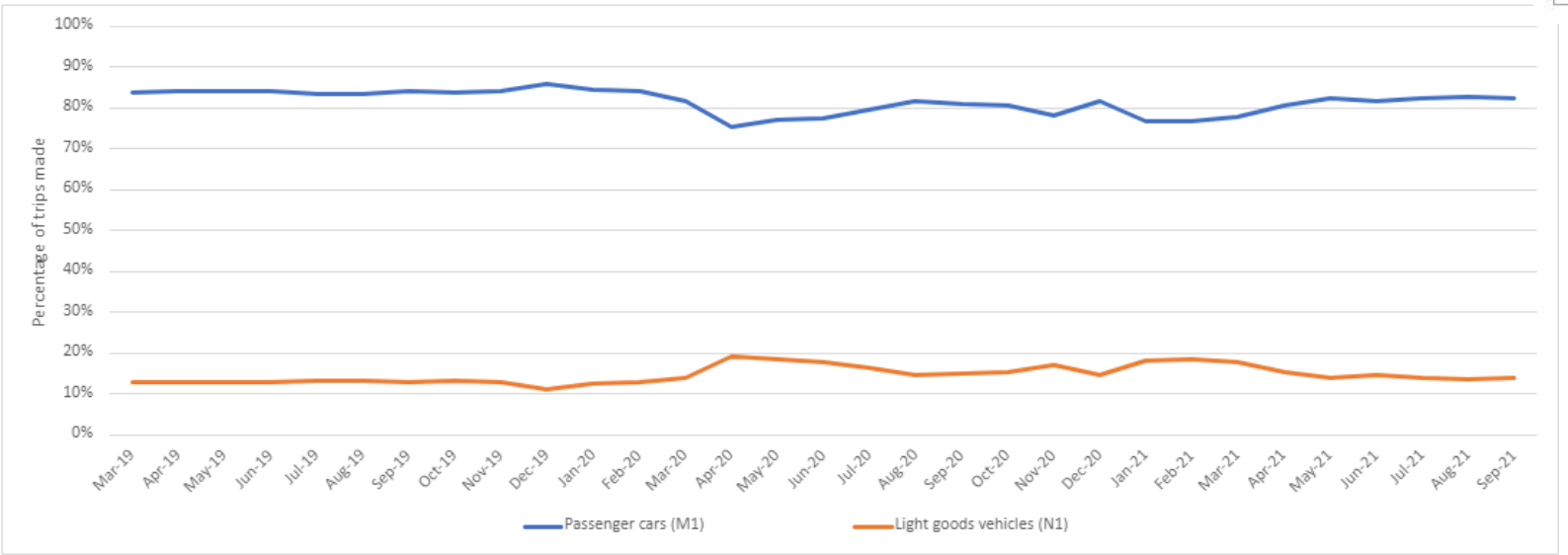

Table 1: Estimated fleet composition based on Bristol ANPR data

	Year	Pre-Euro 4	Euro 4	Euro 5	Euro 6
Diesel cars	2019 - 20	4%	21%	38%	37%
	2020 - 21	4%	22%	38%	36%
Petrol cars	2019 - 20	10%	28%	27%	35%
	2020 - 21	9%	28%	27%	37%
Diesel small bus (M2)	2019 - 20	9%	26%	31%	33%
	2020 - 21	6%	28%	37%	28%
Diesel LGVs	2019 - 20	6%	15%	35%	44%
	2020 - 21	5%	13%	31%	51%
Petrol LGVs	2019 - 20	11%	18%	1%	70%
	2020 - 21	5%	9%	3%	83%

Table 2: Estimated HGV fleet composition based on Bristol ANPR data

	Year	Pre-Euro IV	Euro IV	Euro V	Euro VI
Diesel HGVs (N2)	2019 - 20	1%	5%	21%	74%
	2020 - 21	1%	3%	16%	80%
Diesel HGVs (N3)	2019 - 20	0%	3%	10%	87%
	2020 - 21	0%	2%	7%	91%

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Clusters of regular travellers

- Data for a panel of frequently observed vehicles during a consistent time period (April to June) was compared for 2019, 2020 and 2021
- Clustering was undertaken independently in each year based on trip frequency, spatial coverage and time-of-day variability
- The optimal number of clusters was 5 for each of the years and the clusters had similar characteristics across years

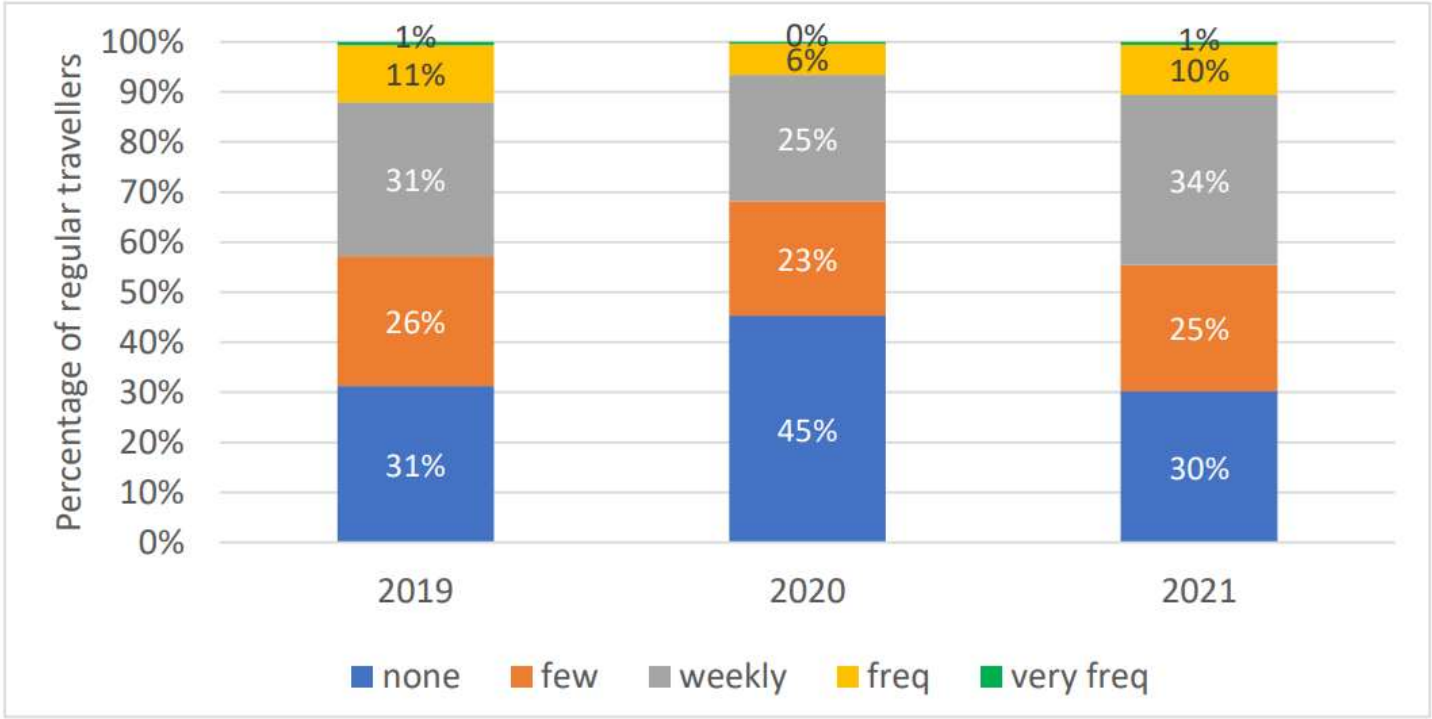

Figure 20: Cluster membership for trips made in April to June in 2019, 2020 and 2021 (consistent panel of 495,483 travellers/vehicles)

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Impact of pandemic (2019 to 2020)

- Increase in light goods vehicles travelling frequently or very frequently in 2020 (but 2021 data similar to 2019)
- 88% of LGVs travelling *more* in 2020 were Euro VI compared with 86% of LGVs travelling *less* in 2020
- 31% of cars travelling *more* in 2020 were Euro 6 compared with 35% of cars travelling *less* in 2020

Table 6: Percentage of cluster members which are light goods vehicles (N1)

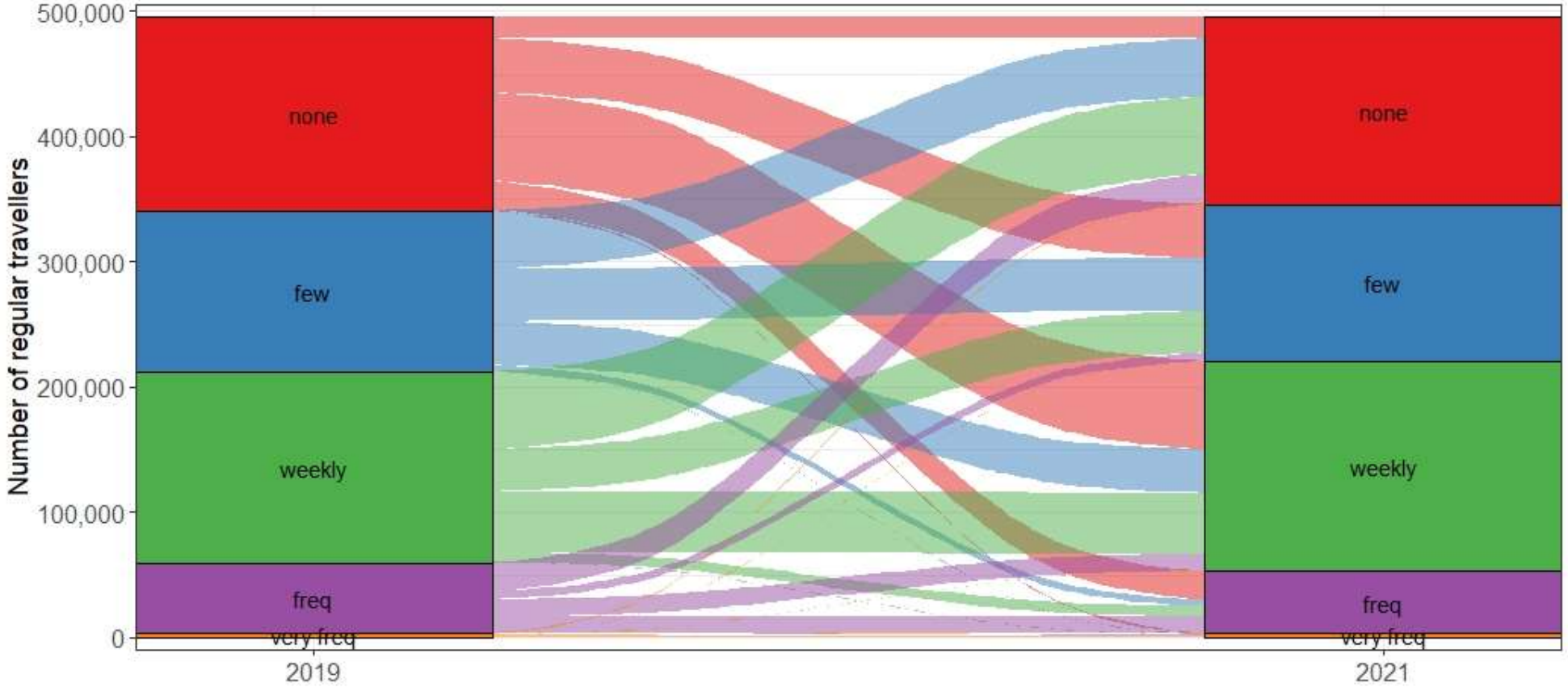
Cluster	2019	2020	2021
No trips	18%	14%	16%
Few trips	15%	13%	15%
Weekly trips	10%	15%	12%
Frequent	21%	27%	23%
Very frequent	4%	11%	5%
Total	**15%**	**15%**	**15%**

Change in behaviour between 2019 and 2021

- Of the vehicles observed in both 2019 and 2021:
  - 50% now in same cluster as pre-pandemic
  - 23% are in a more frequent cluster
  - 26% are in a less frequent cluster

Complex collection of behavioural responses!

Mean manufacture year was 2012 for all three groups



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Key findings

- Traffic in Bristol had returned to pre-pandemic levels by mid-2021 at an aggregate level, BUT this masked more complex changes in behaviour.
- This project identified differences in the effects of the pandemic based on:
  - the spatial characteristics of the trips,
  - the type of vehicle used and
  - individual traveller characteristics
- Fewer ‘cleaner’ cars and more LGVs during lockdowns? Little change longer term?

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Thank you for listening!

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