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Client: Northumbria University  
Project: Student Start of Year Carbon Assessment  
Our ref: 723  
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### **Introduction**

- 1.1 The University are keen to monitor and set targets for the carbon generated by the travel students undertake at the start of each academic year. Students travel to Northumbria University from all over the UK (see Section 4 of the Travel Survey Report) and over 16% of students travel by plane or ferry.
- 1.2 This is the first time this exercise has been carried out using the data collected as part of the annual travel survey and as lessons are learnt about the data and parameters required, the format in which the data is collected in future years will be improved upon. There are quite a number of assumptions that needed to be made in order to calculate the carbon generated and these are described along with the methodology used, below.

### **Methodology**

- 1.3 Students were asked whether they have the same address during term-time and university holidays or whether they travel to Northumbria University campuses at the start of each academic year. For those students who do have different addresses, the postcodes of their permanent/non-term-time address were used to calculate the distances travelled by students.
- 1.4 Students were also asked which mode of transport they use to travel to University at the start of the year including options for plane and ferry/boat. For those who drive by themselves the information about their car fuel type and engine size given in a later question were used assuming that they drive the same vehicle. The above information was then used to calculate carbon emissions from transport following the Department for Food and Rural Affairs (Defra) guidelines and 2017 conversion factors.
- 1.5 The following assumptions were made:
- All UK journey distances were calculated using the driving distance calculation tool Doogal and are therefore the distances it would take to drive between the two postcodes rather than rail, Metro etc;
  - For those students who drove by themselves, the fuel type and engine size they provided in a later question about the type of vehicle they use to drive themselves to

University each day was used where available, assuming that this is the same vehicle they used to drive at the beginning of the year;



- For all those students who car shared, Defra conversion factors for an average vehicle were used as they were not asked about the vehicle they travelled in or who was driving, only if they car shared with friends/other students/family members;
- Distances were factored up to the student population who do travel from a different address at the start of term (81% of the full student population (28,306 x 81% = 22928) and using the mode split for the start of year;
- Distances travelled by car sharers who shared with other students were halved to represent the fact they are most likely sharing with students from the same University. However, distances travelled by car sharers who shared with family members were reported as is, assuming that the purpose of this journey was to transport that student to University and would not have been made otherwise;
- As it was not known at the time of surveying that this data would be used to calculate emissions, international students were only asked which country they travel from and by which mode. Where a city was not provided (in the majority of cases), the capital city airport was used. Distances between these origin airports and Newcastle airport were calculated in all cases. The Defra conversion factors for average domestic, short-haul and long-haul business air travel were used. The guidelines recommend using factors that include for Radiative forcing (RF) which is a measure of the additional environmental impact of aviation (nitrous oxides, water vapour). This captures the maximum climate impact of air travel and substantially increases the overall results.

### Headline Emissions From Student Travel At The Start of the Academic Year

1.6 The following summary table illustrates the total CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions by mode of transport for student travel at the start of each year:

Students	Total KM By Mode	Total Annual kg CO <sub>2</sub> e	Total Annual kg CO <sub>2</sub>	Total Annual kg CH <sub>4</sub>	Total Annual kg N <sub>2</sub> O	Total Annual Tonnes CO <sub>2</sub> e (Metric Tonne)	Total Annual Tons CO <sub>2</sub> e (Imperial UK Ton)
Car	1,376,708	250,696	248,884	268	1,543	250.70	246.74
Bus	182,679	5,078	5,005	4	69	5.08	5.00
Rail	518,386	24,250	24,032	31	187	24.25	23.87
Metro/Tube	56,048	2,492	2,473	4	15	2.49	2.45



Taxi	2,374	371	368	0.0	3	0.37	0.36
Motorcycle	674	79	77	1.4	0.4	0.08	0.08
Ferry	61,001	7,083	7,028	3	52	7.08	6.97
Plane	11,170,997	1,137,805	1,126,997	124	10,684	1,137.80	1,119.83
<b>TOTAL (All Modes)</b>	<b>13,368,868</b>	<b>1,427,854</b>	<b>1,414,865</b>	<b>435</b>	<b>12,554</b>	<b>1,427.85</b>	<b>1,405.30</b>
<b>Per Head</b>	<b>583.08</b>	<b>62.28</b>	<b>61.71</b>	<b>0.02</b>	<b>0.55</b>	<b>0.06</b>	<b>0.06</b>