



**Report on Greenhouse Gas Emissions  
attributable to Tourism in Yukon  
2017-2019**



Prepared by Yukon Bureau of Statistics  
for the Department of Tourism and Culture  
Government of Yukon

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## Introduction

Tourism is a significant economic driver in Yukon, contributing about 5.0%<sup>1</sup> to the territory's Gross Domestic Product (GDP) and accounting for about 9% to 10% of all jobs in Yukon<sup>2</sup>. Tourism also contributes to greenhouse gas (GHG) emissions, which primarily come from activities that burn fossil fuels. These activities range from driving vehicles and heating buildings to commercial and industrial processes. In Yukon, the majority of GHG emissions are generated from transportation and heating, with a small amount from electricity generation, waste and other areas<sup>3</sup>.

The report provides benchmark estimates of GHG emissions from Yukon's tourism sector for the years 2017 through 2019. In this report, GHG emissions from tourism are estimated using four main data sources: Yukon government fuel tax database, Statistics Canada's Supply and Use Tables (SUT) and the Tourism Satellite Account (TSA), and the 2017-2018 Visitor Exit Survey (VES) conducted by Yukon Bureau of Statistics (YBS). Given the availability of the relevant data, these four sources provide adequate information to portray a picture of Yukon's emissions from tourism.

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<sup>1</sup> Yukon Business Survey, 2019. Yukon Bureau of Statistics, Department of Finance, Government of Yukon.

<sup>2</sup> Statistics Canada data table 36-10-0638-01. Tourism sector's share of jobs and employment income.

<sup>3</sup> Our Clean Future: A Yukon Strategy for Climate Change, Energy and a Green Economy. Government of Yukon.

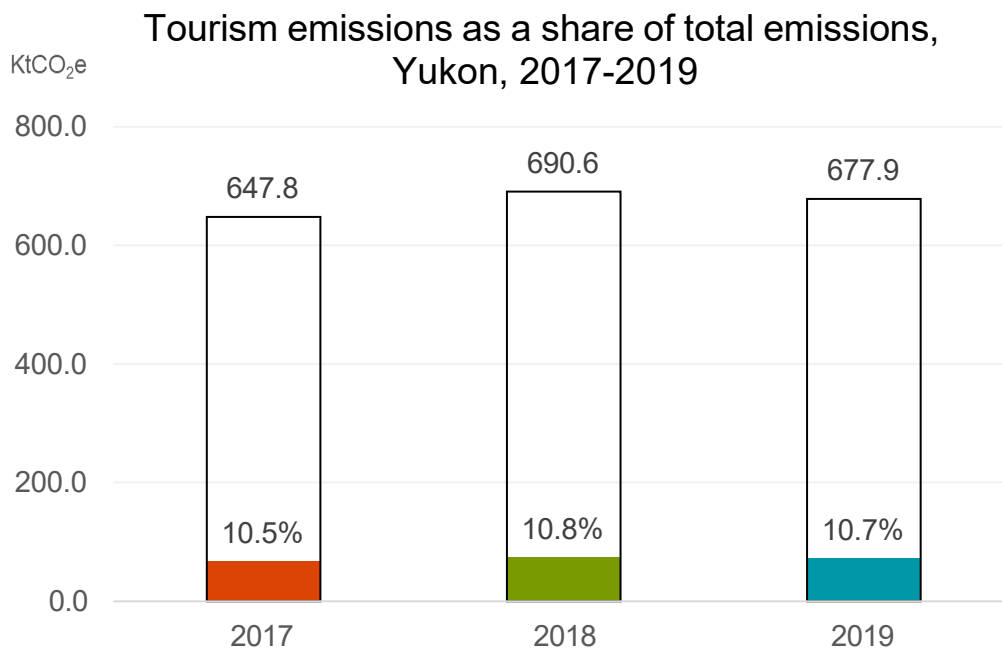
## Key Findings

In 2019<sup>4</sup>, 72.5 KtCO<sub>2</sub>e of Yukon's total GHG emissions were from tourism (both from tourism-related industry sectors and from visitors travelling by road). This was 10.7% of the Yukon's total GHG emissions in 2019.

The proportion of emissions from tourism to Yukon's total emissions over the 3-year period ranged from a low of 10.5% in 2017 to a high of 10.8% in 2018.

The largest share of emissions from tourism-related industry sectors came from *Transportation*, followed by *Accommodation and food services*. Together, these two industry sectors accounted for over 75% of the total emissions from tourism-related industry sectors, and the distribution remained almost the same over these three years.

The quantity of emissions from visitors travelling by road was the highest in 2018 and the lowest in 2017. The same pattern was observed for the share of tourists' on-road emissions in Yukon's total on-road emissions.



<sup>4</sup> The reference year 2019 was the most recent year for which the relevant data were available during the analysis.

# Methodology

## Data used in the Estimation of GHG Emissions

Canada's *Greenhouse Gas Inventory* reports GHG emissions by industry sector (e.g., energy, industrial processes and product use, and agriculture and waste) for Yukon<sup>5</sup>. However, the GHG inventory data do not provide any information on GHG emissions attributable to tourism.

This report analyses available and relevant data to derive estimates of GHG emissions attributable to tourism, by industry sector, for the years 2017 through 2019. The data sources include Yukon government fuel tax database, Statistics Canada's Supply and Use Tables (SUT) and the Tourism Satellite Account (TSA), and the 2017-2018 Visitor Exit Survey (VES) conducted by Yukon Bureau of Statistics (YBS).

Data from the fuel tax database, SUT and TSA were used to estimate emissions from tourism-related industry sectors. Data from the year-long VES were used to estimate emissions associated with visitors' on-road travel.

To summarize, in this report, GHG emissions attributed to tourism in Yukon come from two sources: (i) emissions from tourism-related industry sectors (i.e., businesses), and (ii) emissions from visitors travelling by road within Yukon (i.e., on-road emissions).

## Yukon's Total GHG emissions

Yukon's total GHG emissions were derived from the fuel tax data collected under the *Fuel Oil Tax Act*, and from the *National Inventory Report*. The total GHG emissions was a product of the fuel consumption by fuel type and their respective CO<sub>2</sub>e GHG emission factors. More details can be found from the report *Greenhouse gas emissions in Yukon: 2019*<sup>6</sup>.

## GHG emissions from tourism by industry sector

Tourism spans a number of industry sectors. To examine GHG emissions from tourism-related sectors, seven industry sectors were selected based on the Tourism Satellite Account (TSA). In this report, these seven tourism-related industry sectors were grouped into the following five industry sectors.

- *Transportation.*
- *Accommodation and food services.*
- *Automotive equipment rental and leasing.*
- *Retail trade:*
  - *Food and beverage stores;*
  - *Gasoline stations; and*
  - *Miscellaneous store retailers.*
- *Other sectors, including:*
  - *Arts, entertainment, and recreation;*
  - *Travel arrangement and reservation services; and*
  - *Automotive repair and maintenance.*

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<sup>5</sup> National inventory report: 1990 –2019: greenhouse gas sources and sinks in Canada. Environment and Climate Change Canada.

<sup>6</sup> Greenhouse gas emissions in Yukon: 2019. Climate Change Secretariat, Department of Environment, Government of Yukon.

## Supply and Use Tables (SUT) Ratio

Supply and Use Tables (SUT) provide the dollar value of products used as input to production by industry sector. From the SUT data, industry-specific use ratios were calculated for the following input products in the energy (fuel and electricity) group:

- Natural gas liquids and related products;
- Motor gasoline;
- Diesel and biodiesel fuels;
- Light fuel oils;
- Aviation fuel; and
- Electricity generated from thermal combustion of liquefied natural gas (LNG) and diesel.

Data from 2017 and 2018 were used in the calculations, since these were the most recent years for which data were available.

For each energy product used as input to production, industry averages were derived from the two years' SUT data to overcome year-over-year fluctuations. These averages were used to derive industry-specific use ratios for each energy product.

Then, the ratios were applied to the total Yukon GHG emissions by energy type and their uses by industry sectors to derive the total emissions from tourism-related industry sectors.

## Tourism ratios

To remove Yukon residents' impacts on tourism-related industry sectors' emissions, tourism GDP ratios from TSA were applied to the total emissions from tourism-related industry sectors. During the time of analysis, 2017 was the most recent reference year for which TSA data were available. Based on historical data and other relevant variables (e.g., the number of foreign visitors, GDP by Industry, etc.), the tourism GDP ratios for 2018 and 2019 were estimated.

These tourism ratios were applied to the tourism-related industry sectors emissions to derive emissions attributable to tourism.

Estimation results in all tables were validated against other relevant and available information.

## GHG emissions from tourists travelling by road

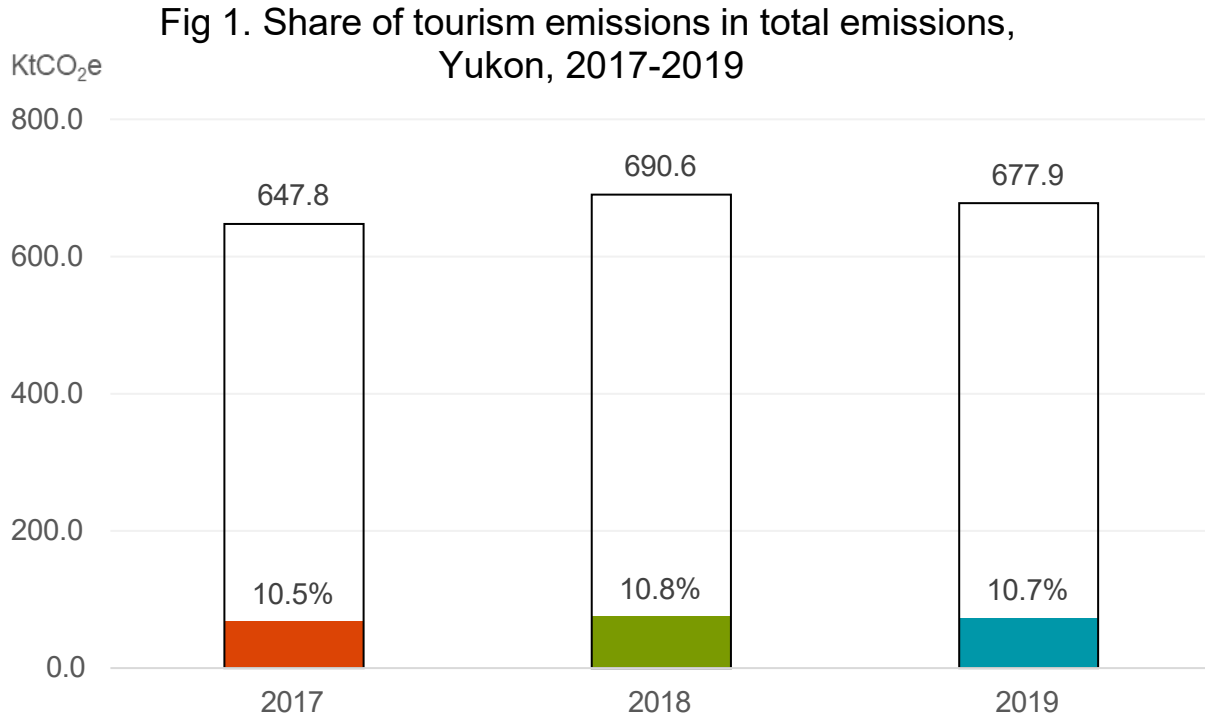
The 2017-2018 Visitor Exit Survey (VES) data were used to estimate the GHG emissions by visitors travelling by road. Kilometres driven by visitors who entered/exited the Yukon by road in 2018 were estimated from their travel routes/patterns. Travel routes were created from each unique entry point, exit point, and communities/attractions visited. The average fuel economy by vehicle type was applied to kilometres driven to estimate litres of motor gasoline consumption by visitors on road. The GHG emissions by visitors travelling by road was a product of their on-road motor gasoline consumption and the CO<sub>2</sub>e GHG emission factor of motor gasoline.

The result derived from the VES data was validated against the GHG emissions estimated from visitors' expenditure on motor gasoline, diesel and biodiesel fuels from the 2018 SUT. The VES result for 2018 was 4.7% lower than the 2018 SUT estimate. Therefore, GHG emissions from visitors travelling by road were adjusted upwards by 4.7%.

# Results

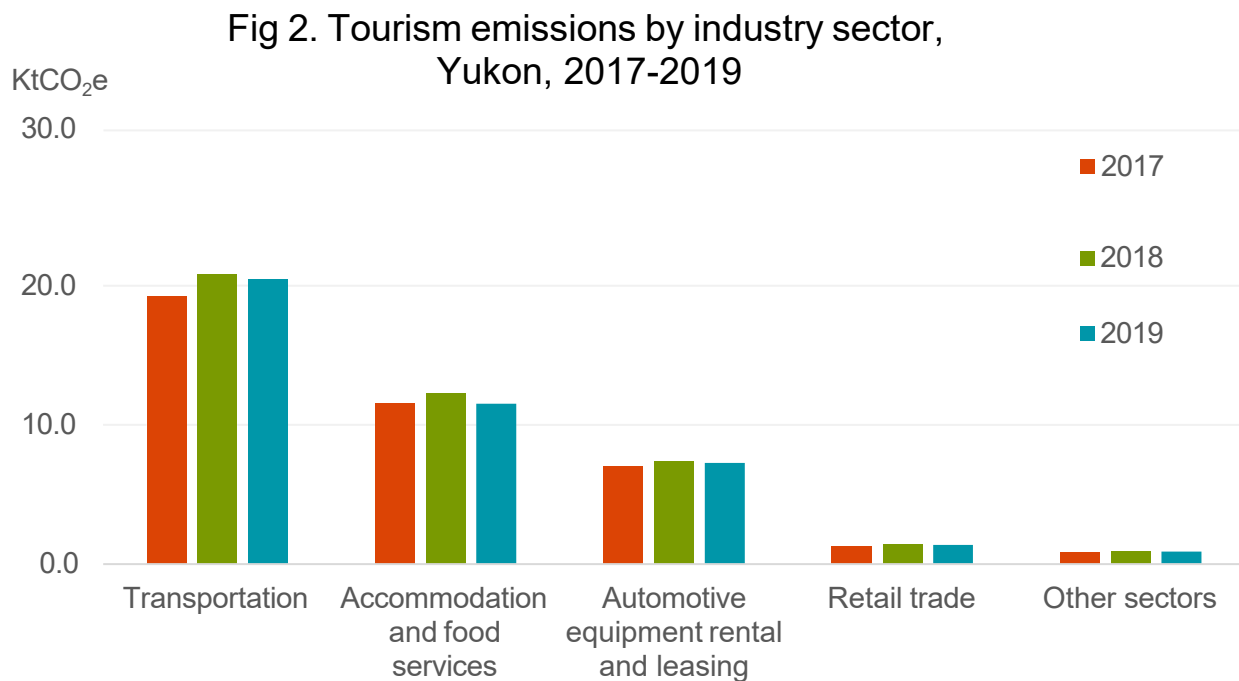
## GHG emissions from tourism

During the period from 2017 to 2019 inclusive, GHG emissions attributable to tourism was the highest in 2018 (74.8 KtCO<sub>2</sub>e). The proportion of emissions from tourism to total emissions over the 3-year period ranged from 10.5% in 2017 to 10.8% in 2018 (Figure 1).



## GHG emissions from tourism, by industry sector

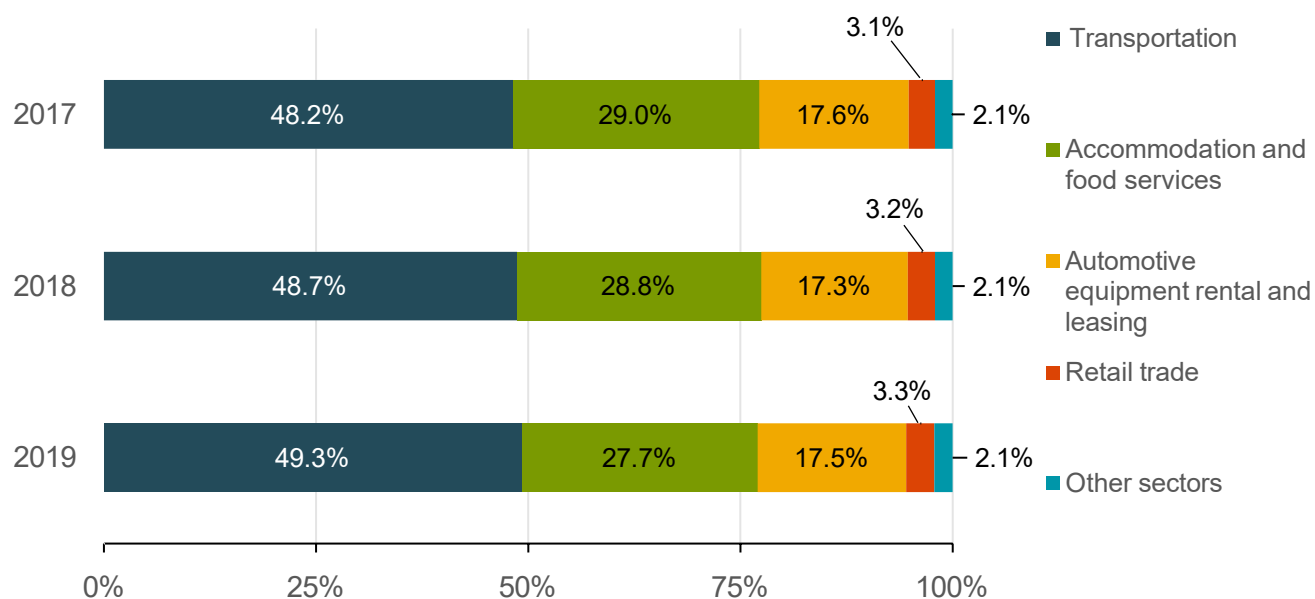
The largest share of emissions from tourism-related industry sectors came from *Transportation*, followed by *Accommodation and food services* (Figure 2). Together, these two industry sectors accounted for over 75% of the total emissions from tourism, and the distribution remained almost the same over these three years (Figure 3). These industry sectors were also the largest contributors to tourism GDP<sup>7</sup>. The third largest emissions came from *Automotive equipment rental and leasing*.



<sup>7</sup> Yukon Business Survey, 2019. Yukon Bureau of Statistics, Department of Finance, Government of Yukon.



Fig 3. Percentage of emissions from tourism by industry sector, Yukon, 2017-2019

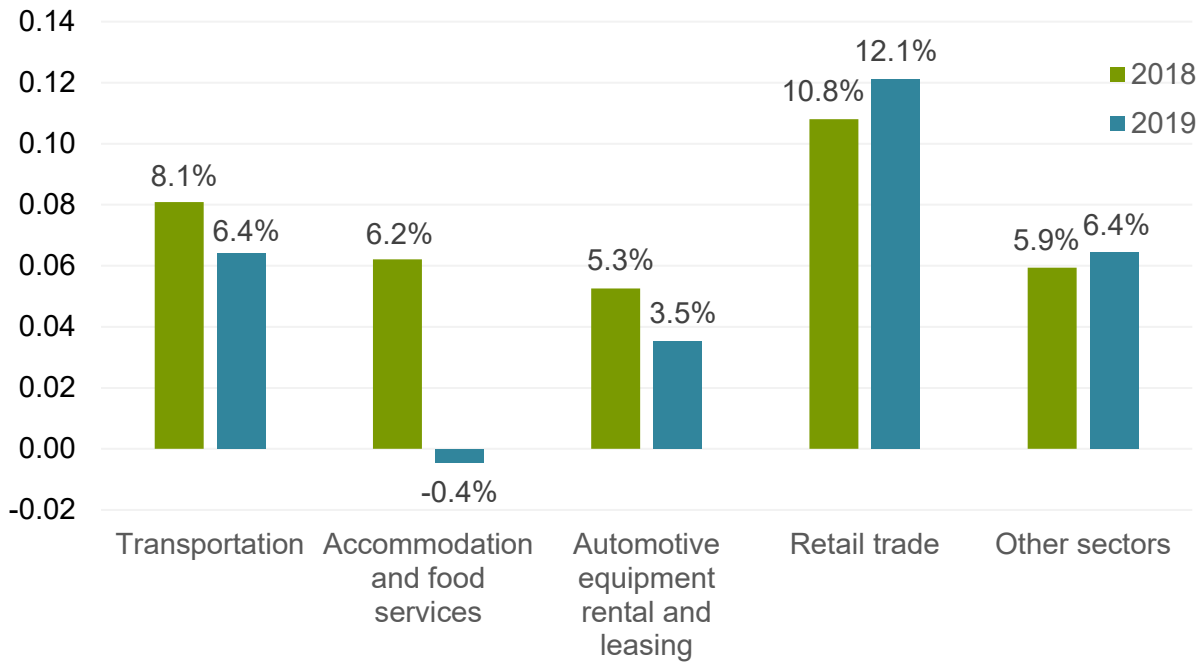


In general, tourism emissions increased in both 2018 and 2019 in most industry sectors, compared to 2017. The only exception was *Accommodation and food services* in 2019, which decreased slightly by 0.4%, compared to 2017. This may have been due to a combined effect of a reduction in heating degree days<sup>8</sup> and/or a possible increase in private short-term accommodations in 2019.

Taking 2017 as the base year, the largest increase in tourism emissions came from *Retail trade* in both 2018 (10.8%) and 2019 (12.1%).

<sup>8</sup> A Degree Day is a unit of measurement equal to a difference of one degree between the mean outdoor temperature and a reference temperature (18°C). Degree Days are used in estimating the energy needs for heating or cooling a building.

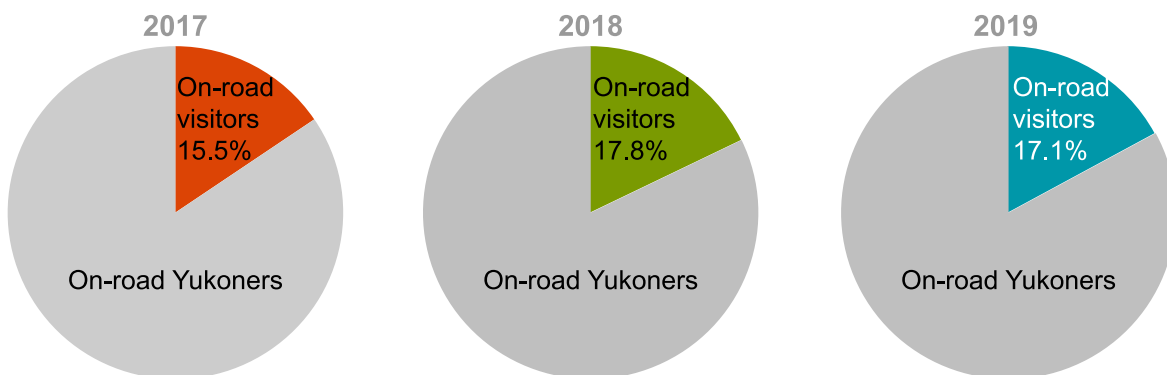
Fig 4. Changes in tourism emissions by industry sector, Yukon, compared to 2017



### GHG emissions from visitors travelling by road

GHG emissions from visitors travelling by road fluctuated over the three years with 2018 being the highest. This was in line with the highest number of tourists in 2018 and transportation being the primary contributor to GHG emissions from tourism.

Fig 5. Share of on-road emissions from tourists in total on-road emissions, Yukon, 2017-2019



## Appendix

Table 1. Yukon greenhouse gas emissions attributable to tourism, measured in KtCO<sub>2</sub>e, by industry sector and from visitors travelling by road, 2017 to 2019

	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Tourism emissions by industry sector</b>	<b>39.9</b>	<b>42.7</b>	<b>41.5</b>
<i>Transportation</i>	19.2	20.8	20.5
<i>Accommodation and food services</i>	11.6	12.3	11.5
<i>Automotive equipment rental and leasing</i>	7.0	7.4	7.3
<i>Retail trade</i>	1.2	1.4	1.4
<i>Other sectors</i>	0.8	0.9	0.9
<b>Emissions from visitors travelling by road</b>	<b>28.0</b>	<b>32.1</b>	<b>31.0</b>
<b>Total emissions attributable to tourism</b>	<b>67.9</b>	<b>74.8</b>	<b>72.5</b>

Table 2. Yukon greenhouse gas emissions attributable to tourism, measured in KtCO<sub>2</sub>e, 2017 to 2019

	<b>2017</b>	<b>2018</b>	<b>2019</b>
Tourism emissions (sectors + on-road)	67.9	74.8	72.5
Total Yukon emissions	647.8	690.6	677.9
Percentage of the total Yukon emissions	10.5%	10.8%	10.7%

Table 3. Yukon greenhouse gas emissions from visitors travelling by road, measured in KtCO<sub>2</sub>e, 2017 to 2019

	<b>2017</b>	<b>2018</b>	<b>2019</b>
On-road visitors' emissions	28.0	32.1	31.0
Total on-road emissions	180.2	180.1	181.5
Percentage of the total on-road emissions	15.5%	17.8%	17.1%