

Cruising Versus Land Vacationing: An Analysis of Vacation Carbon Footprints in Seattle

Cruise ships are known as heavy carbon emitters and impact the health of port communities and destinations. Despite industry greenwashing about better practices, most large cruise ships still use heavy petroleum-based fuels that pollute the air and waters around them, even as they journey through pristine environments.

Friends of the Earth compiles vital information about cruises to help the public understand these impacts. Using public data and calculators, we analyzed the carbon emissions of one day on an average cruise ship and compared it to one day of vacation on land. This analysis highlights low- and high-end emissions activities based on cruise ship accommodations and land-based vacation itineraries. Since many vacationers fly to both land destinations and cruise ports, air travel is excluded.

This study focused on Seattle as a popular cruise port and land destination. Using data from 2019, we were able to tailor vacation activities in the Seattle area to reflect typical vacation choices. The results reflect the average emissions generated by one individual on land and one individual on a 2,000 to 3,000 passenger cruise ship headed to Alaska.

By the numbers: A cruise ship passenger's CO2 footprint

Cruise ships sailing from Seattle to Alaska in the 2019 six-month cruise season emitted a total of [1,120,324 mtCO2e](#) (about 1.1 million tons). These emissions stemmed from [13](#) cruise ships with a total of [559,414](#) total passengers. We chose a [representative voyage](#) from [this study](#), which resulted in us looking at a 7-day cruise with 6 port-stay days on a 2,000-3,000 passenger ship.

Using the associated [calculated](#) climate factor of 2.1 (for a 2,000-3,000 passenger ship), we estimate that one individual on a 7-day cruise will have a carbon footprint



of 300kg per day if that individual stays in a standard double-occupancy cabin.

The associated GHG emissions, under the same assumptions, for an individual staying in a suite is 357.14kg. For an individual staying in a penthouse, the associated GHG emissions will be 542.86. Taking the average of the low-end and high-end accommodations on board the cruise ship, the average cruise goer will emit 421.43 kg CO2 per day.

By the numbers: A land-based vacationer's CO2 footprint

Considering that a cruise ship serves as the place to sleep, eat, drink and get entertainment for passengers, as well as the mode of transportation, we chose comparable activities on land in the Seattle area. Emissions associated with a one-night stay in a hotel room are [calculated](#) at 15.13-26.6 kg CO2e per room day for an average U.S. hotel and upscale U.S. hotels, respectively. We calculated carbon emissions based on eating at restaurants or bars. The average person's diet contributes 7 kg CO2e a day from meals (based on an average U.S., non-vegetarian diet).

Compared to a private car trip, a non-pooled rideshare trip produces about [47 percent more](#) carbon emissions. According to this [study](#), private vehicles emit 464g (0.464kg) of CO2e per mile. Non-pooled rideshare services emit around 700g (0.7kg) of CO2e per mile. The average American driver drives about 39 miles per day, which would measure CO2e emissions for private vehicles about 18kg per day (0.464x39). CO2e emissions for ride-hailing services, like Uber, measure around 27kg per day (0.7x39).

Seattle has invested heavily in electric and sustainable transit options, including scooters, walking and biking. Sound Transit is considered a more carbon-friendly mode of transportation as the first light rail system in the nation

to be operated with [100%](#) carbon-free energy. Bike rental options would have a carbon footprint of 0, and the city is considered [walkable](#).

We chose popular tourist activities including Kerry Park, Alki Beach, the Space Needle, the Seattle Aquarium, museums, hiking and waterfalls. All have zero or close to zero emissions when discounting the carbon footprint of the locations themselves. Carbon-heavy activities include taking a ferry in Puget Sound, assuming a 150-seat passenger-only ferry at full capacity averages [14.13kg](#) of carbon emissions per passenger. Similarly, [whale watching](#) generates a carbon footprint between 0.28 and 6.9 t/CO₂ per person.

For an individual that chooses to low-carbon travel and books their stay in smaller or cheaper hotels, we estimated that a low-end day would result in about **22.13kg CO₂e**. For a vacationer who stays in a 5-star hotel and chooses activities, a high-end day would result in **81.63kg CO₂e**. Calculating the average, the CO₂ emissions per person per day on a trip to Seattle is **51.88 CO₂e**.

Why it Matters

Comparing the average CO₂ emissions of **421.43kg** for a cruise passenger to the average emissions of 51.88 kg of a land tourist in Seattle, the cruise goer's carbon emissions are 8.12 times higher for a single day of travel. In conclusion, an individual on a seven-day cruise ship from Seattle to Alaska that is staying in a standard double occupancy cabin will have a carbon footprint that is **8 times higher** than the average carbon footprint of an individual visiting Seattle by land.

Average CO₂ emissions per person per day on a trip to Seattle is 51.88kg, according to our calculations.

Low end:

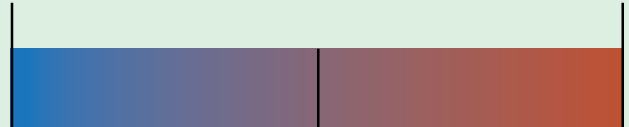
22.13kg CO₂e

(not including whale watching, assuming transportation is via carbon-free transit, and no ferry in Puget Sound)

High end:

81.63kg CO₂e

(including high end of whale watching, ride-hailing transportation, and a ferry in Puget Sound).



Going with **the average** of these two ends
= 51.88kg

By burning heavy petroleum-based fuels, cruise ships continue to generate large quantities of carbon emissions with every excursion, regardless of the ship size, number of passengers or cruise company. While some ships have converted to using shore power when docked, the majority of fleets have yet to update to a less carbon heavy source of power. Until cruise companies make better decisions for our health and environment, their promises of offering a [“green vacation”](#) option are nothing more than greenwashing.

