



C SQUARED

SASIG
Presentation
16th December
2021

Who we are



We are a start-up offering a new and innovative online tool designed to enable carbon accurate footprint calculations and reduction strategies.

Our team currently consists of 4 members. With educational backgrounds from Oxford and City of London Universities. With previous experience in aviation, railways, property, and M&A working for employers including PwC, Cisco Systems, BA, TBI, Dept for Transport, Govt Office for London & large consultancies



Our carbon accounting software uses data collated to accurately estimate and compare carbon emissions for a variety of transport types, down to the level of individual vehicles

We are developing a SaaS (Software-as-a-service) tool for government departments and other public entities – including local authorities, business and the not-for-profit sector. It provides easy and accessible way for organisations to monitor and develop plans to reduce their carbon footprint from travel.



Our aims



Understand

Offer the ability for clients to **realise and understand** their carbon output from travel



Reduce

Use the software to **identify alternative, more carbon-efficient travel modes & routes** and recommend these to our clients



Offset


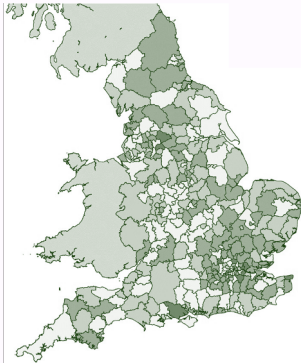
Offer advice as to how to **offset residual emissions**, where reduction may not yet be practically or financially viable



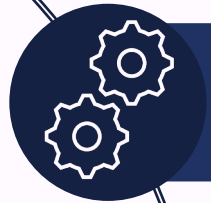
Showcase

Provide an opportunity for clients to be able to **demonstrate & secure accreditation** for developing more sustainable travel

The need

COP 26 / National Government	Local Government	Employees	Customers
<p>“All listed companies in Britain will have to produce a strategy to reduce their carbon emissions or face fines in plans to be unveiled by Rishi Sunak today”</p> <p>-The Times</p>  <p>COP26</p>	<p>“Around 300 local authorities have declared climate emergencies (74% of LAs in the UK). In addition, many of these have pledged to reach net zero by 2030”</p> <p>- Local Gov</p> 	<p>70% of employees are more likely to work for a company with a strong environmental agenda¹</p> <p>83% of employees would be more loyal to a company that supports them contributing to social and environmental issues²</p> <p>90% of employees would accept a drop in salary to work for environmentally and socially responsible companies³</p>	<p>88% of consumers are more loyal to a brand that is committed to sustainability⁴</p> <p>78% of consumers would recommend a brand that is committed to sustainability⁴</p>

What makes us unique?



Our power consumption-based methodology



Our ability to actively compare and recommend more eco-friendly options for business travel before it occurs



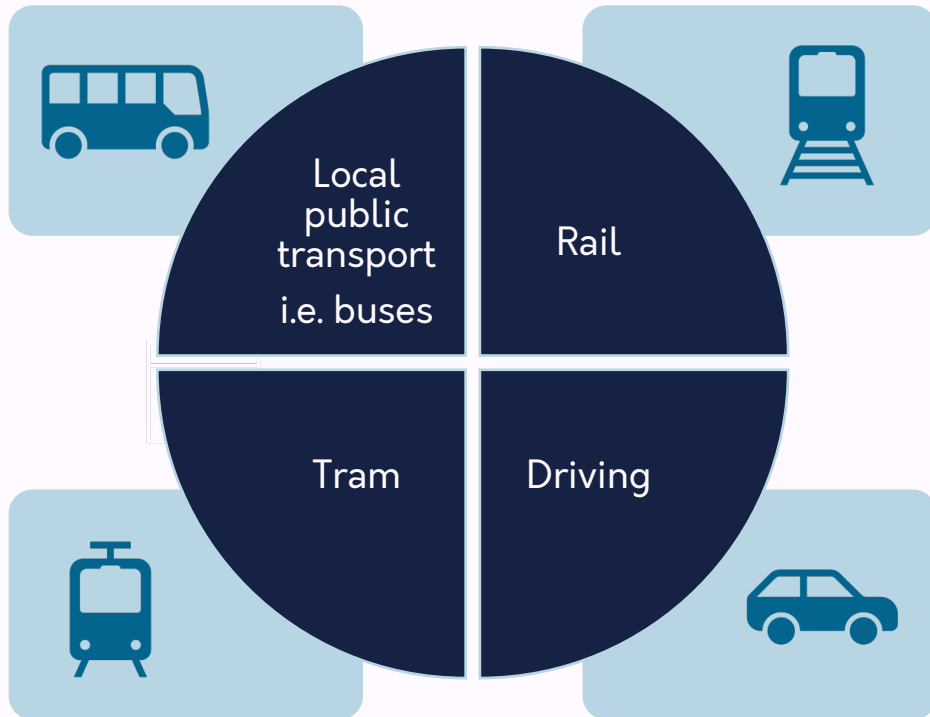
Our ability to automatically generate recommendations for improvements to employee travel/commuting vs past behaviour



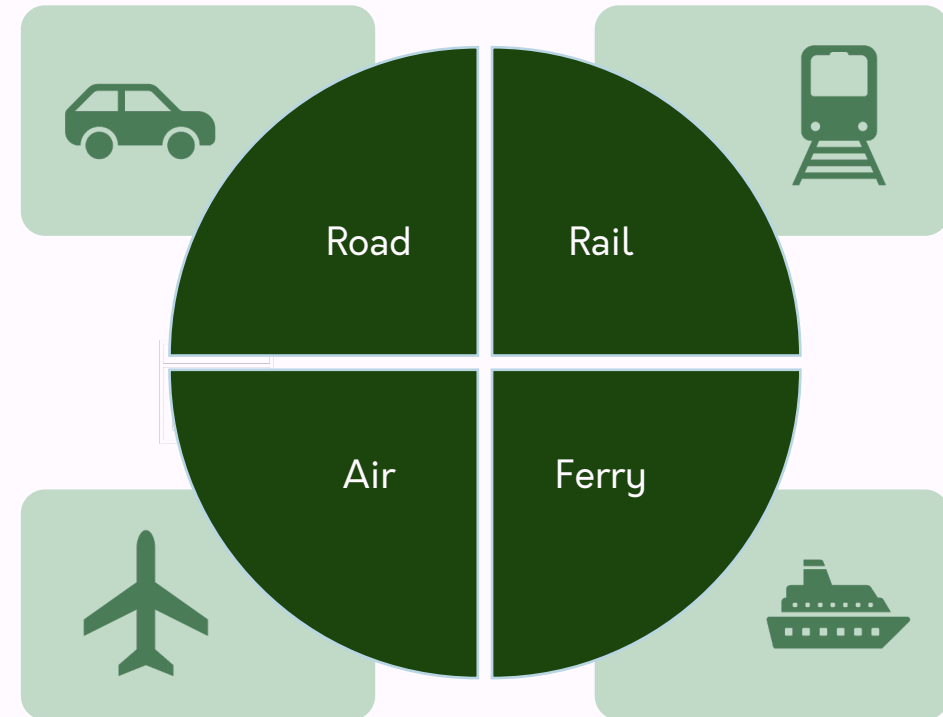
Our software's ability to help calculate carbon footprints, to reduce travel footprints in real-time and provide a practical and accessible tool for reducing carbon further in the future

C Squared can capture all travel related emissions






Employee Commute



Business Travel



Our current capabilities in different geographies

Mode of Transport	Worldwide 	Europe 	Ireland 	UK 	Crown Dependencies 
Air	✓	✓	✓	✓	✓
Road	—	✓	✓	✓	✓
Rail	—	—	✓	✓	✓
Sea	—	—	✓	✓	✓
Local Commute	—	—	✓	✓	✓

Flaws in current methodologies & how our software improves them

Mode of Transport	Flaw	Fix required	Does C Squared provide this fix?
Air	Most do not calculate emissions associated with specific aircraft and routings or their sector length and load factors	Take account of individual aircraft types , their specific routings, sector length and load factors	Yes
	Do not take account of individual airport's taxiing time	Add additional consumption based upon individual airports average taxi times as recorded by the CAA	Yes
	BEIS's conversion factors use fixed emission factors that relate only to " types " of flight and rely on aggregated values based on generic categories of aircraft	Use a dynamic method of calculating emissions which splits phases of the flight into LTO and CCD phases and calculates emissions accordingly in line with ICAO recommendations	Yes
	Uses a single RFI multiplier of 1.9 across all distances even where its application is not appropriate	Apply a higher radiative forcing multiplier but only when the aircraft is at or above harmful altitudes based on the 2020 EU accepted 'Ecotransit World Environmental' methodology.	Yes
Road	Does not provide the ability to calculate the emissions for specific emissions of individual car models	Use a database of individual vehicle emissions projections based upon manufacturer data	Yes

Flaws in current methodologies & how our software improves them

Analysis of BEIS 2021 Government Greenhouse Gas Conversion Factors for Company Reporting methodology paper

Mode of Transport	Flaw	Fix required	Does C Squared provide this fix?
Rail	Electric, diesel, commuter and intercity trains have all been grouped together in BEIS as “national rail”	Take account of specific rolling stock/train sets, their routings, journey length, timetables & load factors	Yes
	There is no account for the distribution of electrified rail across the UK which is focused on cities and access to London	Take account of the extent of electrification along individual legs of the rail journey and determine the carbon emissions accordingly	Yes
	Use of a blanket load factor that is based on a single figure for the entire UK rail network, ignoring differences between commuter, inter city, cross country & remote routes	Use load factors specific for each leg of the journey , determined using the best available data	Yes
	Where a lack of easily accessible data exists, the mileage of a rail journey is often assumed to be the same as a car , when it is not	Use data for the specific sector lengths of each leg of a rail journey	Yes
	A stopping train is assumed to have the same emissions as a limited-stop express train	Use a methodology that uses the scheduled timetable data of trains and so is not reliant purely on distance-based metrics	Yes
Ferry	Does not have the capability to calculate the conversion factor for passenger only ferries	Use a database of individual ship emissions based upon manufacturer data	Yes
	Has one distance-based conversion factor calculated using limited data set	Use a method that has a specific methodology for calculating emissions of individual ships using scheduling data	Yes

How we calculate emissions?

5 steps to calculating the carbon footprint of a journey:



1.



Determine the necessary information for each leg of a single or multi-stage journey

2.



Calculate the vehicles power consumption for each leg of the journey

3.



Calculate the estimated CO₂ emissions of the vehicle for that leg using the power consumption data

4.






Divide the vehicle CO₂ emissions by the estimated number of passengers that leg is shared with

5.







Combine each leg of the journey for a total carbon footprint

Illustrative example 1: Southampton – Edinburgh

Mode of Transport	CO ₂ emissions (per passenger)	Journey time	Cost of Offset ¹	Specific Journey Details
Road 	81.89kg	7h 15m	£6.07	<ul style="list-style-type: none"> The road journey follows the M3, M40 and M6 Use of an 'average' UK vehicle
Rail 	24.30kg	7h	£1.80	<ul style="list-style-type: none"> The rail journey is 100% electric Load factors assumed to range between 45%-50% (relatively high in the context of the UK network).
Air 	52.57kg	1h 35m	£3.90	<ul style="list-style-type: none"> Use of a Bombardier Q400 Assumes a 80% load factor
Sea 	-	-	-	<ul style="list-style-type: none"> No viable route

Illustrative example 2: Londonderry - London

Mode of Transport	CO ₂ emissions (per passenger)	Journey time	Cost of Offset ¹	Specific Journey Details
Road 	93.68kg + ferry	10h 34m	£6.95 + ferry	<ul style="list-style-type: none"> The road journey follows the M40, M6 and the A55 Use of an 'average' UK vehicle Using the Dublin-Holyhead crossing
Rail 	125.44kg + ferry	16h 49m	£9.31 + ferry	<ul style="list-style-type: none"> The rail journey via Crewe and Chester in UK and via Belfast in Ireland Load factors assumed to range between 15%-45% Using the Dublin-Holyhead crossing Majority of the track used is Diesel powered
Air 	66.50kg	1h 25m	£4.94	<ul style="list-style-type: none"> Use of an ATR72 Assumes a 70% load factor Departure from London Heathrow
Sea 	Road: 30.04kg Rail: 2.40kg	3h 30m	Road: £2.23 Rail: £0.18	<ul style="list-style-type: none"> Fastest ground route via Dublin-Holyhead crossing aboard the Stena Adventurer Assumed load factors of 70% Carbon emission split according to weight

Our goals



Awareness

- Aim to raise awareness of the problems associated with currently available calculators and methodologies whilst providing an accurate and transparent alternative



Launch

- Launch the beta-version of our software with pilot clients, with a view to going to market by mid 2022



Develop

- Expand our capabilities to cover European and North America
- Further improve our transport modelling



Expand

- Look to expand our capabilities into freight emissions and supply chain transport utilising appropriate per Kg/Tonne and Kilometre/Sector methodologies

What can you do?



Connect

Find others who are interested in carbon emissions and making a difference to UK transport commitments.

We are always **happy to engage** so please do reach out



Discuss

Talk to your elected members, shareholders, colleagues and stakeholders about this topic

Raise awareness of the current emission inaccuracies and the **need for solutions**.



Join us

We are **looking for pilot clients** to develop our software with.

Our target clients groups are local authorities, not-for-profit organisations and small and medium size enterprises.



Get in
Contact!

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