

P R E D I C T .



SQUAKE

Part 1/3



Choosing the Right Track

**How to Quantify CO₂e Savings
by Shifting Travel from Air to Rail**

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PredictX & SQUAKE

1 Executive Summary

The corporate travel landscape is undergoing a fundamental transformation as organizations grapple with ambitious net-zero commitments and increasingly stringent ESG reporting requirements. Modal shift, encouraging employees to choose rail over air for appropriate journeys, represents one of the most impactful levers for reducing corporate carbon footprints.

This whitepaper examines the critical importance of accurate, route-specific emissions data in driving effective travel policy decisions and demonstrates how integrated technology solutions can transform fragmented data into actionable insights that accelerate progress toward net-zero targets.

“Today’s travel and sustainability managers need more than just numbers, they need insight they can trust. This partnership means our clients can rely on a native solution, purpose-built to meet sustainability reporting requirements, without compromising on accuracy or auditability.”



Keesup Choe
CEO, PredictX

*Research demonstrates that **taking the train instead of flying** cuts your CO₂e emissions by up to 90% on comparable routes.¹*

However...

the true challenge lies not in advocating for sustainable choices, but in quantifying their impact with audit-ready precision.



Business travel
represents about

15-20%
of global travel ²



A train trip
produces up to

90%
fewer CO₂e emissions than a ³
comparable flight

Cutting corporate
travel in Europe by

would reduce emissions by

32.6 MtCO₂e by 2030,

— taking 16 million polluting cars off the road



Accurate emissions tracking requires:

integration
of multiple
data sources

+

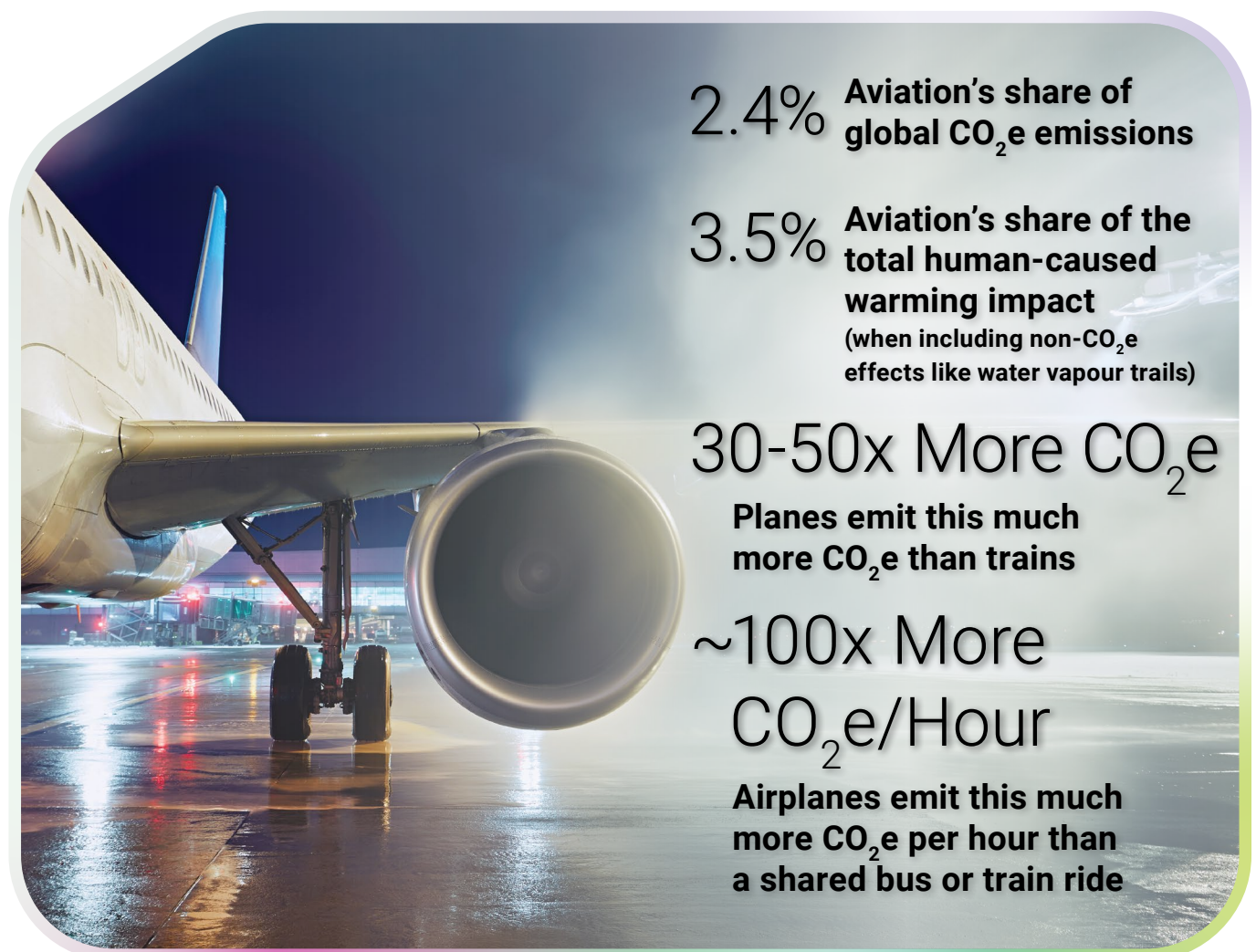
standardized
calculation
methodologies

2 The Modal Shift Imperative: Beyond Good Intentions

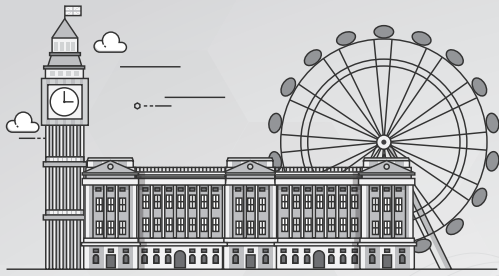
The Scale of the Opportunity

Around 2.4% of global CO₂e emissions come from aviation.⁴ When considering other gases released during flights and the water vapour trails produced by aircraft, aviation represents around 3.5% of the warming impact caused by humans. For corporate travel specifically, business travel represents about 15 to 20 percent of that global travel, representing a significant opportunity for organizational impact.

The mathematics of modal shift are compelling. **Independent analysis shows that planes emit between 30 and 50 times more CO₂e than trains.**⁵ More specifically, **airplanes emit around 100 times more CO₂e per hour than a shared bus or train ride.**⁶



Consider these real-world examples



London



Paris

Distance: ~ 344 km

Eurostar Train: ~ 2 kg CO₂e per passenger

Flight: ~ 56 kg CO₂e per passenger

Potential savings: **Choosing the train:**
~96% emissions reduction



Madrid



Barcelona

Distance: ~ 505 km

Train: ~ 19 kg CO₂e per passenger

Flight: ~ 65 kg CO₂e per passenger

Potential savings: **Choosing the train:**
~71% emissions reduction

The ~25% gap between these routes shows a key challenge in emissions reporting: accuracy.

Rail emissions may vary by energy mix, distance, train type, and other factors.

That's why generic estimates fall short.

3 Business Case: Beyond Carbon

While environmental benefits drive initial interest in modal shift policies, the business case extends far beyond emissions reduction:

Infrastructure and Efficiency:

With airport check-ins up to 2 hours even for a 1-hour flight, plus the time & cost involved in getting to & from remote airports at each end, taking the train city centre to city centre can often be faster door-to-door.⁷

Comparative Footprint:

Research indicates that flying has a higher carbon footprint for journeys less than 1000 kilometers than a medium-sized car.⁸ For longer journeys, flying would actually have a slightly lower carbon footprint per kilometer than driving alone over the same distance.

European Context:

Transport accounted for 25% of EU greenhouse gas emissions in 2018. This sector's emissions come primarily from road transport (72%), while marine transport and aviation represent shares of 14% and 13% of emissions, respectively, and rail a share of 0.4%.⁹

Train Efficiency:

Often **faster door-to-door** than a 1-hour flight (due to 2hr+ airport time)

Road vs. Rail:

Road transport is **72%** of EU transport emissions; Rail is **0.4%**

Transport is **25%** of EU GHG emissions

“Integrating with the technology and innovation leader in travel and expense data analytics is a natural step. Together, we're raising the bar for what enterprise clients can expect from sustainability tools, transforming data into meaningful action.”



Philipp von Lamezan
CEO & Co-founder, SQUAKE

4 The Path to Implementation: A Modal Shift Readiness Checklist

For corporate travel and sustainability managers ready to move beyond approximation, a structured approach is essential. A modal shift readiness assessment helps identify key areas for action and ensures a smooth transition.

Here is a checklist to guide your organization:

Assess Current Capabilities:

Begin by evaluating your existing emissions calculation accuracy and data integration gaps. This includes assessing your company's travel patterns and how you manage and communicate travel warnings.

Identify High-Impact Routes:

Use route-specific analysis to prioritize modal shift opportunities where viable rail alternatives exist.

Implement Integrated Solutions:

Deploy technology platforms that consolidate data from numerous sources and provide audit-ready reporting. Centralizing travel bookings through a single business travel partner can help you manage risk and locate your employees in a crisis.

Develop Evidence-Based Policies:

Create travel guidelines supported by quantified environmental impacts. Be sure to communicate any policy changes to your travelers.

Measure and Optimize:

Establish KPIs and a process for continuous improvement to maximize program effectiveness. Targets for modal shift can aim for a 5% to 15% reduction in single-occupancy car use over a five-year period.



Taking the train instead of flying cuts your CO₂e emissions by up to 90%.

The technology exists today to accurately measure and report these impacts.

The regulatory environment increasingly demands transparency. The time for action is now.

5 Conclusion: The Path Forward

The transition from approximation to precision in travel emissions management represents more than a technical upgrade, it's a strategic imperative for organizations serious about achieving net-zero commitments.

On average, a train trip produces up to 90% fewer CO₂e emissions than a comparable flight, demonstrating the substantial impact potential of well-implemented modal shift policies.

However, success requires moving beyond good intentions to data-driven decision-making. The evidence shows that air travel emissions are increasing 70 percent faster than initially expected by the Intergovernmental Panel on Climate Change (IPCC), making urgent action on corporate travel policies essential.

Organizations that invest in comprehensive emissions tracking capabilities today will find themselves better positioned not only to meet current sustainability goals but to adapt to evolving regulatory requirements and stakeholder expectations.



About PredictX

PredictX is London-headquartered, founded in 2012, an established SaaS company that develops, delivers and manages decision support applications. We are the cutting-edge specialist in travel and expense data intelligence in the business travel sector. For over a decade, we have been pioneers in the use of AI, machine learning and data science for travel and expense analytics, driving the execution of better sourcing, compliance, sustainability, wellbeing and risk for corporate travel managers.

PredictX customers include major well-known international brands and blue-chip companies, such as global technology giants, media and film distributors, financial institutions, and retailers. PredictX's proprietary advanced analytics platform allows our clients to predict business travel costs and trends to optimise their travel policies and strategies.

Our high investment in R&D enables us to continue to bring innovative applications to market to solve complex problems for travel and Employee Generated Spend.

About SQUAKE

SQUAKE is a sector-specialized climate-tech platform that turns messy travel data into audit-ready CO₂e metrics and actionable reductions. Built for aviation, rail, road, and lodging, it applies standards-aligned methodologies (GHG Protocol, ISO 14083, CORSIA/EU ETS) with configurable boundaries (TTW/WTW), RFI toggles, and class-based allocations. An immutable Audit Mode and versioned factors ensure defensible reporting under CSRD and smooth assurance.

For air-to-rail decisions, SQUAKE delivers like-for-like OD-pair comparisons, granular inputs (aircraft/rail class, operator, grid mix), and policy simulation to quantify CO₂ avoided and cost impacts. Its API-first design integrates with TMCs, OBTs, rail operators, and expense systems; the PredictX × SQUAKE integration adds enterprise analytics, exposing real, route-level savings and KPIs (e.g., adoption rates, cost per tonne avoided) so teams can set evidence-based policies and track progress to net-zero.





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Don't miss the next stage of the roadmap: Part 2 - The Precision Imperative, coming soon!

Part 1 proved the potential of modal shift.

Part 2 tackles the real barrier: data precision and audit risk.

Stop estimating. Start auditing.

Part 2: The Precision Imperative

Compliance Without Compromise

Standard reports can't meet CSRD or ISO 14083.

PredictX x SQUAKE sets the new benchmark in certified accuracy:

Premium Class Impact: Reveal the true 1.5x–5x carbon differential.

Power Source Integrity: Temporal grid analysis for verifiable rail data.

Unified Intelligence: One Certified Calculation Method – no more fragmented streams.

The Future: Intelligence Meets Automation

With PredictX x SQUAKE, strategy becomes self-optimizing:

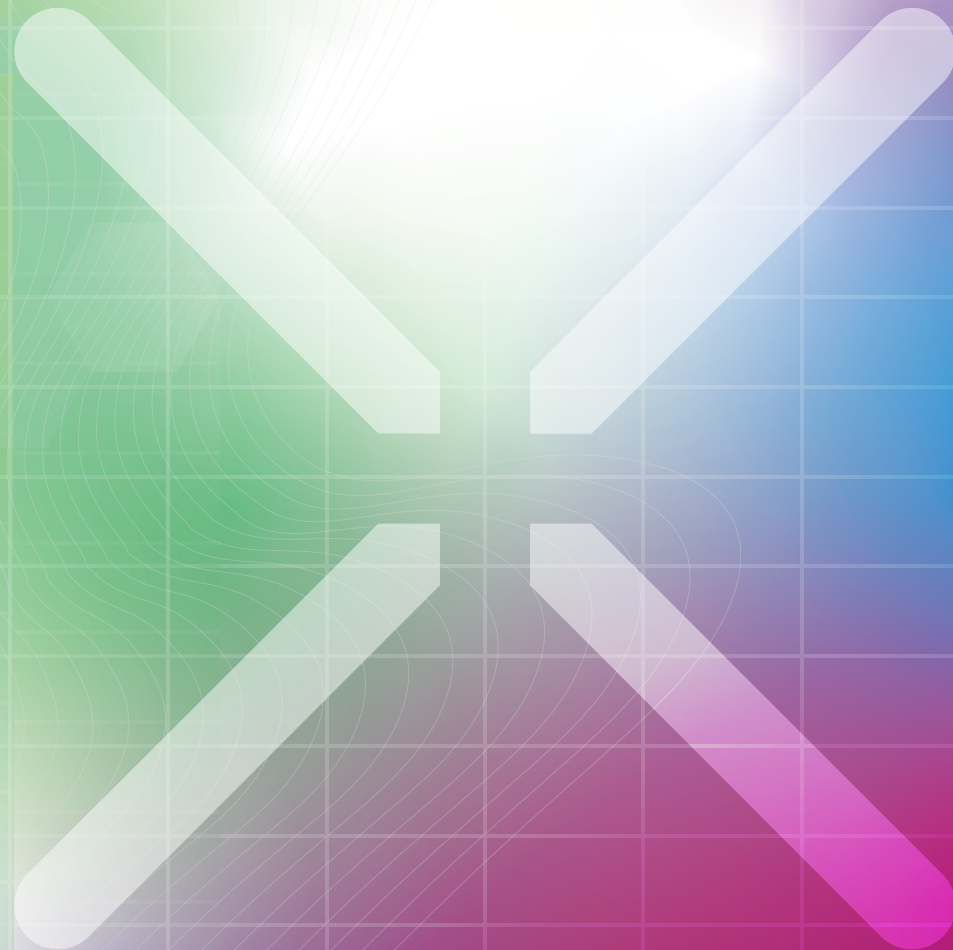
Predictive Forecasting: Anticipate grid shifts, adjust rail policy in real time.

Agentic AI: Automatically identify your highest-impact cost and carbon savings.

The series continues! Stay tuned for Part 2, detailing the data precision required for compliance.

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To learn more about implementing comprehensive travel emissions tracking and modal shift analysis, including access to the enhanced Air vs. Rail Dashboard powered by PredictX & SQUAKE integration, visit predictx.com/solutions/corporate-travel-sustainability or contact us at sales@predictx.com for a demonstration tailored to your organization's specific requirements.

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