



# ECOTRACE LOGISTICS



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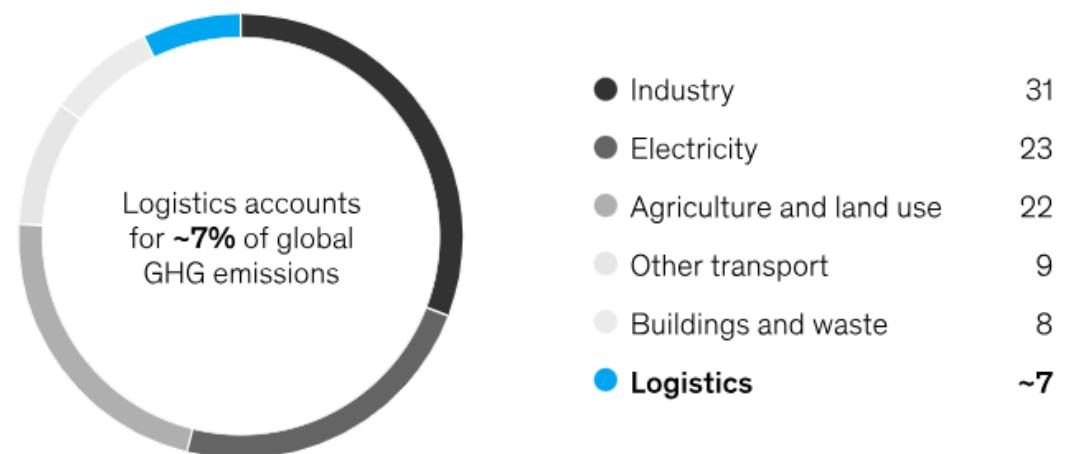


# TEAM INTRODUCTION

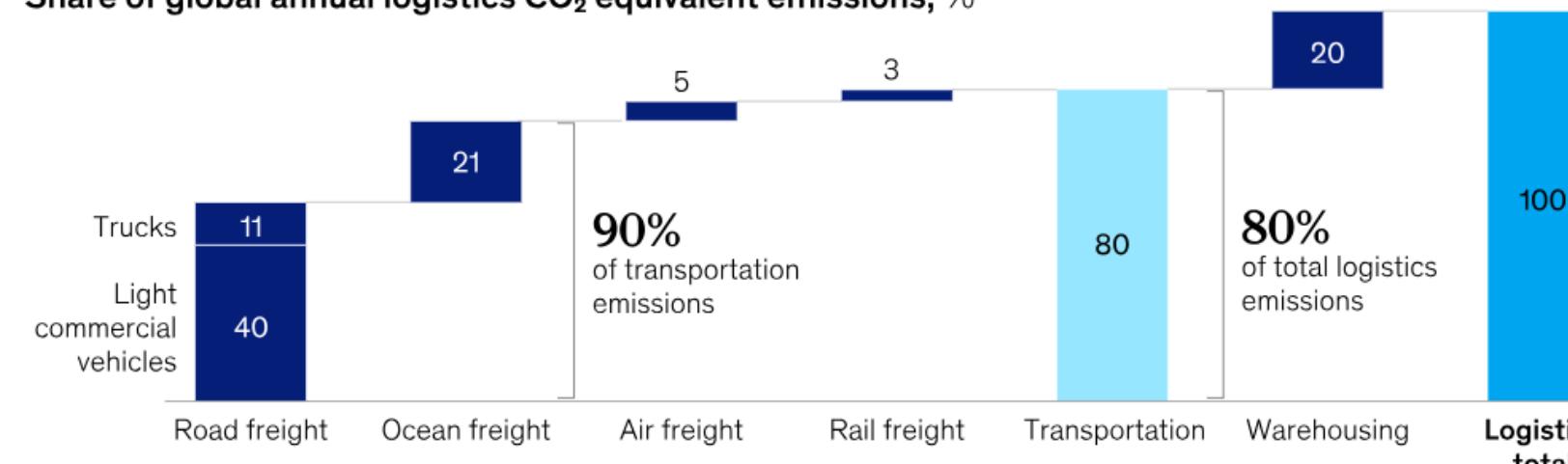


## Decarbonizing logistics is a critical lever for achieving net zero.

Share of global CO<sub>2</sub> equivalent emissions, %

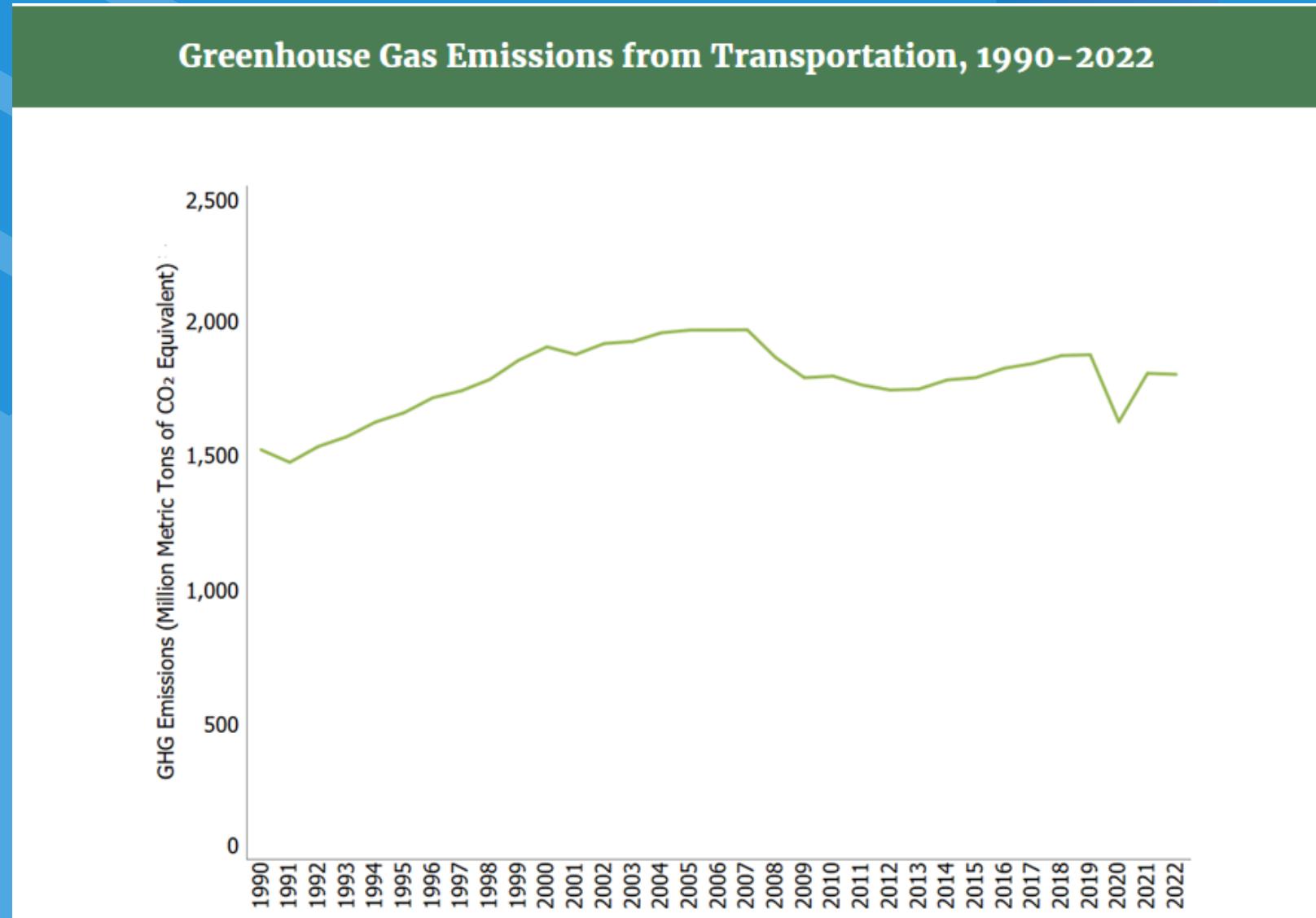


Share of global annual logistics CO<sub>2</sub> equivalent emissions, %



Logistics hub emission intensity values for different types (tonne-based)

	Ambient	Mixed
<b>Transhipment</b>	0.6 kg CO <sub>2</sub> e / t (56)	2.2 kg CO <sub>2</sub> e / t (6)
<b>Storage + transhipment</b>	2.1 kg CO <sub>2</sub> e / t (58)	4.0 kg CO <sub>2</sub> e / t (9)
<b>Warehouse</b>	17.5 kg CO <sub>2</sub> e / t (49)	33.0 kg CO <sub>2</sub> e / t (3)
<b>Liquid bulk terminals</b>	3.1 kg CO <sub>2</sub> e / t (22)	8.1 kg CO <sub>2</sub> e / t (29)
<b>Transhipment</b>	16.7 kg CO <sub>2</sub> e / m <sup>2</sup> (61)	19.5 kg CO <sub>2</sub> e / m <sup>2</sup> (7)
<b>Storage + transhipment</b>	28.0 kg CO <sub>2</sub> e / m <sup>2</sup> (124)	64.4 kg CO <sub>2</sub> e / m <sup>2</sup> (43)
<b>Warehouse</b>	23.6 kg CO <sub>2</sub> e / m <sup>2</sup> (138)	22.8 kg CO <sub>2</sub> e / m <sup>2</sup> (21)
	Chilled	Frozen
<b>Storage + transhipment</b>	68.0 kg CO <sub>2</sub> e / m <sup>2</sup> (12)	103.3 kg CO <sub>2</sub> e / m <sup>2</sup> (9)



All emission estimates are sourced from the [Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022](#).

# PROBLEM STATEMENT



## HIGH CARBON EMISSIONS

- Results from the combustion of petroleum-based products like gasoline and diesel fuels.
- The largest sources of transportation-related greenhouse gas emissions: passenger cars, medium- and heavy-duty trucks, and light-duty trucks



## SECURITY RISKS

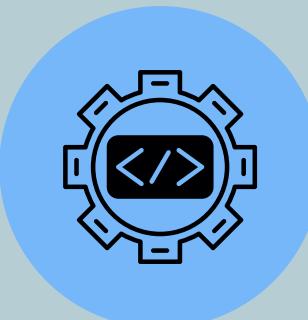
- Data transmitted between the device, network, and cloud is often unencrypted, making it vulnerable to eavesdropping and interception.
- The physical accessibility of devices can lead to theft or tampering, compromising the data and the device itself



## FUEL CONSUMPTION OPTIMIZATION WITH ML MODELS

### Route Optimisation

Regression ML Models minimise fuel/energy use for every possible route segment, considering terrain, speed, and vehicle type. Telemetry: speed, elevation, engine load vs. fuel use



### Load Optimisation

Optimize package arrangement within the vehicle using 3D Bin Packing Algorithms.

### Package Assignment

Cluster delivery addresses logically among drivers/vehicles to minimize overall travel distance and time using Assignment Algorithms.

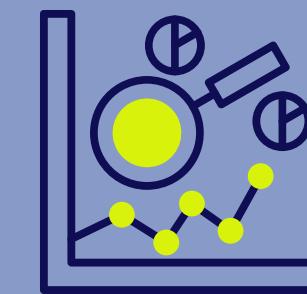
## ANOMALY DETECTION (AI/ML MODELS)

### Route Deviation

Geospatial & Time-based Checks: The AI compares the live GPS stream against the authorized route geometry within the expected time window

### Tampering & Falsification

Use deep learning trained on normal physics to flag illogical changes as highly probable tampering attempts



### Device to Cloud Transmission

Ensures both the IoT device and the Cloud Gateway authenticate each other before transmitting data, preventing Spoofing

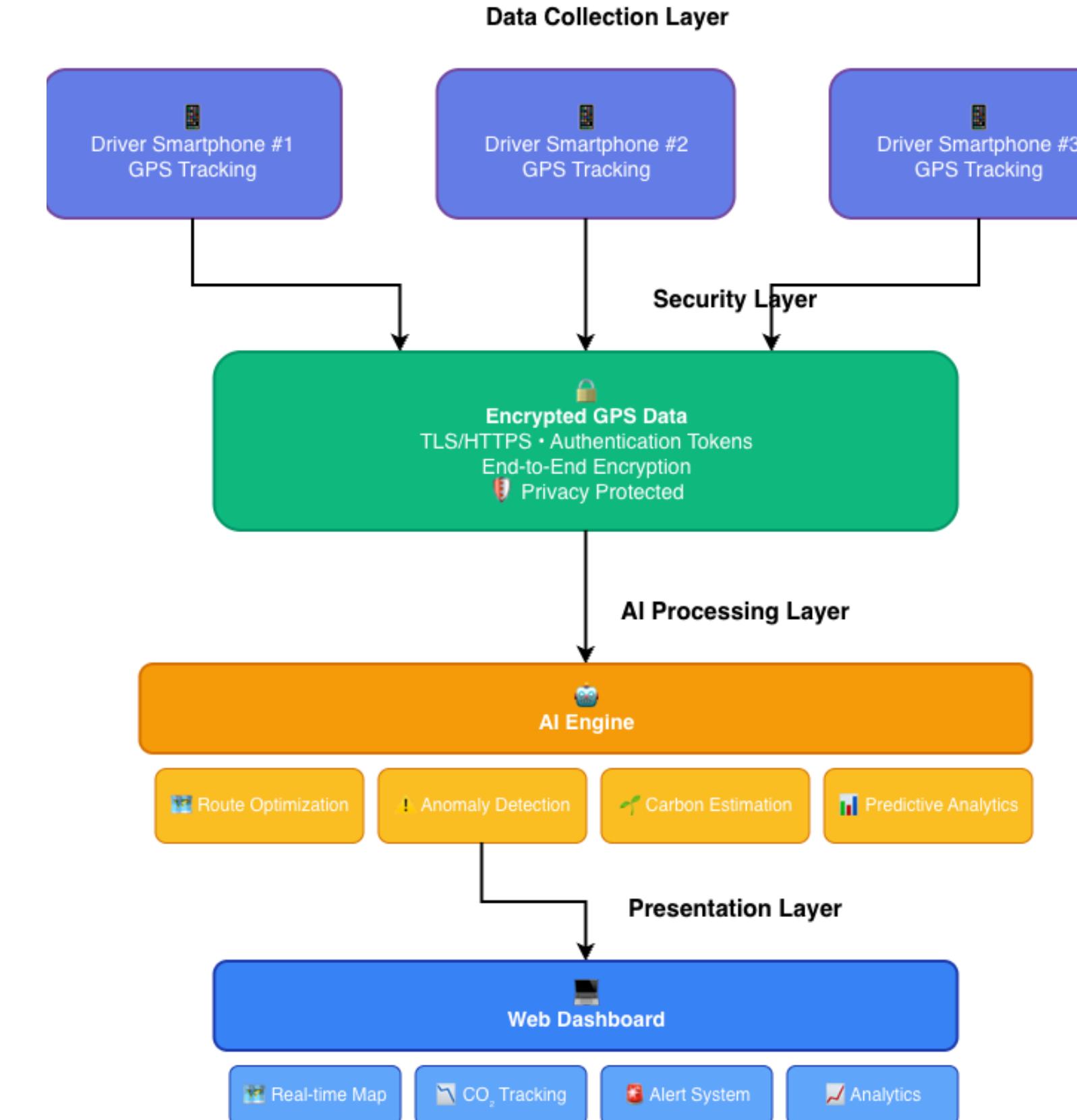
### Platform Access

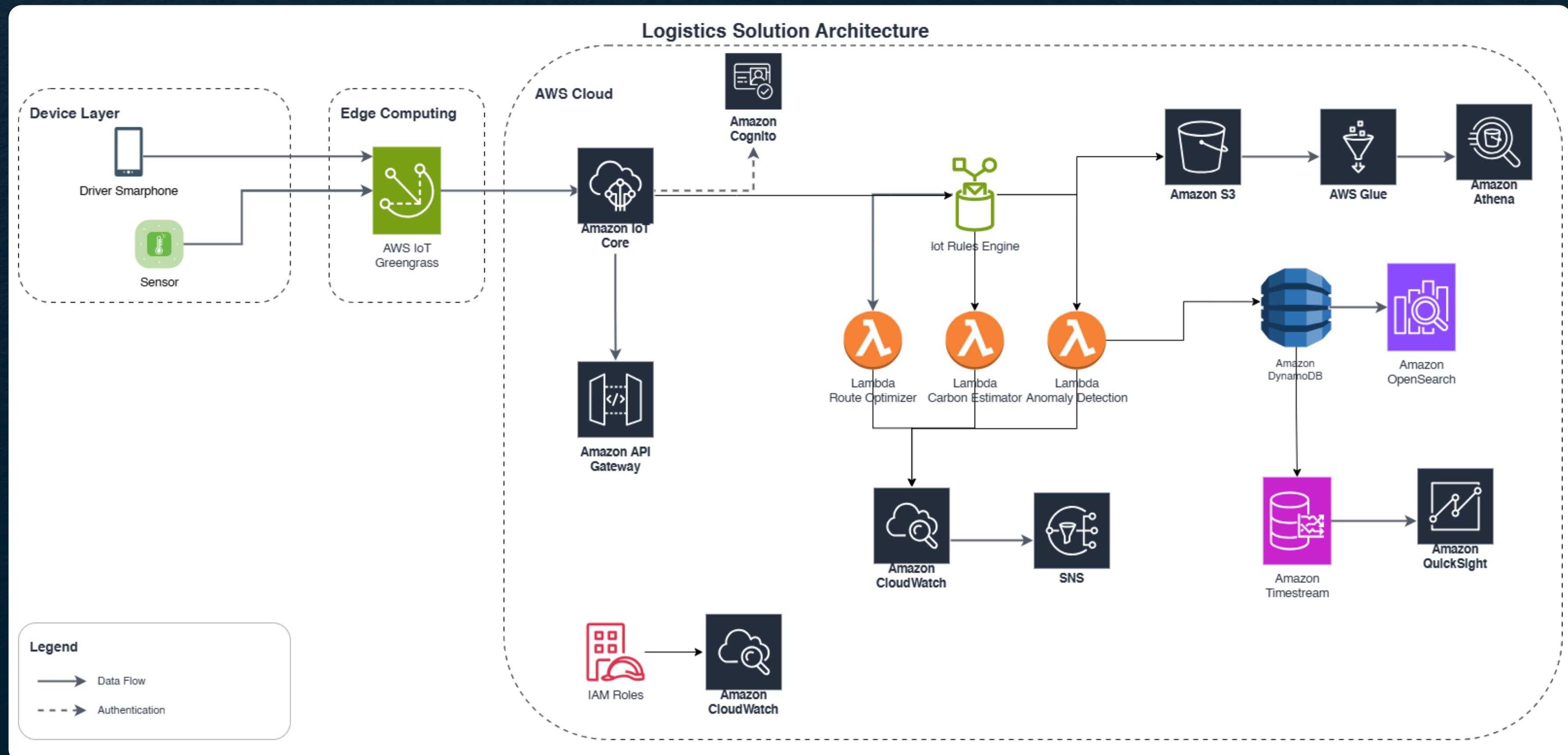
Limits user and system permissions based on necessity

### Data Integrity (Audit Trail)

All critical carbon-related data is cryptographically signed at the point of ingestion and recorded immutably on the database, preventing Tampering and Repudiation









# VISUALS & MOCKUP



<https://route-optimization-app.vercel.app>



# TARGET BENEFICIARY



## FLEET & LOGISTICS MANAGERS (PRIMARY USER)

- Need real-time visibility of vehicles, routes, and fuel usage
- Want lower operational costs & higher route efficiency
- Require ESG reporting for CO<sub>2</sub> emissions



## DRIVERS (END USER)

- Use smartphones for navigation
- Need simple, privacy-respecting tracking
- Prefer solutions without extra hardware



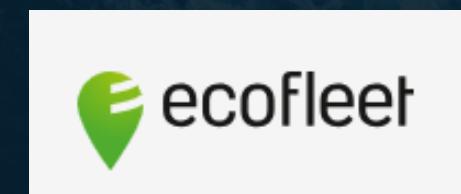
## SUSTAINABILITY / ESG TEAMS

- Responsible for carbon reporting
- Need accurate CO<sub>2</sub> data from logistics activities
- Aim to meet corporate sustainability targets

# MARKET COMPETITION

Feature	Competitor	Our Solution
<b>Traditional GPS IoT Devices</b>	<ul style="list-style-type: none"><li>• High hardware &amp; installation cost</li><li>• Vulnerable to tampering &amp; cyber risks</li><li>• Generates e-waste</li></ul>	<ul style="list-style-type: none"><li>• <b>No new hardware</b> (uses existing smartphones)</li><li>• <b>Lower cost, more secure</b></li></ul>
<b>Fleet Management Software</b>	<ul style="list-style-type: none"><li>• Limited or no CO<sub>2</sub> tracking</li><li>• Minimal AI insights</li><li>• Often requires hardware add-ons</li></ul>	<ul style="list-style-type: none"><li>• <b>AI route optimization</b></li><li>• <b>Carbon estimation built-in</b></li><li>• <b>AI anomaly detection</b></li></ul>
<b>Google Maps / Waze</b>	<ul style="list-style-type: none"><li>• Only navigation for individual drivers</li><li>• No fleet-wide visibility</li><li>• No governance or security controls</li></ul>	<ul style="list-style-type: none"><li>• <b>Centralized dashboard</b></li><li>• <b>Fleet analytics</b></li><li>• <b>Secure, governance-ready system</b></li></ul>

Compare our product with [EcoFleet](#)





# FUTURE PLAN



## SOURCE SUSTAINABLE & CIRCULAR MATERIALS

- Shift from single-use plastics to certified recycled and biodegradable materials.
- Partner with suppliers who can provide packaging made from post-consumer waste or rapidly renewable resources.



## PREDICTIVE MAINTENANCE

- Use speed + vibration data to detect early faults.
- Alerts for tire, engine, or component issues.
- Reduce breakdowns and maintenance cost.



## ERP / SUPPLY CHAIN INTEGRATION

- Sync delivery status with ERP systems.
- Auto-update inventory and orders.
- Improve visibility across logistics operations.





# THANK YOU!

WE APPRECIATE YOUR TIME



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