



Smart & Sustainable  
Traffic Routing

# PRAGATI DHARA

Green Mind Hackathon 2025



# Our Team

## Ritika Mathur

Infosys Technology Architect with 14+ years in cloud-driven digital transformation, sustainable innovation, and low-carbon infrastructure. ESG CoE contributor, committed to client sustainability, leading workshops on environmental responsibility, energy-efficient applications, and greener footprints for a better planet.



## Vaibhav Kulkarni

Senior Technology Architect at Infosys with 24+ years of experience in platform strategy, AI-driven solutions, and sustainability-focused architectures. Active contributor to hackathons and innovation programs, delivering scalable and intelligent enterprise platforms.



## Prerak Jain

Technology Lead at Infosys specializing in Generative AI & cloud solutions, passionate about sustainability & innovation. Thriving on designing impactful architectures, delivering client-focused solutions, & continuously upskilling to stay ahead in emerging technologies & digital transformation.





# The Daily Reality

**Picture this: It's 8 AM in Bangalore. Tanya, a software engineer, has been sitting in her car for 45 minutes. She's moved just 2 kilometers. Her AC is running, fuel burning, and she's watching her phone's battery drain as fast as her patience..**





# The Daily Reality

Tanya isn't alone. 50 million Indians face this every single day





# The Daily Reality



⌚ While we wait...

💰 ₹1,500 crores burned daily in fuel

🌍 400 million kg of CO<sub>2</sub> released every day

🏊 Enough to fill 160,000 Olympic swimming pools with greenhouse gases



# The Daily Reality



**But what if she — and millions like her  
Could become part of the solution  
Instead of just victims of the problem?**





# OUR VISION

## Citizen-Powered Green Mobility

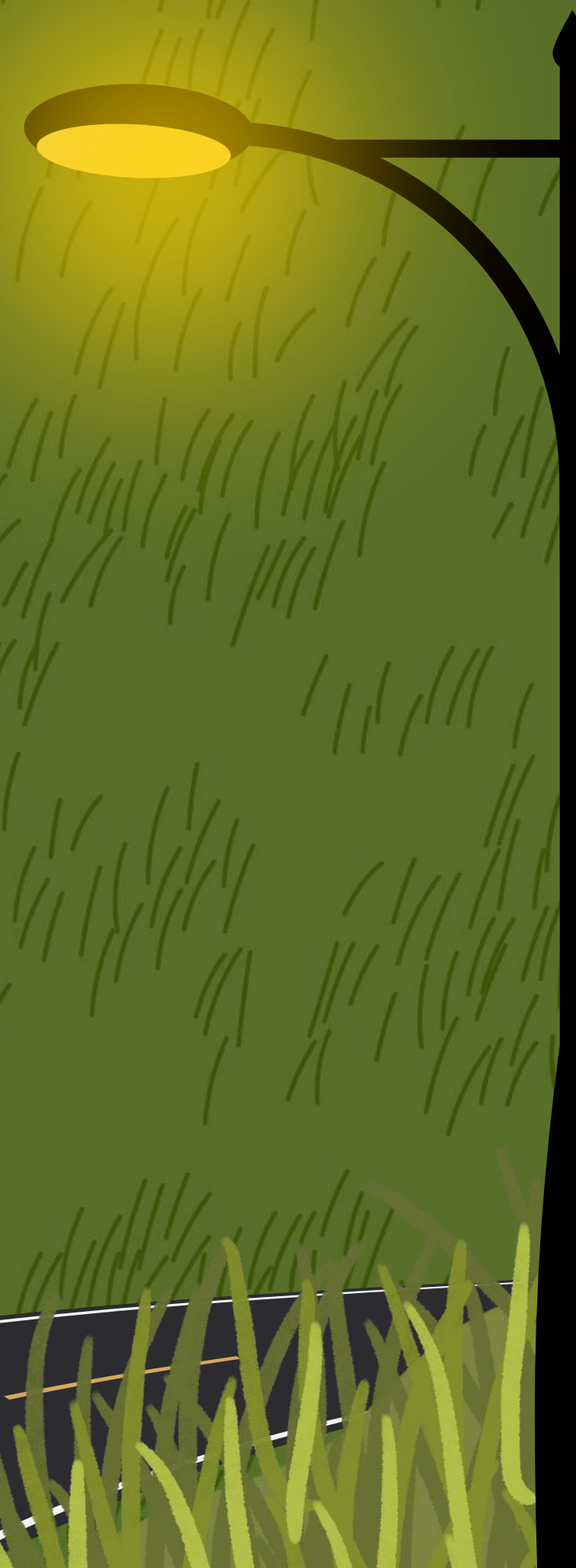
We envision Indian cities where every commuter is a sustainability champion - where your daily drive doesn't just get you to work, it helps build a greener India.

### The Pragati Dhara Way

- **Crowd-Powered Green Intelligence** : Citizens contribute data, not just consume routes
- **Sustainable AI** : Energy-efficient algorithms that save carbon, not consume it
- **Rewards That Matter** : Tangible benefits for eco-friendly choices
- **Truly Indian** : Vernacular AI for every Indian, not just English speakers

"Pragati Dhara means 'Progressive Flow'

Transforming traffic from a problem citizens endure into a solution citizens create."





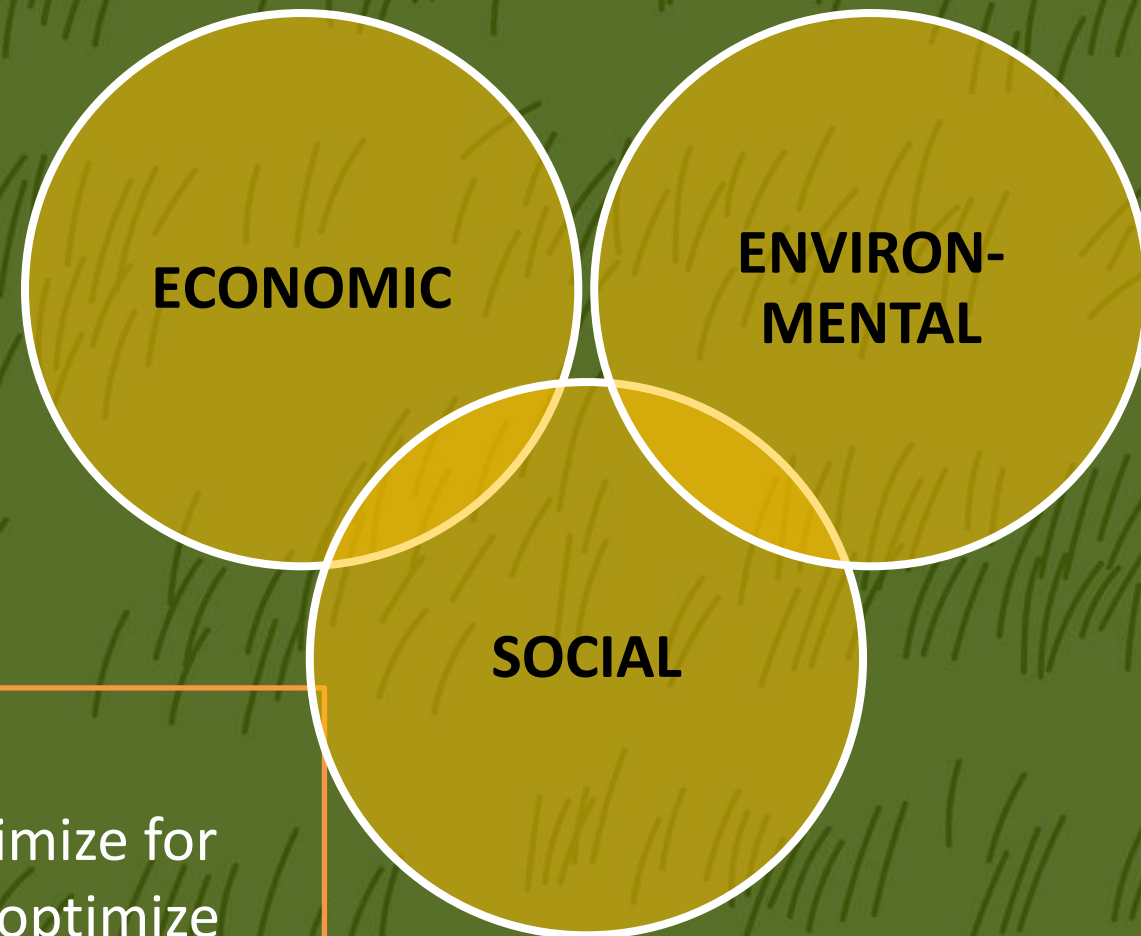


# Major AI Traffic Implementations in India

- **Bengaluru Adaptive Traffic Control System (BATCS)**
- **Pune Expressway Intelligent Traffic Management System (ITMS)**
- **Chandigarh Integrated Traffic Management System (ITMS)**
- **Delhi NCR - AI-based Predictive Analytics for Traffic Surges**
- **Mumbai - AI Adaptive Traffic Signals**



# Problem Statement: The Triple Crisis



## The Fatal Gap

Navigation apps optimize for speed. City systems optimize for flow. But nobody optimizes for sustainability. Nobody empowers citizens. Nobody rewards green choices.

### Economic Hemorrhage

- ₹1,500 crores evaporating daily in wasted fuel
- 2.5+ hours lost per commuter in Tier-1 cities
- 30% productivity drain = ₹4 lakh crores annual GDP loss

### Environmental Emergency

- 400M kg CO<sub>2</sub> daily from traffic congestion alone
- 45% of urban air pollution from vehicles
- 6 of world's 10 most polluted cities are in India
- We're falling behind on India's 2030 climate commitments (45% emission reduction target)

### Social Disconnect

- 600M smartphone users, yet zero participation in traffic solutions
- Citizens are passive victims, not active contributors
- No rewards for sustainable choices
- Existing solutions: expensive infrastructure, slow deployment, limited coverage





# The opportunity : Perfect timing

Why is this the perfect moment for Pragati Dhara?

## Market Reality

- **Urban mobility market** growing at 15% annually
- **600M smartphone users** : built-in distribution channel
- **2M+ EVs** on roads (3x growth in 2 years) = eco-conscious user base ready



# The opportunity : Perfect timing

Why is this the perfect moment for Pragati Dhara?

## Policy Tailwinds

- ✓ **Smart City Mission 2.0** - ₹48,000 crores allocated
- ✓ **Green Credit Program** - rewards for environmental actions
- ✓ **Corporate ESG mandates** - companies **MUST** track emissions
- ✓ **SDG 11 commitments** - sustainable cities by 2030
- ✓ **India's 45% emission reduction target** by 2030



# The opportunity : Perfect timing

Why is this the perfect moment for Pragati Dhara?

## Technology Convergence

- Edge AI maturity (TensorFlow Lite)
- 5G rollout enabling real-time data
- UPI ecosystem proving micro-transaction viability
- Cloud costs down 60% in 3 years



# The opportunity : Perfect timing

Why is this the perfect moment for Pragati Dhara?

## Social Shift

- **Post-pandemic:** 73% Indians prioritize sustainability (Nielsen 2024)
- **Gen Z/Millennials:** 84% willing to pay for green solutions



# Our solution : Pragati Dhara platform

What exactly is Pragati Dhara?

Simple  
Version

Think of it as

**Google Maps**

+

**Sustainability Optimizations**

+

**Rewards & Awareness**

+

**Citizen Empowerment**

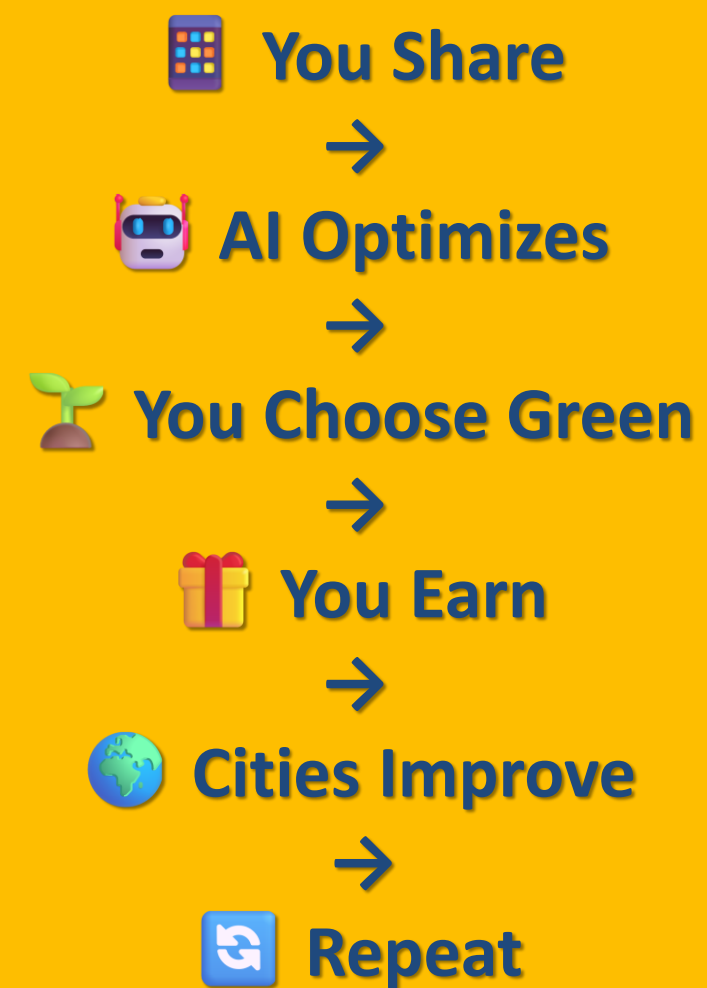
(all optimized for Indian cities)





# Our solution : Pragati Dhara platform

How it works?





# Our solution : Pragati Dhara platform

## Four Pillars of Innovation

### Crowd-Sourced Green Intelligence

- **Real-time traffic data** from every user's phone (anonymous, encrypted)
- **Incident reporting**: "Accident on Highway 1" → Reroute 10,000 users in 30 seconds
- **Community-verified** hotspots and road conditions
- **Privacy First**: Federated learning = your data never leaves your device

### Sustainable AI Engine

- **Smart Routing**: Google Maps integration for route calculation + our sustainability layer.
- **AI Intelligence**: Qwen 2.5 (1.5B parameters) - optimized for CPU via Ziroh Labs
- **Traffic Prediction**: AI models predict congestion 1 hour ahead
- **Vehicle Intelligence**: Emission calculations for various vehicle types.
- **Green AI Architecture**: CPU-only processing via Ziroh Labs, Qwen 2.5 1.5B model, Optimized compute, Intelligent caching, Hybrid approach
- **LLM Features**: Natural language trip planning, incident report analysis, personalized eco-tips
- **Our AI carbon footprint**: 75% lower than GPU-based alternatives.

### Green Points Economy

#### Earn Points

- **Eco-route**: 10 points/km
- **Carpool**: 25 points/ride
- **Off-peak travel**: 15 points/trip
- **Accurate reporting**: 5 points/incident

#### Redeem Rewards

- ₹100 = 1000 points (fuel discounts)
- EV charging credits
- Retail vouchers (Amazon, Flipkart)
- Insurance discounts (partnership with ICICI Lombard)

#### Gamification

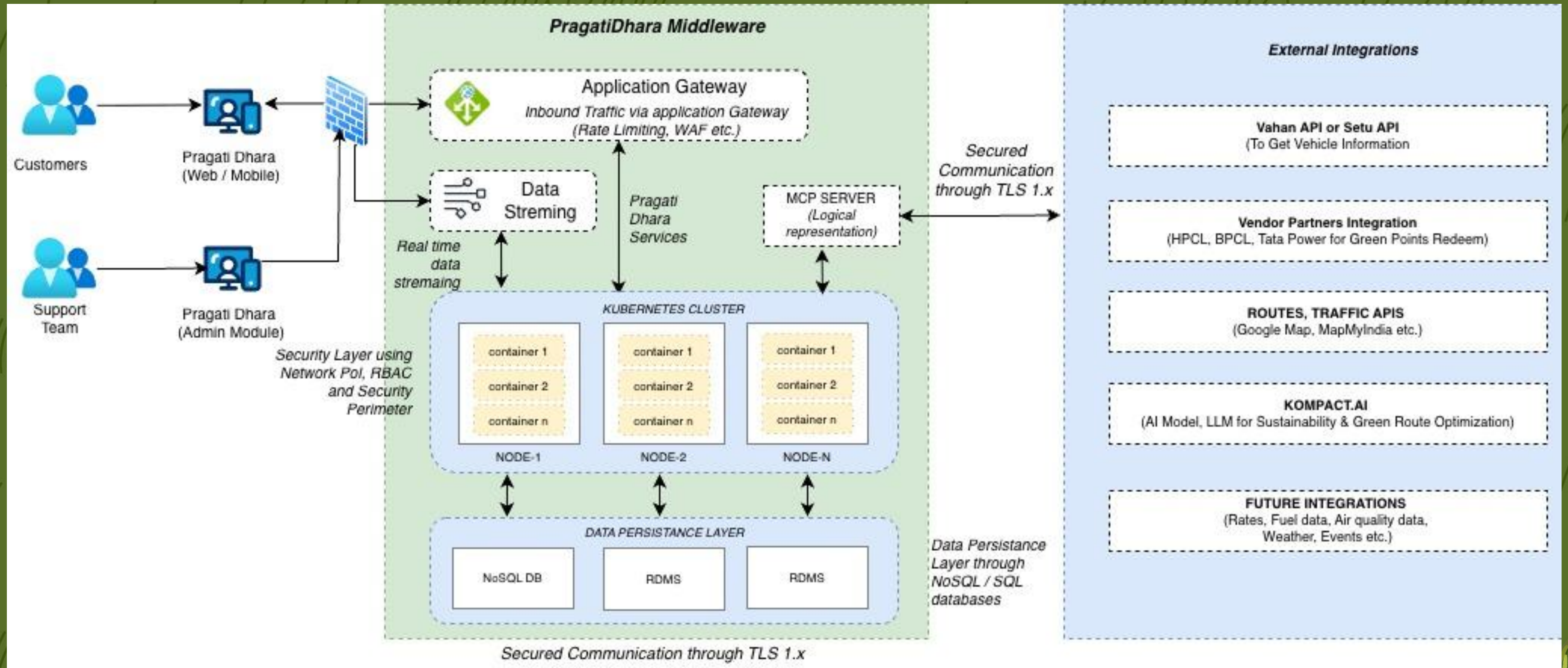
- Leaderboards, badges, city challenges

### Ecosystem Integration

- **Navigation backbone**: Google Maps API for route calculation and real-time traffic
- **Sustainability layer**: Our AI analyzes Google routes and adds eco-scoring
- **Plug into existing apps**: Enhance Ola, Uber with sustainability insights via API
- **Smart City ready**: ATCS integration for signal optimization
- **Corporate ESG**: Track employee commute emissions (SEBI-compliant reporting)



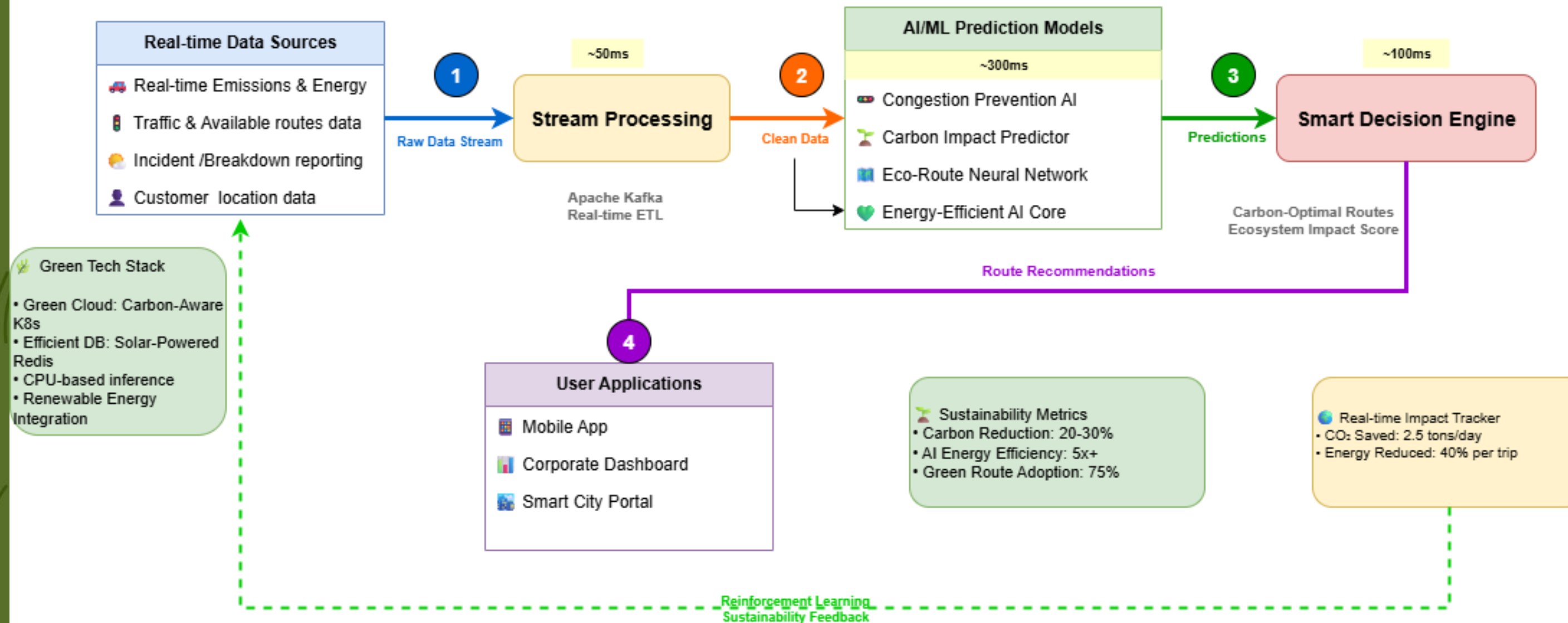
# AI Prediction and Smart Decision Engine flow





# AI Prediction and Smart Decision Engine flow

## PragatiDhara: Sustainable AI-Driven Traffic Intelligence & Carbon Reduction System



## AI Usage in Our Solution

### Sustainability Engine (AI/ML prediction models)

- Calculates eco-routes and green scores
- Analyzes driving patterns & vehicle data
- Processes traffic conditions & city events
- Evaluates road condition metrics

### Smart Decision/Recommendation Engine (Generative AI)

- Hyper-personalized eco-route suggestions
- CPU-optimized LLM/SLM implementation
- Integrates public transport options
- Adapts to individual user preferences



# Unique Differentiator

We're not just another navigation app. We're a sustainability movement with a tech backbone - and **our tech walks the green talk.**


From CPU-optimized AI to carbon-aware cloud infrastructure, **Pragati Dhara is green inside and out.**






# Pragati Dhara

Live Demo


**PragatiDhara**  
Smart Route Planning & Fuel Savings


YOUR GREEN CREDITS  
**217.5**


12 eco trips  
42.3 kg CO<sub>2</sub> saved





**Select Your Vehicle**


**Petrol Car**  
Standard gasoline vehicle  
15 km/L ₹110/L


**Diesel Car**  
Diesel-powered vehicle  
20 km/L ₹95/L


**CNG Car**  
Compressed Natural Gas  
25 km/kg ₹85/kg

**Electric Car**  
Battery Electric Vehicle  
5 km/kWh ₹8/kWh

**Hybrid Car**  
Hybrid Electric Vehicle  
25 km/L ₹110/L

**Tip:** Different vehicles have varying fuel costs and efficiency. Choose your vehicle type for accurate savings calculations.

**Eco Tip:** Electric and CNG vehicles produce significantly lower emissions. Switching to cleaner fuel can save up to 60% on carbon footprint.

**Money Saver:** Choosing eco-friendly routes can reduce fuel consumption by 15-25%. Combined with the right vehicle, you can save thousands annually.

**Plan Your Route**

Starting Point  
Gateway of India, Mumbai

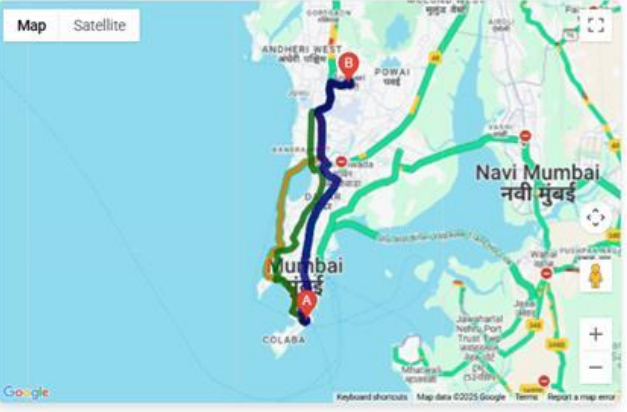
Destination  
Andheri, Mumbai


**Find Best Routes**

**Live Google Maps Route Visualization**

Route Legend:  
Fastest (Orange) Eco-Friendly (Green) Balanced (Blue)  
Routes are displayed with live traffic data for accurate visualization.

Map Satellite





Mobile number

Password

**LOGIN**

[Forgot Password?](#)

**DON'T HAVE AN ACCOUNT? SIGN UP**



# Tanya's new Reality



- 🍷 I'm a Proud Sustainability Ambassador
- 💰 I Earn Real Rewards
- 😊 I'm Genuinely Happier
- 🌍 I'm Part of Something Bigger
- 🚀 I'm Not Just a Commuter Anymore

## Transformation

### Before Pragati Dhara

- ❌ Passive victim
- ❌ Wasted time & fuel
- ❌ Zero rewards
- ❌ Adding to problem
- ❌ Individual frustration

### After Pragati Dhara

- ✅ Active contributor
- ✅ Optimized commute
- ✅ Real earnings
- ✅ Part of solution
- ✅ Community impact



# Why Pragati Dhara Wins

## Quick comparison

You might ask: Don't Google Maps and Uber already do this?

What you need	Google Maps	Uber/Ola	Pragati Dhara
Eco-routing	Basic (fuel-efficient)	✗	✓ AI-powered sustainability layer on top of Google Maps
Sustainability rewards	✗	Ride credits only	✓ Green Points for all green choices
Crowd intelligence	Limited	Drivers only	✓ All citizens contribute
AI Technology	Cloud GPUs	Cloud GPUs	✓ CPU-optimized (Ziroh Labs + Qwen 2.5)
LLM Features	Basic suggestions	✗	✓ Qwen 2.5 1.5B for conversational AI
ESG/Corporate integration	✗	✗	✓ SEBI-compliant reporting
Smart City API	✗	✗	✓ Plug-and-play ATCS
Sustainability = Core Mission	✗	✗	✓ YES





A stylized illustration of a road at night. The road is dark grey with a white dashed center line and yellow solid edge lines. It is flanked by green grass. On either side of the road, there are black lampposts with yellow circular lights. In the center of the road, there is a large yellow rectangular sign with rounded corners and a black border. The sign contains the text 'Plan smart, drive responsibly, and move sustainably' in black, and 'Pragati Dhara' in a smaller font below it.

Plan smart, drive  
responsibly, and move  
sustainably

Pragati Dhara



A stylized illustration of a road at night. The road is dark grey with a white dashed line down the center and yellow solid lines on the sides. It is flanked by green grass. Two black lampposts with yellow circular lights are positioned on either side of the road. In the center of the road, there is a large yellow rectangular sign with rounded corners and a black border. The sign contains the text "Thank you" in a black, sans-serif font.

Thank you

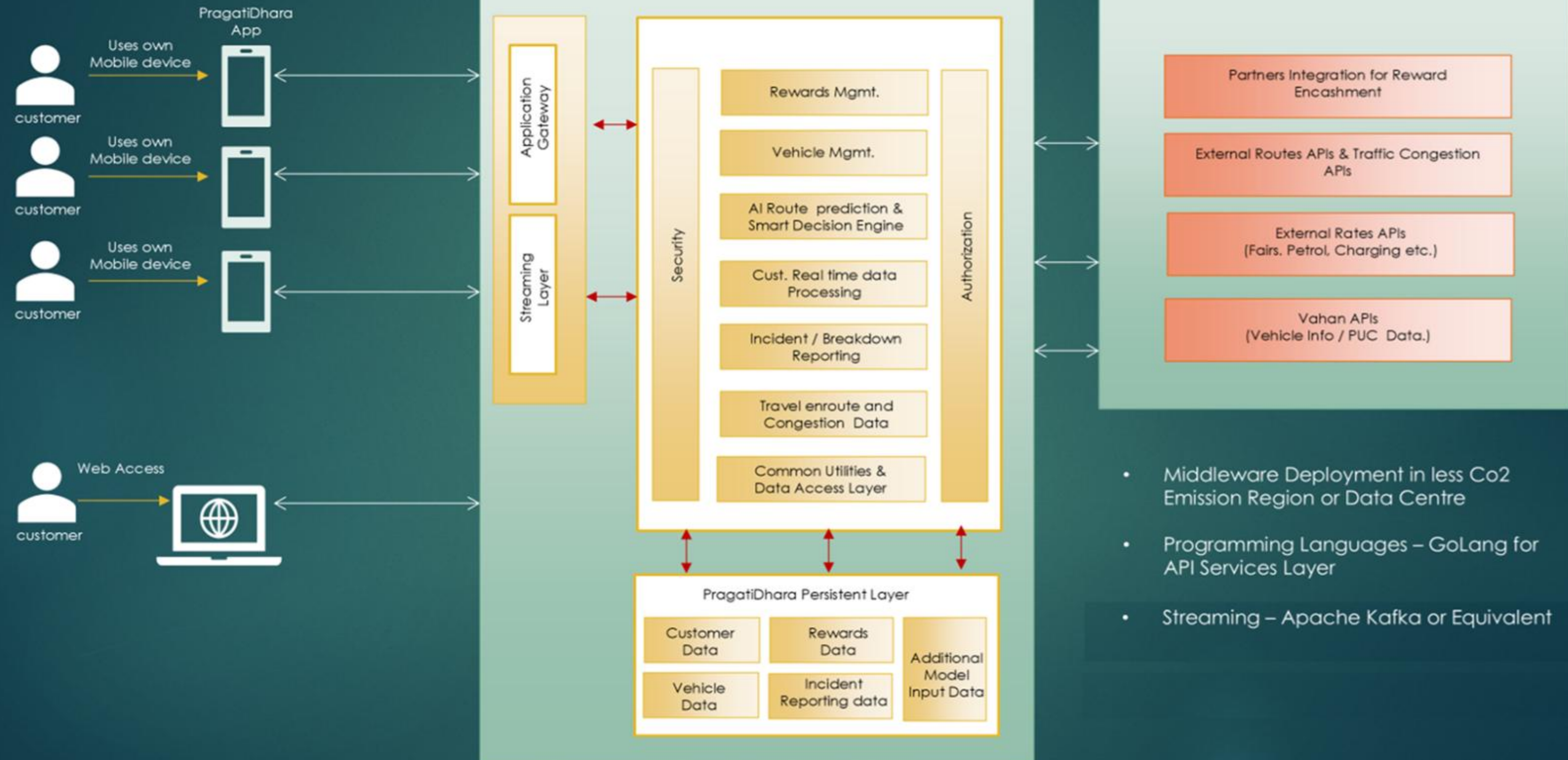


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# Appendix



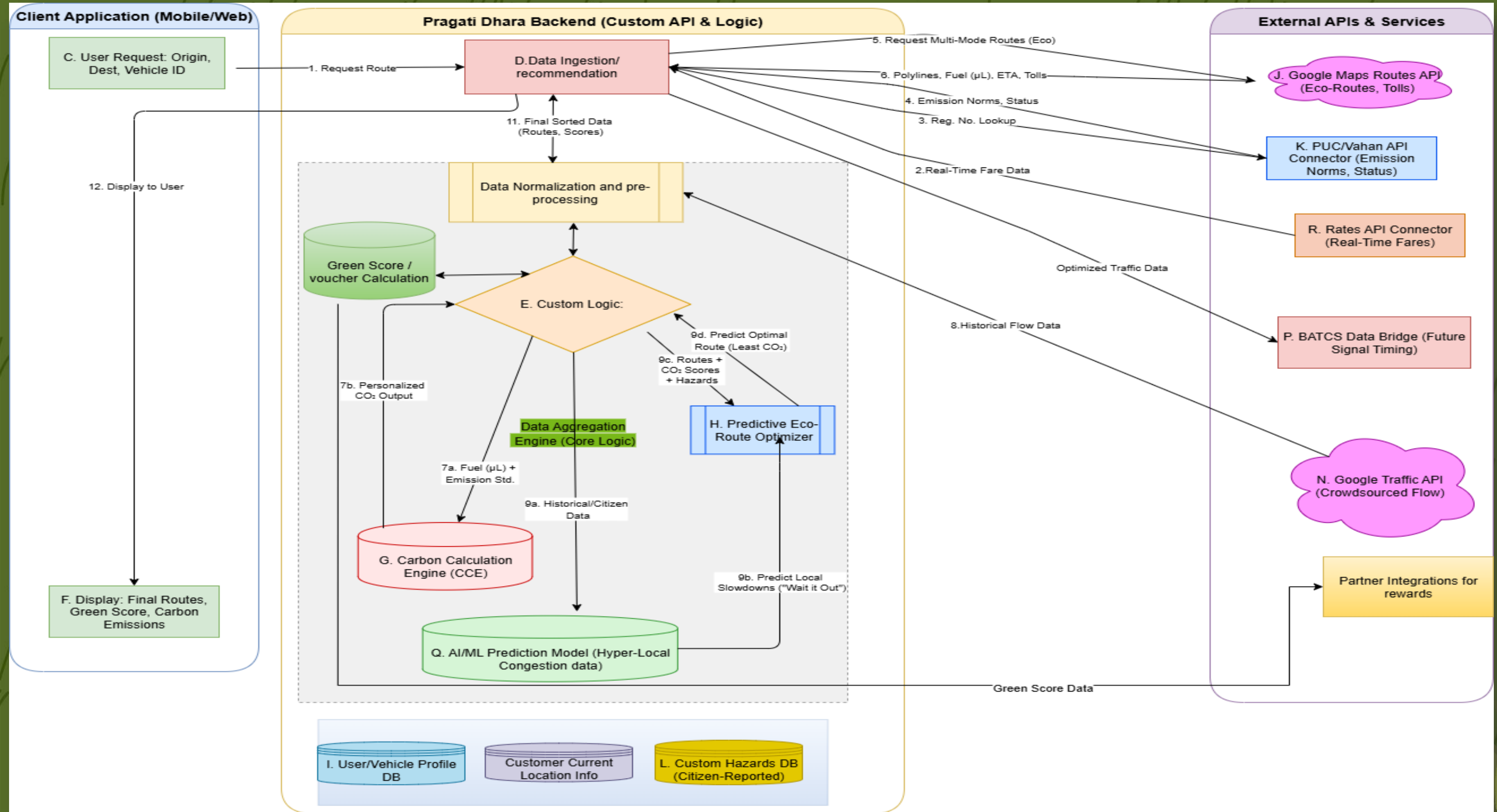
# High Level Solution Design



- Middleware Deployment in less Co2 Emission Region or Data Centre
- Programming Languages – GoLang for API Services Layer
- Streaming – Apache Kafka or Equivalent



# Detailed Solution Sketch





# Prototype snapshots

PragatiDhara

Smart Route Planning & Fuel Savings

YOUR GREEN CREDITS

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18 eco trips  
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Money Saver:

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Reset

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Destination  
Andheri, Mumbai

Find Best Routes

Live Google Maps Route Visualization

Route Legend:  

Fastest (Orange)


Eco-Friendly (Green)

Balanced (Blue)

Routes are displayed with live traffic data for accurate visualization.


Map Satellite

Keyboard shortcuts | Map data ©2025 Google | Terms | Report a map error



### AI-Powered Recommendations

Powered by Qwen/Qwen2.5-1.5B-Instruct




Best Choice for You

#### Eco-Friendly Route


By choosing the eco-friendly route, you not only reduce your carbon footprint but also earn green credits, which can be used for future travel. This choice aligns with your commitment to sustainability and supports environmental protection.

#### Key Insights


- Eco-friendly route saves 1.4 kg CO<sub>2</sub> compared to the fastest route, contributing to a lower carbon footprint.
- You'll save ₹51.08 in fuel costs by opting for the eco-friendly route, which adds up to ₹136.86 over a year of travel.
- The balanced route offers a good compromise, reducing CO<sub>2</sub> emissions by 0.01 kg and saving ₹10.96 in fuel, making it a practical choice for those looking to balance speed and sustainability.



Time Critical



Cost Conscious



Eco Conscious

## Route Results

ECO FRIENDLY ROUTE Environment First	BALANCED ROUTE Best Compromise	FASTEST ROUTE Speed Optimized
Distance: 29.4	Distance: 30.7	Distance: 29.9
Time: 1 hour 28 mins	Time: 1 hour 7 mins	Time: 53 mins
CO <sub>2</sub> Emissions: 3.8 kg	CO <sub>2</sub> Emissions: 4.6 kg	CO <sub>2</sub> Emissions: 5.2 kg
Green Score: 87	Green Score: 75	Green Score: 62
Trip Cost: ₹134.74	Trip Cost: ₹162.16	Trip Cost: ₹185.82
Fuel Used: 1.4 L	Fuel Used: 1.7 L	Fuel Used: 2.0 L
Cost per km: ₹4.59	Cost per km: ₹5.28	Cost per km: ₹6.21
Efficiency: 20.7 km/L	Efficiency: 18 km/L	Efficiency: 15.3 km/L
Green Credits Great reward! +21.9	Green Credits Great reward! +11.2	Green Credits No credits +0.0
SV Rd	Eastern Fwy	Coastal Rd

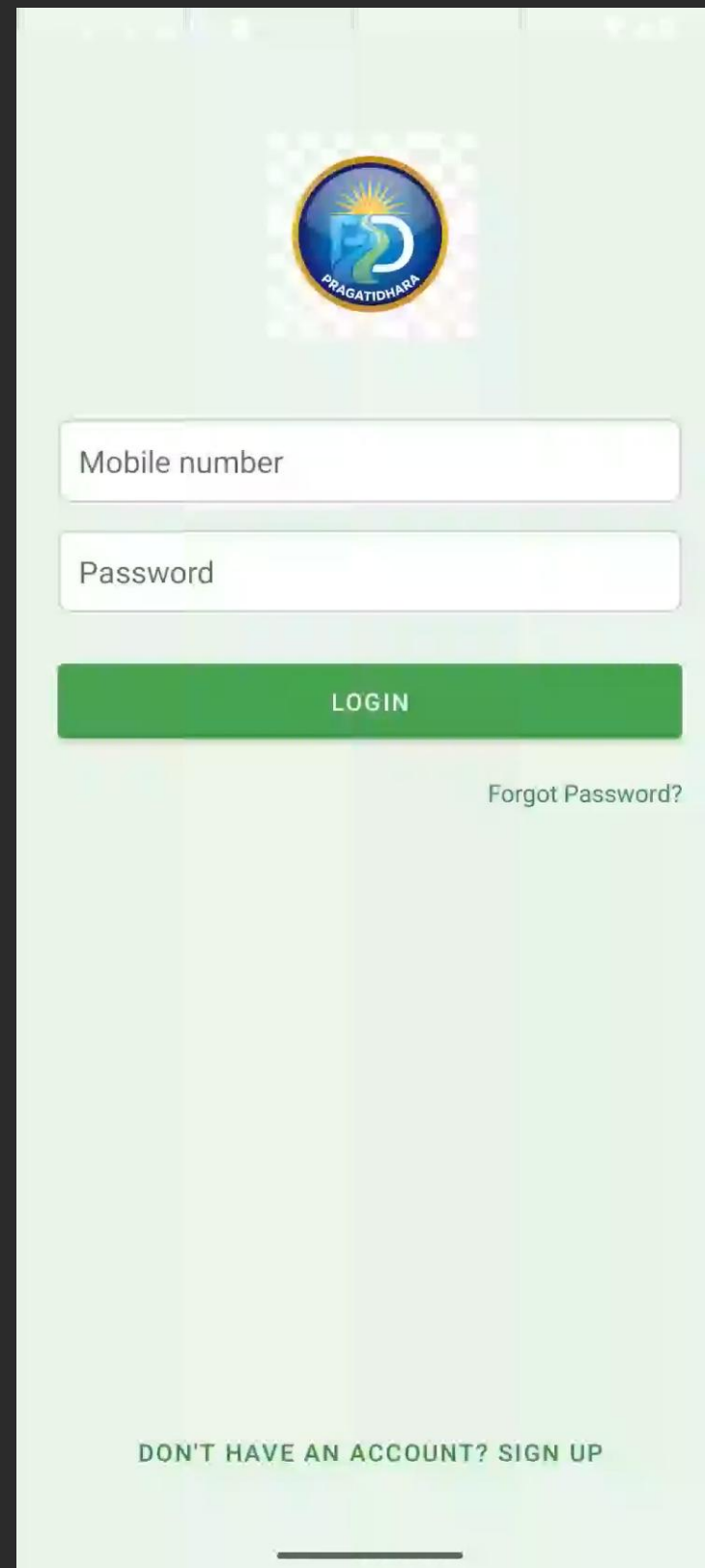
Green Credits
 Fuel Cost Comparison
 Comprehensive Analysis
 Savings Analysis

### Detailed Fuel Savings Analysis

Eco-Friendly vs Fastest Route	Balanced vs Fastest Route
Cost Savings: ₹51.08 per trip	Cost Savings: ₹23.66 per trip
Fuel Savings: 0.54 L per trip	Fuel Savings: 0.25 L per trip
Monthly Savings: ₹1022	Monthly Savings: ₹473
Annual Savings: ₹12259	Annual Savings: ₹5678
CO <sub>2</sub> Reduction: 1.44 kg per trip	Time-Cost Balance: Optimal efficiency



# Mobile App (In development)



The image shows a mobile app login screen for 'PragatiDHARA'. At the top center is a circular logo with a blue background, a yellow sunburst, and the text 'PRAGATIDHARA' below it. Below the logo are two input fields: 'Mobile number' and 'Password'. A green 'LOGIN' button is positioned below the password field. To the right of the button is a link that says 'Forgot Password?'. At the bottom of the screen, there is a link that says 'DON'T HAVE AN ACCOUNT? SIGN UP'. The entire app interface is displayed on a white rectangular background that is part of a larger illustration of a mobile phone.

Mobile number

Password

LOGIN

[Forgot Password?](#)

[DON'T HAVE AN ACCOUNT? SIGN UP](#)



# Revenue Model

## Green Points Partnership Ecosystem

B2B2C - Partner with brands for rewards redemption

- **Fuel Partners** (Indian Oil, BPCL, HPCL)
- **EV Charging Networks** (Tata Power, Charge Zone)
- **Retail Partners** (Flipkart, Amazon, Big Basket)
- **Insurance Providers** (ICICI Lombard, Bajaj Allianz)
- **Delivery apps** (Swiggy, Zomato, Porter)

## Carbon Credits

Pragati Dhara creates **verified, traceable carbon credits** from measurable emission reductions by users. These credits are sold to corporations for ESG compliance.

