



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

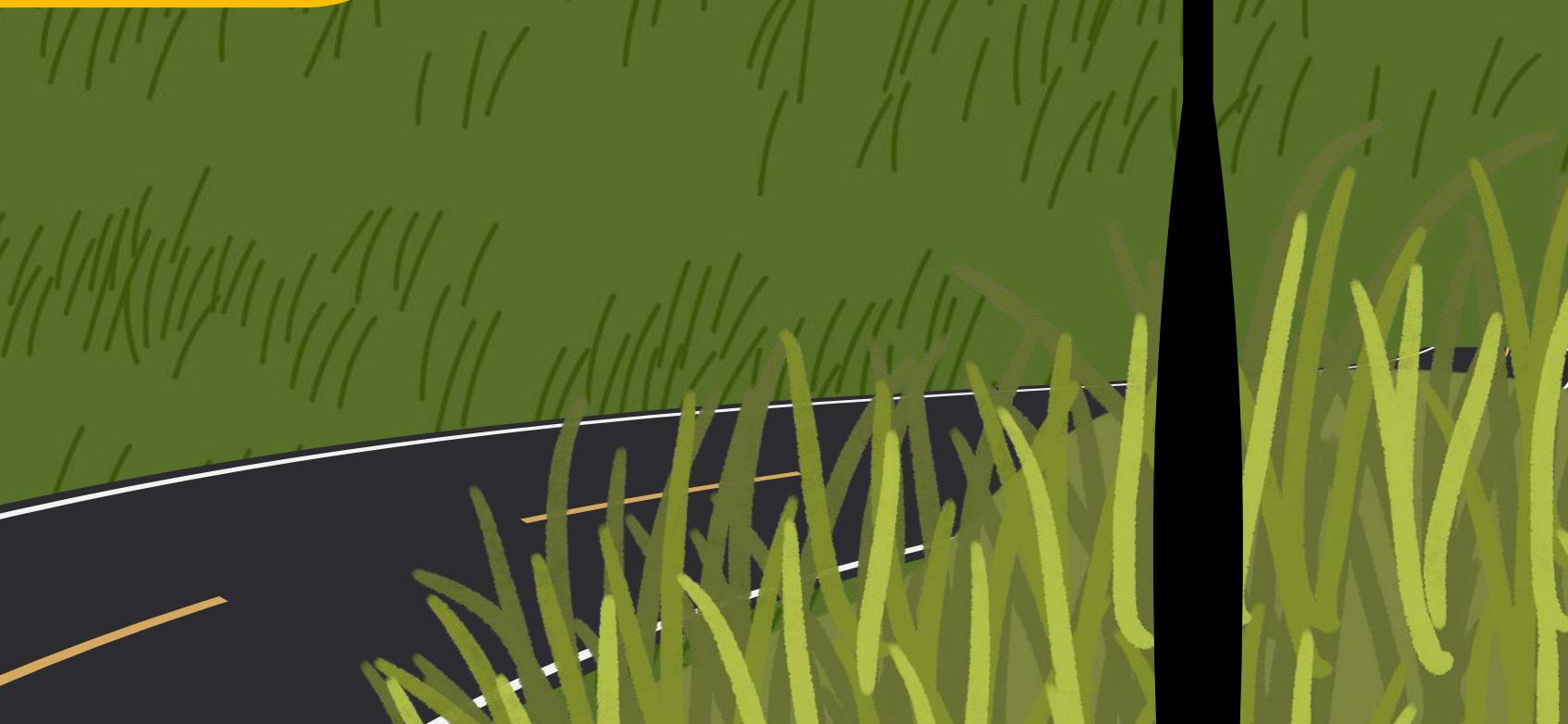
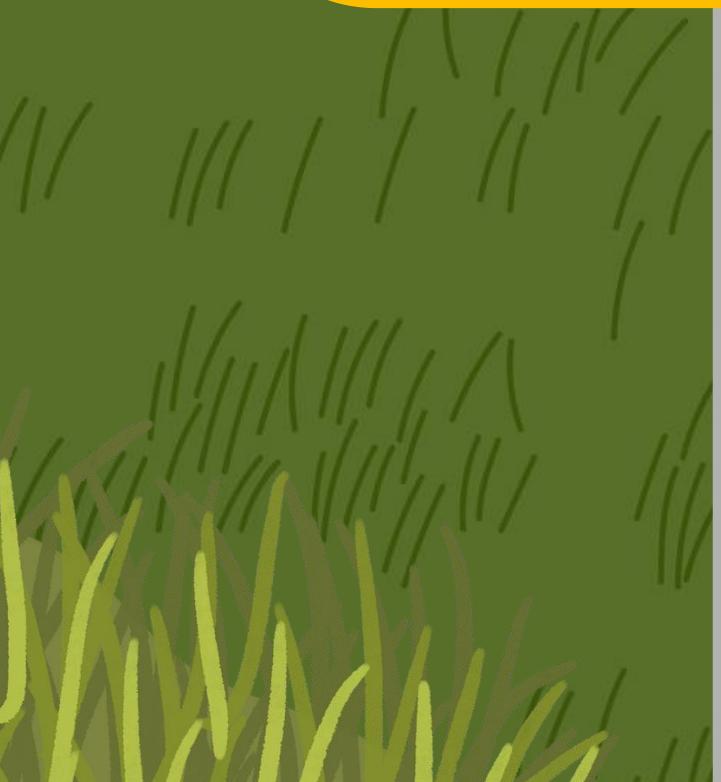
We envision Indian cities where every commuter is a sustainability champion - where your daily drive doesn't just get you to work, it helps build a greener India.

### 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."

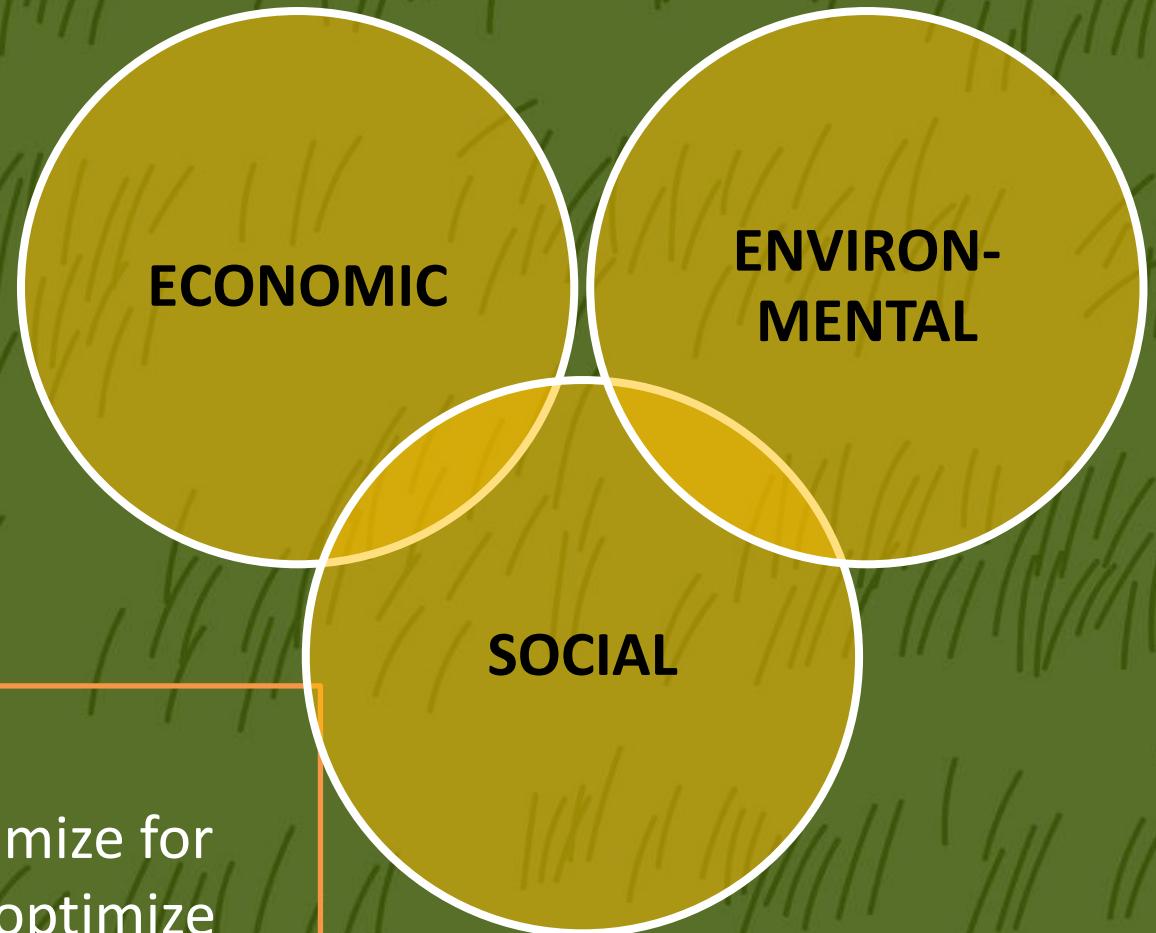




# Major AI Traffic Implementations in India

- **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?

-  You Share →
-  AI Optimizes →
-  You Choose Green →
-  You Earn →
-  Cities Improve →
-  Repeat



# 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)

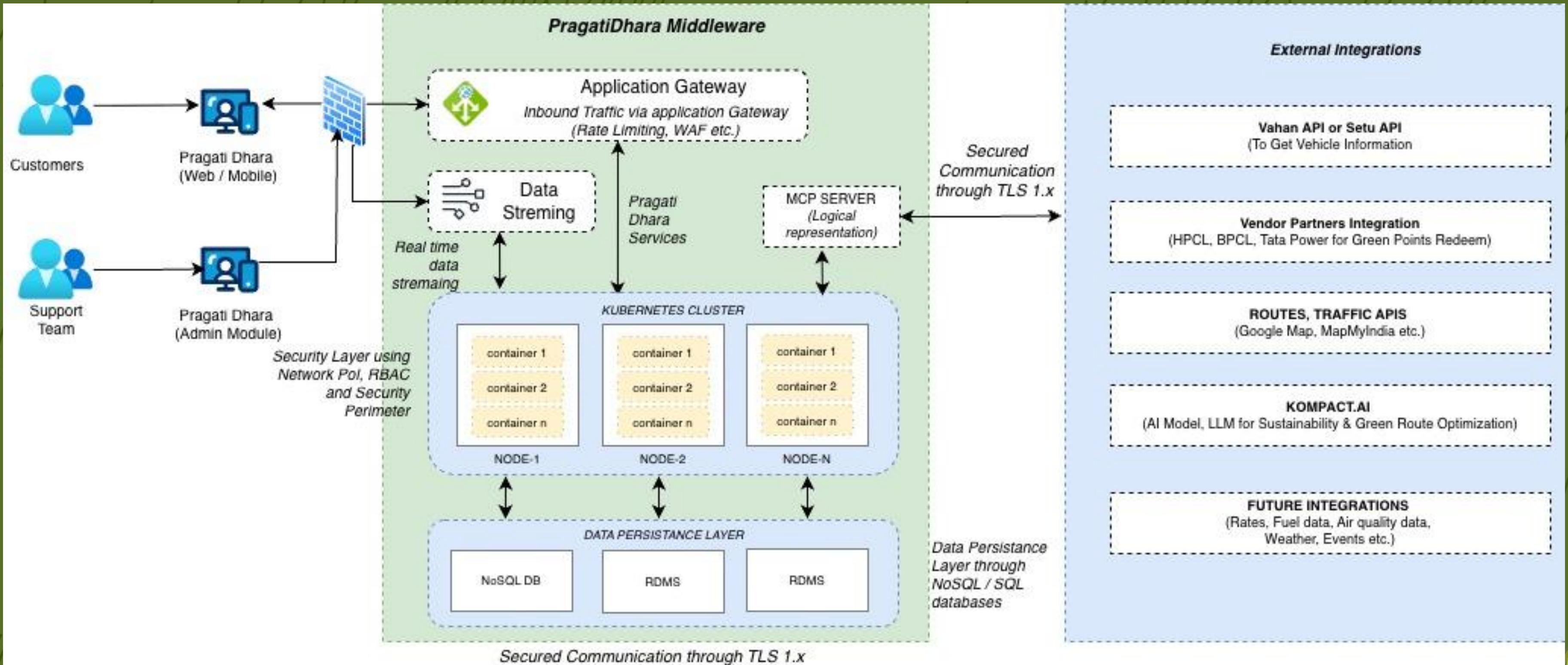
#### Gamification

- Leaderboards, badges, city challenges

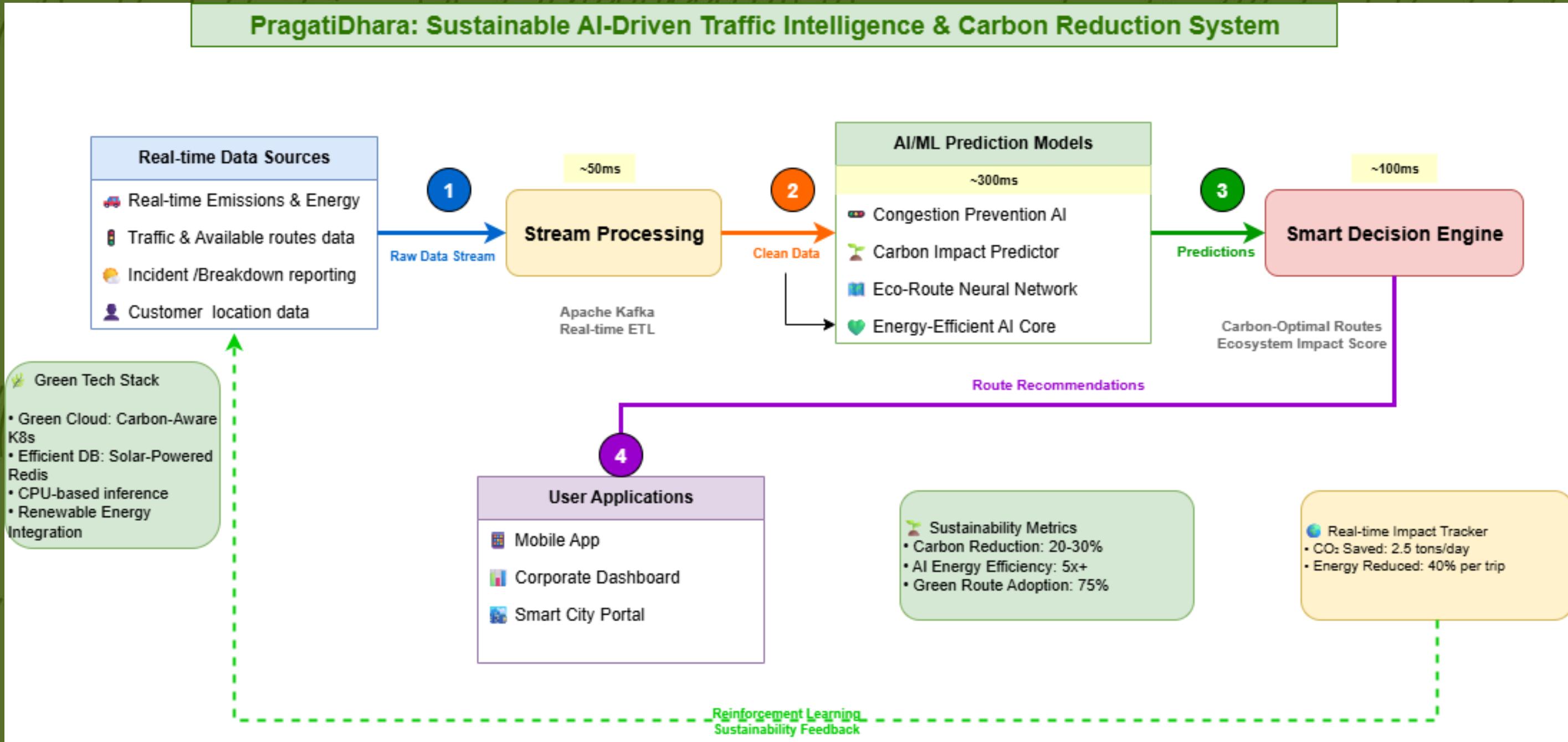
### Ecosystem Integration

- **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



## 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

The screenshot shows the PragatiDhara website interface. At the top, there's a purple header bar with the PragatiDhara logo, a sun icon, and text indicating 'YOUR GREEN CREDITS 217.5' and '10 eco trips 42.3 kg CO<sub>2</sub> saved'. Below the header, there are two main sections: 'Select Your Vehicle' and 'Plan Your Route'. Under 'Select Your Vehicle', there are five options: Petrol Car, Diesel Car (selected), CNG Car, Electric Car, and Hybrid Car. Each option includes a small vehicle icon, a description, and fuel consumption rates. Under 'Plan Your Route', the starting point is set to 'Gateway of India, Mumbai' and the destination is 'Andheri, Mumbai'. A blue button labeled 'Find Best Routes' is present. Below these sections is a map titled 'Live Google Maps Route Visualization' showing a route from Mumbai to Andheri. The map includes a legend for route types: Fastest (Orange), Eco-Friendly (Green), and Balanced (Blue). The map also displays various landmarks and street names.

The screenshot shows the PragatiDhara login page. It features a logo at the top right with the text 'PRAGATIDHARA'. Below the logo are fields for 'Mobile number' and 'Password', both with placeholder text. A large green 'LOGIN' button is centered below the password field. To the right of the button, there's a link 'Forgot Password?'. At the bottom of the page, there's a link '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	After Pragati Dhara
✗ Passive victim	✓ Active contributor
✗ Wasted time & fuel	✓ Optimized commute
✗ Zero rewards	✓ Real earnings
✗ Adding to problem	✓ Part of solution
✗ Individual frustration	✓ 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
<b>Sustainability = Core Mission</b>	✗	✗	✓ YES





A night scene of a road with streetlights and grass. The road has a double yellow line and a white center line. Two streetlights are visible, one on each side of the road, both illuminated. The background consists of dark green grass on both sides of the road.

**Plan smart, drive  
responsibly, and move  
sustainably**

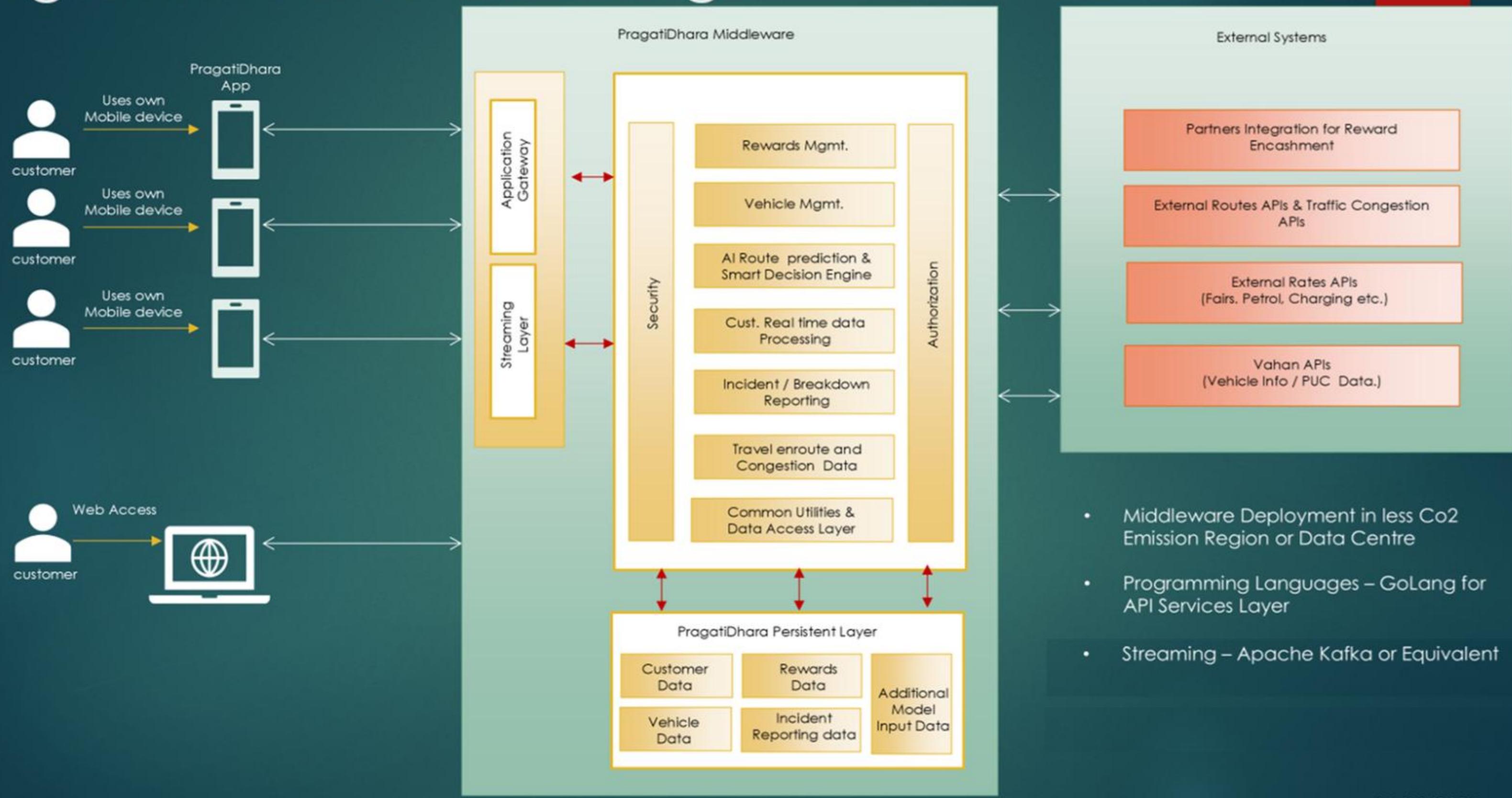
Pragati Dhara

The background is a stylized illustration of a night landscape. It features a dark grey road with a thick yellow double line running horizontally across the center. On either side of the road are green grassy fields. Two streetlights are positioned along the road: one on the left and one on the right. Both streetlights have black curved poles and single circular lamps that are glowing with a bright yellow light. The sky above is a solid dark green color.

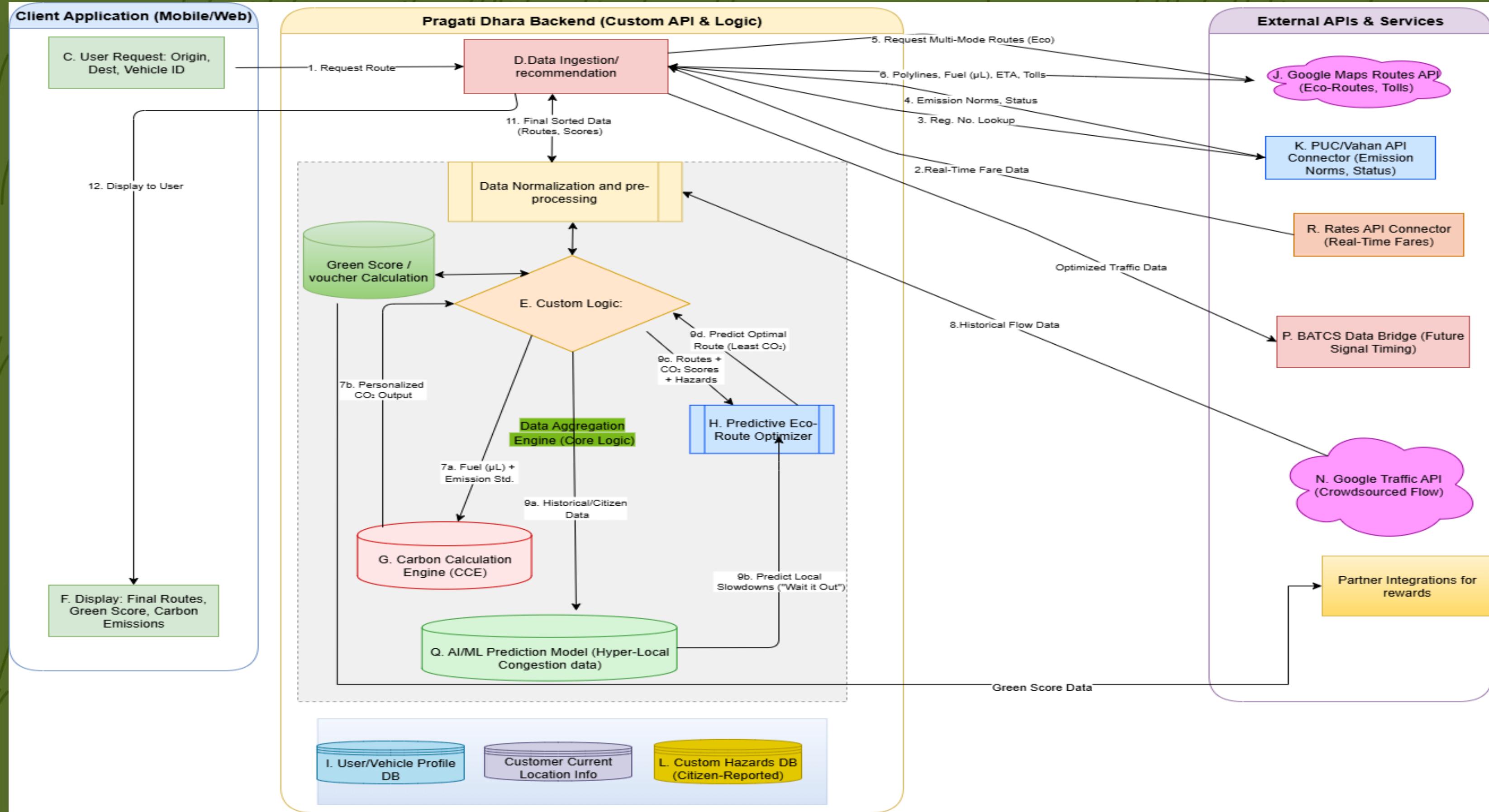
Thank you

# Appendix

# High Level Solution Design



# Detailed Solution Sketch



# Prototype snapshots

**PragatiDhara**  
Smart Route Planning & Fuel Savings

**YOUR GREEN CREDITS**  
217.5 18 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

**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

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.

**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**

Route Type	Description	Distance	Time	CO <sub>2</sub> Emissions	Green Score	Trip Cost	Fuel Used	Cost per km	Efficiency	Green Credits
<b>ECO FRIENDLY ROUTE</b> Environment First	29.4	1 hour 28 mins	3.8 kg	87	₹134.74	1.4 L	₹4.59	20.7 km/L	+21.9	
<b>BALANCED ROUTE</b> Best Compromise	30.7	1 hour 7 mins	4.6 kg	75	₹162.16	1.7 L	₹5.28	18 km/L	+11.2	
<b>FASTEST ROUTE</b> Speed Optimized	29.9	53 mins	5.2 kg	62	₹185.82	2.0 L	₹6.21	15.3 km/L	+0.0	

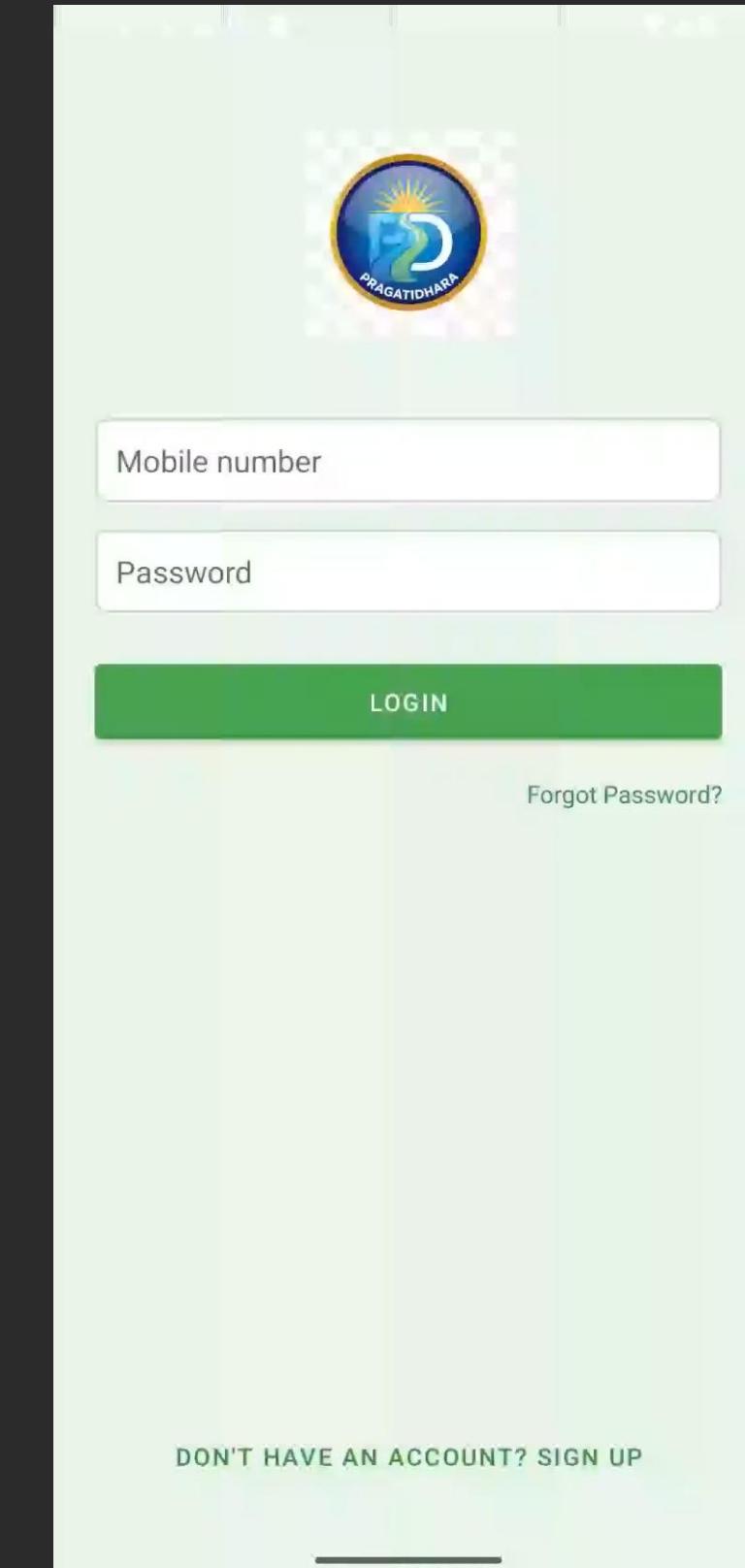
SV Rd Eastern Fwy

Green Credits Fuel Cost Comparison Comprehensive Analysis Savings Analysis

**Detailed Fuel Savings Analysis**

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

# Mobile App (In development)



# 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.