

Project Design Phase
Problem – Solution Fit Template

Date	27 June 2025
Team ID	LTVIP2025TMID59638
Project Name	TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning
Maximum Marks	2 Marks

Problem–Solution Fit:

Project Title: *TrafficTelligence – Advanced Traffic Volume Estimation with Machine Learning*

Problem

- Urban commuters and traffic planners face daily unpredictability in traffic conditions.
- Current traffic monitoring tools are either reactive, lack real-time prediction, or do not integrate dynamic variables such as weather, time-of-day, holidays, or historical patterns.
- These issues lead to delays, miscommunication, inefficient logistics, and poor public infrastructure decisions.

Solution

A machine learning-based traffic volume prediction system that:

- Leverages historical data, weather information, and time-specific patterns.
- Uses Random Forest Regressor or similar models for accurate forecasting.
- Is deployed via a Flask-based web application for real-time access.
- Offers a simple and accessible UI to input environmental factors and get instant predictions.

Customer Segment / Behavior

- Urban Commuters: Want to optimize daily travel and avoid traffic jams.
- Traffic Planners & Smart City Developers: Need reliable data to make evidence-based decisions.
- Delivery & Logistics Companies: Require accurate traffic forecasts to ensure timely deliveries.

- Behavior: These users often check weather or Google Maps, plan routes in advance, or rely on experience—but these methods are not always accurate or sufficient.

Why This Solution Fits

- It automates prediction, reducing the need for manual interpretation or guesswork.
- The system works with real behavioural patterns—users already rely on time, weather, and known traffic hotspots.
- It provides a trustworthy and fast alternative to inaccurate or outdated public data systems.
- By addressing both individual and organizational needs, it creates multiple touch-points for adoption.

Strategic Advantages

- Can be scaled for municipal use or consumer traffic apps.
- Integration possibilities with navigation apps, logistics systems, or smart city dashboards.
- Opportunity for open data collaborations with governments and research bodies.

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) <small>Who is your customer? I.e. working parents of 0-5 y.o. kids</small> Urban commuters Government traffic control departments Smart city planning teams Transport analytics firms	6. CUSTOMER CONSTRAINTS <small>What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.</small> Budget limitations, Low technical expertise, Limited access to real-time data sources, Dependence on legacy systems.	5. AVAILABLE SOLUTIONS <small>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking</small> Manual traffic surveys, Road sensors and loop detectors, Basic vehicle counters, CCTV footage manually analyzed.	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS <small>Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.</small> Need accurate traffic volume data to make infrastructure decisions, Real-time monitoring of traffic patterns, Reduce congestion and travel time, Forecast peak traffic for better signal timing.	9. PROBLEM ROOT CAUSE <small>What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.</small> Lack of real-time, reliable traffic data, Outdated infrastructure and survey methods, Manual analysis leading to slow and inaccurate decisions	7. BEHAVIOUR <small>What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; Indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)</small> Consult traffic engineers or planners, Analyze CCTV manually, Hire third-party agencies for surveys, Use Excel for traffic forecasting.	
Focus on J&P, tap into BE, understand RC	3. TRIGGERS <small>What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.</small> Frequent traffic jams,, Complaints from citizens on delays	10. YOUR SOLUTION <small>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.</small> An AI-based traffic volume estimator using machine learning, Real-time, high-accuracy traffic forecasting, Dashboard for insights, congestion hotspots, and planning assistance, Easily deployable and scalable across cities	8. CHANNELS of BEHAVIOUR 8.1 ONLINE <small>What kind of actions do customers take online? Extract online channels from #7</small> 8.1 ONLINE: Research AI/ML traffic tools, browse YouTube case studies, attend webinars. 8.2 OFFLINE <small>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</small> 8.2 OFFLINE: Attend urban planning meetings, consult with traffic experts, participate in smart city exhibitions	Extract online & offline CH of BE
	4. EMOTIONS: BEFORE / AFTER <small>How do customers feel when they face a problem or a job and afterwards? I.e. lost, insecure > confident, in control - use it in your communication strategy & design.</small> Before: Frustrated, helpless, stressed, reactive, After: Informed, proactive, efficient, data-driven			