

Ideation Phase

Brainstorm & Idea Prioritization Template

Date	27 June 2025
Team ID	LTVIP2025TMID59638
Project Name	TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization for “TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning”:


Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich number of creative solutions.

The goal of this session is to generate innovative and practical solutions for improving traffic volume estimation. By enhancing the accuracy of traffic predictions, we aim to empower individuals to better plan their daily commutes and support traffic authorities in managing and regulating traffic flow more efficiently.

This session will bring together a diverse group of participants, including citizens, traffic officials, educators, community leaders, and tech enthusiasts. This wide range of perspectives will foster rich discussions and spark creative, actionable ideas.

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template



Brainstorm & idea prioritization

Before you collaborate
A little bit of preparation goes a long way with this session. Here's what you need to do to get going.
🕒 10 minutes

Before you collaborate (🕒 10 minutes) *A little bit of preparation goes a long way.*
✔ **Team gathering** Define team members and roles:

- 👤 Bethapudi Hema Jessy (*Team Leader*)
- 👤 Amarthaluri Varshitha (*Team Member*)
- 👤 Annangi Harsha (*Team Member*)
- 👤 Abdul Anees (*Team Member*)

✔ **Set the goal** Focus on the problem of predicting traffic volume using real-time weather and road condition data, powered by machine learning, and delivering predictions through a user-friendly web interface.

✔ **Facilitation tools** Use collaboration boards and structured feedback loops to drive productive sessions and continuous iterations.

1
Define your problem statement
How might we build a machine learning system that can predict traffic volume based on weather and time data, and deliver these predictions through an accessible web interface?
🕒 5 minutes

Problem Statement: Urban areas suffer from unpredictable traffic conditions, leading to congestion, delays, and inefficient commuting. Traditional traffic prediction methods fall short in adapting to dynamic variables like weather. **TrafficTelligence** aims to provide a deep learning-based traffic volume prediction system that integrates real-time environmental data and serves accurate forecasts via a web application to help commuters and planners make informed decisions.

Key rules of brainstorming
To run an smooth and productive session

Stay in topic.

Defer judgment.

Go for volume.

Encourage wild ideas.

Listen to others.

If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

2 Brainstorm

10 minutes

TIP
You can select a sticky note and, with the pencil button in toolbar, come to edit drawing!

PERSON 1
Bethapudi Hema Jessy

- Train Random Forest Regressor using time, weather, and road data
- Use encoder and scaler for preprocessing
- Save model as model.pkl and encoder.pkl

PERSON 2
Amarthaluri Varshitha

- Create a Flask app to accept input and return predictions
- Handle errors and invalid inputs gracefully
- Connect trained model and deploy via Flask routes

PERSON 3
Annangi Harsha

- Design frontend in HTML/CSS with traffic-themed background
- Add form inputs for weather, hour, month, holiday status, etc.
- Display prediction result on same page

PERSON 4
Abdul Anees

- Add feature importance visualization using matplotlib/seaborn
- Monitor model performance using RMSE and R^2
- Improve data quality through correlation and outlier checks

3 Group ideas

20 minutes

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence like label if a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

Group 1 – ML Model & Training

- Train Random Forest Regressor on historical traffic-dataset
- Preprocess using LabelEncoder and MinMaxScaler
- Evaluate performance and save trained model

Group 2 – Backend System

- Develop Flask API for prediction
- Implement input validation and error handling
- Integrate saved model for real-time predictions

Group 3 – Frontend UI

- Build HTML/CSS frontend for input and output
- Style with traffic-related imagery and modern look
- Show prediction result and provide user feedback

Step-3: Idea Prioritization

4 Prioritize

Developing and integrating ML model with Flask backend and deploying a clear, functional frontend.

20 minutes

After you collaborate

- Export mural or snapshot for presentation.
- Test real-world scenarios and iterate accordingly.
- Define next steps like dataset expansion, UX improvements, and scaling predictions via API.

High	High
High	High
High	Medium
Medium	Medium
High	Medium

After evaluating several concepts, we identified **"Using AI/ML to analyze historical traffic data for accurate predictions"** as our top priority. The accuracy of our traffic volume estimation model is critical—without reliable predictions, the entire system's effectiveness would be compromised. Therefore, building a robust and precise AI/ML model was our foremost focus.

Our second most important idea is **"Collaborating with local government to integrate TrafficTelligence into existing traffic management systems."** This collaboration reflects our commitment to social impact. By partnering with government bodies or transportation authorities, we can ensure broader implementation, benefiting both the public and traffic regulators. It also strengthens the real-world applicability and credibility of our solution.

Lastly, we plan to expand our model to offer **"Advanced features such as optimized traffic signal control, emergency route planning, and data-driven urban development."** These enhancements go beyond the core problem and elevate the project's overall value, transforming it into a comprehensive traffic management platform.