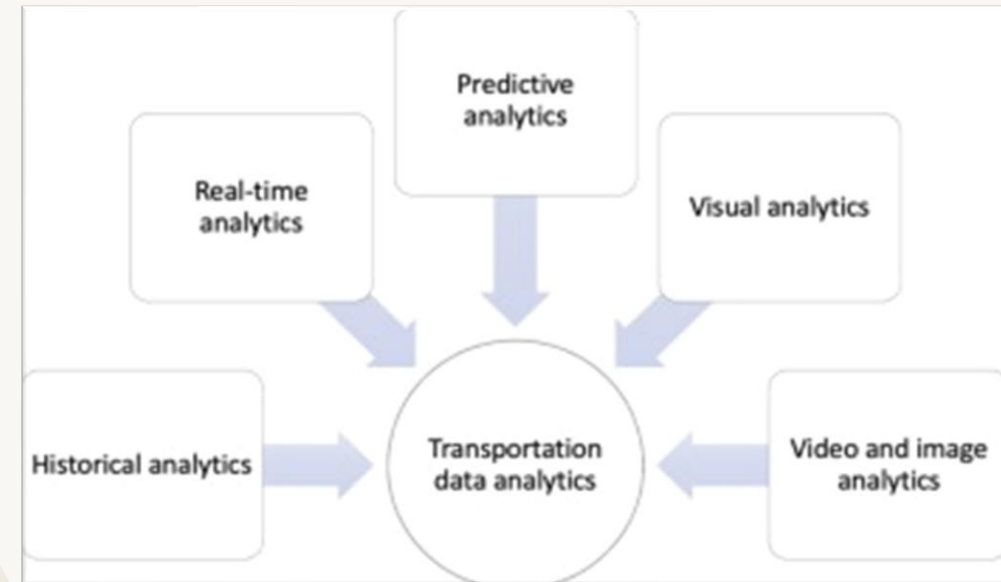# REAL TIME TRAFFIC ANALYSIS

BDM 1034 - Application Design for Big Data

Industry Overview

The transportation industry is critical to economic productivity and urban mobility but faces significant challenges in managing traffic congestion and road safety. According to recent studies, traffic congestion costs U.S. cities over $120 billion annually in lost productivity. Real-time traffic analysis can optimize transportation flow, reduce accidents, and improve commuter experience.

Problem: Urban traffic congestion and accident rates remain high, especially during peak hours. This impacts commuter safety, productivity, and environmental health. **Objective**: Develop a real-time traffic analysis solution to identify high-congestion areas and suggest optimal routing to reduce delays and improve safety.
Target Audience: Commuters, city transportation departments, and emergency responders.

Differentiation

Existing Solutions: Many apps provide basic traffic info but lack detailed accident prediction and data insights.

Our Solution: Integrates accident data and real-time traffic flow to provide:

- Predictive analysis on high-risk areas.

- Proactive alerts for commuters.

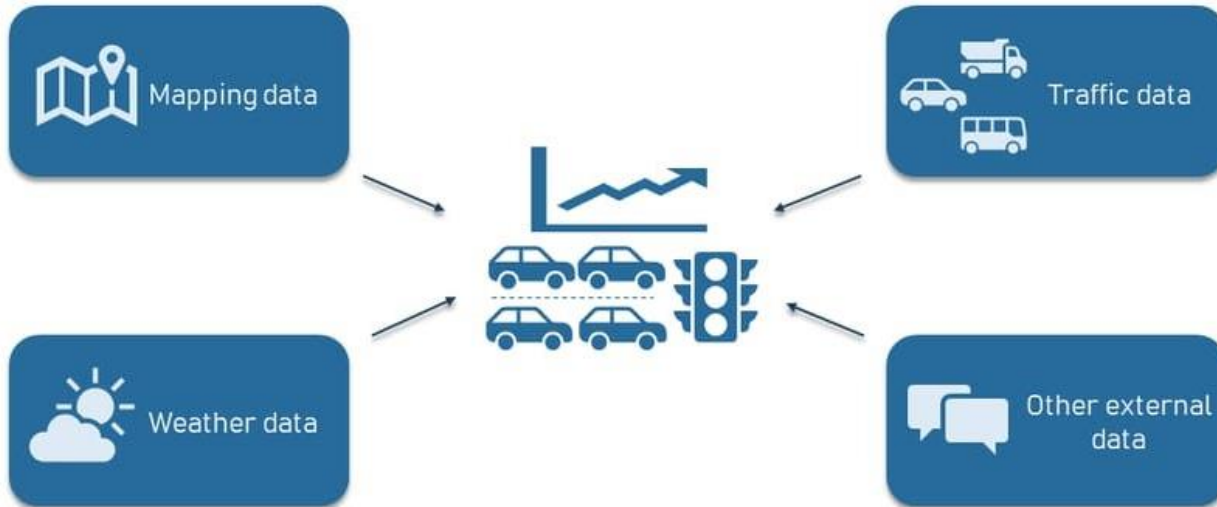- Adaptive routing based on real-time conditions and historical patterns.
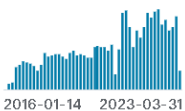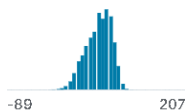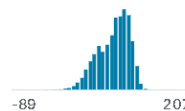
Data Gathering

DATA NEEDED FOR TRAFFIC PREDICTION

Mapping data

Traffic data
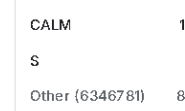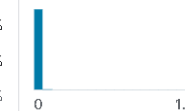
Weather data

Other external data
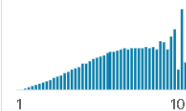
Primary Dataset: Kaggle's US Accident Dataset, which includes information on accidents, weather, location, and time.

Data Collection Plan:

- Historical accident data (2016-2023).

- Real-time feeds from Google Traffic, weather APIs. *Key Variables*: Location, accident severity, weather, road type, traffic volume.

Screenshot of Dataset

Final Output

The final dashboard will display:

- Real-time traffic heat maps and congestion levels.

- Accident predictions and risk zones.

- Optimized routing suggestions for drivers and insights for traffic authorities.
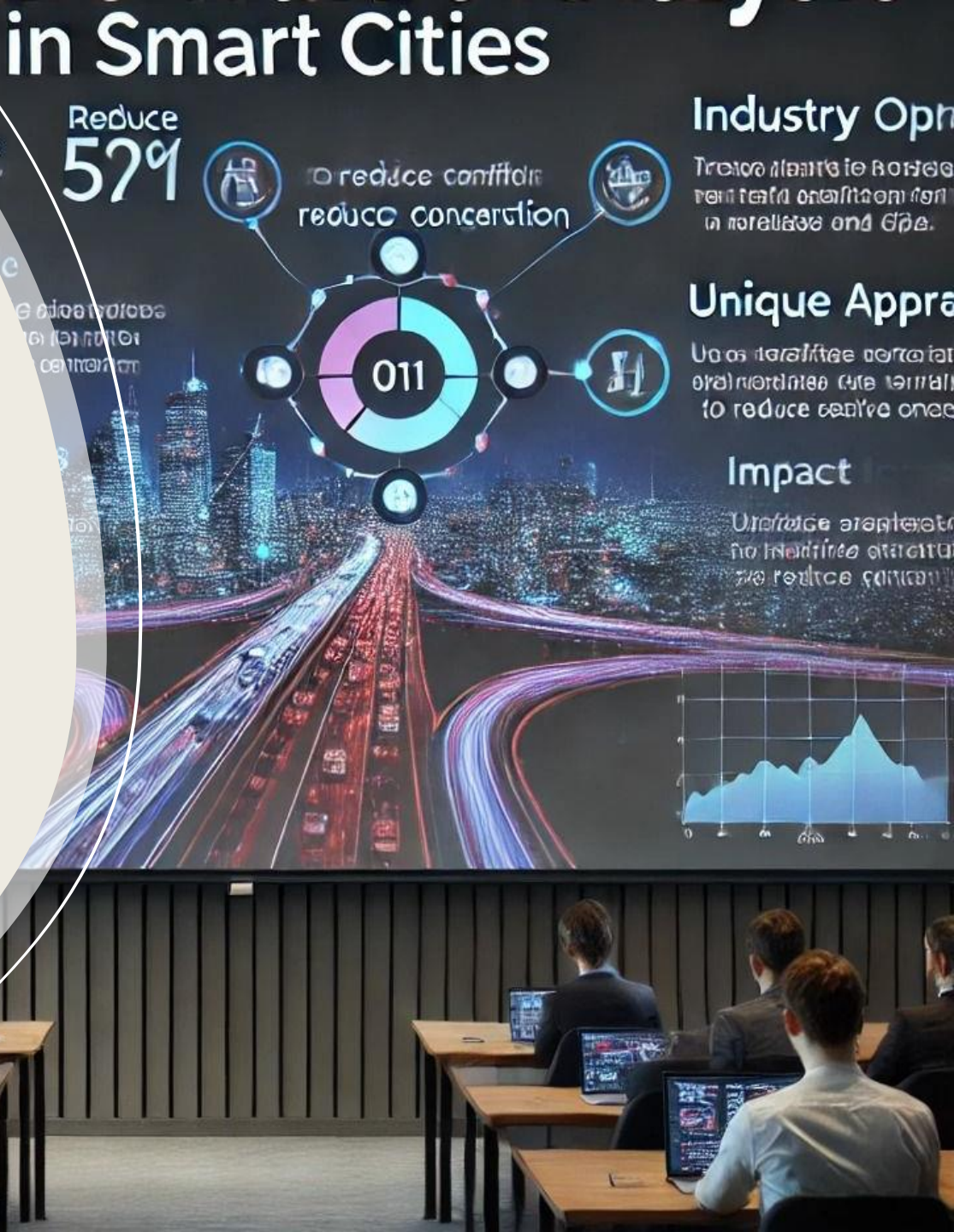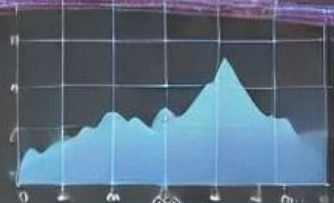
The end-result might look like this

101
Bus

41
Car

Last Updated Time
Taxi: 10/29/2024, 4:31:23 PM
Traffic Incidents: 10/29/2024, 4:31:33 PM

Real-time Traffic Heatmap & Congestion Levels

Accident Predictions & Risk Zones
High-Risk Areas: Downtown, Main St, Highway 401
Predicted Incidents: 4 in next hour

Optimized Routing Suggestions
Route 1: Highway 403 → Low Traffic
Route 2: Main St → Moderate Traffic
Suggestions provided for smoother flow.

Insights for Traffic Authorities
Traffic Peak Hours: 7-9 AM, 4-6 PM
Suggested Measures: Additional lanes, signal optimization

Does Driver Behavior's matter?

The Majority of Residents Say There is a Traffic and Congestion Crisis in the Greater Toronto and Hamilton Area.

Four in ten who commute say that it takes more time to get to work or school, compared to just one year ago.

Jul 16, 2024

Toronto Sun

LILLEY: Toronto marathon frustration just the latest example of traffic chaos

Even marathon runners are complaining that too many roads are shut down for events and construction.
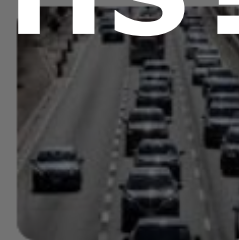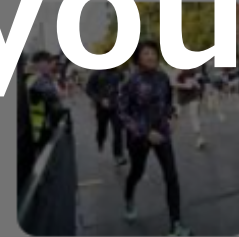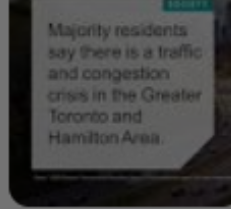
1 week ago

CBC

Bad traffic causing locals to consider leaving Toronto: survey

A new survey commissioned by the Toronto Region Board of Trade shows a majority of respondents have considered moving away from the city due to congestion.

Jul 16, 2024

blogTO

Ontario expects GTA traffic to get so bad that highways will crawl below 20 km/h

Thank you (Any questions?)