



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to AMR FUELS

Objective of the JRM Report

This JRM report is designed to ensure compliance with the Central Motor Vehicle Rules, 1989 (CMVR), AIS 140 standards, and the Road Transport Safety Policy (RTSP). It provides a comprehensive risk assessment for the transportation of hazardous materials along specified routes. By integrating these legal frameworks, the report offers a broad strategy for identifying and mitigating route-specific risks.

Regulatory Compliance

The report complies with the Central Motor Vehicles (Eleventh Amendment) Rules, 2022, mandating safe transportation practices for N2 and N3 category vehicles carrying hazardous materials. These rules require detailed route assessments, especially regarding road conditions, speed limits, and risk areas, to ensure safety compliance.

Risk Management Strategy

This report categorizes transportation routes into high-risk and medium-risk areas, with a focus on factors such as sharp turns, accident-prone regions, and elevation changes. The goal is to provide actionable

recommendations to minimize these risks, including speed regulations, driver warnings for hazardous zones, and the option of alternate routes.

Compliance with the Road Transport Safety Policy (RTSP)

The report integrates RTSP provisions, including mandatory driving hours, rest periods, and nighttime driving restrictions. It ensures that drivers follow official guidelines, such as taking prescribed rest breaks and avoiding dangerous road conditions like poor visibility, heavy crowds, or high-traffic areas during peak hours.

Emergency Preparedness and Response

The report highlights the significance of predetermined emergency stops for refueling, rest, and overnight stays. It includes protocols for safe responses to road hazards, alternative routes, and rerouting processes if roads are closed or severe weather arises. This aligns with the RTSP emphasis on driver safety and rapid emergency response.

Environmental Considerations

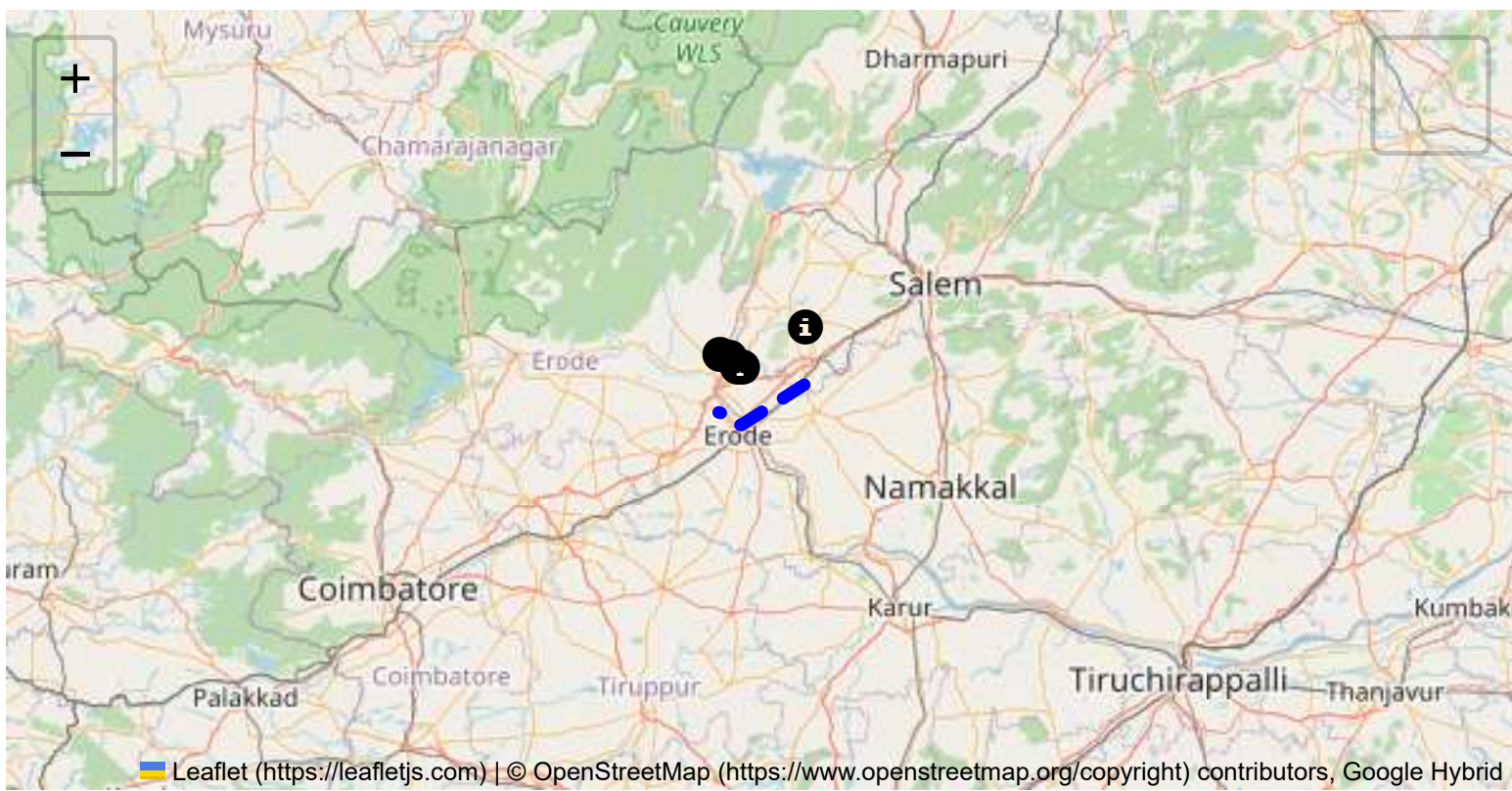
The JRM report addresses environmental risks along the route, ensuring compliance with environmental protection laws in ecologically sensitive zones. It suggests strategies such as identifying areas near water bodies, forests, or populated regions and implementing safety measures to minimize environmental impacts during transport.

Journey Risk Mitigation

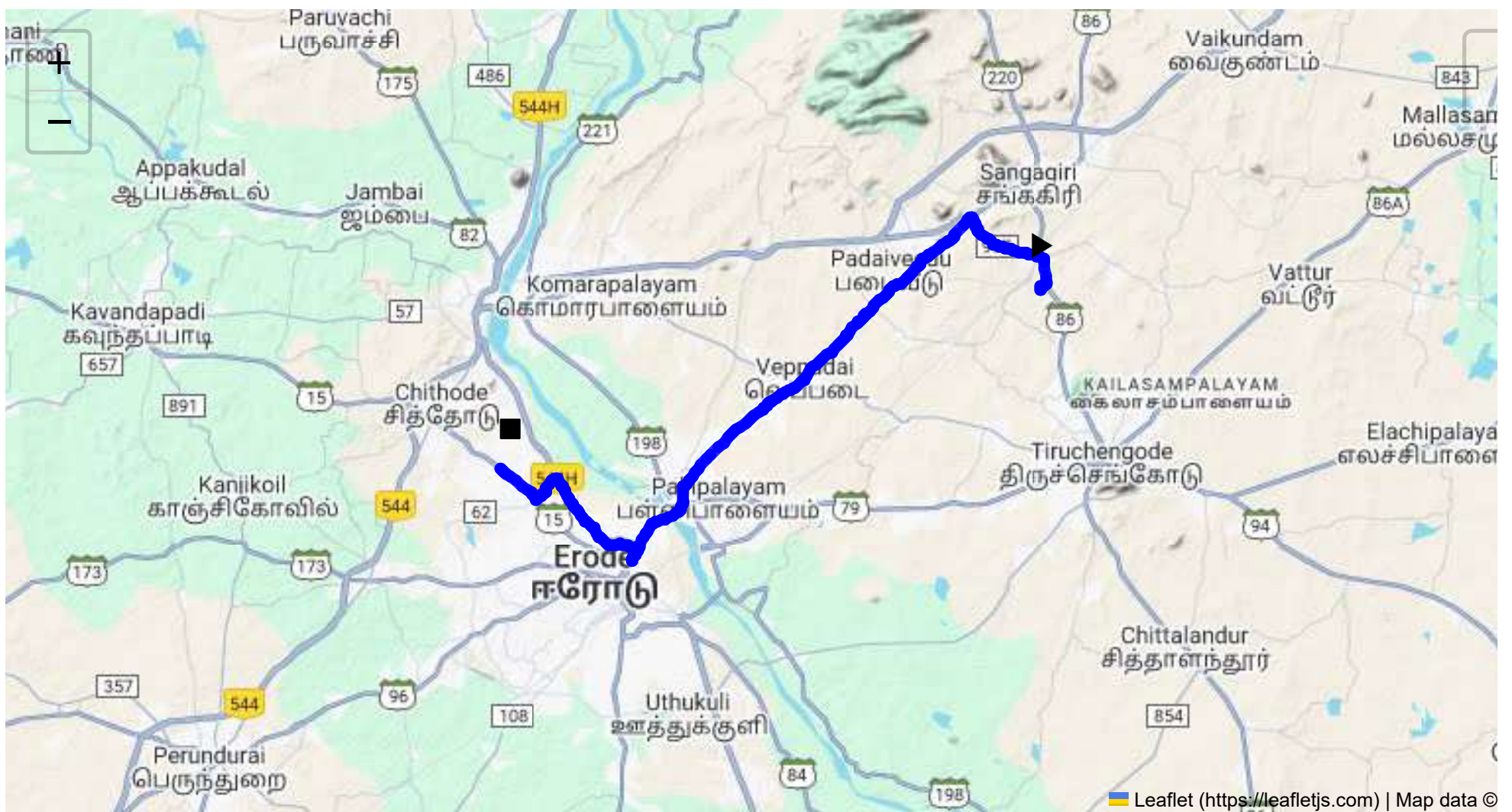
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety norms.

Compliance with Government Directives

This report fully adheres to governmental directives regarding hazardous material transportation, implementing mandatory speed limits, nighttime driving restrictions, and comprehensive driver briefings and real-time alerts about route-related risks.



Route Summary:
Total Distance: 32.21 km
Estimated Duration: 0.9 hours
Adjusted Duration (Heavy Vehicle): 1.1 hours
Start: (11.4381, 77.8734)
End: (11.3754, 77.6869)



Welcome to the Journey Risk Management Study

Route Overview:

The route from Sangagiri to Asokapuram in Erode district, Tamil Nadu, spans approximately 32.21 kilometers. Starting from Sangagiri, the route proceeds through several key urban areas in Erode including Janakiammal Layout, Karungalpalayam, and Moolapatrai, before reaching Asokapuram. The

journey typically takes around 54 minutes for heavy vehicles carrying hazardous materials, assuming normal traffic conditions without additional delays.

Typical Weather Conditions and Potential Hazards:

- **Weather Overview:** Tamil Nadu experiences a tropical climate with dry and wet seasons. Erode, being inland, may exhibit high temperatures, particularly from March to June, and receives rainfall primarily during the monsoon season from October to December.
- **Hazards:** Monsoon rains can cause flooding or waterlogging, potentially leading to roadways being slippery or obstructed, especially at low-lying areas. High temperatures can also affect road conditions, causing potential road surface and tire issues.

Traffic Patterns and Congestion Areas:

- **Peak Hours:** Typically, traffic congestion peaks in the morning (8:00-10:00 AM) and evening (5:00-7:00 PM) due to commuter travel.
- **Congestion Zones:** Urban centers such as Karungalpalayam and Moolapatrai are prone to congestion due to narrow roads and high traffic density.

Road Quality and Infrastructure:

- **Assessment:** Roads are generally paved, but varying maintenance levels can lead to potholes and uneven surfaces, particularly affecting larger vehicles. Certain stretches in urban areas may be narrower with limited shoulder space.
- **Infrastructure:** Adequate signage and traffic signals are present, but urban areas may suffer from insufficient pedestrian crossings and bottleneck intersections.

Suggestions for Alternative Routes:

- **Emergency Routes:** In case of severe congestion or obstruction, bypassing dense urban areas by using bypass roads where available may offer a viable alternative. For instance, utilizing the SH-188 could reroute around central Erode.

Local Regulations on Hazardous Material Transport:

- The transportation of hazardous materials in Tamil Nadu requires adherence to state regulations which include appropriate labeling, documentation, and adherence to specified routes that avoid densely populated areas as much as possible.

Historical Incidents:

- **Heavy Vehicle Incidents:** Erode, being an industrial hub, has recorded incidents involving logistical issues and accidents with heavy vehicles. However, detailed records of hazardous material incidents are limited.

Environmental Considerations and Sensitive Areas:

- **Sensitive Areas:** Proximity to residential zones and schools in urban areas requires caution. Areas near water bodies should be protected from hazardous material spills due to contamination risks.
- **Environmental Protection:** Follow protocols to prevent spillage and environmental contamination.

Communication Coverage:

- **Coverage Analysis:** Urban areas generally have good telecommunications coverage. However, certain rural stretches and low-density areas might have spotty network services.
- **Potential Dead Zones:** Rural regions between Sangagiri and Erode might experience brief communication lapses.

Emergency Response Times:

- **Response Time Variability:** Response times can vary from 15 to 30 minutes in urban areas due to availability of emergency services. More rural stretches might experience delays up to 45 minutes.

Overall Summary of Risk Assessment:

- **Risk Factors:** The primary risks include traffic congestion during peak hours, road quality variations, and adverse weather conditions, particularly during the monsoon season.
- **Mitigation Measures:** Drivers should be equipped with up-to-date GPS for traffic navigation, maintain vehicle safety checks, especially tires and brakes, and carry necessary documentation for hazardous materials.
- **Preparedness:** Drivers should have a list of emergency contacts including local authorities and have first-aid kits and spill kits readily available.

This analysis highlights the importance of preparedness and vigilance in managing the transportation of hazardous materials along this route, underscoring the need for adherence to safety regulations and real-time response planning.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.37086, 77.74828	15 KM/Hr
1	U-Turn	High	11.3453211, 77.7304652	10 KM/Hr
2	U-Turn	High	11.3663553, 77.6968024	10 KM/Hr
3	U-Turn	High	11.3770605, 77.68412	10 KM/Hr
4	Turn	High	11.43811, 77.87348	15 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
5	Turn	Medium	11.43956, 77.87340	30 KM/Hr
6	Turn	High	11.43968, 77.87345	15 KM/Hr
7	Turn	High	11.44029, 77.87544	15 KM/Hr
8	Turn	Medium	11.44898, 77.87410	30 KM/Hr
9	Turn	Medium	11.45357, 77.85789	30 KM/Hr
10	Turn	Medium	11.45352, 77.85698	30 KM/Hr
11	Turn	Medium	11.46303, 77.84945	30 KM/Hr
12	Turn	Medium	11.46318, 77.84913	30 KM/Hr
13	Turn	Medium	11.46312, 77.84886	30 KM/Hr
14	Turn	Medium	11.36622, 77.74789	30 KM/Hr
15	Turn	High	11.34532, 77.73047	15 KM/Hr
16	Blind Spot	Blind Spot	11.34535, 77.73036	10 KM/Hr
17	Blind Spot	Blind Spot	11.34964, 77.73257	10 KM/Hr
18	Turn	High	11.35072, 77.72261	15 KM/Hr
19	Turn	High	11.37396, 77.70396	15 KM/Hr
20	Turn	Medium	11.37309, 77.70214	30 KM/Hr
21	Turn	Medium	11.37055, 77.70037	30 KM/Hr
22	Blind Spot	Blind Spot	11.36677, 77.69653	10 KM/Hr
23	Blind Spot	Blind Spot	11.36636, 77.69680	10 KM/Hr
24	Turn	High	11.36633, 77.69674	15 KM/Hr
25	Turn	High	11.37706, 77.68412	15 KM/Hr
26	Blind Spot	Blind Spot	11.37712, 77.68416	10 KM/Hr

Emergency Locations

	type	name	coordinates	speed_limit	risk_level
1	hospital	Cheran Hospital	11.3680302, 77.7481976	30 km/h	Medium
2	pharmacy	Pharmacy	11.3652161, 77.7486375	30 km/h	Medium
3	hospital	Sri Kumaran E N T Hospital	11.3657814, 77.7477763	30 km/h	Medium
4	hospital	Sri Krishna Hospital	11.3656648, 77.7477783	30 km/h	Medium
5	hospital	Visaalam Hospitals	11.3651528, 77.747808	30 km/h	Medium
6	police	Police Station	11.3630177, 77.7476505	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
7	hospital	Government Hospital	11.3608508, 77.747453	30 km/h	Medium
9	hospital	Sri Hari Sakthivel Hospital	11.3526901, 77.7323055	30 km/h	Medium
10	hospital	Senthil Prakash Hospital	11.352639, 77.732267	30 km/h	Medium
11	hospital	V K Hospital	11.3513792, 77.7313976	30 km/h	Medium
12	hospital	Dhanvantri Critical Care Center	11.3504266, 77.7311274	30 km/h	Medium
13	hospital	Dhanvantri Critical Care Centre	11.35099, 77.730508	30 km/h	Medium
14	hospital	Indrajith Yoga Nature Cure Hospital	11.3499973, 77.732974	30 km/h	Medium
16	hospital	Kumudha Hospital	11.3467172, 77.7306797	30 km/h	Medium
17	hospital	City Hospital	11.3451151, 77.7300887	30 km/h	Medium
18	clinic	K.B.N. Nursing Home	11.344835, 77.7310771	30 km/h	Medium
19	clinic	Kpn Nursing Home	11.3437022, 77.7304525	30 km/h	Medium
20	hospital	Milan Hospital	11.343591, 77.733182	30 km/h	Medium
21	hospital	Roja Hospital	11.3509181, 77.7282478	30 km/h	Medium
23	hospital	Sreedhareeam Eye Hospital	11.352858, 77.722408	30 km/h	Medium
24	hospital	Christhu Jothi Hospital	11.364103, 77.7098785	30 km/h	Medium
25	hospital	Shifa Free Hospital	11.3683589, 77.7070167	30 km/h	Medium
26	hospital	Government Hospital	11.371101, 77.703436	30 km/h	Medium
27	hospital	24 Care Hospital	11.3731527, 77.6943299	30 km/h	Medium
28	hospital	Sakthi Hospital	11.376385, 77.683485	30 km/h	Medium

Crowded Spots

	type	name	coordinates	speed_limit	risk_level
0	school	Ssri Valliappa Vidhayalayam mat hr school	11.4004878, 77.7794381	30 km/h	Medium
8	marketplace	Weekly Market	11.3605669, 77.7488199	30 km/h	Medium
15	school	Municipality Girls Higher secondary school	11.3495618, 77.7325011	30 km/h	Medium
22	school	Siddhartha Matriculation school	11.3519996, 77.7247861	30 km/h	Medium

Route Photos of Risky Spots



Risk Type: Roundabout

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.37086, 77.74828

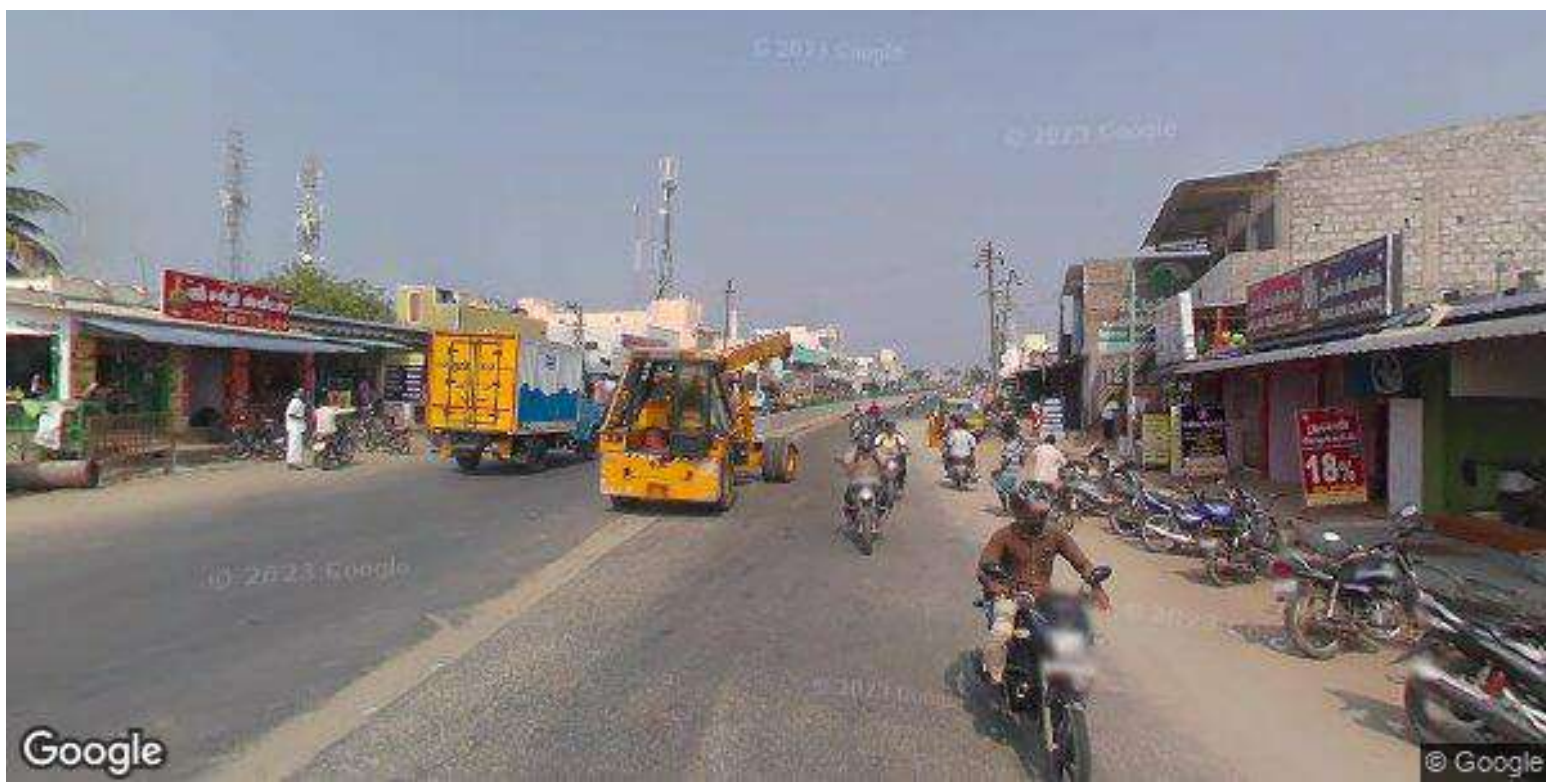


Risk Type: U-Turn

Risk Level: High

Speed Limit: 10 KM/Hr

Coordinates: 11.3453211, 77.7304652



Risk Type: U-Turn

Risk Level: High

Speed Limit: 10 KM/Hr

Coordinates: 11.3663553, 77.6968024



Risk Type: U-Turn

Risk Level: High

Speed Limit: 10 KM/Hr

Coordinates: 11.3770605, 77.68412



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.44029, 77.87544



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.44898, 77.87410



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.45357, 77.85789



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.45352, 77.85698



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.46303, 77.84945



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.46318, 77.84913



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.46312, 77.84886



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.36622, 77.74789



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.34532, 77.73047



Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 11.34535, 77.73036



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.34964, 77.73257



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.35072, 77.72261



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.37396, 77.70396



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.37309, 77.70214



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.37055, 77.70037



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.36677, 77.69653



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.36636, 77.69680



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.36633, 77.69674



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.37706, 77.68412



Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 11.37712, 77.68416

