



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal TO VELAVAN 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

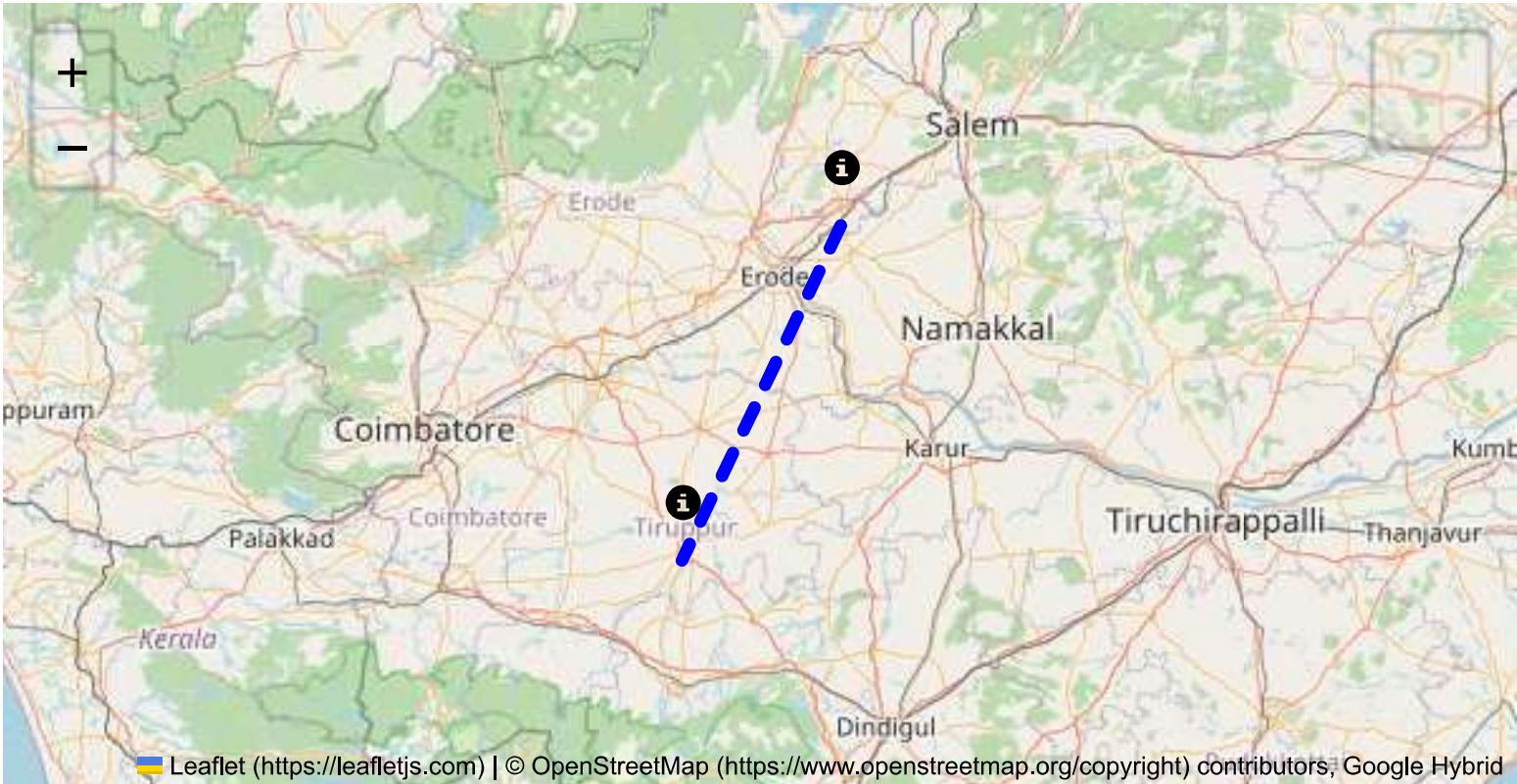
The JRM report addresses environmental risks along the route, ensuring compliance with environmental protection laws in ecologically sensitive zones. It suggests strategies such as identifying areas near water bodies, forests, or populated regions and implementing safety measures to minimize environmental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

Journey Risk Mitigation

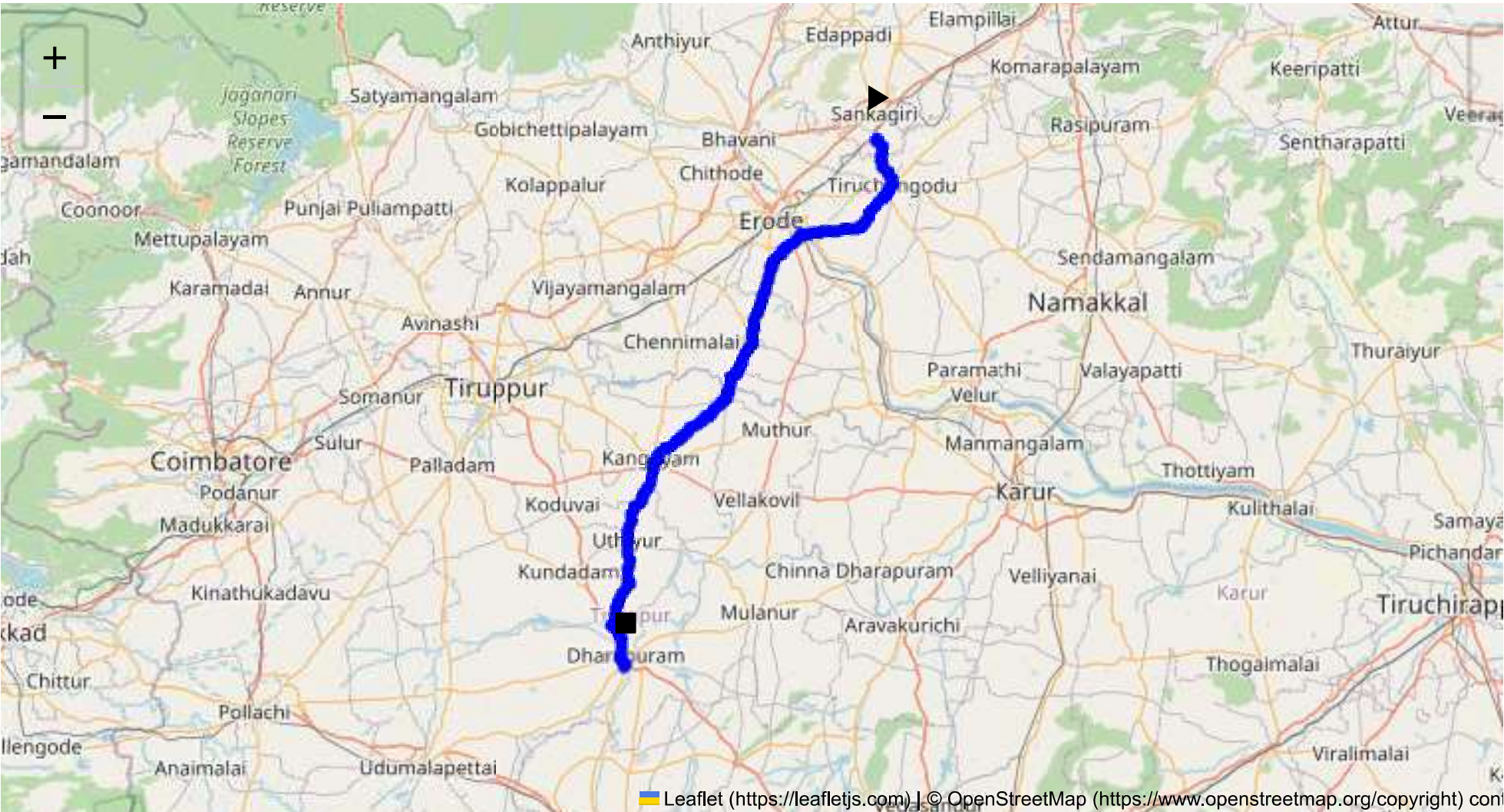
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 104.61 km
Estimated Duration: 2.4 hours
Adjusted Duration (Heavy Vehicle): 3.0 hours
Start: (11.4381, 77.8734)
End: (10.719177, 77.522675)



Welcome to the Journey Risk Management Study

Route Safety Analysis: Sangagiri to Kurunji Nagar, Tamil Nadu

1. Overview of the Route Map: The route from Sangagiri to Kurunji Nagar stretches approximately 104.61 kilometers, primarily via Tamil Nadu State Highway 21. The path passes through rural areas and small towns, providing a mix of straight stretches and winding segments typical of Indian state highways.

2. Typical Weather Conditions and Potential Weather-Related Hazards: Tamil Nadu experiences a tropical climate with distinct wet and dry seasons. The monsoon season (June to September) brings heavy rainfall, potentially leading to flooded roads and reduced visibility. During the dry season (November to February), fog may occur in the early morning, presenting visibility challenges. The summer months (March to May) bring extreme heat, which can affect vehicle performance.

3. Analysis of Traffic Patterns: Traffic is generally moderate, but peak hours occur from 8:00 AM to 10:00 AM and 4:00 PM to 7:00 PM, especially near towns like Tiruchengode. Major market days and festivals can increase congestion. The main congestion-prone areas are urban centers, particularly near intersections and junctions.

4. Assessment of Road Quality and Infrastructure: The road quality varies, with some well-paved sections and others requiring maintenance. Potholes and uneven surfaces may be present, particularly after monsoons. Roadside infrastructure, including signage and lighting, can be sporadic in rural segments.

5. Suggestions for Alternative Routes for Emergencies: An alternative route is via NH 544, although it increases the travel distance. This national highway offers better road conditions and connectivity to emergency services.

6. Summary of Local Regulations Affecting Hazardous Material Transport: Transporting hazardous materials in Tamil Nadu requires adherence to national guidelines, including specific licenses and vehicle markings. Routing through residential and dense commercial areas should be minimized.

7. Overview of Historical Incidents Involving Heavy Vehicles or Hazardous Materials: While specific historical incidents along this route are limited, heavy vehicles have occasionally faced issues with road conditions leading to accidents. Incidents involving hazardous materials usually involve inadequate containment or handling practices.

8. Environmental Considerations and Sensitive Areas: The route crosses several agricultural zones, necessitating care to prevent contamination. Drinking water sources close to Dharapuram are sensitive to pollutants.

9. Analysis of Communication Coverage: Mobile network coverage is generally reliable, but rural stretches may have brief dead zones. Providers like Jio and Airtel cover most areas, but drivers should be prepared for occasional disruptions.

10. Estimated Emergency Response Times for Different Route Segments: Urban areas like Tiruchengode have quicker emergency response times (about 15-20 minutes), while rural segments could see responses extended to 30-45 minutes or more.

12. Overall Summary of Risk Assessment: The route entails moderate risk, primarily due to variable road conditions and weather-related hazards. Traffic congestion is generally manageable, but specific legislative compliance is necessary for hazardous material transport. Drivers should remain vigilant, especially during the monsoon season, and maintain regular communication with logistics and emergency services. Coordination for quicker response and adherence to safety and environmental protocols is crucial for mitigating potential risks.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.38395, 77.89480	15 KM/Hr
1	Roundabout	High	11.00172, 77.56268	15 KM/Hr
2	Turn	High	11.43968, 77.87345	15 KM/Hr
3	Turn	High	11.44022, 77.87546	15 KM/Hr
4	Turn	Medium	11.39976, 77.88382	30 KM/Hr
5	Turn	Medium	11.39690, 77.88852	30 KM/Hr
6	Turn	High	11.36616, 77.88885	15 KM/Hr
7	Turn	Medium	11.34067, 77.86347	30 KM/Hr
8	Turn	High	11.33854, 77.86216	15 KM/Hr
9	Turn	Medium	11.33778, 77.86236	30 KM/Hr
10	Turn	Medium	11.30952, 77.77587	30 KM/Hr
11	Turn	Medium	11.30973, 77.76712	30 KM/Hr
12	Turn	High	11.29490, 77.74685	15 KM/Hr
13	Turn	High	11.29125, 77.74646	15 KM/Hr
14	Turn	Medium	11.28844, 77.74319	30 KM/Hr
15	Turn	Medium	11.28573, 77.74281	30 KM/Hr
16	Turn	High	11.27319, 77.72981	15 KM/Hr
17	Blind Spot	Blind Spot	11.27330, 77.72715	10 KM/Hr
18	Turn	Medium	11.23054, 77.71796	30 KM/Hr
19	Turn	Medium	11.20776, 77.70916	30 KM/Hr
20	Turn	Medium	11.15942, 77.70068	30 KM/Hr
21	Turn	Medium	11.12102, 77.67919	30 KM/Hr
22	Turn	Medium	11.11932, 77.67786	30 KM/Hr
23	Turn	Medium	11.11710, 77.67175	30 KM/Hr
24	Turn	Medium	11.10436, 77.67044	30 KM/Hr
25	Turn	Medium	11.09491, 77.66603	30 KM/Hr
26	Turn	Medium	11.08696, 77.66407	30 KM/Hr
27	Turn	Medium	11.08296, 77.65857	30 KM/Hr
28	Turn	Medium	11.06183, 77.63924	30 KM/Hr
29	Turn	High	11.00826, 77.56962	15 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
30	Blind Spot	Blind Spot	11.00058, 77.56882	10 KM/Hr
31	Turn	High	10.94722, 77.54709	15 KM/Hr
32	Turn	Medium	10.93895, 77.53976	30 KM/Hr
33	Turn	Medium	10.93054, 77.53265	30 KM/Hr
34	Turn	Medium	10.89213, 77.52646	30 KM/Hr
35	Turn	Medium	10.83409, 77.52932	30 KM/Hr
36	Turn	Medium	10.77642, 77.50712	30 KM/Hr
37	Turn	Medium	10.77580, 77.50724	30 KM/Hr
38	Turn	Medium	10.75864, 77.51918	30 KM/Hr
39	Turn	Medium	10.75722, 77.51935	30 KM/Hr
40	Turn	Medium	10.73670, 77.51731	30 KM/Hr
41	Blind Spot	Blind Spot	10.72415, 77.52567	10 KM/Hr

Emergency Locations

	type	name	coordinates	speed_limit	risk_level
0	hospital	Tiruchengode, Goverment Hospital	11.3903328, 77.8920627	30 km/h	Medium
1	hospital	SPM Medical Centre,Tiruchengode	11.3881331, 77.8931963	30 km/h	Medium
5	clinic	Kongu Nursing Home	11.3783065, 77.8961134	30 km/h	Medium
6	hospital	T.C.A Hospital Tiruchengode	11.3791885, 77.8965774	30 km/h	Medium
7	hospital	Soorya Multispecialty Hospital	11.3786429, 77.8931912	30 km/h	Medium
8	hospital	Tiruchengode Government Hospital	11.37645, 77.89426	30 km/h	Medium
9	hospital	Tirukumaran Hospitals	11.3782118, 77.8914933	30 km/h	Medium
10	hospital	Krishna Hospital, Namakkal	11.3754811, 77.8931817	30 km/h	Medium
13	hospital	Government Hospital	11.2343326, 77.719226	30 km/h	Medium
16	police	Kangeyam Police Station	11.0011411, 77.562688	30 km/h	Medium
17	hospital	J K Hospital	11.0042298, 77.5603345	30 km/h	Medium
21	hospital	Sri Balaji Surya Hospital	10.735518, 77.5185388	30 km/h	Medium
22	hospital	Ramana Hospital, Dharapuram	10.7351092, 77.517107	30 km/h	Medium
24	hospital	Janani Hospital, Dharapuram	10.7294033, 77.5210119	30 km/h	Medium
25	clinic	Punitha Nursing Home	10.72901, 77.520148	30 km/h	Medium
26	hospital	Ponnaiah Hospital, Dharapuram	10.72916, 77.520131	30 km/h	Medium

Crowded Spots

	type	name	coordinates	speed_limit	risk_level
2	school	அரசு ஆண்கள் மேல்நிலைப் பள்ளி	11.3850439, 77.8948279	30 km/h	Medium
3	school	அரசு பெண்கள் மேல்நிலைப் பள்ளி	11.3844247, 77.8949053	30 km/h	Medium
4	marketplace	திருச்செங்கோடு தினசரி காய்கறி சந்தை	11.3833608, 77.8970145	30 km/h	Medium
11	school	KSR Educational institution	11.3772013, 77.8908807	30 km/h	Medium
12	school	MDV School	11.3719843, 77.8915244	30 km/h	Medium
14	college	Government Arts and Science College, Kangeyam	11.0626738, 77.636227	30 km/h	Medium
15	school	Carmel Girls Higher Secondary School	11.0009019, 77.5710182	30 km/h	Medium
18	school	Global Matriculation Higher Secondary School	10.965994, 77.5591898	30 km/h	Medium
19	college	Maharani College	10.7625655, 77.5157126	30 km/h	Medium
20	school	Vishnu Lakshmi Matriculation Higher Secondary School	10.7340392, 77.5164506	30 km/h	Medium
23	school	Thenmalar Higher Secondary School	10.7333748, 77.5166481	30 km/h	Medium

Route Photos of Risky Spots



Risk Type: Roundabout

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.38395, 77.89480



Risk Type: Roundabout

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.00172, 77.56268



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.44022, 77.87546



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.39976, 77.88382



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.39690, 77.88852



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.36616, 77.88885



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.34067, 77.86347



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.33854, 77.86216



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.33778, 77.86236



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.30952, 77.77587



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.30973, 77.76712



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.29490, 77.74685



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.29125, 77.74646



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.28844, 77.74319



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.28573, 77.74281



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.27319, 77.72981



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.27330, 77.72715



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.23054, 77.71796



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.20776, 77.70916



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.15942, 77.70068



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.12102, 77.67919



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.11932, 77.67786



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.11710, 77.67175



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.10436, 77.67044



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.09491, 77.66603



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.08696, 77.66407



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.08296, 77.65857



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.06183, 77.63924



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.00826, 77.56962



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.00058, 77.56882



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.94722, 77.54709



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.93895, 77.53976



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.93054, 77.53265



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.89213, 77.52646



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.83409, 77.52932



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.77642, 77.50712



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.77580, 77.50724



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.75864, 77.51918



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.75722, 77.51935



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.73670, 77.51731



Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 10.72415, 77.52567