



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to AA ENTERPRISES

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

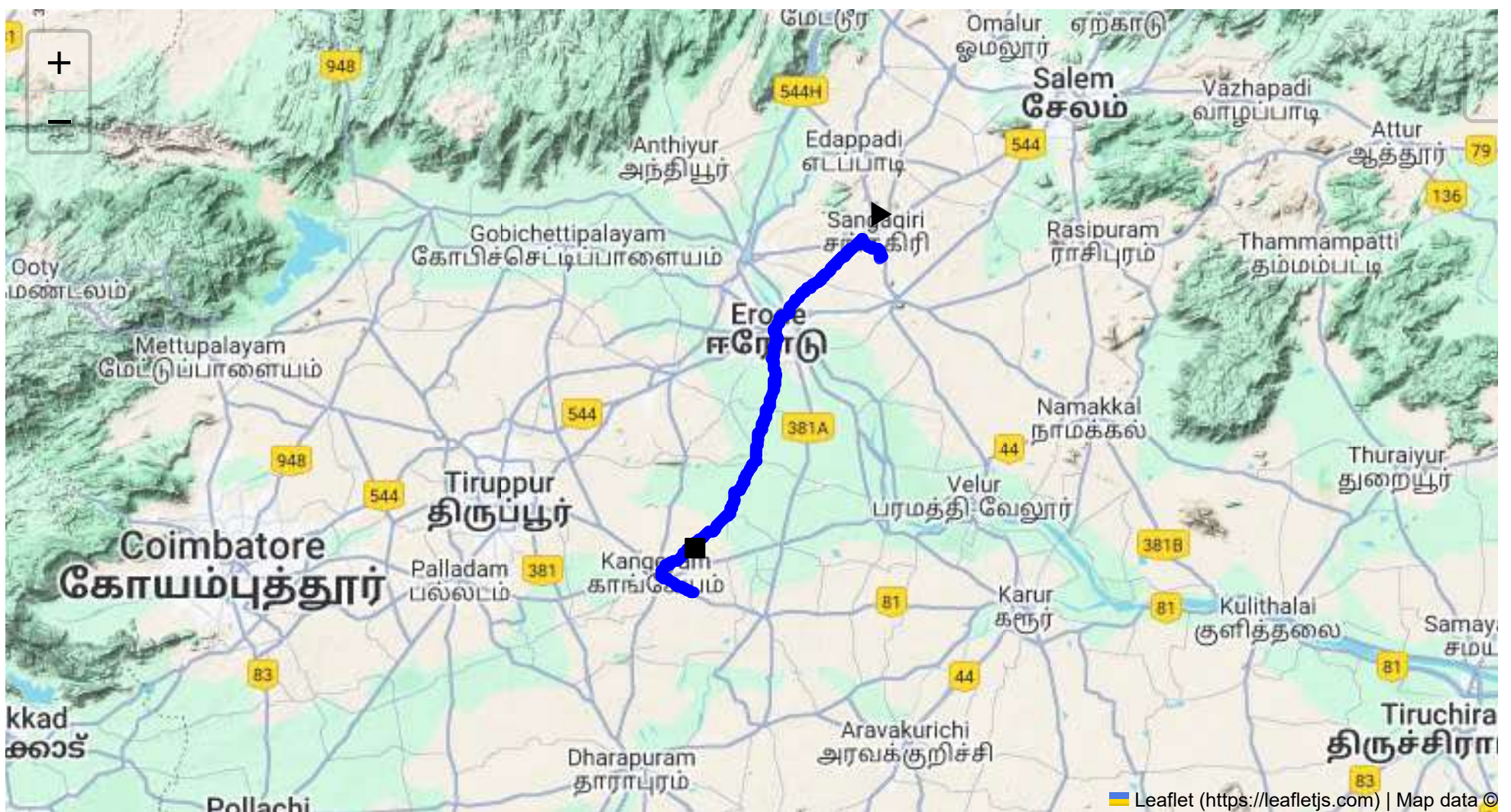
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 75.63 km
Estimated Duration: 1.8 hours
Adjusted Duration (Heavy Vehicle): 2.2 hours
Start: (11.4381, 77.8734)
End: (10.97837922, 77.61308575)



Welcome to the Journey Risk Management Study

1. Overview of the Route Map

The route from Sangagiri to Tiruppur via Attur - Rasipuram - Erode Road and through Erode is approximately 75.63 kilometers long. The journey predominantly follows welltraveled state highways, passing through towns such as Rasipuram and Erode. Given the regional infrastructure, the route is generally aligned through typical urban and semi-rural Tamil Nadu settings.

2. Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions:

- **Summer (March to June):** Temperatures range from 25°C to 40°C. The heat can cause road surfaces to become sticky or uneven.
- **Monsoon (July to September):** Heavy rains can lead to waterlogging and reduce visibility, possibly causing slippery road surfaces.
- **Winter (October to February):** Mild and cooler temperatures ranging from 20°C to 30°C, generally favorable for transportation, though fog can occasionally reduce visibility early in the morning.

Potential Weather-Related Hazards:

- Monsoon season may involve interruptions due to flooding, especially near bridges and low-lying roads.
- Sudden rainfall can lead to mudslides or washouts in rural areas affecting road usability.

3. Analysis of Traffic Patterns

Traffic Patterns:

- **Peak Hours:** Morning (8 AM - 10 AM) and evening (5 PM - 7 PM), with increased traffic around Erode due to local commuting.
- **Congestion-Prone Areas:** Erode city center and major junctions in Rasipuram and at the approach to Tiruppur. These areas often experience delays during peak hours due to the mix of urban traffic.

4. Assessment of Road Quality and Infrastructure

- **Road Quality:** The state highways are generally in good condition but can have sporadic potholes and uneven surfaces, particularly after the monsoon.
- **Infrastructure:** There are periodic toll booths and traffic lights in urban areas. Roads are adequately marked, with reasonable signage regarding turns and exits.

5. Suggestions for Alternative Routes

- In case of blockages or emergencies, consider rerouting via NH 44 (Salem - Coimbatore highway), which is longer but provides better infrastructure and regular maintenance.

6. Summary of Local Regulations Affecting Hazardous Material Transport

- **Permits:** Required for transporting hazardous materials. Ensure all necessary documentation is up-to-date.
- **Timing Restrictions:** Transporting hazardous materials during peak hours or within certain urban limits might need special permission.

7. Overview of Historical Incidents

- Historical data suggests sporadic incidents involving heavy vehicles due to brake failures on slopes and sharp turns, particularly near Erode.

8. Environmental Considerations and Sensitive Areas

- Environmental Concerns:** Sensitive zones along the route include agricultural lands, rivers, and parks which require careful driving to prevent any spillage or leakage.
- Noise Restrictions:** Through certain residential and green areas, noise regulations may be in place.

9. Analysis of Communication Coverage

- Cellular coverage is typically reliable along the main route, but there may be sporadic dead zones in more rural stretches between Rasipuram and Erode where cellular towers are sparse.

10. Estimated Emergency Response Times

- Emergency Services:** Available in moderate timeframes within urban centers like Erode, about 15-30 minutes.
- Rural Areas:** Response times can stretch to about 45 minutes to an hour due to distance and road conditions.

11. Overall Summary of Risk Assessment

The route from Sangagiri to Tiruppur via Erode is feasible for transportation of hazardous materials, provided that drivers are cautious and aware of weather condition impacts, traffic patterns, and local regulations. The infrastructure supports heavy vehicles, but seasonal weather changes and urban congestion remain the primary challenges. Awareness of alternative paths and robust communication protocols is crucial for minimizing risks. Regular updates on road and weather conditions should be monitored for safe navigation.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.37086, 77.74828	15 KM/Hr
1	Turn	High	11.43968, 77.87345	15 KM/Hr
2	Turn	High	11.44029, 77.87544	15 KM/Hr
3	Turn	High	11.44898, 77.87410	15 KM/Hr
4	Turn	Medium	11.45357, 77.85789	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
5	Turn	High	11.45352, 77.85698	15 KM/Hr
6	Turn	Medium	11.45847, 77.85140	30 KM/Hr
7	Turn	Medium	11.45898, 77.85135	30 KM/Hr
8	Turn	Medium	11.46303, 77.84945	30 KM/Hr
9	Turn	High	11.46314, 77.84928	15 KM/Hr
10	Turn	Medium	11.46302, 77.84874	30 KM/Hr
11	Turn	Medium	11.36498, 77.74811	30 KM/Hr
12	Turn	Medium	11.34219, 77.72834	30 KM/Hr
13	Blind Spot	Blind Spot	11.33920, 77.72902	10 KM/Hr
14	Turn	High	11.33909, 77.72653	15 KM/Hr
15	Turn	Medium	11.33860, 77.72640	30 KM/Hr
16	Turn	High	11.33103, 77.72761	15 KM/Hr
17	Turn	Medium	11.33084, 77.72867	30 KM/Hr
18	Turn	High	11.32700, 77.73073	15 KM/Hr
19	Turn	High	11.32421, 77.72727	15 KM/Hr
20	Turn	Medium	11.23041, 77.71787	30 KM/Hr
21	Turn	Medium	11.22406, 77.71390	30 KM/Hr
22	Turn	Medium	11.16091, 77.70124	30 KM/Hr
23	Turn	Medium	11.15935, 77.70059	30 KM/Hr
24	Turn	Medium	11.12090, 77.67914	30 KM/Hr
25	Turn	Medium	11.11924, 77.67776	30 KM/Hr
26	Turn	Medium	11.11754, 77.67216	30 KM/Hr
27	Turn	Medium	11.11698, 77.67172	30 KM/Hr
28	Turn	Medium	11.10494, 77.67062	30 KM/Hr
29	Turn	Medium	11.09479, 77.66598	30 KM/Hr
30	Turn	Medium	11.08743, 77.66441	30 KM/Hr
31	Turn	Medium	11.08288, 77.65842	30 KM/Hr
32	Turn	Medium	11.06193, 77.63948	30 KM/Hr
33	Turn	High	11.00840, 77.56963	15 KM/Hr
34	Turn	High	11.00074, 77.56886	15 KM/Hr
35	Turn	High	10.97818, 77.61288	15 KM/Hr

Emergency Locations

	type	name	coordinates	speed_limit	risk_level
1	pharmacy	Pharmacy	11.3652161, 77.7486375	30 km/h	Medium
2	hospital	Visaalam Hospitals	11.3651528, 77.747808	30 km/h	Medium
3	hospital	Cheran Hospital	11.3680302, 77.7481976	30 km/h	Medium
4	hospital	Sri Kumaran E N T Hospital	11.3657814, 77.7477763	30 km/h	Medium
5	hospital	Sri Krishna Hospital	11.3656648, 77.7477783	30 km/h	Medium
6	police	Police Station	11.3630177, 77.7476505	30 km/h	Medium
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	Kumudha Hospital	11.3467172, 77.7306797	30 km/h	Medium
14	hospital	Dhanvantri Critical Care Centre	11.35099, 77.730508	30 km/h	Medium
15	hospital	Indrajith Yoga Nature Cure Hospital	11.3499973, 77.732974	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	Kaviraj Ayurveda Hospital	11.3400349, 77.7298199	30 km/h	Medium
21	hospital	Dr Kokilasekar Nursing Hospital	11.3395874, 77.7269838	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
22	clinic	M.R Nursing Home	11.3386746, 77.7294262	30 km/h	Medium
24	hospital	Government Maternity Hospital, Agathiar	11.33716, 77.727075	30 km/h	Medium
25	clinic	Naseer Nursing Home	11.3364485, 77.7271691	30 km/h	Medium
26	hospital	Kumarasamy Hospital	11.334273, 77.7259118	30 km/h	Medium
27	hospital	Thangam Hospital, Erode	11.3340961, 77.7262437	30 km/h	Medium
28	hospital	Vikram Hospital, Erode	11.3356411, 77.7280569	30 km/h	Medium
29	hospital	Shabeer Hospital	11.33529, 77.7285236	30 km/h	Medium
30	hospital	J.B. Clinic And Hospital	11.3351769, 77.7282031	30 km/h	Medium
31	hospital	Dr. R.M. Habibullah Hospital	11.335246, 77.7266028	30 km/h	Medium
32	hospital	Ck Hospital	11.3326562, 77.7282011	30 km/h	Medium
33	hospital	JJ hospital	11.33168, 77.728823	30 km/h	Medium
34	hospital	Jai Maaruthi Hospital	11.332, 77.727272	30 km/h	Medium
35	hospital	Bethesda Hospital	11.3314183, 77.7266231	30 km/h	Medium
36	hospital	Shubiksha Hospital	11.3318174, 77.7299544	30 km/h	Medium
37	hospital	Immick Hospital	11.332617, 77.728073	30 km/h	Medium
38	fire_station	Erode District Fire Station	11.3326366, 77.7272532	30 km/h	Medium
39	hospital	Lotus Hospital	11.3266236, 77.7306301	30 km/h	Medium
40	hospital	Lotus Hospital	11.3259471, 77.7302149	30 km/h	Medium
41	clinic	Monika Diabetes Centre	11.3229084, 77.7269179	30 km/h	Medium
42	hospital	Sri Jothi Hospitals	11.3217208, 77.7275956	30 km/h	Medium
43	clinic	Vasanth Clinic	11.3195299, 77.727194	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
44	clinic	Pulze Health Clinic	11.3179874, 77.7288603	30 km/h	Medium
45	hospital	Agathiyar Siddha Hospital	11.3174229, 77.7254599	30 km/h	Medium
46	hospital	Om Shakthi Hospital	11.3108011, 77.7259973	30 km/h	Medium
47	hospital	Government Hospital	11.2343326, 77.719226	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
16	school	Municipality Girls Higher secondary school	11.3495618, 77.7325011	30 km/h	Medium
23	school	E.V.R. Govt Girls Hr. Sec School	11.3371265, 77.7266283	30 km/h	Medium
48	college	Government Arts and Science College, Kangeyam	11.0626738, 77.636227	30 km/h	Medium
49	school	Carmel Girls Higher Secondary School	11.0009019, 77.5710182	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

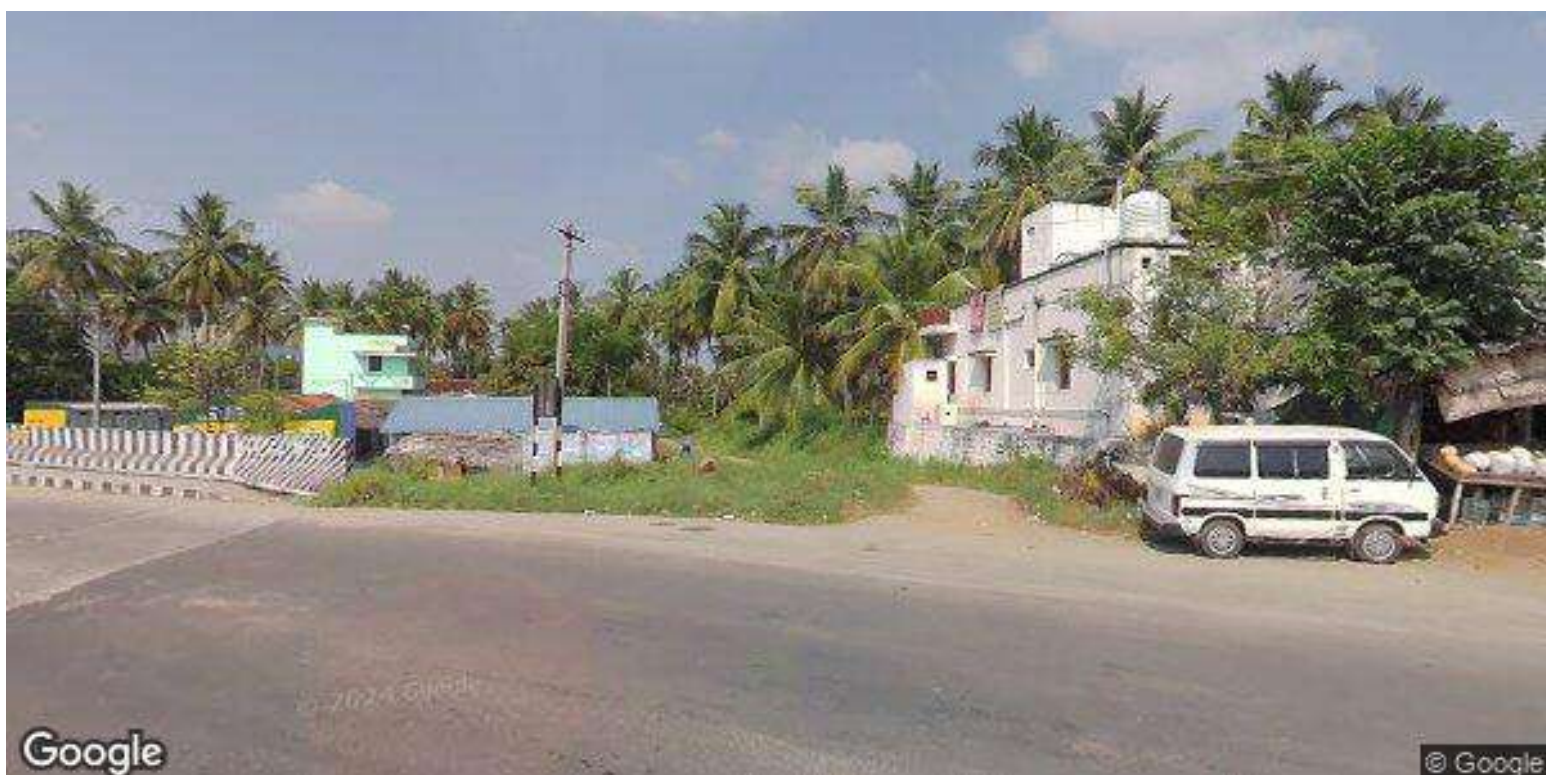


Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.44029, 77.87544



Risk Type: Turn
Risk Level: High
Speed Limit: 15 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: High
Speed Limit: 15 KM/Hr
Coordinates: 11.45352, 77.85698



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.45847, 77.85140



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.45898, 77.85135



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.46303, 77.84945



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.46314, 77.84928



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.46302, 77.84874



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.36498, 77.74811



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.34219, 77.72834



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.33920, 77.72902



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.33909, 77.72653



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.33860, 77.72640



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.33103, 77.72761



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.33084, 77.72867



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.32700, 77.73073



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.32421, 77.72727



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.23041, 77.71787



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.22406, 77.71390



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.16091, 77.70124



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.15935, 77.70059



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.12090, 77.67914



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.11924, 77.67776



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.11754, 77.67216



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.11698, 77.67172



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.10494, 77.67062



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.09479, 77.66598



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.08743, 77.66441



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.08288, 77.65842



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.06193, 77.63948



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.00840, 77.56963



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.00074, 77.56886



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.97818, 77.61288
