



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to ARUL MURUGAN AGENCIES

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

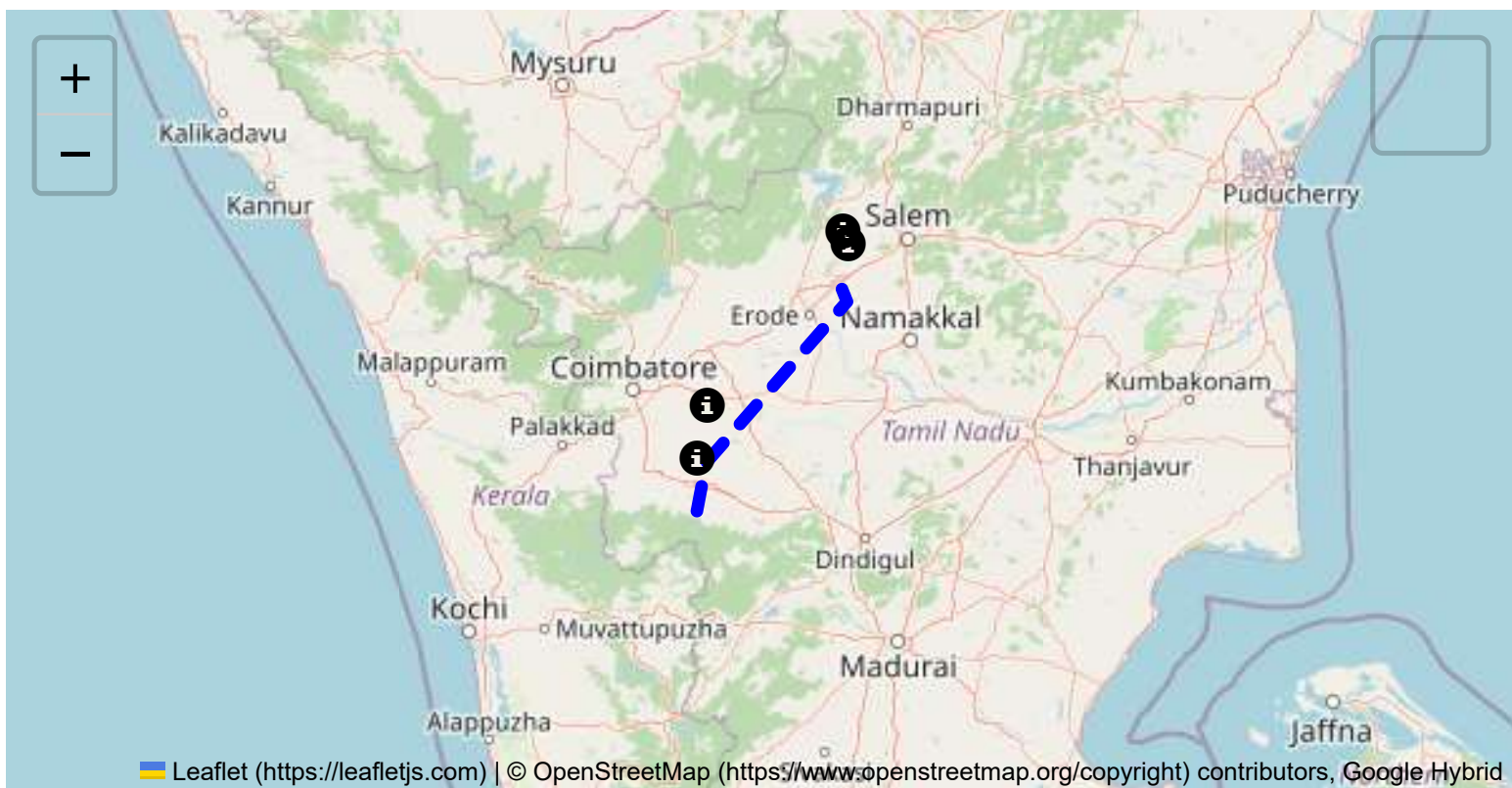
The JRM report addresses environmental risks along the route, ensuring compliance with environmental protection laws in ecologically sensitive zones. It suggests strategies such as identifying areas near water bodies, forests, or populated regions and implementing safety measures to minimize environmental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

Journey Risk Mitigation

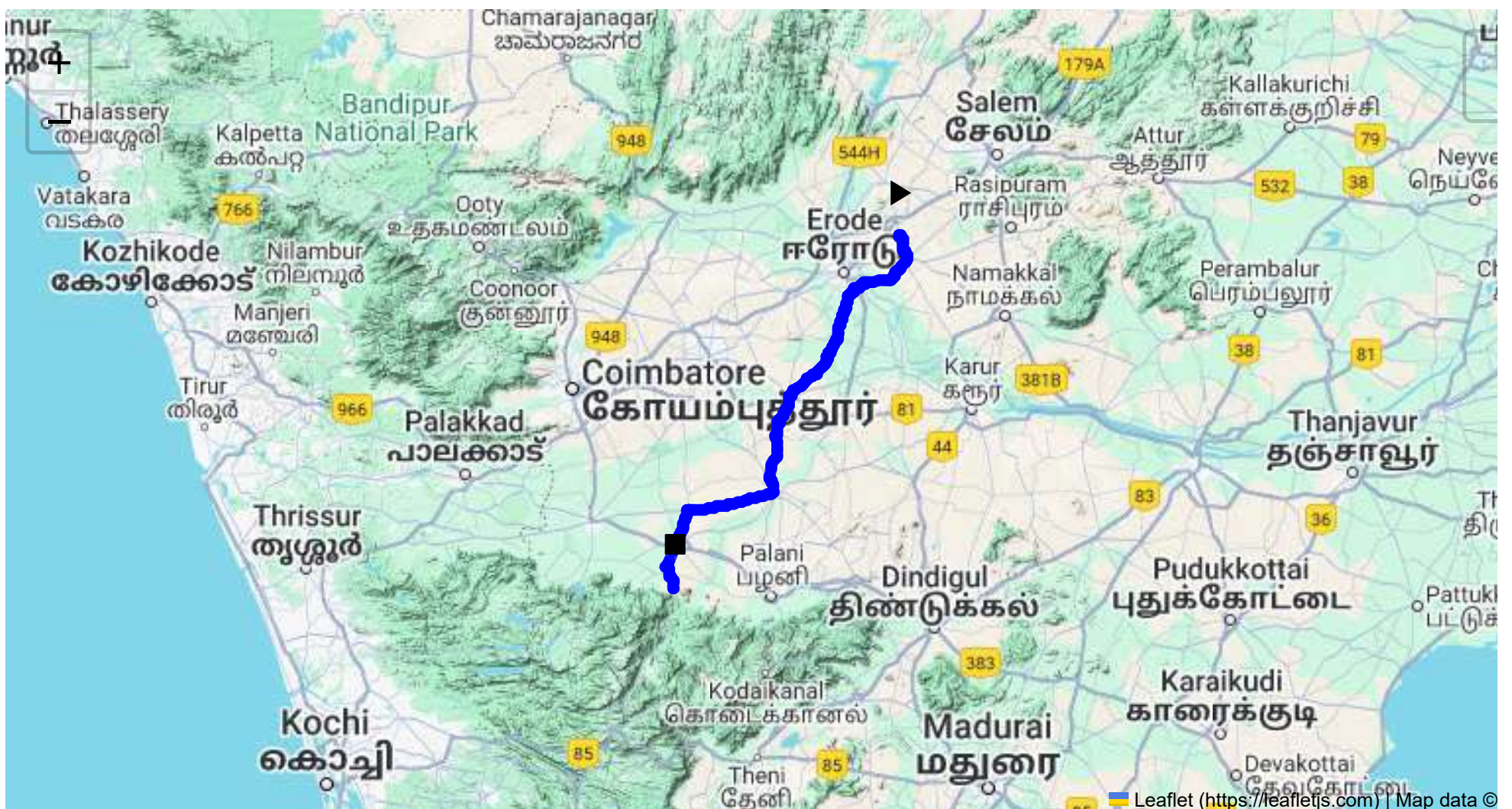
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 156.32 km
Estimated Duration: 3.5 hours
Adjusted Duration (Heavy Vehicle): 4.4 hours
Start: (11.4381, 77.8734)
End: (10.4704266, 77.2379107)



Welcome to the Journey Risk Management Study

Route Overview

The route from CVQF+23W, Sangagiri, Tamil Nadu to F69Q+X3W, Tamil Nadu spans approximately 156.32 kilometers and generally takes about 3.52 hours for heavy vehicles carrying hazardous materials. The journey navigates through various townships and rural areas, including Kamalar in Tiruchengode and

Gudimangalam. The path mostly follows state highways and some national highway segments, primarily NH544, SH79, and local roads.

Weather Conditions and Hazards

Tamil Nadu's weather is broadly characterized by tropical conditions. The route can face heavy rainfall during the monsoon season (June to September), which can lead to treacherous driving conditions due to water accumulations and reduced visibility. During summer (March to June), high temperatures could impact vehicle performance, especially for older trucks, and increase the potential for road surface damage or tire blowouts.

Traffic Patterns

Traffic in Sangagiri, Tiruchengode, and Gudimangalam sees considerable daily activity. Peak hours typically occur between 8:00-10:00 AM and 5:00-7:00 PM. Congestion-prone areas include central parts of Tiruchengode town and entrance/exit points on major highways like NH544. Agricultural seasons can also see an increased volume of heavy vehicles, impacting flow and increasing potential delays.

Road Quality and Infrastructure

The route offers a mix of well-maintained national highways with clear signage and parts of narrow rural roads. Expect good pavement conditions on SH79 and NH544, but local roads in remote areas might be narrower and less maintained, posing challenges for large trucks. Bridges or culverts might show signs of wear, demanding caution during vehicular crossings.

Alternative Routes

In case of emergencies, alternative routes can include detouring via NH544 from Perundurai, but these may not be ideal for all types of vehicles, particularly during peak traffic. Route realignment through local roads should be done carefully due to possible road quality issues and less traffic mitigation infrastructure.

Local Regulations on Hazardous Material Transport

Tamil Nadu mandates that vehicles carrying hazardous materials must adhere to strict safety inspections. Route-specific permits and prior intimation to local authorities might be necessary. There are limitations on movement during certain hours in congested areas, particularly around Tiruchengode.

Historical Incidents

Historically, the region has seen minor incidents involving heavy vehicles in areas like the Gudimangalam corridor, primarily due to vehicular congestion and occasional driver fatigue. Comprehensive data on hazardous material-specific incidents is limited, suggesting possibly low occurrence but also indicating a need for cautious approach.

Environmental Considerations

Rice paddies, agricultural lands, small wildlife reserves, and water bodies punctuate the route. Awareness of these ecological areas is crucial, as any spillages or emissions could lead to significant environmental harm. Navigating through dense rural areas demands awareness.

Communication Coverage

Communication coverage is generally reliable along the highways but may experience dead zones in some remote rural stretches, particularly around agricultural lands. Ensuring a working GPS and communication device with offline capabilities is advisable.

Emergency Response Times

Closer to urban centers like Tiruchengode, emergency services typically respond within 30-45 minutes. However, rural sections or during weather hindrances may see this extended to up to 1.5 hours. Preparing for vehicle break-downs with sufficient supplies and contacts is prudent.

Overall Risk Assessment Summary

The route requires careful planning, especially with regards to handling peak traffic and understanding infrastructure challenges posed by rural road segments. While the potential for incidents related to heavy vehicles is moderate, caution is urged around environmental sensitivities and communication gaps. Ensuring a robust emergency plan and adherence to local regulations is paramount for safe transit of hazardous materials.

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	11.43107, 77.88171	30 KM/Hr
5	Turn	Medium	11.39976, 77.88382	30 KM/Hr
6	Turn	Medium	11.39690, 77.88852	30 KM/Hr
7	Turn	High	11.37862, 77.89530	15 KM/Hr
8	Turn	High	11.37820, 77.89447	15 KM/Hr
9	Turn	Medium	11.36919, 77.88934	30 KM/Hr
10	Turn	Medium	11.36616, 77.88885	30 KM/Hr
11	Turn	Medium	11.33949, 77.86263	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
12	Turn	Medium	11.31752, 77.84260	30 KM/Hr
13	Turn	Medium	11.30955, 77.77637	30 KM/Hr
14	Turn	Medium	11.31115, 77.77102	30 KM/Hr
15	Turn	Medium	11.30963, 77.76695	30 KM/Hr
16	Turn	High	11.29490, 77.74685	15 KM/Hr
17	Turn	High	11.29141, 77.74662	15 KM/Hr
18	Turn	Medium	11.28908, 77.74368	30 KM/Hr
19	Turn	Medium	11.28573, 77.74281	30 KM/Hr
20	Turn	High	11.27319, 77.72981	15 KM/Hr
21	Blind Spot	Blind Spot	11.27330, 77.72715	10 KM/Hr
22	Turn	Medium	11.15944, 77.70068	30 KM/Hr
23	Turn	Medium	11.11962, 77.67818	30 KM/Hr
24	Turn	High	11.11683, 77.67168	15 KM/Hr
25	Turn	Medium	11.10481, 77.67060	30 KM/Hr
26	Turn	Medium	11.09509, 77.66612	30 KM/Hr
27	Turn	Medium	11.08730, 77.66436	30 KM/Hr
28	Turn	Medium	11.08282, 77.65837	30 KM/Hr
29	Turn	High	11.06189, 77.63943	15 KM/Hr
30	Turn	Medium	11.06183, 77.63626	30 KM/Hr
31	Turn	Medium	11.00852, 77.56992	30 KM/Hr
32	Turn	High	11.00090, 77.56888	15 KM/Hr
33	Turn	Medium	10.94900, 77.54681	30 KM/Hr
34	Turn	Medium	10.94764, 77.54709	30 KM/Hr
35	Turn	Medium	10.93853, 77.53921	30 KM/Hr
36	Turn	Medium	10.93794, 77.53764	30 KM/Hr
37	Turn	High	10.93006, 77.53262	15 KM/Hr
38	Turn	Medium	10.89465, 77.52809	30 KM/Hr
39	Turn	Medium	10.89172, 77.52640	30 KM/Hr
40	Turn	Medium	10.83409, 77.52932	30 KM/Hr
41	Turn	Medium	10.77676, 77.50724	30 KM/Hr
42	Turn	Medium	10.77580, 77.50724	30 KM/Hr
43	Turn	High	10.75791, 77.51938	15 KM/Hr
44	Turn	High	10.73533, 77.51739	15 KM/Hr
45	Turn	Medium	10.70318, 77.39789	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
46	Turn	Medium	10.68901, 77.28244	30 KM/Hr
47	Turn	High	10.68872, 77.28115	15 KM/Hr
48	Turn	High	10.59566, 77.24559	15 KM/Hr
49	Turn	High	10.58828, 77.24496	15 KM/Hr
50	Blind Spot	Blind Spot	10.58797, 77.24603	10 KM/Hr
51	Turn	Medium	10.53874, 77.22421	30 KM/Hr
52	Turn	High	10.53483, 77.22429	15 KM/Hr
53	Blind Spot	Blind Spot	10.53104, 77.22003	10 KM/Hr
54	Turn	Medium	10.52368, 77.22684	30 KM/Hr
55	Turn	Medium	10.50851, 77.22699	30 KM/Hr
56	Turn	Medium	10.49430, 77.23687	30 KM/Hr
57	Turn	High	10.49231, 77.24037	15 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
12	hospital	Government Hospital	11.2343326, 77.719226	30 km/h	Medium
15	police	Kangeyam Police Station	11.0011411, 77.562688	30 km/h	Medium
16	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
23	pharmacy	Apollo Pharmacy	10.5860212, 77.2456546	30 km/h	Medium
24	hospital	Anitha Hospital	10.58568, 77.248727	30 km/h	Medium
25	hospital	Government Hospital, Udumalpet	10.5836488, 77.247474	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
26	hospital	Dr.Sivakani Hospital Pvt Ltd	10.5809554, 77.2461377	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	MDV School	11.3719843, 77.8915244	30 km/h	Medium
13	college	Government Arts and Science College, Kangeyam	11.0626738, 77.636227	30 km/h	Medium
14	school	Carmel Girls Higher Secondary School	11.0009019, 77.5710182	30 km/h	Medium
17	school	Global Matriculation Higher Secondary School	10.965994, 77.5591898	30 km/h	Medium
18	college	Maharani College	10.7625655, 77.5157126	30 km/h	Medium
19	school	Vishnu Lakshmi Matriculation Higher Secondary School	10.7340392, 77.5164506	30 km/h	Medium
20	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: 11.43107, 77.88171



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: 11.37862, 77.89530



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.37820, 77.89447



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.36919, 77.88934



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.36616, 77.88885



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.33949, 77.86263



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.31752, 77.84260



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.30955, 77.77637



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.31115, 77.77102



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.30963, 77.76695



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: 11.29141, 77.74662



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.28908, 77.74368



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: 11.15944, 77.70068



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.11962, 77.67818



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.11683, 77.67168



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.10481, 77.67060



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.09509, 77.66612



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.08730, 77.66436



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.08282, 77.65837



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.06189, 77.63943



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.06183, 77.63626



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.00852, 77.56992



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.00090, 77.56888



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.94900, 77.54681



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.94764, 77.54709



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.93853, 77.53921



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.93794, 77.53764



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.93006, 77.53262



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.89465, 77.52809



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.89172, 77.52640



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: 10.77676, 77.50724



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.77580, 77.50724



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.75791, 77.51938



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.73533, 77.51739



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.70318, 77.39789



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.68901, 77.28244



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.68872, 77.28115



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.59566, 77.24559



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.58828, 77.24496



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 10.58797, 77.24603



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.53874, 77.22421



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.53483, 77.22429



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 10.53104, 77.22003



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.52368, 77.22684



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.50851, 77.22699



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.49231, 77.24037
