



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to CHAKRAVARTHY & CO

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

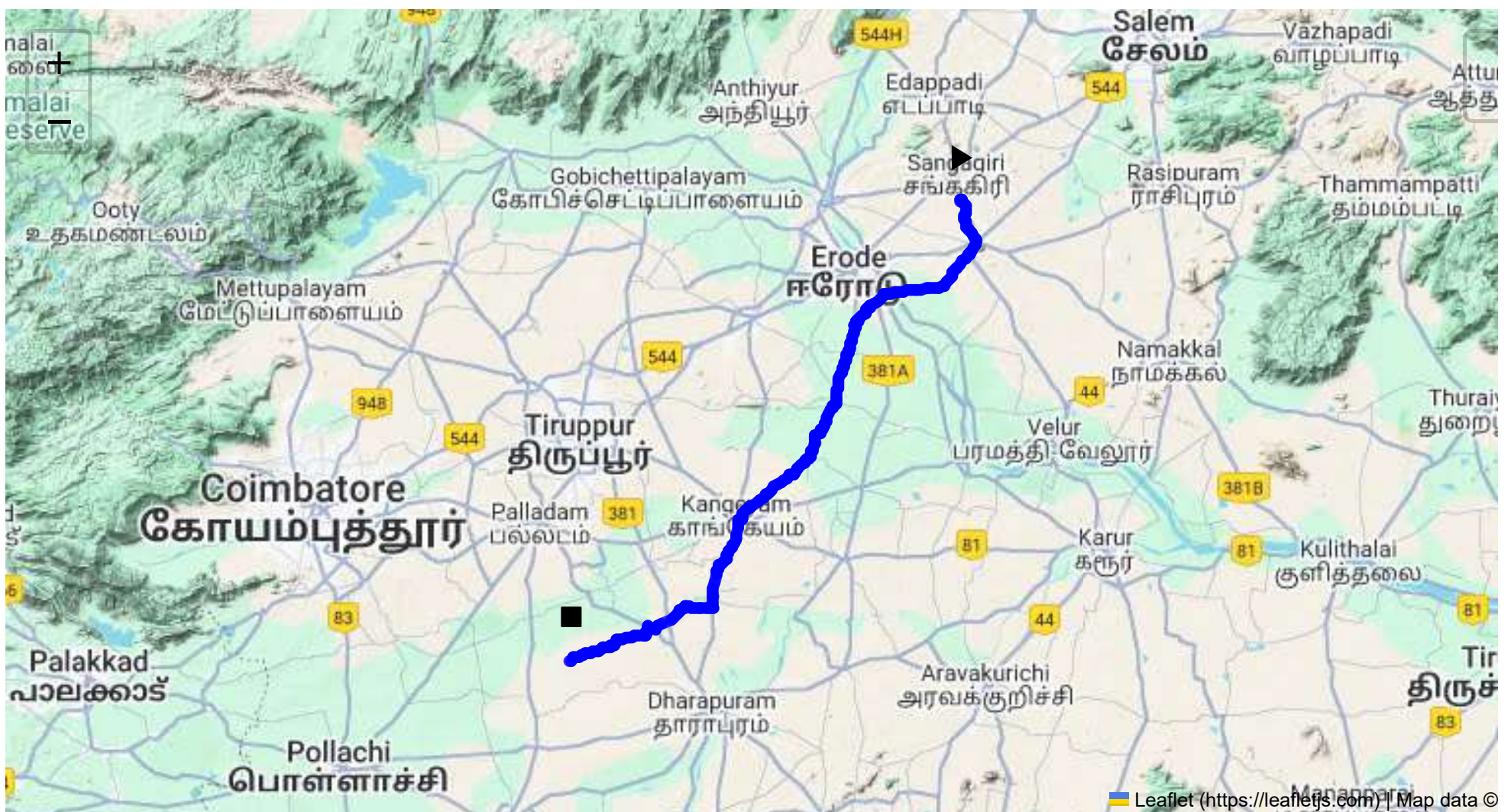
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 111.45 km
Estimated Duration: 2.6 hours
Adjusted Duration (Heavy Vehicle): 3.3 hours
Start: (11.4381, 77.8734)
End: (10.80624, 77.3274)



Welcome to the Journey Risk Management Study

Route Safety Analysis

- Overview of the Route Map:** The route from CVQF+23W, Sangagiri to R84H+92, Manurpalyam covers approximately 111.45 kilometers. It primarily navigates through rural and suburban regions, including segments of the state and national highways that connect various small towns and villages in Tamil

Nadu. The road primarily includes sections of NH-544 and state highways, characterized by single and double-lane carriageways in various stretches.

2. **Typical Weather Conditions and Potential Hazards:** Tamil Nadu generally experiences hot weather, with high temperatures throughout the year. The region experiences its monsoon from October to December, leading to heavy rainfall and potential flooding. During the monsoon, roads may become slippery, and visibility can be severely reduced, posing risks to drivers. Additionally, fog can be an issue early in the morning during the winter months.
3. **Traffic Patterns:** Mornings from 8 a.m. to 10 a.m. and evenings from 5 p.m. to 8 p.m. are peak hours due to commuting traffic. Sangagiri near NH-544 is prone to congestion due to local markets and schools. The vicinity of Erode City, if part of the route, might have heavy traffic, especially near major intersections and bypasses.
4. **Assessment of Road Quality and Infrastructure:** The national highways are generally in good condition, with proper signage and well-maintained surfaces. However, certain sections of state roads may experience wear and tear, with potholes particularly noticeable after the monsoon. Local roads can have uneven surfaces and lack adequate signage.
5. **Suggestions for Alternative Routes:** In case of emergencies or road closures, an alternative route may involve bypassing major urban traffic centers by taking rural connecting roads. Depending on conditions, another alternative might be using longer sections of NH-47, bypassing local roads, though this could increase travel time.
6. **Summary of Local Regulations Affecting Hazardous Material Transport:** Transportation of hazardous materials requires adherence to strict regulations, including having proper permits, clearly marked vehicles, and not traveling through sensitive areas or during peak times. Compliance with speed restrictions and road safety guidelines is crucial.
7. **Historical Incidents Involving Heavy Vehicles:** Historical data indicates sporadic incidents of road accidents involving heavy vehicles, often due to speeding, mechanical failure, or driver fatigue. Incidents involving hazardous materials are rare but can cause significant disruption and environmental damage.
8. **Environmental Considerations and Sensitive Areas:** The route traverses agricultural lands and several small water bodies, where spills of hazardous material could adversely affect local ecosystems. Avoiding these areas with hazardous cargo is advisable when possible.
9. **Analysis of Communication Coverage:** The majority of the route has good mobile network coverage; however, there could be brief stretches through rural areas where mobile reception is weak or intermittent. Drivers should ensure pre-loaded maps and emergency contact methods.
10. **Estimated Emergency Response Times:** Emergency response times vary. Near major towns like Erode, response times can be 20-30 minutes. In rural stretches, it may extend to 45-60 minutes due to distance and road conditions. Having an emergency plan in place is vital.
11. **Overall Summary of Risk Assessment:** The route has moderate risk factors, with particular attention needed during adverse weather conditions and peak traffic times. While primary roads are reliable, state highways require cautious driving due to potential infrastructure issues. Close adherence to local transport regulations and proactive measures for sudden route changes are necessary to

mitigate risks associated with the transportation of hazardous materials. Regular vehicle checks and driver preparedness can further enhance safety along this route.

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	11.36616, 77.88885	15 KM/Hr
8	Turn	Medium	11.34067, 77.86347	30 KM/Hr
9	Turn	Medium	11.33561, 77.86176	30 KM/Hr
10	Turn	Medium	11.31777, 77.84310	30 KM/Hr
11	Turn	Medium	11.30952, 77.77587	30 KM/Hr
12	Turn	Medium	11.31111, 77.77178	30 KM/Hr
13	Turn	Medium	11.30973, 77.76712	30 KM/Hr
14	Turn	High	11.29490, 77.74685	15 KM/Hr
15	Turn	High	11.29125, 77.74646	15 KM/Hr
16	Turn	Medium	11.29076, 77.74528	30 KM/Hr
17	Turn	Medium	11.28844, 77.74319	30 KM/Hr
18	Turn	Medium	11.28518, 77.74231	30 KM/Hr
19	Turn	High	11.27319, 77.72981	15 KM/Hr
20	Blind Spot	Blind Spot	11.27330, 77.72715	10 KM/Hr
21	Turn	Medium	11.23054, 77.71796	30 KM/Hr
22	Turn	Medium	11.20776, 77.70916	30 KM/Hr
23	Turn	Medium	11.15942, 77.70068	30 KM/Hr
24	Turn	Medium	11.12102, 77.67919	30 KM/Hr
25	Turn	Medium	11.11932, 77.67786	30 KM/Hr
26	Turn	Medium	11.11710, 77.67175	30 KM/Hr
27	Turn	Medium	11.09491, 77.66603	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
28	Turn	Medium	11.08696, 77.66407	30 KM/Hr
29	Turn	Medium	11.08296, 77.65857	30 KM/Hr
30	Turn	Medium	11.06183, 77.63924	30 KM/Hr
31	Turn	High	11.00826, 77.56962	15 KM/Hr
32	Blind Spot	Blind Spot	11.00058, 77.56882	10 KM/Hr
33	Turn	Medium	10.94862, 77.54680	30 KM/Hr
34	Turn	High	10.94722, 77.54709	15 KM/Hr
35	Turn	Medium	10.93895, 77.53976	30 KM/Hr
36	Turn	Medium	10.93765, 77.53710	30 KM/Hr
37	Turn	Medium	10.93054, 77.53265	30 KM/Hr
38	Turn	Medium	10.89213, 77.52646	30 KM/Hr
39	Turn	High	10.87916, 77.52773	15 KM/Hr
40	Turn	Medium	10.88265, 77.48996	30 KM/Hr
41	Turn	Medium	10.88260, 77.48881	30 KM/Hr
42	Turn	High	10.88221, 77.48831	15 KM/Hr
43	Turn	High	10.87783, 77.48740	15 KM/Hr
44	Turn	Medium	10.85466, 77.45054	30 KM/Hr
45	Turn	High	10.85164, 77.44708	15 KM/Hr
46	Blind Spot	Blind Spot	10.84969, 77.44694	10 KM/Hr
47	Turn	High	10.85361, 77.43716	15 KM/Hr
48	Turn	Medium	10.85334, 77.43681	30 KM/Hr
49	Turn	High	10.84323, 77.43549	15 KM/Hr
50	Turn	Medium	10.84300, 77.43450	30 KM/Hr
51	Turn	Medium	10.84267, 77.43414	30 KM/Hr
52	Turn	High	10.83777, 77.40922	15 KM/Hr
53	Turn	Medium	10.83495, 77.39394	30 KM/Hr
54	Turn	Medium	10.82716, 77.38831	30 KM/Hr
55	Turn	Medium	10.82438, 77.37275	30 KM/Hr
56	Turn	Medium	10.82376, 77.37202	30 KM/Hr
57	Turn	High	10.82150, 77.37132	15 KM/Hr
58	Turn	Medium	10.81588, 77.34834	30 KM/Hr
59	Turn	Medium	10.81183, 77.33303	30 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
10	hospital	Krishna Hospital, Namakkal	11.3754811, 77.8931817	30 km/h	Medium
11	hospital	Government Hospital	11.2343326, 77.719226	30 km/h	Medium
14	police	Kangeyam Police Station	11.0011411, 77.562688	30 km/h	Medium
15	hospital	J K Hospital	11.0042298, 77.5603345	30 km/h	Medium
17	hospital	Government Hospital, Thayampalayam	10.88012, 77.487323	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
9	school	KSR Educational institution	11.3772013, 77.8908807	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
12	college	Government Arts and Science College, Kangeyam	11.0626738, 77.636227	30 km/h	Medium
13	school	Carmel Girls Higher Secondary School	11.0009019, 77.5710182	30 km/h	Medium
16	school	Global Matriculation Higher Secondary School	10.965994, 77.5591898	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: 11.36616, 77.88885



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.34067, 77.86347



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.33561, 77.86176



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.31777, 77.84310



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: 11.31111, 77.77178



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: 11.29076, 77.74528



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: 11.28518, 77.74231



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: 11.09491, 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: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.94862, 77.54680



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: 10.93765, 77.53710



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: High

Speed Limit: 15 KM/Hr

Coordinates: 10.87916, 77.52773



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.88265, 77.48996



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.88260, 77.48881



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.88221, 77.48831



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.87783, 77.48740



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.85164, 77.44708



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 10.84969, 77.44694



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.85361, 77.43716



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.85334, 77.43681



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.84267, 77.43414



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.83777, 77.40922



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.83495, 77.39394



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.82716, 77.38831



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.82438, 77.37275



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.82376, 77.37202



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.82150, 77.37132



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.81588, 77.34834
