



IndianOil

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to SRI VARI 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

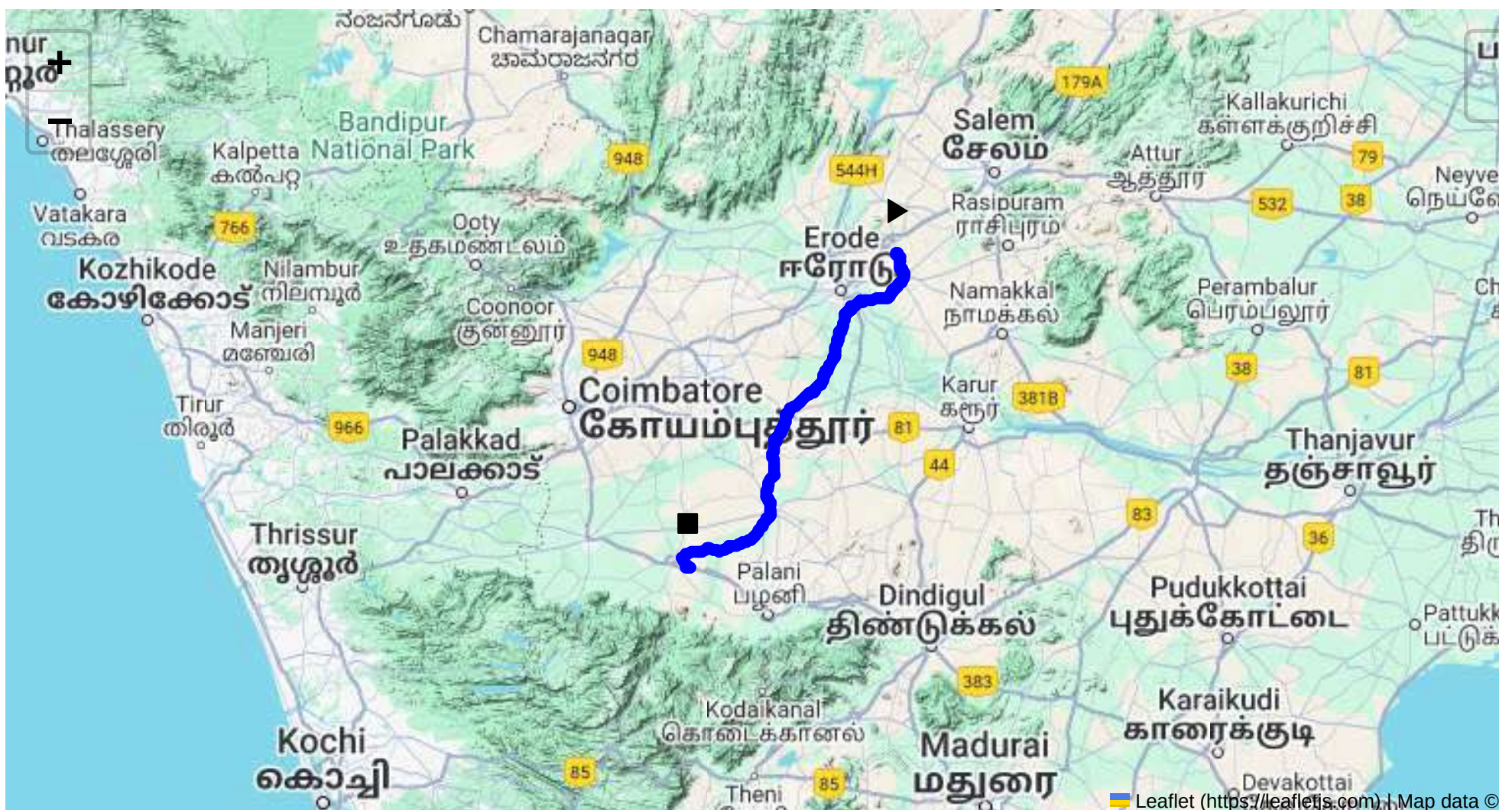
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 142.49 km
Estimated Duration: 3.2 hours
Adjusted Duration (Heavy Vehicle): 3.9 hours
Start: (11.4381, 77.8734)
End: (10.57817, 77.284355)



Welcome to the Journey Risk Management Study

1. Overview of the Route Map

The route from Sangagiri to Udumalaipettai covers approximately 142.49 kilometers, passing through the districts of Salem, Erode, and Tiruppur, before reaching the destination in Udumalaipettai, Tamil Nadu. This journey through the western part of Tamil Nadu primarily uses state highways and regional roads.

2. Typical Weather Conditions and Potential Weather-Related Hazards

- **Weather:** Tamil Nadu generally experiences hot and humid conditions with a tropical climate. The region receives most of its rainfall between October and December due to the northeast monsoon.
- **Potential Hazards:** Heavy rains during the monsoon can cause local flooding and landslides in certain areas, leading to road blockages and reduced visibility.

3. Analysis of Traffic Patterns

- **Peak Hours:** Congestion is typically highest during morning (8:00 - 10:00 AM) and evening (5:00 - 7:00 PM) hours, especially near urban centers and local markets.
- **Congestion Areas:** Notable congestion points include the towns of Tiruchengode and Palladam, where local traffic and market activity can significantly slow down movement.

4. Assessment of Road Quality and Infrastructure

- **Road Quality:** The roads along the route vary from well-maintained state highways to less maintained rural roads. Potholes and uneven surfaces are common in less urbanized zones.
- **Infrastructure:** Adequate signage and lighting are generally available on major portions, but urban junctions and village roads may lack adequate street lighting.

5. Suggestions for Alternative Routes for Emergencies

- **Alternative Route:** If necessary, consider using the NH544 and SH166 via Coimbatore, which is slightly longer but has better infrastructure and emergency service access.

6. Summary of Local Regulations Affecting Hazardous Material Transport

- **Regulations:** Regulations require all hazardous materials to be clearly labeled, and transportation is typically restricted to designated routes with proper permits. Driving during night hours with hazardous cargo is restricted.

7. Overview of Historical Incidents Involving Heavy Vehicles or Hazardous Materials

- **Historical Incidents:** While specific data is scarce, common incidents involve vehicle breakdowns due to overloading, minor collisions in busy market areas, and occasional incidents during monsoon with waterlogging affecting vehicle stability.

8. Environmental Considerations and Sensitive Areas

- **Sensitive Areas:** The route passes near forested areas and agricultural land. Spillage or leakage could potentially contaminate soil and water, harming local biodiversity and agriculture.

9. Analysis of Communication Coverage

- Dead Zones:** Mobile coverage is generally reliable, but there may be weak signal areas in more remote sections or when passing through hilly terrain.

10. Estimated Emergency Response Times for Different Route Segments

- Urban Areas:** Emergency response times in urban centers like Sangagiri and Near Udumalapettai are relatively quick (approximately 15-30 minutes).
- Rural Areas:** Response times in rural or less accessible areas might extend to 45-60 minutes due to the terrain and road quality.

12. Overall Summary of Risk Assessment

- Low-Medium Risk:** The route presents a low to medium risk level for transporting hazardous materials. The major concerns are road quality, monsoon weather effects, potential congestion in urban areas, and compliance with transportation regulations.
- Key Recommendations:** Scheduled trips outside peak traffic times, continuous monitoring of weather conditions, and ensuring all regulatory compliance for hazardous material transport are essential. Adequate rest stops and frequent vehicle checks can mitigate mechanical faults and enhance driver alertness.

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	Roundabout	High	10.72668, 77.52217	15 KM/Hr
3	U-Turn	High	10.578569, 77.29638849999999	10 KM/Hr
4	Turn	High	11.43968, 77.87345	15 KM/Hr
5	Turn	High	11.44022, 77.87546	15 KM/Hr
6	Turn	Medium	11.43107, 77.88171	30 KM/Hr
7	Turn	Medium	11.39976, 77.88382	30 KM/Hr
8	Turn	Medium	11.39690, 77.88852	30 KM/Hr
9	Turn	Medium	11.36593, 77.88847	30 KM/Hr
10	Turn	Medium	11.33561, 77.86176	30 KM/Hr
11	Turn	Medium	11.31777, 77.84310	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
12	Turn	Medium	11.30952, 77.77587	30 KM/Hr
13	Turn	Medium	11.31111, 77.77178	30 KM/Hr
14	Turn	Medium	11.30900, 77.76647	30 KM/Hr
15	Turn	Medium	11.29503, 77.74747	30 KM/Hr
16	Turn	Medium	11.29414, 77.74685	30 KM/Hr
17	Turn	High	11.29125, 77.74646	15 KM/Hr
18	Turn	Medium	11.29076, 77.74528	30 KM/Hr
19	Turn	Medium	11.28844, 77.74319	30 KM/Hr
20	Turn	Medium	11.28518, 77.74231	30 KM/Hr
21	Turn	Medium	11.27307, 77.72916	30 KM/Hr
22	Blind Spot	Blind Spot	11.27330, 77.72715	10 KM/Hr
23	Turn	Medium	11.23054, 77.71796	30 KM/Hr
24	Turn	Medium	11.22949, 77.71670	30 KM/Hr
25	Turn	Medium	11.15942, 77.70068	30 KM/Hr
26	Turn	Medium	11.12102, 77.67919	30 KM/Hr
27	Turn	Medium	11.11932, 77.67786	30 KM/Hr
28	Turn	Medium	11.11763, 77.67232	30 KM/Hr
29	Turn	Medium	11.08696, 77.66407	30 KM/Hr
30	Turn	Medium	11.08296, 77.65857	30 KM/Hr
31	Turn	Medium	11.06225, 77.63983	30 KM/Hr
32	Turn	High	11.00826, 77.56962	15 KM/Hr
33	Blind Spot	Blind Spot	11.00058, 77.56882	10 KM/Hr
34	Turn	Medium	10.94862, 77.54680	30 KM/Hr
35	Turn	High	10.94722, 77.54709	15 KM/Hr
36	Turn	Medium	10.93765, 77.53710	30 KM/Hr
37	Turn	Medium	10.93135, 77.53302	30 KM/Hr
38	Turn	Medium	10.89213, 77.52646	30 KM/Hr
39	Turn	Medium	10.83409, 77.52932	30 KM/Hr
40	Turn	High	10.77642, 77.50712	15 KM/Hr
41	Turn	Medium	10.75864, 77.51918	30 KM/Hr
42	Turn	Medium	10.75722, 77.51935	30 KM/Hr
43	Turn	Medium	10.73670, 77.51731	30 KM/Hr
44	Turn	Medium	10.63682, 77.41748	30 KM/Hr
45	Turn	Medium	10.63657, 77.40427	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
46	Turn	Medium	10.63096, 77.39875	30 KM/Hr
47	Turn	Medium	10.62891, 77.38675	30 KM/Hr
48	Turn	Medium	10.62501, 77.37810	30 KM/Hr
49	Turn	Medium	10.63099, 77.34357	30 KM/Hr
50	Blind Spot	Blind Spot	10.60493, 77.27069	10 KM/Hr
51	Turn	Medium	10.57823, 77.29291	30 KM/Hr
52	Blind Spot	Blind Spot	10.57850, 77.29615	10 KM/Hr
53	Turn	High	10.57779, 77.28441	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
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
19	hospital	Sri Balaji Surya Hospital	10.735518, 77.5185388	30 km/h	Medium
20	hospital	Ramana Hospital, Dharapuram	10.7351092, 77.517107	30 km/h	Medium
22	hospital	Janani Hospital, Dharapuram	10.7294033, 77.5210119	30 km/h	Medium
23	clinic	Punitha Nursing Home	10.72901, 77.520148	30 km/h	Medium
24	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
9	school	KSR Educational institution	11.3772013, 77.8908807	30 km/h	Medium
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
17	college	Maharani College	10.7625655, 77.5157126	30 km/h	Medium
18	school	Vishnu Lakshmi Matriculation Higher Secondary School	10.7340392, 77.5164506	30 km/h	Medium
21	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: Roundabout

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.72668, 77.52217



Risk Type: U-Turn

Risk Level: High

Speed Limit: 10 KM/Hr

Coordinates: 10.578569, 77.29638849999999



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: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.36593, 77.88847



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: 11.30900, 77.76647



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.29503, 77.74747



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.29414, 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: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.27307, 77.72916



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: 11.22949, 77.71670



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: 11.11763, 77.67232



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: 11.06225, 77.63983



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: 10.93765, 77.53710



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.93135, 77.53302



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: High
Speed Limit: 15 KM/Hr
Coordinates: 10.77642, 77.50712



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: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.63682, 77.41748



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.63657, 77.40427



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.63096, 77.39875



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.62891, 77.38675



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.62501, 77.37810



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.63099, 77.34357



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 10.60493, 77.27069



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.57823, 77.29291



Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 10.57850, 77.29615



Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.57779, 77.28441
