JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to ACMS COOPERATIVE PETROL BUNK

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

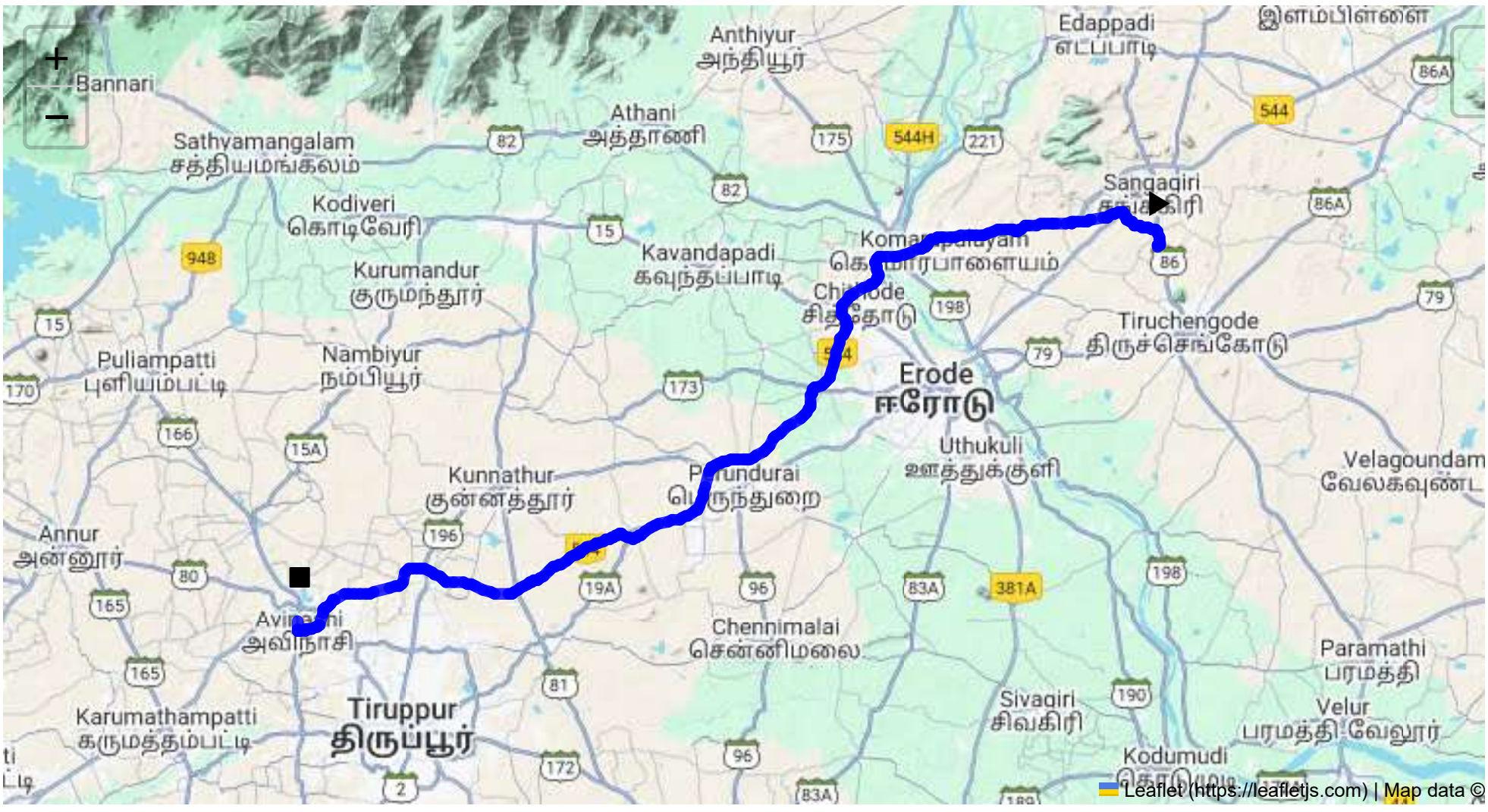
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 87.42 km
Estimated Duration: 1.6 hours
Adjusted Duration (Heavy Vehicle): 2.0 hours
Start: (11.4381, 77.8734)
End: (11.1793126, 77.2686404)



Welcome to the Journey Risk Management Study

Route Safety Analysis:

1. Overview of the Route Map: The route from Sangagiri to Avinashi spans approximately 87.42 kilometers, primarily traversing state highways and national highways. The journey typically includes segments of NH544 and SH87, which are major roads connecting small towns and rural areas.

2. Typical Weather Conditions and Potential Weather-related Hazards: Tamil Nadu generally experiences a tropical climate. The region encounters heavy rainfall during the monsoon (June to September), which can lead to slippery roads and occasional flooding. During summer (March to May), high temperatures can affect tire pressure and overall vehicle performance. Fog is less common but can occur during early winter mornings.

3. Analysis of Traffic Patterns: Traffic tends to be heavy during morning (8 AM - 10 AM) and evening (5 PM - 7 PM) hours, especially near urban areas like Sangagiri, Erode, and Avinashi. Key congestion areas include town junctions and toll plazas. Weekends might see heavier traffic due to local tourism and religious pilgrimage activities.

4. Assessment of Road Quality and Infrastructure: The primary highways (NH544 and SH87) are generally well-maintained, but secondary roads might experience deterioration, including potholes and uneven surfaces, particularly after monsoons. Construction and maintenance work can occasionally cause detours or lane narrowing.

5. Suggestions for Alternative Routes for Emergencies: In case of road blockages or emergencies, alternative routes include taking NH79 from Sangagiri to connect back to NH544 via SH190. Another alternative is using rural roads connecting Erode and further joining NH544 eastward, though this may add travel time.

6. Summary of Local Regulations Affecting Hazardous Material Transport: Transport of hazardous materials requires adherence to national regulations, including vehicle permits, hazard signage, and driver certification. Some state roads may have restrictions regarding the time of day for transport.

7. Overview of Historical Incidents Involving Heavy Vehicles or Hazardous Materials: There have been periodic reports of overturned trucks on greater inclines, often due to speeding or braking failure. Specific data on hazardous material spills is limited but highlights the importance of following safety protocols and equipment checks.

8. Environmental Considerations and Sensitive Areas: The route passes near agricultural land and small water bodies, which could be environmentally sensitive to spills. Disposal and emissions must be properly managed. Wildlife crossings are minimal but may exist near forested patches.

9. Analysis of Communication Coverage: Telecom coverage is generally good along the highway. However, rural stretches, particularly near Erode, might experience sporadic signal issues. GPS navigation should be pre-checked for offline usage.

10. Estimated Emergency Response Times for Different Route Segments: Typically, emergency services in urban areas like Erode or Sangagiri might take about 15-30 minutes to reach an incident site. In rural stretches, response times could be longer, around 40-60 minutes, due to lesser direct access routes.

12. Overall Summary of Risk Assessment:

- **Moderate Risk:** The main risks include weather-related issues, infrastructure shortcomings, and traffic congestion. Essential safety measures include thorough vehicle checks, speed regulation, updated navigation data, and ensuring communication devices are functional.
- **Preparedness:** Drivers should be trained in emergency procedures, aware of alternative routes, and comply with hazardous material regulations. Adequate rest breaks should be scheduled during off-

peak hours to minimize congestion exposure.

- **Environmental Safety:** Careful monitoring of the transport materials and pre-planned strategies for spill management can mitigate environmental risks. Compliance with existing local regulations is crucial for further minimizing risks.

Overall, with proper adherence to safety protocols and informed decision-making, the journey can be conducted effectively with manageable risk levels.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.17250, 77.26863	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
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	Medium	11.46314, 77.84928	30 KM/Hr
10	Turn	Medium	11.45509, 77.81383	30 KM/Hr

Emergency Locations

	type	name	coordinates	speed_limit	risk_level
3	hospital	Government Hospital	11.4525596, 77.7749426	30 km/h	Medium
4	hospital	Dhanvantri Multi Speciality Hospital	11.451362, 77.766602	30 km/h	Medium
5	hospital	Dhanvanthri Hospital	11.4496712, 77.7593772	30 km/h	Medium
6	hospital	J.K.K. Trust Hospital	11.4445841, 77.7307962	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
8	hospital	Shri Sathyanarayana Hospital	11.4291297, 77.6913408	30 km/h	Medium
9	hospital	Thanish Siddha Hospital	11.430003, 77.674964	30 km/h	Medium
10	clinic	Harshitha Clinic	11.4313207, 77.674718	30 km/h	Medium
11	hospital	Sri Kaalangi Siddhar Mooligai Vaithiya Nilayam	11.432369, 77.674894	30 km/h	Medium
12	clinic	G.K Clinic	11.4297244, 77.6749715	30 km/h	Medium
13	clinic	Erode Cancer Centre	11.3732, 77.649152	30 km/h	Medium
15	hospital	Irt Hospital	11.2803603, 77.5644118	30 km/h	Medium
17	hospital	Gen Siddha Hospital	11.2375033, 77.5059797	30 km/h	Medium
18	hospital	Vijayamangalm Government Hospital	11.2382827, 77.501687	30 km/h	Medium
19	hospital	Dr. N Viswanathan Hospital	11.2412783, 77.5005502	30 km/h	Medium
20	clinic	P.M. Clinic	11.2281078, 77.4647296	30 km/h	Medium
22	hospital	Sri Renu Hospital	11.1990225, 77.4219937	30 km/h	Medium

Crowded Spots

	type	name	coordinates	speed_limit	risk_level
0	school	KRP Matric. Hr. Sec School	11.4546193, 77.8142445	30 km/h	Medium
1	college	Vivekanandha Engineering College	11.4589312, 77.7899284	30 km/h	Medium
2	marketplace	Monday market	11.452863, 77.775989	30 km/h	Medium
7	school	SSM Matriculation Higher Secondary School	11.4321653, 77.6880046	30 km/h	Medium
14	college	Government polytechnic college	11.2907053, 77.5698726	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
16	school	Bharathi Matriculation School	11.2494613, 77.5307028	30 km/h	Medium
21	marketplace	Weekly Market (sandhai)	11.2287229, 77.4646676	30 km/h	Medium

Route Photos of Risky Spots

Risk Type: Roundabout

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.17250, 77.26863

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: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.46314, 77.84928

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.45509, 77.81383