JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal To SRI KUPPANNA PETROLIUM

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

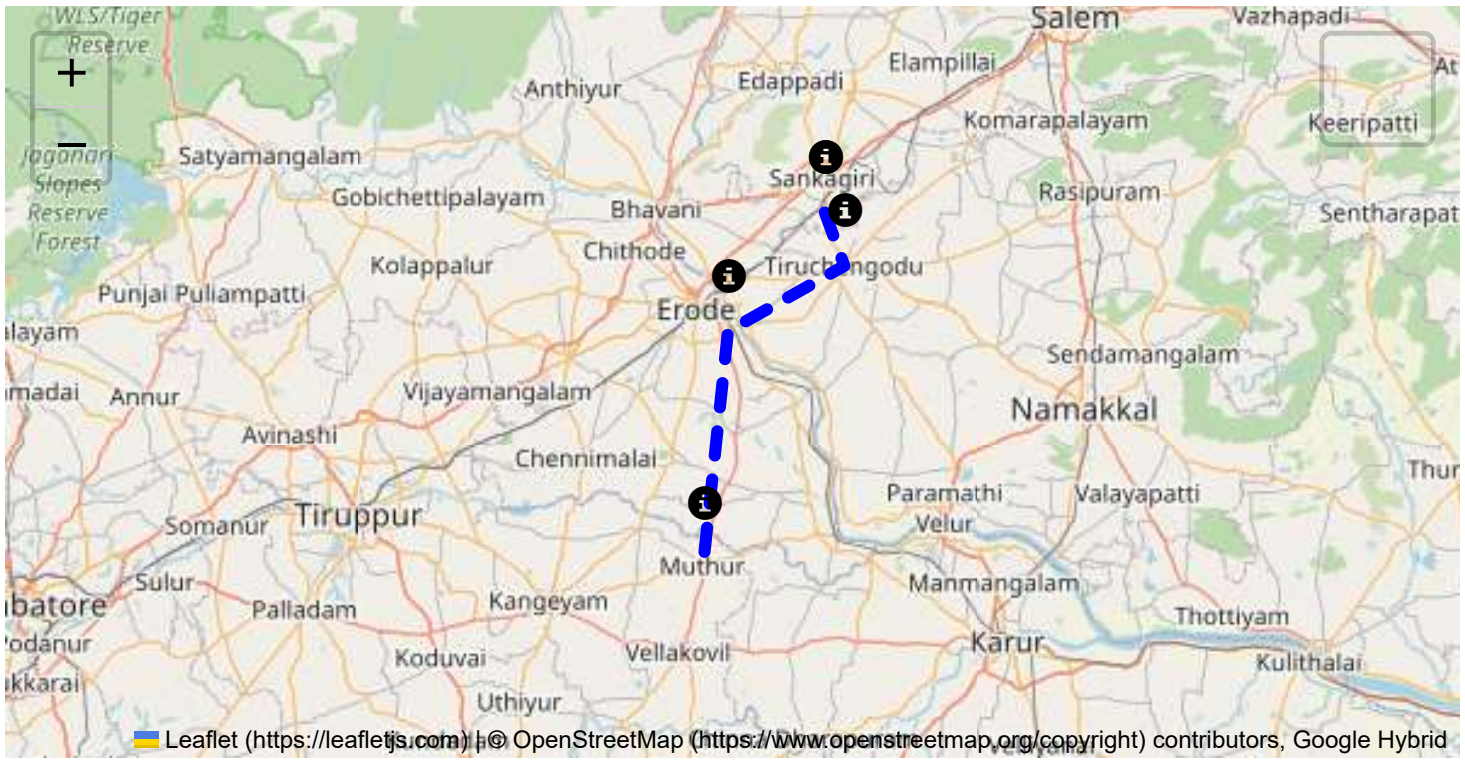
The JRM report addresses environmental risks along the route, ensuring compliance with environmental protection laws in ecologically sensitive zones. It suggests strategies such as identifying areas near water bodies, forests, or populated regions and implementing safety measures to minimize environmental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

Journey Risk Mitigation

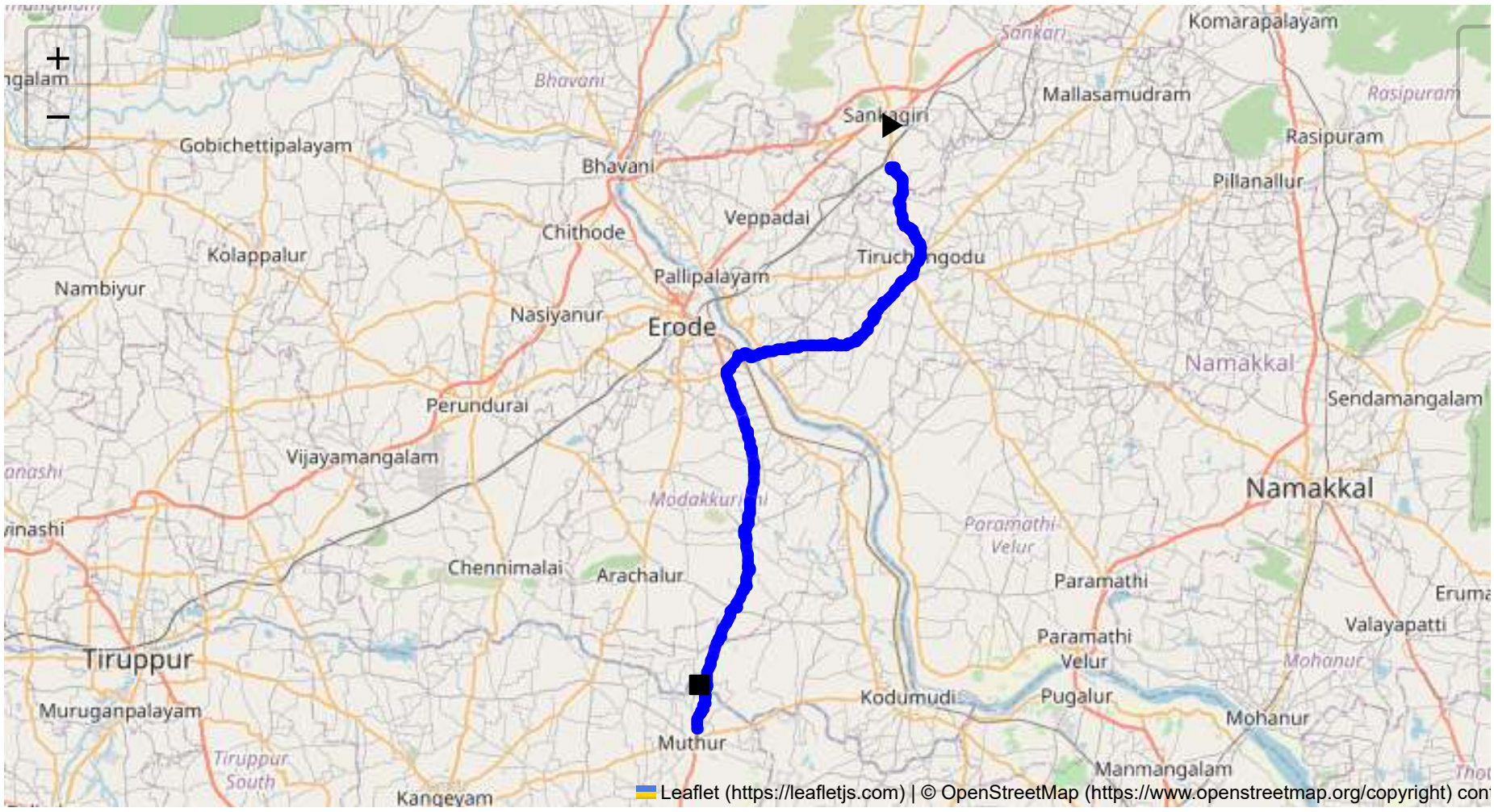
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 56.14 km
Estimated Duration: 1.4 hours
Adjusted Duration (Heavy Vehicle): 1.7 hours
Start: (11.4381, 77.8734)
End: (11.052737, 77.7375)



Welcome to the Journey Risk Management Study

1. Overview of the Route Map: The route spans approximately 56.14 kilometers, starting at Sangagiri, passing through Tiruchengode and Erode, and concluding at Muthur in Tamil Nadu, India. The journey typically follows major state highways and connecting roads, known for accommodating both commercial and passenger traffic.

2. Typical Weather Conditions and Potential Weather-Related Hazards: Tamil Nadu experiences a tropical climate, with peak temperatures in summer (March to May) reaching up to 40°C, and substantial rainfall during the monsoon season (June to September). The rainy season can lead to reduced visibility and slippery roads, increasing the risk of accidents. Additionally, cyclonic activity from the Bay of Bengal can cause sudden weather changes.

3. Traffic Patterns Analysis: Traffic congestion is typically observed during morning (7:00 AM - 10:00 AM) and evening (5:00 PM - 8:00 PM) peak hours, particularly around Sangagiri, Tiruchengode, and Erode. Erode, being a major commercial hub, might experience additional congestion and delays. Weekends can also see increased traffic due to local market activities.

4. Assessment of Road Quality and Infrastructure: The road infrastructure varies along the route. While major highway segments are well-maintained, some connecting roads might have potholes and uneven surfaces, demanding cautious navigation, especially for heavy vehicles. Regular ongoing roadworks could also impact travel.

5. Suggestions for Alternative Routes for Emergencies: In case of emergencies, consider alternative routes such as:

- Using NH 544 from Sangagiri to Erode, bypassing Tiruchengode for a more direct path.
- Local roads parallel to state highways can also serve as detours, but these should be verified for heavy vehicle suitability.

6. Summary of Local Regulations Affecting Hazardous Material Transport: Vehicles carrying hazardous materials must comply with regulations such as securing appropriate permits, obeying weight limits, adhering to designated hazardous cargo routes, and displaying proper signage. Night travel might require specific permissions due to safety regulations.

7. Overview of Historical Incidents Involving Heavy Vehicles or Hazardous Materials: The region has witnessed minor incidents primarily associated with vehicle fatigue or road conditions, rather than material spills. However, no major hazardous material incidents have been reported recently, suggesting effective control measures in place.

8. Environmental Considerations and Sensitive Areas: Passage through residential and commercial areas necessitates strict adherence to speed limits and noise regulations. Preservation zones or nearby wildlife areas demand extra precautions to prevent accidents and spills.

9. Analysis of Communication Coverage: The route generally has good mobile coverage from major providers, though brief dead zones might exist in rural pockets between major towns. Knowledge of emergency numbers and equipped communication devices is advised for continuity.

10. Estimated Emergency Response Times for Different Route Segments: Emergency services in the region are relatively prompt due to proximity to urban centers:

- Sangagiri to Tiruchengode: Approx. 15-20 minutes
- Tiruchengode to Erode: Approx. 20-30 minutes
- Erode to Muthur: Approx. 30-40 minutes

11. Overall Summary of Risk Assessment: The route from Sangagiri to Muthur is manageable for transiting hazardous materials with moderate risk factors, primarily influenced by weather conditions and traffic congestion. Regular monitoring during monsoon is critical, and adherence to local transportation regulations is essential for safe transit. Proper driver training and awareness of alternative routes, emergency contacts, and compliance with environmental protocols will mitigate most potential risks.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.38395, 77.89480	15 KM/Hr
1	Turn	High	11.43811, 77.87348	15 KM/Hr
2	Turn	Medium	11.43961, 77.87341	30 KM/Hr
3	Turn	Medium	11.43968, 77.87345	30 KM/Hr
4	Blind Spot	Blind Spot	11.44029, 77.87544	10 KM/Hr
5	Turn	Medium	11.39671, 77.88878	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
6	Turn	High	11.37868, 77.89498	15 KM/Hr
7	Turn	High	11.37850, 77.89453	15 KM/Hr
8	Turn	High	11.36604, 77.88887	15 KM/Hr
9	Turn	Medium	11.34105, 77.86426	30 KM/Hr
10	Turn	Medium	11.34074, 77.86356	30 KM/Hr
11	Turn	Medium	11.33865, 77.86216	30 KM/Hr
12	Turn	Medium	11.33794, 77.86235	30 KM/Hr
13	Turn	Medium	11.30968, 77.76701	30 KM/Hr
14	Turn	High	11.29899, 77.75806	15 KM/Hr
15	Turn	Medium	11.18947, 77.77076	30 KM/Hr
16	Turn	Medium	11.16419, 77.77365	30 KM/Hr
17	Turn	Medium	11.16377, 77.77421	30 KM/Hr
18	Turn	Medium	11.16354, 77.77435	30 KM/Hr
19	Turn	High	11.05276, 77.73776	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	Krishna Hospital, Namakkal	11.3754811, 77.8931817	30 km/h	Medium
10	hospital	Tirukumaran Hospitals	11.3782118, 77.8914933	30 km/h	Medium
13	hospital	Keerthana Hospital	11.2365339, 77.7772287	30 km/h	Medium
14	hospital	Nataraj Nursing Home	11.2351682, 77.7785956	30 km/h	Medium
15	hospital	Government Hospital, Elumathur	11.18533, 77.772496	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	KSR Educational institution	11.3772013, 77.8908807	30 km/h	Medium
12	school	MDV School	11.3719843, 77.8915244	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: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 11.44029, 77.87544

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.39671, 77.88878

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.37868, 77.89498

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.37850, 77.89453

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.36604, 77.88887

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.34105, 77.86426

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.34074, 77.86356

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.33865, 77.86216

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.33794, 77.86235

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.30968, 77.76701

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

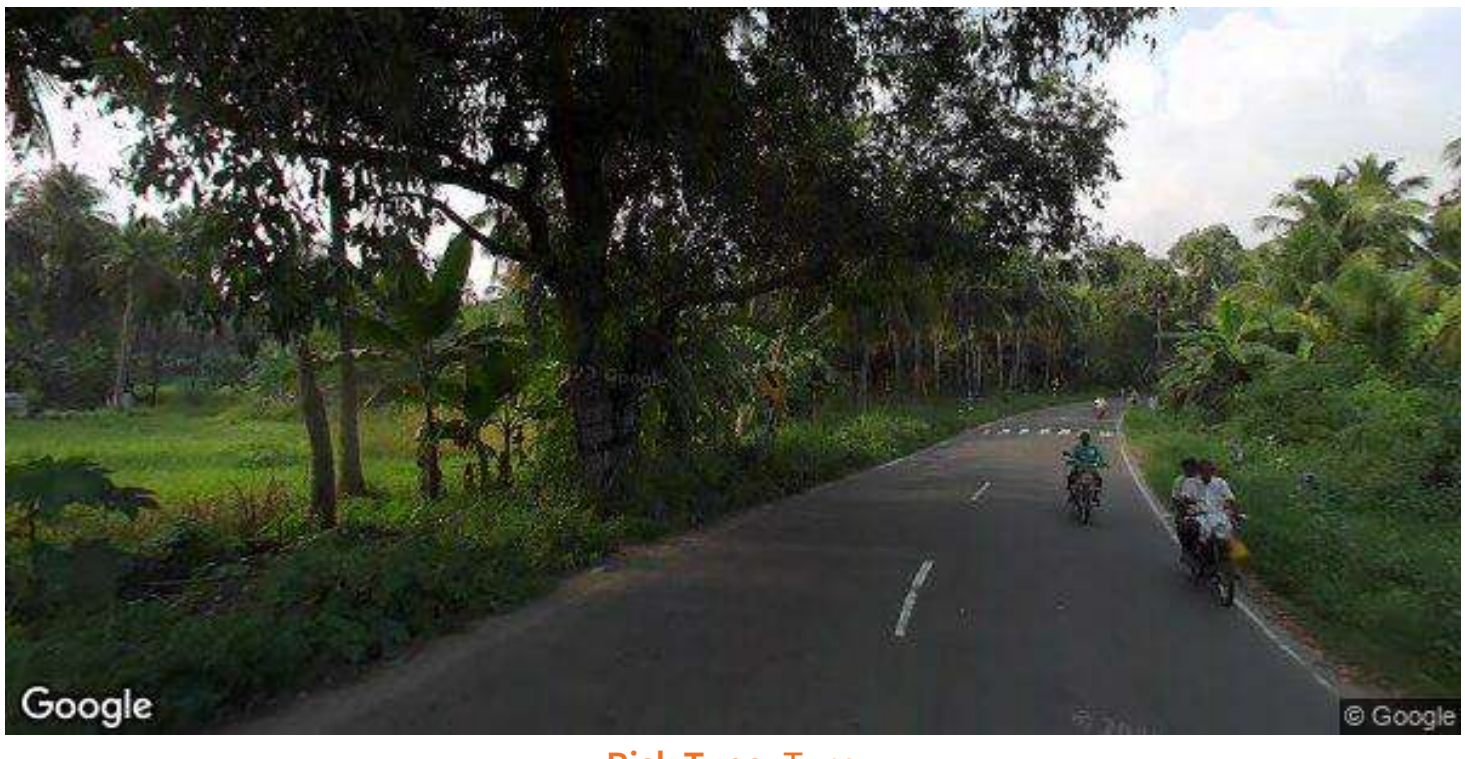
Coordinates: 11.29899, 77.75806

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.18947, 77.77076



Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.16419, 77.77365

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.16377, 77.77421

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.16354, 77.77435

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.05276, 77.73776