JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to AMMAN AGENCIES MULANUR

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

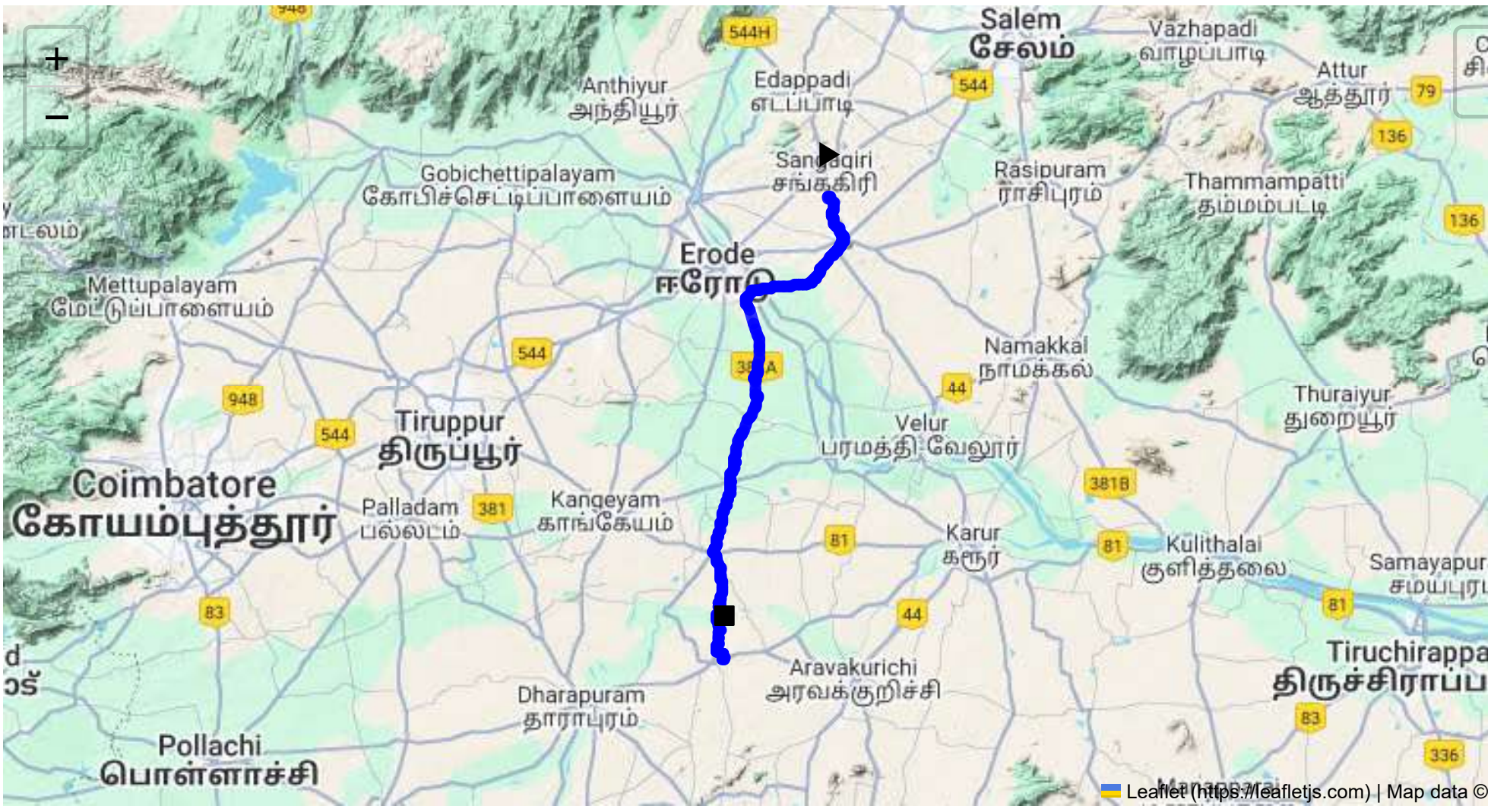
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 87.16 km
Estimated Duration: 2.1 hours
Adjusted Duration (Heavy Vehicle): 2.6 hours
Start: (11.4381, 77.8734)
End: (10.799796, 77.725254)



Welcome to the Journey Risk Management Study

Route Analysis Report

1. Overview of the Route Map

The route from CVQF+23W, Sangagiri to QPXG+W4 Mooventhar Nagar, via 8Q58+55P Erode Outer Ring Rd, features several key segments through the state of Tamil Nadu. It initially involves traveling through minor

roads in Sangagiri before linking to the Erode Outer Ring Road, eventually transitioning onto highways and arterial roads towards Mooventhar Nagar.

2. Typical Weather Conditions and Potential Weather-Related Hazards

Tamil Nadu generally experiences a tropical climate with high temperatures and humidity. The region sees substantial rainfall during the monsoon seasons (June to September and October to November). This can lead to potential hazards like water-logged roads or reduced visibility. Temporary road closures due to flooding or landslides in monsoon periods should be anticipated.

3. Analysis of Traffic Patterns

- **Peak Hours:** Morning (8:00-10:00 AM) and evening (5:00-7:00 PM) see significant traffic, especially around urban centers like Erode.
- **Congestion-Prone Areas:** Erode Outer Ring Road can get congested during peak hours. The entry and exit points leading to and from major highways may experience bottlenecks.

4. Assessment of Road Quality and Infrastructure

- **Road Quality:** Varies across the route. Urban sections near Erode are generally well-maintained, while certain rural sections may have potholes or uneven surfaces.
- **Infrastructure:** Adequate signage and street lighting in most parts, but less so in rural areas.

5. Suggestions for Alternative Routes for Emergencies

In emergencies, bypass traffic congestion by taking internal roads and smaller village paths for a short distance until reconnecting with the main route, primarily around urban areas like Erode.

6. Summary of Local Regulations Affecting Hazardous Material Transport

Tamil Nadu mandates permits for hazardous materials transport, requiring adherence to specific routes and times (usually restricted to non-peak hours). Loading and unloading should happen in designated areas.

7. Overview of Historical Incidents

In recent years, the region has experienced a few vehicular accidents involving trucks, often due to human error or adverse weather conditions. However, major incidents involving hazardous materials are rare but underline the need for compliance with safety guidelines.

8. Environmental Considerations and Sensitive Areas

Route passes near agricultural lands and small residential settlements. The outskirts of Erode are particularly sensitive due to their ecological and social significance—drivers should be cautious of

pollution and noise levels.

9. Analysis of Communication Coverage

Communication coverage is generally good near urban areas but can be spotty in rural and less populated zones. Identifying potential network dead zones is crucial for maintaining regular updates on position and condition.

10. Estimated Emergency Response Times

- **Urban Areas:** Approximately 30-45 minutes response time in Erode due to proximity to emergency services.
- **Rural Areas:** Could extend up to 1-2 hours given the distance and road conditions.

12. Overall Summary of Risk Assessment

The route is largely safe for heavy vehicle travel, with a few concerns primarily relating to weather, road conditions in rural areas, and peak-hour traffic congestions. Ensuring adherence to local regulations and preparing contingency plans for communication and emergency rerouting will enhance safety. Awareness of environmental and weather-related challenges will aid in smooth transit, with adequate risk mitigation measures in place for hazardous materials.

By understanding and preparing for the highlighted factors, truck drivers can minimize risks, ensuring both safety and regulatory compliance during transit.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.38395, 77.89480	15 KM/Hr
1	Roundabout	High	11.04637, 77.73761	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	11.39976, 77.88382	30 KM/Hr
5	Turn	Medium	11.39690, 77.88852	30 KM/Hr
6	Turn	High	11.37868, 77.89498	15 KM/Hr
7	Turn	Medium	11.37857, 77.89473	30 KM/Hr
8	Turn	High	11.36616, 77.88885	15 KM/Hr
9	Turn	Medium	11.34067, 77.86347	30 KM/Hr
10	Turn	Medium	11.33854, 77.86216	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
11	Turn	Medium	11.33778, 77.86236	30 KM/Hr
12	Turn	Medium	11.30952, 77.77587	30 KM/Hr
13	Turn	Medium	11.30973, 77.76712	30 KM/Hr
14	Turn	High	11.29908, 77.75818	15 KM/Hr
15	Turn	Medium	11.18935, 77.77078	30 KM/Hr
16	Turn	High	11.16434, 77.77360	15 KM/Hr
17	Turn	Medium	11.16375, 77.77424	30 KM/Hr
18	Turn	Medium	11.13659, 77.76519	30 KM/Hr
19	Turn	Medium	11.04614, 77.73704	30 KM/Hr
20	Turn	Medium	11.04505, 77.73623	30 KM/Hr
21	Turn	High	10.99023, 77.72506	15 KM/Hr
22	Turn	High	10.98970, 77.72385	15 KM/Hr
23	Blind Spot	Blind Spot	10.94597, 77.71319	10 KM/Hr
24	Turn	High	10.94563, 77.71574	15 KM/Hr
25	Turn	Medium	10.92228, 77.72392	30 KM/Hr
26	Turn	Medium	10.86278, 77.72143	30 KM/Hr
27	Turn	Medium	10.86158, 77.71764	30 KM/Hr
28	Turn	Medium	10.86118, 77.71726	30 KM/Hr
29	Turn	Medium	10.85613, 77.71791	30 KM/Hr
30	Turn	Medium	10.85462, 77.72064	30 KM/Hr
31	Turn	Medium	10.84875, 77.72076	30 KM/Hr
32	Turn	Medium	10.82285, 77.72027	30 KM/Hr
33	Turn	High	10.81280, 77.71753	15 KM/Hr
34	Turn	Medium	10.81256, 77.72035	30 KM/Hr
35	Turn	Medium	10.80911, 77.72390	30 KM/Hr
36	Turn	High	10.80865, 77.72416	15 KM/Hr
37	Turn	Medium	10.80868, 77.72432	30 KM/Hr
38	Turn	High	10.80774, 77.72667	15 KM/Hr
39	Turn	High	10.80125, 77.72786	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
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
16	hospital	Malar Hospital, Muthur	11.0438049, 77.7361156	30 km/h	Medium
17	hospital	SIBI Hospital, Vellakoil	10.9569141, 77.7160216	30 km/h	Medium
18	hospital	KG Hospital, Vellakoil	10.9511, 77.714116	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: Roundabout

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.04637, 77.73761

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: 11.39976, 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: 11.37868, 77.89498

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.37857, 77.89473

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: 11.33854, 77.86216

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.33778, 77.86236

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: 11.30973, 77.76712

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.29908, 77.75818

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.18935, 77.77078

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 11.16434, 77.77360

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.16375, 77.77424

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.13659, 77.76519

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.04614, 77.73704

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.04505, 77.73623

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.99023, 77.72506

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.98970, 77.72385

Risk Type: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 10.94597, 77.71319

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.94563, 77.71574

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.92228, 77.72392

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.86278, 77.72143

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.86158, 77.71764

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.86118, 77.71726

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.85613, 77.71791

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.85462, 77.72064

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.84875, 77.72076

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.82285, 77.72027

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.81280, 77.71753

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.81256, 77.72035

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.80911, 77.72390

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.80865, 77.72416

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.80868, 77.72432

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.80774, 77.72667

Risk Type: Turn

Risk Level: High

Speed Limit: 15 KM/Hr

Coordinates: 10.80125, 77.72786