JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal TO YADHAVAN AGENCIES

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

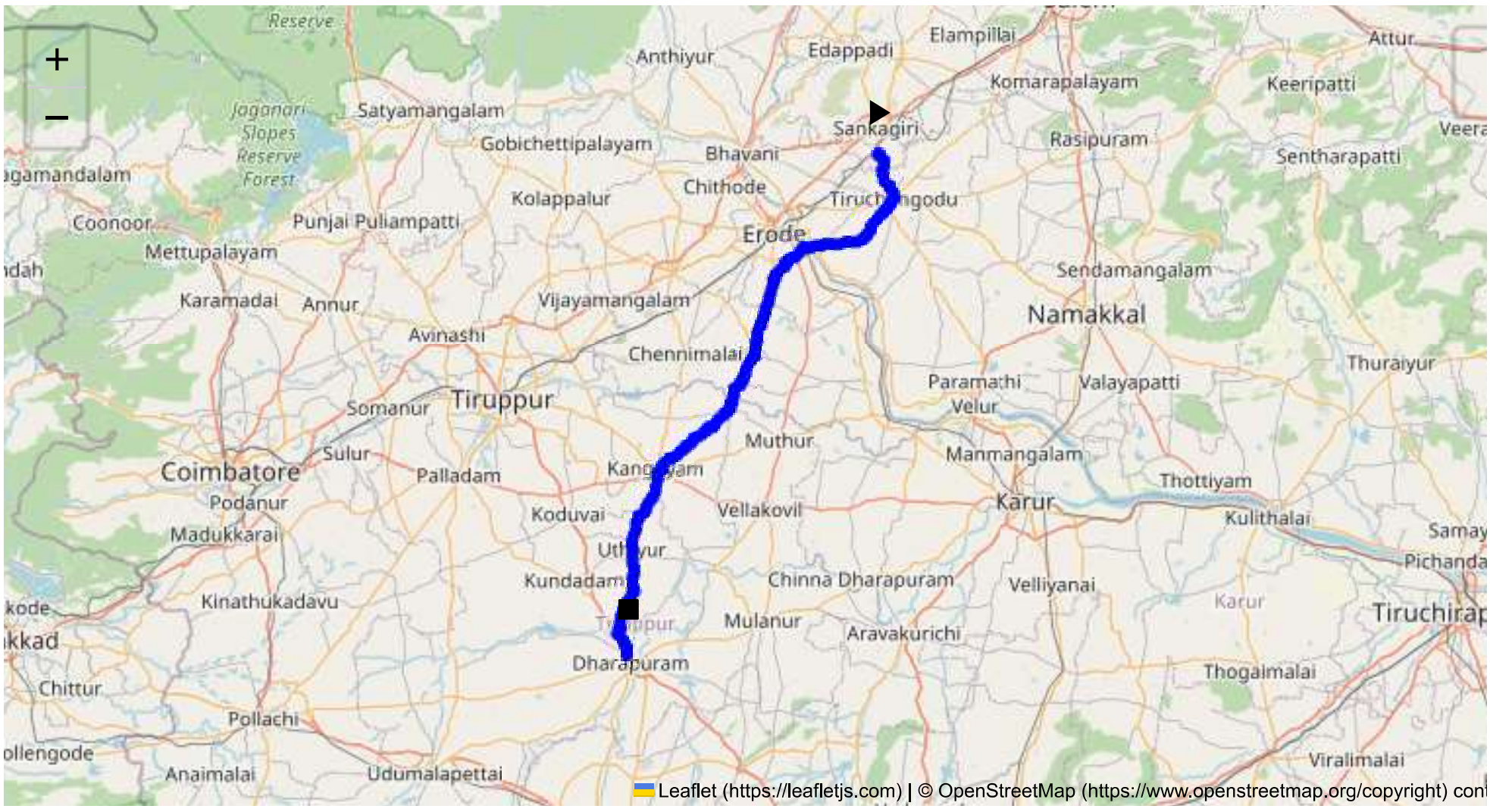
The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety 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: 101.16 km
Estimated Duration: 2.3 hours
Adjusted Duration (Heavy Vehicle): 2.8 hours
Start: (11.4381, 77.8734)
End: (10.748972, 77.518379)



Welcome to the Journey Risk Management Study

Here is a detailed analysis of the route from Sangagiri to Dharapuram in Tamil Nadu, India, focusing on potential hazards for a truck driver transporting hazardous materials.

1. **Overview of the Route Map:**
    - The route commences at Sangagiri and follows state highways and local roads leading to Dharapuram. It predominantly traverses rural and semi-urban settings, involving varied road

conditions and traffic levels.

2. **Typical Weather Conditions:**
    - The region experiences a tropical climate with the potential for heavy rains during the monsoon season (June to September) and high temperatures during summer (March to May). Weather-related hazards include flooding during monsoons which can affect certain low-lying areas, reducing visibility and road traction.
3. **Traffic Patterns:**
    - Traffic is generally moderate but can spike during peak hours (8 AM - 10 AM and 5 PM - 7 PM). Traffic congestion is more likely near urban centers and market areas, especially in smaller towns where roads may narrow.
4. **Road Quality and Infrastructure:**
    - Road quality varies along the route. Some sections, especially closer to urban areas, may have better infrastructure with wider lanes and signage. However, rural stretches might have narrower roads, occasional potholes, and limited lighting at night.
5. **Alternative Routes for Emergencies:**
    - An alternative route could involve taking NH-44 and then connecting through local roads, though it may increase the travel distance and time due to additional urban traffic. In emergencies, local traffic advisories should be checked to avoid bottlenecks.
6. **Local Regulations Affecting Hazardous Material Transport:**
    - Movement of hazardous material is subject to regulations requiring permits. There may be restrictions on movement through populous areas during peak hours. It's crucial to adhere to designated hazardous transport corridors if applicable.
7. **Historical Incidents:**
    - While specific historical data may not be readily available, similar routes have witnessed accidents involving heavy vehicles, typically due to poor road conditions, overspeeding, or mechanical failures. Checking with local authorities for records might provide further insights.
8. **Environmental Considerations and Sensitive Areas:**
    - The route traverses rural and agricultural areas. Transport should minimize risks of spills and emissions. Areas near water bodies or farmland may impose additional restrictions on hazardous materials.
9. **Communication Coverage:**
    - Communication may be patchy in more remote sections of the route. Ensure that drivers have mobile devices with local service providers for better coverage. Utilize GPS tracking for real-time updates.
10. **Estimated Emergency Response Times:**
    - Response times vary widely depending on proximity to urban centers. Major towns along the route may have quicker access to emergency services (~30 minutes), while in rural areas, it may exceed 60 minutes.
11. **Overall Summary of Risk Assessment:**

- While the primary route is manageable, attention must be paid to road conditions, weather, and traffic patterns. The presence of densely populated areas requires strict adherence to regulations concerning hazardous materials. Consideration must be given to maintaining up-to-date communication methods and having a clear emergency response strategy. Safety can be enhanced through comprehensive planning and staying informed of local advisories.

In summary, the route involves relative risk due to varied road conditions and potential weather impacts. Proper planning, adherence to regulations, and continual communication are essential in mitigating these risks.

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	U-Turn	High	10.7474551, 77.5187942	10 KM/Hr
3	Turn	High	11.43968, 77.87345	15 KM/Hr
4	Turn	High	11.44022, 77.87546	15 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	High	11.33854, 77.86216	15 KM/Hr
10	Turn	Medium	11.33778, 77.86236	30 KM/Hr
11	Turn	Medium	11.30952, 77.77587	30 KM/Hr
12	Turn	Medium	11.30973, 77.76712	30 KM/Hr
13	Turn	High	11.29490, 77.74685	15 KM/Hr
14	Turn	High	11.29125, 77.74646	15 KM/Hr
15	Turn	Medium	11.28844, 77.74319	30 KM/Hr
16	Turn	Medium	11.28573, 77.74281	30 KM/Hr
17	Turn	High	11.27319, 77.72981	15 KM/Hr
18	Blind Spot	Blind Spot	11.27330, 77.72715	10 KM/Hr
19	Turn	Medium	11.23054, 77.71796	30 KM/Hr
20	Turn	Medium	11.20776, 77.70916	30 KM/Hr
21	Turn	Medium	11.15942, 77.70068	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
22	Turn	Medium	11.12102, 77.67919	30 KM/Hr
23	Turn	Medium	11.11932, 77.67786	30 KM/Hr
24	Turn	Medium	11.11710, 77.67175	30 KM/Hr
25	Turn	Medium	11.09491, 77.66603	30 KM/Hr
26	Turn	Medium	11.08296, 77.65857	30 KM/Hr
27	Turn	Medium	11.06183, 77.63924	30 KM/Hr
28	Turn	High	11.00826, 77.56962	15 KM/Hr
29	Blind Spot	Blind Spot	11.00058, 77.56882	10 KM/Hr
30	Turn	Medium	10.94722, 77.54709	30 KM/Hr
31	Turn	Medium	10.93895, 77.53976	30 KM/Hr
32	Turn	Medium	10.93054, 77.53265	30 KM/Hr
33	Turn	Medium	10.89213, 77.52646	30 KM/Hr
34	Turn	Medium	10.83409, 77.52932	30 KM/Hr
35	Turn	Medium	10.77642, 77.50712	30 KM/Hr
36	Turn	Medium	10.77580, 77.50724	30 KM/Hr
37	Turn	Medium	10.75864, 77.51918	30 KM/Hr
38	Turn	Medium	10.75722, 77.51935	30 KM/Hr
39	Blind Spot	Blind Spot	10.74756, 77.51879	10 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	Government Hospital	11.2343326, 77.719226	30 km/h	Medium
16	police	Kangeyam Police Station	11.0011411, 77.562688	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
17	hospital	J K Hospital	11.0042298, 77.5603345	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
14	college	Government Arts and Science College, Kangeyam	11.0626738, 77.636227	30 km/h	Medium
15	school	Carmel Girls Higher Secondary School	11.0009019, 77.5710182	30 km/h	Medium
18	school	Global Matriculation Higher Secondary School	10.965994, 77.5591898	30 km/h	Medium
19	college	Maharani College	10.7625655, 77.5157126	30 km/h	Medium
20	school	Sindhu Matriculation Higher Secondary School	10.7471261, 77.5182993	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: U-Turn

Risk Level: High

Speed Limit: 10 KM/Hr

Coordinates: 10.7474551, 77.5187942

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: 11.36616, 77.88885

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.34067, 77.86347

Risk Type: Turn

Risk Level: High

Speed Limit: 15 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: 11.29490, 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: 11.28844, 77.74319

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 11.28573, 77.74281

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: 11.08296, 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: 10.94722, 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: 10.93054, 77.53265

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: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.77642, 77.50712

Risk Type: Turn

Risk Level: Medium

Speed Limit: 30 KM/Hr

Coordinates: 10.77580, 77.50724

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: Blind Spot

Risk Level: Blind Spot

Speed Limit: 10 KM/Hr

Coordinates: 10.74756, 77.51879