



# IndianOil

## JOURNEY RISK MANAGEMENT (JRM) STUDY

### Salem Terminal to SRI SHRI VEERAMATHI 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.

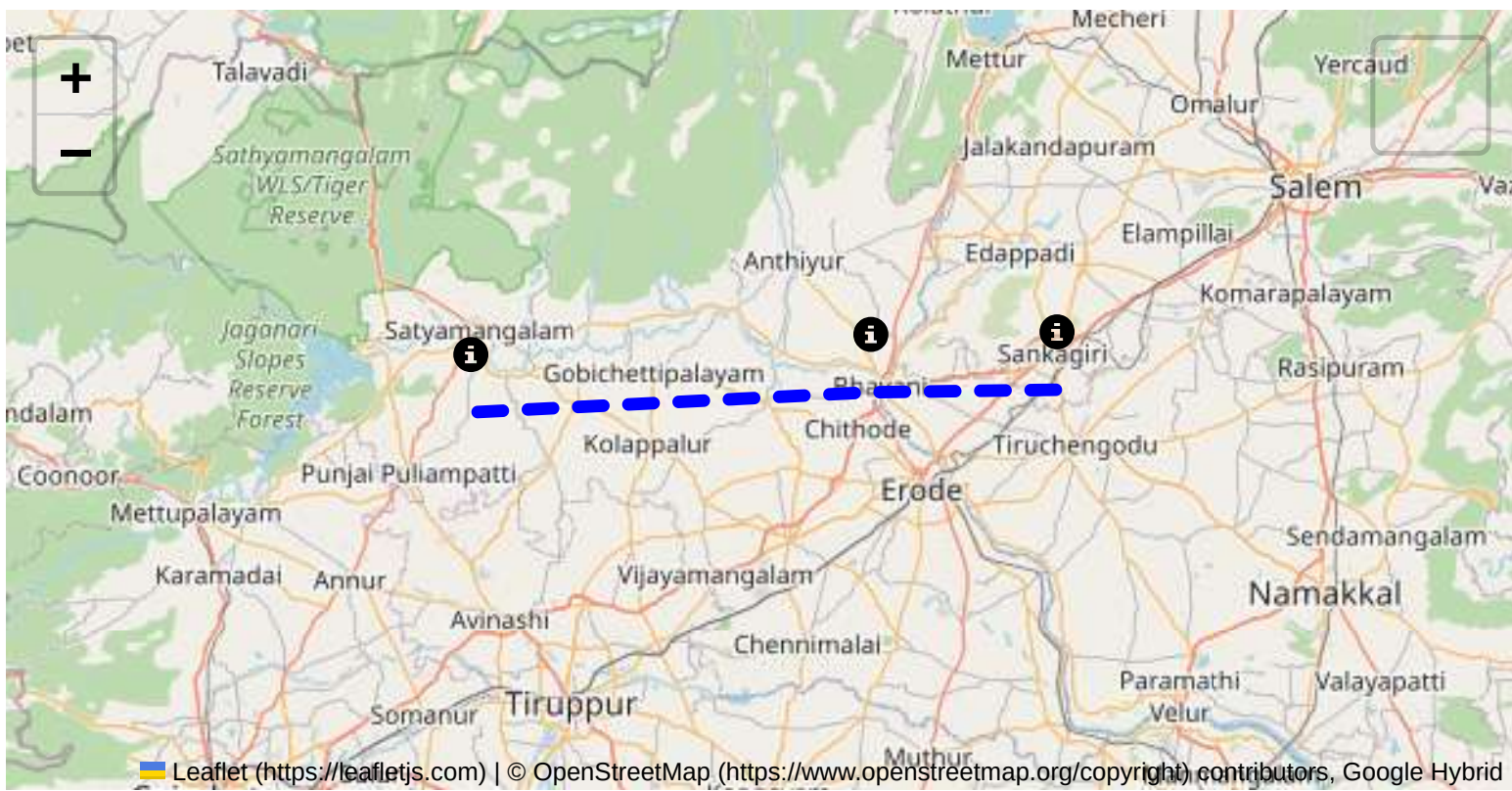
## **Journey Risk Mitigation**

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.

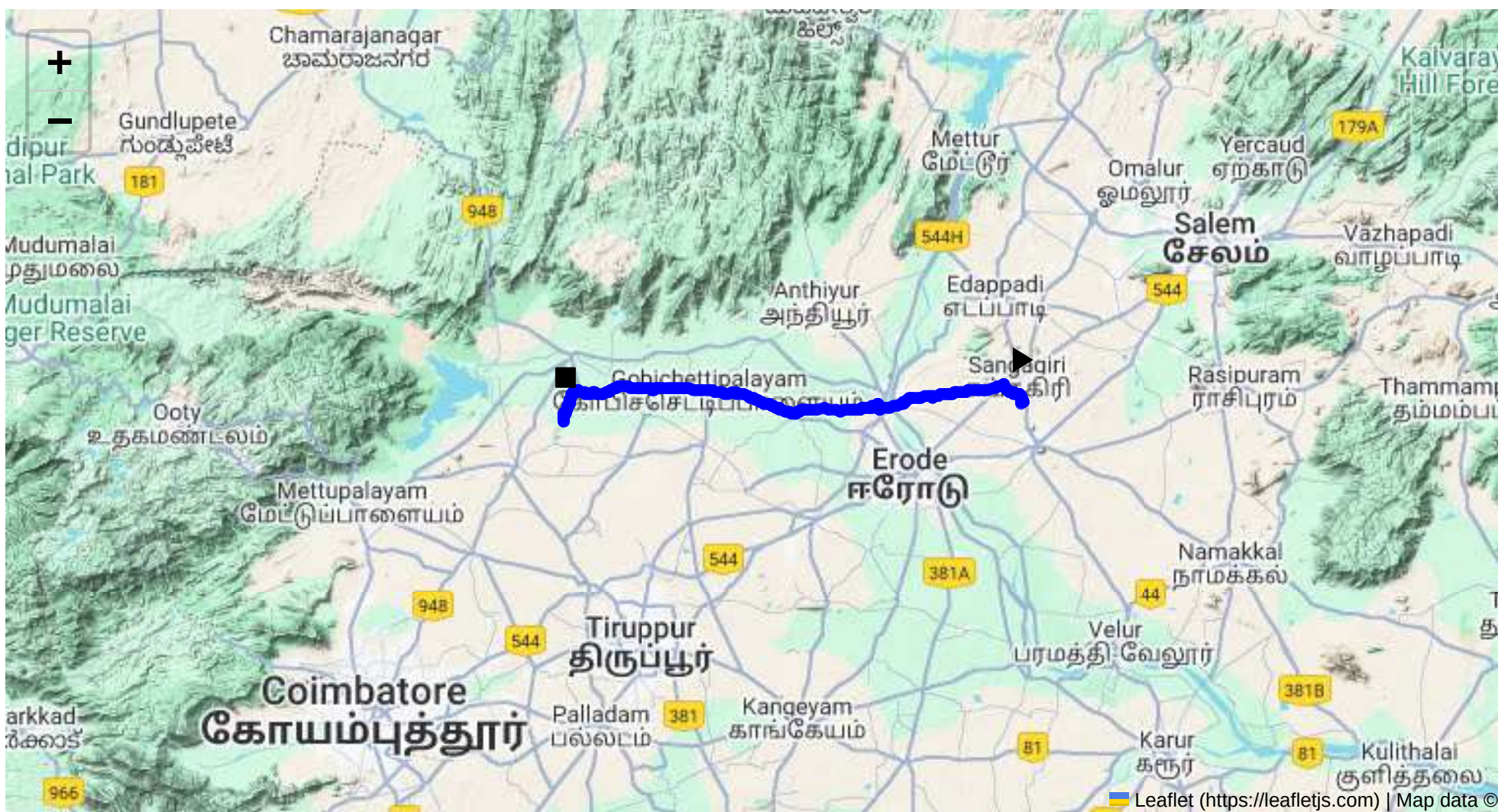
## **Compliance with Government Directives**

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: 79.61 km**  
**Estimated Duration: 1.7 hours**  
**Adjusted Duration (Heavy Vehicle): 2.1 hours**  
**Start: (11.4381, 77.8734)**  
**End: (11.413796, 77.233262)**



## Welcome to the Journey Risk Management Study

### 1. Overview of the Route Map

The route spans approximately 79.61 kilometers, beginning in Sangagiri, Tamil Nadu, and ending in Ukkaram, Tamil Nadu. Key transition points include Bhavani - Kavindapadi Road and Gandhipuram, passing through Erode before reaching the destination. This route incorporates a combination of national and state highways, as well as rural roads.



## 2. Typical Weather Conditions and Potential Weather-Related Hazards

Tamil Nadu generally experiences a tropical climate, with hot and dry conditions most of the year. However, from June to September, the area is affected by the southwest monsoon, and from October to December, the northeast monsoon can bring heavy rains, leading to potential flooding and landslides. During these periods, the roads can become slippery and visibility might diminish due to rain and fog.

## 3. Analysis of Traffic Patterns

The route sees diverse traffic:

- **Peak Hours:** Typically, between 8:00 AM – 10:00 AM and 5:00 PM – 7:00 PM.
- **Congestion-Prone Areas:** Erode town is a common traffic bottleneck due to commercial activities, especially near market areas and industrial zones.

## 4. Assessment of Road Quality and Infrastructure

The overall road quality varies:

- **National Highways:** Generally well-maintained and wide, allowing smooth passage for heavy vehicles.
- **State Roads:** Some sections might be narrow with occasional potholes, causing potential delays, especially during rainy seasons.
- **Rural Roads:** These may have limited maintenance, poor signage, and fewer safety barriers.

## 5. Suggestions for Alternative Routes

For emergency detours:

- Consider routes through NH544, which bypasses congested town centers.
- In severe weather, divert to higher elevations or seek alternate paths to avoid flooded areas along the Kalingarayan canal.

## 6. Summary of Local Regulations Affecting Hazardous Material Transport

Tamil Nadu has specific restrictions regarding hazardous material transport. Key points include:

- Restricted movement through densely populated areas during peak hours.
- Mandatory use of official routes designated for hazardous material where applicable.
- Compliance with safety norms, including adequate marking and escort vehicle requirements.

## 7. Overview of Historical Incidents

While comprehensive records are not easily available, anecdotal evidence suggests:

- Occasional instances of heavy vehicle accidents, often due to driver error or challenging weather conditions.
- Some incidents have involved hazardous materials near Erode, primarily due to traffic collisions.

## 8. Environmental Considerations and Sensitive Areas

- Vulnerable Water Bodies:** River Cauvery is a major water body; any spillovers or accidents involving hazardous materials near waterways should be meticulously avoided.
- Protected Zones:** There are agricultural lands along the route; hence, precautions are necessary to prevent contamination.

## 9. Analysis of Communication Coverage

Primary areas have good mobile network coverage. Potential dead zones include underpasses and rural stretches, particularly near dense vegetation or high-elevation sections.

## 10. Estimated Emergency Response Times

- Urban Segments (Erode):** 15-30 minutes due to proximity to emergency services.
- Rural Segments:** Up to 60 minutes or more, depending on accessibility and weather conditions.

## 12. Overall Summary of Risk Assessment

The primary risks include weather-related hazards, road quality issues, and traffic congestion, particularly in urban areas like Erode. Improving awareness of alternative routes and ensuring strict adherence to regulations for transporting hazardous materials are crucial for mitigating risks.

### Recommendations:

- Regularly update drivers on weather conditions.
- Train drivers on alternate routes and emergency protocols.
- Equip vehicles with GPS and communication tools to ensure contact during travel.

Overall, with proper planning and hazard awareness, the route can be navigated safely, albeit with cautious consideration of specific local challenges.

## Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Turn	High	11.43968, 77.87345	15 KM/Hr
1	Turn	High	11.44029, 77.87544	15 KM/Hr
2	Turn	High	11.44898, 77.87410	15 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
3	Turn	Medium	11.45357, 77.85789	30 KM/Hr
4	Turn	High	11.45352, 77.85698	15 KM/Hr
5	Turn	Medium	11.45847, 77.85140	30 KM/Hr
6	Turn	Medium	11.45898, 77.85135	30 KM/Hr
7	Turn	Medium	11.46303, 77.84945	30 KM/Hr
8	Turn	Medium	11.46314, 77.84928	30 KM/Hr
9	Turn	Medium	11.45509, 77.81383	30 KM/Hr
10	Turn	High	11.43001, 77.67575	15 KM/Hr
11	Turn	Medium	11.43003, 77.67551	30 KM/Hr
12	Turn	High	11.43026, 77.67525	15 KM/Hr
13	Turn	High	11.43099, 77.67543	15 KM/Hr
14	Turn	Medium	11.43113, 77.67507	30 KM/Hr
15	Turn	High	11.43600, 77.67354	15 KM/Hr
16	Turn	High	11.43441, 77.67066	15 KM/Hr
17	Turn	Medium	11.43327, 77.67052	30 KM/Hr
18	Turn	High	11.43273, 77.67018	15 KM/Hr
19	Turn	Medium	11.43345, 77.66711	30 KM/Hr
20	Turn	Medium	11.43306, 77.66631	30 KM/Hr
21	Turn	Medium	11.43169, 77.66404	30 KM/Hr
22	Turn	Medium	11.43223, 77.65338	30 KM/Hr
23	Turn	Medium	11.42778, 77.64603	30 KM/Hr
24	Turn	Medium	11.42711, 77.56414	30 KM/Hr
25	Turn	High	11.42329, 77.55798	15 KM/Hr
26	Turn	High	11.45744, 77.36602	15 KM/Hr
27	Turn	Medium	11.45764, 77.36319	30 KM/Hr
28	Turn	Medium	11.45648, 77.35763	30 KM/Hr
29	Turn	Medium	11.45335, 77.29409	30 KM/Hr
30	Turn	Medium	11.45037, 77.28935	30 KM/Hr
31	Turn	Medium	11.45522, 77.25438	30 KM/Hr
32	Turn	High	11.45616, 77.25388	15 KM/Hr
33	Turn	High	11.45630, 77.25276	15 KM/Hr
34	Turn	High	11.45400, 77.25224	15 KM/Hr
35	Turn	High	11.45360, 77.25146	15 KM/Hr
36	Blind Spot	Blind Spot	11.45280, 77.25178	10 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
37	Turn	High	11.45322, 77.24737	15 KM/Hr
38	Turn	Medium	11.42569, 77.23795	30 KM/Hr
39	Turn	Medium	11.42482, 77.23730	30 KM/Hr
40	Turn	High	11.42480, 77.23502	15 KM/Hr
41	Turn	Medium	11.42277, 77.23477	30 KM/Hr
42	Turn	High	11.42247, 77.23458	15 KM/Hr
43	Blind Spot	Blind Spot	11.42255, 77.23252	10 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
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	Velavan Homoeo Clinic	11.4367087, 77.6761472	30 km/h	Medium
14	hospital	PST Mahaa Hospital	11.4312903, 77.6585751	30 km/h	Medium
15	hospital	Dharun Hospital	11.4223638, 77.5597735	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
16	hospital	Dr. Ramaswamy Hospital	11.4249065, 77.5535658	30 km/h	Medium
17	hospital	Dakshin Trauma Centre	11.454593, 77.4461819	30 km/h	Medium
18	hospital	Dakshin Hospital	11.4546301, 77.445905	30 km/h	Medium
19	hospital	Sri Varahi Herbal Research Centre and Hospital	11.4539333, 77.4427438	30 km/h	Medium
20	clinic	Germen Homeopathy Clinic	11.4536305, 77.4394692	30 km/h	Medium
21	hospital	KKS Hospital	11.4551792, 77.4392927	30 km/h	Medium
22	hospital	JP Hospital	11.454765, 77.438257	30 km/h	Medium
24	hospital	Siranjeeve Hospitals	11.453132, 77.4344382	30 km/h	Medium
25	clinic	Anandhan Clinic	11.4548037, 77.4349074	30 km/h	Medium
26	hospital	Ramachandran Hospital	11.452242, 77.434641	30 km/h	Medium
27	hospital	Kumaran Hospital	11.4533971, 77.4349621	30 km/h	Medium
28	hospital	Dr. Rathinasamy Hospital	11.457562, 77.4327752	30 km/h	Medium
29	hospital	Gobi Neuro Mind Care	11.4548344, 77.434649	30 km/h	Medium
30	hospital	Hariharan Hospital	11.4523578, 77.4299287	30 km/h	Medium
31	hospital	Vasanth Hospital	11.4526864, 77.4292173	30 km/h	Medium
32	hospital	KKRS Hospital	11.45417, 77.430584	30 km/h	Medium
33	clinic	Jeeva Nursing Home	11.4533031, 77.4294145	30 km/h	Medium
34	hospital	Sathya Hospital	11.4561856, 77.4298694	30 km/h	Medium
35	hospital	S K Hospital	11.4540106, 77.430108	30 km/h	Medium
36	hospital	Sivakami Hospital	11.4531846, 77.4299288	30 km/h	Medium



	type	name	coordinates	speed_limit	risk_level
37	clinic	Sri Sudha Physiotherapy Clinic	11.4559915, 77.4300217	30 km/h	Medium
38	hospital	Arun Hospital	11.4538121, 77.4305743	30 km/h	Medium
39	clinic	Sairam Clinic	11.4560122, 77.4306716	30 km/h	Medium
40	hospital	Best Hospital	11.4543558, 77.4263617	30 km/h	Medium
41	clinic	Anand Nursing Home	11.4553169, 77.4296248	30 km/h	Medium
42	clinic	Kanmani Child Care Clinic	11.4545273, 77.428668	30 km/h	Medium
43	hospital	Rajasekaran Hospital	11.454463, 77.4262	30 km/h	Medium
44	hospital	Samuel Hospital	11.4542555, 77.4271194	30 km/h	Medium
45	hospital	Sivasakthi Hospital	11.4544711, 77.4297229	30 km/h	Medium
46	clinic	NMS Cardio Care Clinic	11.4550147, 77.430786	30 km/h	Medium
47	hospital	SS Children's Hospital	11.4555386, 77.4296357	30 km/h	Medium
48	hospital	Poorani Ravichandran Hospital	11.4550863, 77.4307802	30 km/h	Medium
49	hospital	Kavitha Children's Hospital	11.4565402, 77.4310815	30 km/h	Medium
50	hospital	SP Dhanapal Hospital	11.4559935, 77.4304406	30 km/h	Medium
51	clinic	Gobi Siddha Health Centre	11.455616, 77.4307062	30 km/h	Medium
52	clinic	Sri Dhanvantari Siddha Clinic	11.4561216, 77.4295797	30 km/h	Medium
53	hospital	Neha Hospital	11.4560138, 77.4270219	30 km/h	Medium
54	hospital	M.S Children's Hospital	11.4556012, 77.4301006	30 km/h	Medium
55	hospital	Gobi Diabetic Hospital	11.455394, 77.4301181	30 km/h	Medium
56	clinic	Dr. Ramesh Babu Clinic	11.4560871, 77.4296353	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
57	hospital	Sankareswari Eye Hospital	11.4572997, 77.428765	30 km/h	Medium
58	hospital	Dr. Moorthy Hospital	11.4546045, 77.4308533	30 km/h	Medium
59	hospital	SP Hospital	11.456607, 77.430302	30 km/h	Medium
62	hospital	Government Hospital	11.4565126, 77.4288768	30 km/h	Medium
63	pharmacy	Abirami Medicals	11.4550894, 77.4309286	30 km/h	Medium
64	hospital	Sri Chakra Hospital	11.4544464, 77.4228363	30 km/h	Medium
65	hospital	U M Hospital	11.4544151, 77.4240386	30 km/h	Medium
66	hospital	Dr. Gopal Hospital	11.455258, 77.422901	30 km/h	Medium
67	hospital	Arun Hospital	11.4548852, 77.4250314	30 km/h	Medium
68	clinic	VG Ortho Centre	11.4550504, 77.4225102	30 km/h	Medium
69	clinic	Palaniappa Clinic	11.4555925, 77.4202828	30 km/h	Medium
70	hospital	Abi SK Hospital	11.457163, 77.412487	30 km/h	Medium
71	clinic	Nalam Vazh S.K Siddha and Varma Clinic	11.457576, 77.412164	30 km/h	Medium
73	clinic	Singiripalayam Natarajan Siddha Ortho Care	11.4603252, 77.3183801	30 km/h	Medium
75	hospital	Government Hospital, Ukkaram	11.4156444, 77.2350458	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

	type	name	coordinates	speed_limit	risk_level
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
23	school	Shree Vidyalaya Matric Higher Secondary School	11.4536114, 77.4383163	30 km/h	Medium
60	school	Diamond Jubilee Higher Secondary School	11.4529541, 77.4280306	30 km/h	Medium
61	school	CKK Palaniammal School	11.4569211, 77.4276828	30 km/h	Medium
72	school	Saratha Techno School	11.4544819, 77.379986	30 km/h	Medium
74	school	Saratha International School	11.4541471, 77.3032962	30 km/h	Medium

## Route Photos of Risky Spots



**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



**Risk Type:** Turn  
**Risk Level:** High  
**Speed Limit:** 15 KM/Hr  
**Coordinates:** 11.43001, 77.67575



**Risk Type:** Turn  
**Risk Level:** Medium  
**Speed Limit:** 30 KM/Hr  
**Coordinates:** 11.43003, 77.67551





**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.43026, 77.67525



**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.43099, 77.67543





**Risk Type: Turn**

**Risk Level: Medium**

**Speed Limit: 30 KM/Hr**

**Coordinates: 11.43113, 77.67507**



**Risk Type: Turn**

**Risk Level: High**

**Speed Limit: 15 KM/Hr**

**Coordinates: 11.43600, 77.67354**



**Risk Type: Turn**

**Risk Level: High**

**Speed Limit: 15 KM/Hr**

**Coordinates: 11.43441, 77.67066**





**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.43327, 77.67052



**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.43273, 77.67018





**Risk Type:** Turn  
**Risk Level:** Medium  
**Speed Limit:** 30 KM/Hr  
**Coordinates:** 11.43345, 77.66711



**Risk Type:** Turn  
**Risk Level:** Medium  
**Speed Limit:** 30 KM/Hr  
**Coordinates:** 11.43306, 77.66631



**Risk Type:** Turn  
**Risk Level:** Medium  
**Speed Limit:** 30 KM/Hr  
**Coordinates:** 11.43169, 77.66404





**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.43223, 77.65338



**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.42778, 77.64603





**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.42711, 77.56414



**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.42329, 77.55798



**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.45744, 77.36602





**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.45764, 77.36319



**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.45648, 77.35763





**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.45335, 77.29409



**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.45037, 77.28935



**Risk Type:** Turn

**Risk Level:** Medium

**Speed Limit:** 30 KM/Hr

**Coordinates:** 11.45522, 77.25438





**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.45616, 77.25388



**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.45630, 77.25276





**Risk Type:** Turn  
**Risk Level:** High  
**Speed Limit:** 15 KM/Hr  
**Coordinates:** 11.45400, 77.25224



**Risk Type:** Turn  
**Risk Level:** High  
**Speed Limit:** 15 KM/Hr  
**Coordinates:** 11.45360, 77.25146



**Risk Type:** Blind Spot  
**Risk Level:** Blind Spot  
**Speed Limit:** 10 KM/Hr  
**Coordinates:** 11.45280, 77.25178





**Risk Type:** Turn

**Risk Level:** High

**Speed Limit:** 15 KM/Hr

**Coordinates:** 11.45322, 77.24737



**Risk Type:** Blind Spot

**Risk Level:** Blind Spot

**Speed Limit:** 10 KM/Hr

**Coordinates:** 11.42255, 77.23252

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