

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to BEST FUELS

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:

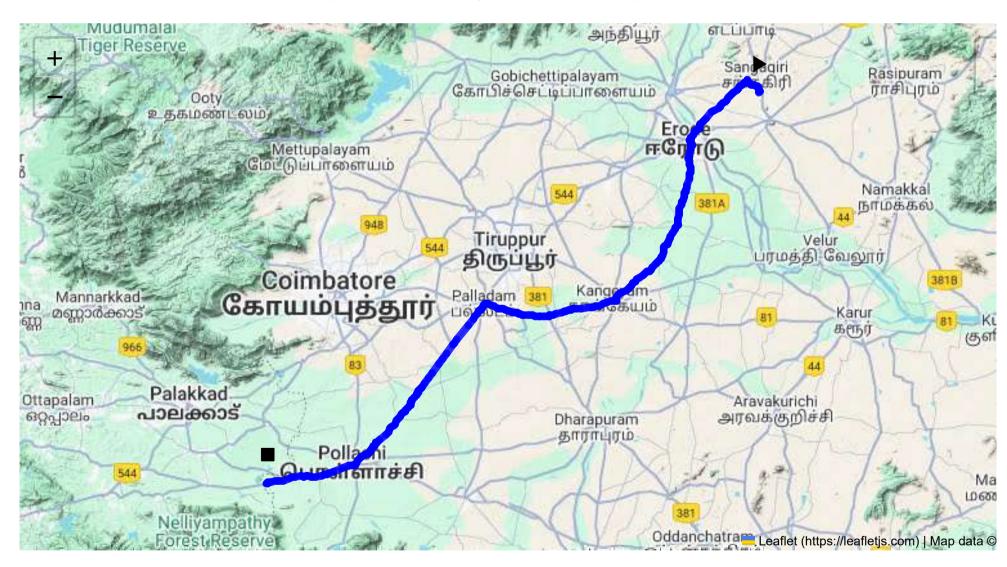
Total Distance: 173.23 km

Estimated Duration: 3.9 hours

Adjusted Duration (Heavy Vehicle): 4.9 hours

Start: (11.4381, 77.8734)

End: (10.6178379, 76.8220171)



Welcome to the Journey Risk Management Study

Route Safety Analysis: Sangagiri to Vanjiyapuram Kalam via Erode and Kangeyam

1. **Overview of the Route Map:** The route from Sangagiri, encompassing Attur-Rasipuram-Erode Road and finally merging into the Nagapattinam-Coimbatore-Gundlupet Highway, traverses through urban and semi-urban areas, with a total distance of approximately 173.23 kilometers. The route passes

through notable towns like Erode and Kangeyam before reaching the destination in Ganapathipalayam.

2. Weather Conditions and Potential Hazards: Tamil Nadu's climate is typically hot and humid, with significant variations due to monsoonal influences. The southwest monsoon (June to September) may cause heavy rainfall, leading to slippery roads and reduced visibility. Occasional cyclonic weather conditions can also disrupt travel.

3. Traffic Patterns:

- **Erode**: Expect high traffic density during morning (8-10 AM) and evening (6-8 PM) peak hours, especially around Erode due to its commercial activity.
- Congestion: Noted around Erode and Kangeyam, especially in market areas and near industrial zones.

4. Road Quality and Infrastructure:

- Major sections of the route, such as Attur-Rasipuram-Erode Road and parts of NH-83, are wellmaintained with standard lane markings.
- Secondary roads in rural areas may have potholes and uneven surfaces; caution is advised.

5. Alternative Routes for Emergencies:

- For Erode Congestion: Consider bypass roads parallel to city centers.
- For Kangeyam Detours: Route through nearby smaller towns like Vellakoil for temporary relief but note possible road width constraints.

6. Regulations on Hazardous Material Transport:

- Compliance with Tamil Nadu State Transport norms is required, including designated hazardous material routes.
- Restrictions may occur in certain urban areas during peak trading hours to reduce risk.

7. Historical Incidents:

- Occasional reports of heavy vehicle accidents due to driver fatigue or mechanical failures.
- Past incidents have highlighted the need for increased safety measures on Erode to Kangeyam segments.

8. Environmental Considerations:

- Several sensitive ecological areas throughout the route require careful navigation, particularly around agricultural lands and water bodies.
- Adhere to regulations regarding emissions and spill management, especially near populated areas.

9. Communication Coverage:

- Generally good along major roads; however, signal strength may weaken in rural segments,
 particularly near hilly or forested stretches.
- Mobile network reliability is crucial for real-time navigation and emergency communications.

10. Emergency Response Times:

Urban Areas (e.g., Erode): Emergency services can reach within 15-30 minutes.

• Rural Sections: Response may take 45-60 minutes; plan accordingly and use emergency contacts.

11. Overall Risk Assessment Summary:

- **Moderate Risk**: Main risks involve heavy traffic in urban centers, possible weather-related delays, and condition of secondary rural roads.
- **Mitigation Measures**: Plan for off-peak travel when possible, ensure constant communication, adhere to regulatory standards, and conduct prior vehicle maintenance checks.

The analysis concludes that while the route is generally safe, prudent strategies in timing, vehicle handling, and adherence to local regulations will minimize risks associated with transporting hazardous materials.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.37086, 77.74828	15 KM/Hr
1	Roundabout	High	11.00065, 77.56884	15 KM/Hr
2	Roundabout	High	10.65701, 77.01165	15 KM/Hr
3	Turn	High	11.43968, 77.87345	15 KM/Hr
4	Turn	High	11.44077, 77.87533	15 KM/Hr
5	Turn	High	11.44898, 77.87410	15 KM/Hr
6	Turn	High	11.45352, 77.85698	15 KM/Hr
7	Turn	Medium	11.45764, 77.85219	30 KM/Hr
8	Blind Spot	Blind Spot	11.46303, 77.84945	10 KM/Hr
9	Turn	Medium	11.36498, 77.74811	30 KM/Hr
10	Turn	Medium	11.36244, 77.74673	30 KM/Hr
11	Turn	Medium	11.35874, 77.73842	30 KM/Hr
12	Turn	Medium	11.34269, 77.72866	30 KM/Hr
13	Turn	Medium	11.34109, 77.72832	30 KM/Hr
14	Blind Spot	Blind Spot	11.33920, 77.72902	10 KM/Hr
15	Turn	High	11.33860, 77.72640	15 KM/Hr
16	Turn	High	11.33103, 77.72761	15 KM/Hr
17	Turn	High	11.33084, 77.72867	15 KM/Hr
18	Turn	High	11.32700, 77.73073	15 KM/Hr
19	Turn	High	11.32421, 77.72727	15 KM/Hr
20	Turn	Medium	11.30034, 77.72406	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
21	Turn	Medium	11.28139, 77.72815	30 KM/Hr
22	Turn	Medium	11.23041, 77.71787	30 KM/Hr
23	Turn	Medium	11.22938, 77.71656	30 KM/Hr
24	Turn	Medium	11.22406, 77.71390	30 KM/Hr
25	Turn	Medium	11.16091, 77.70124	30 KM/Hr
26	Turn	Medium	11.12090, 77.67914	30 KM/Hr
27	Turn	Medium	11.11924, 77.67776	30 KM/Hr
28	Turn	High	11.11754, 77.67216	15 KM/Hr
29	Turn	Medium	11.08288, 77.65842	30 KM/Hr
30	Turn	Medium	11.08139, 77.65784	30 KM/Hr
31	Turn	Medium	11.06193, 77.63948	30 KM/Hr
32	Turn	Medium	11.06135, 77.63494	30 KM/Hr
33	Turn	Medium	11.00803, 77.56960	30 KM/Hr
34	Turn	High	11.00170, 77.56266	15 KM/Hr
35	Turn	High	11.00168, 77.56264	15 KM/Hr
36	Turn	High	10.97018, 77.42713	15 KM/Hr
37	Turn	High	10.96793, 77.42692	15 KM/Hr
38	Turn	Medium	10.99478, 77.29140	30 KM/Hr
39	Turn	Medium	10.99467, 77.29005	30 KM/Hr
40	Turn	Medium	10.81658, 77.15224	30 KM/Hr
41	Turn	Medium	10.81240, 77.14713	30 KM/Hr
42	Turn	Medium	10.81006, 77.14689	30 KM/Hr
43	Turn	Medium	10.78337, 77.13017	30 KM/Hr
44	Turn	Medium	10.77233, 77.11885	30 KM/Hr
45	Turn	Medium	10.76905, 77.11751	30 KM/Hr
46	Turn	High	10.70369, 77.05651	15 KM/Hr
47	Turn	Medium	10.70116, 77.05569	30 KM/Hr
48	Turn	High	10.69559, 77.05120	15 KM/Hr
49	Turn	Medium	10.69506, 77.04953	30 KM/Hr
50	Turn	High	10.65664, 77.01060	15 KM/Hr
51	Blind Spot	Blind Spot	10.65494, 77.01008	10 KM/Hr
52	Turn	High	10.61882, 76.82367	15 KM/Hr
53	Turn	High	10.61790, 76.82330	15 KM/Hr
54	Turn	Medium	10.61794, 76.82253	30 KM/Hr

Emergency Locations

	type	name	coordinates	speed_limit	risk_level
1	pharmacy	Pharmacy	11.3652161, 77.7486375	30 km/h	Medium
2	hospital	Visaalam Hospitals	11.3651528, 77.747808	30 km/h	Medium
3	hospital	Cheran Hospital	11.3680302, 77.7481976	30 km/h	Medium
4	hospital	Sri Kumaran E N T Hospital	11.3657814, 77.7477763	30 km/h	Medium
5	hospital	Sri Krishna Hospital	11.3656648, 77.7477783	30 km/h	Medium
6	police	Police Station	11.3630177, 77.7476505	30 km/h	Medium
7	hospital	Government Hospital	11.3608508, 77.747453	30 km/h	Medium
9	hospital	Dhanvantri Critical Care Center	11.3504266, 77.7311274	30 km/h	Medium
10	hospital	V K Hospital	11.3513792, 77.7313976	30 km/h	Medium
11	hospital	Kumudha Hospital	11.3467172, 77.7306797	30 km/h	Medium
12	hospital	Dhanvantri Critical Care Centre	11.35099, 77.730508	30 km/h	Medium
13	hospital	Indrajith Yoga Nature Cure Hospital	11.3499973, 77.732974	30 km/h	Medium
15	hospital	City Hospital	11.3451151, 77.7300887	30 km/h	Medium
16	clinic	K.B.N. Nursing Home	11.344835, 77.7310771	30 km/h	Medium
17	clinic	Kpn Nursing Home	11.3437022, 77.7304525	30 km/h	Medium
18	hospital	Kaviraj Ayurveda Hospital	11.3400349, 77.7298199	30 km/h	Medium
19	clinic	M.R Nursing Home	11.3386746, 77.7294262	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
20	hospital	Dr Kokilasekar Nursing Hospital	11.3395874, 77.7269838	30 km/h	Medium
22	hospital	Government Maternity Hospital, Agathiar	11.33716, 77.727075	30 km/h	Medium
23	clinic	Naseer Nursing Home	11.3364485, 77.7271691	30 km/h	Medium
24	hospital	Kumarasamy Hospital	11.334273, 77.7259118	30 km/h	Medium
25	hospital	Thangam Hospital, Erode	11.3340961, 77.7262437	30 km/h	Medium
26	hospital	Vikram Hospital, Erode	11.3356411, 77.7280569	30 km/h	Medium
27	hospital	Shabeer Hospital	11.33529, 77.7285236	30 km/h	Medium
28	hospital	J.B. Clinic And Hospital	11.3351769, 77.7282031	30 km/h	Medium
29	hospital	Dr. R.M. Habibullah Hospital	11.335246, 77.7266028	30 km/h	Medium
30	hospital	Ck Hospital	11.3326562, 77.7282011	30 km/h	Medium
31	hospital	JJ hospital	11.33168, 77.728823	30 km/h	Medium
32	hospital	Jai Maaruthi Hospital	11.332, 77.727272	30 km/h	Medium
33	hospital	Bethesda Hospital	11.3314183, 77.7266231	30 km/h	Medium
34	hospital	Shubiksha Hospital	11.3318174, 77.7299544	30 km/h	Medium
35	hospital	Immick Hospital	11.332617, 77.728073	30 km/h	Medium
36	fire_station	Erode District Fire Station	11.3326366, 77.7272532	30 km/h	Medium
37	hospital	Lotus Hospital	11.3266236, 77.7306301	30 km/h	Medium
38	hospital	Lotus Hospital	11.3259471, 77.7302149	30 km/h	Medium
39	hospital	Sri Jothi Hospitals	11.3217208, 77.7275956	30 km/h	Medium
40	clinic	Monika Diabetes Centre	11.3229084, 77.7269179	30 km/h	Medium
41	clinic	Pulze Health Clinic	11.3179874, 77.7288603	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
42	hospital	Agathiyar Siddha Hospital	11.3174229, 77.7254599	30 km/h	Medium
43	clinic	Vasanth Clinic	11.3195299, 77.727194	30 km/h	Medium
44	hospital	Om Shakthi Hospital	11.3108011, 77.7259973	30 km/h	Medium
45	hospital	Government Hospital	11.2343326, 77.719226	30 km/h	Medium
48	police	Kangeyam Police Station	11.0011411, 77.562688	30 km/h	Medium
49	hospital	J K Hospital	11.0042298, 77.5603345	30 km/h	Medium
52	hospital	Ponni Hospital, Coimbatore	10.9955604, 77.2887151	30 km/h	Medium
53	hospital	Balaji Hospital	10.9936939, 77.2849449	30 km/h	Medium
54	clinic	Syndhiya Ortho Clinic	10.6663252, 77.0158674	30 km/h	Medium
55	clinic	J M Polyclinic	10.6621816, 77.012638	30 km/h	Medium
56	clinic	Pkd Nursing Home	10.6577822, 77.011376	30 km/h	Medium
57	clinic	Surya Polyclinic	10.6626982, 77.0122866	30 km/h	Medium
58	hospital	Ar Ortho Hospital	10.6622765, 77.0125401	30 km/h	Medium
59	hospital	Surya Hospital, Pollachi	10.6627371, 77.0122918	30 km/h	Medium
60	hospital	Arun Hospital, Pollachi	10.6625657, 77.0129734	30 km/h	Medium
61	hospital	Government Hospital, Pollachi	10.6581617, 77.0098249	30 km/h	Medium
63	police	Police Station	10.6571159, 77.0083512	30 km/h	Medium
64	clinic	PKD Nursing Home	10.65723, 77.0074748	30 km/h	Medium
67	hospital	Aalva Hospital	10.6378336, 76.950131	30 km/h	Medium

Crowded Spots

	type	name	coordinates	speed_limit	risk_level
0	school	Ssri Valliappa Vidhayalayam mat hr school	11.4004878, 77.7794381	30 km/h	Medium
8	marketplace	Weekly Market	11.3605669, 77.7488199	30 km/h	Medium
14	school	Municipality Girls Higher secondary school	11.3495618, 77.7325011	30 km/h	Medium
21	school	E.V.R. Govt Girls Hr. Sec School	11.3371265, 77.7266283	30 km/h	Medium
46	college	Government Arts and Science College, Kangeyam	11.0626738, 77.636227	30 km/h	Medium
47	school	Carmel Girls Higher Secondary School	11.0009019, 77.5710182	30 km/h	Medium
50	school	PVKN Higher Secondary School	10.9711766, 77.3699335	30 km/h	Medium
51	school	Pongalur Uppathiyar Venkadasamy Naidu Elementry School	10.9703113, 77.3693546	30 km/h	Medium
62	school	Govt. Girls Higher Secondary School	10.6534699, 77.0088777	30 km/h	Medium
65	school	Shenbagam Matriculation Higher Secondary School	10.6492585, 76.9829288	30 km/h	Medium
66	school	Nachiar Vidyalam Higher Secondary School	10.6481192, 76.980423	30 km/h	Medium

Route Photos of Risky Spots



Risk Type: Roundabout
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.37086, 77.74828



Risk Type: Roundabout
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.00065, 77.56884

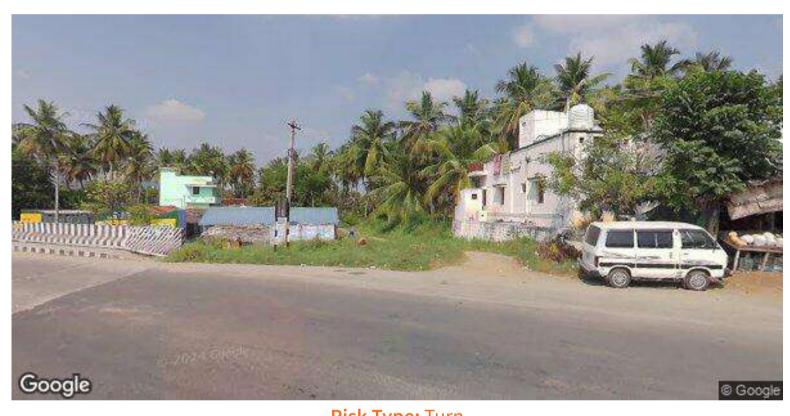


Risk Type: Roundabout
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.65701, 77.01165



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.44077, 77.87533



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.44898, 77.87410

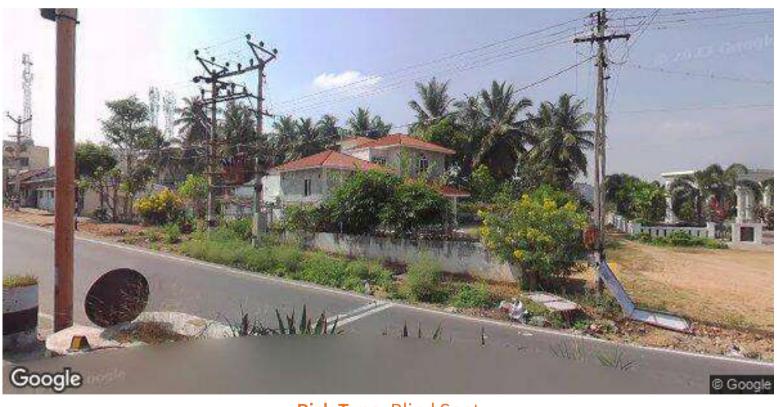


Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.45352, 77.85698

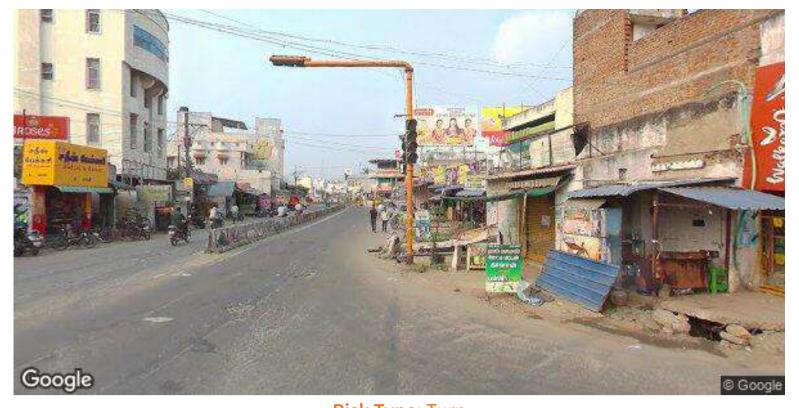


Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.45764, 77.85219



Risk Type: Blind Spot Risk Level: Blind Spot Speed Limit: 10 KM/Hr

Coordinates: 11.46303, 77.84945



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.36498, 77.74811



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.36244, 77.74673



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 11.35874, 77.73842



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 11.34269, 77.72866



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 11.34109, 77.72832



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.33920, 77.72902



Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.33860, 77.72640



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.33103, 77.72761



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.33084, 77.72867



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.32700, 77.73073



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.32421, 77.72727



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.30034, 77.72406



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 11.28139, 77.72815



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.23041, 77.71787



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.22938, 77.71656



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.22406, 77.71390



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.16091, 77.70124



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 11.12090, 77.67914



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.11924, 77.67776



Risk Type. Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.11754, 77.67216



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.08288, 77.65842



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.08139, 77.65784

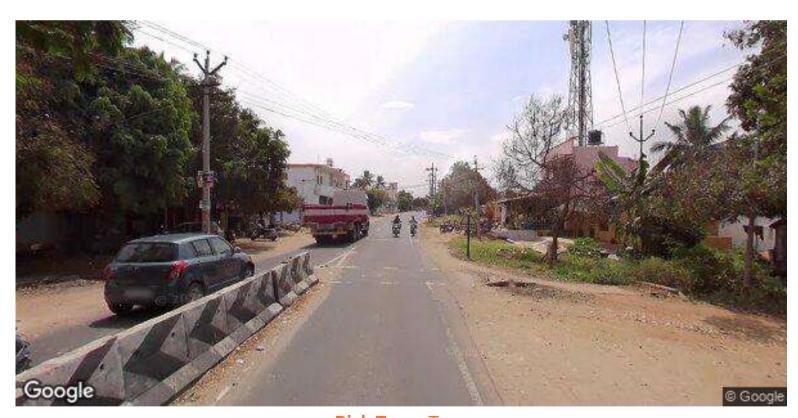


Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 11.06193, 77.63948



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.06135, 77.63494



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.00803, 77.56960



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 11.00170, 77.56266



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.00168, 77.56264



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.97018, 77.42713



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.96793, 77.42692



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 10.99478, 77.29140



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.99467, 77.29005



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.81658, 77.15224



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 10.81240, 77.14713



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 10.81006, 77.14689



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.78337, 77.13017



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.77233, 77.11885



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.76905, 77.11751



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.70369, 77.05651



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr

Coordinates: 10.70116, 77.05569

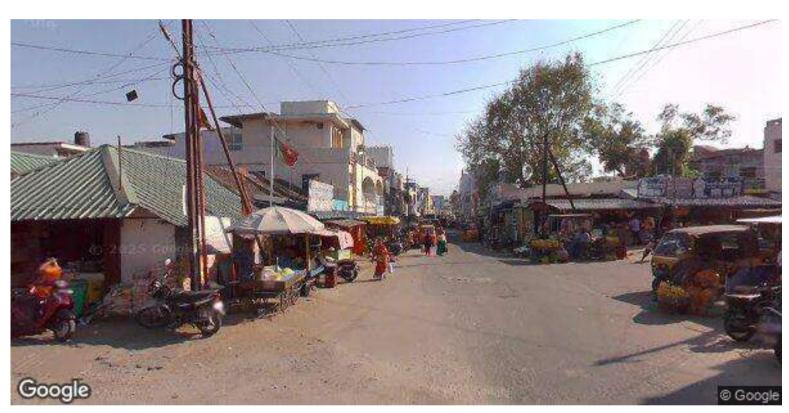


Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.69559, 77.05120



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 10.69506, 77.04953



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 10.65664, 77.01060



Risk Type: Blind Spot Risk Level: Blind Spot Speed Limit: 10 KM/Hr

Coordinates: 10.65494, 77.01008



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.61882, 76.82367



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr

Coordinates: 10.61790, 76.82330