

JOURNEY RISK MANAGEMENT (JRM) STUDY

Salem Terminal to BALAJI OILS

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.



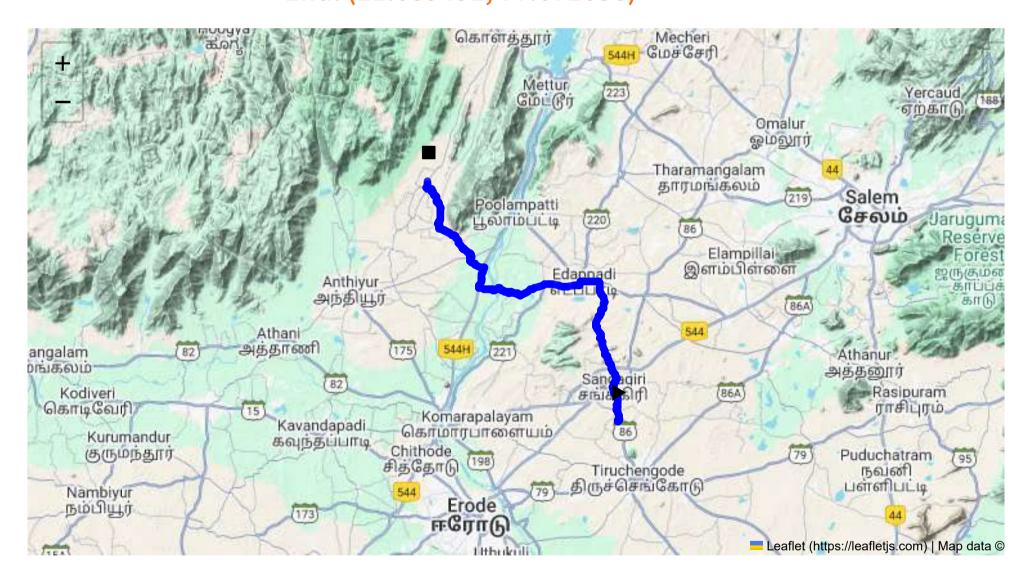
Route Summary:

Total Distance: 50.68 km

Estimated Duration: 1.4 hours

Adjusted Duration (Heavy Vehicle): 1.8 hours

Start: (11.4381, 77.8734) End: (11.689492, 77.671036)



Welcome to the Journey Risk Management Study

Risk Assessment Report for Route from Sangagiri to MMQC+RC9, Tamil Nadu

1. Overview of the Route Map

The route from Sangagiri, Tamil Nadu to MMQC+RC9 spans approximately 50.68 kilometers, primarily utilizing state highways and arterial roads. The path likely traverses through rural areas, agricultural lands, and small towns, with a mix of two-lane roads and potentially narrower village roads.

2. Typical Weather Conditions and Potential Hazards

• **Weather Conditions:** Tamil Nadu experiences a tropical climate, with significant variation between the wet and dry seasons.

Potential Hazards:

- Monsoon Rains (June to September): Heavy rainfall can lead to waterlogging and road surface deterioration.
- Visibility Issues: Occasional fog or mist during early mornings in the winter months can impair visibility.

3. Traffic Patterns

- Peak Hours: Typically, peak traffic hours are in the mornings (8-10 AM) and evenings (6-8 PM),
 especially closer to urban centers.
- Congestion-Prone Areas: Watch for congestion near Sangagiri town center and marketplaces. Small town junctions could also be significant bottlenecks.

4. Assessment of Road Quality and Infrastructure

- Road Quality: Varies from good on major highways to potentially poor in rural segments. Expect potholes and uneven surfaces in less maintained stretches.
- Infrastructure: Limited lighting in rural areas, infrequent signage, and narrow bridges could be challenges.

5. Suggestions for Alternative Routes

- Main Alternate: Utilize national highways if accessible nearby, which might involve a detour but offer better infrastructure and safety.
- Local Detours: Identify major villages for alternative pathways in case of a roadblock or accident.

6. Summary of Local Regulations

 Hazardous Material Transport: Tamil Nadu enforces strict regulations such as designated times for hazardous materials transport and requires permits. Ensure compliance with Tamil Nadu MVD guidelines.

7. Historical Incidents

• **Heavy Vehicle Accidents:** Overall, incidents are more frequent during monsoon season due to slippery conditions. Historical data might not be abundant but expect increased risk around bends and curves.

8. Environmental Considerations

- Sensitive Areas: Proximity to any wildlife sanctuaries or water bodies should be noted.
- **Spill Risks:** Ensure measures for spill containment near agricultural lands or water bodies to prevent pollution.

9. Communication Coverage

- Potential Dead Zones: Rural routes may have patches of poor mobile network coverage, especially away from major towns.
- Coverage Quality: Varies by provider; drivers should confirm network availability.

10. Estimated Emergency Response Times

- **Urban Segments:** Typically faster response times due to closer proximity to towns, averaging 30-40 minutes.
- Rural Segments: Can be significantly longer, ranging from 60 90 minutes depending on access and weather conditions.

11. Summary of Risk Assessment

- Overall Risk Level: Moderate to High, influenced by variable road conditions, weather impact, traffic patterns, and rural nature.
- **Key Risks:** Include poor road infrastructure in rural areas, weather-induced hazards, and possible communication shortfalls.

Recommendations:

- Equip trucks with necessary gear for quick response in emergencies, like spill kits and first aid.
- Plan trips to avoid peak congestion and poor weather.
- Maintain strict adherence to regulated hours and permits.

Continual reassessment is necessary to update this analysis, accounting for improvements in infrastructure, weather pattern changes, or policy updates.

Risk Assessment - Turns

	Risk Type	Risk Level	Coordinates	Speed Limit
0	Roundabout	High	11.58435, 77.83651	15 KM/Hr
1	Turn	Medium	11.43822, 77.87348	30 KM/Hr
2	Turn	High	11.43968, 77.87345	15 KM/Hr
3	Turn	High	11.44029, 77.87544	15 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
4	Turn	High	11.44898, 77.87410	15 KM/Hr
5	Turn	High	11.45007, 77.87201	15 KM/Hr
6	Turn	Medium	11.46392, 77.87328	30 KM/Hr
7	Turn	Medium	11.47391, 77.86844	30 KM/Hr
8	Turn	Medium	11.47412, 77.86848	30 KM/Hr
9	Turn	High	11.47460, 77.86913	15 KM/Hr
10	Turn	Medium	11.47915, 77.86989	30 KM/Hr
11	Turn	Medium	11.48066, 77.87166	30 KM/Hr
12	Turn	Medium	11.48150, 77.87172	30 KM/Hr
13	Turn	High	11.48267, 77.87250	15 KM/Hr
14	Turn	Medium	11.49490, 77.86661	30 KM/Hr
15	Turn	Medium	11.52551, 77.85524	30 KM/Hr
16	Turn	Medium	11.52759, 77.85585	30 KM/Hr
17	Turn	Medium	11.55481, 77.85639	30 KM/Hr
18	Turn	Medium	11.56389, 77.85969	30 KM/Hr
19	Turn	Medium	11.58508, 77.85281	30 KM/Hr
20	Turn	High	11.58533, 77.83450	15 KM/Hr
21	Turn	Medium	11.58157, 77.83303	30 KM/Hr
22	Turn	Medium	11.58097, 77.83247	30 KM/Hr
23	Turn	High	11.57013, 77.76998	15 KM/Hr
24	Turn	Medium	11.57220, 77.76682	30 KM/Hr
25	Turn	Medium	11.57293, 77.76202	30 KM/Hr
26	Turn	Medium	11.57469, 77.75975	30 KM/Hr
27	Turn	High	11.57479, 77.75941	15 KM/Hr
28	Turn	Medium	11.57439, 77.75894	30 KM/Hr
29	Turn	High	11.57329, 77.75850	15 KM/Hr
30	Turn	Medium	11.57324, 77.75818	30 KM/Hr
31	Turn	Medium	11.57349, 77.75755	30 KM/Hr
32	Turn	Medium	11.57332, 77.75714	30 KM/Hr
33	Turn	Medium	11.57398, 77.75535	30 KM/Hr
34	Turn	Medium	11.57490, 77.75116	30 KM/Hr
35	Turn	Medium	11.57567, 77.75065	30 KM/Hr
36	Turn	High	11.57781, 77.74745	15 KM/Hr
37	Turn	Medium	11.57769, 77.74570	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
38	Turn	Medium	11.57514, 77.74101	30 KM/Hr
39	Turn	Medium	11.57526, 77.74068	30 KM/Hr
40	Turn	Medium	11.57576, 77.74019	30 KM/Hr
41	Turn	High	11.57674, 77.74005	15 KM/Hr
42	Turn	High	11.57833, 77.72536	15 KM/Hr
43	Turn	High	11.59953, 77.73130	15 KM/Hr
44	Turn	Medium	11.59990, 77.73076	30 KM/Hr
45	Turn	Medium	11.60202, 77.72111	30 KM/Hr
46	Turn	Medium	11.60221, 77.72100	30 KM/Hr
47	Turn	Medium	11.60310, 77.72111	30 KM/Hr
48	Turn	Medium	11.60354, 77.72086	30 KM/Hr
49	Turn	Medium	11.60524, 77.71671	30 KM/Hr
50	Turn	Medium	11.60645, 77.71646	30 KM/Hr
51	Blind Spot	Blind Spot	11.61016, 77.71751	10 KM/Hr
52	Turn	High	11.60984, 77.71612	15 KM/Hr
53	Turn	Medium	11.61003, 77.71605	30 KM/Hr
54	Blind Spot	Blind Spot	11.61277, 77.71687	10 KM/Hr
55	Turn	High	11.61331, 77.71567	15 KM/Hr
56	Turn	High	11.61428, 77.71584	15 KM/Hr
57	Turn	High	11.61541, 77.71369	15 KM/Hr
58	Turn	High	11.61601, 77.71382	15 KM/Hr
59	Turn	Medium	11.61803, 77.71008	30 KM/Hr
60	Turn	Medium	11.61885, 77.70960	30 KM/Hr
61	Turn	Medium	11.62502, 77.70417	30 KM/Hr
62	Turn	High	11.63947, 77.68504	15 KM/Hr
63	Turn	Medium	11.64002, 77.68470	30 KM/Hr
64	Turn	Medium	11.64097, 77.68330	30 KM/Hr
65	Turn	Medium	11.64356, 77.68340	30 KM/Hr
66	Turn	High	11.64530, 77.68200	15 KM/Hr
67	Turn	Medium	11.64851, 77.68314	30 KM/Hr
68	Turn	Medium	11.64917, 77.68396	30 KM/Hr
69	Turn	High	11.66196, 77.68444	15 KM/Hr
70	Turn	Medium	11.66216, 77.68420	30 KM/Hr
71	Turn	Medium	11.66603, 77.68232	30 KM/Hr

	Risk Type	Risk Level	Coordinates	Speed Limit
72	Turn	High	11.66670, 77.68238	15 KM/Hr
73	Turn	High	11.66702, 77.68142	15 KM/Hr
74	Turn	Medium	11.66772, 77.68151	30 KM/Hr
75	Turn	High	11.66792, 77.68140	15 KM/Hr
76	Turn	High	11.66833, 77.67995	15 KM/Hr
77	Turn	High	11.67415, 77.67985	15 KM/Hr
78	Turn	High	11.67475, 77.67827	15 KM/Hr
79	Turn	Medium	11.67567, 77.67811	30 KM/Hr
80	Turn	Medium	11.67747, 77.67647	30 KM/Hr
81	Turn	High	11.67923, 77.67607	15 KM/Hr
82	Turn	High	11.67982, 77.67463	15 KM/Hr
83	Turn	High	11.68116, 77.67475	15 KM/Hr
84	Turn	Medium	11.68199, 77.67245	30 KM/Hr
85	Turn	Medium	11.68188, 77.67207	30 KM/Hr
86	Blind Spot	Blind Spot	11.68269, 77.66971	10 KM/Hr

Emergency Locations

	type	name	coordinates	speed_limit	risk_level
0	police	Police Quarters	11.4741243, 77.8673495	30 km/h	Medium
1	hospital	Thilagam Hospital	11.4753573, 77.8685829	30 km/h	Medium
2	clinic	Meyyazhagan Clinic	11.4752254, 77.8685671	30 km/h	Medium
3	hospital	Dr. Jaganathan Hospital	11.4752717, 77.8709312	30 km/h	Medium
4	hospital	Kathir Eye Hospital	11.4740976, 77.8681591	30 km/h	Medium
7	hospital	Sankari Hospital	11.4777496, 77.873892	30 km/h	Medium
8	hospital	KRS Hospital and Diabetic Centre	11.5848828, 77.8449664	30 km/h	Medium
9	hospital	Kannan Hospital	11.5854802, 77.8425936	30 km/h	Medium
10	hospital	Aravind Hospital	11.5854615, 77.8424165	30 km/h	Medium
11	hospital	Muthu Eyecare Hospital	11.584736, 77.8393794	30 km/h	Medium
12	clinic	Uma Clinic	11.58398, 77.83977	30 km/h	Medium
13	clinic	KGP Clinic	11.5847763, 77.8387488	30 km/h	Medium
14	hospital	Government Hospital, Edapadi	11.5848264, 77.8380174	30 km/h	Medium

	type	name	coordinates	speed_limit	risk_level
15	hospital	Sri Sankar Hospital	11.5862984, 77.8355021	30 km/h	Medium
16	hospital	Sri Advika Hospital	11.585049, 77.834422	30 km/h	Medium
17	clinic	Xcellent Homecare Clinic	11.584762, 77.8338085	30 km/h	Medium
18	clinic	Raj Physiotherapy Clinic	11.5857357, 77.8341218	30 km/h	Medium
19	hospital	Dr. O.S. Subramanium Hospital	11.584996, 77.834235	30 km/h	Medium
20	hospital	Aravinthu Eye Hospital	11.5866631, 77.8341465	30 km/h	Medium
21	hospital	Mohan Hospital	11.5841331, 77.8336277	30 km/h	Medium
22	hospital	Pachiappa Hospital	11.58571, 77.833131	30 km/h	Medium
23	hospital	SKM Hospital	11.5841611, 77.8334397	30 km/h	Medium
24	hospital	Nivetha Hospital	11.5858509, 77.833451	30 km/h	Medium
25	clinic	Krishna Hospital and Clinic	11.5846542, 77.8333239	30 km/h	Medium
26	hospital	Rathanasamy Hospital	11.58583, 77.833443	30 km/h	Medium
27	hospital	Arunagiri Hospital	11.5837095, 77.8332129	30 km/h	Medium
28	clinic	Rakshan Polyclinic	11.5809367, 77.8326223	30 km/h	Medium
29	hospital	Siddha Hospital	11.5827668, 77.8022539	30 km/h	Medium
30	hospital	Sri Shankar Hospital	11.5780699, 77.7471671	30 km/h	Medium
31	hospital	Government Hospital, Guruvareddyur	11.6468761, 77.6822366	30 km/h	Medium

Crowded Spots

	type	name	coordinates	speed_limit	risk_level
5	school	Goverment Boys Higher Secondary School	11.477659, 77.8659632	30 km/h	Medium
6	marketplace	Sunday Market	11.4796502, 77.8708458	30 km/h	Medium

Route Photos of Risky Spots



Risk Type: Roundabout
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.58435, 77.83651



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.44029, 77.87544



Coordinates: 11.44898, 77.87410



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

Coordinates: 11.45007, 77.87201



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.46392, 77.87328



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.47391, 77.86844



Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.47412, 77.86848



Coordinates: 11.47460, 77.86913



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

Coordinates: 11.47915, 77.86989



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.48066, 77.87166



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.48150, 77.87172



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.48267, 77.87250



Coordinates: 11.49490, 77.86661



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.52551, 77.85524



Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.52759, 77.85585



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.55481, 77.85639



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.56389, 77.85969

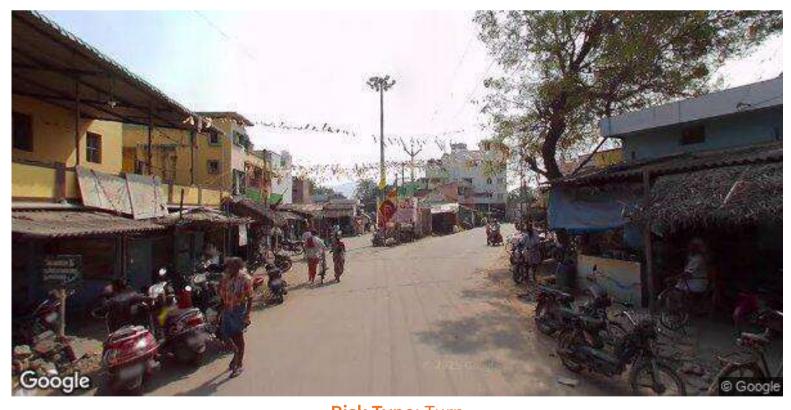


Coordinates: 11.58508, 77.85281



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

Coordinates: 11.58533, 77.83450



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.58157, 77.83303



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.58097, 77.83247



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

Coordinates: 11.57013, 77.76998



Coordinates: 11.57220, 77.76682



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

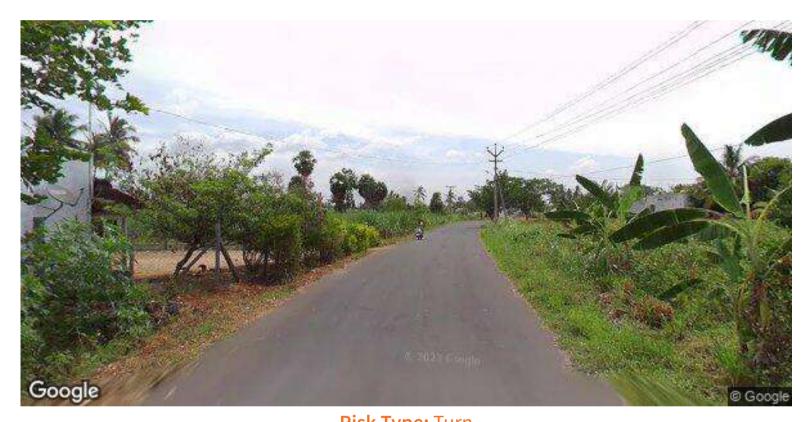
Coordinates: 11.57293, 77.76202



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57469, 77.75975



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.57479, 77.75941



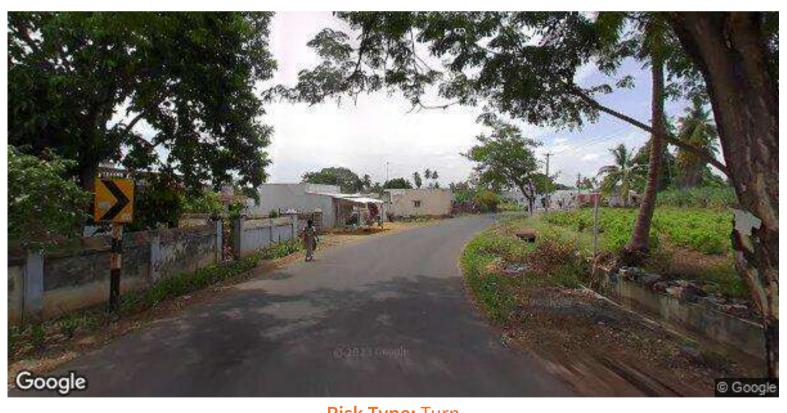
Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57439, 77.75894



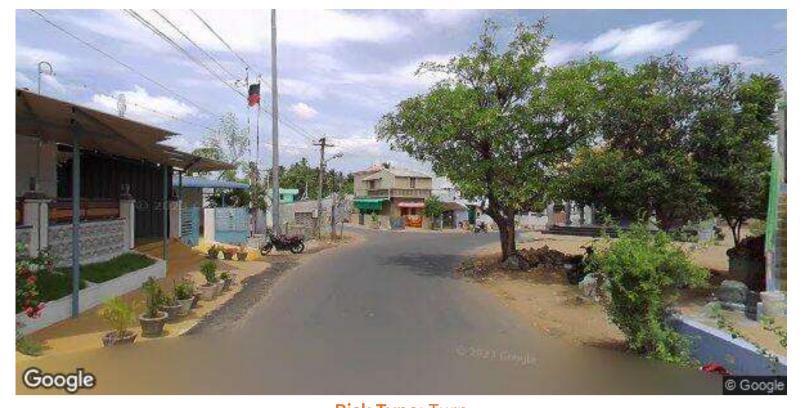
Coordinates: 11.57329, 77.75850



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57324, 77.75818



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57349, 77.75755



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57332, 77.75714



Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57398, 77.75535



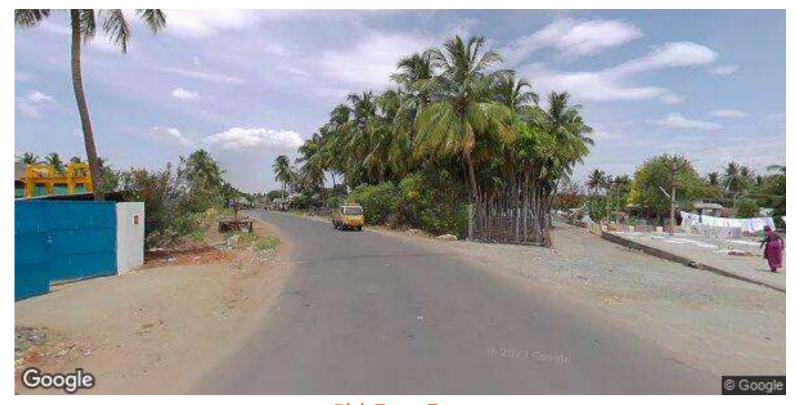
Coordinates: 11.57490, 77.75116



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57567, 77.75065



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.57781, 77.74745



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57769, 77.74570



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57514, 77.74101



Coordinates: 11.57526, 77.74068



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.57576, 77.74019



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

Coordinates: 11.57674, 77.74005

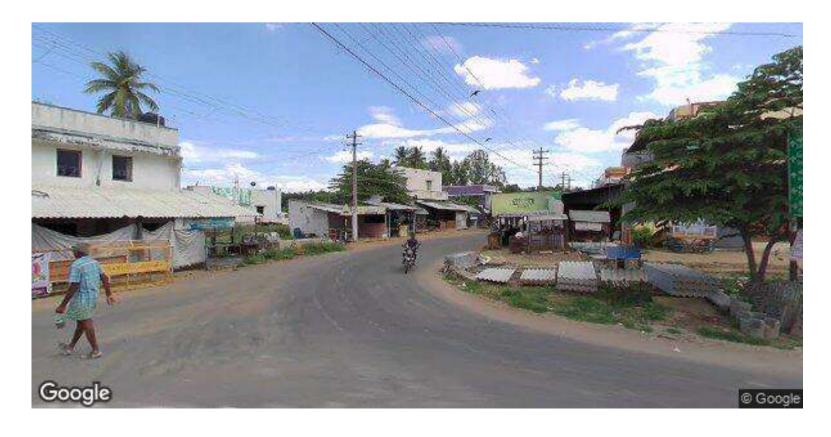


Coordinates: 11.57833, 77.72536



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

Coordinates: 11.59953, 77.73130



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

Coordinates: 11.61016, 77.71751



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

Coordinates: 11.60984, 77.71612



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

Coordinates: 11.61003, 77.71605



Risk Type: Blind Spot
Risk Level: Blind Spot
Speed Limit: 10 KM/Hr
Coordinates: 11.61277, 77.71687



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.61331, 77.71567

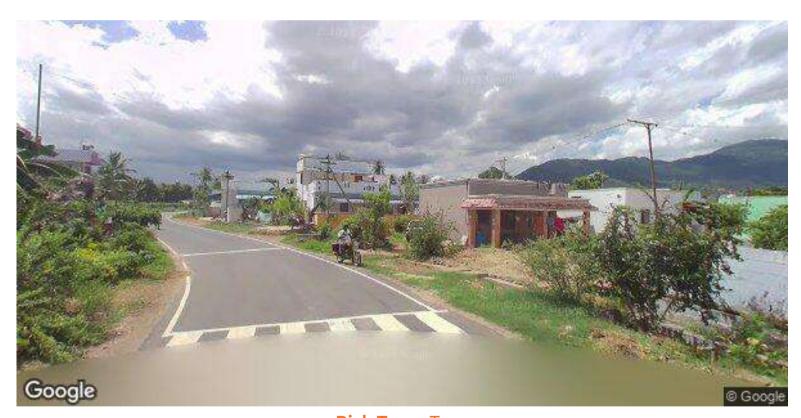


Coordinates: 11.61428, 77.71584



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

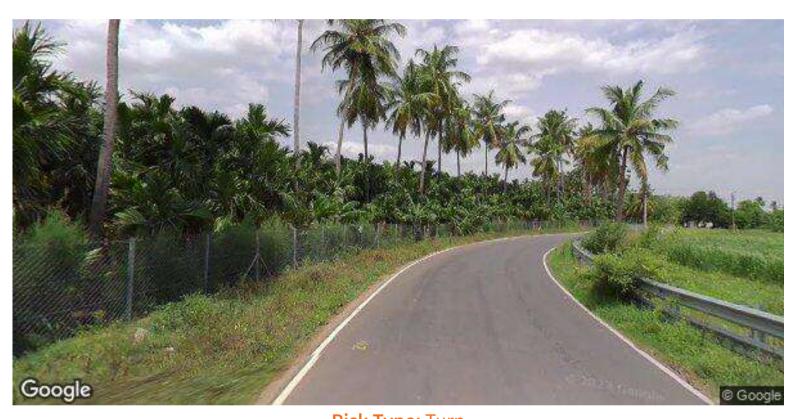
Coordinates: 11.61541, 77.71369



Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.61601, 77.71382



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.61803, 77.71008



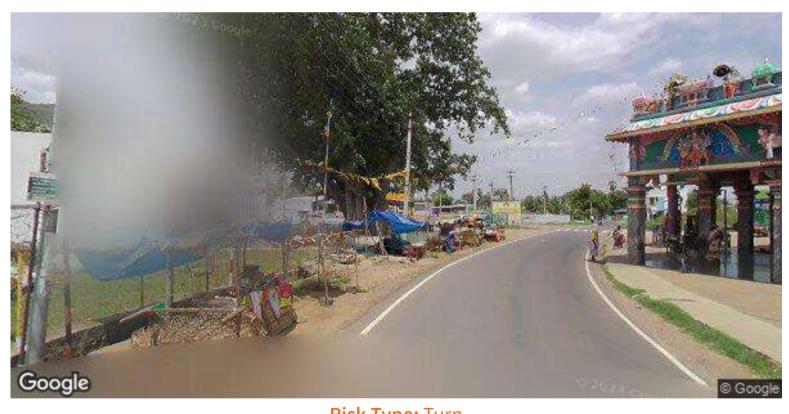
Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.61885, 77.70960



Coordinates: 11.62502, 77.70417



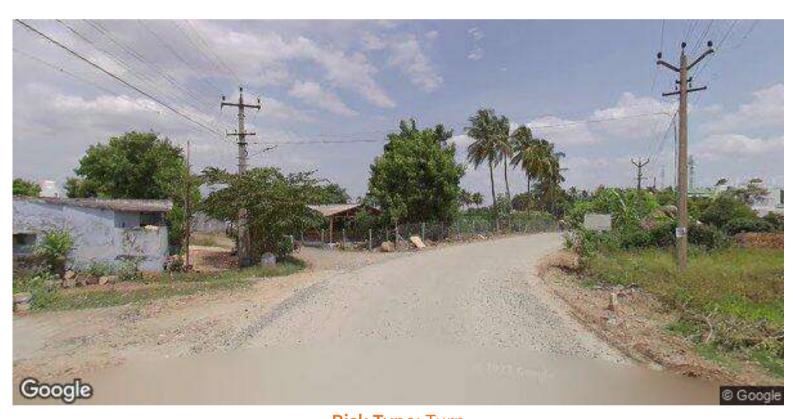
Risk Type: Turn
Risk Level: High
Speed Limit: 15 KM/Hr
Coordinates: 11.63947, 77.68504



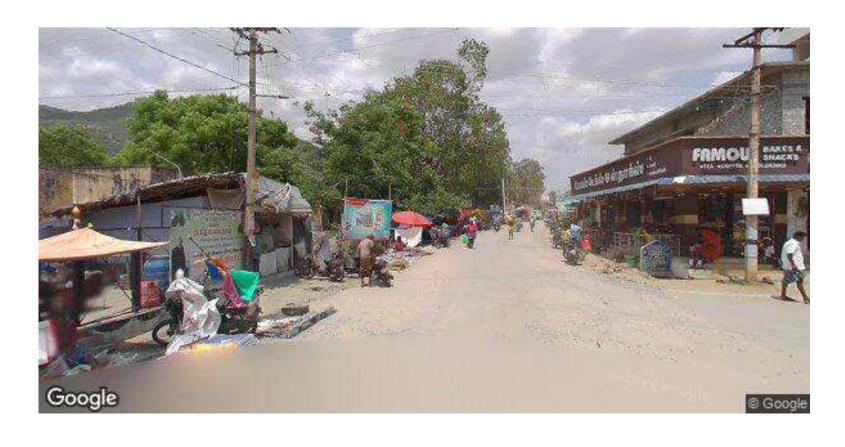
Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.64002, 77.68470



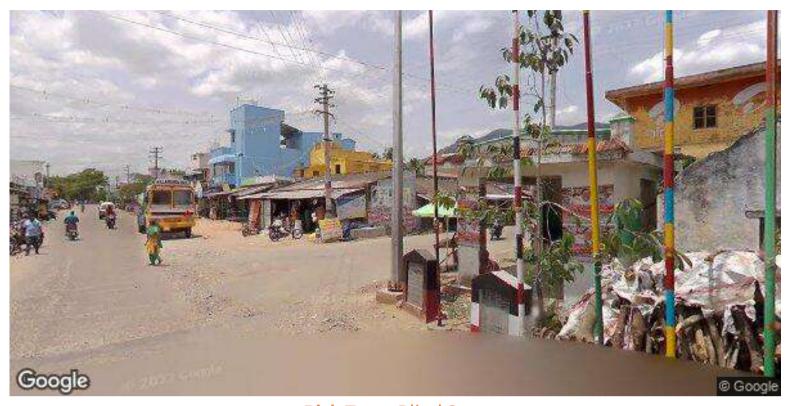
Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.64097, 77.68330



Risk Type: Turn
Risk Level: Medium
Speed Limit: 30 KM/Hr
Coordinates: 11.64356, 77.68340



Coordinates: 11.64530, 77.68200



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

Coordinates: 11.68269, 77.66971