

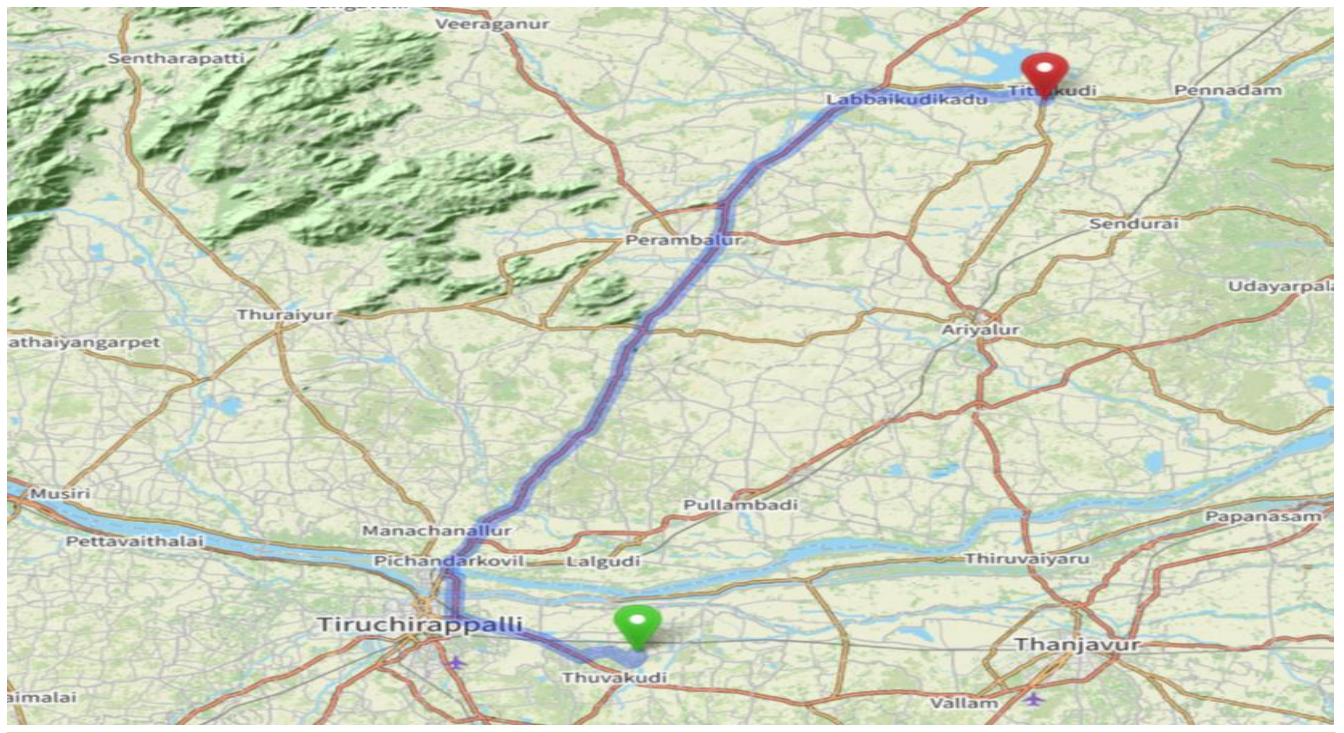
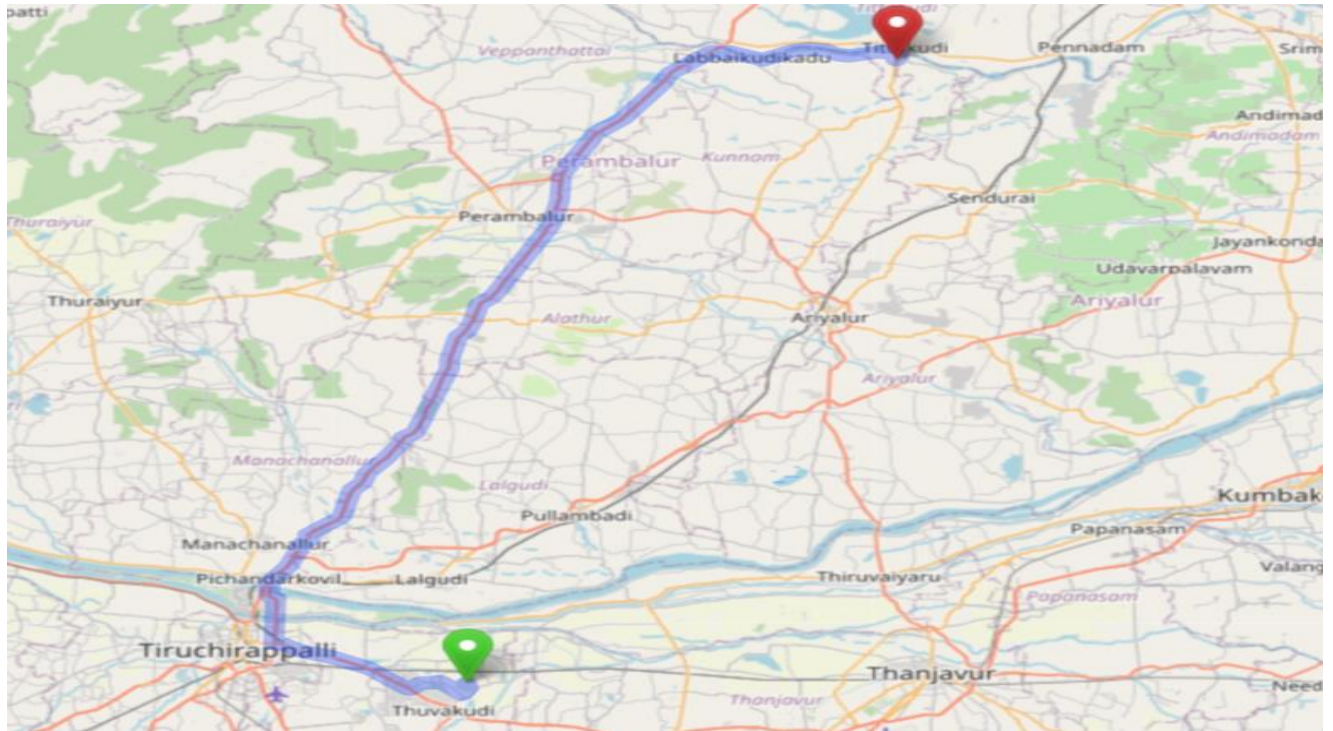


IndianOil

WELCOME TO JOURNEY
RISK MANAGEMENT
(JRM) STUDY USING
ARTIFICIAL
INTELLIGENCE (AI)
FOR IOCL TRICHY
TERMINAL

JOURNEY RISK MANAGEMENT STUDY REPORT

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO THIRUMALAI AGENCY (11.389735 , 79.114791), TOTAL DISTANCE -109 KM



Welcome to the Journey Risk Management Study for THIRUMALAI AGENCY

Total distance: 109km; Start with: (10.7753, 78.8368), End with: (11.389735, 79.114791)

❖ Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) To THIRUMALAI AGENCY. The route passes through several key points including Ayampatti road, Trich Grand Southern Trunk Road (NH38) y Tanjore, Tiruchchirappalli Bypass (NH38), Sendurai - Anganur - Agaram Seegore - Thirumandurai Road (MDR1121), Mathur - Thittakudi Road,

and Total distance from Trichy Terminal To THIRUMALAI AGENCY is 109km for heavy vehicles carrying hazardous materials.

Typical Weather Conditions and Potential Weather-related Hazards

Weather Conditions: Trichy Terminal (T.N) To THIRUMALAI AGENCY experiences a tropical climate with heavy monsoon rains from June to September, high humidity, and moderate temperatures throughout the year, The summers are short and sweltering; the winters are short, cool, and dry; and it is mostly clear year-round. Over the course of the year, the temperature typically varies from 60.8°F to 110°F and is rarely below 60.8°F to 110°F.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0 (91.4)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	43.0 (109.4)	42.0 (107.6)	40.0 (104.0)	39.0 (102.2)	38.0 (100.4)	37.0 (98.6)	34.0 (93.2)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.18)	36.0 (96.8)	38.27 (100.89)	38.79 (101.82)	36.78 (98.2)	36.17 (97.11)	35.4 (95.72)	35.03 (95.05)	32.9 (91.22)	30.38 (86.68)	29.34 (84.81)	34.35 (93.83)
Daily mean °C (°F)	26.57 (79.83)	28.67 (83.61)	31.87 (89.37)	34.46 (94.03)	35.18 (95.32)	33.45 (92.21)	32.92 (91.26)	32.18 (89.92)	31.78 (89.2)	29.86 (85.75)	27.44 (81.39)	26.32 (79.38)	30.89 (87.6)
Average low °C (°F)	19.88 (67.78)	20.93 (69.67)	24.04 (75.27)	27.62 (81.72)	28.89 (84.0)	27.59 (81.66)	27.04 (80.67)	26.45 (79.61)	25.95 (78.71)	24.64 (76.35)	22.43 (72.37)	20.93 (69.67)	24.7 (76.46)
Record low °C (°F)	16.0 (60.8)	17.0 (62.6)	19.0 (66.2)	22.0 (71.6)	25.0 (77.0)	25.0 (77.0)	24.0 (75.2)	23.0 (73.4)	22.0 (71.6)	21.0 (69.8)	18.0 (64.4)	17.0 (62.6)	16.0 (60.8)
Average precipitation mm (inches)	12.32 (0.49)	20.82 (0.82)	26.34 (1.04)	57.63 (2.27)	102.32 (4.03)	61.68 (2.43)	63.88 (2.51)	124.75 (4.91)	141.74 (5.58)	231.04 (9.1)	159.62 (6.28)	71.08 (2.8)	89.44 (3.52)
Average precipitation days (≥ 1.0 mm)	3.09	3.27	5.36	7.36	16.73	12.36	13.55	18.91	19.64	22.73	17.55	9.73	12.52
Average relative humidity (%)	72.01	65.19	58.27	53.97	51.56	50.59	51.14	56.11	60.33	70.18	77.39	76.61	61.95
Mean monthly sunshine hours	11.19	11.34	11.34	11.63	12.65	12.68	11.83	11.24	11.05	9.11	7.68	8.29	10.84

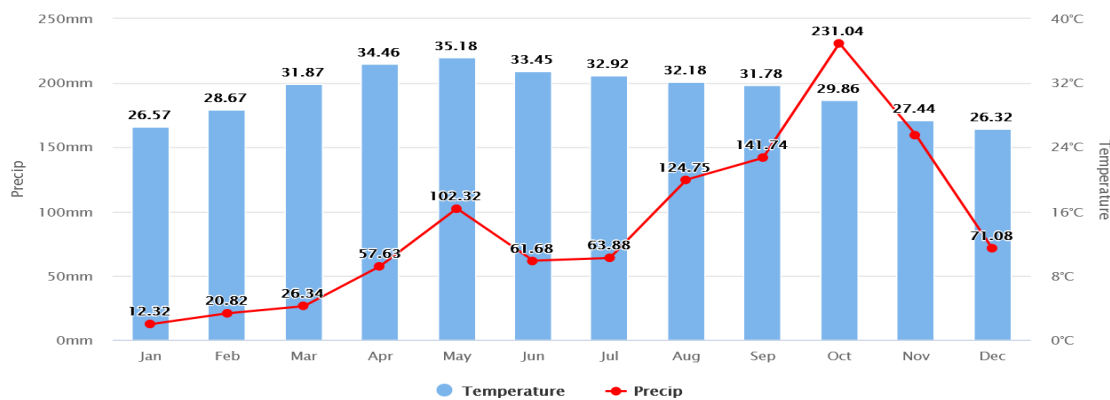
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Weather-Related Hazards: Trichy Terminal (T.N) To THIRUMALAI AGENCY Providing a local hourly weather forecast of rain, sun, wind, humidity and temperature.

The Long-range 12 day forecast also includes detail for weather today. Live weather reports from Trichy Terminal (T.N) To THIRUMALAI AGENCY weather stations and weather warnings that include risk of thunder, high UV index and forecast gales.

Climate Graph

The chart below shows the mean monthly temperature and precipitation of Tiruchirappalli in recent years.



Analysis of Traffic Patterns

Peak Hours:

Typically, Trichy Terminal (T.N) to THIRUMALAI AGENCY peak traffic hours are from 8:00 AM to 11:00 AM and 5:00 PM to 8:00 PM on weekdays.

Congestion-Prone Areas:

- Muthu
- Sk tata ace
- Cabs
- Akash Residency
- AP Residency
- Hotel Hollywood and A/c Rooms
- Tholudur
- Indian Oil
- Nayara Petrol Bunk, crystal agencies
- Government General Hospital, Jayankondam

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- Apollo Speciality Hospitals - Trichy
- ARIYALUR GOLDEN HOSPITAL PVT LTD
- CANARA BANK - AGARAMSIGOOR
- Indian Overseas Bank

❖ **Assessment of Road Quality and Infrastructure**

Road Quality: Generally, the roads are well-maintained but can suffer from potholes and waterlogging on State Highway during the Xmonsoon season.

Infrastructure: Adequate signage, street lighting, and traffic signals are present, but some areas may lack proper drainage systems, leading to waterlogging.

❖ **Suggestions for Alternative Routes for Emergencies**

Alternative Route 1 Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Take NH 38 to SH 141. Exit from NH 38, Continue on SH 141 to your destination in Agaram Sigoor

Alternative Route 2: Take Valavandan Kottai Rd/VOC Nagar - VV Kottai Rd and Ayyampatti Rd to NH 83, Follow NH 83 and NH 38 to SH 141. Exit from NH 38, Continue on SH 141 to your destination in Agaram Sigoor

❖ **Summary of Local Regulations Affecting Hazardous Material Transport**

Regulations: Transport of hazardous materials is regulated by the Petroleum and Explosives Safety Organization (PESO) and the Motor Vehicles Act. Specific routes and timings may be restricted for hazardous material transport.

Permits: Ensure all necessary permits and documentation are in place.

❖ **Overview of Historical Incidents**

Historical Incidents: There have been occasional incidents involving heavy vehicles, particularly during the monsoon season due to waterlogging and poor visibility. No major incidents involving hazardous materials have been reported recently.

❖ **Environmental Considerations and Sensitive Areas**

- **Sensitive Areas:** Hotel Hollywood and A/c Rooms, Perambalur, Siruvachur, SIDCO to Indian oil Storage, Akash Residency

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- **Educational institutions:** - Raja Typewriting Institute, Vel Typewriting Institute, Sankar Sir home, Veera thamizhanda boys ariya
- **Hospital:** - Government General Hospital, Jayankondam, Government General Hospital, Jayankondam, ARIYALUR GOLDEN HOSPITAL PVT LTD, Lakshmi Hospital, NLC General Hospital
- **Gas Station:** - Bharat Petroleum, Indian Oil, Nayara Petrol Bunk, crystal agencies, HP Petrol Pump, Bharat Petroleum, Petrol Pump - Arumugam Traders, Indian oil petrol bunk.

Environmental Impact: Minimize noise and air pollution, especially in residential and sensitive areas.

Air pollution: Volatile chemicals evaporate during the filling and discharge process, or from leaks.

- **Loss of habitats:** Oil and gas operations can degrade animal habitats and disrupt migratory pathways.
- **Oil spills:** Oil spills can be devastating for animals and humans.
- **Greenhouse gas emissions:** Oil and gas operations can emit greenhouse gases like methane.

❖ **Analysis of Communication Coverage**

Communication Coverage: Generally good throughout the route, but potential dead zones may exist densely built-up areas or underpasses.

Dead Zones: Monitor for any communication blackouts, especially in underpasses or near large buildings.

❖ **Estimated Emergency Response Times**

Hotel Hollywood and A/c Rooms, Perambalur, Siruvachur, SIDCO to Indian oil Storage, Akash Residency Sengipatti Bus Stop, areas like have quicker response times (15- 20 minutes).

- Congested areas may experience delays (up to 30-40 minutes).

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❖ Overall Summary of Risk Assessment

- **Risk Level:** Moderate to High, especially during monsoon season.
- **Key Risks:** Waterlogging, traffic congestion, and potential communication dead zones.
- **Mitigation Measures:** Plan travel during non-peak hours, ensure proper vehicle maintenance, and have alternative routes and emergency contacts ready and control on the speed limit of the vehicle.










❖ Road Signage for TT/PT Driver

Road Traffic Signs in India

Mandatory/Regulatory Signs

















 Stop	 Give way	 No entry	 Straight prohibited
 One way	 One way	 Vehicles prohibited in both directions	 Horn prohibited
 Pedestrians prohibited	 Cycles prohibited	 Right turn prohibited	 Left turn prohibited
 U-turn prohibited	 Overtaking prohibited	 Trucks prohibited	 Tonga prohibited

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 <p>All motor vehicles prohibited</p>	 <p>Hand cart prohibited</p>	 <p>Bullock cart prohibited</p>	 <p>Bullock and hand carts prohibited</p>
 <p>No parking</p>	 <p>No parking or stopping</p>	 <p>Speed limit</p>	 <p>Axle load limit</p>
 <p>Width limit</p>	 <p>Weight limit</p>	 <p>Length limit</p>	 <p>Load limit</p>
 <p>Restriction and</p>			





















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Cautionary signs

			
Right hand curve	Left hand curve	Right hand pin bend	Left hand pin bend
			
Right reverse bend	Narrow bridge	Gap in median	Cycle crossing
			
Pedestrian crossing	School	Men at work	Roundabout
			
Narrow road	Road widens	Side road left	Side road right

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Information signs

			
Advance direction	Map type advance direction	Rotary intersection	Reassurance
			
Direction	Direction	Place identification	Truck lay bay
			
Toll booth ahead	Parking this side	Parking both sides	Cycle stand
			
Scooter and motor cycle stand	Taxi stand	Auto-rickshaw stand	Cycle-rickshaw stand
			
Public telephone	Filling station	Hospital	First aid post

Conclusion

The route for Trichy Terminal (T.N) To THIRUMALAI AGENCY is generally manageable but poses several risks, particularly during the monsoon season. Proper planning, adherence to regulations, and awareness of potential hazards can significantly mitigate these risks.

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❖ **Risk Assessment - Sharp Turns**

Risk Type	Risk Level	Coordination	Distance From Start	Recommendation Speed
Sharp turn	Medium	10.759426637609334, 78.82233359030198	3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.816085525093564, 78.7138436043216	18.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.853852174266892, 78.71521689528338	22.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.876520310600862, 78.70819268473257	25.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.91403582545906, 78.73438983127075	30.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.933327675679614, 78.75294614340193	33.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.01598959388011, 78.79720806909073	44.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.044577834030944, 78.81126904965234	47.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.119485503796625, 78.82834309341241	56.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	11.147078222048458, 78.84642149268778	60.0 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	11.277122812352587, 78.9056784680904	76.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.318852214466544, 78.92208979712156	81.2 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	11.376867039521517, 78.96677038798244	89.5 KM	10 km/hr TO 20 Km/Hr
Sharp turn	Medium	11.40705375843805, 79.00541306388212	95.1 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	11.407645622801898, 79.02413060870221	96.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.406461892840607, 79.03862161114358	98.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.404686288647444, 79.07243395017345	102 KM	20km/hr TO 30 Km/Hr

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Sharp turn	High	11.40705375843805, 79.10383112212973	106 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	11.405110132409844, 79.11724304980406	107 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	11.39948925875491, 79.11674443719413	108 KM	20km/hr TO 30 Km/Hr

❖ SHARP TURN PICTURE FOR TRICHY TERMINAL TO THIRUMALAI AGENCY



SHARP TURN IMAGE START FROM TRICHY TERMINAL

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.764118710454547, 78.83443236808421



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.758190538318457, 78.83346264741843

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.751215591860491, 78.82524312987819



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.786414467572362, 78.77565847066403

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.81314083766686, 78.71198107972846



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.856171133841162, 78.71333027247728

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.860172537778979, 78.70940557851135



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.911493543101132, 78.72932306671564

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.921777485353992, 78.73441760427232



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 11.017399551659802, 78.79626856305197

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 11.081214051471925, 78.82282722342002

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI11.14976913477506, 78.84526170600422



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 11.37714423517465, 78.96983244899268

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 11.40868005391918, 79.00630249085063



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 11.405217204180346, 79.10665276313021

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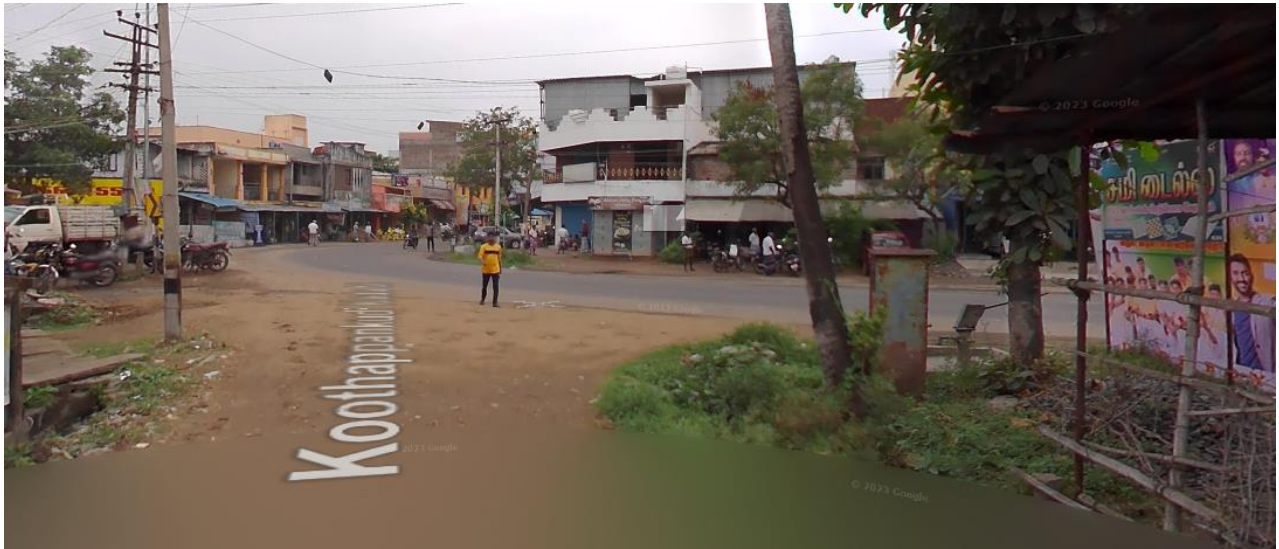


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 11.404045488416466, 79.1162910079969



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 11.389922817400276, 79.1154629686767