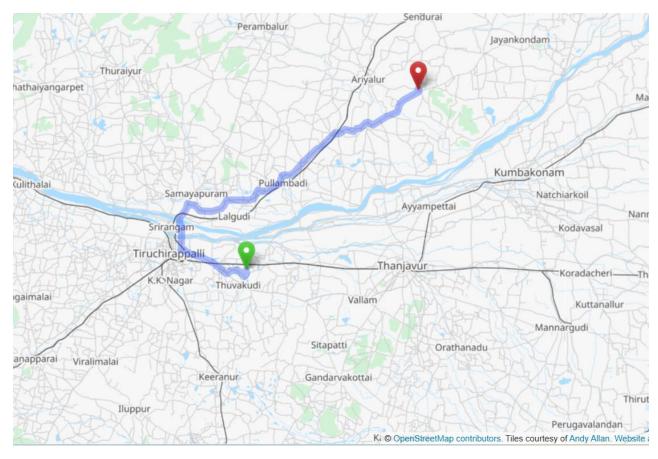
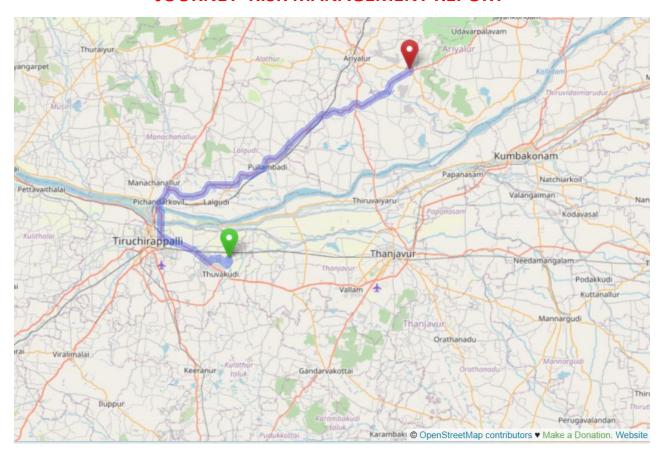


WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

ALARP/JRM/TNSO/RAJA FUEL SUPPLIERS

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO RAJA FUEL</u> <u>SUPPLIERS(</u>11.115614, 79.166853) TOTAL DISTANCE – 90.7 KM





Welcome to the Journey Risk Management Study for RAJA FUEL SUPPLIERS

Total distance: 90.7 KM; Start with: (10.7753, 78.8368), End with: (11.115614, 79.166853)

* Route Safety Analysis Report

ALARP/JRM/TNSO/RAJA FUEL SUPPLIERS

1. Overview of the Route Map

The route from Trichy Terminal (T.N) To RAJA FUEL SUPPLIERS. The route passes Through several key point including Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Drive along NH 81, Drive to your destination in Reddipalayam and Total distance from Trichy Terminal To RAJA FUEL SUPPLIERSIS 90.7 KM.

Typical Weather Conditions and Potential Weather-Related Hazards

<u>Weather Conditions:</u> Trichy Terminal (T.N) To RAJA FUEL SUPPLIERS 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	38.0	41.0	43.0	43.0	42.0	40.0	39.0	38.0	37.0	34.0	33.0	43.0
	(91.4)	(100.4)	(105.8)	(109.4)	(109.4)	(107.6)	(104.0)	(102.2)	(100.4)	(98.6)	(93.2)	(91.4)	(109.4)
Average high °C (°F)	30.27	32.88	36.0	38.27	38.79	36.78	36.17	35.4	35.03	32.9	30.38	29.34	34.35
	(86.49)	(91.18)	(96.8)	(100.89)	(101.82)	(98.2)	(97.11)	(95.72)	(95.05)	(91.22)	(86.68)	(84.81)	(93.83)
Daily mean °C (°F)	26.57	28.67	31.87	34.46	35.18	33.45	32.92	32.18	31.78	29.86	27.44	26.32	30.89
	(79.83)	(83.61)	(89.37)	(94.03)	(95.32)	(92.21)	(91.26)	(89.92)	(89.2)	(85.75)	(81.39)	(79.38)	(87.6)
Average low °C (°F)	19.88	20.93	24.04	27.62	28.89	27.59	27.04	26.45	25.95	24.64	22.43	20.93	24.7
	(67.78)	(69.67)	(75.27)	(81.72)	(84.0)	(81.66)	(80.67)	(79.61)	(78.71)	(76.35)	(72.37)	(69.67)	(76.46)
Record low °C (°F)	16.0	17.0	19.0	22.0	25.0	25.0	24.0	23.0	22.0	21.0	18.0	17.0	16.0
	(60.8)	(62.6)	(66.2)	(71.6)	(77.0)	(77.0)	(75.2)	(73.4)	(71.6)	(69.8)	(64.4)	(62.6)	(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

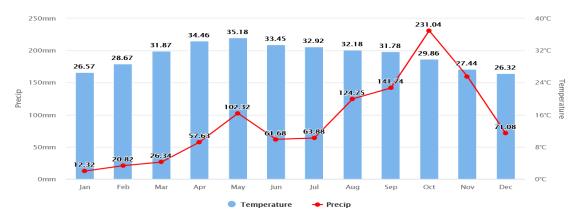
<u>Weather-Related Hazards:</u> Trichy Terminal (T.N) To RAJA FUEL SUPPLIERS Providing a local hourly weather forecast of rain, sun, wind, humidity and temperature.

The Long-range 12 day forecast also includes detail for weather today. Live weather reports from Trichy Terminal (T.N) To RAJA FUEL SUPPLIERS 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 RAJA FUEL SUPPLIERS peak traffic hours are from 8:00 AM to 11:00 AM and 4:00 PM to 8:00 PM on weekdays.

Congestion-Prone Areas:

- Malar Mahal
- Old Burma Colony
- Government Branch Press, Tiruchirappalli
- National Institute of Technology Tiruchirappalli
- Civil Engineering Department : NIT Trichy
- AGN InfoSystems & AGN INFOTECH
- NIT Trichy
- Govt Polytechnic
- BHELEC CINEMA 4K Dolby 7.1
- Arulmigu Erumbeeswarar Temple, Thiruverumbur.
- Aswins Sweets and Snacks Veg Restaurant
- Urmu Dhanalakshmi Arts College

ALARP/JRM/TNSO/RAJA FUEL SUPPLIERS

- SESHASAYEE INSTITUTE OF TECHNOLOGY
- JB Residency
- Sri Vignesh Vidyalaya Senior Secondary School
- Government High School
- Nava Bharath School
- Sagayamatha Hospital DMLT Courses | CMLT Courses | M.P.H.W Courses
- Dalmia Higher Secondary School
- Golden Gates Matriculation school
- Ariyalur Engineering College
- BETHEL GINNING MILL, POYYUR (Paruthi, Cotton seed &Lint)
- Nelliandavar Institute of Technology
- State Bank of India REDDIPALAYAM

❖ Assessment of Road Quality and Infrastructure

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

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

Suggestions for Alternative Routes for Emergencies

Alternative Route 1-). Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Drive along NH 81, Drive to your destination in Reddipalayam and Total distance from Trichy Terminal To RAJA FUEL SUPPLIERSIS 90.7 KM.

Alternative Route 2- Take Valavanthankottai to Thirunedukulam temple road, Indalur to Solakampatti Village, Solakampatti Railway Station - Katachamangalam Rd and MDR782 to Kollidam - Kallanai Main Rd/Poondi Matha Temple to Thirukattupalli in Puduchatram, Continue on Kollidam - Kallanai Main Rd. Drive from NH 136 and NH 81 to Reddipalayam, Turn left.

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: malar mahal, old burma colony, government branch press, tiruchirappalli, national institute of technology tiruchirappalli Civil engineering department: nit trichy, agn infosystems & agn infotech, nit trichy ,govt polytechnic ,bhelec cinema 4k dolby 7.1

 Arulmigu erumbeeswarar temple, thiruverumbur. ,aswins sweets and snacks veg restaurant ,urmu dhanalakshmi arts college, seshasayee institute of technology ,jb residency ,sri vignesh vidyalaya senior secondary school ,government high school ,nava bharath school Sagayamatha hospital dmlt courses | cmlt courses | m.p.h.w courses Dalmia higher secondary school ,golden gates matriculation school Ariyalur engineering college ,bethel ginning mill , poyyur (paruthi,cotton seed &lint) ,nelliandavar institute of technology State bank of india reddipalayam.
- **Educational institutions**: State Institute Of Hotel Management and Catering Technology, National Institute of Technology Tiruchirappalli, AGN InfoSystems & AGN INFOTECH, NIT Trichy.
- **Hospital:** Dr Kamali's Home Clinic, Muthammal Medical Foundation Hospital, Times Hospital (Trichy Institute of Medical and Educational Services), Apollo Speciality Hospitals Trichy. GVN Hospital (P) Ltd. Multispecialty Hospital Trichy.

- **Gas Station:** IndianOil, Bharat Petroleum Sri Vela Fuels, IndianOil, Reliance 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- malar mahal, old burma colony, government branch press, tiruchirappalli, national institute of technology tiruchirappalli, Civil engineering department: nit trichy, agn infosystems & agn infotech, nit trichy ,govt polytechnic ,bhelec cinema 4k dolby 7.1 ,Arulmigu erumbeeswarar temple, thiruverumbur. ,aswins sweets and snacks veg restaurant ,urmu dhanalakshmi arts college, seshasayee institute of technology ,jb residency ,sri vignesh vidyalaya senior secondary school ,government high school ,nava bharath school Sagayamatha hospital - dmlt courses | cmlt courses | m.p.h.w courses

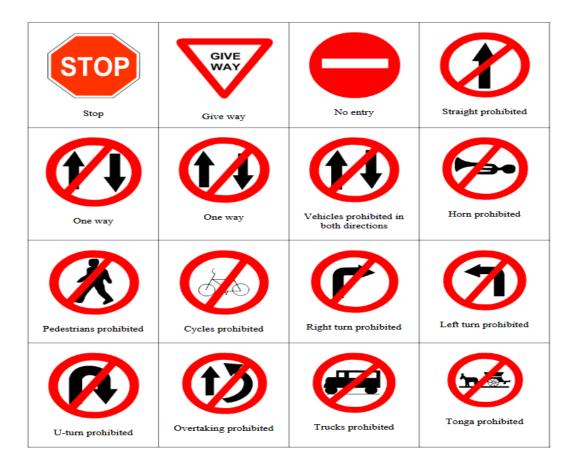
ALARP/JRM/TNSO/RAJA FUEL SUPPLIERS

Dalmia higher secondary school ,golden gates matriculation school Ariyalur engineering college ,bethel ginning mill , poyyur (paruthi,cotton seed &lint) ,nelliandavar institute of technology , State bank of india reddipalayam.areas like have quicker response times (15- 20 minutes). Congested areas may experience delays (up to 30-40 minutes).

- Overall Summary of Risk Assessment
- **Risk Level:** Moderate to High, especially during monsoon season.
- **Key Risks**: Water logging, 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





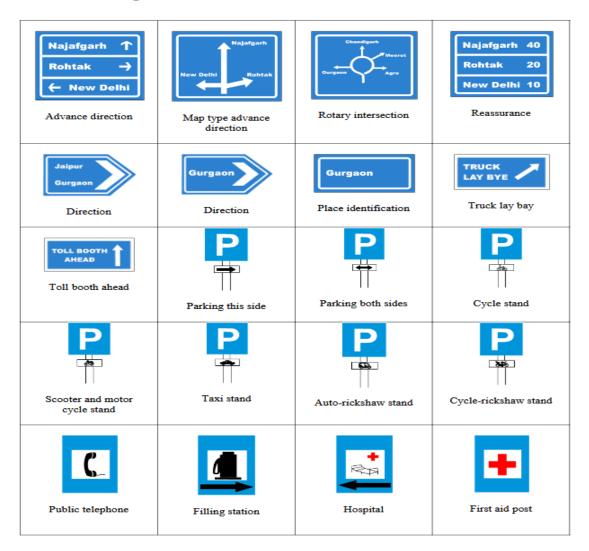


Restriction ands

Cautionary signs



Information signs



Conclusion

The route for Trichy Terminal (T.N) To RAJA FUEL SUPPLIERS 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.

• Risk Assessment - Sharp Turns

Risk Type	Risk Level	Coordination	Distance	Recommendation
			From Start	Speed
Sharp turn	Medium	10.769517372474736,	650 M	20km/hr TO 30
		78.83735063199906		Km/Hr
Sharp turn	Medium	10.76584461192607,	1.1 KM	20km/hr TO 30
		78.8361700257199		Km/Hr
Sharp turn	Medium	10.764182189802032,	1.3 KM	20km/hr TO 30
		78.83459588401435		Km/Hr
Sharp turn	Medium	10.75826698538096,	2 KM	20km/hr TO 30
_		78.83349398474651		Km/Hr
Sharp turn	Medium	10.756372549032195,	2.4 KM	20km/hr TO 30
		78.83034570133539		Km/Hr
Sharp turn	High	10.751346435623256,	3.2 KM	10km/hr TO 15
		78.8252297405902		Km/Hr
Sharp turn	High	10.813226887132624,	18.1 KM	10km/hr TO 15
		78.7122163292411		Km/Hr
Sharp turn	Medium	10.817428232253208,	18.7 KM	20km/hr TO 30
		78.71207608898139		Km/Hr
Sharp turn	Medium	10.855306551127532,	22.9 KM	20km/hr TO 30
		78.713548609723		Km/Hr
Sharp turn	Medium	10.86026481225808,	23.7 KM	20km/hr TO 30
		78.70913104708548		Km/Hr
Sharp turn	High	10.87424391118605,	25.3 KM	10km/hr TO 15
		78.70920116713285		Km/Hr
Sharp turn	High	10.879064138093348,	25.9 KM	10km/hr TO 15
		78.71165536859816		Km/Hr
Sharp turn	High	10.897793422927336,	28.4 KM	10km/hr TO 15
		78.72413673623166		Km/Hr
Sharp turn	High	10.899032819310374,	28.9 KM	10km/hr TO 15
		78.72413673623166		Km/Hr

Sharp turn	Medium	10.897449145238195,	30.4 KM	20km/hr TO 30
		78.73759978426983		Km/Hr
Sharp turn	High	10.887878066086776,	31.9 KM	10km/hr TO 15
		78.7469958698798		Km/Hr
Sharp turn	High	10.886363190668318,	34.6 KM	10km/hr TO 15
		78.77125740564925		Km/Hr
Sharp turn	Medium	10.888910931000886,	35.5 KM	20km/hr TO 30
		78.7794614505475		Km/Hr
Sharp turn	High	10.890494650494096,	36.4 KM	10km/hr TO 15
		78.78759537540388		Km/Hr
Sharp turn	High	10.895796606624664,	37.3 KM	10km/hr TO 15
		78.79334521883686		Km/Hr
Sharp turn	Medium	10.906331382372407,	38.6 KM	20km/hr TO 30
		78.79783290229437		Km/Hr
Sharp turn	High	10.907088770214388,	43.4 KM	10km/hr TO 15
		78.84109696941483		Km/Hr
Sharp turn	Medium	10.91390517336265,	45.1 KM	20km/hr TO 30
		78.85505085920332		Km/Hr
Sharp turn	High	10.92526549774902,	46.5 KM	10km/hr TO 15
		78.85925806171524		Km/Hr
Sharp turn	Medium	10.924232759188184,	48.4 KM	20km/hr TO 30
		78.87587651235216		Km/Hr
Sharp turn	Medium	10.93703846663078,	51.4 KM	20km/hr TO 30
		78.89971732734251		Km/Hr
Sharp turn	High	10.95424956721787,	53.6 KM	10km/hr TO 15
		78.9086926927013		Km/Hr
Sharp turn	Medium	10.955213359504718,	55.2 KM	20km/hr TO 30
		78.92327766230562		Km/Hr
Sharp turn	Medium	10.976691339681432,	58.5 KM	20km/hr TO 30
		78.94333199516447		Km/Hr
Sharp turn	Medium	11.005870194753422,	63.6 KM	20km/hr TO 30
		78.97876033101527		Km/Hr
Sharp turn	Medium	11.024573557660831,	66.5 KM	20km/hr TO 30
		78.99712809814062		Km/Hr
Sharp turn	High	11.033335084281488,	68.1 KM	10km/hr TO 15
		79.00802859514972		Km/Hr

ALARP/JRM/TNSO/RAJA FUEL SUPPLIERS

Sharp turn Medium 11.033672060858978, 79.01721247845661 69.1 KM 20km/hr T Km/Hr Sharp turn Medium 11.03864242079728, 69.9 KM 20km/hr T Km/Hr	
Sharp turn Medium 11.03864242079728, 69.9 KM 20km/hr T	0 30
T T T T T T T T T T	0 30
70.00000070	
79.02236232126958 Km/Hr	
Sharp turn Medium 11.041169690045262, 71.0 KM 20km/hr T	0 30
79.03206118868712 Km/Hr	
Sharp turn High 11.036789076193788, 72.4 KM 10km/hr T	0 15
79.04296168569623 Km/Hr	
Sharp turn Medium 11.042433316512685, 73.3 KM 20km/hr T	0 30
79.04974230982 Km/Hr	
Sharp turn High 11.053974186727364, 76.1 KM 10km/hr T	0 15
79.07077082905549 Km/Hr	
Sharp turn Medium 11.048835607241001, 77.4 KM 20km/hr T	0 30
79.08072718852837 Km/Hr	
Sharp turn Medium 11.06534613300883, 80.8 KM 20km/hr T	0 30
79.10664805659975 Km/Hr	
Sharp turn Medium 11.074274907145698, 83.4 KM 20km/hr T	0 30
79.12896403472861 Km/Hr	
Sharp turn Medium 11.089183668456515, 85.2 KM 20km/hr T	0 30
79.13248309382108 Km/Hr	
Sharp turn Medium 11.110155723319314, 89.4 KM 20km/hr T	0 30
79.16441211006891 Km/Hr	
Sharp turn High 11.112403353943963, 90.1 KM 10km/hr T	0 15
79.17105352391127 Km/Hr	
Sharp turn Medium 11.115944097689301, 90.7 KM 20km/hr T	0 30
79.16718991397082 Km/Hr	

• Risk Assessment - Elevation Changes

Risk Type	Specific	Risk	Coordination	Elevation	Gradient	Recommen
	Risk	Level		Change		dation
						Speed
						•

Elevation Change	Descent	Low	10.7753, 78.8368	-3.02m	-2.96 %	40 km/hr to 50 km/hr
Elevation Change	Descent	Low	10.993921 , 78.326323	-9.28m	-6.28%	40 km/hr to 50 km/hr

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO RAJA FUEL</u> <u>SUPPLIERS(</u>11.115614, 79.166853) TOTAL DISTANCE – 90.7 KM



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.769073692604486, 78.83720120889187



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.764113439530249, 78.83446118711721



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.758209570013967, 78.83344387884853



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.751314343624747, 78.82530656733346



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.75126610223314, 78.82518044583597



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.788368665250962, 78.77316631109866



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.816037779535078, 78.71216333699147



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.85877873083927, 78.71089686586222



IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 10.897894499006538, 78.72392297304442



IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 10.89902341669176, 78.7247350018641

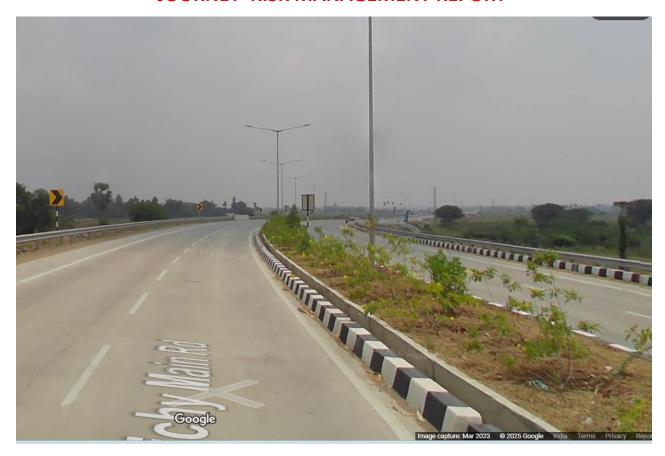


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.897579801598685, 78.7373779940077



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.887943342610972, 78.74668739885827



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.890218025099417, 78.78684948319828



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.906760973913892, 78.7982138522536



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.907356660781696, 78.84060123426639



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.926174954460356, 78.8598481644231



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.953543422722861, 78.90702634766502



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.03353666584845, 79.00811042729099

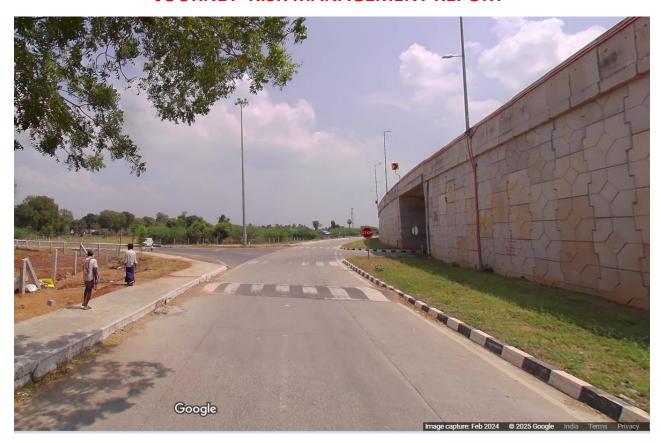


IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 11.041455882879527, 79.03215194367202

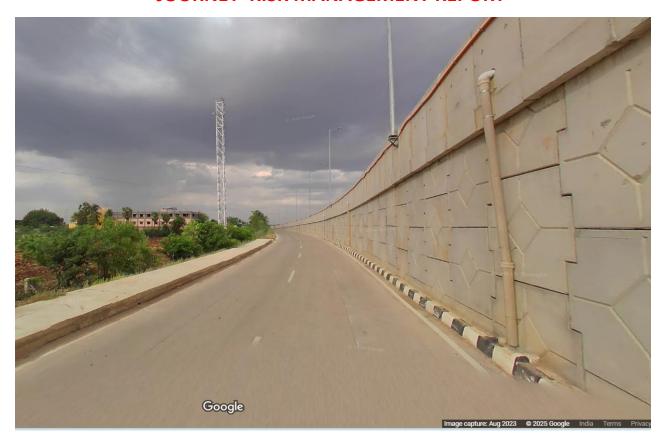


IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 11.048779452927304, 79.0805915427297



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.074959388682357, 79.12913033969598

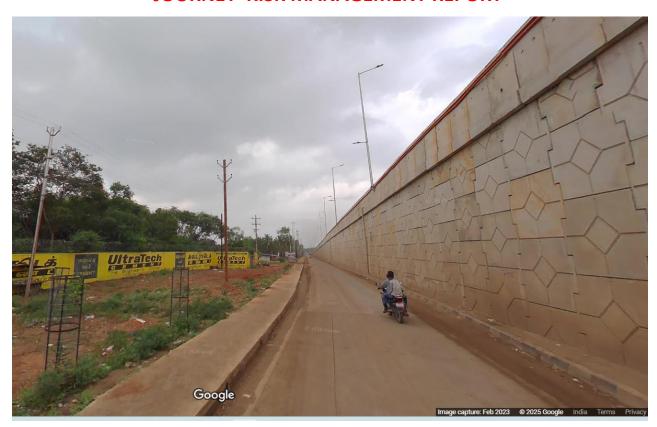


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.11236478403653, 79.17034735945823

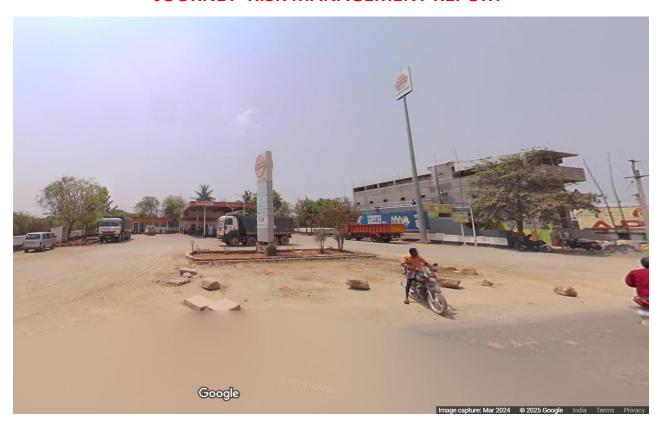


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.115753531362378, 79.16690307909329

THANK YOU
YOUR DESTINATION IS HERE!