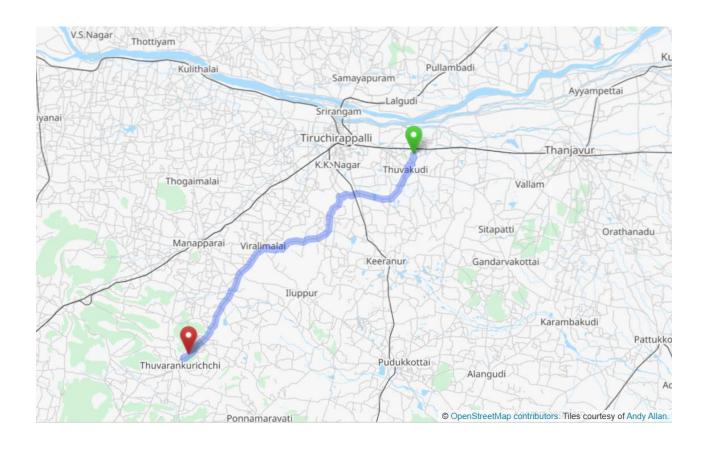
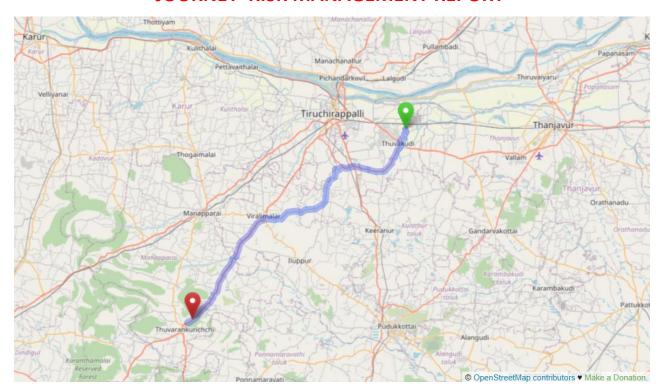


WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO STAR FUEL</u> <u>STATION(</u>10.396064 , 78.403088) TOTAL DISTANCE – 84 KM





Welcome to the Journey Risk Management Study for STAR FUEL STATION

Total distance: 84 KM; Start with: (10.7753, 78.8368), End with: (10.396064, 78.403088)

• Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) TO STAR FUEL STATION. The Route passes Through several Key point Including Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Follow Trichy Bypass and NH 38 to Ponnampatti, Turn left and Total distance from Trichy Terminal To STAR FUEL STATION IS 84 KM.

<u>Typical Weather Conditions and Potential Weather-Related Hazards</u>

<u>Weather Conditions:</u> Trichy Terminal (T.N) To STAR FUEL STATION experiences a tropical climate with heavy monsoon rains from June to September, high humidity, and moderate temperatures throughout the year ALARP/JRM/TNSO/STAR FUEL STATION

,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.

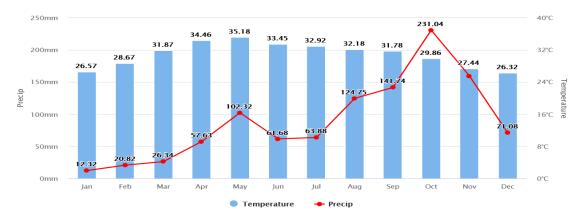
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0	38.0	41.0	43.0	43.0	42.0	40.0	39.0	38.0	37.0	34.0	33.0	43.0
	(91.4)	(100.4)	(105.8)	(109.4)	(109.4)	(107.6)	(104.0)	(102.2)	(100.4)	(98.6)	(93.2)	(91.4)	(109.4)
Average high °C (°F)	30.27	32.88	36.0	38.27	38.79	36.78	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 STAR FUEL STATION 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 STAR FUEL STATION 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 STAR FUEL STATION 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:

- Old Burma Colony
- TRICHY REFRACTORIES
- PANCHAYAT UNION MIDDLE SCHOOL VALAVANDHANKOTTAL
- Irrigation Management Training Institute
- ANJU ELECTRICALS AND ENGINEERING
- Thuvakudi Toll Plaza
- Sakya Garden Farmhouse Trichy
- Ring road korai bridge
- Indra Ganesan College of Engineering
- Shri Murugan Temple, Esanapatti
- Government Hr Sec School, Poongudi, Trichy
- Srirangam Revenue Divisional Office
- J.J. College of Engineering and Technology
- Jamiya Yaseen Arabic College
- Vikas Collage of Arts and Science
- IOCL LPG Bottling Plant
- Nehru College Of Nursing
- Manapparai Bus Stand

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, Follow Trichy Bypass and NH 38 to Ponnampatti, Turn left and Total distance from Trichy Terminal To STAR FUEL STATION IS 84 KM.

Alternative Route 2 :-) Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Follow NH 83 to Manapparai, Drive to Madurai Rd/Thuvarankurichi - Manapparai Rd in Vadagupatti.

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: Old Burma Colony, TRICHY REFRACTORIES
PANCHAYAT UNION MIDDLE SCHOOL VALAVANDHANKOTTAI
Irrigation Management Training Institute, ANJU ELECTRICALS AND
ENGINEERING, Thuvakudi Toll Plaza, Sakya Garden - Farmhouse

Trichy, Ring road korai bridge, Indra Ganesan College o Engineering Shri Murugan Temple, Esanapatti, Government Hr Sec School, Poongudi, Trichy, Srirangam Revenue Divisional Office ,J.J. College of Engineering and Technology, Jamiya Yaseen Arabic College, Vikas Collage of Arts and Science, IOCL LPG Bottling Plant, Nehru College Of Nursing, Manapparai Bus Stand.

- Educational institutions: Irrigation Management Training Institute, Indra Ganesan College o Engineering Indian Institute of Information Technology Tiruchirappalli, Mother Terasa college of physical education J.J. College of Engineering and Technology, Jamiya Yaseen Arabic College, Nehru College Of Nursing.
- **Hospital:** Dr. Miller Hospital, lakmandoss Hospital, Muthammal Medical Foundation Hospital, Apollo Speciality Hospitals Trichy, Government Head Quarters Hospital Manaparai.
- **Gas Station:** ESSAR petrol pump, SP Petroleum (HPCL), HP PETROL PUMP M/S. A.V.R. PETROL BUNK, IndianOil, IndianOil.
- **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: old burma colony,trichy refractories panchayat union middle school valavandhankottai irrigation management training institute,anju electricals and engineering, thuvakudi toll plaza, sakya garden farmhouse trichy, ring road korai bridge, indra ganesan college o engineering shri murugan temple, esanapatti, government hr sec school, poongudi, trichy, srirangam revenue divisional office ,j.j. college of engineering and technology, jamiya yaseen arabic college, vikas collage of arts and science, iocl lpg bottling plant, nehru college of nursing, manapparai bus stand.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





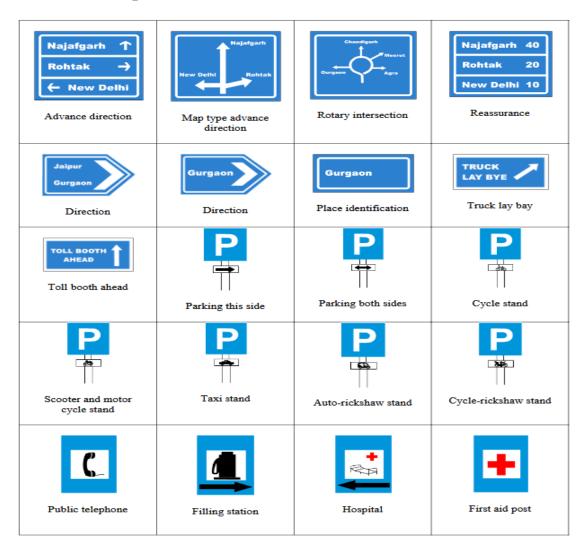


Restriction ands

Cautionary signs



Information signs



Conclusion

The route for Trichy Terminal (T.N) To STAR FUEL STATION 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	10.749377180278545,	3.8 KM	10km/hr TO 15		
		78.83033762183268		Km/Hr		
Sharp turn	Medium	10.706656105166736,	9.3 KM	20km/hr TO 30		
		78.80776967379646		Km/Hr		
Sharp turn	Medium	10.69115063561065,	11.9 KM	20km/hr TO 30		
		78.7905332993053		Km/Hr		
Sharp turn	Medium	10.701527460970988,	18.8 KM	20km/hr TO 30		
		78.72887077370295		Km/Hr		
Sharp turn	Medium	10.69747219228168,	20.7 KM	20km/hr TO 30		
		78.71224131380654		Km/Hr		
Sharp turn	Medium	10.712261733865379,	23.1 KM	20km/hr TO 30		
		78.6957332368291		Km/Hr		
Sharp turn	High	10.742196417954885,	26.9 KM	10km/hr TO 15		
		78.68056037018484		Km/Hr		
Sharp turn	Medium	10.759607259957601,	30.1 KM	20km/hr TO 30		
		78.65919697644931		Km/Hr		

Sharp turn	Medium	10.743175250738751,	32.8 KM	20km/hr TO 30
		78.64146139062494		Km/Hr
Sharp turn	Medium	10.736795019700754,	35.9 KM	20km/hr TO 30
		78.63466394716365		Km/Hr
Sharp turn	High	10.7395975676874,	36.2 KM	10km/hr TO 15
		78.6342391069473		Km/Hr
Sharp turn	Medium	10.745023703709258,	36.9 KM	20km/hr TO 30
		78.63345011797412		Km/Hr
Sharp turn	High	10.744308175002837,	37.3 KM	10km/hr TO 15
		78.62580299303546		Km/Hr
Sharp turn	High	10.752059647097582,	39.4 KM	10km/hr TO 15
-		78.61251156341024		Km/Hr
Sharp turn	Medium	10.758022182758358,	40.2 KM	20km/hr TO 30
•		78.6091735326155		Km/Hr
Sharp turn	High	10.747823179224675,	42 KM	10km/hr TO 15
1		78.59642958884501		Km/Hr
Sharp turn	Medium	10.743309482545422,	43.6 KM	20km/hr TO 30
•		78.5826768369447		Km/Hr
Sharp turn	High	10.729525351084916,	46 KM	10km/hr TO 15
1		78.56641162743256		Km/Hr
Sharp turn	High	10.725263167561243,	47.2 KM	10km/hr TO 15
_		78.55594940513704		Km/Hr
Sharp turn	High	10.709357967352167,	50.1 KM	10km/hr TO 15
-		78.53568113345055		Km/Hr
Sharp turn	Medium	10.68635671400491,	53.5 KM	20km/hr TO 30
-		78.5154232157558		Km/Hr
Sharp turn	Medium	10.673919227958672,	55.3 KM	20km/hr TO 30
•		78.50521616961383		Km/Hr
Sharp turn	Medium	10.67376877138209,	56.2 KM	20km/hr TO 30
•		78.49781606116092		Km/Hr
Sharp turn	High	10.655734542596523,	59 KM	10km/hr TO 15
		78.47985074614596		Km/Hr
Sharp turn	Medium	10.645762417463626,	61 KM	20km/hr TO 30
_		78.46547284244622		Km/Hr
Sharp turn	Medium	10.626699501303749,	65.2 KM	20km/hr TO 30
_		78.43299416386724		Km/Hr

Sharp turn	Medium	10.61992783256916,	66 KM	20km/hr TO 30
		78.43279002294439		Km/Hr
Sharp turn	Medium	10.616015244448151,	66.5 KM	20km/hr TO 30
		78.43003412048607		Km/Hr
Sharp turn	High	10.605897525712725,	69.1 KM	10km/hr TO 15
		78.40926906313085		Km/Hr
Sharp turn	High	10.604894256733525,	69.6 KM	10km/hr TO 15
		78.41370912820261		Km/Hr
Sharp turn	Medium	10.605847362341887,	70.2 KM	20km/hr TO 30
		78.41922093311926		Km/Hr
Sharp turn	Medium	10.591237557247412,	73.6 KM	20km/hr TO 30
		78.37858683223008		Km/Hr
Sharp turn	Medium	10.578183379033451,	75.9 KM	20km/hr TO 30
		78.35549092329292		Km/Hr
Sharp turn	Medium	10.42163953349756,	76.8 KM	20km/hr TO 30
		78.43033046444232		Km/Hr
Sharp turn	Medium	10.418262924918862,	77.7 KM	20km/hr TO 30
		78.42346400963343		Km/Hr
Sharp turn	Medium	10.40273005437729,	79.7 KM	20km/hr TO 30
		78.41247768193922		Km/Hr
Sharp turn	Medium	10.395540419683988,	83.9 KM	20km/hr TO 30
		78.40299470280021		Km/Hr

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO STAR FUEL</u> <u>STATION(</u>10.396064 , 78.403088) TOTAL DISTANCE – 84 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: 10.749546767168214, 78.83024154621916

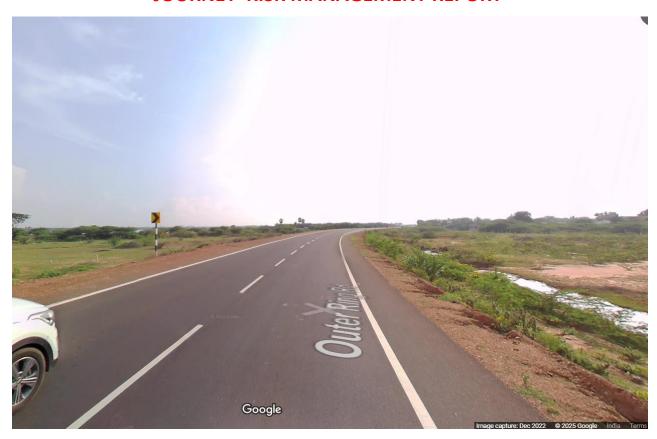


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.707289183782246, 78.80828207588743



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.692361705220529, 78.79279989714924



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.70200401259101, 78.73290298518882



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.757803454244932, 78.66047144916918

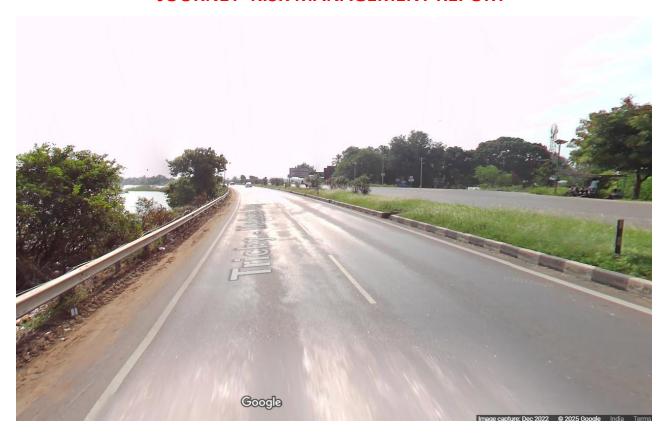


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.73686711516488, 78.63505586806994



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.74459302439685, 78.62867558475862



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.752069459237575, 78.61266782770917

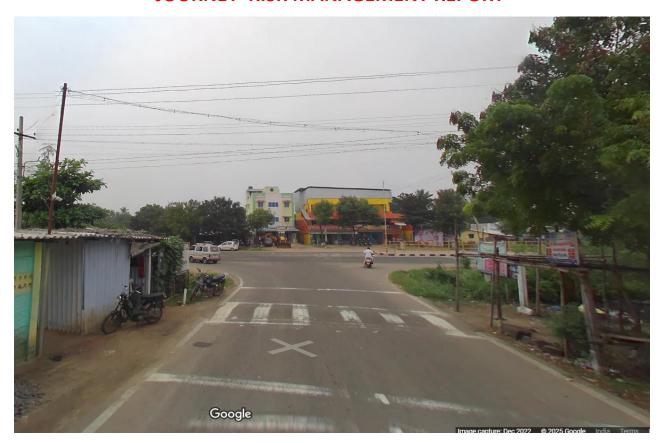


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.757944966387909, 78.60938851323502

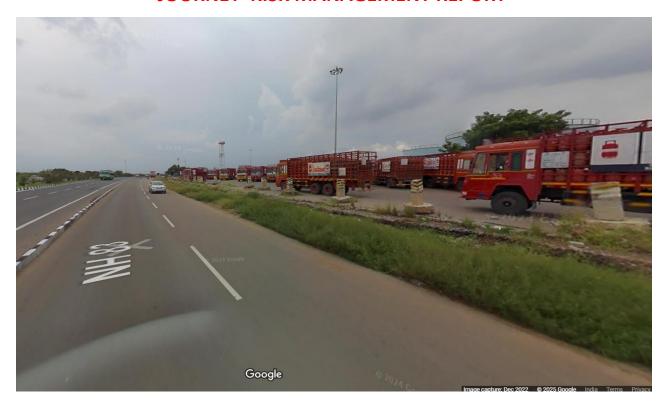


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.7092171321234, 78.53555213634974



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.674018172327653, 78.50542289685146



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.67385716338519, 78.50482835620632

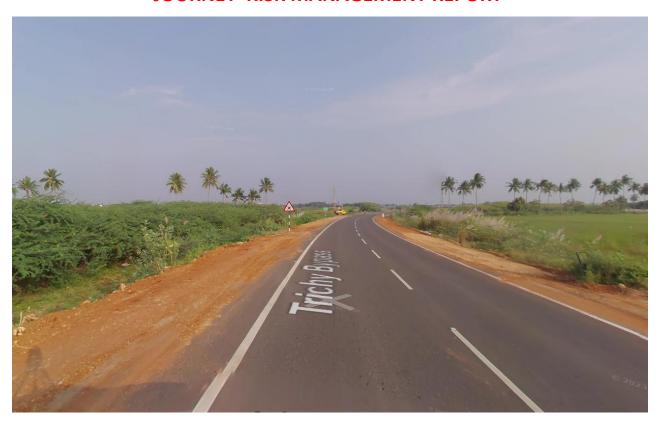


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.759255228641473, 78.66650163797



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.62831885114384, 78.56176460161895



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.552550692689541, 78.50166291163536



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.446551055747578, 78.44579691143407



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.403910996220555, 78.4131905718201



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.39582795159115, 78.40318998169846

THANK YOU
YOUR DESTINATION IS HERE!