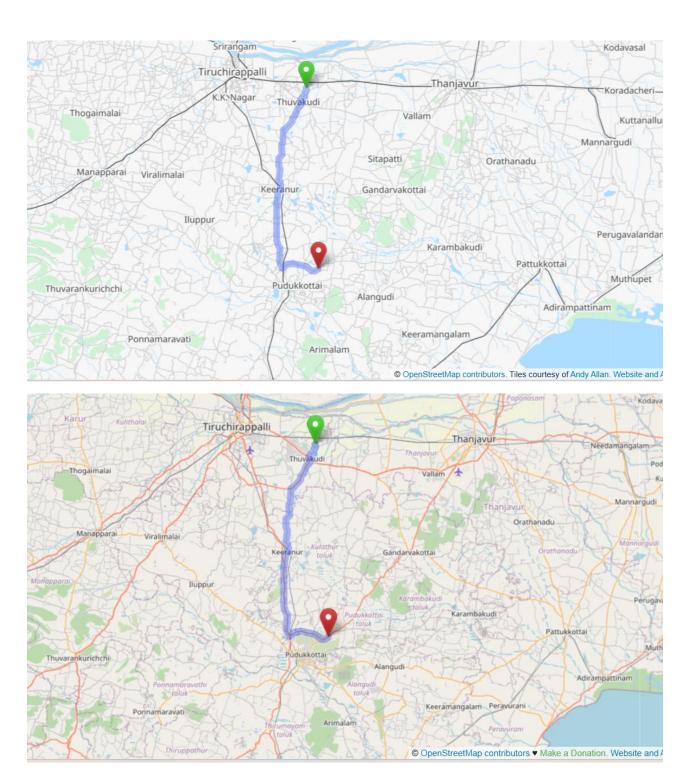


WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO NAMBIKAI</u>
<u>VINAYAGAR AGENCIES (</u>10.4152944 , 78.8616215) TOTAL DISTANCE – 53
KM



Welcome to the Journey Risk Management Study for NAMBIKAI VINAYAGAR AGENCIES

Total distance: 53 km; Start with: (10.7753, 78.8368), End with: (10.4152944, 78.8616215)

Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) TO NAMBIKAI VINAYAGAR AGENCIES IS Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Follow Outer Ring Rd/Trichy Bypass to Kanthalur Rd in Sooriyur, Continue on Kanthalur Rd to Pallathuppatti, Sharp left onto NH336, Continue onto NH 36, and Total distance from Trichy Terminal To NAMBIKAI VINAYAGAR AGENCIES IS 53 KM.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) To NAMBIKAI VINAYAGAR AGENCIES 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.

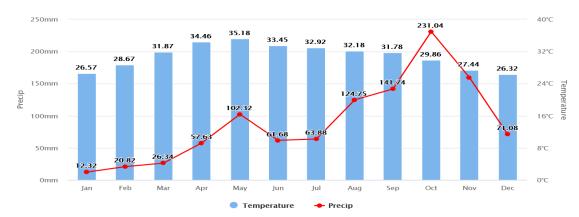
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0	38.0	41.0	43.0	43.0	42.0	40.0	39.0	38.0	37.0	34.0	33.0	43.0
	(91.4)	(100.4)	(105.8)	(109.4)	(109.4)	(107.6)	(104.0)	(102.2)	(100.4)	(98.6)	(93.2)	(91.4)	(109.4)
Average high °C (°F)	30.27	32.88	36.0	38.27	38.79	36.78	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	20.82	26.34	57.63	102.32	61.68	63.88	124.75	141.74	231.04	159.62	71.08	89.44
	(0.49)	(0.82)	(1.04)	(2.27)	(4.03)	(2.43)	(2.51)	(4.91)	(5.58)	(9.1)	(6.28)	(2.8)	(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 NAMBIKAI VINAYAGAR AGENCIES 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 NAMBIKAI VINAYAGAR AGENCIES 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 NAMBIKAI VINAYAGAR AGENCIES 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:

- State Institute Of Hotel Management and Catering Technology
- Valavanthankottai Toll Plaza
- SPOT ON 42969 Royal Residency
- Anand Engineering Products Ptv. Ltd. (Unit 2)
- The Urban Coffee House | coffee shop | Cafe | restaurant
- GNR Marriage Hall
- Tool Fab Engineering Industries Ltd. (Unit 2)
- Anandam Law college
- Psk Matriculation Hr Sec School
- IIPHS SAFETY COLLEGE
- PJ WATER SERVICE STATION
- Pudukkottai Medical College Monument

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 monsoon 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, Follow Outer Ring Rd/Trichy Bypass to Kanthalur Rd in Sooriyur, Continue on Kanthalur Rd to Pallathuppatti, Sharp left onto NH336, Continue onto NH 36 Farm onto NH 136B, Continue on Aduthurai - Porayar Rd. Drive to Main Rd in Nallathur.

Alternative Route 2 -) Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, ake Outer Ring Rd/Trichy Bypass, Kanthalur Rd and NH336 to NH 36 in Mullur,

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: State Institute Of Hotel Management and Catering Technology, Valavanthankottai Toll Plaza, SPOT ON 42969 Royal Residency, Anand Engineering Products Ptv. Ltd. (Unit 2), The Urban Coffee House | coffee shop | Cafe | restaurant, GNR Marriage Hall, Tool Fab Engineering Industries Ltd. (Unit 2), Anandam Law college, School of Law, SASTRA University, Masjidul Aqsa vallam, Maruti Suzuki ARENA (PLA Motors, Thanjavur, Nangikkottai Road), Hotel Anitha Parthiban, Bon Secours College of Education, Best Matriculation Higher Secondary School, Vembukudi Toll Plaza, Sri Saravana Balaji Marriage Mahal.
- Educational institutions: Chanakya share market training Institute, Indian Institute of Catering Technology and Hotel Management, Samiyappa Institute Of Co Operative Management, Premier Institute, S.K Institute of Arts & Education, Dr S R J Group of Educational Institutions, DEEPA INSTITUTE FOR VEDIC MATHS.
- **Hospital:** Dr Kamali's Home Clinic, Meenakshi Hospital, Rohini Hospital, Government Raja Mirasudar Hospital, Anbu Hospital.
- **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: State Institute Of Hotel Management and Catering Technology, Valavanthankottai Toll Plaza, SPOT ON 42969 Royal Residency, Anand Engineering Products Ptv. Ltd. (Unit 2), The Urban Coffee House | coffee shop | Cafe | restaurant, GNR Marriage Hall, Tool Fab Engineering Industries Ltd. (Unit 2), Anandam Law college, School of Law, SASTRA University, Masjidul Aqsa vallam, Maruti Suzuki ARENA (PLA Motors, Thanjavur, Nangikkottai Road), Hotel Anitha Parthiban, Bon Secours College of Education, Best Matriculation Higher Secondary School, Vembukudi Toll Plaza, Sri Saravana Balaji Marriage Mahal, areas like have quicker response times (15- 20 minutes). Congested areas may experience delays (up to 30-40 minutes).

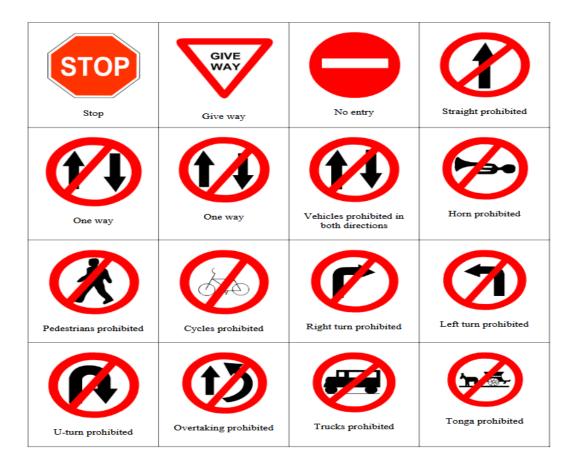
Overall Summary of Risk Assessment

- **Risk Level:** Moderate to High, especially during monsoon season.
- **Key Risks**: 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





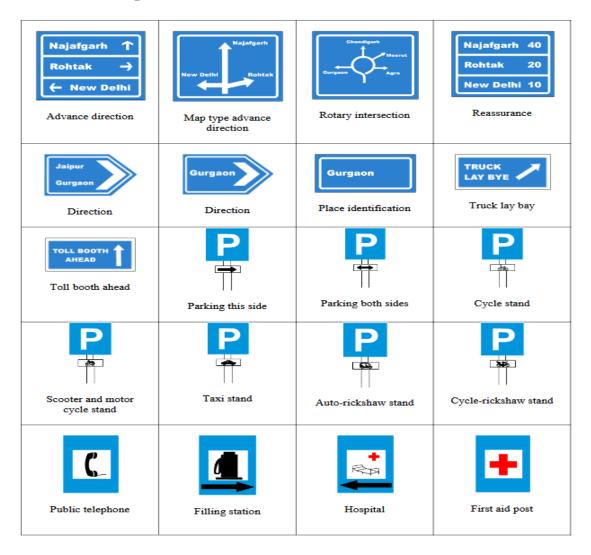


Restriction ands

Cautionary signs



Information signs



Conclusion

The route for Trichy Terminal (T.N) To NAMBIKAI VINAYAGAR AGENCIES 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 From Start	Recommendation Speed	
Sharp turn	Medium	10.769517372474736,	650 KM	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	10.749451955814655,	3.8 KM	10km/hr TO 15	
_	_	78.83046376176118		Km/Hr	
Sharp turn	Medium	10.739326461561383,	5.3 KM	20km/hr TO 30	
		78.83800479151158		Km/Hr	
Sharp turn	Medium	10.73642740628165,	7.4 KM	20km/hr TO 30	
		78.85764863813984		Km/Hr	
Sharp turn	Medium	10.733604466438722,	9.1 KM	20km/hr TO 30	
		78.87281181707364		Km/Hr	
Sharp turn	Medium	10.73080526998016,	12.8 KM	20km/hr TO 30	
		78.90617767628218		Km/Hr	
Sharp turn	Medium	10.730477923035412,	13 KM	20km/hr TO 30	
		78.90801389404626		Km/Hr	
Sharp turn	Medium	10.724463035027611,	15 KM	20km/hr TO 30	
		78.92577296721807		Km/Hr	
Sharp turn	Medium	10.723788382097183,	15.4 KM	20km/hr TO 30	
		78.92890578732897		Km/Hr	
Sharp turn	Medium	10.721500875854746,	16.3 KM	20km/hr TO 30	
		78.93682366832411		Km/Hr	

Sharp turn	Medium	10.720994881360893,	16.5 KM	20km/hr TO 30
		78.93834716298483		Km/Hr
Sharp turn	High	10.71915010256302,	16.8 KM	10km/hr TO 15
		78.9411152027286		Km/Hr
Sharp turn	Medium	10.71843327121256,	17 KM	20km/hr TO 30
		78.94211298444303		Km/Hr
Sharp turn	High	10.717263145760954,	17.5 KM	10km/hr TO 15
		78.94670492633878		Km/Hr
Sharp turn	High	10.716985075928461,	18 KM	10km/hr TO 15
		78.95102478766644		Km/Hr
Sharp turn	Medium	10.71809195248243,	18. 5 KM	20km/hr TO 30
		78.95607806951443		Km/Hr
Sharp turn	High	10.725197170776585,	21 KM	10km/hr TO 15
-		78.97692607372574		Km/Hr
Sharp turn	Medium	10.586245270039095,	24.6 KM	20km/hr TO 30
1		78.77577999109394		Km/Hr
Sharp turn	High	10.56308507045,	27.2 KM	10km/hr TO 15
1		78.7724142290844		Km/Hr
Sharp turn	High	10.54461080227603,	29.4 KM	10km/hr TO 15
•		78.77914575310348		Km/Hr
Sharp turn	Medium	10.525859664927024,	31.7 KM	20km/hr TO 30
1		78.77746287209871		Km/Hr
Sharp turn	Medium	10.496076103838332,	34.9 KM	20km/hr TO 30
1		78.77718239193125		Km/Hr
Sharp turn	Medium	10.474563969680514,	37.4 KM	20km/hr TO 30
1		78.77774335226619		Km/Hr
Sharp turn	Medium	10.454803957686499,	39.7 KM	20km/hr TO 30
1		78.78446318876087		Km/Hr
Sharp turn	Medium	10.43604737721131,	41.8 KM	20km/hr TO 30
		78.78221934742116		Km/Hr
Sharp turn	High	10.416186235757952,	44.1 KM	10km/hr TO 15
Р •••	8	78.78895087144025		Km/Hr
Sharp turn	Medium	10.424737715842344,	45.6 KM	20km/hr TO 30
Р		78.79848719713395		Km/Hr
Sharp turn	M - 1:	10.425841115527431,	47.0 KM	20km/hr TO 30
	Medium	110.42384111337.7431	1 4 / .() N VI	ZUKM/Nr TU NU

Sharp turn	High	10.423082608984595,	48.2 KM	10km/hr TO 15
		78.82176705103326		Km/Hr
Sharp turn	High	10.421703346551386,	49.3 KM	10km/hr TO 15
		78.83158385689444		Km/Hr
Sharp turn	Medium	10.420324078011344,	49.8 KM	20km/hr TO 30
		78.83663249990875		Km/Hr
Sharp turn	High	10.419078663072911,	50 KM	10km/hr TO 15
		78.83817887136384		Km/Hr
Sharp turn	Medium	10.411373727895647,	51.6 KM	20km/hr TO 30
		78.84849200164066		Km/Hr
Sharp turn	Medium	10.411628830138296,	52.2 KM	20km/hr TO 30
		78.85484743015594		Km/Hr
Sharp turn	Medium	10.415381078567352,	53 KM	20km/hr TO 30
		78.86141996453782		Km/Hr

• Risk Assessment - Elevation Changes

Risk Type	Specific Risk	Risk Level	Coordination	Elevation Change	Gradient	Recommen 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 NAMBIKAI</u>
<u>VINAYAGAR AGENCIES (</u>10.4152944 , 78.8616215) TOTAL DISTANCE – 53
KM



10.769073692604486, 78.83720120889187



ALARP/JRM/TNSO/NAMBIKAI

10.764113439530249, 78.83446118711721



10.758209570013967, 78.83344387884853



10.751314343624747, 78.82530656733346



10.75126610223314, 78.82518044583597



10.749591316479634, 78.83018387464983



10.739318685033433, 78.8379420178455



10.735064036857814, 78.86553394452655

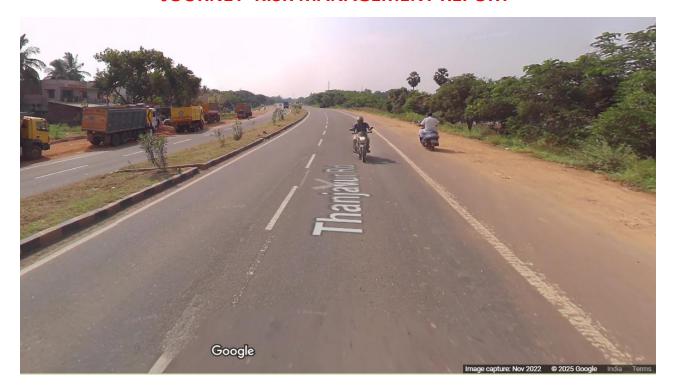
ALARP/JRM/TNSO/NAMBIKAI



10.731428224715632, 78.90834087863155



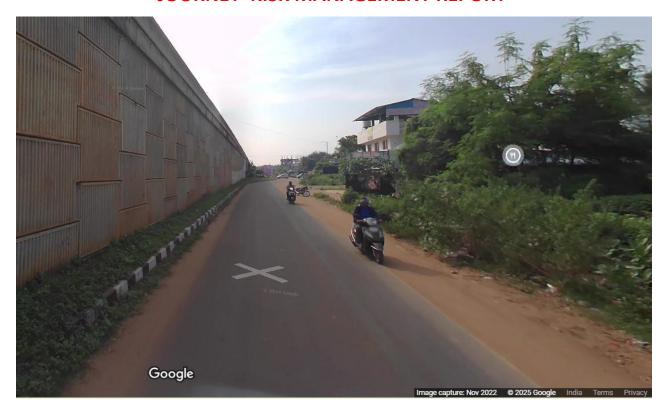
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10.74239869421108, 79.13924228433945



10.762835880662, 79.15885726520942



10.86508872374555, 79.19199892851083



10.983050192850786, 79.38667088419274



10.982396440646552, 79.39381342050322



10.991527724757828, 79.40666540897624

ALARP/JRM/TNSO/NAMBIKAI



11.022490944084682, 79.47018786867453



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10.416433603918119, 78.7880496858331



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10.415404990633254, 78.8614231885938



10.415306911625928, 78.86161916104075