

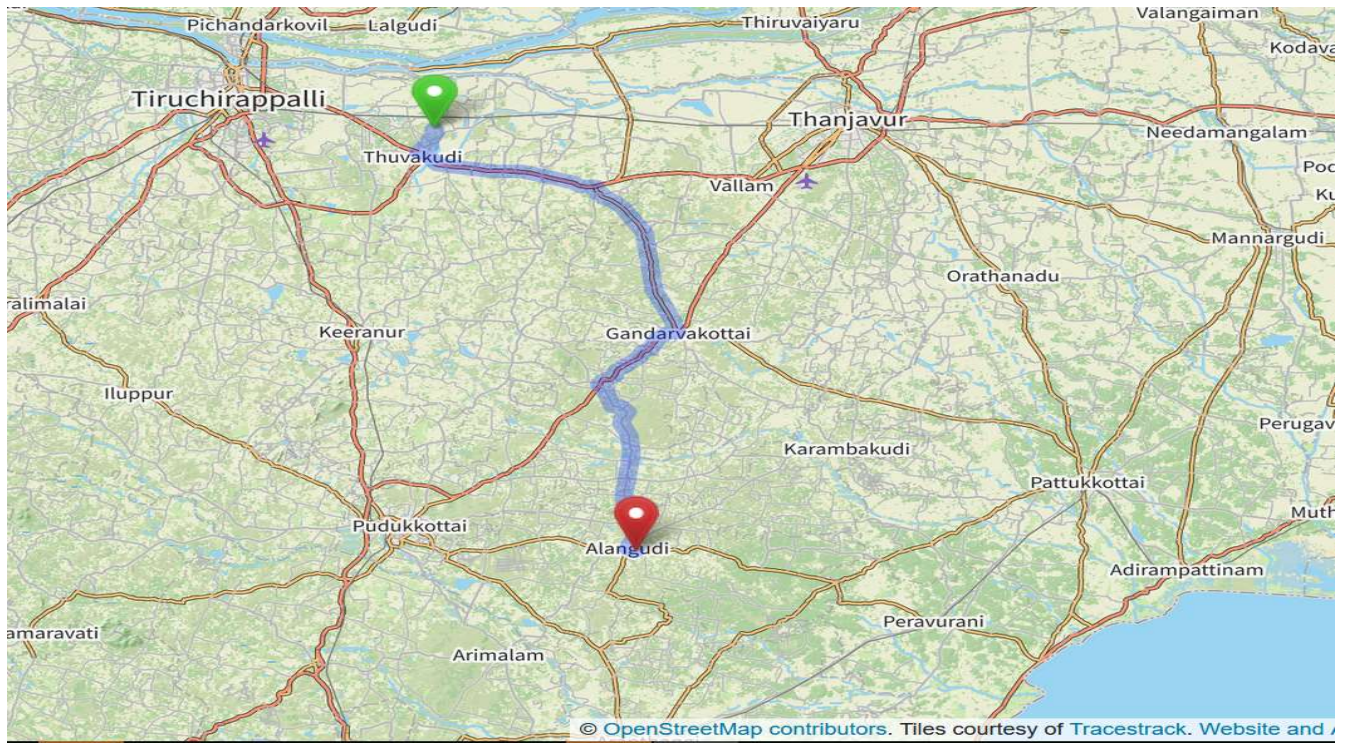
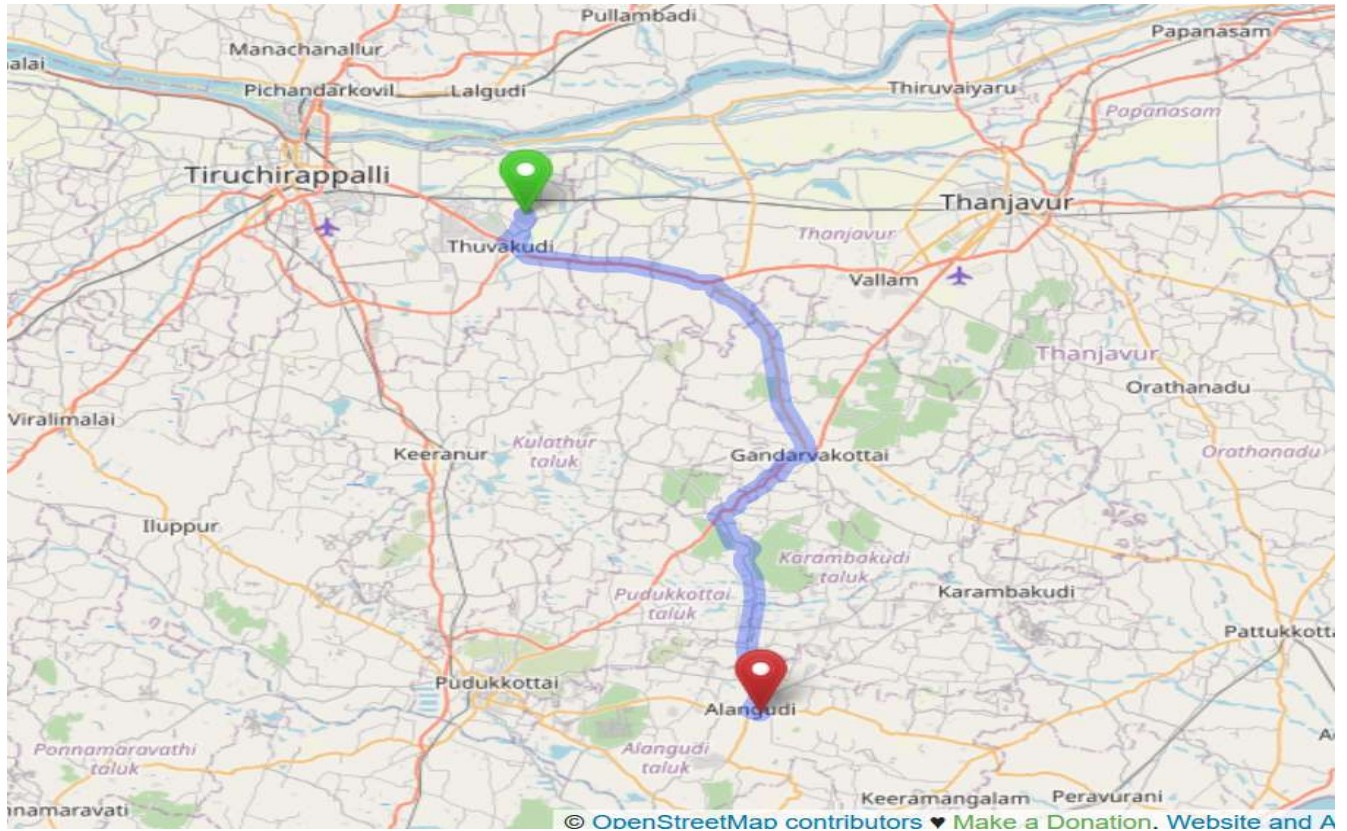


IndianOil

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

JOURNEY RISK MANAGEMENT STUDY REPORT

IOCL TIRUCHY TERMINAL (10.7753, 78.8368) TO SORNA AGENIES (10.35728, 78.98379), TOTAL DISTANCE -66.3 KM



JOURNEY RISK MANAGEMENT STUDY REPORT

Welcome to the Journey Risk Management Study for Sorna Agencies

Total distance: 68.2 km; Start with: (10.7753, 78.8368), End with: (10.35728, 78.98379)

❖ Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) To Sorna Agencies. The route passes through several key points including Thuakundi, Thircy – Tanjore Road, Thanjavur Road, Thircy -Thanjavur Road, Coimbatore – Nagapattan Highway, Pudukkottal – Tanjore Road, Alangudi- Pudhupati- Karambakundi Road and Total distance from Trichy Terminal To Sorna Agencies is 66.3 km for heavy vehicles carrying hazardous materials.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) To Sorna 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 (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

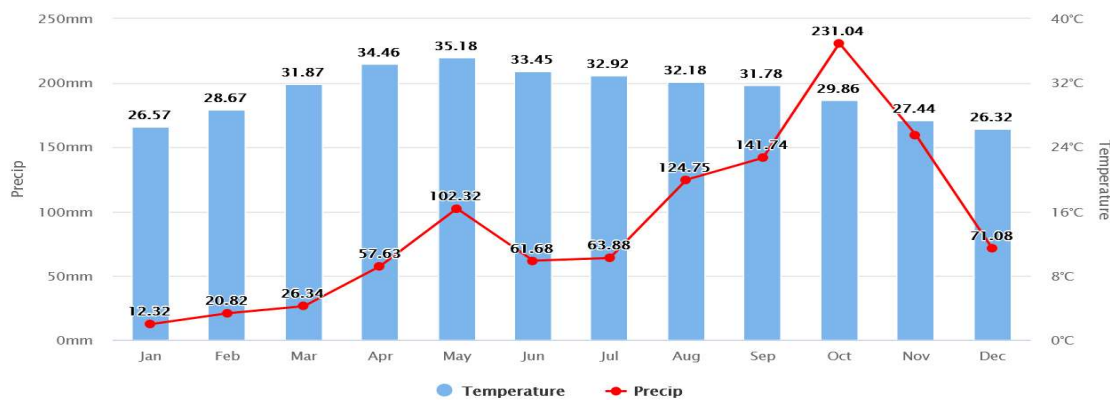
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Weather-Related Hazards: Trichy Terminal (T.N) To Sorna Agencies
Providing a local hourly weather forecast of rain, sun, wind, humidity and temperature.

The Long-range 12 day forecast also includes detail for weather today. Live weather reports from Trichy Terminal (T.N) To Sorna 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 Sorna Agencies 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:

- Green and Clean Technology solution
- GOPI VELKANAISINC SHOP
- Bismi Briyani
- Sri Muthumari Amman Thirukovil
- Ajs Maligai
- Sengipatti
- Aishwarya Medical Centre
- Taj Auto Diesel Works
- Sengipatti Bus Stop
- Pandian's Organic Farm

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- Parvatham Dental Clinic
- Vinayakar temple
- Government Hospital
- Thiru Muthiah Physio Clinic

❖ **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: SIDCO Industrial Estate Valavanthankottai, NH 83, Muthandipatti Rd, SH 99, NH36, Thiruvalluvar Salai, Kummangulam - Alangudi Rd/Thiruvalluvar Salai, udukkottai - Alangudi - Avanam - Pattukkottai Rd/Vadakkadu - Alangudi Rd

Alternative Route 2: NH 83, Muthandipatti Rd, SH 99, NH36, Thiruvalluvar Salai, Kummangulam - Alangudi Rd/Thiruvalluvar Salai,

❖ **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:** Green and Clean Technology solution, GOPI VELKANASINC SHOP, Bismi Briyani, Sri Muthumari Amman Thirukovil, Ajs Maligai, Sengipatti, Aishwarya Medical Centre, Taj Auto Diesel Works, Sengipatti Bus Stop

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- **Educational institutions:** - Many colleges, universities and school in between Trichy Terminal (T.N) To Sorna Agencies I.E Trichy High School, Girls Senior Secondary School .
- **Hospital:** - Government Hospital Alangudi, Noble Hospital, MGM Healthcare, Cauvery nagar hospital quarters, Ozone Hospitals, Chirag Hospital And Institute Of Proctology
- **Gas Station:** - A.V.R Petrol Bunk, R.M Traders, M/S R.K Agencies, Ranjith Petrol Pump, GTN Indian Oil , Nayara Petrol Pump, Amuthusurabhi Agencies Indian oil petrol pump, Sai Banu Agency Indian Oil, STD FUEL HP Petrol & Diesel 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**

Green and Clean Technology solution, Bismi Briyani, Sri Muthumari Amman Thirukovil, Ajs Maligai, Sengipatti ,Aishwarya Medical Centre,Taj Auto Diesel Works, 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>			

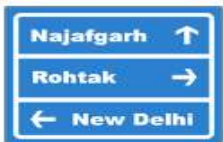


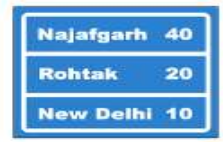
















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Cautionary signs

			
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 Sorna 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.

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❖ Risk Assessment - Sharp Turns

Risk Type	Risk Level	Coordination	Distance From Start	Recommendation Speed
Sharp turn	Medium	10.769008535749057, 78.83723765484662	300 M	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.765497799294907, 78.83604620042777	700 M	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.764009578128617, 78.83419636244746	950 M	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.758028485487644, 78.8334001457567	1.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.756122556562806, 78.83055889901199	2.0 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.751420920596344, 78.82521649200099	2.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.739011461069182, 78.83858885050212	4.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.732693078871645, 78.8744004316786	9.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.717181602413664, 78.95464873306916	17.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.720753025938777, 78.96377618938521	19.0 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.71097912745339, 78.9558694661921	20.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.71089603398133, 78.95587353077819	20.8 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.710510777725322, 78.95815078770025	21.1 KM	10 km/hr TO 20 Km/Hr
Sharp turn	Medium	10.707892309680394, 78.9581432313126	21.4 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.71089603398133, 78.95587353077819	25.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.573492136690625, 79.01365840917202	32.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.55341892238224, 78.98920283882778	41.9 KM	20km/hr TO 30 Km/Hr

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Sharp turn	Medium	10.526932823658742, 78.96621925865193	46.0 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.521018452488628, 78.95777910855021	47.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.500478807978283, 78.96719126485432	49.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.489673396392101, 78.97667721669097	51.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.475470878269865, 78.97744660699965	53.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.461719875337447, 78.98089783911972	55.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.431851234791166, 78.97814636161263	58.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.366911225762008, 78.9863942537038	64 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.361878194809277, 78.98016952853372	67.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.361143177391408, 78.98166916302662	64.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.357266261057422, 78.98084609847567	65.8 KM	20km/hr TO 30 Km/Hr

❖ Risk Assessment - Elevation Changes

Risk Type	Specific Risk	Risk Level	Coordination	Elevation Change	Gradient	Recommendation Speed
Elevation Change	Descent	Low	10.7753, 78.8368	-3.02m	-2.96 %	40 km/hr to 50 km/hr
Elevation Change	Descent	Low	10.35728, 78.98379	-9.28m	-6.28%	40 km/hr to 50 km/hr

JOURNEY RISK MANAGEMENT STUDY REPORT

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Sr No	Location	Lat, lon.
1	Hall/Hotel	10.757627679523425, 78.83287045929539
2	OLD Burma Colony	10.75810448259808, 78.83342945889828
3	School/College	10.751940259658717, 78.824855152166
4	School/College	10.751244043943656, 78.82964545444308
5	Bank	10.749935829138195, 78.8268757083185
6	Toll Plaza	10.739223590189045, 78.82491390378034
7	Hotel/Restaurant	10.701444574062581, 78.73129207330703
8	School/College	10.703678000471413, 78.73189375630369
9	Hostel	10.72417231487581, 78.68718618406425
10	BPC Retail Outlet	10.758181036689974, 78.65598357301882
11	School/College	10.74008121723329, 78.6379129330532
12	IOCL Retail Outlet	10.733112284745776, 78.63240994992489
13	School/College	10.751575145484235, 78.614060731372
14	School/College	10.75066744861209, 78.59905450362704
15	Temple	10.746887750005037, 78.59479570906672
16	School/College	10.720295382587906, 78.55149351755783
17	IOCL Retail Outlet	10.710207607228426, 78.53753206431443
18	IOCL LPG Bottling Plant	10.707624098893909, 78.53612845795988
19	ESSAR Petrol Pump	10.676876960685677, 78.5083325274308
20	Dairy	10.655209313280023, 78.47786068494291
21	Bank	10.638480473093344, 78.44810155282683
22	IOCL Retail Outlet	10.635808318189218, 78.4456274984975
23	BPCL Retail Outlet	10.607172101131809, 78.41180072584812
24	Residency	10.605861306601657, 78.41756933692223

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❖ SHARP TURN PICTURE FOR TRICHY TERMINAL TO SORNA AGENCIES



SHARP TURN IMAGE START FROM TRICY TERMINAL



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.765497799294907, 78.83604620042777

JOURNEY RISK MANAGEMENT STUDY REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.756122556562806, 78.83055889901199



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.739011461069182, 78.83858885050212

JOURNEY RISK MANAGEMENT STUDY REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.720753025938777, 78.96377618938521



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.573492136690625, 79.01365840917202

JOURNEY RISK MANAGEMENT STUDY REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.489673396392101, 78.97667721669097



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.461719875337447, 78.98089783911972

JOURNEY RISK MANAGEMENT STUDY REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.366911225762008, 78.9863942537038



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.494374169846944, 78.97771872041729

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.361143177391408, 78.98166916302662



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.357266261057422, 78.98084609847567

JOURNEY RISK MANAGEMENT STUDY REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 23.423073831779945, 70.68656297849758



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.494374169846944, 78.97771872041729

JOURNEY RISK MANAGEMENT STUDY REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.366911225762008, 78.9863942537038



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI. 10.521018452488628, 78.95777910855021

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