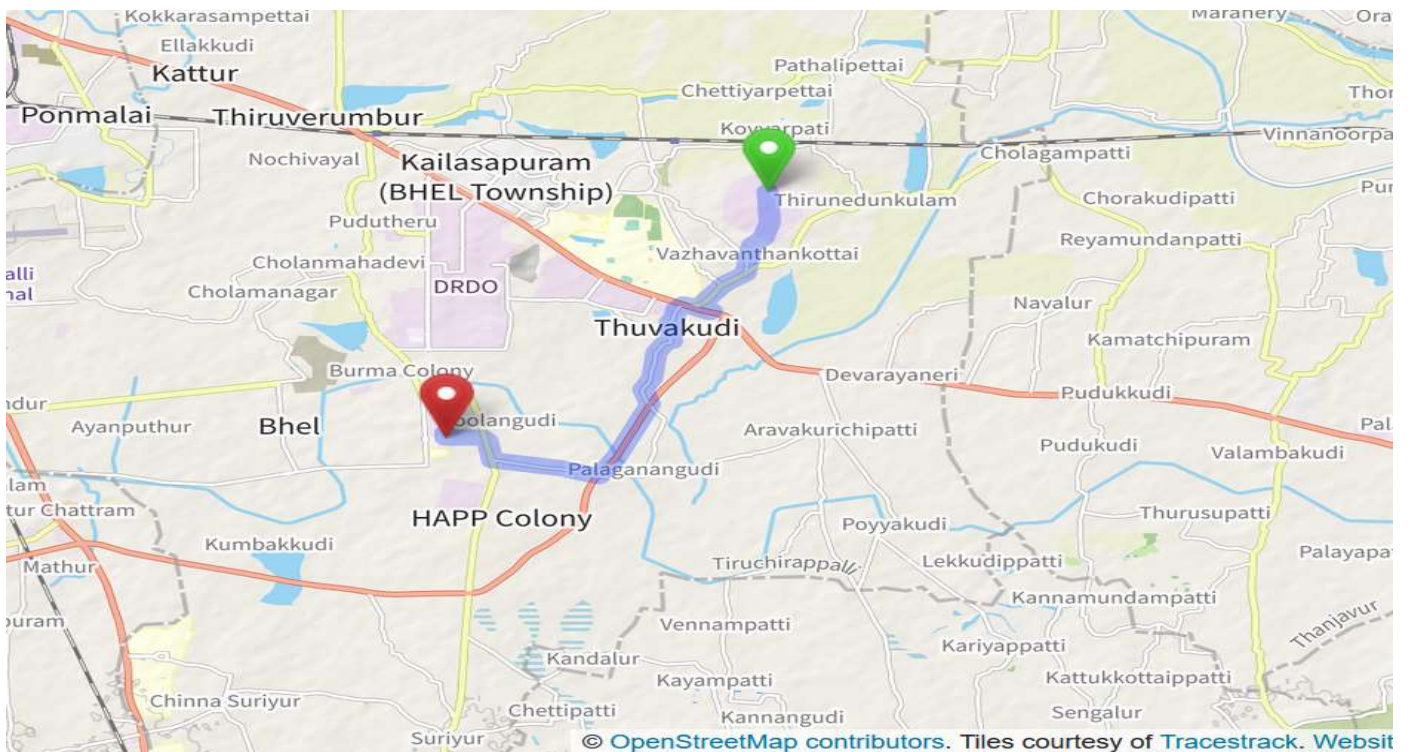
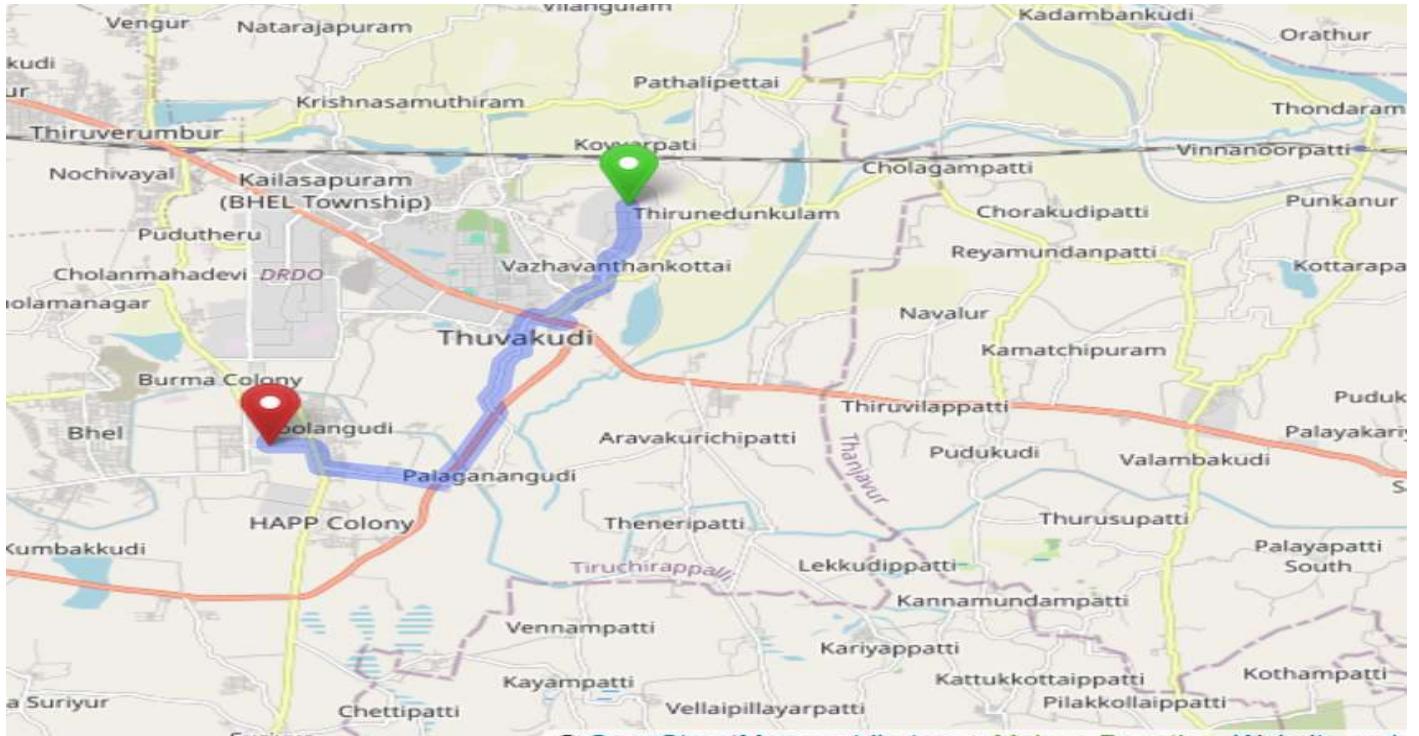




IndianOil

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

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO ORDINANCE FACTORY
(10.723743, 78.787079), TOTAL DISTANCE -12 KM



Welcome to the Journey Risk Management Study for ORDINANCE FACTORY

Total distance: 12 km; Start with: (10.7753, 78.8368), End with: (10.723743 , 78.787079)

❖ Route Safety Analysis Report Overview of the Route Map

The route from Trichy Terminal (T.N) to ORDINANCE FACTORY. The route passes through several key points including SIDCO Industrial Estate, Thuvakudi to SIDCO& Indian oil Storage, NH 83, Trichy Bypass, Outer Ring Rd/Trichy Bypass, Palanganangudi Rd,

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) to ORDINANCE FACTORY 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.

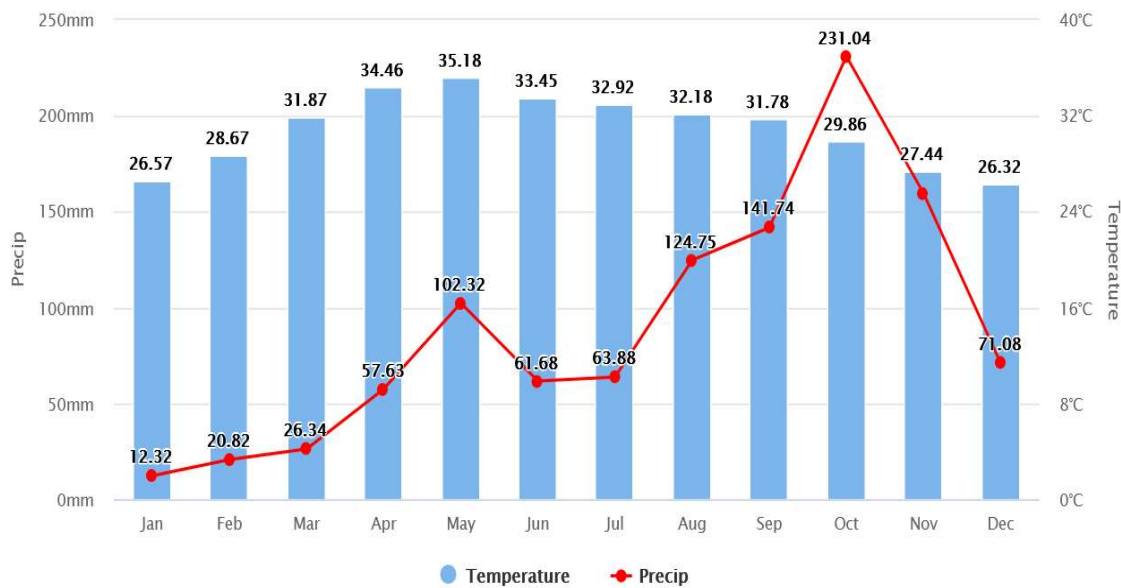
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0 (91.4)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	43.0 (109.4)	42.0 (107.6)	40.0 (104.0)	39.0 (102.2)	38.0 (100.4)	37.0 (98.6)	34.0 (93.2)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.18)	36.0 (96.8)	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

Weather-Related Hazards: Trichy Terminal (T.N) To ORDINANCE FACTORY 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 ORDINANCE FACTORY 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 ORDINANCE FACTORY peak traffic hours are from 8:00 AM to 11:00 AM and 4:00 PM to 9:00 PM on weekdays.

Congestion-Prone Areas:

- Bismi Briyani
- SARAN STORE
- ARS MILLK AGENCY
- Aishwarya Medical Centre
- Arunapuri

- Aravind Engg Pvt Ltd
- Salini Chicken kadai
- SHA INFOTECH
- BALAMEHASHWARY MUTHUKUMAR SHOP

❖ **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 Route1: NH83

Alternative Route 2: NIL .

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:-** Bismi Briyani, SARAN STORE,ARS MILLK AGENCY, Aishwarya Medical Centre, Arunapuri, Aravind Engg Pvt Ltd, Salini Chicken kadai, SHA INFOTECH,BALAMEHASHWARY MUTHUKUMAR SHOP

- **Educational institutions:** I.E Trichy High School, Girls Senior Secondary School.
- **Hospital:** - Government Hospital Alangudi, Noble Hospital, MGM Healthcare.
- **Gas Station:** - A.V.R Petrol Bunk, R.M Traders.
- **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**

Bismi Briyani, SARAN STORE, ARS MILLK AGENCY, Aishwarya Medical Centre, Arunapuri, Aravind Engg Pvt Ltd. 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

			
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

 <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>			

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

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 ORDINANCE FACTORY , Nallathur Road, Nedungadu Commune, Kurumbagaram, Thiruvavur State-TN is generally manageable but poses several risks, particularly during the monsoon season and Winter (Fog Weather) 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	10.75826994715787, 78.83326651420096	2.0 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.756715887788083, 78.83021887801165	2.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.751274985268047, 78.82506273704801	3.2 KM	10km/hr TO 20 Km/Hr
Sharp turn	High	10.750277996315637, 78.82811314184613	3.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.74905481445307, 78.83068971790057	3.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.742539235146788, 78.82757393279459	4.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73973556832621, 78.82562793774534	5.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.739905319126704, 78.82563344316605	5.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.715741968991477, 78.81077448598636	8.1 KM	10km/hr TO 20 Km/Hr
Sharp turn	High	10.719184965783784, 78.79433271897989	10.1 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.723726980097384, 78.79333471154888	10.6 KM	20km/hr TO 30 Km/Hr

❖ **Risk Assessment – Key Location:**

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	10.744657137862134, 78.83396676954393
	Residency/Hotel	10.74244590807412, 78.83739600508359
7	Jagdish Filling station IOCL RO	10.730096699158965, 78.86385149738328
8	Bus Stand	10.737757663945956, 78.84463219368527
9	School/College	10.743654738281231, 78.85235497712233

**IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO ORDINANCE
FACTORY(10.723743 , 78.787079), TOTAL DISTANCE – 12 KM**



10.758262863684411, 78.83351425048



10.755557510143007, 78.82964043768688



10.752134298790681, 78.82718013759803



10.75124649331893, 78.8252916438317



10.744321179303157, 78.83417370199756



10.739248384583261, 78.8381029124365



10.729351757363672, 78.9111983896726



10.722889017911928, 79.0708448272496