

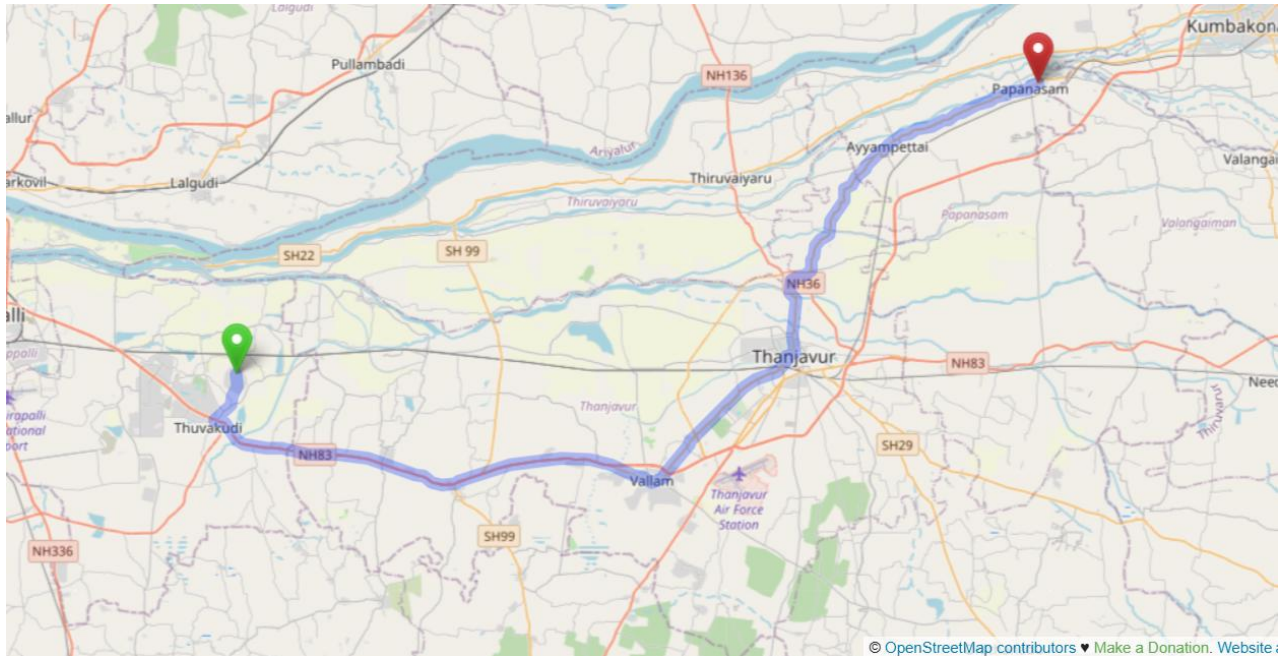


IndianOil

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

JOURNEY RISK MANAGEMENT REPORT

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO RAJA MOHAMMED - BROS(10.92978 , 79.2701) TOTAL DISTANCE – 69 KM



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JOURNEY RISK MANAGEMENT REPORT

Welcome to the Journey Risk Management Study for RAJA MOHAMMED - BROS

Total distance: 69 KM; Start with: (10.7753 , 78.8368), End with: (10.92978 , 79.2701)

❖ Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) To RAJA MOHAMMED - BROS .The Route passes Through several Key Point including Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi Follow NH 83 to Pudukkottai Rd in AVP Azhagammal Nagar, Thanjavur Continue on Pudukkottai Rd to NH 36, At the roundabout, take the 1st exit onto NH 36, Take Papanasam-Saliangalam Rd to Manthai - Karuppur Main Rd/Thanjavur Rd/Thanjavur - Kumbakonam Main Rd in Papanasam, Slight right at DHEEN MALIGAI BAZAAR onto Manthai - Karuppur Main Rd/Thanjavur Rd/Thanjavur - Kumbakonam Main Rd and Total distance from Trichy Terminal To RAJA MOHAMMED - BROS IS 69 KM.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) To RAJA MOHAMMED - BROS 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.

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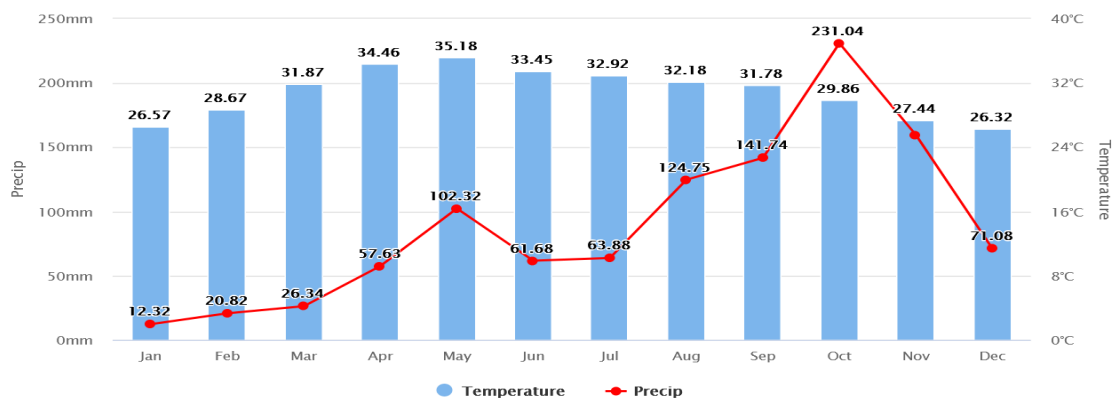
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0 (91.4)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	43.0 (109.4)	42.0 (107.6)	40.0 (104.0)	39.0 (102.2)	38.0 (100.4)	37.0 (98.6)	34.0 (93.2)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.18)	36.0 (96.8)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

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Typically, Trichy Terminal (T.N) To RAJA MOHAMMED - BROS 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
- School of Law, SASTRA University
- Masjidul Aqsa vallam
- Maruti Suzuki ARENA (PLA Motors, Thanjavur, Nangikkottai

❖ 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 NH 83 to Pudukkottai Rd in AVP Azhagammal Nagar, Thanjavur Continue on Pudukkottai Rd to NH 36, At the roundabout, take the 1st exit onto NH 36, Take Papanasam-Saliangalam Rd to Manthai - Karuppur Main Rd/Thanjavur Rd/Thanjavur - Kumbakonam Main Rd in Papanasam, Slight right at DHEEN MALIGAI BAZAAR onto Manthai - Karuppur Main Rd/Thanjavur Rd/Thanjavur - Kumbakonam Main Rd.

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Alternative Route 2 -) Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, At Jude Digital Studios, continue onto Thuvakudi to SIDCO & Indian oil Storage, Follow NH 83 and NH 36 to Chinnammal Kallarai/Kallanai - Poombuhar Rd/Poompuhar Rd in Kumbakonam, Keep right to stay on NH 83, At the roundabout, take the 2nd exit and stay on NH 36, Slight right at Pugazendi Car AC & Electrician Works onto NH 136B, Follow Chinnammal Kallarai/Poompuhar Rd to NH 136B in Aduthurai, Turn right at M.S.K Fish Farm onto NH 136B, Continue on Aduthurai - Porayar Rd. Drive to Main Rd in Nallathur.

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.
- **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.

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- **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,

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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:** 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**














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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 ands</p>			



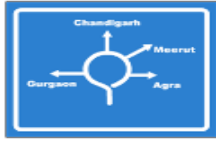
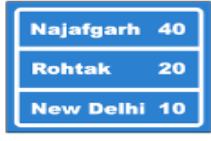
















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Cautionary signs

			
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 RAJA MOHAMMED - BROS 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.

JOURNEY RISK MANAGEMENT REPORT

- **Risk Assessment - Sharp Turns**

Risk Type	Risk Level	Coordination	Distance From Start	Recommendation Speed
Sharp turn	Medium	10.769517372474736, 78.83735063199906	650 M	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.76584461192607, 78.8361700257199	1.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.764182189802032, 78.83459588401435	1.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.75826698538096, 78.83349398474651	2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.756372549032195, 78.83034570133539	2.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.751346435623256, 78.8252297405902	3.2 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.749451955814655, 78.83046376176118	3.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.739326461561383, 78.83800479151158	5.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73642740628165, 78.85764863813984	7.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.733604466438722, 78.87281181707364	9.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73080526998016, 78.90617767628218	12.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.730477923035412, 78.90801389404626	13 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.724463035027611, 78.92577296721807	15 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.723788382097183, 78.92890578732897	15.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.721500875854746, 78.93682366832411	16.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.720994881360893, 78.93834716298483	16.5 KM	20km/hr TO 30 Km/Hr

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Sharp turn	High	10.71915010256302, 78.9411152027286	16.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.71843327121256, 78.94211298444303	17 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.717263145760954, 78.94670492633878	17.5 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.716985075928461, 78.95102478766644	18 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.71809195248243, 78.95607806951443	18. 5 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.725197170776585, 78.97692607372574	21 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.730780555846192, 79.01656126512937	25.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.730190246964545, 79.02046656130192	25.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.730401071697452, 79.02480101090002	26.2 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.727139512814995, 79.03926391834526	27.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.726633527742022, 79.06514187050024	30.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.723049442647225, 79.07037754229201	31.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.736837396359547, 79.10561104002268	35.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73612060698111, 79.11058922045575	36.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.742782466810393, 79.13346309881189	38.8 KM	10km/hr TO 15 Km/Hr

- **Risk Assessment - Elevation Changes**

JOURNEY RISK MANAGEMENT REPORT

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	10.993921 , 78.326323	-9.28m	-6.28%	40 km/hr to 50 km/hr

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO RAJA MOHAMMED - BROS(10.92978 , 79.2701) TOTAL DISTANCE – 69 KM



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

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JOURNEY RISK MANAGEMENT REPORT



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



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

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JOURNEY RISK MANAGEMENT REPORT



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



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

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**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI:
10.749591316479634, 78.83018387464983**



**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI:
10.739318685033433, 78.8379420178455**

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**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI:
10.735064036857814, 78.86553394452655**

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JOURNEY RISK MANAGEMENT REPORT



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI:
10.781310293609426, 79.16451866056907



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.863227230977438,
79.1922052049595

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**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.893193719076036,
79.26998882614816**

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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.927484181019077,
79.26552208826718

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**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.929793931526099,
79.27119209895773**

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**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.93138006642112,
79.27152652255161**

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**IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.929788163506409,
79.27008198614455**

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