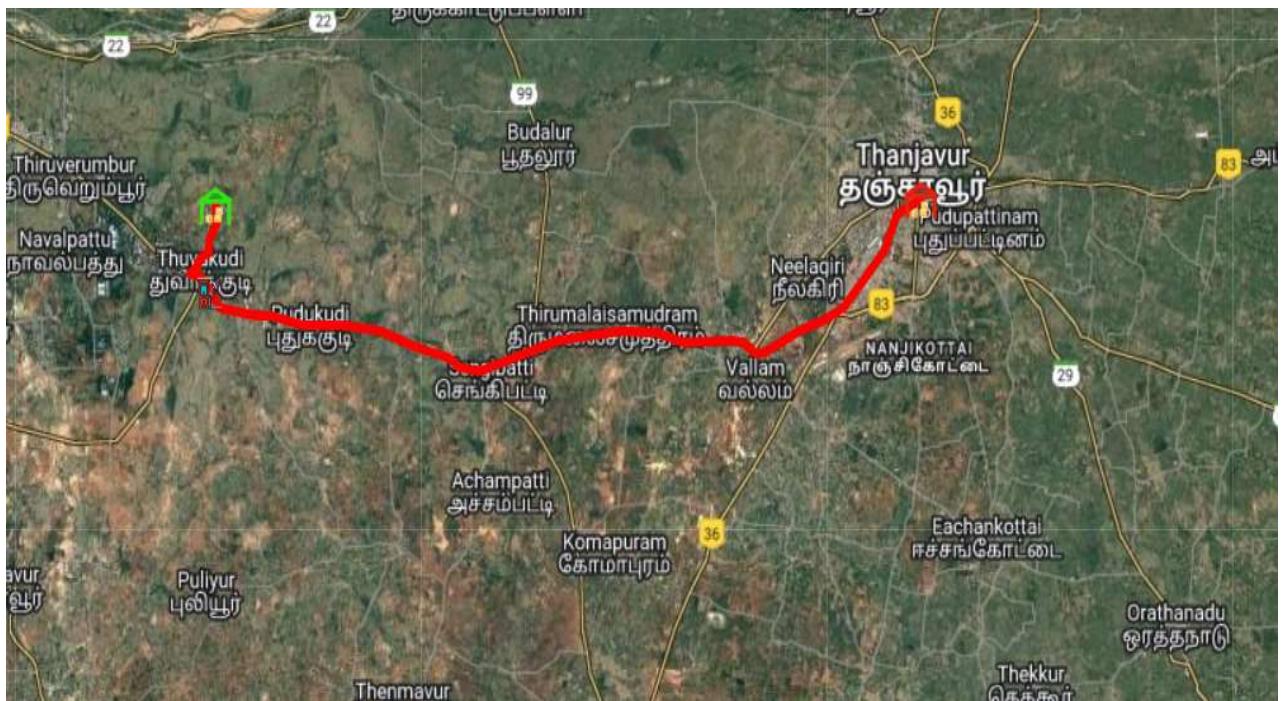
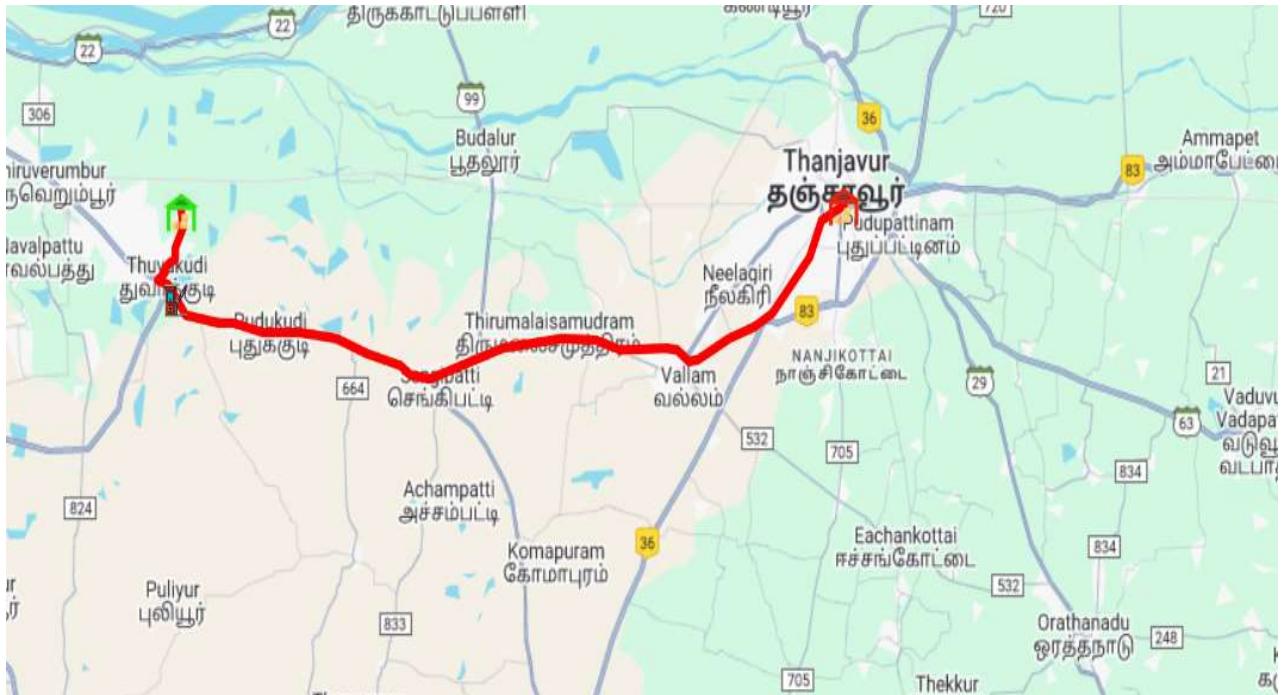




IndianOil

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

**IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO PLA TRADERS
(10.777291 , 79.141836) TOTAL DISTANCE -83.6 KM**



Objective of the JRM Report

This JRM report is designed to ensure compliance with the Central Motor Vehicle Rules, 1989 (CMVR), AIS140 standards, and the Road Transport Safety Policy (RTSP). It provides a comprehensive risk assessment for the transportation of hazardous materials along specified routes. By integrating these legal frameworks, the report offers a broad strategy for identifying and mitigating route-specific risks.

Regulatory Compliance

The report complies with the Central Motor Vehicles (Eleventh Amendment) Rules, 2022, mandating safe transportation practices for N2 and N3 category vehicles carrying hazardous materials. These rules require detailed route assessments, especially regarding road conditions, speed limits, and risk areas, to ensure safety compliance.

Risk Management Strategy

This report categorizes transportation routes into high-risk and medium-risk areas, with a focus on factors such as sharp turns, accident-prone regions, and elevation changes. The goal is to provide actionable recommendations to minimize these risks, including speed regulations, driver warnings for hazardous zones, and the option of alternate routes.

Compliance with the Road Transport Safety Policy (RTSP) The report integrates RTSP provisions, including mandatory driving hours, rest periods, and nighttime driving restrictions. It ensures that drivers follow official guidelines, such as taking prescribed rest breaks and avoiding dangerous road conditions like poor visibility, heavy crowds, or high-traffic areas during peak hours.

Emergency Preparedness and Response

The report highlights the significance of predetermined emergency stops for refueling, rest, and overnight stays. It includes protocols for safe responses to road hazards, alternative routes, and rerouting processes if roads are closed or severe weather arises. This aligns with the RTSP emphasis on driver safety and rapid emergency response.

Environmental Considerations

The JRM report addresses environmental risks along the route, ensuring compliance with environmental protection laws in ecologically sensitive zones. It suggests strategies such as identifying areas near waterbodies, forests, or populated regions and implementing safety

measures to minimize environmental impacts during transport.

Journey Risk Mitigation

The report includes route-specific risk assessments, detailed journey charts, and defensive driving guidelines for each transport route. Integration with vehicle tracking systems guarantees real-time warnings on hazardous areas, speed limits, and mandatory stops, consistent with RTSP and CMVR safety norms. Compliance with

Government Directives

This report fully adheres to governmental directives regarding hazardous material transportation, implementing mandatory speed limits, nighttime driving restrictions, and comprehensive driver briefing sand real-time alerts about route-related risks.

Welcome to the Journey Risk Management Study for PLA TRADERS

Total distance: 83.6 km; Start with: (10.7753, 78.8368), End with: (10.777291, 79.141836)

❖ Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) to PLA Traders. The route passes through several key points including Thuvakudi to SIDCO & Indian oil Storage Pass by Jude Digital Studios, NH 83, via NH 83 and Thanjavur - Karaikudi - Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Kodiakkarai Rd/Thanjavur - Mannargudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd, Karaikudi - Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Kodiakkarai Rd/Thanjavur - Mannargudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd and SH 99A to Srinivasam Pillai Rd in Shivaji Nagar, and Total distance from Trichy Terminal To PLA TRADERS is 41.9 km for heavy vehicles carrying hazardous materials.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) To PLA TRADERS 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	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

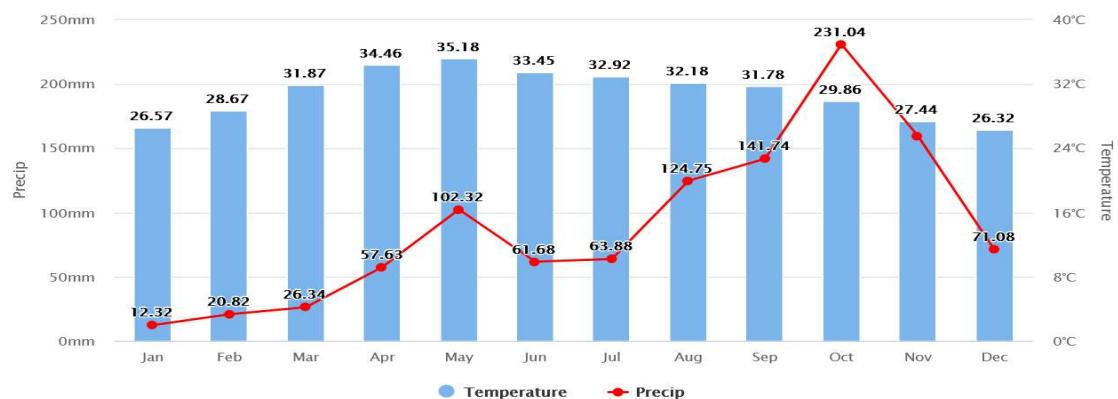
Weather-Related Hazards: Trichy Terminal (T.N) To PLA TRADERS

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 PLA TRADERS 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 PLA TRADERS 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:

- Wonder World Theme Park
- Ponnaiyah Ramajayam Institute of Science & Technology
- Hotel AKSHITH Inn
- Akka Kowsa Kadai- Burma Foods

❖ 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 Valavanankottai, NH 83, Muthandipatti Rd, SH 99, NH36, Thiruvalluvar Salai, Kummangulam - Alangudi Rd/Thiruvalluvar Salai, udkkottai - 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:** National Institute of Technology Tiruchirappalli, BHELEC CINEMA 4K Dolby 7.1, 39/47A, Dr Ambedkar Nagar, Thiruverumbur, Tamil Nadu 620019, QQQC+RHH, Malaikoil, Thiruverumbur, Tamil Nadu 620013
- **Educational institutions:** - Ponnaiyah Ramajayam Institute of Science & Technology, NIT Trichy
- **Hospital:** - Anu Multispecialty Hospital, Vinod Hagan Memorial Hospital , G.M Hospital.
- **Gas Station:** - Petrol Bunk CNG station, Thanjavur, COVAI LPG - AUTO GAS – THANJAVUR, HP PETROL PUMP - DELTA FUELS., BPCL Masiya Fuels
- **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).

❖ 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

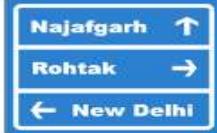
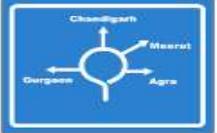
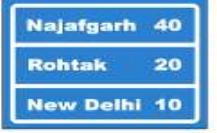
			
Stop	Give way	No entry	Straight prohibited
			
One way	One way	Vehicles prohibited in both directions	Horn prohibited
			
Pedestrians prohibited	Cycles prohibited	Right turn prohibited	Left turn prohibited
			
U-turn prohibited	Overtaking prohibited	Trucks prohibited	Tonga prohibited

			
All motor vehicles prohibited	Hand cart prohibited	Bullock cart prohibited	Bullock and hand carts prohibited
			
No parking	No parking or stopping	Speed limit	Axle load limit
			
Width limit	Weight limit	Length limit	Load limit
			
Restriction ends			

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 PLA TRADERS 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	10.76935549127747, 78.83728706844668	600 M	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.765743086556203, 78.83597380160015	1.1KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.76413532891628, 78.83433260447404	1.3KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.758184845604113, 78.83337661180767	2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.756282311648162, 78.83047176373097	2.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.751289353636015, 78.82527088475665	3.2 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.749300491277532, 78.83060116311232	3.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73927336058094, 78.83800266064627	5.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73292605409822, 78.8754500411899	9.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.730610492214005, 78.90764961039615	13 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.718227813748994, 78.94280882638635	17 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.717289169616222, 78.95431357938347	18.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73132171088083, 79.02565721913443	26.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.726902510828884, 79.06463840622818	30.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.723219794792627, 79.07063551193492	31.4 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.737893842044162, 79.10519396484231	35.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.772687230959127, 79.13238553078472	40.6 KM	20km/hr TO 30 Km/Hr

Sharp turn	High	10.777627388244786, 79.14131871985892	41.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.74328897463726, 79.14225760188724	39.8 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.780404751602815, 79.16734250741605	45 KM	10km/hr TO 20 Km/Hr
Sharp turn	High	10.817736360016776, 79.18047515526581	49.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.840339877729143, 79.19191515410074	52.3KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.866183705074247, 79.1927810209242	55.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.932095836643457, 79.31034743170252	70.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.938511393691135, 79.34586818266324	74.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.965236885200495, 79.39181811063801	81.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.955166244553812, 79.39483327418229	82.4 KM	10km/hr TO 20 Km/Hr

❖ Risk Assessment - Elevation Changes

Risk Type	Specific Risk	Risk Level	Coordination	Elevation Change	Gradient	Recommendation Speed
Elevation Change	Ascent	Low	10.7753, 78.8368	1.02m	2.96 %	40 km/hr to 50 km/hr
Elevation Change	Ascent	Low	10.777291, 79.141836	10.28m	5.28%	40 km/hr to 50 km/hr

**IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO PLA TRADERS
(10.777291, 79.141836) TOTAL DISTANCE - 83.6 KM**



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.764332145608435, 78.83395156745746



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.758165460712583, 78.83328500110595

Image capture: Nov 2022 © 2025 Google India Terms

Google



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.992066778173717, 79.56820237764057



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.99122294842798, 79.57203662086194



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.987740544991665, 79.58142784769393



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.987540562736278, 79.5871215963912



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.98257682421649, 79.603774136502



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.997468072824544, 79.52261457790277



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.978642804669425, 79.61216319719159



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.980311502737374, 79.6269924536789



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.981093919837123, 79.63238714523666



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.981093919837123, 79.63238714523666



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.980289845806885, 79.64038449669609



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.980974794669736, 79.65339382615088



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.981434236664478, 79.65609416186935



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.98205716524272, 79.66772881733506



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.983622084540597, 79.67921211595166



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.983611079081712, 79.6794698558881



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.983623141682171, 79.6834547111762



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.981989652855994, 79.690124444837



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.97900065737536, 79.69900788046597



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.97614303989356, 79.70712467304794



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.977932476045517, 79.71594218031824



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.977607564144272, 79.7244128789247



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.976343782644864, 79.74606516666324



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.976143547065968, 79.75277076450837



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.97406285566265, 79.77076007615538



IMAGE: Blind Spot RISK LEVEL: - MEDIUM, COORDI 10.966870491363219, 79.79981994069612



IMAGE: SHARP TURN RISK LEVEL: - MEDIUM, COORDI 10.960160926774313, 79.81119260218072



10.757199274142135, 78.8318101612274



10.755939424436578, 78.82978997572098



10.751976096162563, 78.82662458111328



10.75124502122275, 78.82508388631817



10.749589922809644, 78.83024242045755



10.739217100874933, 78.83812021380733



10.717597297177274, 78.9417220700943



10.71783855786776, 78.95352819574961



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IMAGE :- Blind Spot RISK LEVEL :- MEDIUM COORDI 10.737855240943937, 79.10581933834833



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IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.737886188737212, 79.10618843969131



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10.772306971436587, 79.13208774666771



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10.775945063815081, 79.14016315964453



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10.777609339381153, 79.14138317326545