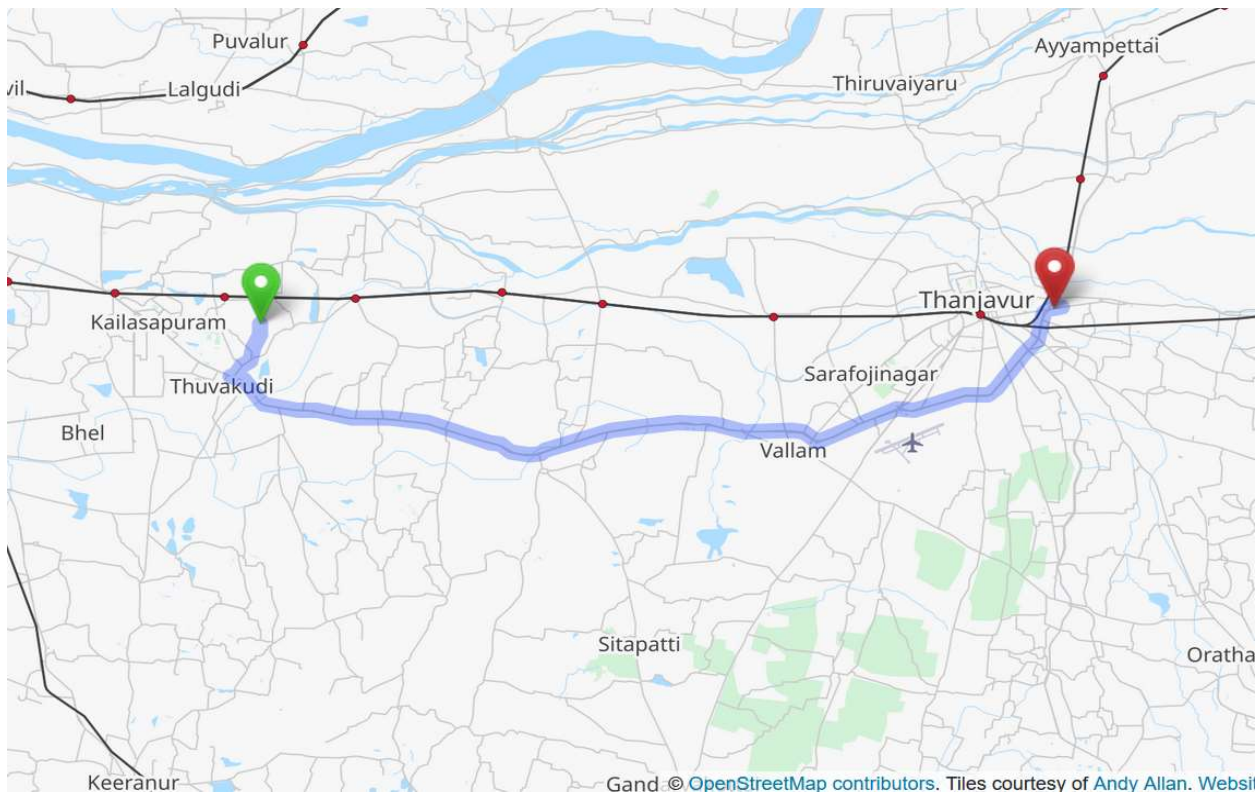
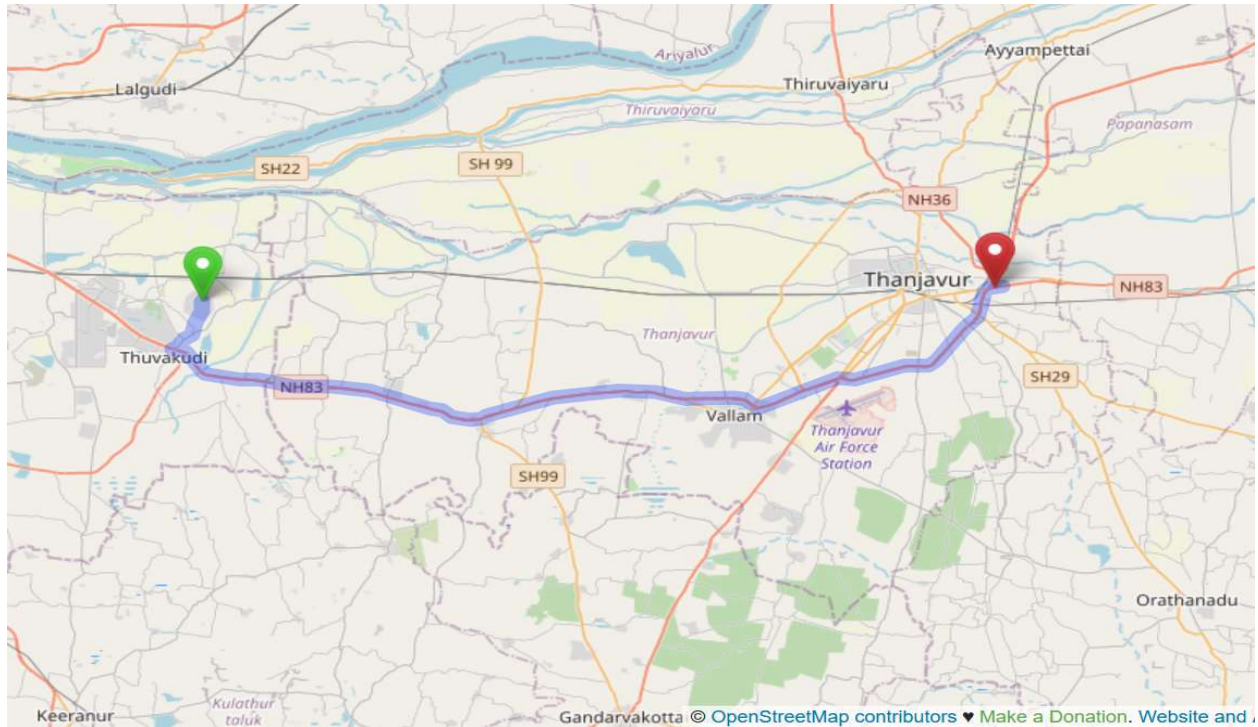




IndianOil

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

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO RANEE (10.780638, 79.170229) TOTAL DISTANCE -47 KM



Welcome to the Journey Risk Management Study for Ranee Agency

Total distance: 47 km; Start with: (10.7753, 78.8368), End with: (10.780638 , 79.170229)

❖ Route Safety Analysis Report Overview of the Route Map

The route from Trichy Terminal (T.N) to Ranee Agency . The route passes through several key points including SIDCO Industrial Estate Valavanthankottai, Coimbatore-Nagapattnam hwy turn right, Maravapattivillur-kalikkudi Road, SH99A, Nagapattinum Rd, Over Bridge grand Anicut canal.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) to Ranee 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.

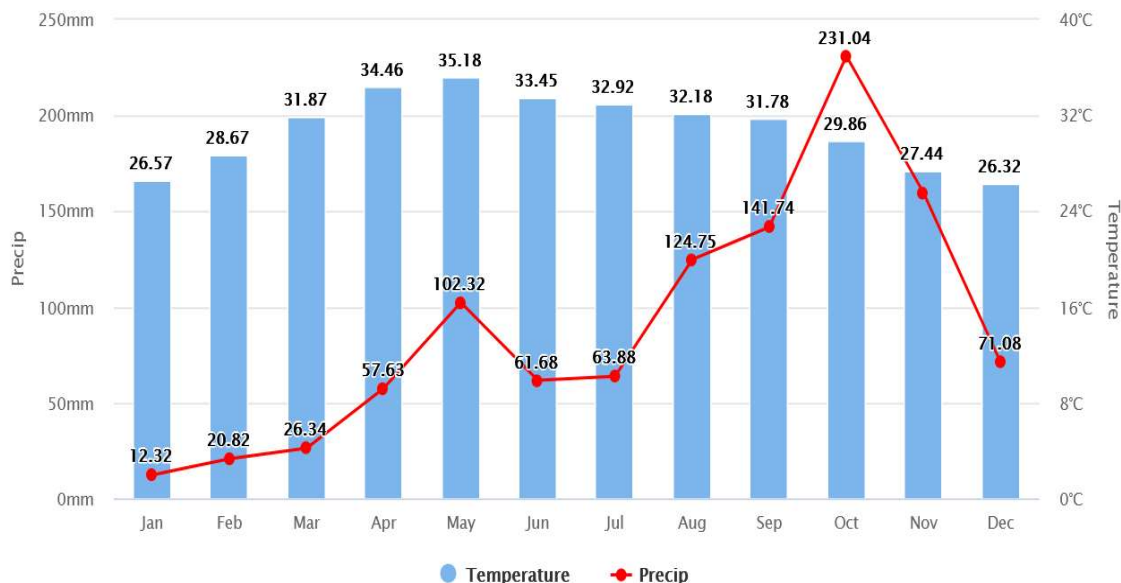
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0 (91.4)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	43.0 (109.4)	42.0 (107.6)	40.0 (104.0)	39.0 (102.2)	38.0 (100.4)	37.0 (98.6)	34.0 (93.2)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.18)	36.0 (96.8)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

Weather-Related Hazards: Trichy Terminal (T.N) To Ranee Agency 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 Ranee Agency 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 Ranee Agency 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:

- Ganesh Wine
- Bridgestone Select - Shakthi Tyres
- Diamond Diesel Pump Service

- Government hospital kottucherry
- Servite Higher secondary School
- Kottucherry Police Station,
- Navakiraha Orphanage Care Home - Nocom Trust,
- Mary Help Of Christians Church,
- Mary St,
- Kumarpillai st

❖ **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: Thuvakudi to SIDCO & Indian oil Storage, Trichy-Tanjore Rd, Tanjore to Nagapattinam two way bypass Rd, NH83, Kottucherry Rd, Vedamattam Main Rd, Maravapatti-villur-kalikkudi Road.

Alternative Route 2: NH-99A, Kulithalai -Manapparai Rd, Vadakkada – Alangudi Rd, Rannathpuram Rd, NH83/service Road.

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:** Sri Kailsh car wash service station, Rani food & herbals, Matriculation Higher Secondary School, near by Residential colonies
- **Educational institutions:** - Irrigation Management Training Institute, State Institute Of Hotel Management and Catering Technology, Matriculation Higher Secondary School, St. marry School, Agricultural office.
- **Hospital:** - Dr TVS multispecialty Hospital
- **Gas Station:** - In route there are several of Retail Outler/gas station are available like Rakku shakti, Jagdish fuels and others.
- **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**

Sri Kailsh car wash service station, Rani food & herbals, Matriculation Higher Secondary School, near by Residential colonies 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

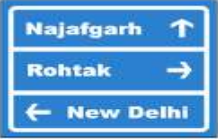


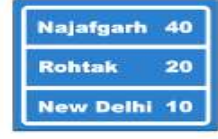
















			
Stop	Give way	No entry	Straight prohibited
			
One way	One way	Vehicles prohibited in both directions	Horn prohibited
			
Pedestrians prohibited	Cycles prohibited	Right turn prohibited	Left turn prohibited
			
U-turn prohibited	Overtaking prohibited	Trucks prohibited	Tonga prohibited

 <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

 <p>Advance direction</p>	 <p>Map type advance direction</p>	 <p>Rotary intersection</p>	 <p>Reassurance</p>
 <p>Direction</p>	 <p>Direction</p>	 <p>Place identification</p>	 <p>Truck lay bay</p>
 <p>Toll booth ahead</p>	 <p>Parking this side</p>	 <p>Parking both sides</p>	 <p>Cycle stand</p>
 <p>Scooter and motor cycle stand</p>	 <p>Taxi stand</p>	 <p>Auto-rickshaw stand</p>	 <p>Cycle-rickshaw stand</p>
 <p>Public telephone</p>	 <p>Filling station</p>	 <p>Hospital</p>	 <p>First aid post</p>

Conclusion

The route for Trichy Terminal (T.N) to Rane Agency , 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	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.73973556832621, 78.82562793774534	5.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.736441637916617, 78.85866865833536	7.5KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73306853761192, 78.87530689191752	9.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.730466677694444, 78.90793169146286	13.0 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.720355782572513, 78.93953458514072	16.6 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.716855431264852, 78.94865012422567	17.7KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.717254606701436, 78.95458103348875	18.4 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.730142316906687, 79.02045012148626	25.8 KM	10 km/hr TO 20 Km/Hr
Sharp turn	High	10.726945721254284, 79.03852767991275	27.8 KM	10km/hr TO 20 Km/Hr

Sharp turn	Medium	10.726662618067378, 79.06547234748942	30.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.72287025138317, 79.07106498558738	31.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.737084366135134, 79.10597418877352	35.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.736035539591844, 79.11050550047638	36.2 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.742964311939556, 79.13371387905696	38.8 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.742749345230601, 79.14340308146065	39.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.7676387758176, 79.16396091570267	43.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.779985327200968, 79.16758133160567	44.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.781372489965866, 79.17200239007866	45.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.781071441777586, 79.17137553130569	45.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.780708599863177, 79.17020952253309	45.6 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	1.02 m	5%	30 km/hr to 40 km/hr
Elevation Change	Descent	Low	10.780638, 79.170229	1.02 m	5%	30 km/hr to 40 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
10	Shri Rakku Sakti IOCL retail outlet	10.736854782210685, 78.85825905782572
11	School/College	10.727678358770339, 78.97828938482074
	BPCL RO	10.725879040209913, 78.98063626596378
12	Institution/School	10.731872102837507, 79.06810085715502
13	IOCL RO	10.75776869440378, 79.15525494344298
14	Temple	10.767030601669454, 79.16429139341496
15	School	10.781831297810923, 79.16943912019556

**IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO RANEE (10.780638, 79.170229),
TOTAL DISTANCE – 47 KM**



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.758262863684411, 78.83351425048



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.755557510143007, 78.82964043768688



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.752134298790681, 78.82718013759803



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.75124649331893, 78.8252916438317



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.744321179303157, 78.83417370199756



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.739248384583261, 78.8381029124365



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.729351757363672, 78.9111983896726



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.718199438174326, 78.94263468659615



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.730165958806392, 79.0200749419451



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.730038373807972, 79.02697854293257



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.722889017911928, 79.0708448272496



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.737039321922905, 79.10617598879925



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.736059554306644, 79.11087033763184



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.742887598886316, 79.1339170990376



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.743106188872718, 79.14359127001919



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.767849216068843, 79.16395199458142



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.779145184533025, 79.16673243634816



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.762549961824753, 79.1598003989667



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.781276642172475, 79.17202585793288



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI 10.780617420278142, 79.16969315717833