

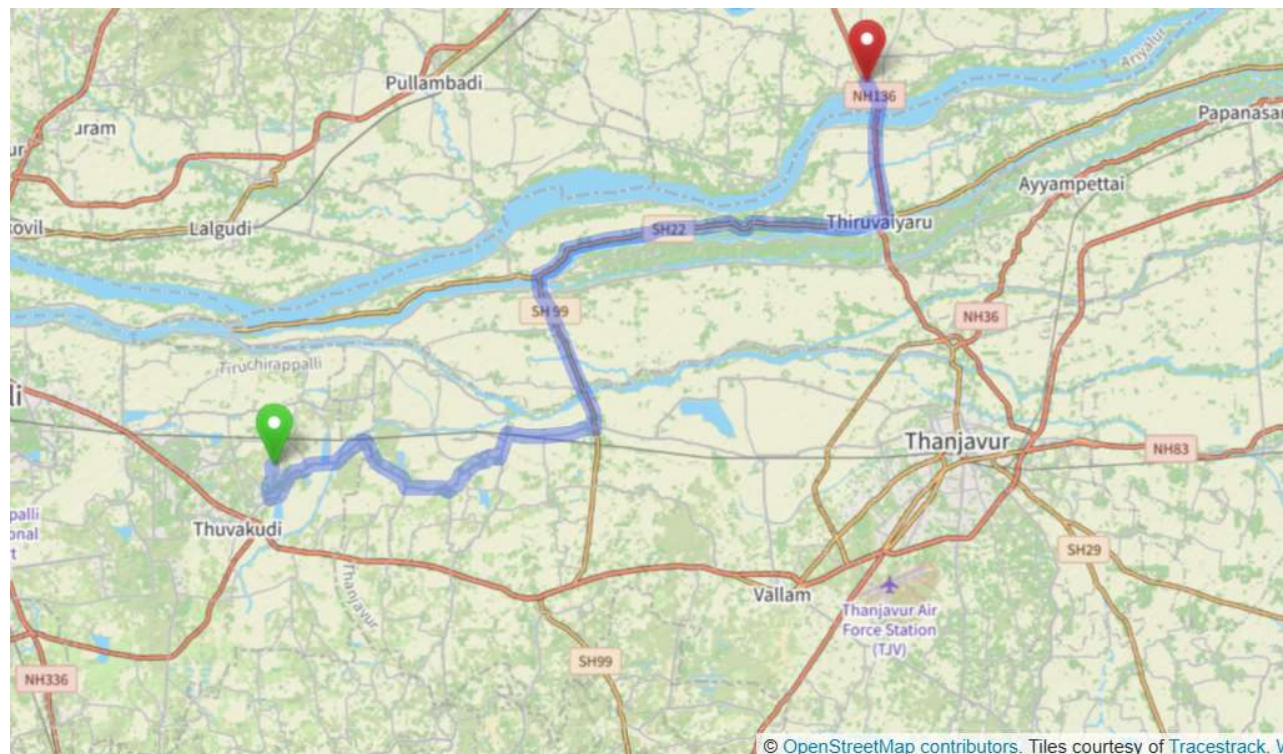
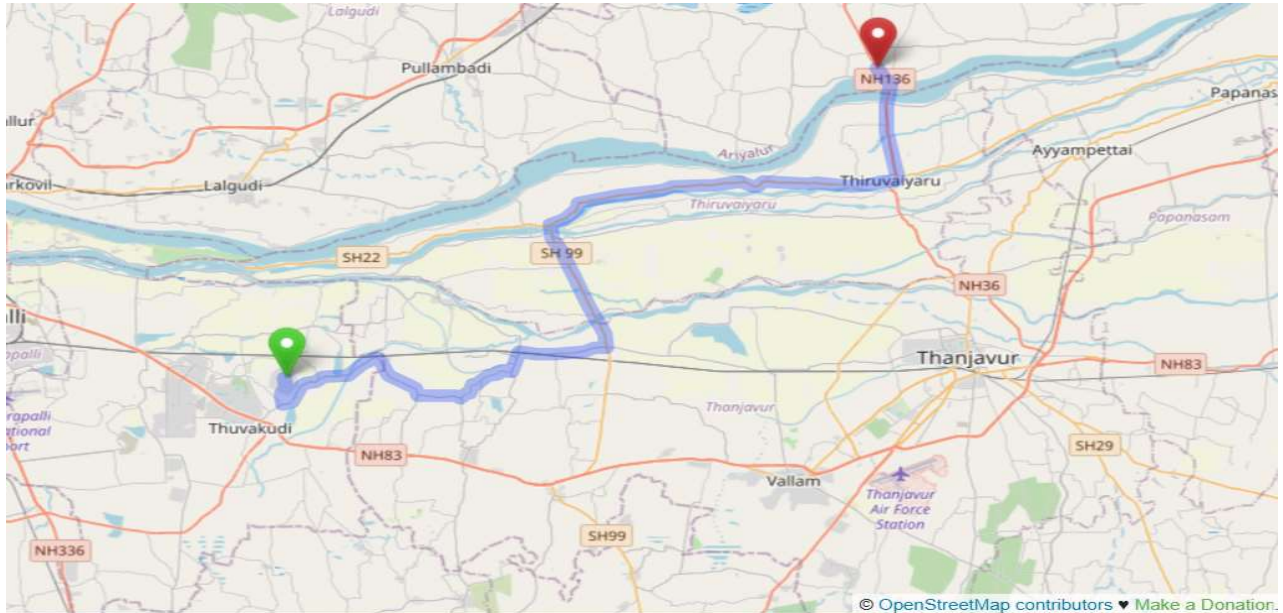


IndianOil

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 HARI BALAJI PETROLEUM (10.939666, 79.098055) TOTAL DISTANCE – 62.5 KM



ALARP/JRM/TNSO/HARIBALAJI

JOURNEY RISK MANAGEMENT REPORT

Welcome to the Journey Risk Management Study for HARI BALAJI PETROLEUM

Total distance: 62.5 km; Start with: (10.7753, 78.8368), End with: (10.939666 , 79.098055)

❖ Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) TO Hari Balaji Petroleum SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Take Peacock Rd to NH 136 in Kalayabhanurajathottam, At the roundabout, take the 2nd exit onto Peacock Rd, Follow NH 136 to Thirumanur, and Total distance from Trichy Terminal To HARI BALAJI PETROLEUM is 62.5 km for heavy vehicles carrying hazardous materials.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) To HARI BALAJI PETROLEUM 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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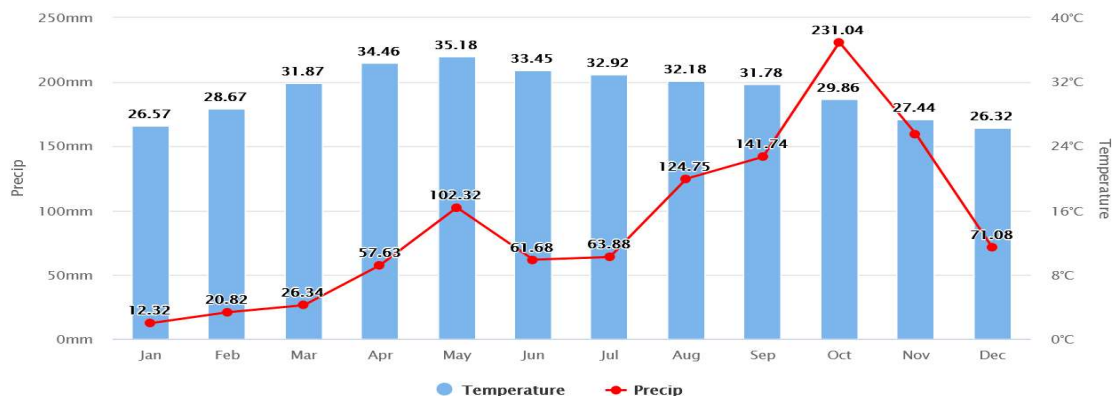
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0 (91.4)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	43.0 (109.4)	42.0 (107.6)	40.0 (104.0)	39.0 (102.2)	38.0 (100.4)	37.0 (98.6)	34.0 (93.2)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.18)	36.0 (96.8)	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 HARI BALAJI PETROLEUM 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 HARI BALAJI PETROLEUM 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 HARI BALAJI PETROLEUM 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
- Shriram Automall Trichy
- Gnanam School of Business
- Tamil University
- K.R.P Samy residency
- Veterinary University Training & Research Centre (VUTRC)
- Adyar Ananda Bhavan - A2B
- Thanjavur District Collector Office
- Vannarapettai Bus stop
- Arulneri High School
- Divya Desam Sri Hara Saaba Vimochana Perumaal Temple, Thirukandiyur
- Hangout Spot
- Vishnu Priya Marriage Hall

❖ 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 to Indian oil Storage to NH 83 in Thuvakudi, Take Peacock Rd to NH 136 in Kalayabhanurajathottam, At the roundabout, take the 2nd exit onto Peacock Rd, Follow NH 136 to Thirumanur.

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Alternative Route 2- Take SIDCO to Indian oil Storage to NH 83, Take Peacock Rd to NH 136 in Kalayabhanurajathottam, Turn right at Kishore Original Nei Alwa Kadai to stay on NH 136, At the roundabout, take the 2nd exit and stay on NH 136.

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 Technolog Shriram Automall Trichy Gnanam School of Business Tamil University K.R.P Samy residency Veterinary University Training Research Centre (VUTRC) Adyar Ananda Bhavan - A2B.
- **Educational institutions:** TIRUCHY PUBLIC SCHOOL, Arasu Education - Jcb Institute in Trichy, Mahabodhi Technical Institute (Typewriting), Chanakya share market training Institute, Adaikala Matha College, National Institute of Food Technology, Entrepreneurship and, Jesus Technical Institute(Typewriting, Shorthand, COA).
- **Hospital:** - Dr Kamali's Home Clinic, Meenakshi Hospital, Government Raja Mirasudar Hospital, James Samuel raj memorial hospital.
- **Gas Station:** IndianOil IRM ENERGY LTD, Nayara Petrol Pump Nayara Petrol Pump, Moogambigai Agencies, Sengipatti Petroleum Centre, HP PETROL PUMP - DELTA FUELS, IndianOil, Arasabakaran Petrol Bunk, GKM Fuels, Indian Oil Petrol Pump.

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- **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 Technolog Shriram Automall Trichy Gnanam School of Business Tamil University K.R.P Samy residency Veterinary University Training Research Centre (VUTRC) Adyar Ananda Bhavan - A2B.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**














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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>			

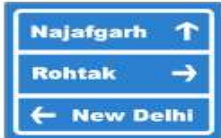

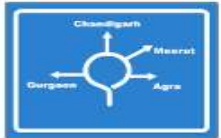
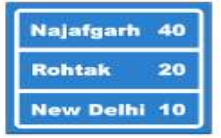
















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Cautionary signs

			
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 HARI BALAJI PETROLEUM 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	10.769517372474736, 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	10.739322086318483, 78.83809834927386	5.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73638358720799, 78.85765706064745	7.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.732981078965743, 78.87520874109956	9.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.732865083664377, 78.88929730997383	10.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.730622499591515, 78.90775412216747	12.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.720904924338443, 78.93805787452602	16.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.71823691532396, 78.94246547130157	17 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.71690507655357, 78.94798176089265	17.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.717137481731783, 78.95400634061058	18.3 KM	20km/hr TO 30 Km/Hr

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Sharp turn	High	10.730900505082582, 79.01556181426031	25.2 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.730299012811585, 79.01924891254475	25.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.730435715696514, 79.02466129484826	26.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.727783668496738, 79.03442862718894	27.3 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.72670370445174, 79.06509415541184	30.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.726498647557053, 79.06572026644128	30.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.723012659062045, 79.07056219187302	31.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.722821270296135, 79.07192572255934	31.6 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.731009867200703, 79.09011077034829	33.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.733593535457311, 79.08884463466796	34.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.742668848814892, 79.08513074175781	35.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.743106279950474, 79.08483855661075	35.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.749380613162888, 79.08165234707891	36.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.763733172507049, 79.07536340935114	37.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.77418960679377, 79.08098449521928	39.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.780832329360788, 79.08108189024321	39.9 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.825236388927799, 79.11359792435161	46 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.826193006092579, 79.11585192405758	46.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.828304278495638, 79.13222963043383	48.1 KM	10km/hr TO 15 Km/Hr

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Sharp turn	High	10.829506870122225, 79.1314365564632	48.3 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.834204964818829, 79.12462894725647	49.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.835735504981887, 79.1237663053937	49.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.836446110254684, 79.12327933014858	49.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.843661391502158, 79.11935570083986	50.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.847364621662221, 79.11639210851982	5-0.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.853131183920448, 79.11513988640964	51.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.855431101919702, 79.11335471526796	51.9 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.855711226135222, 79.112325110464	52 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.857979539419182, 79.11108680192768	52.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.860036037490485, 79.10897193793588	52.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.873147491751284, 79.10615137236005	54.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.87735998923263, 79.1035638768714	54.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.879466215623452, 79.103662260728	55 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.879475877178109, 79.10528559436185	55.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.88023913905875, 79.10732214027752	55.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.894615148833767, 79.10427224059596	57 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.933095282877318, 79.1042605242033	61.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.934024231995553, 79.10192304302674	61.7 KM	20km/hr TO 30 Km/Hr

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Sharp turn	High	10.939919361237672, 79.09834385152696	62.4 KM	10km/hr TO 15 Km/Hr
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- **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	10.993921 , 78.326323	-9.28m	-6.28%	40 km/hr to 50 km/hr

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO HARI BALAJI PETROLEUM (10.939666 , 79.098055) TOTAL DISTANCE – 62.5 KM

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ALARP/JRM/TNSO/HARIBALAJI

JOURNEY RISK MANAGEMENT REPORT



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ALARP/JRM/TNSO/HARIBALAJI