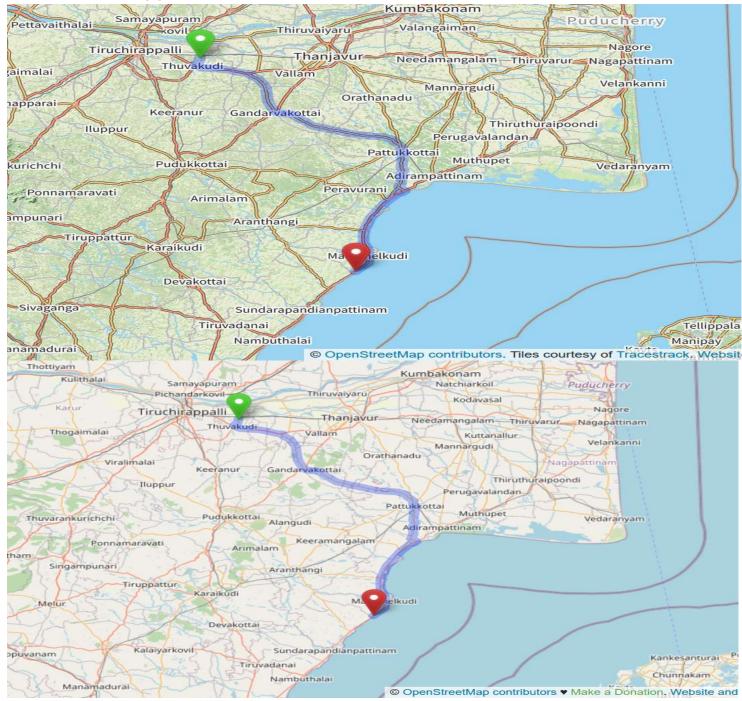


# WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

ALARP/JRM/TNSO/ HANIFFA FILLING STATION

# <u>IOCL TIRCHY TERMINAL (10.13253, 78.8368) TO HANIFFA FILLING</u> <u>STATION ( (</u>10.419159 , 79.319237) TOTAL DISTANCE – 132KM



# Welcome to the Journey Risk Management Study for HANIFFA FILLING STATION (

Total distance: 132km; Start with: (10.13253, 78.8368), End with: 9.982623, 79.200263

# **Route Safety Analysis Report**

# 1. Overview of the Route Map

The route from Trichy Terminal (T.N) TO HANIFFA FILLING STATION (-via NH 83 and Thanjavur - Kalayarkoil - Sayalkudi Rd/Thanjavur - Karaikudi - Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd.Turn right onto Thanjavur - Kalayarkoil - Sayalkudi Rd/Thanjavur - Karaikudi- Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd, Continue on Pattukkottai Byepass Rd. Drive to MDR343 in Thuvarankurichi North, Thuvarankurichi, Semmanampottal Kottaippattinam Rd ,and Total distance from Trichy Terminal To HANIFFA FILLING STATION ( is 132km for heavy vehicles carrying hazardous materials.

# <u>Typical Weather Conditions and Potential Weather-Related</u> <u>Hazards</u>

Weather Conditions: Trichy Terminal (T.N) To HANIFFA FILLING STATION (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.

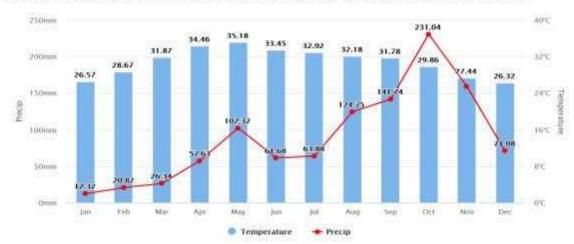
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33,0 (91,4)	38.0 (100.4)	41.0 (105.8)	43,0 1105-41	49,0 (109,4)	42,0 (107,6)	46.0 (104.0)	39.0	38.0 (100.4)	-37.0 (8-6)	34.0	33.0 (91.4)	#3:8 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.16)	36.0 (96.8)	38.27 (100.69)	38.79 (101.82)	36.78 (98.2)	36.17 (97.11)	35.4 (96.72)	35.93 (95.05)	32.9 (91.22)	30.38 (85.68)	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)	Z2.0 (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 (8.82)	26:34 (1.04)	57.63 (2.27)	102.32 (4.03)	61.68 (2.43)	(3.88 (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	11,95	9.11	7,68	8.29	10.54

<u>Weather-Related Hazards:</u> Trichy Terminal (T.N) To HANIFFA FILLING STATION (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 HANIFFA FILLING STATION (weather stations and weather warnings that include risk of thunder, high UV index and forecast gales.

# Climate Graph





# **Analysis of Traffic Patterns**

### **Peak Hours:**

ALARP/JRM/TNSO/ HANIFFA FILLING STATION

Typically, Trichy Terminal (T.N) To HANIFFA FILLING STATION (peak traffic hours are from 9:00 AM to 11:00 AM and 4:00 PM to 8:00 PM on weekdays.

# **Congestion-Prone Areas:**

- TIRUCHY PUBLIC SCHOOL
- Gnanam School of Business
- Ponnaiyah Ramajayam Institute of Science & Technology
- Blossom Bluebells Academy School (CBSE Syllabus)
- Dr.M.S. Swaminathan Agricultural College and Research Institute, ECK
- MMA School
- Sugalaya Varmakalai Treatment Center
- Meenakshi Chandrasekaran College of Arts and Science(women)
- JFK & TOOLS ELECTRICAL
- Fincare Small Finance Bank
- B.R.P
- SS RICE SHOP
- Fathu Muthu Zuhara Store

# **❖** 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- ). via NH 83 and Thanjavur - Kalayarkoil - Sayalkudi Rd/Thanjavur - Karaikudi - Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd.
Turn right onto Thanjavur - Kalayarkoil - Sayalkudi Rd/Thanjavur - Karaikudi

ALARP/JRM/TNSO/ HANIFFA FILLING STATION

- Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd, Continue on Pattukkottai Byepass Rd. Drive to MDR343 in Thuvarankurichi North, Thuvarankurichi.

Alternative Route 2 -) via NH 83, Vallam Rd and Thanjavur - Kalayarkoil - Sayalkudi Rd/Thanjavur - Karaikudi - Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Pattukkottai Rd,

### **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: TIRUCHY PUBLIC SCHOOL, Wonder World Theme Park, Ponnaiyah Ramajayam Institute of Science & Technology, Blossom Bluebells Academy School (CBSE Syllabus), Dr. M.S. Swaminathan Agricultural College and Research Institute, ECK, MMA School.
- **Educational institutions**: Arasu Education Jcb Institute in Trichy, Chanakya share market training Institute, Adaikalamatha Institute of Teacher Education, National Institute of Food Technology, Entrepreneurship and.
- **Hospital:** Dr Kamali's Home Clinic, Meenakshi Hospital, Sivapreethi Hospital, Sugalaya Varmakalai Treatment Center.
- **Gas Station:** Jagdish filling station, Nayara Petrol Pump Nayara Petrol Pump, Indianoil S. Ashok kumar, BPCL Masiya Fuels, Gayatri Agency.
- **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:

TIRUCHY PUBLIC SCHOOL, Wonder World Theme Park, Ponnaiyah Ramajayam Institute of Science & Technology, Blossom Bluebells Academy School (CBSE Syllabus), Dr.M.S. Swaminathan Agricultural College and Research Institute, ECK MMA School. 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

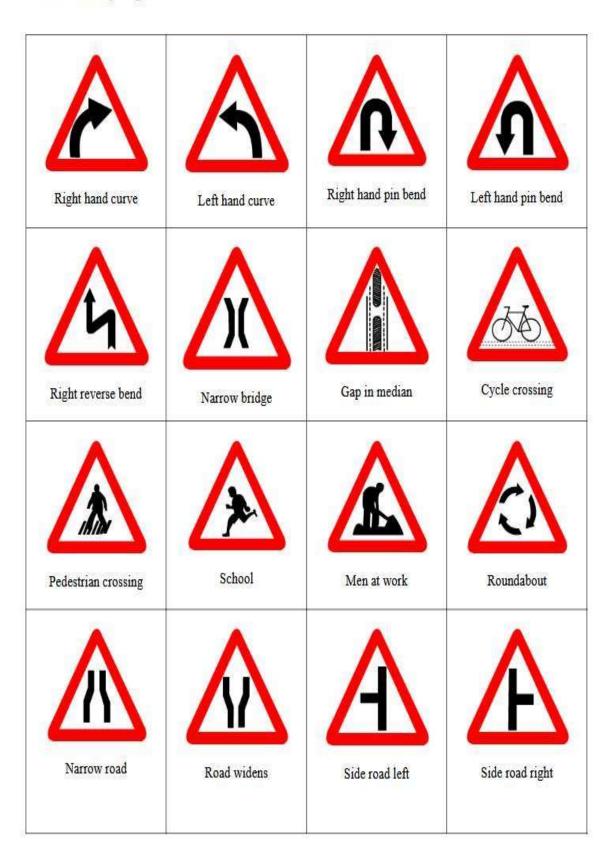




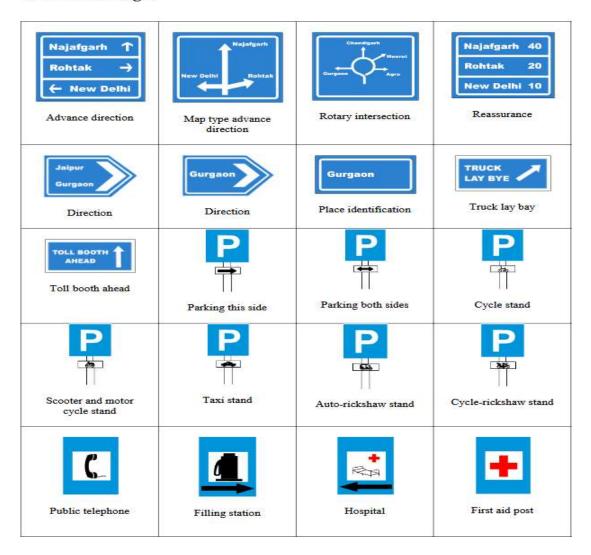


Restriction ands

# Cautionary signs



### Information signs



### Conclusion

The route for Trichy Terminal (T.N) To HANIFFA FILLING STATION ( 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	Risk	Coordination	Distance	Recommendation	
Type	Level		From Start	Speed	
Sharp	Medium	10.769517372474736,	650 M	20km/hr TO 30	
turn		78.83735063199906		Km/Hr	
Sharp	Medium	10.76584461192607,	1.1 KM	20km/hr TO 30	
turn		78.8361700257199		Km/Hr	
Sharp	Medium	10.764182189802032,	1.3 KM	20km/hr TO 30	
turn		78.83459588401435		Km/Hr	
Sharp	Medium	10.75826698538096,	2 KM	20km/hr TO 30	
turn		78.83349398474651		Km/Hr	
Sharp	Medium	10.756372549032195,	2.4 KM	20km/hr TO 30	
turn		78.83034570133539		Km/Hr	
Sharp	High	10.751346435623256,	3.2 KM	10km/hr TO 15	
turn		78.8252297405902		Km/Hr	
Sharp	High	10.749451955814655,	3.8 KM	10km/hr TO 15	
turn		78.83046376176118		Km/Hr	
Sharp	Medium	10.739322086318483,	5.2 KM	20km/hr TO 30	
turn		78.83809834927386		Km/Hr	
Sharp	Medium	10.73638358720799,	7.4 KM	20km/hr TO 30	
turn		78.85765706064745		Km/Hr	
Sharp	Medium	10.732981078965743,	9.4 KM	20km/hr TO 30	
turn		78.87520874109956		Km/Hr	
Sharp	Medium	10.7328650836643132,	10.9 KM	20km/hr TO 30	
turn		78.88929730997383		Km/Hr	
Sharp	Medium	10.730622499591515,	12.9 KM	20km/hr TO 30	
turn		78.901325412216747		Km/Hr	
Sharp	Medium	10.720904924338443,	16.4 KM	20km/hr TO 30	
turn		78.93805787452602		Km/Hr	
Sharp	Medium	10.71823691532396,	17 KM	20km/hr TO 30	
turn		78.94246547130157		Km/Hr	
Sharp	Medium	10.71690507655357,	17.6 KM	20km/hr TO 30	
turn		78.94798176089265		Km/Hr	

Sharp	Medium	10.717137481731783,	18.3 KM	20km/hr TO 30
turn		78.95400634061058		Km/Hr
Sharp	High	10.724822618517969,	20.9 KM	10km/hr TO 15
turn		78.9767159328364		Km/Hr
Sharp	Medium	10.729882461351261,	23.6 KM	20km/hr TO 30
turn		79.00023354091847		Km/Hr
Sharp	High	10.730894419758593,	25.8 KM	10km/hr TO 15
turn		79.01997459879757		Km/Hr
Sharp	High	10.730388440978299,	26.5 KM	10km/hr TO 15
turn		79.02701271508492		Km/Hr
Sharp	Medium	10.72785853437635,	27.5 KM	20km/hr TO 30
turn		79.03593910647373		Km/Hr
Sharp	High	10.727084939556493,	30.8 KM	10km/hr TO 15
turn		79.06554150725997		Km/Hr
Sharp	High	10.723822902909419,	31.3 KM	10km/hr TO 15
turn		79.06929459251997		Km/Hr
Sharp	High	10.72091540581739,	31.7 KM	10km/hr TO 15
turn		79.06756239932304		Km/Hr
Sharp	High	10.721908212843593,	32.1 KM	10km/hr TO 15
turn		79.07066591213419		Km/Hr
Sharp	High	10.715809489668976,	32.8 KM	10km/hr TO 15
turn		79.06922241780342		Km/Hr
Sharp	Medium	10.715242160336519,	33 KM	20km/hr TO 30
turn		79.07095461100035		Km/Hr
Sharp	Medium	10.703469836629056,	35.3 KM	20km/hr TO 30
turn		79.08798784468142		Km/Hr
Sharp	Medium	10.6964481325454964,	36.7 KM	20km/hr TO 30
turn		79.09794795556375		Km/Hr
Sharp	Medium	10.695502569729664,	37.2 KM	20km/hr TO 30
turn		79.10318339482231		Km/Hr
Sharp	Medium	10.694130913553563,	37.5 KM	20km/hr TO 30
turn		79.10561105323868		Km/Hr
Sharp	High	10.681487529695021,	40.4 KM	10km/hr TO 15
turn		79.12824896855714		Km/Hr
Sharp	Medium	10.676954861326632,	41.2 KM	20km/hr TO 30
turn		79.13313218914544		Km/Hr

Sharp turn	Medium	10.67399171404084, 79.14020364483756	42 KM	20km/hr TO 30 Km/Hr
Sharp	High	10.67005536178023, 79.14845768345319	43 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.654428733549738, 79.16836448268437	45.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.652221854896029, 79.17540469243615	46.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.650492128115856, 79.18469048587875	47.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.647688756813132, 79.1868753787529	48 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.646197591437373, 79.19094170660031	48.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.642678412119103, 79.2064180294603	50.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.644467830353127, 79.21588589728412	51.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.644987886203523, 79.21863195462178	51.6 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.644749298119521, 79.23222684175344	53.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.64528612104593, 79.23799253049232	53.7 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.634609131813274, 79.24782454730857	55.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.620710591849507, 79.24758178157975	56.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.614566400591388, 79.2504949716794	57.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.612955766919104, 79.25480406536846	58.1 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.613194379850361, 79.25765656400769	58.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.606356045215447, 79.26178068181336	59.3 KM	20km/hr TO 30 Km/Hr

Sharp turn	Medium	10.604864678000341, 79.2614165330509	59.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.599674663282858, 79.265901320124272	60.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.587623945432698, 79.26687876460927	61.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.5132564156151789, 79.26661048804998		10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.564071436487005, 79.27114295850889	64.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.544242460468135, 79.28135681019415	66.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.544242460468135, 79.291055613276085	67.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.545339415945685, 79.296913299512458	68.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.550064717918724, 79.30650520131842	69.7 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.491257310473884, 79.29853818515302	73. 0 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.424661950688284, 79.31226139002187	81.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.416442030846467, 79.30990104560138	88.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.40040253783099, 79.31157475617015	92.6 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.394915164995396, 79.30990104667534	98.2 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.389986994584193, 79.30955771683284	102. KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.379951012921873, 79.30842046652553	108 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.375170357409853, 79.30960063486825	113 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.365260053434971, 79.30903191596222	117 KM	20km/hr TO 30 Km/Hr

Sharp	Medium	10.347355576191307,	119 KM	20km/hr TO 30
turn		79.30846128024429		Km/Hr
Sharp	Medium	10.247594431352876,	121 KM	20km/hr TO 30
turn		79.27867815293504		Km/Hr
Sharp	Medium	9.982628323961311,	135 KM	20km/hr TO 30
turn		79.20058365650434		Km/Hr

<u>IOCL TIRCHY TERMINAL (10.13253, 78.8368) TO HANIFFA FILLING STATION ( (</u>10.419159 , 79.319237) TOTAL DISTANCE – 132K



10.769073692604486, 78.83720120889187



10.764113439530249, 78.83446118711721

ALARP/JRM/TNSO/ HANIFFA FILLING STATION



10.758209570013967, 78.83344387884853



10.751314343624747, 78.82530656733346

ALARP/JRM/TNSO/ HANIFFA FILLING STATION



10.75126610223314, 78.82518044583597



10.749591316479634, 78.83018387464983



10.739318685033433, 78.8379420178455



10.735064036857814, 78.86553394452655

ALARP/JRM/TNSO/ HANIFFA FILLING STATION



10.72580557887016, 79.0641504304304



10.721070762434657, 79.061320763454654

ALARP/JRM/TNSO/ HANIFFA FILLING STATION



10.721721269051843, 79.07032492179873



10.715856047911897, 79.06925965827192



10.645338366462365, 79.2350894341454



10.61312680226564, 79.255443411729



10.6057006893810132, 79.26145932867404



10.544054693387439, 79.28156554890528



10.435606920027084, 79.3310542197561



10.405626151321467, 79.35654026186128



10.399951058474931, 79.3837085094



10.78264888430246, 79.19827687817182



10.780416257312543, 79.2379448355477



10.777589957207995, 79.25308715211956



10.780076298248042, 79.25832468636311



10.780647803864088, 79.26569120395301



10.790174840169144, 79.27781013069385



10.78849870678751, 79.28802397538799





10.792380219077335, 79.30826986447208



10.982267525456553, 79.38847428720712

ALARP/JRM/TNSO/ HANIFFA FILLING STATION



11.094631280176856, 79.45314082348497

ALARP/JRM/TNSO/ HANIFFA FILLING STATION



9.987103513917836, 79.20643919061685



9.984514769595433, 79.20201890864882



9.98276076150387, 79.200248636635