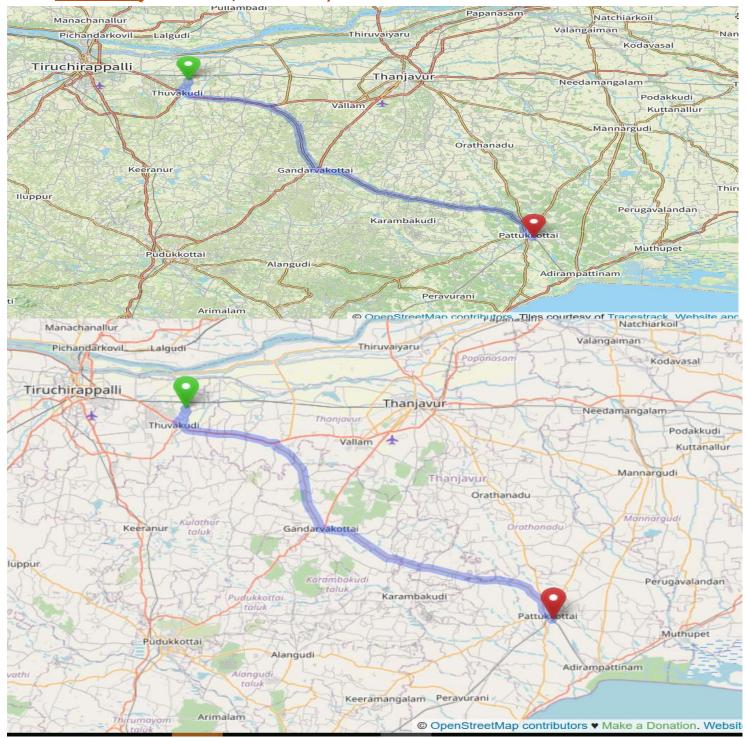


WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO KANNAPPA AUTO</u> <u>SERVICE (</u>10.419159 , 79.319237) TOTAL DISTANCE – 77KM



Welcome to the Journey Risk Management Study for KANNAPPA AUTO SERVICE

Total distance: 77km; Start with: (10.7753, 78.8368), End with: (10.399969, 79.384056)

* Route Safety Analysis Report

1. Overview of the Route Map

The route from Trichy Terminal (T.N) TO KANNAPPA AUTO SERVICE -via NH 83 and Thanjavur - Kalayarkoil - Sayalkudi Rd/Thanjavur - Karaikudi - Kalaiyarkoil - Sayalkudi Rd/Thanjavur - Orathanadu - Pattukottai Rd/Thanjavur - Karaikudi - Kalaiyarkoil - 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, and Total distance from Trichy Terminal To KANNAPPA AUTO SERVICE is 77km for heavy vehicles carrying hazardous materials.

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

Weather Conditions: Trichy Terminal (T.N) To KANNAPPA AUTO SERVICE 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.

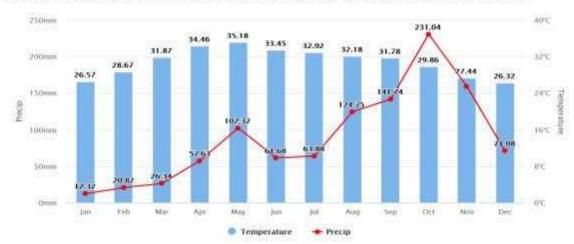
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33,0 (91,4)	38.0 (100.4)	41.0 (105.8)	43,0 1105-41	49,0 (109,4)	42,0 (107,6)	46.0 (104.0)	39.0	38.0 (100.4)	-37.0 (8-6)	34.0	33.0 (91.4)	#3:8 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.16)	36.0 (96.8)	38.27 (100.69)	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 (8.43)	(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 KANNAPPA AUTO SERVICE 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 KANNAPPA AUTO SERVICE weather stations and weather warnings that include risk of thunder, high UV index and forecast gales.

Climate Graph





Analysis of Traffic Patterns

Peak Hours:

Typically, Trichy Terminal (T.N) To KANNAPPA AUTO SERVICE 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)

❖ 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 - 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:

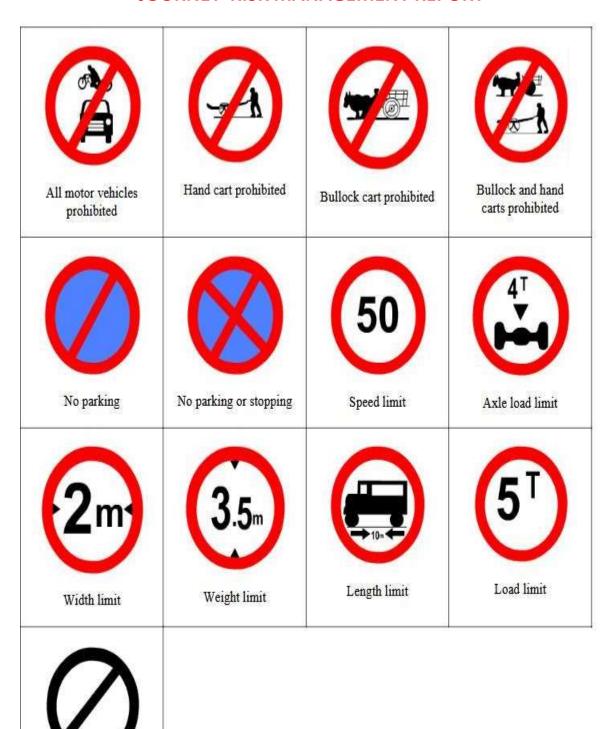
TIRUCHY PUBLIC SCHOOL, Wonder World Theme Park, Ponnaiyah Ramajayam Institute of Science & Technology, Blossom Bluebells Academy School (CBSE Syllabus), Dr.M.S. Swaminathan Agricultural College and Research Institute, ECK MMA School. areas like have quicker response times (15- 20 minutes). Congested 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

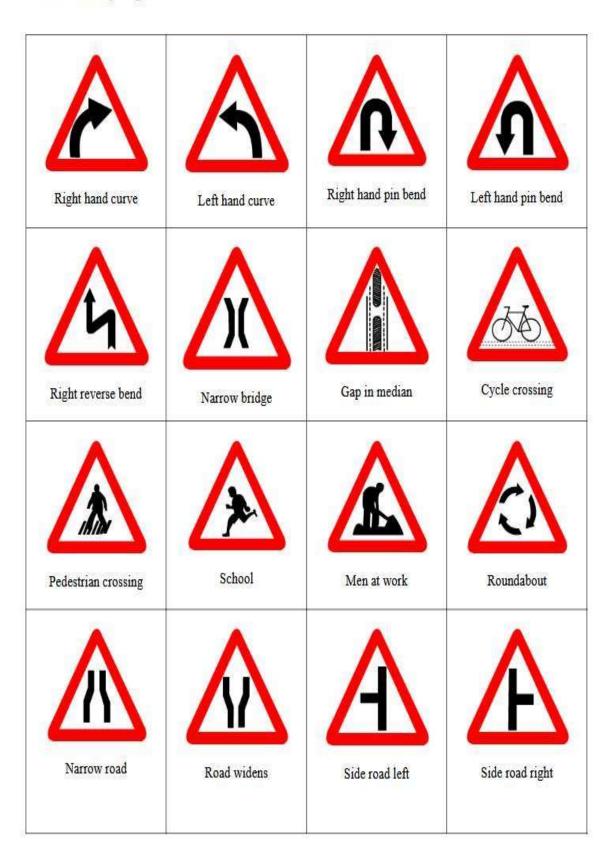
Mandatory/Regulatory Signs

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

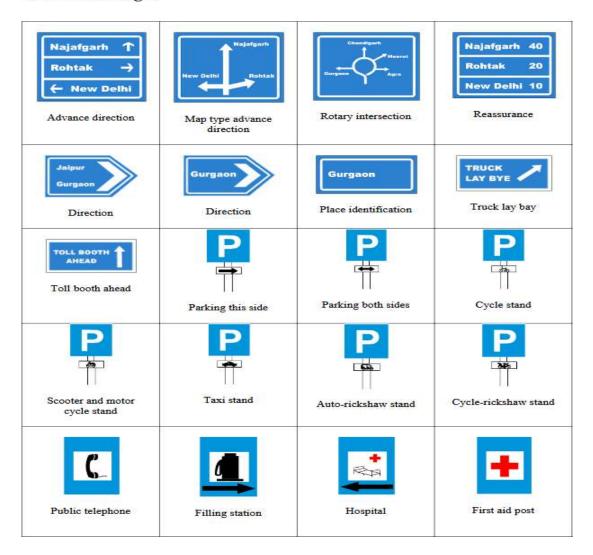


Restriction ands

Cautionary signs



Information signs



Conclusion

The route for Trichy Terminal (T.N) To KANNAPPA AUTO SERVICE 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	10.732865083664377,	10.9 KM	20km/hr TO 30		
turn		78.88929730997383		Km/Hr		
Sharp	Medium	10.730622499591515,	12.9 KM	20km/hr TO 30		
turn		78.90775412216747		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	10.696448775454964,	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	10.67695486776632,	41.2 KM	20km/hr TO 30
turn		79.1337718914544		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	Medium	10.599674663282858,	60.2 KM	20km/hr TO 30
turn		79.26590770124272		Km/Hr
Sharp	Medium	10.587623945432698,	61.6 KM	20km/hr TO 30
turn		79.26687876460927		Km/Hr
Sharp	High	10.577564156151789,	62.8 KM	10km/hr TO 15
turn		79.26661048804998		Km/Hr
Sharp	Medium	10.564071436487005,	64.3 KM	20km/hr TO 30
turn		79.27114295850889		Km/Hr
Sharp	High	10.544242460468135,	66.8 KM	10km/hr TO 15
turn		79.28135681019415		Km/Hr
Sharp	Medium	10.544242460468135,	67.9 KM	20km/hr TO 30
turn		79.29105567776085		Km/Hr
Sharp	Medium	10.545339415945685,	68.5 KM	20km/hr TO 30
turn		79.29697799512458		Km/Hr
Sharp	High	10.550064717918724,	69.7 KM	10km/hr TO 15
turn		79.30650520131842		Km/Hr
Sharp	High	10.491257310473884,	73. 0 KM	10km/hr TO 15
turn		79.29853818515302		Km/Hr

<u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO KANNAPPA AUTO</u> <u>SERVICE (</u>10.419159 , 79.319237) TOTAL DISTANCE – 77K



10.769073692604486, 78.83720120889187



10.764113439530249, 78.83446118711721



10.758209570013967, 78.83344387884853



10.751314343624747, 78.82530656733346



10.75126610223314, 78.82518044583597



10.749591316479634, 78.83018387464983



10.739318685033433, 78.8379420178455



10.735064036857814, 78.86553394452655



10.72580557887016, 79.0641504304304



10.721070762434657, 79.06770763454654



10.721721269051843, 79.07032492179873



10.715856047911897, 79.06925965827192



10.645338366462365, 79.2350894341454



10.61312680226564, 79.255443411729



10.605700689381077, 79.26145932867404



10.544054693387439, 79.28156554890528



10.435606920027084, 79.3310542197561



10.40562615771467, 79.35654026186128



10.399951058474931, 79.3837085094