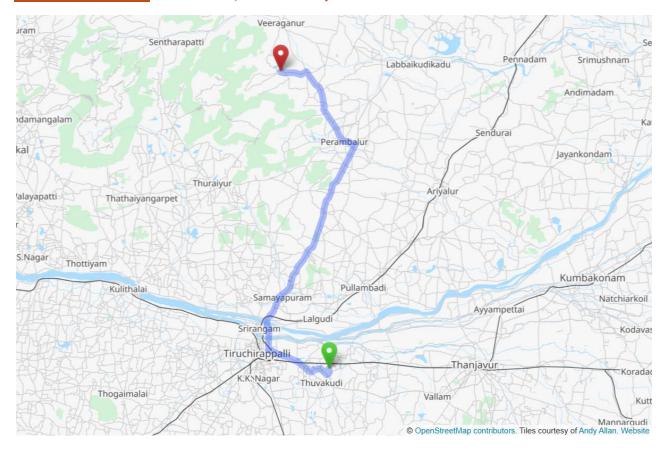
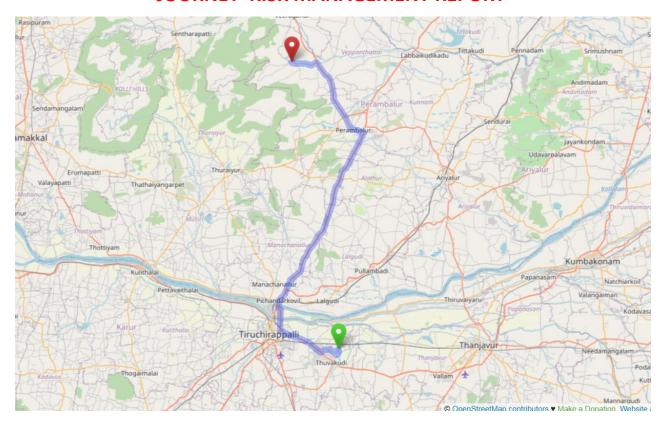


# WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

ALARP/JRM/TNSO/L.S.V. ENTERPRISES

# <u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO L.S.V</u> <u>ENTERPRISES(</u>11.378083 , 78.735797) TOTAL DISTANCE – 98.1 KM





# Welcome to the Journey Risk Management Study for L.S.V <u>ENTERPRISES</u>

Total distance: 98.1 KM; Start with: (10.7753, 78.8368), End with: (11.378083, 78.735797)

ALARP/JRM/TNSO/L.S.V. ENTERPRISES

# **❖** Route Safety Analysis Report

# 1. Overview of the Route Map

The route from Trichy Terminal (T.N) To L.S.V ENTERPRISES. The rouite passes Through several key point including Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, Follow NH 83, NH 38 and Attur - Perambalur Rd/Salem - Perambalur Rd to Krishnapuram - Arumbavur Rd in Krishnapuram, Turn left at the medical store onto Krishnapuram - Arumbavur Rd and Total distance from Trichy Terminal To L.S.V ENTERPRISESIS 98.1 KM.

# **Typical Weather Conditions and Potential Weather-Related Hazards**

**Weather Conditions:** Trichy Terminal (T.N) To L.S.V ENTERPRISES 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.

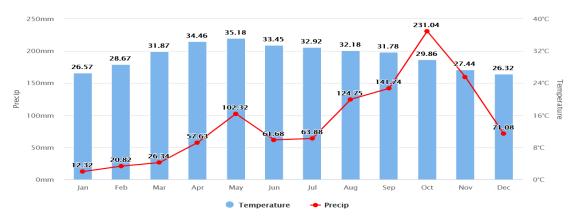
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0	38.0	41.0	43.0	43.0	42.0	40.0	39.0	38.0	37.0	34.0	33.0	43.0
	(91.4)	(100.4)	(105.8)	(109.4)	(109.4)	(107.6)	(104.0)	(102.2)	(100.4)	(98.6)	(93.2)	(91.4)	(109.4)
Average high °C (°F)	30.27	32.88	36.0	38.27	38.79	36.78	36.17	35.4	35.03	32.9	30.38	29.34	34.35
	(86.49)	(91.18)	(96.8)	(100.89)	(101.82)	(98.2)	(97.11)	(95.72)	(95.05)	(91.22)	(86.68)	(84.81)	(93.83)
Daily mean °C (°F)	26.57	28.67	31.87	34.46	35.18	33.45	32.92	32.18	31.78	29.86	27.44	26.32	30.89
	(79.83)	(83.61)	(89.37)	(94.03)	(95.32)	(92.21)	(91.26)	(89.92)	(89.2)	(85.75)	(81.39)	(79.38)	(87.6)
Average low °C (°F)	19.88	20.93	24.04	27.62	28.89	27.59	27.04	26.45	25.95	24.64	22.43	20.93	24.7
	(67.78)	(69.67)	(75.27)	(81.72)	(84.0)	(81.66)	(80.67)	(79.61)	(78.71)	(76.35)	(72.37)	(69.67)	(76.46)
Record low °C (°F)	16.0	17.0	19.0	22.0	25.0	25.0	24.0	23.0	22.0	21.0	18.0	17.0	16.0
	(60.8)	(62.6)	(66.2)	(71.6)	(77.0)	(77.0)	(75.2)	(73.4)	(71.6)	(69.8)	(64.4)	(62.6)	(60.8)
Average precipitation mm (inches)	12.32	20.82	26.34	57.63	102.32	61.68	63.88	124.75	141.74	231.04	159.62	71.08	89.44
	(0.49)	(0.82)	(1.04)	(2.27)	(4.03)	(2.43)	(2.51)	(4.91)	(5.58)	(9.1)	(6.28)	(2.8)	(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 L.S.V ENTERPRISES 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 L.S.V ENTERPRISES 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 L.S.V ENTERPRISES 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:**

- Malar Mahal
- Old Burma Colony
- Government Branch Press, Tiruchirappalli
- National Institute of Technology Tiruchirappalli
- Civil Engineering Department : NIT Trichy
- AGN InfoSystems & AGN INFOTECH
- NIT Trichy
- Govt Polytechnic
- BHELEC CINEMA 4K Dolby 7.1
- DHANALAKSHMI SRINIVASAN UNIVERSITY

ALARP/JRM/TNSO/L.S.V. ENTERPRISES

- Aswins Sweets and Snacks Veg Restaurant
- Urmu Dhanalakshmi Arts College
- SESHASAYEE INSTITUTE OF TECHNOLOGY
- Krishna College of Paramedical and Allied Health Sciences
- Trichy Zoological Park
- Sree Ambaals Matric Hr. Sec. School
- Dhanalakshmi Srinivasan Medical College and Hospital
- Jolly world\_Games,Park,Entertainment,Game zone,etc.,(Perambalur)
- Arumbavur Government Higher Secondary School

# **❖** Assessment of Road Quality and Infrastructure

**Road Quality:** Generally, the roads are well-maintained but can suffer from potholes and water logging 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 water logging.

# **Suggestions for Alternative Routes for Emergencies**

**Alternative Route 1-** ). Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi , Follow NH 83, NH 38 and Attur - Perambalur Rd/Salem - Perambalur Rd to Krishnapuram - Arumbavur Rd in Krishnapuram , Turn left at the medical store onto Krishnapuram - Arumbavur Rd and Total distance from Trichy Terminal To L.S.V ENTERPRISES IS 98.1 KM.

**Alternative Route 2-** Take Valavanthankottai to Thirunedukulam temple road, Indalur to Solakampatti Village, Solakampatti Railway Station - Katachamangalam Rd and MDR782 to Kollidam - Kallanai Main Rd/Poondi Matha Temple to Thirukattupalli in Puduchatram, Continue on Kollidam - Kallanai Main Rd. Drive from NH 136 and NH 81 to Reddipalayam, Turn left.

**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 water logging and poor visibility. No major incidents involving hazardous materials have been reported recently.

#### **\*** Environmental Considerations and Sensitive Areas

- Sensitive Areas: malar mahal, old burma colony, government branch press, tiruchirappalli, national institute of technology tiruchirappalli Civil engineering department: nit trichy, agn infosystems & agn infotech, nit trichy, govt polytechnic, bhelec cinema 4k dolby 7.1, SESHASAYEE INSTITUTE OF TECHNOLOGY, Krishna College of Paramedical and Allied Health Sciences, Trichy Zoological Park, Sree Ambaals Matric Hr. Sec. School, Dhanalakshmi Srinivasan Medical College and Hospital, Jolly world\_Games, Park, Entertainment, Game, zone, etc., (Perambalur) Arumbav ur Government Higher Secondary School.
- **Educational institutions**: State Institute Of Hotel Management and Catering Technology, National Institute of Technology Tiruchirappalli, AGN InfoSystems & AGN INFOTECH, NIT Trichy.
- **Hospital:** Dr Kamali's Home Clinic, Muthammal Medical Foundation Hospital, Times Hospital (Trichy Institute of Medical and Educational Services), Apollo Speciality Hospitals Trichy. GVN Hospital (P) Ltd. Multispecialty Hospital Trichy.
- **Gas Station:** IndianOil, Bharat Petroleum Sri Vela Fuels, IndianOil, Reliance Petrol Bunk.

- **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- malar mahal, old burma colony, government branch press, tiruchirappalli, national institute of technology tiruchirappalli, Civil engineering department: nit trichy, agn infosystems & agn infotech, nit trichy, govt polytechnic, bhelec cinema 4k dolby 7.1 ,Arulmigu erumbeeswarar temple, thiruverumbur. ,aswins sweets and snacks veg restaurant ,urmu dhanalakshmi arts college, seshasayee institute of technology ,jb residency ,sri vignesh vidyalaya senior secondary school ,government high school ,nava bharath school Sagayamatha hospital - dmlt courses | cmlt courses | m.p.h.w courses Dalmia higher secondary school ,golden gates matriculation school Ariyalur engineering college ,bethel ginning mill , poyyur (paruthi,cotton seed &lint) ,nelliandavar institute of technology , State bank of india

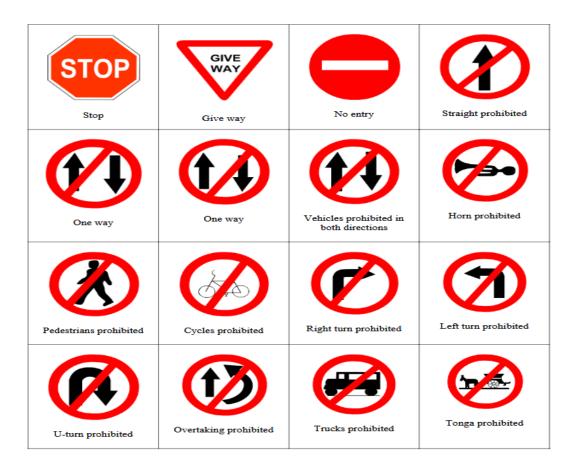
ALARP/JRM/TNSO/L.S.V. ENTERPRISES

reddipalayam.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**: Water logging, 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





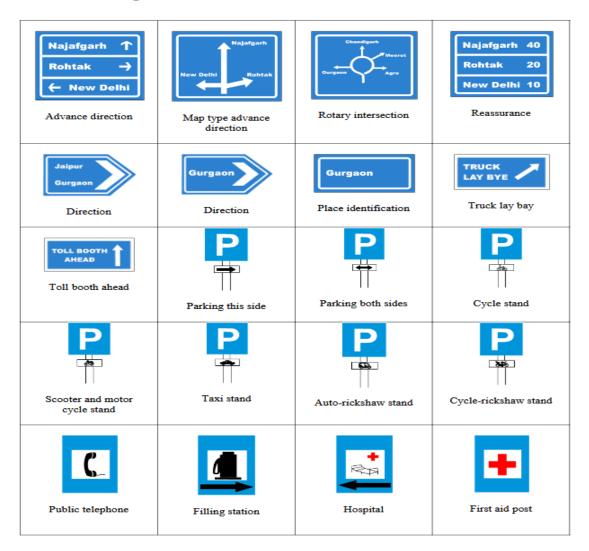


Restriction ands

# Cautionary signs



#### Information signs



#### Conclusion

The route for Trichy Terminal (T.N) To L.S.V ENTERPRISES 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 Exerc Stort	Recommendation		
			From Start	Speed		
Sharp turn	Medium	10.769517372474736,	650 M	20km/hr TO 30		
		78.83735063199906		Km/Hr		
Sharp turn	Medium	10.76584461192607,	1.1 KM	20km/hr TO 30		
		78.8361700257199		Km/Hr		
Sharp turn	Medium	10.764182189802032,	1.3 KM	20km/hr TO 30		
		78.83459588401435		Km/Hr		
Sharp turn	Medium	10.75826698538096,	2 KM	20km/hr TO 30		
		78.83349398474651		Km/Hr		
Sharp turn	Medium	10.756372549032195,	2.4 KM	20km/hr TO 30		
		78.83034570133539		Km/Hr		
Sharp turn	High	10.751346435623256,	3.2 KM	10km/hr TO 15		
_		78.8252297405902		Km/Hr		
Sharp turn	High	10.813226887132624,	18.1 KM	10km/hr TO 15		
_		78.7122163292411		Km/Hr		
Sharp turn	Medium	10.817428232253208,	18.7 KM	20km/hr TO 30		
		78.71207608898139		Km/Hr		
Sharp turn	Medium	10.855306551127532,	22.9 KM	20km/hr TO 30		
		78.713548609723		Km/Hr		
Sharp turn	Medium	10.86026481225808,	23.7 KM	20km/hr TO 30		
		78.70913104708548		Km/Hr		
Sharp turn	High	10.87424391118605,	25.3 KM	10km/hr TO 15		
		78.70920116713285		Km/Hr		
Sharp turn	High	10.879064138093348,	25.9 KM	10km/hr TO 15		
_		78.71165536859816		Km/Hr		
Sharp turn	High	10.897793422927336,	28.4 KM	10km/hr TO 15		
		78.72413673623166		Km/Hr		
Sharp turn	High	10.899032819310374,	28.9 KM	10km/hr TO 15		
		78.72413673623166		Km/Hr		

Sharp turn	Medium	10.914315577333976,	30.7 KM	20km/hr TO 30
		78.73507336753168		Km/Hr
Sharp turn	High	10.923101273152122,	31.5 KM	10km/hr TO 15
		78.73351724993424		Km/Hr
Sharp turn	High	10.936470311365099,	34.2 KM	10km/hr TO 15
		78.75569192569779		Km/Hr
Sharp turn	Medium	11.02235145283642,	45.3 KM	20km/hr TO 30
		78.80362213159445		Km/Hr
Sharp turn	High	11.08498726408724,	52.7 KM	10km/hr TO 15
		78.82370336129307		Km/Hr
Sharp turn	High	11.150848386408398,	60.4 KM	10km/hr TO 15
		78.8448849318981		Km/Hr
Sharp turn	Medium	11.219662712871157,	69.4 KM	20km/hr TO 30
		78.88697298814844		Km/Hr
Sharp turn	High	11.226138512793996,	70.8 KM	10km/hr TO 15
		78.87706991639917		Km/Hr
Sharp turn	Medium	11.234502872681194,	71.7 KM	20km/hr TO 30
		78.87927059901011		Km/Hr
Sharp turn	High	11.235181092088906,	72.6 KM	10km/hr TO 15
		78.87201437554845		Km/Hr
Sharp turn	Medium	11.237908424488518,	73.3 KM	20km/hr TO 30
		78.86678024071084		Km/Hr
Sharp turn	Medium	11.298223996137036,	81.2 KM	20km/hr TO 30
		78.8281784943017		Km/Hr
Sharp turn	High	11.307206082601326,	82.5 KM	10km/hr TO 15
		78.82621569373758		Km/Hr
Sharp turn	Medium	11.34363446989502,	86.6 KM	20km/hr TO 30
		78.81783667864514		Km/Hr
Sharp turn	Medium	11.378425142499738,	91.6 KM	20km/hr TO 30
		78.79019060334507		Km/Hr
Sharp turn	Medium	11.375063099215303,	92.2 KM	20km/hr TO 30
		78.78674090314938		Km/Hr
Sharp turn	Medium	11.371774030660722,	93.1 KM	20km/hr TO 30
		78.78051428002657		Km/Hr
Sharp turn	High	11.37507765253194,	94.8 KM	10km/hr TO 15
		78.76510950094632		Km/Hr

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Sharp turn	Medium	11.375819276644647,	95.8 KM	20km/hr TO 30
		78.7556878285182		Km/Hr
Sharp turn	Medium	11.374742436847521,	96.8 KM	20km/hr TO 30
		78.74656724178945		Km/Hr
Sharp turn	Medium	11.375277948924818,	97.1 KM	20km/hr TO 30
		78.74455635065564		Km/Hr
Sharp turn	High	11.375778519522008,	97.2 KM	10km/hr TO 15
		78.74336494812009		Km/Hr
Sharp turn	Medium	11.37799532166245,	98.1 KM	20km/hr TO 30
		78.73582750321196		Km/Hr

# <u>IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO L.S.V</u> <u>ENTERPRISES(</u>11.378083 , 78.735797) TOTAL DISTANCE – 98.1 KM



IMAGE:- SHARP TURN RISK LEVEL:- MEDIUM COORDI: 10.769073692604486,

78.83720120889187

ALARP/JRM/TNSO/L.S.V. ENTERPRISES



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.764113439530249, 78.83446118711721



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.758209570013967, 78.83344387884853



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.751314343624747, 78.82530656733346



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.75126610223314, 78.82518044583597



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.813176649085515, 78.71455631484942



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.826323528793923, 78.7122281367531



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.855752714675047, 78.71345325036293



IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 10.911790053954828, 78.72960912493043



IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 10.935493942378274, 78.75266263778042



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.219346980181877, 78.88731954322806



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.226418985262137, 78.876800940087



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.234187215030934, 78.8795059706898

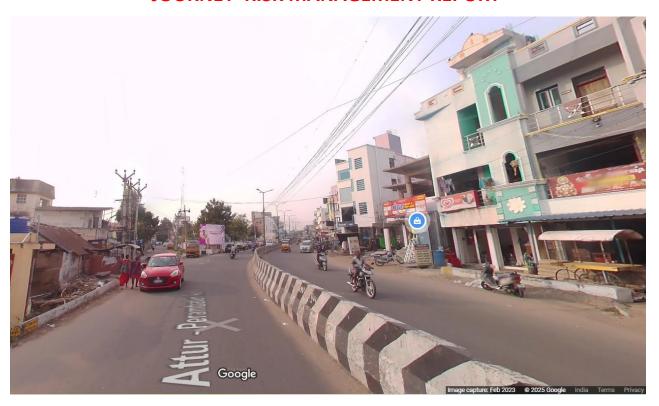


IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 10.906760973913892, 78.7982138522536



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.297532273188219, 78.8285096051832



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.342824551975141, 78.81782064529314



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.373780415466664, 78.76769847871427



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.374715312318903, 78.74678794309808



IMAGE :- SHARP TURN RISK LEVEL :- MEDIUM COORDI: 11.37579893476733, 78.74334551049404



IMAGE :- SHARP TURN RISK LEVEL :- HIGH COORDI: 11.378157986803954, 78.73589521709229

THANK YOU
YOUR DESTINATION IS HERE!