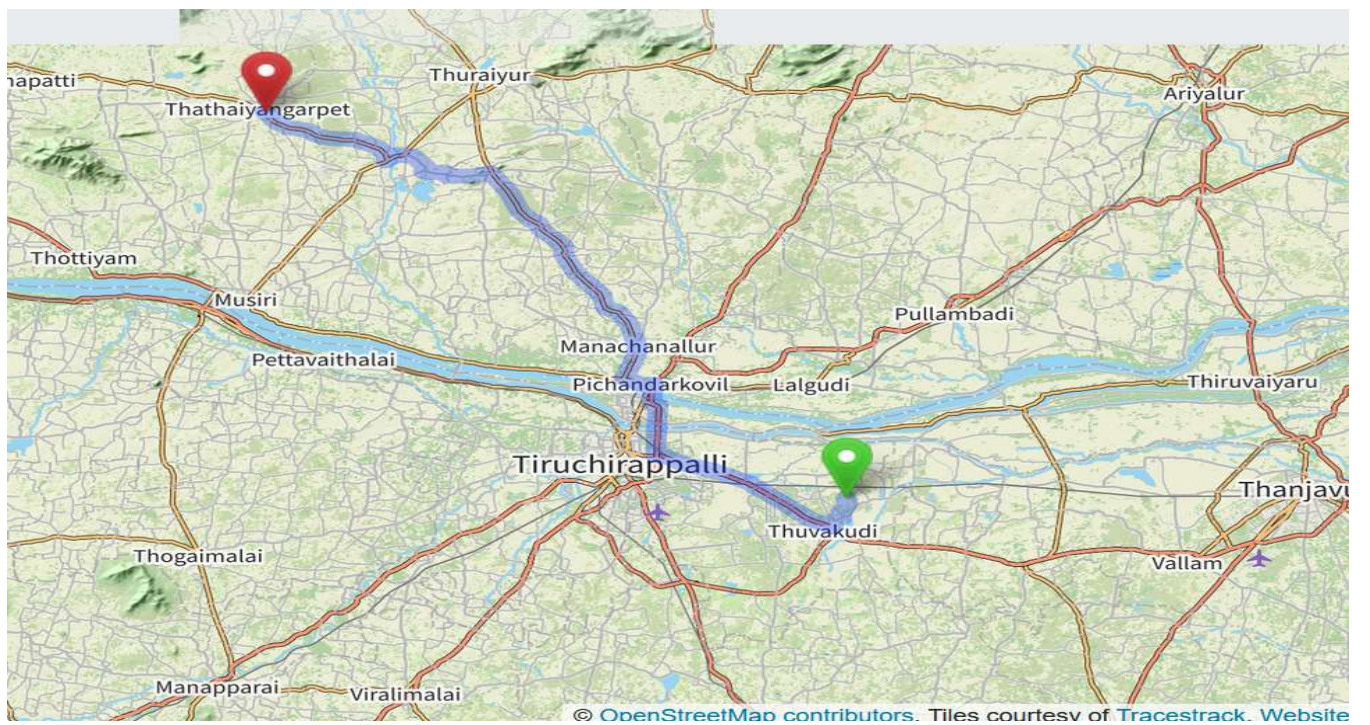
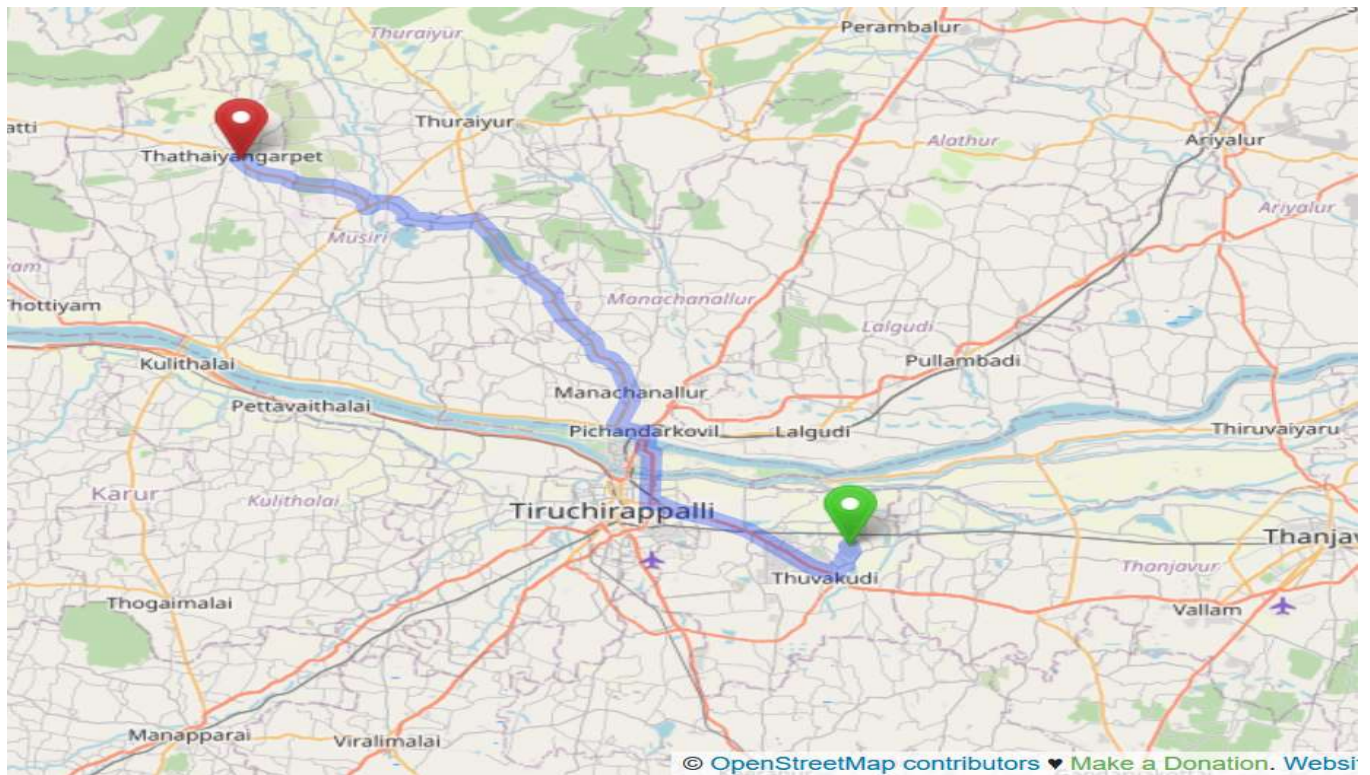




IndianOil

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

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO EKAMBARAM,(10.291629 , 79.190799), TOTAL DISTANCE -71 KM



Welcome to the Journey Risk Management Study for EKAMBARAM,

Total distance: 71 km; Start with: (10.7753, 78.8368), End with: (10.291629, 79.190799)

❖ Route Safety Analysis Report **Overview of the Route Map**

The route from Trichy Terminal (T.N) to EKAMBARAM. The route passes through several key points including SIDCO Industrial Estate Valavanthankottai, for Veppampalayam Rd, NH 81, arur - Namakkal Hwy/Service Rd, Karur - Namakkal Hwy/Service Rd, NH 44, MDR867, Karur - Vangal - Nerur Road, Mohanur - Vangal Rd/Vangal - Pugalur Rd, Mohanur - Valayapatty Rd, Kalichettipatty Rd, Namakkal - Thuraiyur Rd/Salem-Namakkal-Thuraiyur Rd/Thuraiyur Rd, Namakkal - Thuraiyur Rd/Salem-Namakkal-Thuraiyur Rd/Thuraiyur Rd, heavy vehicles carrying hazardous materials.

Typical Weather Conditions and Potential Weather-Related Hazards

Weather Conditions: Trichy Terminal (T.N) to EKAMBARAM, 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.

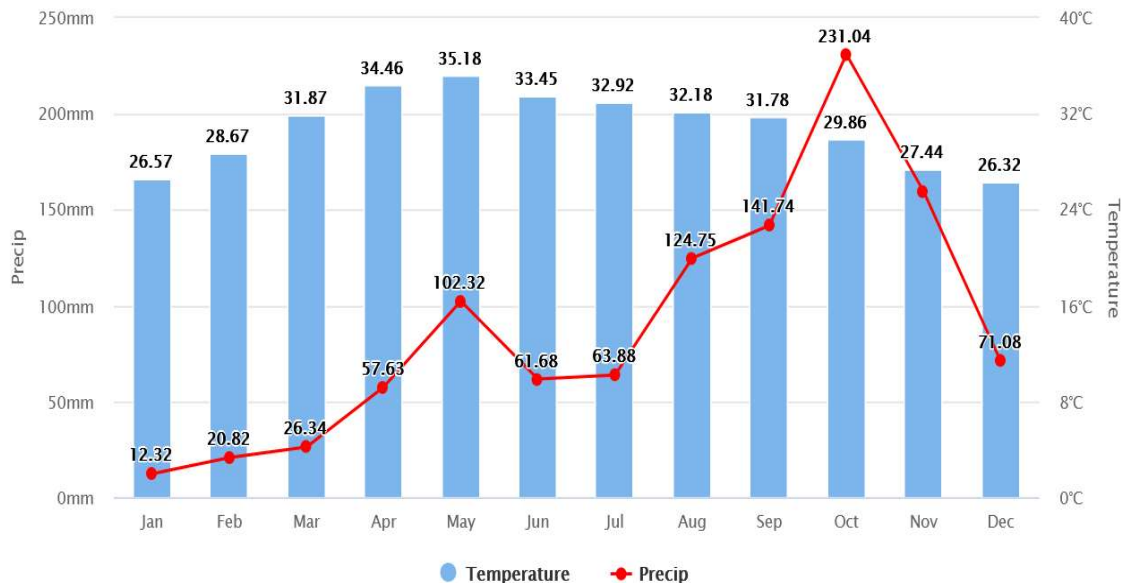
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0 (91.4)	38.0 (100.4)	41.0 (105.8)	43.0 (109.4)	43.0 (109.4)	42.0 (107.6)	40.0 (104.0)	39.0 (102.2)	38.0 (100.4)	37.0 (98.6)	34.0 (93.2)	33.0 (91.4)	43.0 (109.4)
Average high °C (°F)	30.27 (86.49)	32.88 (91.18)	36.0 (96.8)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

- Kumaravel House
- Subiksha Bakery and Sweets,
- Sri Muthu weigh Bridge
- Sun Bearings & Belt
- KVB ATM
- SK Dental Clinic
- Vangal Bus Stop
- VELU TEA SHOP
- Panneer tea shop & hotel

- Samaya tex

❖ **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:. Mohanur - Valayapatty Rd, Kalichettipatty Rd, Namakkal - Thuraiyur Rd/Salem-Namakkal-Thuraiyur Rd/Thuraiyur Rd, Namakkal

Alternative Route 2: NIL

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:** Bridgestone Select - Shakthi Tyres, Ganesh Wines, Government hospital kottucherry, Servite Higher secondary School, Kottucherry Police Station, Navakiraha Orphanage Care Home - Nocomer Trust, Mary Help Of Christians Church, Marryy St, Kumarpillai st
- **Educational institutions:** - Irrigation Management Training Institute, State Institute Of Hotel Management and Catering Technology, V.O.C

Govt Higher Secondary School, ENPEE International School, Don Bosco Higher Secondary

- **Hospital:** - ESI Dispensary, Trustee Medical Center Velangudi, Govt.Hospital Thenkarai Mathur
- **Gas Station:** - In there are several of fuel/Gas station some of them are G Parthasarathi Fuel Agencies , S N Ravi Kumar Agencies, Siva Fuels , Bhavani Agencies Energy-Sri Kandhar AGenct truchy-thanjavur Hyw , rakku sakti Kamatchupura fuel sataion.
- **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**

Bridgestone Select - Shakthi Tyres, Ganesh Wines, Government hospital kottucherry, Servite Higher secondary School, Kottucherry Police Station, Navakiraha Orphanage Care Home - Nocomme Trust, Mary Help Of Christians Church, Marryy St, Kumarpillai st. 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

 <p>Right hand curve</p>	 <p>Left hand curve</p>	 <p>Right hand pin bend</p>	 <p>Left hand pin bend</p>
 <p>Right reverse bend</p>	 <p>Narrow bridge</p>	 <p>Gap in median</p>	 <p>Cycle crossing</p>
 <p>Pedestrian crossing</p>	 <p>School</p>	 <p>Men at work</p>	 <p>Roundabout</p>
 <p>Narrow road</p>	 <p>Road widens</p>	 <p>Side road left</p>	 <p>Side road right</p>

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 EKAMBARAM,, 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	3.3 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.749406921191936, 78.83062696831735	3.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.745171516487582, 78.83368104214479	4.5 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.739119119860915, 78.83810753689248	5.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.735296935060319, 78.8649298251201	8.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.732950078633909, 78.87545277973047	9.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.73087486908852, 78.90608995975295	12.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.713764671171908, 78.9285599071715	15.4 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.711125274436691, 78.93786647838668	16.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.718221002127057, 78.94304398964309	17.2 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.7181899017704, 78.9560914041222	18.6 KM	10 km/hr TO 20 Km/Hr
Sharp turn	Medium	10.730969484477892, 79.01761228410292	25.5KM	10km/hr TO 20 Km/Hr
Sharp turn	HIGH	10.716561431768483, 79.06521400420263	30.7 KM	20km/hr TO 30 Km/Hr

Sharp turn	HIGH	10.71308854798758, 79.0698337039081	31.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.73705102370136, 79.10766164424598	35.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.74328897463716, 79.14225760188714	39.8 KM	10km/hr TO 20 Km/Hr
Sharp turn	High	10.780404751602815, 79.16734250741605	45 KM	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.817736360016776, 79.18047515526581	49.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.840339877719143, 79.19191515410074	52.3KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.866183705074247, 79.1927810209242	55.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.932095836643457, 79.31034743170252	70.9 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.938511393691135, 79.34586818266324	74.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.966870491363219, 79.79981994069612	130	10km/hr TO 20 Km/Hr
Sharp turn	High	10.965228164843323, 79.80660661023323	131	10km/hr TO 20 Km/Hr
Sharp turn	High	10.960160926774313, 79.81119260218071	132	10km/hr TO 20 Km/Hr
Sharp turn	High	10.959236701175161, 79.82539343794978	133	10km/hr TO 20 Km/Hr
Sharp turn	Medium	10.955673978543059, 79.82540563716985	71	20km/hr TO 30 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	10.739223590189045, 78.82491390378034
7	Jagdish Filling station IOCL RO	10.730096699158965, 78.86385149738328
8	Bus Stand	10.737619717156392, 78.84469108474981
9	School/College	10.743654738281231, 78.85235497712233
10	Shri Rakku Sakti IOCL retail outlet	10.736854782210685, 78.85825905782571
11	School/College	10.736328228804307, 78.86222089649122
12	Moogambigai Agencies IOC RO	10.710992946251965, 78.94066066619781
13	G Parthasarathi Fuel Agencies IOCL RO	10.731949135570895, 79.01839981851398
14	Auto Parts Mall	10.73479825344718, 78.86383650381019
15	Trichy-Thanjavur Border check post	10.734414736299165, 78.8687554646539
16	Hotel	10.73449559471593, 78.8705371771324
17	Pkd railway station starting point	10.733035467327712, 78.87760665657318
18	Nayara Petrol Pump	10.733201787527669, 78.88075610377959
19	IOCL RO	10.7370281264634, 79.13691139189406
20	Smv Puncture Shop	10.733071879186443, 78.88788151537116
21	Hotel	10.732766784125532, 78.89204005296241
22	IOCL retail outlet	10.732484981220054, 78.89788773851032
23	Bank	10.730614988892885, 78.90808861916952
24	Bus Stop	10.71762381663031, 78.91707309156152
25	Tool Fab Industry	10.714738429698235, 78.92771569309396
26	Hotel	10.719730509674973, 78.96118243846999
27	Vikas Global City	10.714186034036219, 78.97449603271008
28	Gnanam Business School	10.717431325357013, 78.9783943535095

29	BPCL RO	10.715825464578664, 78.9807445894157
30	Peekay Mediequip Limited	10.719355844598135, 78.99185652717746

IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO EKAMBARAM,(10.291629 , 79.190799), TOTAL DISTANCE -71 KM



10.716561431768483, 79.06521400420263



10.71308854798758, 79.0698337039081



10.73705102370136, 79.10766164424598



10.74328897463716, 79.14225760188714



10.780404751602815, 79.16734250741605



10.954296171087506, 79.34774637112439



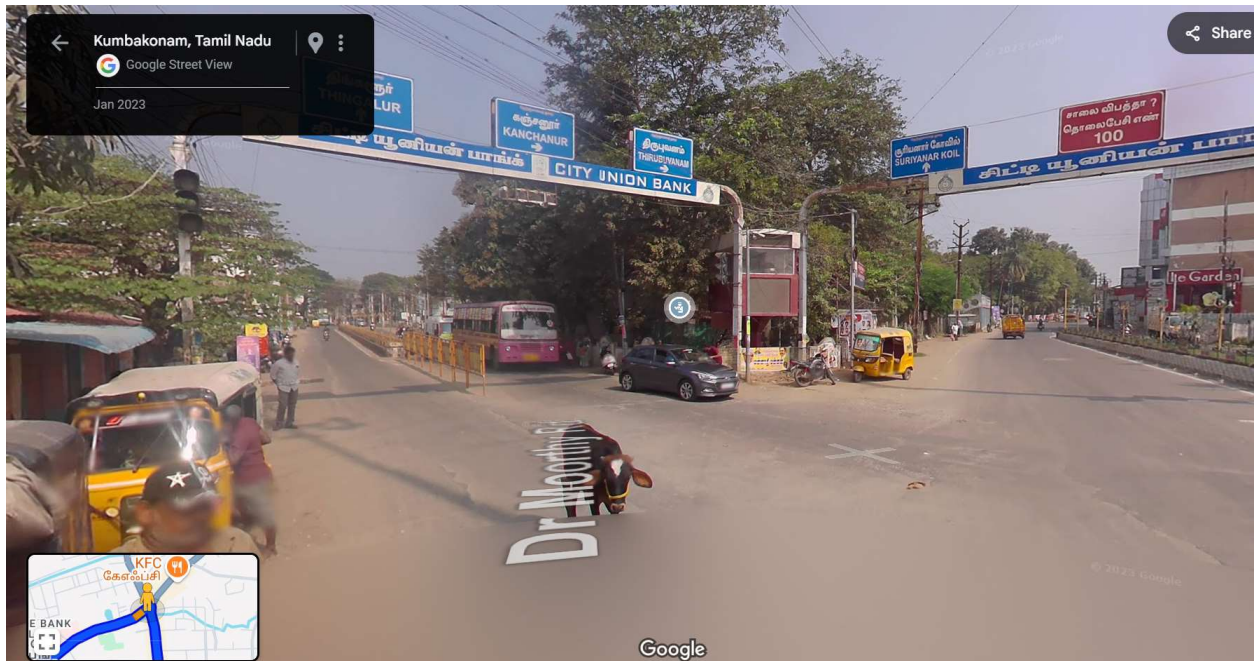
10.955808147992787, 79.36573625410698



10.960551970688885, 79.38611597124178



10.998322719754582, 79.53231697386092



10.97664252932043, 79.46227340774438



11.000530877432295, 79.54660314053001



10.994194075371174, 79.56081163873246



10.992066778173717, 79.56820237764057



10.99122294842798, 79.57103662086194



10.987740544991665, 79.58142784769393



10.987540562736278, 79.5871215963912



10.98257682421649, 79.603774136502



10.997468071824544, 79.52261457790277



11.11321, 78.44597



11.11528, 78.44681



11.11529, 78.44681



11.12054, 78.45267



10.291643330980584, 79.19079917544268