STUDY ON IMPACT ANALYSIS ON COVID-19 ON TRAFFIC AND TRAVEL CHARACTERISTIC AT SHOLIGANALLUR JUNCTION INTERSECTION, CHENNAI, TAMIL NADU

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering degree in Civil Engineering

By

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DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF BUILDING AND ENVIRONMENT

SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

APRIL 2021

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **BERSIL TONY K W (37200013)** and **PRAGADHESHWARAN G (Reg.No.37200054)** who carried out the project entitled **"STUDY ON IMPACT ANALYSIS ON COVID-19 ON TRAFFIC AND TRAVEL CHARACTERISTIC AT SHOLINGANALLUR JUNCTION INTERSECTION, CHENNAI, TAMIL NADU"** under our supervision from October 2020 to April 2021.

Internal Guide

(Mrs. R. NIRMALA M.E.)

Head of the Department

_____

Submitted for Viva voce Examination held on_____

Internal Examiner **External Examiner**

DECLARATION

We **BERSIL TONY K W (Reg.No.37200013)** and **PRAGADHESHWARAN G (Reg.No.37200054)** hereby declare that the Project Report entitled **"STUDY ON IMPACT ANALYSIS OF COVID-19 ON TRAFFIC AND TRAVEL CHARACTERISTICS AT SHOLINGANALLUR JUNCTION INTERSECTION, CHENNAI, TAMIL NADU**" done by us under the guidance of **Mrs.R.NIRMALA** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Civil Engineering.

1.

2.

SIGNATURE OF THE CANDIDATES

DATE:

PLACE:

ACKNOWLEDGEMENT

We are pleased to acknowledge our sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. We are grateful to them.

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ABSTRACT

The study of several months, the novel corona virus (COVID-19), has developed into a catastrophic global phenomenon with multiple impacts on the health and well-being of people, as well as far-reaching impacts across different industries and business sectors. the transportation sector was severely impacted by the emergence of this global health crisis, From a transportation perspective the novel corona virus also has had a profound impact on travel behavior, mobility, air quality, environment, as well as on logistics and supply chains on a global basis. This paper aims to investigate the impacts of before pandemic and after pandemic on traffic and travel behavior in Chennai Metro city – Sholinganallur Intersection. The first section of this report is a comprehensive review of traffic volume data before COVID – 19 in 2014 for the following main junctions which is TIDEL Park, ECR, Medavakkam and Navalur at different Peak Hours (8.00 am – 4.00 pm). The second section contains traffic volume data after COVID – 19 for same areas. The results shows the difference between 2014 and 2020 traffic volume at peak hours, also explain about the impacts of pandemic and which parameters are need to improve and continue while the time of travel for people safety

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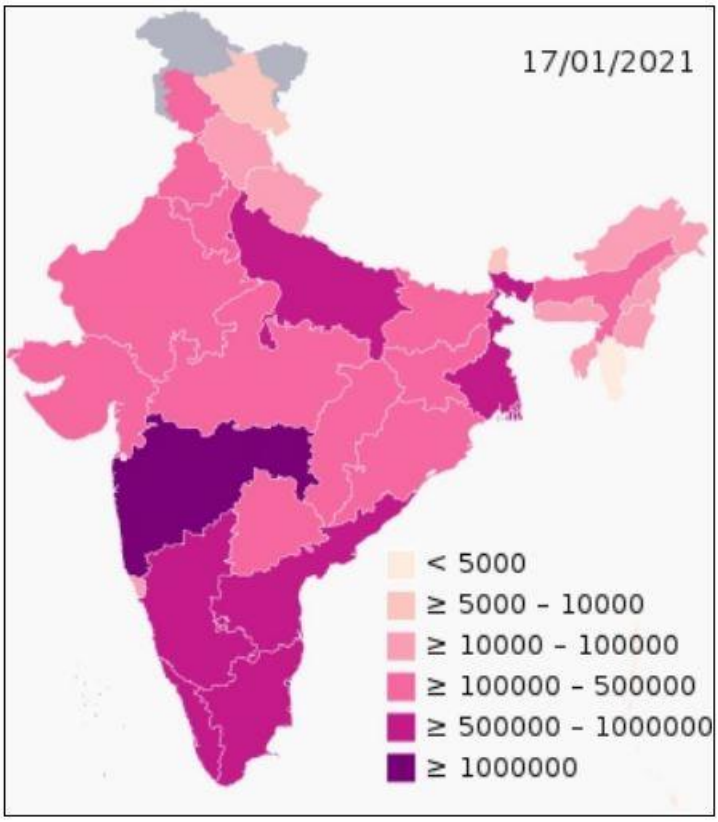
CHAPTER 1
INTRODUCTION

1.1 GENERAL

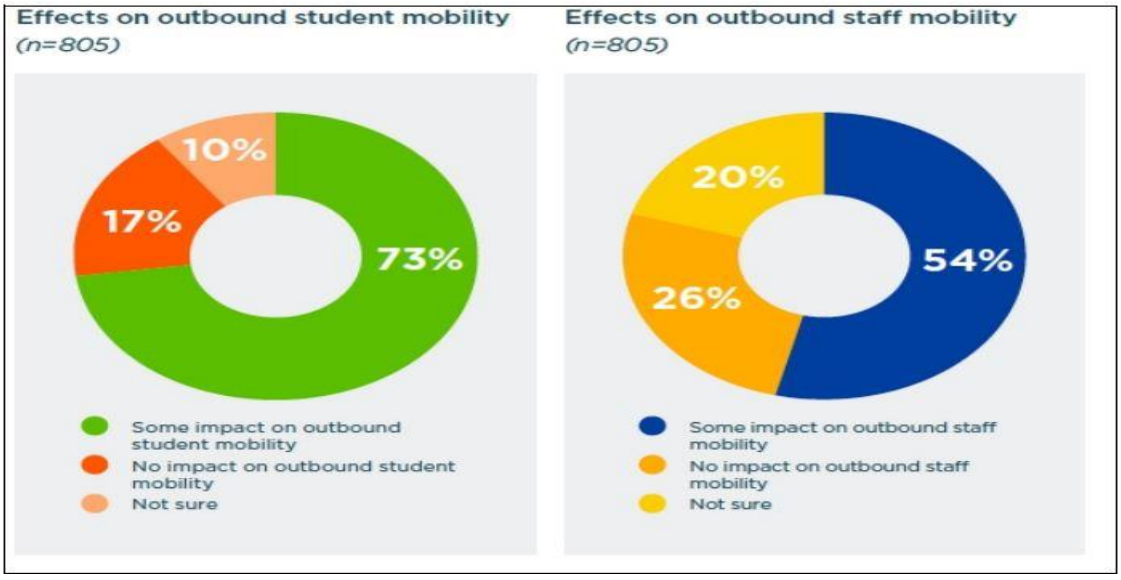
The corona virus disease (COVID-19) pandemic, which began in the Chinese city of Wuhan, has rapidly spread to other countries, with numerous cases recorded around the world. In India, 56,342 positive cases have been registered as of May 8th, 2020. India, which has a population of over 1.34 billion people and is the world's second-largest, will face challenges in managing the spread of the disease. To control the spread of the current outbreak, several techniques will be needed, including computational modelling, statistical methods, and quantitative analyses, as well as the rapid creation of a new treatment. On the 17th of January 2021, the map below depicts the global status of public transportation operations. To avoid the pandemic from spreading further, 80 percent of the world's PT activities had been halted or drastically reduced. Countries such as India, China, Pakistan, Egypt, Brazil, Argentina, and Ukraine have outright banned public transportation.



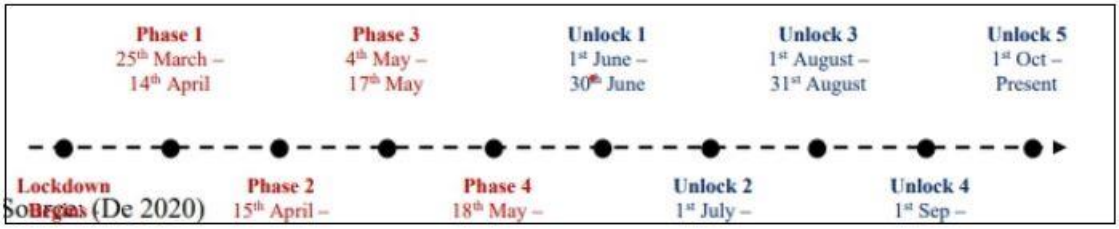
1.2 IMPACTS OF COVID-19 ON GLOBAL MOBILITY

Mobility to various destinations is affected differently by regions and income groups, according to the analysis: For the most part, Latin America and the Caribbean (LAC) has the greatest influence. High-income countries have the most significant differences from the baseline across income classes. When searching for modes of transportation in all countries, there was a 60 percent reduction in the number of results.

The downturn began on March 8, 2020, and the lowest point was in early April. Public transit has undergone the biggest decline, with a 76 percent reduction at its lowest point in April 2020.



The paper presents the findings of an online survey conducted in the months of May and June 2020 to assess the effects of Covid-19 on travel behaviour in various cities, especially metro cities. There are two parts to this article.



In India, the Lockdown and Unlock phases are depicted in the diagram above. On January 30, 2020, the first case of Covid-19 was registered in India. Because of the steady spike in cases in February and March, the lockdown was declared on March 24, 2020, and public transit services were suspended for more than two months during the four phases of the lockdown (March 24, 2020 – May 31, 2020). The first step of unlocking was a challenge.

Covid-19 group mobility reports for various countries, including India, have been released by Google.

Trips to public transit nodes were substantially reduced in the initial lockdown period from March to mid-April, according to the reports, relative to the baseline (Pre-COVID times denoted as 0 on the Y-axis).

During pandemic conditions, understanding and anticipating travel patterns is important for transportation planning, decision-making, and policy-making based on people's travel needs. For example, government officials could use this information to reschedule public transportation, and taxi and ride-sharing companies could use it to better organize their services.

The findings from previous study studies may not be specifically relevant since the COVID19 pandemic is a global health epidemic relative to previous pandemics. As a result, the current research aims to examine the influence of the COVID19 pandemic on human travel actions.

The features of changes in travel behaviour before and during COVID19, as well as the factors that affect them, are investigated. This research focuses on trips that are taken out of necessity and are referred to as primary trips because people feel obligated

to make them for different reasons. Data was gathered using a questionnaire survey that was sent out to people all over the world.

Additionally, the trip characteristics of various job groups, such as critical service personnel and other daily workers, are investigated. The following is how the rest of the paper is organized: The next segment addresses recent research on the effect of pandemics on travel habits, trends, and mode choices.

The methods are then presented, which include specifics of the questionnaire survey that was performed to collect the necessary data as well as data analysis techniques. Following that, the findings of statistical studies are discussed, along with a discussion. Finally, the findings, as well as policy consequences and limitations, are discussed.

1.3 NEED AND SCOPE OF THE STUDY

- ✓ Ensurement Passengers and pedestrian safety.
- ✓ Decrease in traffic after COVID-19
- ✓ Safe and secure travel
- ✓ Proper formulation of road rules and regulations
- ✓ Increase in the usage of private vehicles -social distancing.

Proper formulation of road rules and regulations.

1.4 FUTURE STATUS OF AUTOMOBILE SECTOR

The government of Tamil Nadu expects its strengths in the auto and auto component industries to draw significant investments in the sector at the second Global Investors' Meet (GIM), which will be held in Chennai on January 23 and 24. Chennai, according to the state, is the country's largest contributor to the automotive sector in terms of manufacturing production and one of the top ten global automakers.

Chennai can generate one car every 20 seconds (three cars per minute) and one commercial vehicle every 90 seconds, according to its installed power. The total installed capacity for cars is 14,60,000, with about 10,90,000 units manufactured in 2017-18.

Tamil Nadu has the largest auto component industry in India, accounting for 35% of all auto component production in the country. Over the next five years, Chennai's auto components sector is expected to rise by 20% annually, with exports expected to increase

by 30%. The vehicle industry's high degree of indigenization demonstrates the industry's ability to produce and manufacture components according to demand. With a combined investment of $553.85 million, Tamil Nadu now has over 100 major auto component manufacturers.

The production is estimated at $1.2 billion, with $140 million in exports directly employing about 45,000 people. There are over 350 tier I to III suppliers in Chennai, as well as 4,000 SMEs in the tier IV segment. Visteon, Delphi, and other auto component manufacturers produce more than 25% of their components in Chennai. Automobile manufacturers' just-in-time (JIT) practices have resulted in the expansion of the auto component sector in the vicinity of their plants. To reduce its overdependence on the automobile market, the industry is also looking into projects into non-auto sectors.

CHAPTER 2
LITERATURE REVIEW AND METHODOLOGY

2.1 LITERATURE REVIEW

Nishant Sawant and Shalini Sinha, Following India's nationwide lockout, this study explores the expectations of people living in Indian cities about the effect of Covid-19 on the urban transportation market. The effect of lockdown on various parameters such as mode preference, vehicle ownership, public transportation patronage, pace of travel, and expectations from public transportation operators is examined in this paper. It also compares how public transit operations around the world were impacted by the pandemic.According to the report, current public transportation users would prioritize their health and safety when commuting, resulting in a continued decrease in demand for public transportation. According to the perception report, mode choices would most likely change after Covid-19, with a significant shift away from public transportation and toward walking, cycling, or customized modes anticipated, at least in the short term.In comparison to Ahmedabad, Chennai, and Hyderabad, the study indicates that Mumbai, Delhi, and Kolkata may see smaller changes from public transportation modes.

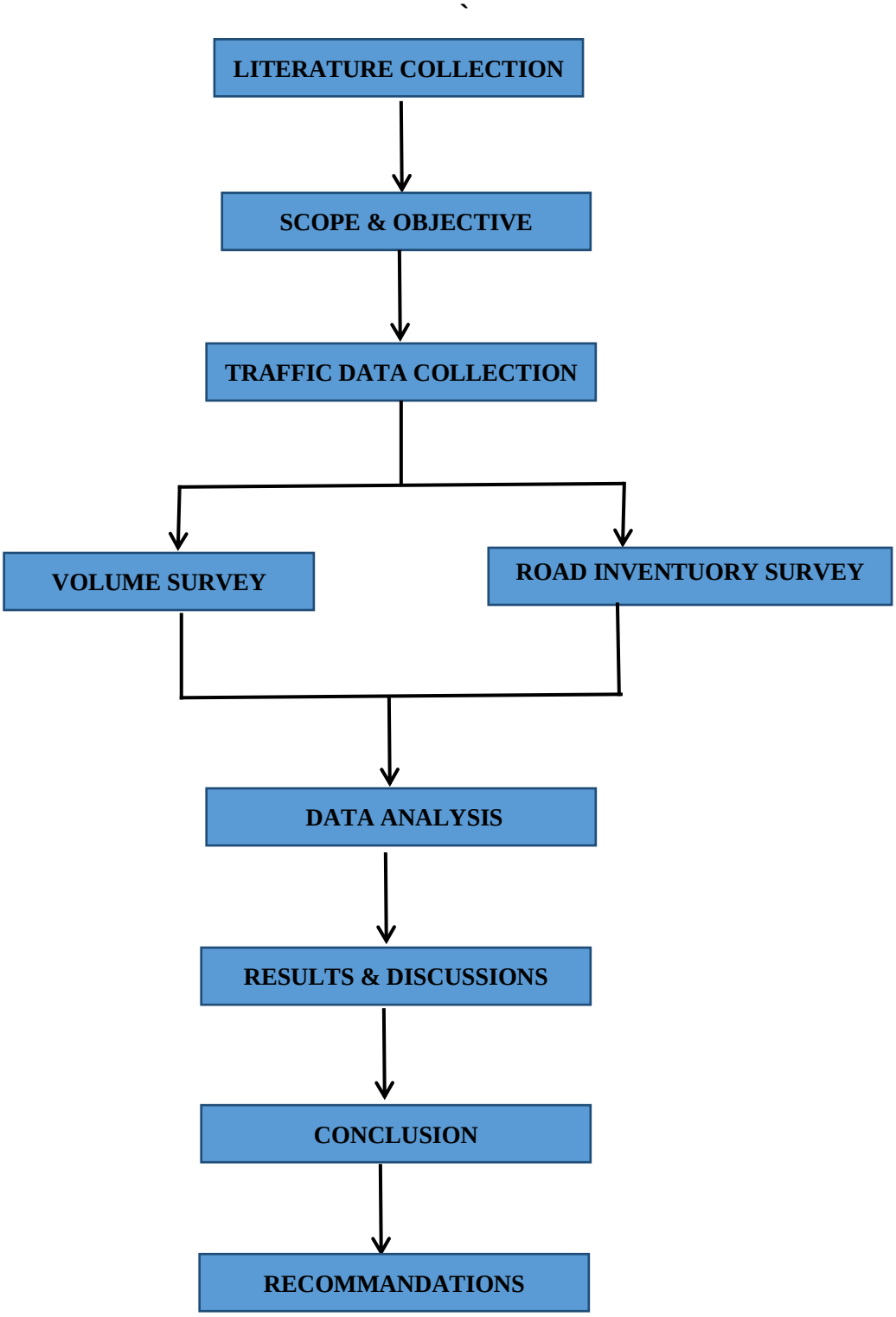
Shahin Shakibaei,Taha H. Rashidi, It examines the evolution of travel behaviour during the outbreak as a result of residents' self-regulation and government actions, distinguishing travel for commuting, social/recreational/leisure (SRL), and shopping activities, as well as the use of different modes of transportation based on various socio-economic characteristics. Between the second and third phases of our data collection in Istanbul, the change in travel activity pattern and transport mobility appears to be very extreme, especially for commuting. This is due to the application of a social distancing of at least 1.5 m, the closure of multiple non-essential venues, promoting teleworking and distance education, job losses, and cancellation of all social gatherings.
Future research should look into the complexities of the transition to teleworking and other types of flexible working systems in Istanbul. Staggered work hours may have a positive effect on transportation ability and demand in a megacity like Istanbul, where traffic jams and crowding on public transportation are common during rush hours.

Muhammad Abdullah, Deepti Muley, The effect of the COVID19 pandemic on travel behaviour is discussed in this report. Before and during COVID19, data was collected through an online questionnaire survey that included questions about trip intent, mode of transportation, distance travelled, and frequency of trips.
1203 responses were collected from various countries around the world. Results explained that trip purpose, mode choice, distance traveled, and frequency of trips for the primary travel were significantly different before and during the pandemic. Further, the majority of trips were made for shopping during the pandemic.71% of the respondents traveled a distance between 0 and 10 km during COVID-19, whereas only 45% traveled this distance before COVID-19. A study conducted in Switzerland also stated that the median daily travel distance varied between 0 km and 10 km while travel restrictions were in place, i.e., during 15th March and 30th April 2020.

BrianWolshon, Scott Parr It describes the drastic changes in human behavior using the analysis of highway volume data as a representation of personal activity and interaction. Same-day traffic volumes for 2019 and 2020 across Florida were analyzed to identify spatial and temporal changes in behavior resulting from the disease or fear of it and statewide directives to limit person-to-person interaction. Compared to similar days in 2019, overall statewide traffic volume dropped by 47.5%. Although decreases were evident across the state, there were also differences between rural and urban areas and between highways and arterials both in terms of the timing and extent. However, apart from the increasing tendency to use private car, the pandemic has contributed to the recognition of the importance of the active mode of transportation (e.g. bicycle) **(Budd &Ison, 2020; Zhang, 2020)**. In this context, early leadership came from the global south where Bogota, Colombia expanded its cycle network to alleviate the pressure on their public transportation **(Nurse & Dunning, 2020)**.

Sampathkumar and Vanjinathan, The increase in traffic volume with lack of road geometry results in congestion. The Sterling road has Information Technology companies with lakhs of employees travelling along this road. This intersection has roads along north to south and east to west which connects to the major regions.

2.2 METHODOLOGY



CHAPTER 3
STUDY AREA AND DATA COLLECTION

3.1 STUDY AREA

On the IT corridor, Sholinganallur is a southern suburb of Chennai, India. Information technology business parks and dedicated special economic zones are primarily responsible for Sholinganallur's rapid economic, population, and infrastructure development (SEZ). Other IT-related suburbs such as Siruseri, Perungudi, and Taramani surround Sholinganallur. Government of Tamil Nadu.

Fig 3.1 Satellite Map of study area

The plot is 14700 square metres in size. It was previously undeveloped land that has now been turned into a residential development. The planned site is listed as Industrial Use in the CMDA Master Plan. The site has a flat landscape, and the land's soil quality is fertile. It has the ability to soak up rainwater. The project's position is 12° 53' 59.68" north latitude and 80° 13' 37.97" east longitude. The location of the site is adjacent to Old Mahabalipuram Road (OMR)).

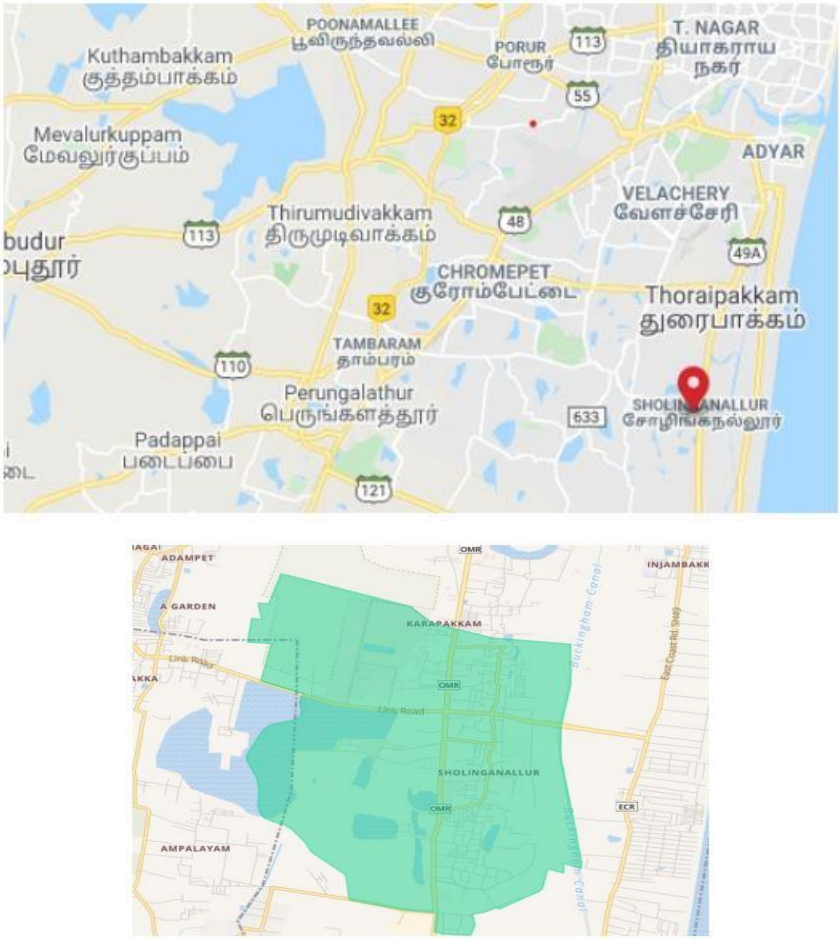


Fig 3.2 Location Map of study area

Along Old Mahabalipuram Route, Sholinganallur is located at the intersection linking East Coast Road to Tambaram, Mudichur, and Adyar to Mahabalipuram. It is a major intersection in Greater Chennai's southern region. Tambaram is 14.3 kilometers away, East Coast Road (ECR) is 2 kilometers away, Mamallapuram is 34.8 kilometers away, and Adyar is 13.5 kilometers away. Roads bind Sholinganallur to the rest of the world. Within a 5-kilometer radius, there are numerous IT companies. MTC and TNSTC-villupuram provide excellent connections to the area, as do many shared autorichshaws.

India has 4.5L km of roads in 2013, the 2nd largest road network in the world.Union Government took initiatives to develop the National Highways at the rate of 20km per day which create easy access and help the people tomigrate into cities.

Fig 3.3 Shollinganallur junction

Tamil Nadu has approximately 250,000 kilometres of road, with 14500 kilometres of National and State Highways. Tamil Nadu has 25 national highways, 12 of which operate entirely within the state. The state has 153 kilometres of road per 100 kilometres of land area, which is more than the national average of 103 kilometres. The Chennai Metropolis, located between 12°50'49” and 13°17'24” latitude and 79°59'53” and 80°20'12” longitude, is the country's gateway to South East Asia and serves as the country's economic and national growth backbone. Chennai is the fastest growing city in the world, with a total road length of 2780 kilometres in a radial and ring pattern. According to the Workforce Patterns Report, it had 4.40 million workers in 2011.

3.2 DATA COLLECTION

From 8 to 20 hours, a road inventory survey and traffic volume count is performed at the intersection. The volume of traffic at different locations of the intersection is studied, as well as graphs of traffic accumulations per half-hour, with the peak volume defined as 8 a.m. to 9.00 p.m.

At the Sholinganallur intersection, vehicles travelling in opposite directions compete for the same lane. 3000 pedestrians per hour are also looking for the same crossing space. The intersection is formed by Rajiv Gandhi Road, which is 41 metres wide, and Karunanidhi Road, which is 20.5 metres wide. It's a four-legged intersection of 32 dispute numbers. The speed of the vehicle decreases significantly, and the time it takes to drive increases dramatically. On a daily basis, over one lakh vehicles pass through the intersection, resulting in an average of 25 traffic violations and 10 incidents. Intersection studies are critical for traffic engineers from both an accident and capability standpoint. On a weekday, an inventory survey and volume count at the intersection, as well as a speed delay survey along Rajiv Gandhi Road, are conducted to assess the accumulation and evaluate the peak traffic time. Vehicles travelling to Perungudi (North) are classified as position 1, while those travelling to ECR (East), Siruseri (South), and Tambaram (West) are classified as locations 2, 3, and 4, respectively.

3.2.1 VOLUME SURVEY

- ✓ By Toll Plaza Ticketing
- ✓ Registration offices
- ✓ Statistical Approach
- ✓ By Interviewing
- ✓ By Check posts
- ✓ Modern Global Positioning Systems

TOLL PLAZA TICKETING

Toll Plazas are now being designed for the purpose of raising revenue from road users. This method of revenue collection is very successful since many people who use the road would pay, thereby contributing significantly to the establishment of the economy.

The traffic survey may also be conducted at the Toll Plaza. Since any vehicle going through is required to pay a tax and is given a receipt, it is possible to determine how

many cars, buses, trucks, and other vehicles have left and entered the city by measuring the number of receipts for each form of vehicle.

REGISTRATION OFFICES

When you buy a new vehicle, the government needs you to register it. Residents in the region are required to register their vehicles at the designated registration office in each district. Records from these offices may be taken for a specific year in order to perform traffic surveys. As a result of this record, we will be able to calculate the number of new vehicles on the road.

STATISTICAL APPORACH

When the records for previous countries are kept effectively and efficiently, this approach can be used. As a result, statistical approximation techniques can be used to predict future traffic flow projections on the lane.

BY INTERVIEWING

An interview is the most effective way to learn about a person's everyday life. The knowledge of regular traffic density at various locations and times of the day is needed for a traffic survey interview.

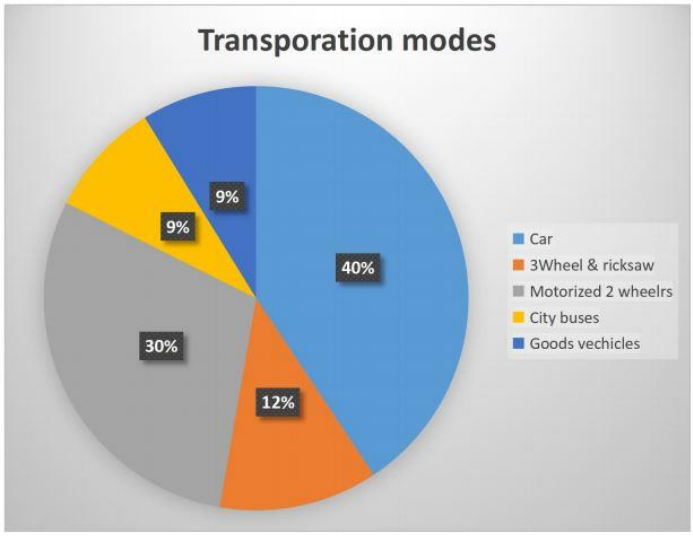


Fig 3.4 Transportation mode of Chennai

This can be achieved by a group of people standing at various entrance points of a city and asking each person about their routine so that proper data about traffic density at a

specific point can be preserved, and better traffic flow control strategies can be used by respective departments using this data.

CHECK POST

Checkpoints are situated at the city or province's entry and exit points. The primary aim of these is to ensure legal entry and exit in order to deter robberies and other criminal proceedings as much as possible. Checkpoints can be used to perform traffic surveys as well. It is very straightforward to calculate the number of vehicles entering and exiting the city on a regular basis if proper records of vehicle entry and exit are kept.

GLOBALPOSITIONING SYSTEM

The Navstar Global Positioning System, or GPS, was launched in 1973 to assist navigation systems. GPS attracted a wide range of users by developing a system that overcame the shortcomings of many existing navigation systems. Since GPS is accessible using lightweight, low-cost equipment, it has been popular in navigation applications. Many new technologies, such as highway design, have benefited from GPS.

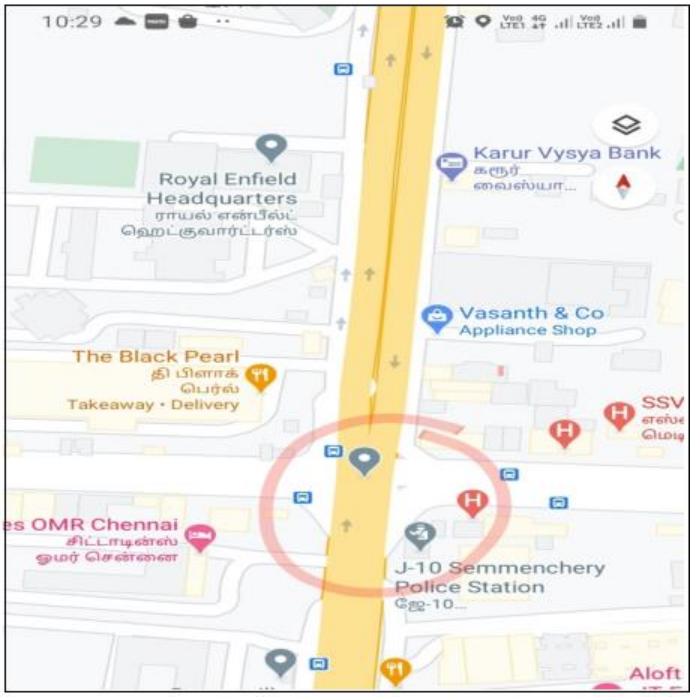


Fig 3.5 Map showing the Study Area

This technique is now being used in traffic surveys in major countries such as the United States, China, and other developed countries. This method includes built-in chips and a navigation control centre. The chip is installed in the vehicle, and a record of it is kept in the control room. As a result, a database of the exact number of vehicles on any given

road in the city is accessible at any time. "Automated Surveillance Technique" is another name for this.

DEFINITIONS

Service flow rate: The maximum hourly rate of a roadway section during a given period under prevailing roadway condition.

LOS : “Qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers.”

ADT : : Average daily traffic is the volume of traffic counted on the roadway(two way) over a given time period (greater than one day but less than one year) divided by the number of days in that time period.

AADT : Average annual daily traffic is obtained by adding daily traffic counts over one year divided by 365 days.

Directional Distribution : Directional distribution refers to the percentage of traffic flow in one direction during a particular time of day.

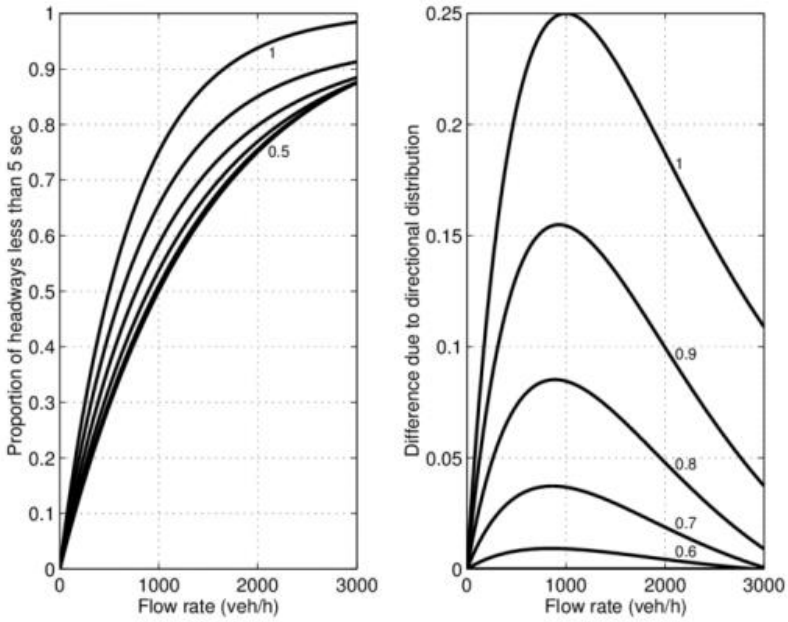


Fig 3.6 Directional distribution curve

This is especially true on commuter roads, where the most traffic flows in one direction in the morning and the other in the evening. This must also be taken into account for successful geometric architecture.

PCE : PCE means passenger car equivalent to express various types and characteristics vehicles to a common type usually the passenger car. One car is considered to one unit.

Volume/flow : The total number of vehicles that pass over a given point or section of a lane or roadway during a given time interval. It may be expressed in terms of annual, daily, hourly, or sub-hourly periods; usually in vph or vpd. Volume is an actual number of vehicles observed or predicted to passing a point during a given interval.

Design purpose : Structural and geometric design of pavements, bridge, and other highway facilities; intersection design including minimum turning path, channelization, flaring, traffic control devices viz. traffic signs, markings, signals based on approach volume and turning proportions etc.

INDIRECT METHOD

Data is collected using a video camera in this process. Rewinding is used to gather data from video that has been captured for a long time. Aside from traffic volume, filmed film can provide many traffic parameters. Data can be double-checked for accuracy, and consistency can be guaranteed. When there is a lot of traffic, this approach works well. It is sufficient for non-lane traffic operations.

AUTOMATIC COUNTING METHOD

Vehicles are counted automatically in this process, with no human intervention. Centered on a communication method (pneumatic, mechanical, magnetic or piezoelectric method) Contactless (electrical/optical, ultrasound/infrared radar, microwave, CCTV/video image processing tool, etc.) systems.

Fig 3.6 Motion sensors on road

This method is appropriate for long-term or continuous counting. Poor weather has no impact on the count. Ultrasound, light ray, or other infrared technologies are used to record vehicle numbers.

IMPORTANCE OF VOLUME SURVEY

- ✓ Increase the efficiency and life of roads
- ✓ Reduces traffic volume at a particular section
- ✓ Provide better means for development of infrastructures
- ✓ Provide better means to utilize other roads in case of special events in the city
- ✓ Provide estimate of no vehicles against no of persons.

3.2.2 Road Inventory

Road inventory also assists in the construction and maintenance of data bases for highway and street traffic signs. Geolocation of signs and roadway markers (destination distance signs), mapping of feature positions (e.g. signs erected on the side of, or above, and at what height), and documentation of relevant attribute information are all part of the data collection process. Our field engineers collect images and precise geographic coordinates of each sign or multiple signs on a single supporter using a survey vehicle fitted with a panoramic camera, GPS, and IMU (post). Each road sign and marker has its exact position registered in a geodatabase and on digital road maps. The ability to alter routes when changes arise on the road network is at the core of RIMS. Maintaining a clear view of the road network necessitates ensuring that all roadway attributes remain correctly located when realignments occur. All of the types of modifications needed to

keep the road network up to date are supported by RIMS. RIMS is capable of maintaining accurate asset positions, from adding and removing new routes to making changes from any point. Road inventory projects in developing countries and remote areas are focused on:

- ✓supply routes, connection routes, warehouses
- ✓arterial and minor roads
- ✓road conditions
- ✓bridge inventory and conditions
- ✓obstacles like flooding zones, debris flows, ruined bridges
- ✓mountain passes and gaps
- ✓ferry crossings and quays.

3.2.3 Growth In Vehicle Population

The number of vehicles in Chennai has gradually risen from 600,000 in 1992 to 1.3 million in 2001 and 3.64 million in 2012. Every day, about 1,500 new vehicles enter the market, with two-wheelers accounting for more than 75% of them. New car registrations, on the other hand, are on the rise.

Vehicles in Chennai account for one-fourth of the 17.5 million vehicles in Tamil Nadu. The state has a higher number of two-wheelers (13 million) than Maharashtra, which has a higher total number of vehicles. Two-wheelers account for 78% of all vehicles in the province, while automobiles account for 14%.According to a city traffic police survey conducted in 2012, there is one vehicle on the road for every two Chennai cites. Given the current pace of growth, Chennai is expected to have twice as many vehicles as Mumbai in the near future.

The city's transportation system is user-friendly, environmentally friendly, and provides adequate coverage and connectivity. Aside from that, numerous flyovers at major roads and intersections are being designed to provide residents and tourists with convenient and timely services. Transport vehicles that emit significant amounts of black fumes are prohibited in order to keep the air safe, and CNG is the chosen fuel for vehicles.

Bus

In Chennai, buses are the most popular and least expensive mode of transportation. The government-owned Metropolitan Transport Corporation operates the bus service, which serves the entire city as well as its suburbs. This service is thought to be well-organized and realistic.

However, some of these buses' routes are extremely congested, particularly during peak hours in the morning and evening. On a daily basis, about 4.35 million passengers use this mode of transportation, which includes 3257 buses on more than 622 routes. The Chennai Mofussil Bus Terminus (CBMT) is one of Asia's most well-known bus terminals, serving as the departure point for all intercity buses departing from Chennai. Aside from that, there are private luxury buses that travel to all of Tamil Nadu's major cities and towns as well as neighbouring states.

Taxis

Taxis are also available in Chennai, which can be hired or pre-booked via travel or cab agencies. It's perfect if you want to get out and about in the city or if you have a lot of luggage. The fare is calculated based on the distance travelled, so check that the metre is in good working order before departing. Fixed-rate taxis are also available on airport, bus terminal and railway station.

Auto Rickshaws

Another convenient but pricey mode of transportation is auto rickshaws. For short distances inside the city, it is the preferred mode of transportation. Ask the driver about the meter's operation before getting into the auto rickshaw.

Local Train

Chennai currently has six rail lines. The North Line runs from Chennai Central to Sullurpeta, while the South West Line and South Line run from Chennai Beach to Chengalpattu. The West Line runs from Chennai Central to Arakkonam, while the West North Line runs from Chennai Central to Tiruttani and the West South Line runs from Chennai Beach to Arakkonam. The rail system, known as MRTS (Mass Rapid Transit System), is well-connected throughout Chennai and its suburbs. Trains run every 15 minutes, with fares ranging from Rs 5 to Rs 10.

3.2.4 Transportation Status In Lockdown

Even though the central government has exempted the sector from restrictions to stop the spread of the corona virus, the world's largest lockdown has brought transportation of goods in India to a near halt.

According to the All India Motor Transport Congress, an umbrella body of goods vehicle operators representing around 10 million truckers, daily truck movement has decreased to less than 10% of usual levels. According to the Ministry of Road Transport and Highways, road transport accounts for about 60% of freight traffic and 87 % of passenger traffic in India.

Lockdown Restrictions

- No train or air passenger services will be allowed aside from special trains and flights meant for transporting migrant workers after getting approval from both, the state and central government.
- Autos, cycle rickshaws, metro rail, and local electric trains will not be allowed to operate.
- Tourist locations will also remain shut.
- Autorickshaws: Only two passengers allowed.
- Cycle rickshaw can ply without e-pass.
- Call and hired taxis are allowed to operate with three passengers within Chennai.

CHAPTER 4
DATA ANALYSIS

4.1 DATA ANALYSIS

4.1.1 Traffic Volume at Shollinganallur Junction in 2014

With the exponential growth of urban traffic, the disparity between demand and supply has become even more apparent, and traffic congestion has become the norm. Transportation planners and administrators are grappling with how to locate often congested road sections, quantify their effect on the entire road network, and enhance the connectivity and accessibility of the entire road network through local traffic reformation. Congestion is described as a reduction in speed, an increase in travel time, and an increase in the number of vehicles parked on the road. Furthermore, traffic congestion arises when the demand for a road exceeds the capacity of the road. The rapid growth of automobiles causes severe urban traffic congestion, which has a negative impact on people's jobs and lives. Establishing successful traffic congestion analysis and assessment techniques, as well as tracking the condition of congestion, would provide substantial assistance to transportation management and planning. Not only the decrease in nation’s economy, it torments our physical and mental stature. In addition to that its contribution towards global warming is in excess.

Road without foot path

Entire stretches of Medavakkam area are found to have narrow footpath. Footpath of two junctions in Medavakkam is extremely poor in all side of road or we can say there is no footpath at all.

Fig 4.1 Foot path of medavakkam

Pedestrians are compelled to walk roadside braving the rush of the vehicles.

Poorly maintained drains:

The drains on Medavakkam road are poorly maintained. Instead of acting as a medium for the flood water to pass through it has become a dumping place and a majestic haven for mosquito breeding.

Unused pavements

The pavements in Medavakkam Road are totally unused. The used water from nearby hotels and restaurants are openly let off. Plastic containers, tyres and polythene bags are thrown into it. Off-street parking is also done in free style.

Width of road

Medavakkam- Sholinganallur road: This is a private road with a divider that divides it into two parts of around 20 metres each. It is a one-way road with two lanes. Global Health Hospital, Sholinganallur, East Coast Road, Thoraipakkam, and other public and common places are all connected by this road. IT corridors and some renounced Colleges and Universities are connected by this road.

The volume of traffic from various directions in Shollinganallur intersection at peak hour (8.00am -9.00 pm) is shown in Table 1 , the hourly peak volume of intersection and the volume of flow is shown in figure.

Table 4.1 Traffic volume at peak hours for different location

LOCATION	LEFT	RIGHT	STRAIGHT	PEAK HOUR
Tidal Park	939	643	1013	3.30 - 4.00pm
ECR	222	123	528	8.00 - 9.00am
Medavakkam	177	335	709	3.30 - 4.00pm
Navalur	176	382	433	8.00 - 9.00am

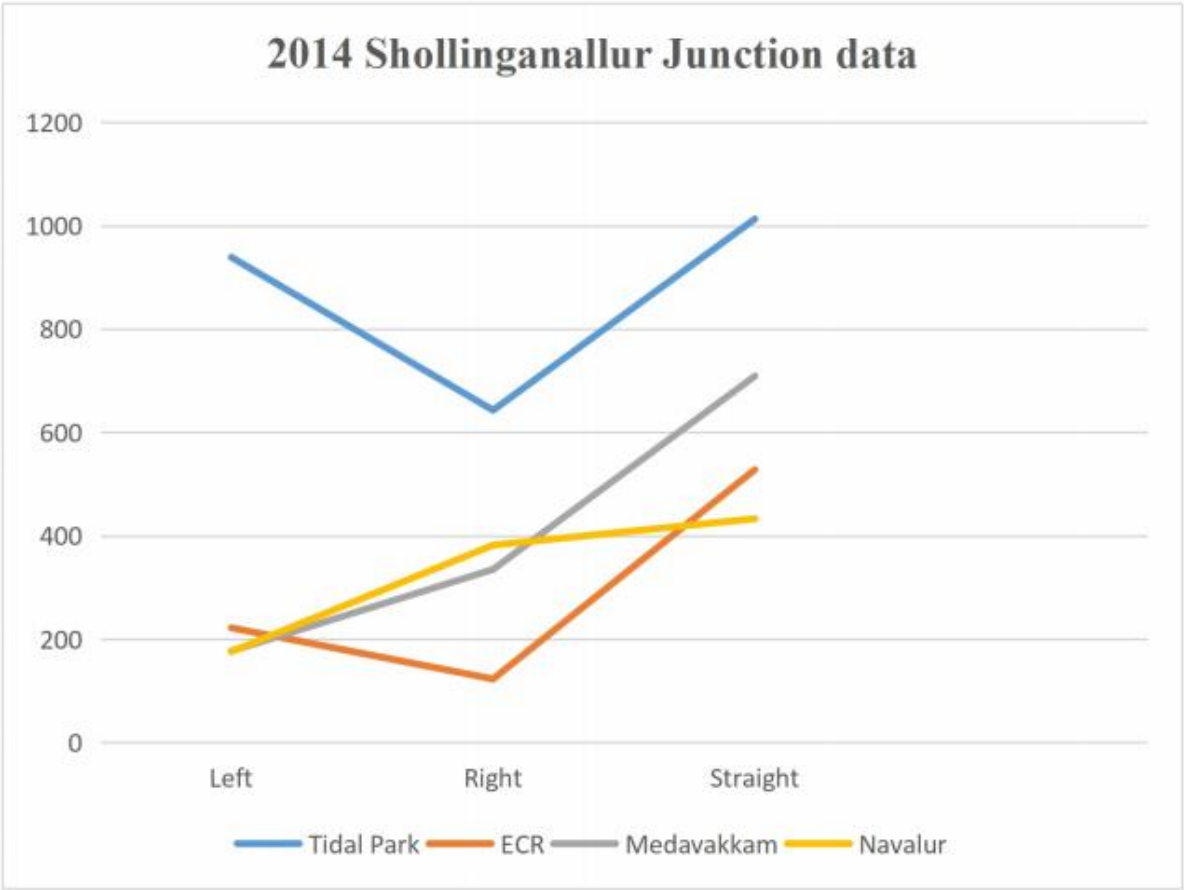


Fig 4.2 Traffic volume at peak hours for different locations

4.1. Traffic Volume at Shollinganallur Junction in 2020

Road traffic has been growing a very rapid rate in chennai after pandemic . The number of motor vehicles and cars has been growing at a rate around 10 percent. The growth rate of various vehicle classes has been as under:

TIDEL Park

TIDEL Park is an information technology (IT) park situated in the city of Chennai, India.TIDEL Park is located on the six-lane Rajiv Gandhi Salai in Taramani opposite to the Thiruvanmiyur MRTS Railway Station and close to the Rajiv Gandhi Salai–Thiruvanmiyur West Avenue Junction, a high-density traffic junction used by about 30,000 vehicles a day.

Table 4.2 Traffic volume data towards TIDEL PARK

S.NO	TIME PERIOD	CAR	BIKE	AUTO	BUSES	HEAVY VECHICLES
1	8.00am - 9.00am	205	2941	559	104	27
2	3.00pm - 5.00pm	887	4359	593	125	11

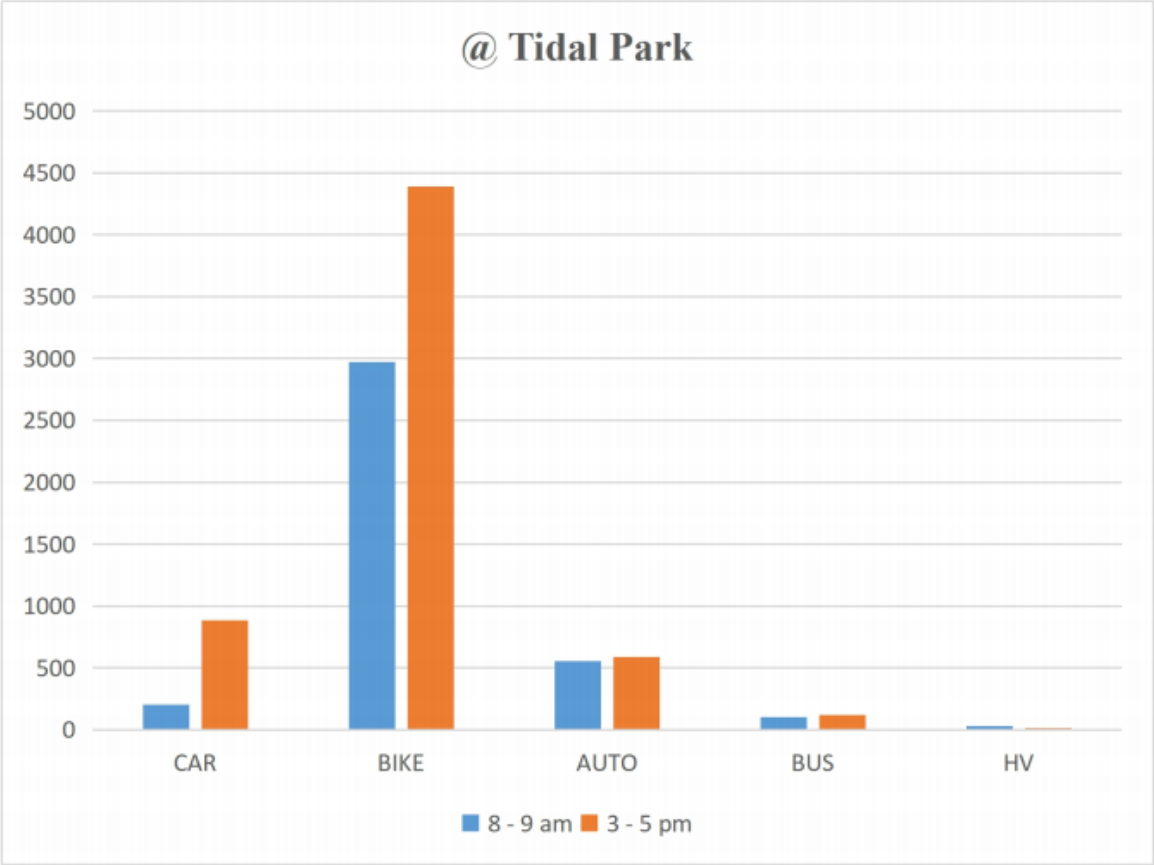


Fig 4.3 Traffic volume data towards TIDEL park

From this figure explains the number of individual vehicles will be increased,most of the students and employee's prefer bike and car for transportation, compared to morning time (8.00 am - 9.00am) evening time(3.00 pm - 5.00pm) will be more denser traffic.

ECR

State Highway 49, also known as East Coast Road (ECR), is a two-lane (now four-lane) highway in Tamil Nadu, India, that runs along the coast of the Bay of Bengal, connecting Chennai, the state capital, with Cuddalore via Pondicherry. The highway is a state highway maintained by the Government of Tamil Nadu under the Department of

Highways and Minor Ports. It was a two-lane state highway, and has been partially upgraded to four-lane divided highway.

Table 4.3 Traffic volume data towards ECR

S.NO	TIME PERIOD	CAR	BIKE	AUTO	BUSES	HEAVY VECHICLES
1	8.00am - 11.00am	452	2552	369	54	11
2	3.00pm - 5.00pm	722	1954	264	57	6

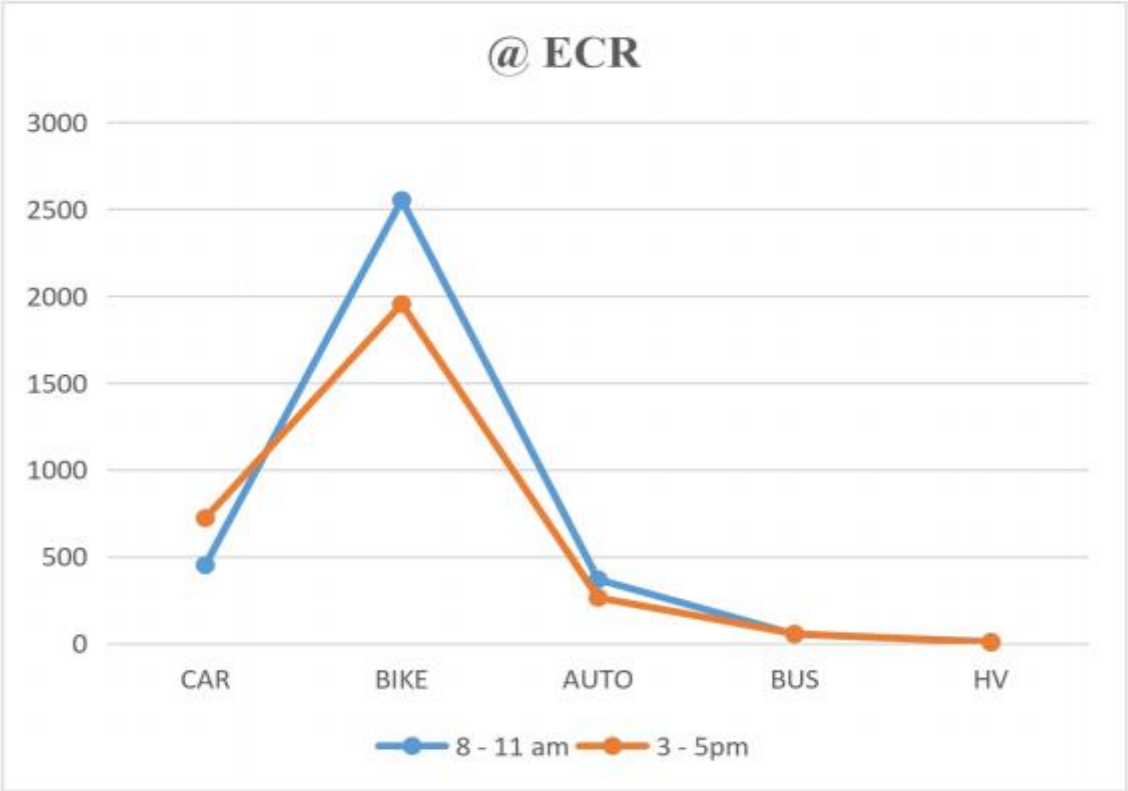


Fig 4.4 Traffic volume data towards ECR

This figure shows the usage of car will be high at evening time (3.00 pm - 5.00pm).

Medavakkam

Medavakkam- Sholinganallur road: This is a private road of about 20 meter width separated by a divider. It is double lane one way road. This road connects some public

and popular places such as Global Health hospital, Sholinganallur, East Coast Road, Thoraipakkam etc.

Road towards Tambaram: This is 24 meter width separated by a divider. This road connects Shitlapakkam,Sembakkam, Madambakkam, Camp road, Tambaram and Bangalore highway. The Madras Christian collage with student from all over the world is located in Tambaram.

Table 4.4 Traffic volume data towards Medavakkam

S.NO	TIME PERIOD	CAR	BIKE	AUTO	BUSES	HEAVY VECHICLES
1	8.00am - 11.00am	439	1168	279	34	6
2	3.00pm - 5.00pm	510	1130	220	55	9

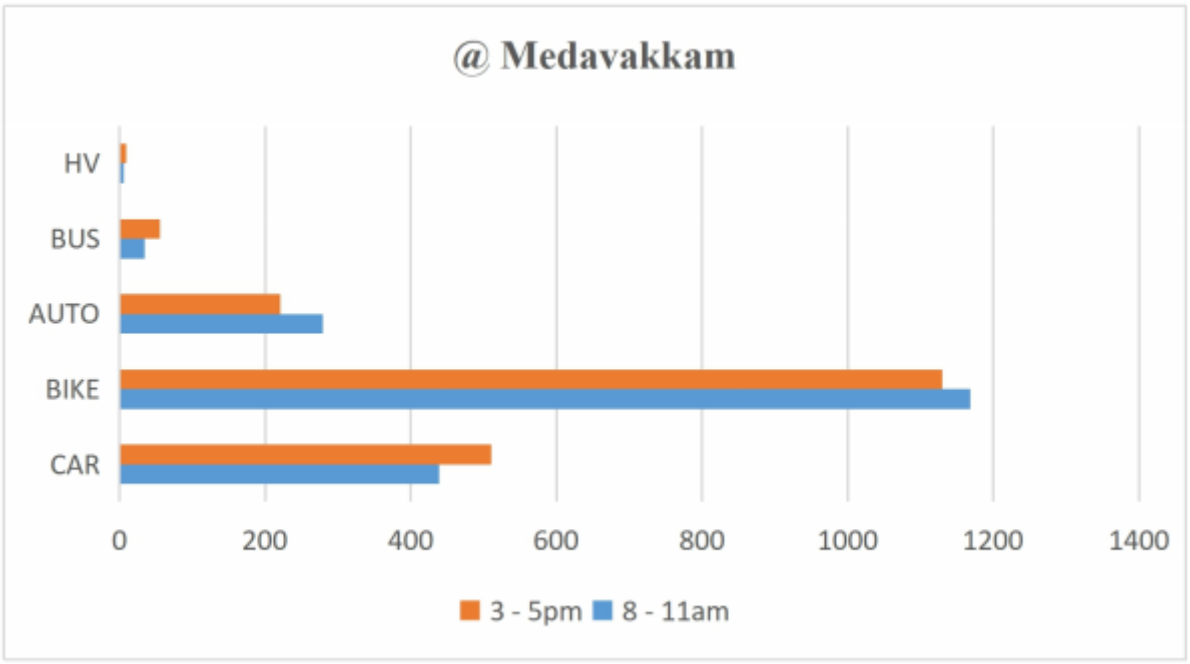


Fig 4.5 Traffic volume data towards Medavakkam

Navalur

Navalur is a fast-growing suburb in Chennai's south, located on the Old Mahabalipuram Road (OMR). Originally a village, this area has developed into a residential destination as a result of excellent connectivity through the OMR and the presence of prominent IT

parks and SEZs in the area. The locality is surrounded by nearby areas of Semmanjeri, Thalambur, Siruseri, Egattur and Sholinganallur.

Table 4.5 Traffic volume data towards Navalur

S.NO	TIME PERIOD	CAR	BIKE	AUTO	BUSES	HEAVY VECHICLES
1	8.00am - 11.00am	560	1503	350	56	10
2	3.00pm - 5.00pm	578	1787	334	43	5

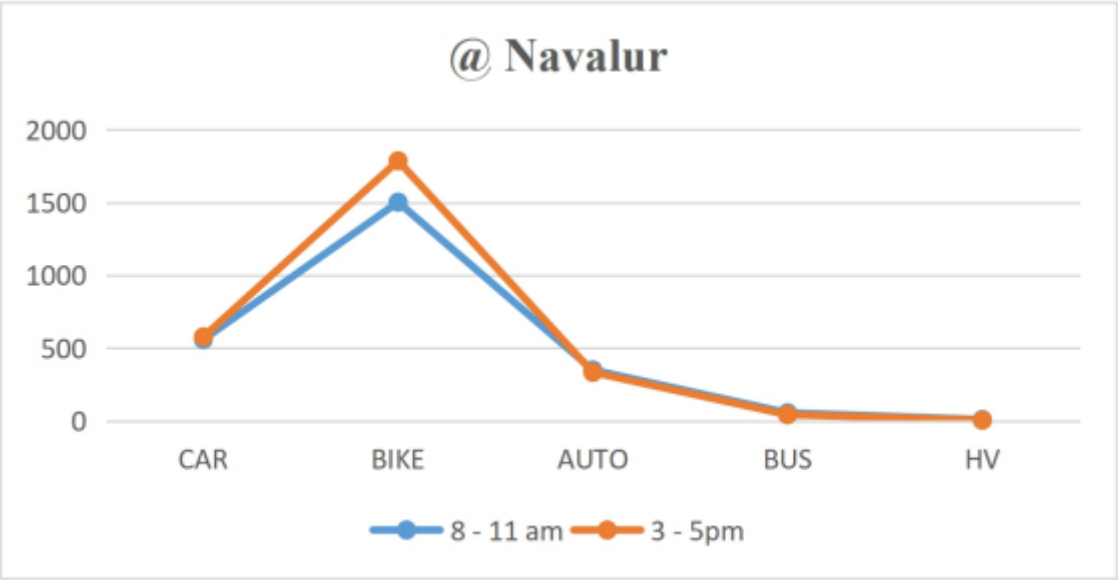


Fig 4.6 Traffic volume data towards Navalur

4.2 Discussions on Traffic Volume Data

Transport System Management is a package of short term measures to make the most productive and cost effective use of existing transportation facilities. Re-orient of traffic pattern on the streets will reduce the conflicts between vehicles and pedestrians. The two basic modes of active transportation, walking and cycling may be the most promising modes for a sustainable urban mobility Apart from all the negative impacts of the COVID-19 pandemic on human life, encouraging people to use active modes of transportation in

many parts of the world, the pandemic may offer an exceptional opportunity for transportation policy to enhance sustainability in urban environments.

Table 4.6 Comparison of traffic volume data for ECR 2014- 2020

S.NO	YEAR	CAR	BIKE
1	2014	360	1587
2	2016	375	1652
3	2018	452	1887
4	2019	532	1980
5	2020	722	2552

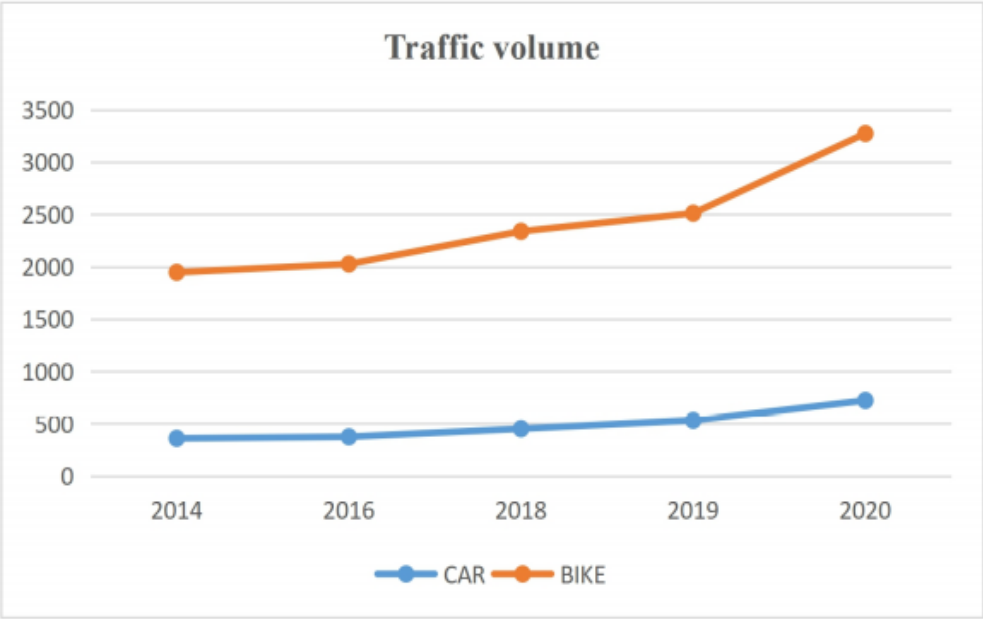


Fig 4.7 Traffic volume data to ECR 2014-2020

This intersection is mostly used by two and four wheelers. The volume to capacity ratio is reduced to 0.8 in the second scenario by diverting them to alternative routes as shown

in Figure in order to enter ECR without going via Sholinganallur intersection, which is lower than the current volume 2020.

The result describes the potential growth rate of car and bike production. To stop trucks and multi-axle vehicles (MAVs), double counting of changes in freight vehicles due to changes in potential load volumes is not taken into account.Double counting of changes in freight vehicles due to changes in future cargo volumes to avoid trucks and multi-axle vehicles (MAVs) are not taken into consideration.On the other hand, more research is needed to address the prevalence of active modes of transportation. On aggregate, we did not detect any positive changes in the frequency of active modes such as cycling in the context of this study.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

Sholinganallur intersection is located at Chennai. This area is covering much of the commercial developments and IT parks. It is the intersection where Tidal park,ECR, Medavakkam and Navalur are intersecting. Road inventory survey and volume count are conducted. Pedestrians waiting to cross the intersection at Medavakkam Main Road on Rajiv Gandhi Salai, and Kalaignar Karunanidhi Salai in Sholinganallur have to do so at their own risk.

Due to this study we concluded that pandemic increase preference for personal mobility the pandemic has brought about marked changes in consumer habits and behaviours. There is likely to be a shift away from shared mobility options as people prioritize social distancing and personal hygiene. This would effectively translate into a higher preference for affordable personal mobility, which could boost sales for auto manufacturers, especially in the entry-level vehicles category.the increasing preference for contact-less online transactions has emerged as a major trend and is expected to reflect in automotive purchases as well. There was already a shift towards online models in after-sales with increases in online booking of appointments, doorstep pickup/delivery and online payments. Several original equipment manufacturers (OEMs), both premium and mass market, have already recognized this trend and launched a complete online buying experience.

5.2 RECOMMENDATIONS

Transportation system management (TSM) interventions will dramatically improve the intersection's situation. The installation of an escalator would increase pedestrian mobility and reduce traffic congestion caused by pedestrians. Navalur and Medavakkam roads both have on-street parking. More than this unauthorized on street parking creates traffic problem. According to the IRC norm, no parking is allowed within 100 metres of the intersection. Pedestrian areas have been encroached upon, causing traffic congestion. To reclaim the encroached areas, medians can be built, which will increase road traffic. Vehicles flowing south from north can turn in the first street before the intersection as a

trail. By turning the vehicles on the road itself, the flow can be limited from east to west and south at intersections, lowering the V/C ratio to 0.86. Finally, decision-makers must have short- to long-term plans in place for food stock, logistics, and freight during similar events. During the early days of the virus outbreak in the country, grocery shopping was extremely difficult, especially for food and sanitary/cleaning supplies, which people were trying to stock up on. Following the COVID-19 pandemic, Turkish authorities must ensure the country's staple food self-sufficiency and develop early-stage plans for inventory and staffing. Furthermore, marginalized members of society, such as the disabled, elderly, and low-income persons, must be viewed with constructive discrimination.

5.2.1 Impact After Covid 19 In Automobile Sector

Online marketing : The pandemic has hastened the transition to digital marketing, which now incorporates augmented and virtual reality technology. With social distancing being the norm, traditional marketing activities such as auto shows and exhibitions can take a backseat for a while. Going forward, this will significantly disrupt traditional marketing channels and directly impact how advertising dollars will be spent.

Innovating with new features: Several customers will look for better health, hygiene, and sanitation features in their vehicles as they adjust to the post-COVID-19 environment. Certain features, such as built-in sanitization, improved air-purification systems, and antimicrobial surfaces, can see an increase in demand. Customers are more likely to choose vehicles with such technologies, and they may even be able to pay more for their own physical and mental health.

5.2.2 Impact After Covid 19 In Environment

The usual two humps of frequent emissions coinciding with morning and evening traffic peak-hours have nearly flattened out in Chennai as vehicles leave the road following the country-wide lockdown in the aftermath of the novel corona virus disease (COVID-19) outbreak. This emphasizes traffic's significant impact on hourly emissions trends. Hourly trends have plummeted as traffic has been reduced, eliminating daily exposures to toxic vehicular emissions. While total daily PM2.5 and NO2 concentrations have decreased dramatically — up to 60% in some cities during the lockdown days — the hourly shift has

been equally drastic. Hourly NO2 levels, which are closely linked to cars, have fallen even more significantly.

Rivers regaining its power

Rivers are one of India's most valuable natural resources, providing a necessary and unavoidable need for any life at the very least, as well as many material needs in day-to-day life. The need for water has been felt for a long time, but in the last decade, the demand for fresh water has increased several times due to rapid population growth and the need to meet everyday needs.

Reduction in emission of greenhouse gases

The level of carbon foot prints are improved (17%) globally by reduction in mono-carbon and bi-carbon releases due to less transportation, release of toxic emissions from various industries during this lockdown days (reported in DD news on 05.06.2020). The only proof of the reduction in emission of greenhouse gases is getting repaired the level of ozone hole of the atmosphere. Air quality in Chennai city is affected by many factors including industrial pollution, emissions from vehicles, garbage burning and dust pollution.

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