



HUMAN GEOGRAPHY & SOCIETAL NEEDS

HS202

PROJECT REPORT

SmartFlow : AI - Powered Traffic Control and Crowd Management

AY - 2024 / 2025

RESEARCHED AND WRITTEN BY -

HARSH SHARMA 2023MEB1346

RISHAB JAIN 2023MEB1376

MOHIT KUMAR 2023MEB1359

ANAND KUMAR 2023EEB1184

ACKNOWLEDGEMENTS

We would like to extend our deepest gratitude to everyone who assisted and supported us along the way in the completion of our group project on AI-Based Traffic Control and Crowd Management System.

Most importantly, we are extremely thankful to Professor Dr. Kamal Kumar Choudhary and instructor Ms. Shalu S. for their invaluable suggestions, continuous motivation, and timely feedback, which were of ultimate significance towards the improvement of our research.

A special thanks to our peers and classmates for their valuable responses on our survey, which helped us refine our concepts and make our work better.

Finally, we wish to acknowledge the collaborative efforts of all our group members Harsh Sharma, Mohit Kumar, Rishab Jain and Anand Kumar.

The project truly involved a whole-group effort, and each participant's commitment, collaboration, and enthusiasm were all critical in the project's facilitation.

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PROJECT ABSTRACT

AI-BASED TRAFFIC CONTROL & CROWD MANAGEMENT SYSTEM

In our today's fast-moving world, cities are growing rapidly, and so is the traffic. Roads are getting busier, public spaces more crowded. People tend to lose valuable time stuck in traffic, waiting for buses that are either too late or too crowded.

To solve these problems faced by common people, we are building an AI-powered system that makes the traffic smoother, public transport smarter, and crowd management safer.

Our main goal here is to make the traffic condition better by the use of artificial intelligence (AI) and real-time data analysis. With smart cameras, sensors, and tracking tools placed across the city in strategic locations, our system will monitor real-time traffic flow and the movement of people in crowded places like bus stops, train stations, markets, and stadiums.

Along with the smart infrastructure, we came up with a mobile application that helps people travel more comfortably and efficiently. The app will show real-time location of buses and trains, their expected arrival times and how crowded they are. It will also suggest the best travel routes.

Our system will be exceptionally useful during public events like marathons, concerts and festivals, where managing large crowds can be difficult. The AI will detect high crowd density, spot unusual behaviour, and quickly alert the enforcing authorities to prevent accidents or confusion.

The real-time data we collect may be sent to government agencies to help them in better design of roads and improve bus routes.

In conclusion, our project will help to integrate smart technology and high quality surveillance devices to make the traffic smoother. By improving public transport and helping people move around more easily with the help of a simple app, we hope to build smarter, greener, and more connected communities.

DEFINITION OF THE PROBLEM

THE PROBLEM STATEMENT

Every day, we often see people getting stuck in traffic for hours, we see buses that come late or just too crowded. In some major events or celebrations, we see crowds that get out of control so easily which can actually be dangerous. These things have become a common part of our life.

Currently automatic traffic signals and surveillance cameras are being used for traffic management and crowd monitoring but they just do not work as they should be. Also, they are not designed to react quickly in critical situations.

Hence, we identified this problem from our daily life and we are trying to design a system that can manage traffic and crowds better in real-time, and also help users to plan their travel to real-time data.

Isn't this contempt of court, wonder stranded commuters

Professionals heading to office, school students, senior citizens visiting banks and travellers rushing to railway stations, bus terminals and Kempegowda International Airport (KIA) were stuck in long traffic jams caused by the Congress rally in the morning. "This is sad for the common man and taxpayers. Whenever there is political drama and stunts on the roads, members of public are at the receiving end. We really wonder why these politicians don't respect the general public? If not, at least they should consider the orders passed by the high court, which recently banned protest marches on Bengaluru roads. Doesn't this act of Congress amount to contempt of court," many motorists stranded in the snarls were heard saying.



MONDAY BLUES: Several vehicles were held up between Kengeri and Corporation Circle, a distance of around 15km, as workers from Congress hit the roads leading towards Shantinagar

#BENGALURUTRAFFIC TRENDS



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It's some rally near Lalbagh, so much traffic. Was stuck there two hours
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TIMES VIEW

Il-conceived plans, prolonged Metro work, poor coordination between agencies and stopgap solutions have already rendered Bengaluru roads unmotorable, making commuting an onerous task. Add rallies and VIP visits and it's absolute chaos. While protesting is a fundamental right, surely such events can be better managed to minimise public inconvenience. Restricting them to a designated spot would be ideal – a view espoused by the high court too – but who's listening? Even emergency vehicles like ambulances have borne the brunt of political demonstrations in the past. Those in positions of power must realise that time is of essence, and not just for them.



IDENTIFICATION OF THE PROBLEM

METHODOLOGY USED TO IDENTIFY THE PROBLEM

To understand the real issues and problems, we followed a simple three-step methodology which involved observation, research and feedback from the users.

We began by simply observing the things happening around us - both in the college and the city. We looked into how people use public transport, what is the behaviour of traffic during peak hours, and crowds get managed during any kind of events. In one of the events held at the Senate Hall of IIT Ropar, we saw how bad really is crowd management followed by the event organisers.

Also, this understanding became the foundation of our project.

We also conducted some research to understand how is the current development in this field, and how its being used in the cities like Bengaluru, Delhi etc. We also looked on how effective are these current systems.

To understand the things more clearly, we created a small survey and shared it among the college students and also to some faculty members. We tried to gather as many responses as we can, so we also shared the survey among some non IIT Ropar members. We kept the survey simple and tried to gather real experiences - how people commute, what problems they face regularly, and what kind of solution would actually help them. The responses actually gave us valuable insights.

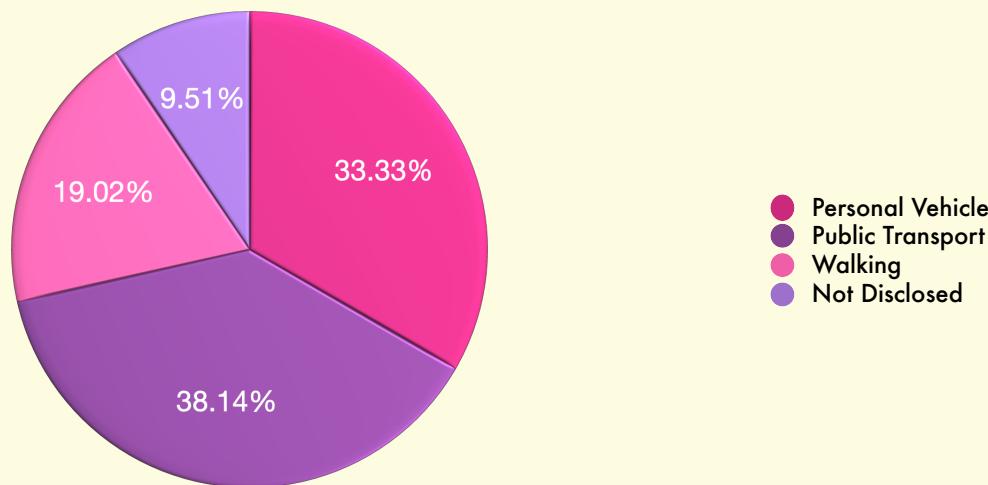
By combining all of three approaches - observation, research and feedback from users; we were able to clearly define the problem. Traffic and crowd management systems used currently are not effective in satisfying the demands of urban population and there is a strict need of a system that works in real-time data, not just changing traffic lights at regular intervals.



SURVEYS AND DISCUSSIONS

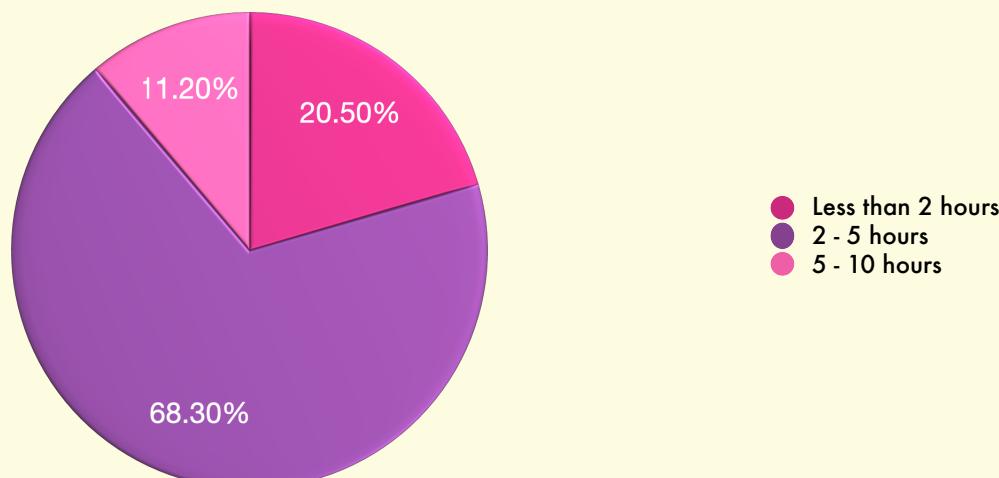
The survey was conducted primarily in our college campus which involved responses from students as well as faculty members, however it also got some responses from old friends and family members.

1. PRIMARY MODE OF TRANSPORTATION



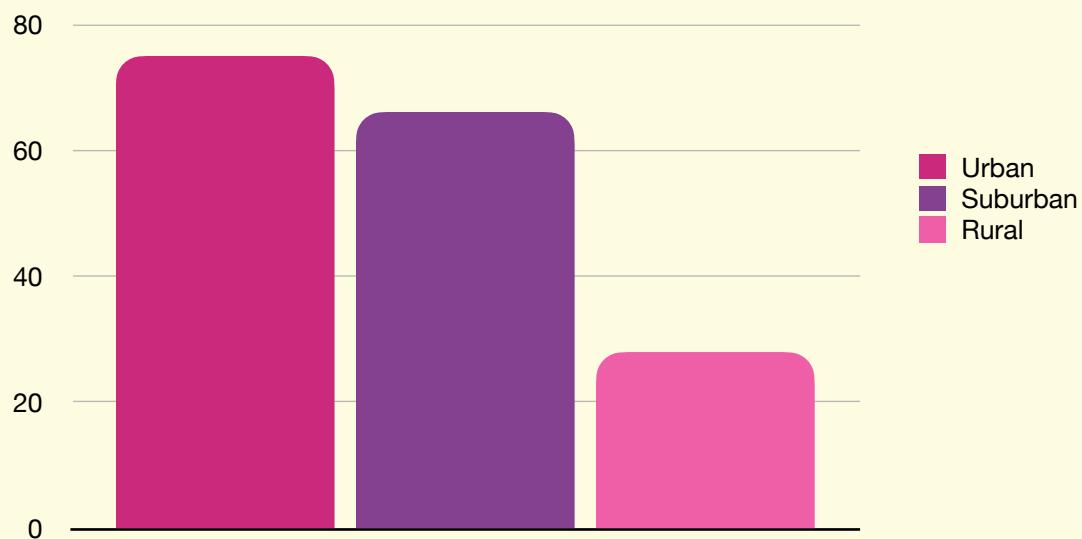
It signifies that most of the population is dependent on public transportation while the most traffic causing section is the people with personal vehicles which still holds a significant section. This implies the need for better public transport while trying to reduce overuse of personal vehicles.

2. TIME SPENT IN TRAFFIC EACH DAY



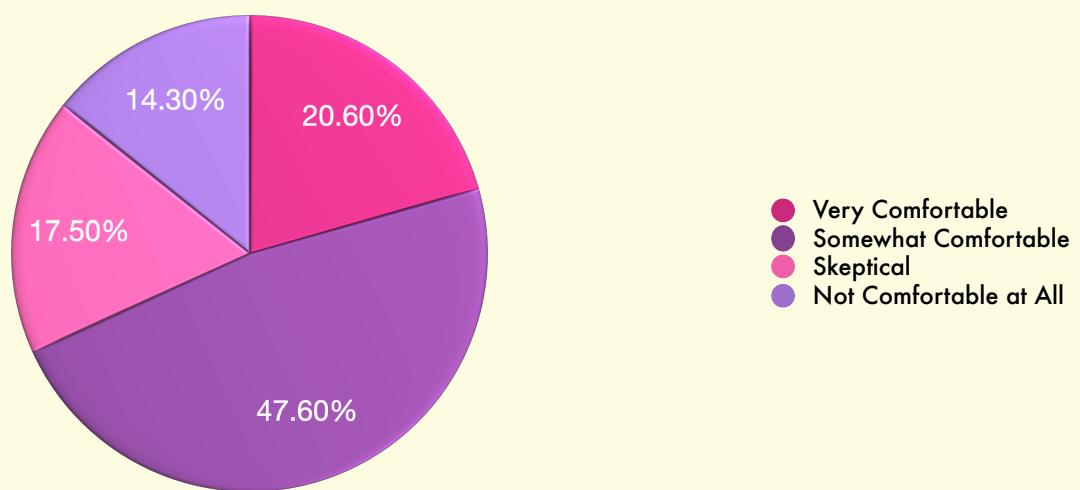
From the survey results, we can see how actually a large proportion of population is spending a large fraction of their day (2 - 5 hours) just in traffic. This time could be utilised in other productive aspects of life but is just wasted in waiting for the car in front of you to pass by.

3. WHERE DO YOU FIND THE MOST TRAFFIC ?



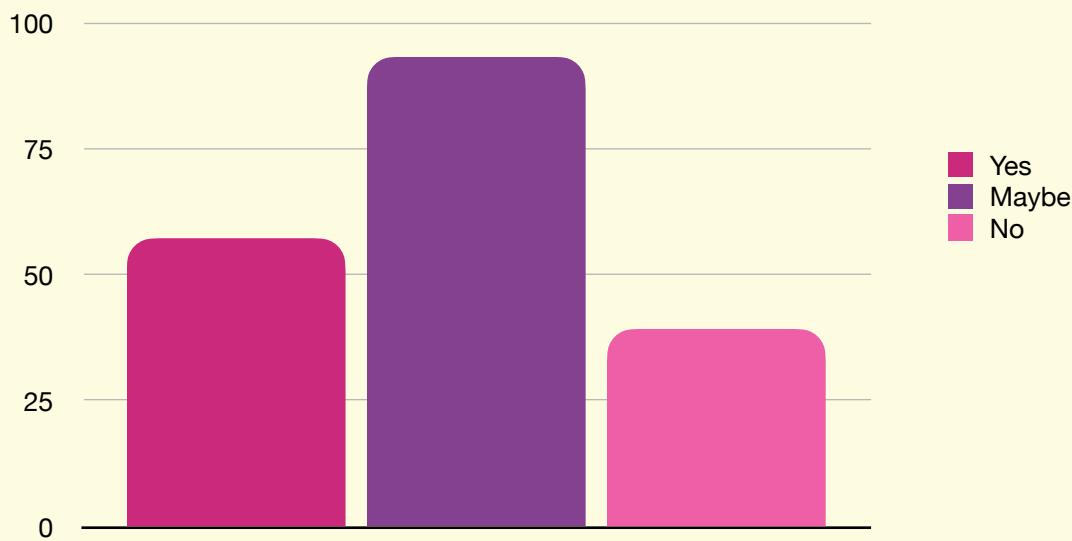
It is clear from the above results that most of the people commuting in urban and suburban areas are facing problems related to traffic on a large level. While rural areas are definitely not completely free of this problem, our system should be targeting urban and suburban areas first.

4. COMFORTABLE WITH SMART TECH CONTROLLING TRAFFIC ?



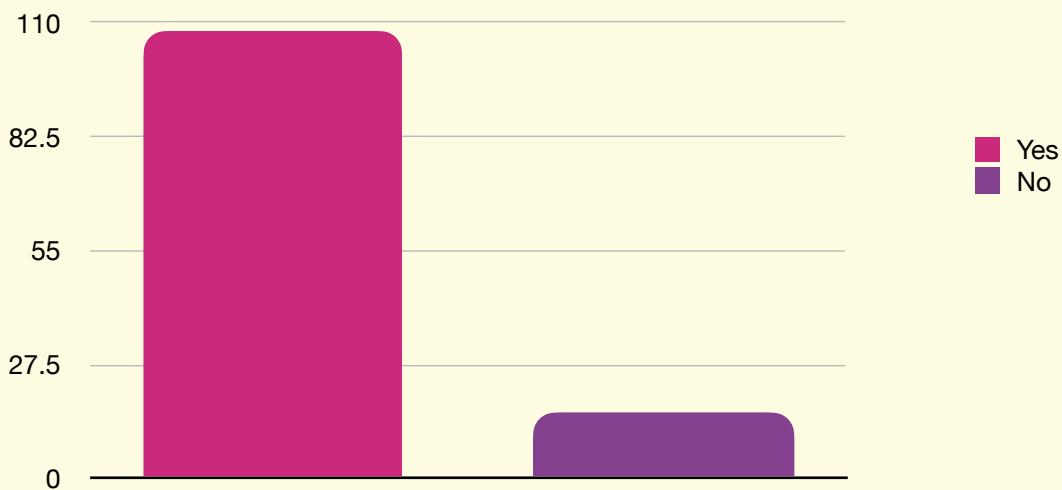
From the survey results, we can see how a large population is somewhat comfortable with smart systems controlling traffic which is actually a good sign. It means they are ready to try how this new AI-Based system can actually help them to stay out of the traffic jams for hours.

5. WILL YOU SHARE YOUR LOCATION DATA TO IMPROVE TRAFFIC ?



Same as the previous result, most of the people are ready to share their location analytics to improve the traffic flow in cities. This actually solves one of the biggest problems because generally people rarely want to get tracked or share their personal data.

6. HAVE YOU EXPERIENCED MAJOR CROWD SITUATIONS IN PUBLIC EVENTS ?



From these findings, we can say that people actually face these kinds of crowd situations regularly. Also, we know how crowd is managed in these type of events, which usually involves police or some other enforcing agencies which is less efficient.

All these results lead to one common conclusion - an immediate need of smart real-time traffic control and crowd management systems which uses powerful algorithms to work on real-time data and produce smart insightful results.

DETAILED DESCRIPTION OF PROBLEM

Traffic often grows over time, thus traffic congestion can be simply because of poorly designed road or large traffic demand at peak hours. The detailed description of problem is given below -

1. Too Many Vehicles on the road -

Every day, more and more cars are being added on the road and the number of vehicles has become much more than what the roads were designed for. This simply means that the roads are overcrowded.

Police aim to switch to AI-powered traffic signals across city in the coming days

This move is part of a technology initiative by the traffic police, designed to streamline vehicular flow and also reduce manual intervention at the signals

The Hindu Bureau
BENGALURU: In a bid to tackle growing traffic woes, Bengaluru's traffic police have kept their sights on full automation. AI-powered, real-time adaptive traffic signal junctions. The move is a part of the Bengaluru Adaptive Traffic Control System (BATS), a technology initiative designed to streamline traffic flow and reduce manual intervention in traffic signals.

On Friday May, the Bengaluru Traffic Police have been implementing BATS system, which is designed to dynamically adjust signals based on real-time traffic data. According to officials, this will enhance the efficiency of day-to-day traffic management and reduce the burden on personnel who manually manage traffic signals.

On Wednesday, Bengaluru Police Commissioner K. Jayananda said: "The BATS project, initiated in

ing work is expected to be completed by March next year."

Bengaluru, known for having one of the highest number of personal vehicles, is home to one of the highest numbers of vehicles in India. With two-wheelers accounting for nearly 40% of the city's traffic, managing such a diverse mix of vehicles on the roads is increasingly challenging for the authorities.

According to M.N. Anucheth, Joint Commissioner for Traffic, the BATS system represents a significant

New AI-powered traffic signals were installed at Hudson Circle and J.C. Road junction, under the Bengaluru Adaptive Traffic Control System. (K. MOHAN KRISHNA)

Key traffic statistics of Bengaluru

Population: 4.8 million	Road network: 1,04,000 km
Intersections: Over 40,000	Registered vehicles: 3.5 million
More than 400 traffic signals	

Sources: Bangalore Traffic Police

NO LESSON LEARNED

Cops switch patrol pattern to curb accidents after midnight

TOI report on June 3, 2018

More road space, drink driving and truck movement led to more accidents, shows the report

40% of all accidents in the city take place after 9pm

140 people lost their lives between 9pm and 6am in 2016	125 people lost their lives after 9pm in 2017	55 commuters have died between 9pm and 6am till June this year
79 of 140 victims died after midnight in 2016	76 of 125 died after midnight in 2017	26 of 55 have died after midnight till June in 2018

2. Poorly Planned Roads -

Due to the ever increasing number of vehicles, roads feel narrow and this even lead to the breakage of roads. Some areas still have the old road layouts, which are definitely not made for modern traffic. Other reason is that there are not enough flyovers or underpasses in busy areas.

3. Lack of Reliable Public Transport -

Even though there are buses and even metros available in some cities , they do not prove to be enough for such a large population. Because of this, many people prefer using their personal vehicles, which adds up to traffic. This signifies the need of a lot of work to be done in the sector of public transport.

4. Lack of a proper system -

Most of the cities still use traffic lights that change signals at regular time interval which are definitely not efficient. There needs to be proper system that uses the advanced of real-time data and advanced technology to control traffic and also for a better crowd management.

A class in traffic control

Traffic police plan to train guards of schools to regulate flow of buses, pvt vehicles during peak hours



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5. Lack of Traffic Discipline -

Most drivers do not follow the traffic rules - they randomly jump across signals, drive on the wrong side and take wrong turns at junction which can create chaos, especially at large intersections.

6. Public Events and VIP Movements -

Public events like festivals, protests, political rallies and VIP convoys block the active roads for hours. This increases the traffic with exponential rate.

Construction work to add to traffic worries on WEH

While MMRDA will be managing and finishing Metro-related works, the BMC will be looking at road repairs, works related to flyovers and bridges

ASHWARYA IYER / MUMBAI

The condition of the already congested Western Express Highway (WEH) will further worsen before the monsoon, says the Mumbai Traffic Police has given a 'go-ahead' to major construction work on the road. Most flyovers, link roads and road repairs, which are being undertaken by the authorities and bodies like BMC and MMRDA.

According to traffic officials, they have received letters from the authorities (BMC, MMRDA) of one go for construction work on the roads. They wanted the traffic police to manage the traffic movements during the hours they conduct the work, and look for diversions. Only then can we issue them the No-Objection Certificate (NOC), however, since the priority is to finish the work by June 30.

"The traffic police have said that the work will be completed by June 30. We are looking forward to the same," said a senior traffic official.

While the MMRDA will be managing and finishing the Metro-related works, BMC

Santacruz-Chembur Link Road (SCLR) work is being conducted, said the traffic police.

"We have asked the agencies to provide us with manpower to manage traffic at traffic wardens. These traffic wardens will be placed temporarily at junctions and signal points which are impacted due to construction work," said an official, who added that the traffic police will deployed maximum manpower including traffic cops and wardens to manage traffic and maintain the flow of traffic in major choke points.

The traffic police will take diversions to avoid traffic congestion, but a diversion to Oberoi Mall Road (from Goregaon) will badly impact the traffic during peak hours or rush hours.

"The only way to manage traffic is not diversion, but traffic signalisation. We have the power; only then the traffic will keep moving so as to not create much chokes, especially during peak hours," the official added.

will be looking at road repairs, works related to flyovers and bridges. Some places like Bandra where storm-water drains are being taken place.

From Dahisar to Santacruz, work is being conducted which will directly impact the traffic movement at the signalised spots like Juhu, where storm-water drains are being taken place.

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CURRENT DEVELOPMENTS IN THE DOMAIN

USE in MAHA KUMBH 2025

The Maha Kumbh Mela 2025 held in Prayagraj also called by the name "Digital Maha Kumbh" due to its integration of advanced technologies. There were some records saying that authorities have deployed 2,760 CCTV cameras, including 328 AI-enabled ones, to monitor the crowd density across different areas to detect surges and prevent stampedes.

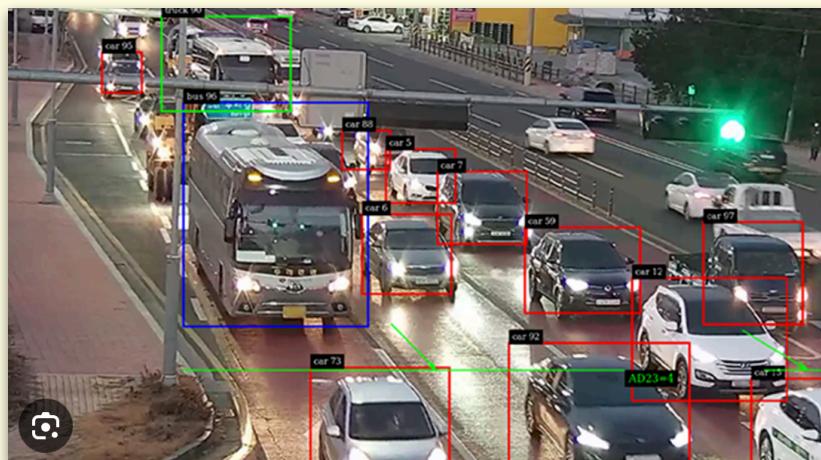
However, a tragic stampede occurred in the event which resulted in around 40 casualties and leaving many injured. This raised serious concerns over the implementation of these systems.



Bengaluru Adaptive Traffic Control System (BATCS)

Bengaluru, one of the most busy cities in India has implemented the BATCS at a total of 165 junctions. This system dynamically modifies signal timings based on real-time traffic density trying to smooth the traffic flow.

But this system failed to smooth out the traffic during the peak hours, which clearly shows that such a system is not enough for such high volume traffic cities.



NEED OF RESOLVING THE PROBLEM

Every day, millions of people in major cities face the same challenge - getting from one place to another in the long traffic jams, packed buses, unpredictable delays and so on. It is something we've all experienced, and it affects more than just our schedules, causing a lot of mental stress.

Also, from the survey we conducted, around 50% of responses said they regularly get delayed due to traffic. Other than this, over 35% of responses mentioned them avoiding public transport because they could not really depend on it.

A large proportion of responses mentioned they would love if there was a single app where they could get all the real-time updates about the public transport available nearby which will also notify about its crowd situation, find better routes, and avoid crowd-heavy areas.

Our idea is to use AI to not just monitor, but actually respond to real-time traffic and crowd situations. And instead of keeping that data locked up in a data centre, we want to bring it straight to people's phones. Through our app, users would be able to see live updates on public transport, check how crowded a route is, and get suggestions that help them move faster in a smart way.

This would help us to achieve -

- Fewer delays and better travel planning
- Safe experiences during large-scale events
- More confidence in using public transport
- Less pollution and fuel waste

We're not just building the app but making the daily life of common people a bit easier. little easier for everyone.

Hence, we can say that our project focuses on two of the most fundamental problems -

- Smarter traffic
- Efficient public transport.

GOALS PERTAINING TO MINIMIZE / REMOVE THE PROBLEM

1. Making the daily travel less stressful and more enjoyable

We will help people save time by effectively providing them the real-time traffic and crowd updates through our network of surveillance cameras, sensors and user-friendly mobile application.

2. Promote Public Transport System and Making it better

We will focus on the betterment of public transport system by making it more reliable and our app will able to track the location of nearby buses, their crowd situation and best travel routes.

3. Better Crowd Management In Public Events

We will be using smart crowd monitoring systems and pre-trained surveillance systems to keep track on the crowd situation and prevent any risk of stampedes.

4. Social Equality

Our system will be accessible to each and every section of the society, no matter the age, gender or occupation.

5. Lower the Carbon Emissions

Our system will help to reduce huge traffic jams and wait times, and thus helping to reduce air pollution. This will result in low carbon footprints overall.

6. Sustainable Urban Living

Our system will strongly promote public transport and we will be trying to reduce the use of private vehicles to a large extent. Consequently, this will help in fewer congestions and low fuel usage.

7. Helping Local Authorities

We will helping the local authorities with real time data and insights, which will help them to take better steps toward future planning.

TOOLS AND TECHNIQUES PERCEIVED TO BE EFFECTIVE FOR RESOLVING THE ISSUE

1. Surveillance cameras -

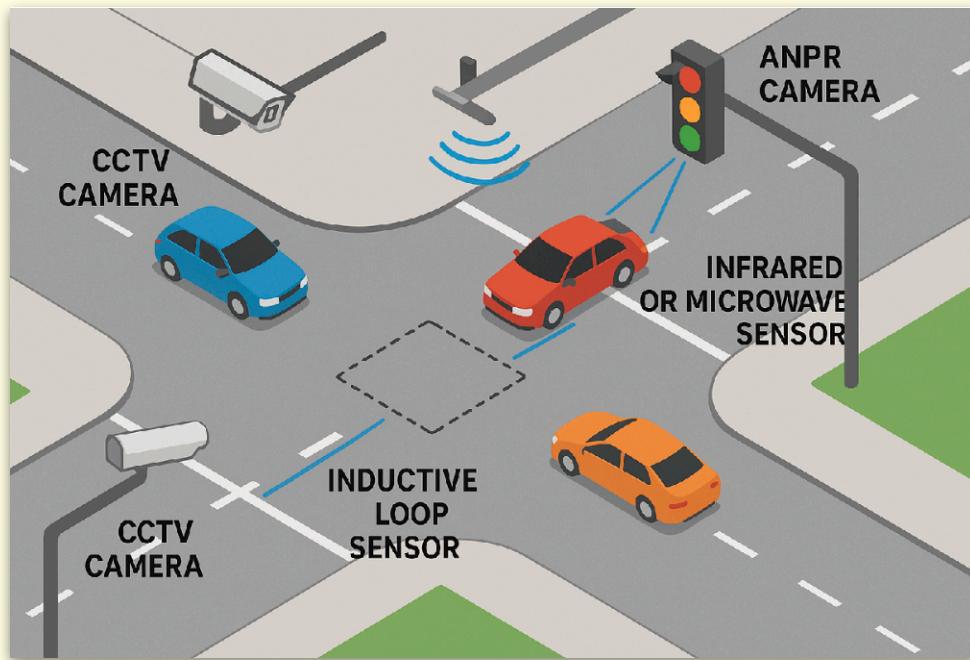
They will be installed at major junctions and highways to monitor traffic and spot problems.

Their live-stream traffic footage will be processed by a AI engine and it can be very effective to -

- Spot accidents.
- Detect any kind of illegal parking and traffic rule violations.
- Respond immediately with action — like sending a towing truck or police.

For example, if a car breaks down, it will alert traffic control system, which can further reroute the traffic and dispatch a recovery vehicle.

It will help to manage emergencies quickly and reduce the need for manual police



2. Smart Sensors -

These sensors are the core part of our system and they will be installed in traffic signals, bus stops, and public squares to monitor vehicle flow and foot traffic. These sensors will capture the real-time data which is the foundation of our AI system.

Types of Sensors Used -

- Inductive Loop Sensors : Placed under the road surface to detect cars passing over.
- Infrared / microwave sensors : To detect the vehicle movement and its speed.
- Auto Number Plate Recognition : These will track the vehicle's entry/exit information.

3. Artificial Intelligence -

Our system not only depends on AI but it forms the fundamental part of it. We are planning to use machine learning algorithms to analyze traffic and crowd movement patterns over time, make smart predictions and suggest alternate routes and transport modes to our users.

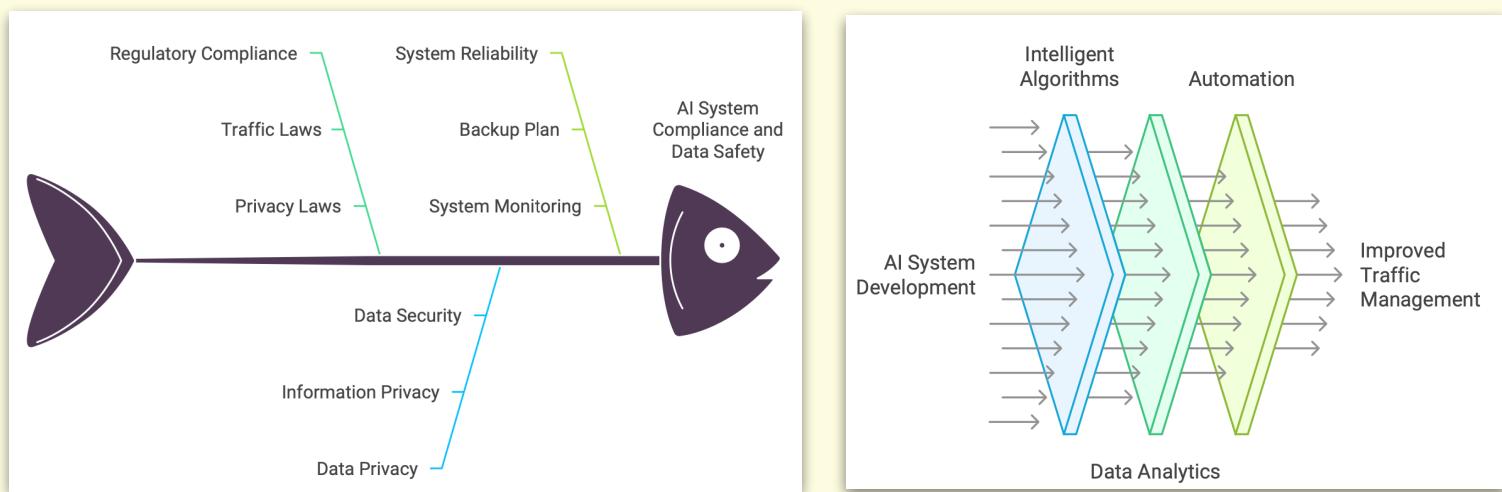
All data from these sensors and cameras will be collected in a central system.

The AI system will analyze this data to -

- Predict the common traffic patterns.
- Provide the real-time traffic insights to the public.
- Monitor the crowd situation across the city and report any abnormal behaviour.
- Send useful alerts to drivers about expected delays and alternate routes.

The biggest advantage of our system is that with time, it gets better because the more data it consumes, the smarter it becomes.

It will help to greatly reduce the human error and delays in decision-making.



4. Smart Traffic Signals -

It will adjust automatically according to the real-time data captured by our surveillance cameras and sensors placed at strategic locations in the city.

At the junction, the AI will use some complex algorithms to process the data and smartly predict the signals.

For example, if one side of the junction has 20 cars and the other has 5 cars, the smart signal will give more green time to the side with 20 cars.

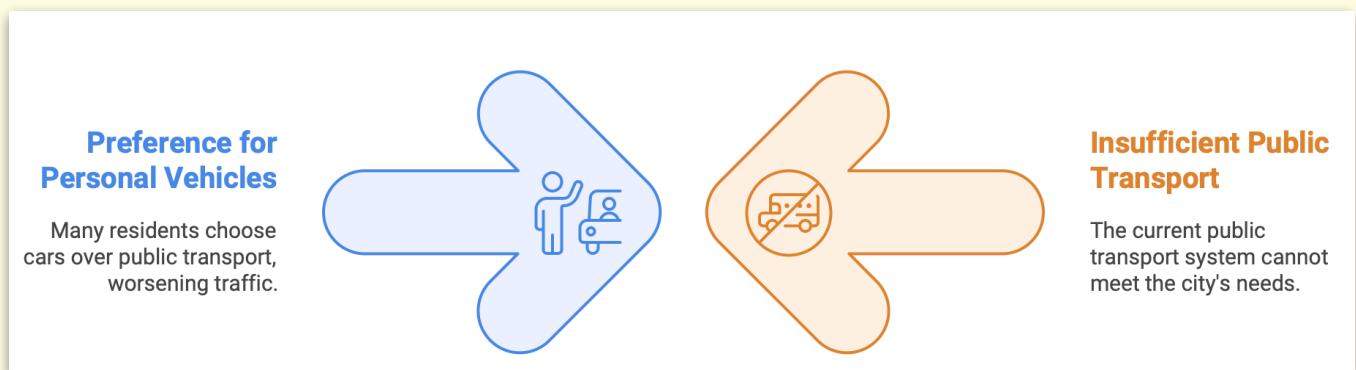
It will help to reduce wait time and clear congestion faster.

5. Integration with Public Transport

By integrating our system with existing transport authorities, we can provide our users with live bus (or metro) availability, their expected arrival time and the available number of seats.

We will also promote the use of public transport service instead of personal vehicles, by introducing multiple new options to travel, and also making it faster and safer.

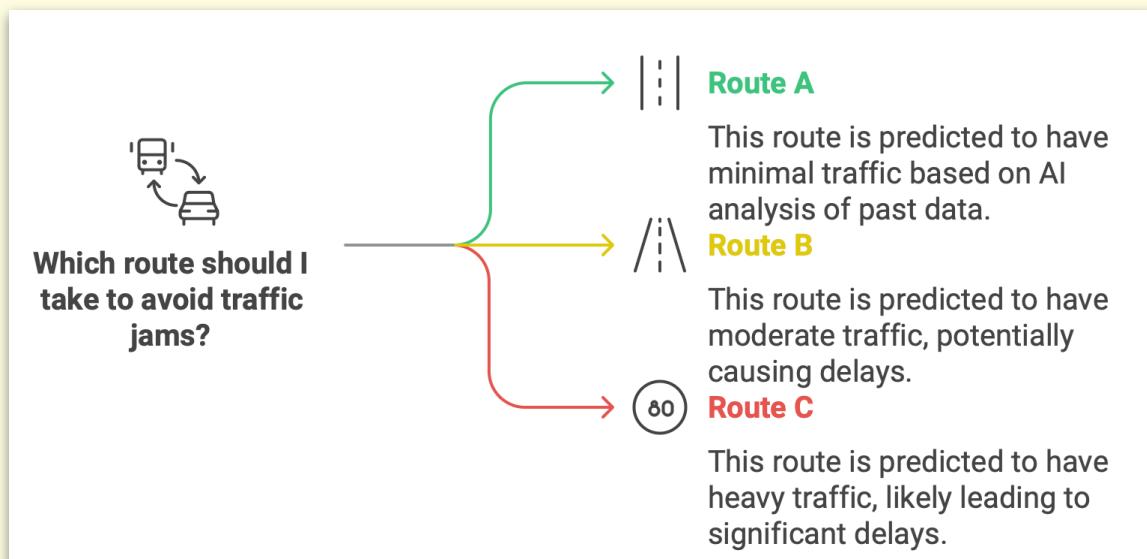
It will make the public transport system more reliable and transparent.



6. User-Friendly Mobile Application -

Our mobile application will provide all the useful insights generated by our AI system by working on real-time data.

The app will display live updates about traffic, bus locations, crowd density, and can also suggest best travel plans.



DETAILED WORK PLAN

STEP 1 - IDENTIFYING THE PROBLEM AND DATA

- India is facing a problem of huge traffic and overcrowding in many places like markets and public transport systems.
- Over traffic on roads is one major big problem in cities; Bangalore and Chandigarh are some of the prime examples of overly crowded roads.
- Managing large crowds at public events have become a big problem in countries with a large population like India.

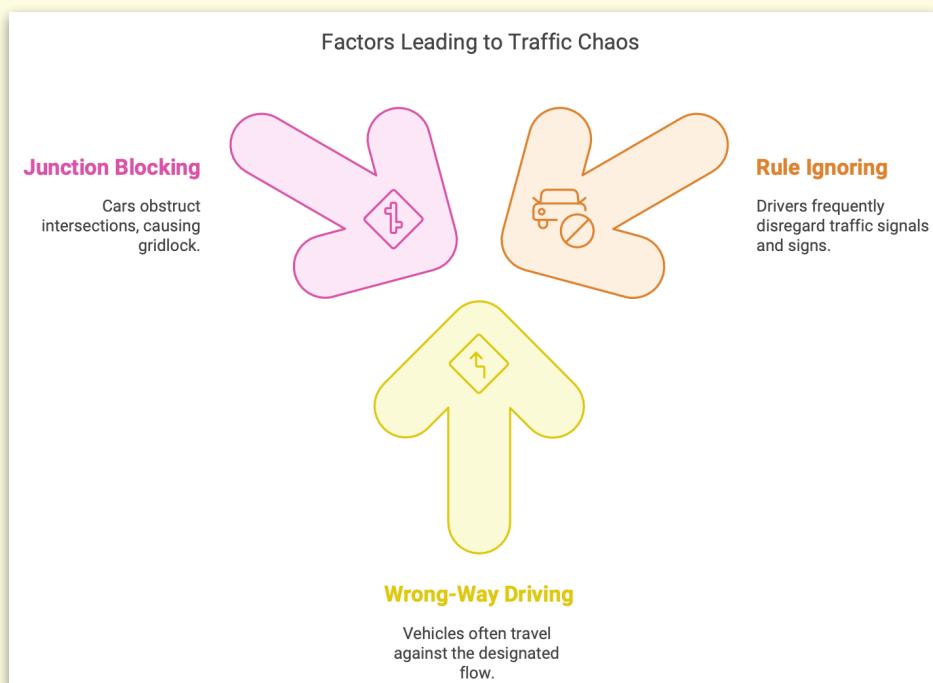
STEP 2 - FINDING ROOT CAUSE OF THE PROBLEM

To solve this issue, finding the root cause behind the problem is a very important step -

- Poor planning of market places.
- Lack of Good Public Transport.
- Lack of awareness towards rules.

STEP 3 - FINDING A SOLUTION FOR THE PROBLEM

- Many countries are opting for AI based solutions for managing crowds in many places.
- Integrating AI with Public Transport can enhance the public transport system and adding AI to traffic control can improve traffic control system to large extent.



STEP 4 - FINDING GAP IN CURRENT TECHNOLOGY

Even after integrating an AI based solution some gaps are still there which have to be filled so that the overall system could further improve .

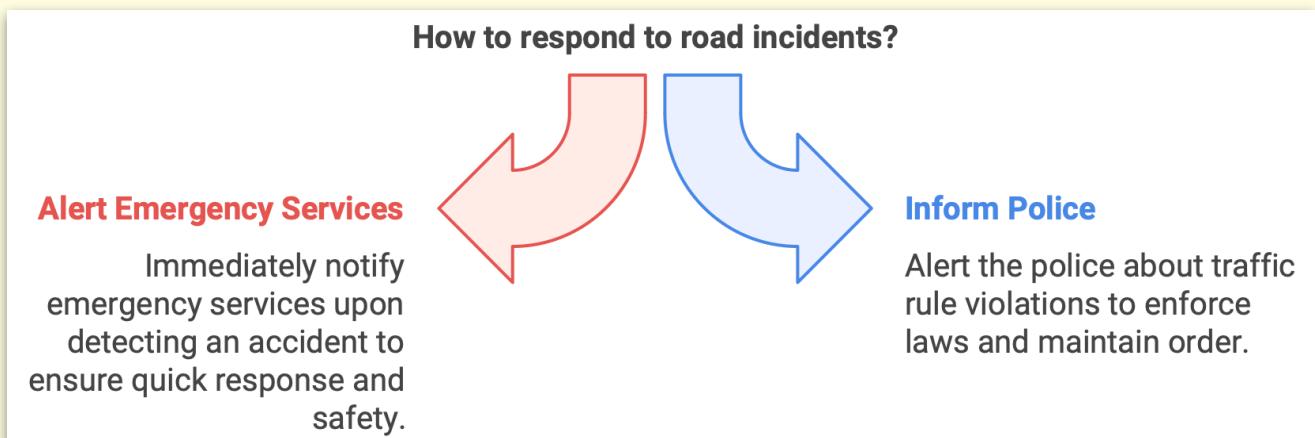
STEP 5 - PROPOSING OUR SOLUTION

Considering all the possible solutions, technological advancements and further improvements, we will propose our solution to can solve the problem.

STEP 6 - ESTIMATING OUTCOMES

We have to estimate how much the problem of traffic and overcrowding will be solved after implementing our proposed solution.

This estimation will be based on data from places it has been implemented before and by how much extent we are solving the problems.



NOVELTY / INNOVATION

Novelty of proposed intervention is how it integrates real-time data, smart AI systems, user friendly interface and a deep focus on public well-being.

Unlike the already existing systems which work on the hands of traffic departments or government authorities, our system take it one step further and gives power directly to the people. With our app, users can directly get access to the real-time data recorded by a large number of surveillance cameras and sensors. And this will not be just raw data, our app will give them useful insights for them to make better travel plans.

What's even better is that our system will not only work on traffic control but also will be extremely useful in crowd management. Our AI system will constantly monitor the crowd levels, and will make smart predictions based on the situation. It will suggest users to avoid certain routes, and would inform authorities if the situation gets out of hand.

And promoting public transport on a large scale, with more reliable systems and intelligent routing, we will also be saving a lot of fuel and thus it will also have a positive environmental impact.

Also, in a country like India, where everyone do not have smartphone access, we can also provide the useful insights through SMS alerts and maybe we can even put public displays on common junction points.

In short, our main innovation lies in use of more connected, real-time and people-first system, that is useful for both everyday life as well as some highly intense crowd situations, and this can be our first step towards smarter cities.

Not to mention, this project is highly scalable. We can start from a basic demo at our college, then it can be scaled to larger areas and even metropolitan cities like Bengaluru.

APPROACHES THAT CAN BE TAKEN TO IMPLEMENT INTERVENTION PLANS

1. High Capital Investment

Objective - To gather capital investment from investors.

Activities - Collaborate with private tech firms and investors to raise funds for development costs and in return the government can give them permission to advertise their products over highly crowded areas.

2. Infrastructure Development

Objective - Upgrade the existing infrastructure.

Activities - We have to work with the government authorities to install the new cameras, sensors and smart traffic signals in place of the original ones.

3. Collaboration with Local Transport Bodies

Objective - To collaborate with local bodies to gain existing resources.

Activities - Reaching out to local transportation authorities for getting data like bus timings, live bus locations, route updates, and proposing them to integrate our system with them.

4. Cybersecurity Threat

Objective - Handling of the cybersecurity threats.

Activities - Monitor regularly for suspicious activities and hacking attempts. Hire good ethical hackers to make sure our systems remain safe.

5. Outreach and Educational Awareness

Objective - To make sure people actually use our designed system and understand its true value.

Activities - Organize awareness campaigns in places like college campuses, bus terminals, and public event areas. Provide simple tutorials and demo videos to help it introduce to a wider group of people.

6. Feedback Loop

Objective - Build a feedback loop for the system for continuous development and better product.

Activities - Include a feedback system for the users so that they can report issues, share suggestions and flag incorrect information. If the system fails due to any unknown causes, we can switch to manual control until we found the fix.

POSSIBLE AREAS OF IMPLEMENTATION NEAR OUR COLLEGE

- 1. Rupnagar Railway Station** – One of the most busy points in the city.
- 2. Ropar Bus Stand** – It gets too crowded during weekends and holidays.
- 3. Bela Chowk, Rupnagar** – A busy local market with narrow roads and low parking spaces.

POSSIBLE CONSTRAINTS AND BARRIERS

Let us now look at the difficulties that may arise while trying to implement our system in real life scenarios -

1. CAPITAL INVESTMENT -

- Out of the many challenges that are hindering the widespread adoption of smart traffic management systems, the core reason is the high cost of technology.
- AI systems require data to process and to collect the data related to traffic, high-end CCTV cameras and proximity sensors are required which are very costly.
- In addition to that, processing a large amount of data requires heavy-duty computer hardware which also adds up to the cost.

2. ABSENCE OF INFRASTRUCTURE -

- To implement an Artificial Intelligence based system, certain advancements in civil infrastructure is required.
- Most cities in India lack the basic infrastructure to install such systems.
- Also, the road networks are required to be built according to a certain standard across the city to help train Artificial Intelligence algorithms for efficient working.

3. ETHICAL, SOCIAL AND PRIVACY CONCERNs -

- AI-based traffic management systems rely on data from various sources such as cameras, GPS, and sensors, which raise concerns about data collection and privacy.
- Also there is a lack of trust and understanding of the technology among the general public and decision-makers, which makes it harder to implement and maintain these systems.

4. CYBER-ATTACK THREATS -

- Cyber-attacks on the AI traffic management systems could be just as disruptive as attacks on the traffic signals themselves.
- Hackers could manipulate the traffic signals to create traffic jams and accidents. Hackers could even fill-up the system with fake data to disrupt the traffic completely.

EXPERTISE AVAILABLE WITH EACH STUDENT TO CONTRIBUTE TO THE DEVELOPMENT OF THE INTERVENTION

Harsh Sharma

- Good at Artificial Intelligence and Machine Learning
- Expertise in Data Analysis
- Interest in Designing of Systems

Mohit Kumar

- Deep Interest in Investment and Stock Markets
- Good at Research Work and Data Collection

Rishab Jain

- Good in Electronics and Software Programming
- Expertise in Economics

Anand Kumar

- Expertise in Electronics and Hardware Programming
- Deep interest in Data Analysis and Finances

EXPECTED OUTCOMES

Our smart AI-Based system can have several potential outcomes, both in terms of public welfare and environmental impact. Here are some possible outcomes -

1. Less Time in Traffic - The biggest gain is reducing traffic congestion. In cities like Pittsburgh and Hangzhou, AI that can change traffic lights in real-time has been able to cut travel times by 25%. Our system can even make predictions when the traffic is about to build, and take preventative measures ahead of time.

2. Cleaner Air and Greener Cities - When traffic becomes more fluid, cars spend less time sitting at red lights. Less time idling equals less emissions and better air quality. Google's AI-based "Project Green Light" has lowered pollution levels in certain intersections by decreasing unnecessary stops.

3. Better Public Transit - Our AI will also prioritize buses to enhance efficiency so they can stay on-time, and by investing in people's time to speed transit might just convince them to use it over cars altogether.

4. Faster help for Emergencies - Our AI System can detect ambulances and fire truck on the road and automatically clear a path by changing the signals nearby.

5. Smarter, Faster Incident Response - When an accident or breakdown does happen, AI is able to identify it in real time and notify the proper authorities without delay. This gets traffic back to normal as fast as possible and minimizes the times when traffic might stop for what was once an isolated incident.

6. Safer Roads - Our AI not only monitors traffic, but it also learns from the traffic. Using patterns and behaviors, AI can recognize hazards and potentially avert crashes before they even happen.

7. Planning for the Future - Over time, all of that traffic data adds up and it can provide city planners with critical insight to build new, better roads and improve and better manage traffic at the same time, as well as help with decisions in the long run.

SUGGESTED PLAN OF ACTION FOR UTILIZATION OF EXPECTED OUTCOMES

1. DEPLOYMENT AND EVALUATION WITHIN OUR CAMPUS -

For initial checking and feedbacks, we will apply the system around our IIT Ropar campus, for managing the traffic flow, student movement and gaining insights about high crowd places. This will help us to test the system on a real environment and fine tune based on feedbacks.

2. COLLABORATION WITH LOCAL AUTHORITIES FOR A CITY TRIAL -

After the successful working of our campus deployment, we will plan on a formal proposal of this idea to Rupnagar Municipal Council indicating the costs and targeting the high crowd areas like the Rupnagar Bus Stand and Rupnagar Railway Station. It will be small-scale implementation but we will try to make big local impact.

3. LAUNCHING OF OUR PUBLIC USER FRIENDLY APPLICATION -

We will release our simple mobile application which will provide core insights like crowd density, traffic situations, estimated wait times and best routing suggestions. The app will be primarily in english but we will add support for local languages too. The app will be open to feedbacks and we will improve the app interface according to that.

4. SMARTER CITY PLANNING WITH OUR COLLECTED DATA -

The system will collect a lot of useful data over time and this data will include information like common traffic levels, the time when the roads get most busy, which place have the highest wait times, common crowd movement behaviour and much more. We will provide this data to city planners for better decisions.

CONCLUSION

Managing large crowds in public spaces and controlling huge traffic on roads is a major challenge which India and many countries are facing nowadays. A large unmanaged crowd overall leads to decreased quality of transport and unsafe environment for people. Also, standing vehicles cause a lot of pollution which is very difficult to handle. And due to these vehicle emissions, the Air Quality Index is increasing day by day.

We identified the root cause of the problem to be unawareness towards rules, poor planning of market places, lack of public transport both in terms quality and quantity. We can improve the traffic system by introducing AI in it and allowing it to make smart real-time decisions. We also need to improve the overall quality of public transport by making it safer, reliable and smoother for people.

AI can help to improve overall traffic situation by dynamically managing routes and checking unauthorised parkings.

Input for our AI based system can be taken by Surveillance Cameras and Smart Sensors placed across the city, which can then be processed and used to provide useful insights to manage the crowd and traffic smoothly.

Our system will be trained on day to day and as time will pass it will grow more stronger in decision making.

This also have some positive social impacts. Traffic will be reduced and more people will use the public transport system; less traffic on roads means less emission which is a measure of concern in our country nowadays and good market place experience means the will boost economy too.

The learning through this project is beyond AI, Machine Learning and academics. Thought this project we learnt about team-work skills, survey conductions, public behaviour and also managerial economics.

CONTRIBUTION OF EACH STUDENT TOWARDS DEVELOPMENT OF THIS PROJECT

Harsh Sharma

- Survey Conduction and Result Calculation
- Designing and Writing of the Report
- Identification of the Problem
- Novelty / Innovation
- Suggested Plan of Action

Mohit Kumar

- Barriers and Constraints
- Expected Outcomes
- Summary of the Project
- Survey Conduction

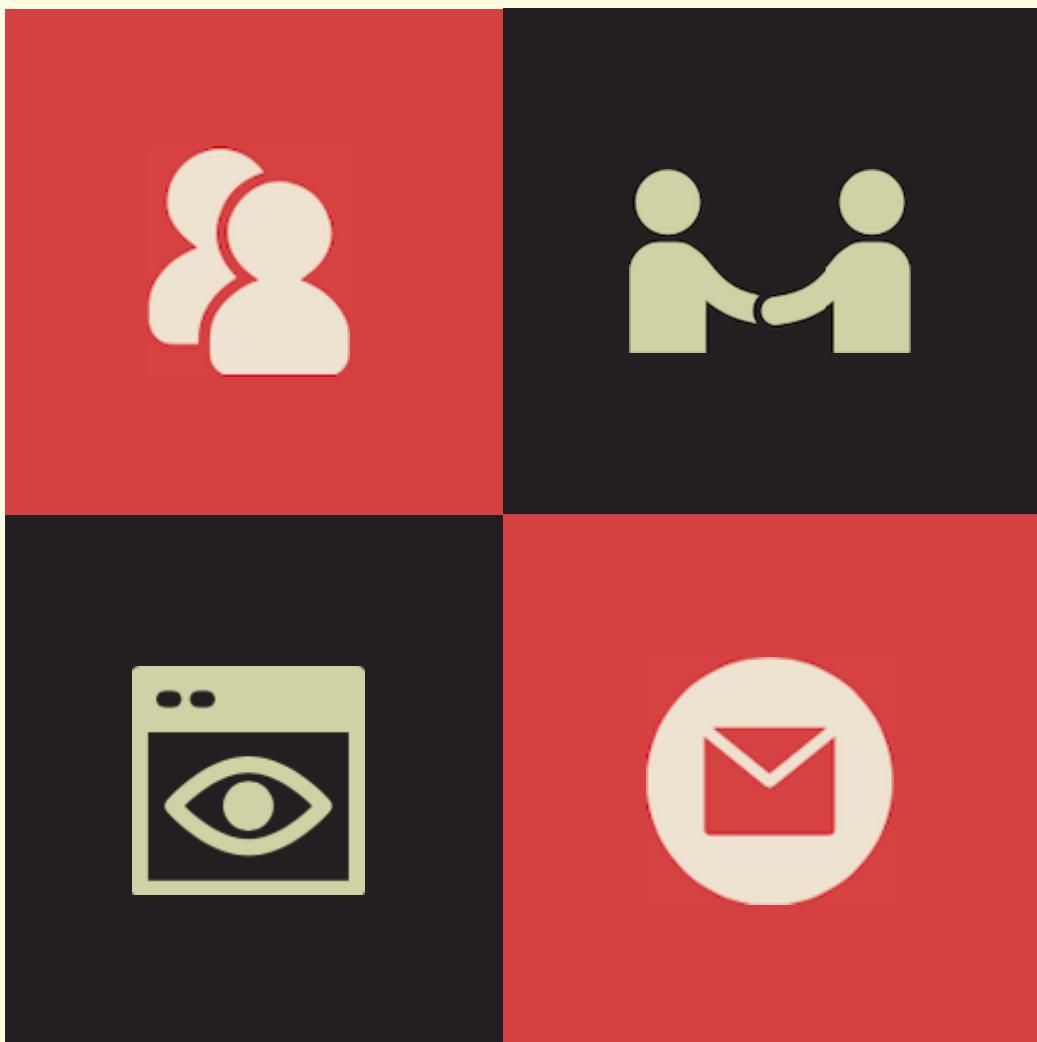
Rishab Jain

- Need of Resolving the Problem
- Conclusion
- Implementation Plan
- Approached for Intervention Plans

Anand Kumar

- Detailed Definition of the Problem
- Goals of the Project
- Tools and Techniques
- Expected Outcomes

THANK YOU



HAVE A GREAT DAY !