# What's the reason behind this increase in traffic?

Rising Transport Demand

Three key variables have been used to describe travel demand:

- Population
- Employment
- Vehicle Ownership

Rapid growth in population & employment have resulted in a drastic increase in number of trips. Further, these trips are being catered by private vehicles which have led to this congestion. Also, it's interesting to note how Employment and No. of Vehicles are closely related.

Pune's Rising Transport Demand

In Lakhs
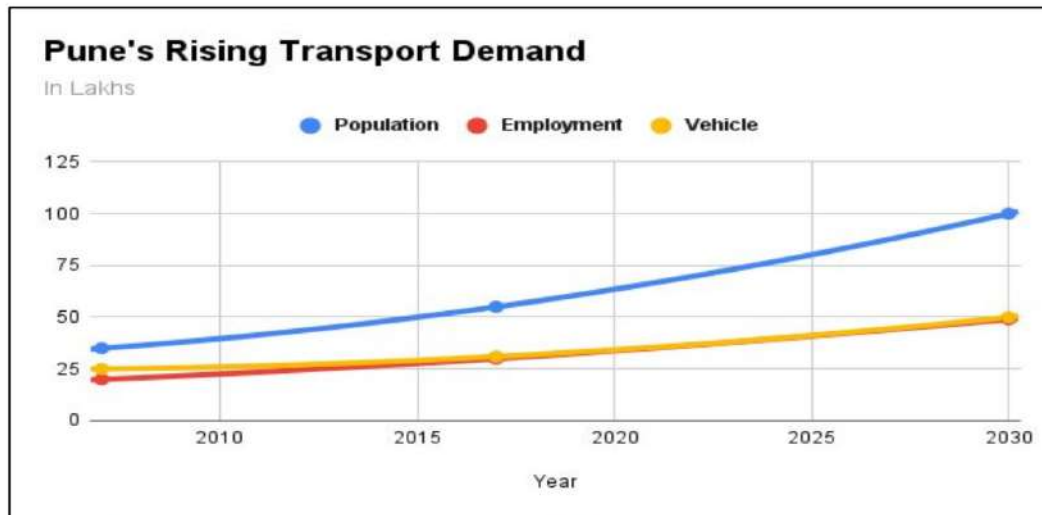
890/1000

Pune has a density of 890 vehicles per 1000 persons.

100 Lakh

Estimated Population of Pune in 2030.

42%

Increase in Employment by 2030.

Sub-optimal use of Pune BRTS

- Pune has 0.25 buses per 1000 people, well below the national average of 1.2. Infact, The number of buses running on various routes have declined over the years.
- PMPML Mobile App, which was designed to provide real time information of buses doesn't work. *Play Store Rating : 2.3*
- Operational Network of only 16 km. [Ahmedabad - 89 km]

All these factors have led to an extremely low adoption of public transport in Pune.

Share of Public Transit is as low as 19%.

Cost of this Chaos?

- Economic Cost — Reduced productivity, fuel wastage
- Health Cost — Increasing accidents and air pollution
- Environmental Cost — Carbon emissions

Annual Avoidable Social Cost of Congestion = 4 Billion Dollars
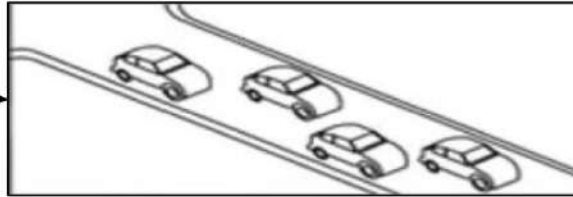
The Traffic systems in Pune fails to clear the queue during peak hours. All crossroads need at least 4-8 policemen to control the flow of traffic.
We plan to implement an Intelligent Traffic System(ITS) to automate the traffic lights based on the density of vehicles on road.
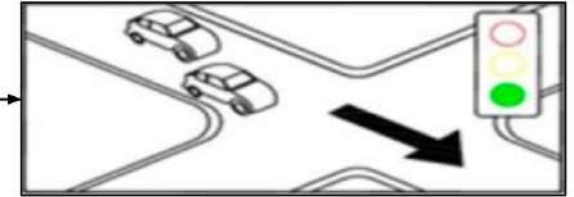
How It Works?
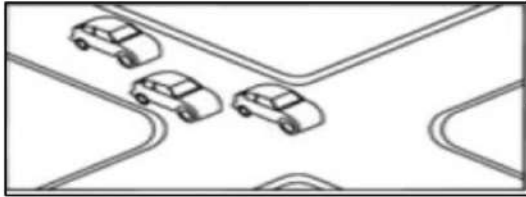
Group of cars receive a green light and leave an intersection.

The group proceeds travelling near the speed limit towards the next signal.

The next signal is timed to turn green just before the group arrives.

How It's Done?

- Traffic Sensors at signals generate data on vehicle queue length. **[CCTV Camera]**
- This data is fed into the central control office. **[Fibre Optic Cables]**
- Central Control office uses algorithms to analyse this data and further alter signal cycle lengths. **[Machine Learning]**

25% Reduction
Signal Cycle Time Reduction at Haji Ali, Mumbai

Feasibility Analysis
Assuming Economic Costs consists 30% of the Total Annual Avoidable Cost of Congestion. Health & Environment Savings ignored.
ITS will be implemented at the busy corridors of Pune. Any intersection with per hour vehicle count > 10000 is considered busy.

Total such junction = 33.
Cost of implementing ITS at each junction = 2 Cr
Total Cost = 66 Cr

Assuming 25% reduction in each signal cycle time,
Value Created = 1% of Annual Avoidable Cost of Congestion
= 300 Cr

≅ 5x Return on Investment

Fleet & Network Expansion

Currently, **1476** buses are operational in Pune. But the requirement is close to 3000.

- The plan is to increase the daily public transportation ridership from **9 lakh in 2021 to 20 lakh by 2025.**
- This would require an **additional 1500** buses.
- 500 Electric + 1000 CNG Buses

Cost of Buses = 500*1 Cr + 1000*35 Lakh = 850 Cr

Pune got approval of BRT project with Network Length of 68.80 km under JnNURM. But only 16 km of the project is completed.
The rest will be completed by 2025.
Cost of Network Expansion = 300 Cr
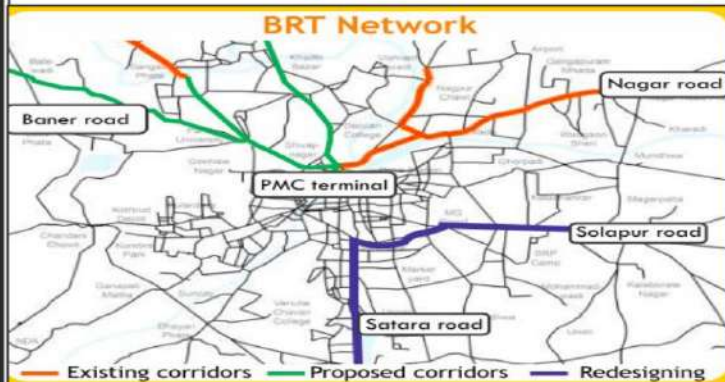
Smart Mobility

To make public transportation more convenient and attractive for commuters, PMPML mobile app will be upgraded.

- Buses are already fitted with GPS tracking. The app will leverage that and provide **real time information/journey time accurately.**
- Currently, MI cards are offered as an automated ticketing option. But, only about 3% passengers use it. The Reason? - Mandatory Aadhar & Physical Recharge of Cards. **Instead, the commuters could now use the app as a ticketing option. DigiLocker will be utilised for Aadhar verification and Recharge option will be available online.**
- The app will be integrated across all modes of transport.
- Data collection will be done via the app to improve capacity utilisation & provide a demand-driven service.

Feasibility Analysis

Only Capex Costs are considered. Operational Costs will be included in the bus fares..

Total Capex Cost ≅ 1200 Cr for a period of 5 years ≅ 250 Cr/Year

11 Lakh new public commuters, 16% Modal Shift
Value Created ≅ 5% of Annual Avoidable Cost of Congestion
≅ 1500 Cr/Year
≅ 6x Return On Investment!!