6115-MAHENDRA INSTITUTE OF ENGINEERING AND TECHNOLOGY

PUBLIC TRANSPORTATION OPTIMISATION

PROBLEM DEFINITION AND DESIGN THINKING

TEAM MEMBERS:

1.DEEPAK.V
2.BHARATH.M
3.DHANUSH.J
4.CHANDRU.S
5.DHANAVEL.M

FACULTY MENTOR NAME:

SANTHANARAJ M

DECLARATION:

We, he Student of Computer Science and Engineering,

MAHENDRA INSTITUTE OF ENGINEERING AND TECHNOLOGY,

TAMIL NADU

that the work entitled ”**PUBLIC TRANSPORTATION OPTIMISATION**”

has been successfully compledunder the guidance of asst.porf.Ms.Santhana raja M ,Computer Science and Engineering Department , Mahendra Institute of Engineering and Technology, Namakkal.

This dissertation work is submitted in partialfulfillment of the requirement for award of Degree of Bachelor of Engineering in Computer Science and Engineering during the academic year 2021-2025.

➢ ABSTRACTION:

- Urban public transport is a very complex system, and with the development of urbanization, there are many new urban traffic characteristics.
- To solve the urban public transport line design problem, this paper describes the implicit law of the characteristics of public transport travel from a deep perspective and analyzes the forms, influencing factors and existing problems of bus dispatching.
- By establishing a multiobjective public transport dispatching optimization model, starting from bus companies, passengers and government departments, public transportation operating costs comprehensively consider the interests of various parties and finally realize the optimization objective of minimizing fixed costs, fuel costs, carbon emission costs and time window penalty costs.
- The objective function is set reasonably, and the generation and optimization method of the initial line set in the public transport line design problem is improved; suitable constraint conditions and evaluation indicators are considered.
- This paper attempts to control the overall length of the bus line on the premise of fully meeting the travel needs of passengers.

➢ INTRODUCTION:

- Public transportation is one of the principal components of any urban transportation system.
- It plays a key role in providing mobility for a considerable share of the population in any society in a sustainable manner.
- The role of public transportation has been given increasing attention in urban transportation planning and operations, whether in developed or developing countries.
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- If public transportation does not satisfy the population's needs in a comfortable and suitable manner, transportation system problems may occur.
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- The public transportation sector in developing countries, in general, has faced several challenges and been affected by many problems.
- This depends on several factors, such as the passenger demand, desired headway, and route cycle time as will be shown in the following sections.

➢ PROBLEM STATEMENT:

- The transportation problem is an optimization problem with a linear objective function and linear constraints.

- The process of analyzing shipments, rates and. constraints to produce realistic load plans that reduce overall freight spend and gain efficiencies across entire transportation networks.

- Public transportation systems include a variety of transit options such as buses, light rail, and subways. These systems are available to the general public, may require a fare, and run at scheduled times.

- There are two phases to solve the transportation problem. In the first phase, the initial basic feasible solution has to be found and the second phase involves optimization of the initial basic feasible solution that was obtained in the first phase.

➢ OBJECTIVE:

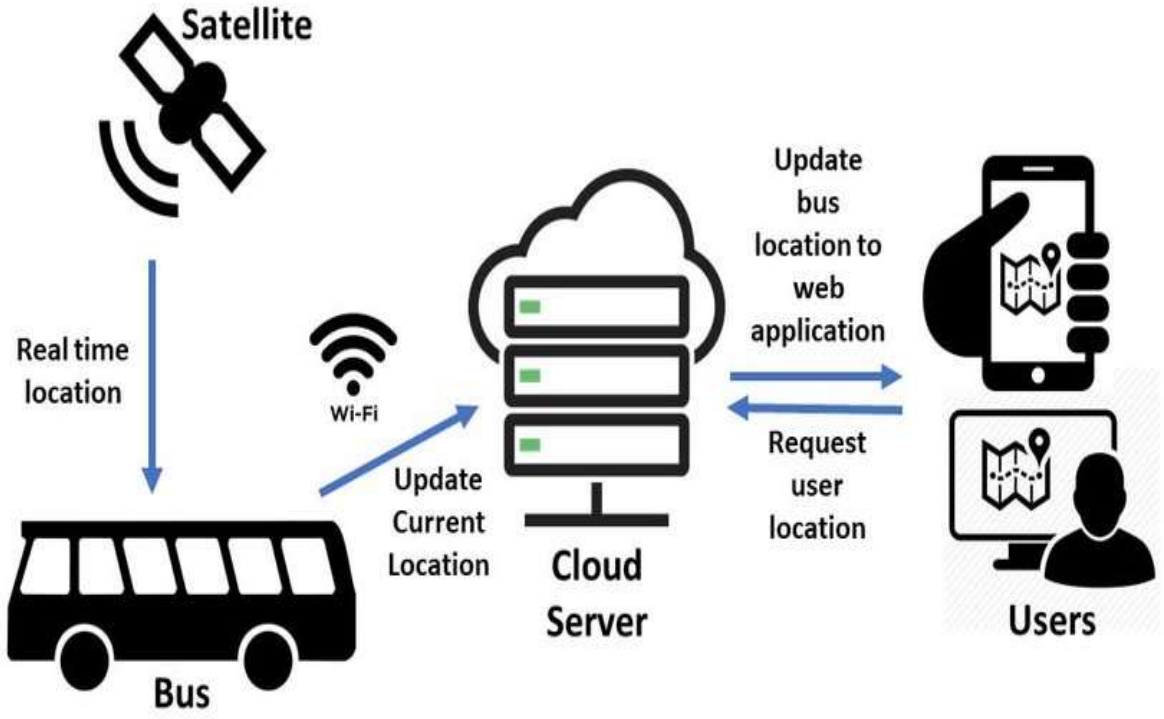
- It promotes sustainable and well-balanced regional development, reduces adverse environmental impacts and improves road safety.

- Public transport also boosts the accessibility of basic services and the mobility of population .

- Transport planning is highly essential in shaping cities, enabling economic activities, promoting community interaction, and enhancing quality of life.
- It is also essential for sustainable development and ensuring safe accessibility at various levels for all individuals.
- There are three most prominent benefits of using Public Transport over single-occupancy vehicles includes the reduction of carbon emissions, air pollution (which results in better air quality) and congestion on roads-including traffic.
- To decide how to satisfy the demand at destinations using the available supply at the origins that leads to the minimization of the total cost.
- The transportation or shipping problem involves determining the amount of goods or items to be transported from a number of sources to a number of destinations. Usually the objective is to minimize total shipping costs or distances.

➢ FACTORS OF TRANSPORTATION:

- Cost of Transport.
- Reliability and Regularity of Service.
- Safety.
- Characteristics of goods.
- Budget.
- Timescale.
- Flexibility.



➢ ADVANTAGES :

1.Reducing carbon emissions – Public transportation utilizes fuel-efficient vehicles, leading to a lower carbon footprint compared to individual car usage.

2.Promoting a sense of community – Using public transport allows us to interact with a diverse group of people, fostering a sense of connection and camaraderie.

3.Easing traffic congestion – By providing an alternative mode of transportation, public transport can alleviate the strain on roads and highways, leading to a smoother flow of traffic.

4.Saving money – Public transport can be a more economical choice compared to owning and maintaining a personal vehicle, especially in urban areas with high parking and fuel costs.

➢ DISADVANTAGES:

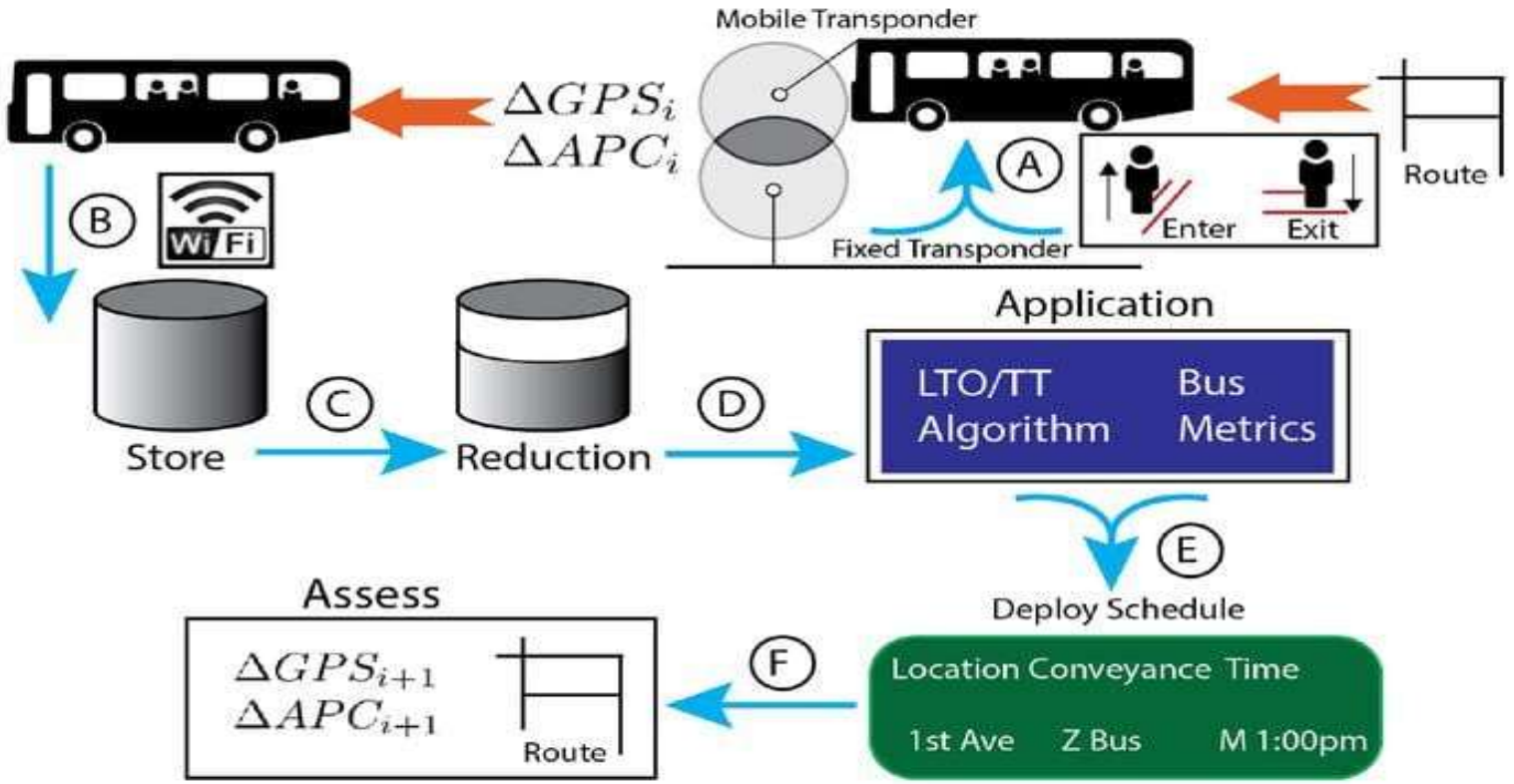
1.Limited accessibility – Public transportation may not always be available in all areas, making it difficult for people to get to their desired destination.

2.Time constraints – Using public transport can often be time-consuming, as we may have to wait for a bus or train to arrive or transfer to another mode of transportation.

3.Potential for overcrowding – During peak hours, public transportation can become overcrowded, making it uncomfortable and unpleasant for riders.

➢ EMERGING DATA SOURCES:

The complexity and extensive data requirements to infer public transport trips have reasonably hindered the application of mobile phone data for the purposes of public transportation planning.



➢ AIM:

In order to be environment-friendly, relieve traffic congestion, reduce pollution, and be green and sustainable, the optimization and development of public transportation, as the subject of people's long-term research, has always been shining.

➢LITERATURE REVIEW:

- The problem of planning efficient public transport systems subject to operational and resource constraints is not tractable and thus usually treated as a sequence of sub-problems solved at different stages.
- There are four distinct stages: strategic, tactical, operational and real-time.

➢ NETWORK DESIGN:

Traditionally, strategic network planning has been based on fixed demand and travel times representing average conditions, while the design process has relied on expected passenger flows derived from travel surveys, socio-demographic data and the application of transit assignment models .

➢ CONCLUSION:

To conclude, the relationship between optimization and public transport planning, although being constantly redefined, remains indispensable and will continue to evolve in parallel with the emerging significance of the role of transit systems

THANK YOU