The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Electrical and Computer Engineering

Bachelor of Software Engineering Honours

EEX5362 - Performance Modelling

**Mini Project**

Deliverable 01

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**Selected System**

Public Bus Transportation Network Colombo

**High Level Problem**

The chosen system for this mini project is a Public Bus Network that is one of the real-life examples of a city transport service in which buses move in fixed routes and are schedulable. Each route is made up of a number of bus stops, every one of which the passenger gets at random intervals, boards when a bus comes, and waits at random times, depending on the rate of service and traffic.

With high population density in big cities, it is a difficult task to have good and stable public transportation because of changing passenger demand, congestion, and fleet capacity. These aspects have direct bearing on the performance in the system with regard to the waiting time of the passengers, bus occupancy, travel delays, and schedule compliance. Wastages in the scheduling or allocation of resources will result in increased queues, bus bunching, vehicle underutilization and poor service quality.

The main issue, which the given project helps to solve, is to examine the work of the Public Bus Network, finding out where the delays and inefficiencies can be observed, how the available resources are used, and how the alterations of the demand or the number of buses in the fleet can influence the quality of services. The performance-driven analysis will assist in concluding on how the network can perform at higher levels of throughput, reduce waiting periods, and remain constant under different load requirements.

**Define Performance Objectives**

The overall aim of the research is to assess and improve the efficiency of the Public Bus Network operation by considering the key performance factors like waiting time, throughput, utilization, and reliability. The performance of the system will be modeled in order to determine the delay and resource bottlenecks, optimize the fleet schedule, and provide the passengers with the timely service. In particular, attention is paid to reducing the waiting time of passengers, optimizing passenger flows, bus utilization, identifying route bottlenecks, and assessing scalability at varying demand rates. Through these goals, the project will create a more acceptable and balanced system of transporting the population that will provide higher quality of services and effective utilization of available resources.

* Minimize passenger waiting time
* Maximize throughput
* Optimize fleet utilization
* Identify & reduce bottleneck
* Improve reliability
* Evaluate scalability