

Queuing Analysis and Optimization of Public Vehicle Transport Stations: A Case of South West Ethiopia Region Vehicle Stations

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Abstract : Modern urban environments present a dynamically growing field where, notwithstanding shared goals, several mutually conflicting interests frequently collide. However, it has a big impact on the city's socioeconomic standing, waiting lines and queues are common occurrences. This results in extremely long lines for both vehicles and people on incongruous routes, service coagulation, customer murmuring, unhappiness, complaints, and looking for other options sometimes illegally. The root cause of this is corruption, which leads to traffic jams, stopping, and packing vehicles beyond their safe carrying capacity, and violating the human rights and freedoms of passengers. This study focused on the optimizing time of passengers had to wait in public vehicle stations. This applied research employed both data gathering sources and mixed approaches, then 166 samples of key informants of transport station were taken by using the Slovin sampling formula. The length of time vehicles, including the drivers and auxiliary drivers 'Weyala', had to wait was also studied. To maximize the service level at vehicle stations, a queuing model was subsequently devised 'Menaharya'. Time, cost, and quality encompass performance, scope, and suitability for the intended purposes. The minimal response time for passengers and vehicles queuing to reach their final destination at the stations of the Tepi, Mizan, and Bonga towns was determined. A new bus station system was modeled and simulated by Arena simulation software in the chosen study area. 84% improvement on cost reduced by 56.25%, time 4hr to 1.5hr, quality, safety and designed load performance calculations employed. Stakeholders are asked to put the model into practice and monitor the results obtained.

Keywords : Arena 14 automatic rockwell, queue, transport services, vehicle stations

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