Bus Service Model with Rectangular Service Zone under Exponential Relation

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Abstract

Most researchers developed bus service models with a rectangular service zone that relations among different costs are related by a linear relation. A bus service model had been constructed with a rectangular service zone where costs are synthesized by an exponential relation. An accepted paper had pointed out that a previous model without capacity constraint is unreasonable. This paper examines another model with capacity constraint to show that previous formulated optimal solution contains questionable findings and then we provide our solution approach. The key feature of our paper is to point out that using the route width as a continuous variable will derive unreasonable results. Our improved approach is to use the partition number for the zone width as a discrete variable. A numerical example is provided to illustrate our proposed approach.

Keywords: Bus service model, bus service zones, optimal solution.

1. Introduction

In Tung et al. [16], they classified traffic models into two categories: (a) Simplified traffic systems with formulated solutions, and (b) Complicated traffic models with numerical solutions. Most researchers have tried to develop traffic models to be applied in the real-world situation. However, those papers did not know whether or not their numerical findings are the optimal solutions. Moreover, the real world is so complex so that those complicated traffic models only reflect a few features in traffic environment. In this paper, we will work on traffic models in category (a) for bus service models with a rectangular service zone. We will provide a review for related papers of bus service models with a rectangular service zone. Chang and Schonfeld [2] first constructed a bus service model for rectangular bus service areas with a steady fixed demand such that there are three variables: the headway, the service route length and capacity constraint. And then Chang and Schonfeld [2] extended their models with a cyclical fixed demand and several time periods. Chang and Schonfeld [3] generalized Chang and Schonfeld [2] to consider the service route width as a new variable. Yang et al. [19] pointed out that in Chang and Schonfeld [3], their derivation including questionable results and then Yang
The Exponential distribution is a continuous distribution bounded on the lower side. Its shape is always the same, starting at a finite value at the minimum and continuously decreasing. The Exponential distribution is frequently used to represent the time between random occurrences, such as the time between arrivals at a specific location in a queuing model or the time between failures in reliability models. It has also been used to represent the services times of a specific operation. Further, it serves as an explicit manner in which the time dependence on noise may be treated. As such, these models are making explicit use of the lack of history dependence of the exponential distribution; it has the same set of probabilities when shifted in time. This model provides hire car service (using environment-friendly vehicles) at the rail station, with the aim of reducing long-distance car trips. Cars would be stored in silos, which could also be used for light freight containers received from trains for distribution in town centres by road.

4.1.4 Eighteen best practice criteria, to be applied at early design stage. An Interchange zone on the west or landside face of the main terminal building connects to buses, coaches and car parking. Heathrow Terminal 5 itself, made possible by the clearance of a redundant sewerage facility to the west of the original terminal area, has been the subject of a long gestation period. We've wrapped our Service Bus Message Queue payload in a class that specifies the number of delivery attempts. We multiply the number of delivery attempts times a constant, then add that number to the current dateTime for scheduled delivery in the future. After the number of delivery attempts that we want to try are exceeded, we explicitly dead letter the message. Proxy services and business services define the endpoints in a Service Bus system. They include the binding and transport layers, and are the points at which Service Bus communicates with external services, including producers and consumers. 1.3.1.1 Proxy Services. Proxy services are Service Bus definitions of generic intermediary web services that are hosted locally on Service Bus.