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Comparative study of phase type single and multiple queues for ticket service facility at subway stations

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This paper is a comparative study of ticket service facilities at subway stations with single and multiple queues. The ticket service facilities at subway stations are a unique queuing systems of which inter arrival interval and service time are Phase Type (PH) distributed with multi servers and queues that can either be single or multiple. The PH/PH/1 and PH/PH/C queuing models are used evaluate multiple and single queues ticket service facilities respectively. The study showed that ticket service facilities with single queues perform better than the ticket service facilities with multiple queues. Also, the PH/PH/1 and PH/PH/C queuing models are compared with the expositing M/M/C and D/D/C queuing models for the assessment. Thus, this study provides guideline to the subway station planners and designer to evaluate the subway station service facilities more efficiently and design intelligently.

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Sustainable construction, landslides of Grand Ethiopian Renaissance Dam in Ethiopia

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Landslide-generated ground failures are common geo-environmental hazards especially in the mountainous terrains. Ethiopia is currently implementing huge dams and hydropower infrastructural development. Landslides and landslide-generated ground failures need to be given due attention in order to reduce losses from such hazards. Dam related landslides are extremely widespread in mountainous areas. Landslides may occur in conjunction with other vital natural disasters such as earthquakes, floods, and volcanic eruptions. The incidence of landslide disasters has been increased by changing land-use practices and unsustainable urbanization. Landslide disasters include human injury, loss of life and economic devastation. Landslide should be studied as part of the fields of earth, water and engineering sciences. The objective of the paper is to assess landslide processes, hazards, risk analysis, mitigation, and the protection of both Ethiopia and Nile River Basin and the environment related to construction of Grand Ethiopian Renaissance Dam. The paper presents landslide mechanisms and processes, risk evaluation, hazard assessment, and vulnerability assessment, monitoring systems, reservoir related landslides, landslide disasters in urban areas and along critical infrastructure, landslides and natural resources, land development and land-use practices and landslide remedial measures and prevention works are assessed. The paper concludes that landslides should be highlighted and associated with geohazards to be considered by planners, decision-makers, and concerned organizations.

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