Study on Campus Bus Transportation Routes: Case of Universitas Indonesia

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- (1) Introduction: The well-managed transportation system is one of the keys to a sustainable campus. Effective transportation management determines the effective mobility among the campus origin to destination. Effective transportation management offers energy efficiency, cheaper cost, and passengers' satisfaction. There is a lack of significant issues on the campus bus management. However, there is also a lack of studies on effective campus bus transportation routes. This study explores the campus bus transportation routes to investigate the factors that cause the delay in the campus bus. Even though Putera et al. (2017) have pointed out this argument, they did not investigate the relation of the routes to the physical features along the routes. The management of transportation management is significant to maximize the service to the users as well as to target the sustainable campus transportation system (Harvanto & Franklin, 2011). The use of satellite technology is an effective tool to get the precise spatial data and analysis (Kluga et al., 2013).
- (2) Method: This study investigated two campus bus routes (in this context called Route a and Route b) from the same origin point and destination. The study area was situated at Universitas Indonesia campus, Depok city, Jakarta, Indonesia. The study used the Global Navigation Satellite System (GNSS) application to analyze the spatial data in 2016. The data were collected during the lunch break when the traffic volume was moderate. The study also used Google Map Image to integrate with the presentation of GNSS spatial data. The Google street view was also used to explore the physical features along the routes due to the challenges of field study during the pandemic in 2020.
- (3) Result: Figure 1 shows the results of GNSS spatial coordinates in two campus bus transportation routes. The results indicate that there is a gap of trip durations between the two routes. Route a recorded 28 minutes and 20 seconds while Route b recorded 30 minutes and 2 seconds. The analysis of physical features shows that Route a met 23 slowing down

locations and 26 spotted in Route b. It was concluded that the management of campus bus transportation management needs to consider the spatial and physical features consideration to achieve a more sustainable transportation system. The study also highlights that the aid of GNSS technology offers the more precise spatial data in the effective transportation management study. Further studies on larger scales of routes and more variables on transportation management are needed to get comprehensive findings.





(4) Reference:

Putera, R., Pratama, O., Nanditho, G., et al. (2017). Efficiency of Public Transportation Using Global Navigation Satellite System (GNSS). International Journal of GEOMATE, 13(36), 26-30.

Haryanto, B., & Franklin, P. (2011). Air Pollution: A Tale of Two Countries. Reviews on Environmental Health, 26(1), 53-59.

Kluga, A., Kluga, J., Bricis, A., & Mitrofanovs, I. (2013). Multiple Frequencies Precise GNSS RTK System Research in Dynamic Mode. IFAC Proceedings Volumes, 46(28), 95-98.