Analysis Of Autonomous Rail Rapid Transit (ART) Planning For Congestion And Pollution Management: Surabaya City Case Study

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Abstract

In a study conducted by INRIX 2021 Global Traffic Scorecard, it is said that Surabaya occupies the first largest city in Indonesia and number 41 cities in the world with a total duration wasted during peak hours in Surabaya reaching 62 hours / year and an average speed of 20.9 km / hour. In addition, according to IQAir data in January 2022, the value of air pollution levels in Surabaya is unhealthy with an air quality index of 180 US AQI and PM2.5 concentrations in the city of Surabaya air are currently 22.3 times above who's annual air quality guidance value. To overcome this, the Surabaya city government plans to plan the construction of Autonomous Rail Rapid Transit (ART) as one of the solutions to overcome the congestion and pollution problem. In this study, the identification of significant variables on the effectiveness of ART transportation modes will be carried out, measuring the level of customer loyalty when implementing ART transportation modes and providing several policy alternatives to regulators to achieve the desired level of effectiveness. The created model will consist of 10 scenarios. This simulation will be supported by data obtained through a questionnaire that will be distributed to the public to measure how interested the community is in supporting this policy. The method used is a simulation of a dynamic system. The results obtained are significant variables to the effect of ART modes of transportation are the percentage of increase in fuel prices, the percentage of public support and the reduction in transportation travel time, the rate of change from customer loyalty as measured from quite high, and to increase the effectiveness of the application of ART transportation modes, the researchers proposed to use a policy of increasing fuel prices accompanied by a reduction in travel time from public transportation. in 2023, 2025 and 2026, using the policy of reducing travel time from public transportation accompanied by community support in 2024 and using the policy of increasing fuel prices in 2017.

Keywords :
Autonomous Rail Rapid Transit (ART), Effectiveness, System Dynamic

Biographies
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