

## **Jabodebek Light Rail Transit with Grade of Automation (GoA) No.3 (Driverless) Technology towards Jakarta Net-Zero Emissions (NZE) 2050**

**Authors :** Nadilla Saskia, Octoria Nur, Assegaf Zareeva

**Abstract :** Mass transport infrastructures are essential to enhance the connectivity between regions and regional equity in Indonesia. Indonesia's capital city, Jakarta, ranked the 10th highest congestion rate in the world based on the 2019 traffic index, contributing to air pollution and energy consumption. Other than that, the World Air Quality Report in 2019 depicted Jakarta's air pollutant concentration at 49.4 mg, the 5th highest in the world. Issues of severe traffic congestion, lack of sufficient urban infrastructure in Jakarta, and greenhouse gas emissions have to be addressed through mass transportation. Indonesia's government is currently constructing The Greater Jakarta LRT (Light Rapid Transit) as convenient, efficient, and environmentally friendly transportation connecting Jakarta with Bekasi and Cibubur areas and plans to serve the passengers in August 2023. Greater Jakarta LRT is operated with Grade of Automation (GoA) No.3, Driverless Train Operation (DTO). Hence, the automated technology used in rail infrastructure is anticipated to address these issues with greater results. The paper will be validated and establish the extent to which the automation system would increase energy efficiency, help reduce carbon emissions, and benefit the environment. Based on the calculated CO<sub>2</sub> emissions and fuel consumption for the existing condition (2015) during the feasibility study of the LRT Project and the predicted condition in 2030, it is obtained that Greater Jakarta LRT with GoA3 operation will reduce the CO<sub>2</sub> emissions and fuel consumption by more than 50% in 2030. In the bigger picture, Greater Jakarta LRT supports the government's goal of achieving Jakarta Net-Zero Emissions (NZE) 2050.

**Keywords :** LRT, Grade of Automation (GoA), energy efficiency, carbon emissions, railway infrastructure, DKI Jakarta

**Conference Title :** ICRE 2023 : International Conference on Railway Engineering

**Conference Location :** London, United Kingdom

**Conference Dates :** September 18-19, 2023