Spatial Pleasure

Promoting Transit Oriented Development (TOD) through carbon credit generation

Objective of the project

This project aims to evaluate the feasibility of creating and trading carbon credits based on the quantified environmental value of public transportation, thereby promoting TOD. By analyzing CO_2 reduction from bus operations in BSD City, Indonesia, the project seeks to demonstrate the business viability and scalability of such an approach. In partnership with Sinar Mas Land, data was collected and analyzed to verify both the environmental benefits and the potential for monetization through carbon credits, positioning the initiative as a model for sustainable urban development in emerging economies.

Cooperation with local companies/governments

Sinar Mas Land provided operational data, including bus ridership and vehicle movement within BSD City. Spatial Pleasure utilized this data to analyze CO_2 reduction effects, deliver data-driven solutions, and apply for carbon credit certification based on the analysis results.

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Provide Data

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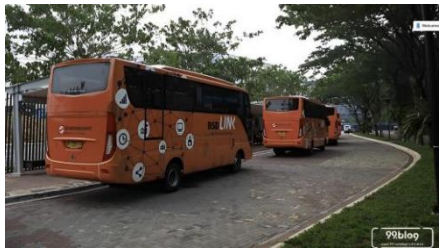
Data solution provision / Credit application

Targeted economic/social issues

In Indonesia and other Southeast Asian countries, rapid economic growth and urbanization have outpaced the development of public transport infrastructure, resulting in heavy reliance on private cars and motorcycles. This contributes to increased traffic congestion, air pollution, and greenhouse gas (GHG) emissions. As global pressure mounts for climate action, including through agreements like the Paris Accord, developing countries are expected to adopt effective emissions reduction strategies. However, the transport sector remains underutilized in carbon credit markets due to institutional gaps and complex measurement methodologies. The Joint Crediting Mechanism (JCM), while promising, requires bilateral government approvals, often making the process slow and difficult to implement—particularly in transport-related projects. This project addresses those challenges by using real-time mobility data and digital analysis tools to develop a replicable model for measuring CO_2 reductions. By doing so, it aims to enable sustainable urban development while facilitating access to carbon finance, helping emerging economies pursue both environmental and economic goals.



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Demonstration period

January 2024 – August 2024

Details of demonstration

This project was implemented over the period from January to August 2024, focusing primarily on public transportation buses in BSD City, Indonesia. Its objectives were to conduct a quantitative analysis of CO_2 reduction effects and to demonstrate the functionality of an analytical system. Specifically, a passenger survey was conducted to assess alternative modes of transport that would have been chosen had public transportation not been available—such as private cars or motorcycles—and the difference in emissions was quantified as the effect of modal shift. Based on actual bus operation data collected from April to August 2023, the analysis estimated a CO_2 reduction of approximately 587 tons during the period. In parallel, a system was developed to automate this analytical process. The system implemented functions to estimate CO_2 emissions based on bus operation data and to calculate reductions through comparisons with baseline scenarios. In addition, functionality was added to analyze the emission reduction impact of introducing electric vehicles (EVs). The development of this multi-method analytical platform constitutes a core achievement of the project.

Project outcome/ future plans

As a key outcome of this project, the effectiveness of the CO_2 reduction analysis methodology and the supporting system was successfully validated, establishing a foundation for future large-scale deployment. In particular, the ability to automatically quantify environmental benefits derived from modal shift within public transportation systems was confirmed, demonstrating that support for the visualization of environmental value can be provided as a viable service to domestic and international transit operators. On the other hand, regarding the registration of carbon credits, the process has been prolonged due to the nature of the JCM, which requires approval from the Joint Committee (JC) of both the Japanese and Indonesian governments. As a result, the registration has not yet been completed. However, technical and institutional approval from the relevant domestic authorities has already been obtained, and the project is expected to be officially registered by the end of 2025, with JCM credit issuance targeted for completion within 2026. Looking ahead, the project aims to establish a track record of credit distribution through sales agreements with domestic buyers, and to strategically promote the horizontal deployment of similar projects across the Southeast Asian region.