

PROJECT DETAILS

Project Title:

Sustainable Enhancement of Asphalt Performance Using Biochar, Waste Plastic Aggregate, and Mining Waste

Project Summary:

This project aims to improve road performance and sustainability through a novel approach using biochar as a bitumen modifier, waste plastic aggregate as a coarse aggregate, and mining waste (lithium slag) as filler in asphalt mixtures. Uniquely, the project will investigate the synergistic effects of these materials, an area never explored before, to address asphalt degradation, global environmental challenges, and the depletion of non-renewable resources. Expected outcomes include enhanced road durability, effective waste repurposing, reduced landfill usage and CO₂ emissions, and support for resource efficiency and cost savings. This transformative research aligns with the United Nations SDGs and Australia's emissions targets for 2030 and 2050, paving the way for sustainable and resilient roads.

Preferred Applicant Skillset:

The applicant has a strong background in civil/transportation engineering with expertise in pavement materials and sustainable construction practices. They bring extensive experience in advanced material characterisation, laboratory testing, and academic research, along with strong analytical skills in data analysis and statistical modelling. Their knowledge of sustainable waste management practices, particularly the use of biochar and recycled materials, further enhances their profile. The candidate demonstrates excellent teamwork and communication abilities, evidenced by successful collaborations on industry partnerships. Notably, they have secured a collaboration with biochar supplier Rainbow Bee Eater and Energy Farmers for this project.

Internship Opportunity:

Yes. The internship opportunity is currently under consideration, with a strong potential placement with Main Roads Western Australia. This placement would offer hands-on experience in sustainable asphalt production and road infrastructure development. It will provide valuable industry exposure, practical research experience, and the opportunity to contribute to innovative, sustainable road construction projects.

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