IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, August 2025
Impact Factor: 7.67

High-Tech Highway

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Abstract: *This paper suggests a technology-driven, integrated corridor for India's highways that combines four complementary innovations: fully automated mobile toilet reverse osmosis (RO) water-purification stations solar-powered artificial trees for air-quality management and sustainable road-construction strategy that re-engineers pavement materials, sub-grade soil, and median design. In order to provide hygienic sanitation while lowering open defecation and water consumption, the mobile toilets use touchless RFID/QR access, UV-C self-cleaning, IoT-based waste-level sensing, bio-digester treatment, and solar energy. Under continuous sensor-based quality monitoring, highway-side RO plants provide passengers with mineral-balanced potable water, support smart rest-stop cleaning operations, and provide emergency supplies during natural disasters. Artificial trees made from recycled metal with photovoltaic "leaves" provide bird nesting opportunities, produce renewable electricity, and extract greenhouse gases up to 1,000 times faster than natural vegetation.*

Keywords: Mobile toilet, Highway, Recycling

DOI: 10.48175/IJARSCT-28660