

Purifi: Phytoremediation Air Filtration System

Addressing air pollution in New Delhi

Problem

New Delhi is one of the most polluted cities in the world, where citizens who can't afford a car and rely on public transportation can be exposed to twice the amount of air pollution than those who have the privilege of driving cars. The long-term exposure is proven to reduce the lifespans of its residents by up to five years.

Challenge

Exposure to air pollution in New Delhi is not equal across socioeconomic classes. Implementing a phytoremediation air purification system is a necessary step towards improving equity in this city. Phytoremediation is the process of using plants and technologies to create a balanced environment.

Solution

The three-part phytoremediation air purification system implements moss cultures on bus rooftops, bus shelters, and moss walls within the Delhi Transport Corporation and around the city. Decreasing air pollution exposure through phytoremediation will ensure that all citizens of New Delhi, especially those who rely on public transportation, experience high air quality.



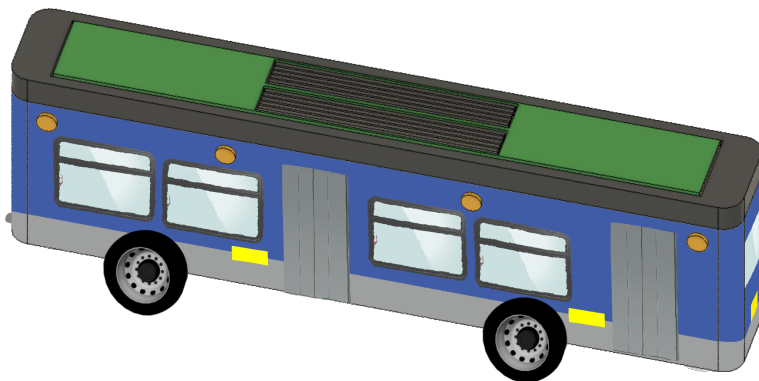
Bus-Roof and Moss Wall Air Purification System

Moss cultures will be installed on the roofs of buses and Moss Walls will be placed around the city between bus stops, one per block. One moss culture has the environmental benefit equivalent to **275 trees**. These installations will have **IoT sensors** and their data will be sent to the servers at bus shelters. Every moss culture is **self-sustainable** and only requires a few hours of maintenance per year. IoT systems will **self-water** the moss with collected rainwater and will need to be manually filled during the dry season.



Bus Shelter Air Filtration System

Solar panels will be installed on bus shelter roofs, bordered by moss cultures. The solar panels power a **filtration system** that is activated when a bus pulls into the stop. The filtration system will **draw in** the exhaust released by the bus's exhaust pipe and filter it back into **clean** air that is pumped out from the top of the bus shelter. Servers at bus shelters will upload the data from the IoT sensors to a cloud. The data will track where pollution levels are most dangerous, allowing bus routes to be **optimized** with the lowest levels of pollution.



Specific moss cultures have the unique ability to filter polluted matter out of the air by binding the particulates to the leaf surface and permanently integrating them into their own biomass.

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