It was annoying at the time, but Phanindra Sama, a frequent bus traveler in India, has come to treasure the fall day in 2005 when he couldn’t catch a bus from Bangalore to Hyderabad to celebrate Diwali, a major Indian holiday, with his family. When Sama’s usual travel agency couldn’t find him a ticket, his only choice was to trek across the city to five other agencies before throwing in the towel and spending the holiday alone.

For the Bangalore-based engineer with Texas Instruments, it became a blue-sky moment. “The bus operators, travel agents and customers were all losing out because information wasn’t available to everybody,” he says. So he enlisted his college roommates turned engineers to create a centralized online bus-booking system.

Seven years later, Redbus has roped in more than 700 of India’s roughly 2,000 bus operators to become the country’s biggest e-bus ticket seller, with 3 million tickets sold, 400% growth since 2008 and $30 million in revenues this year.

In India, where rapid growth and urbanization have saddled megacities with smog and congestion, a better bus system is as good for the environment as it is for travelers. The Energy and Resources Institute found that increasing bus trips from 62% to 80% of travel in Bangalore would reduce fuel consumption by 21% and CO2 emissions by 15% over 15 years. “Redbus is a crucial step in making transportation more sustainable in India,” says Susan Zielinski, a transportation expert at the University of Michigan. “People need to take more buses. They aspire to own cars, but the idea of everyone owning their own vehicle is an illusion because of space constraints.”

Still, as Indian incomes rise and the government pours billions into crumbling roads, more affluent travelers see cars as an escape from tickety, unreliable buses. Only 4.7% of Indian households have a car now, but annual car sales are expected to quadruple to 9 million by 2020, according to the Society of Indian Automobile Manufacturers, especially as more low-cost models hit India. The implications for the environment are grim: cars and two-wheelers contribute 60% to 90% of CO2 emissions in Indian cities, compared with 3% to 21% for buses, according to Geetam Tiwari, a civil-engineering professor at the Indian Institute of Technology Delhi.

Online ticketing could help boost investment in higher-end, greener bus fleets, says Redbus investor Parag Dhol of Inventus Capital, who estimates India’s bus market is growing 25% per year. “The stigma is, you only ride a bus if you can’t own a car,” says Zielinski, “but better-quality buses can make alternative forms of travel sexier even to car owners.” Since adopting Redbus’ reservation system last year, Goa’s state-owned bus operator has increased profits and rolled out snazzy Mercedes-Benz and Volvos featuring softer seats and smoother rides. Volvo is increasing coach production in India fivefold to 5,000 per year. Indian busmaker Ashok Leyland has teamed up with plastics maker Saertex India to make 500 lighter-weight buses. Dhol calls Redbus the center of “a new ecosystem,” one that hopefully will help India avoid a Malthusian traffic jam.