Clean-air allies: Rickshaws get a lift . . .

In developing countries, most people can adopt a new technology only if it's cheap. Keeping low cost paramount, a team of Indian and American engineers has redesigned a widely used, nonpolluting human-powered taxi—the cycle-rickshaw. In cities such as New Delhi in India and Dhaka in Bangladesh, hundreds of thousands of such rickshaws ply the roads.

Unlike the light, strong, metal-alloy bicycles with 10 speeds or more that abound in Western countries, cycle-rickshaws remain largely single-gear bruisers weighing up to 90 kilograms unloaded.

The redesign team trimmed 38 percent of that weight by switching to a tubular frame and streamlining the carriage. The engineers also changed distances between wheels to improve handling and provided at least two speeds.

"We couldn't increase the bore of the human engine, the human heart, so we had to make the machine more efficient," says Matteo Martignoni of the nonprofit Institute for Transportation and Development Policy in New York City.

The team also tested and rejected more complex and costly improvements, such as shock absorbers and differential gears.


ITDP

Modernized rickshaw reduces driver fatigue.

Air-pollution damage to the Taj Mahal in Agra has prompted a ban on gas-powered vehicles from a wide swath around the building. The institute and cosponsors of the redesign hope to use the ban to boost the fortunes of the environmentally friendly rickshaw, which offers a livelihood to many extremely poor people.

Late last month, the team paraded some four dozen of the first batch of machines past the Taj Mahal. About 30 of the $100 vehicles have already been sold by two Indian firms. —*P.W.*

. . . and no-solvent paint spares the air

Most paints release toxic vapors that pose health risks and add to smog. Industry spends millions of dollars each year to meet increasingly tough environmental rules related to such volatile organic compounds (VOCs) (SN: 8/5/95, p. 92).

Now, researchers at the Georgia Institute of Technology in Atlanta say they have created a new type of paint that emits, at worst, only minute traces of the volatile chemicals. The coating, a type of polyester, gives off "essentially zero VOCs," Robert E. Schwerzel, a member of the research team, told SCIENCE NEWS. The scientists expect the coating eventually to be used by companies that paint aircraft or huge rolls of sheet metal that get cut up into appliance panels.

For now, however, curing the paint takes too long for practical use, Schwerzel says. A heat-activated catalyst initiates curing, which requires up to half an hour at 100°C. The team is seeking funding to continue the research, he says.

The new paint squelches emissions because it contains no solvents—the main source of volatile chemical emissions from ordinary paints. Also, the manufacturing process removes other VOCs that stay in normal paint until it dries.

A little of the solventfree paint goes a long way because it consists of ring-shaped molecules that slip past each other. "Instead of a gallon, you might buy only several ounces," Schwerzel says. —*P.W.*