

Concepts & Prototypes

A COMMUTER FERRY BUILT LIKE A RACING BOAT

For all their convenience, most commuter ferries are dirty machines. A high-speed one burns, on average, 6,600 gallons of fuel a day. Multiply that by the number of passenger boats on a busy waterway, like San Francisco Bay, and you've got a lot of spent diesel. Wind + Wing Technologies (WWT), a Napa, California, company, claims it can reduce that consumption by up to 40 percent.

WWT is developing a ferry that makes use of an abundant—and free—natural resource: wind. Instead of relying solely on engine power, specially designed catamarans will be equipped with vertical carbon-fiber “wing sails” similar to those introduced in the last America’s Cup sailing race. Used in conjunction with an electric or clean diesel engine, the

SAIL TO WORK!

1

WING

Each wing weighs about 4,000 pounds and is connected to the vessel by a 75-foot spine that turns freely. Three microphones measure audio signals from the wind. A computer then analyzes the readings to determine the wind's direction.

2

TRIM TAB

Based on real-time wind direction, an actuator offsets the thin, outermost piece on the top of the wing by 15 degrees. This action forces the trim tab to move the wing, which provides thrust to the ferry, propelling it forward.

solar-powered wings automatically adjust position to capture the wind. And unlike traditional cloth sails, they require no expertise to operate, which has been a big stumbling block for wind-powered commercial vessels in the past.

The custom boats themselves will carry 149 passengers (and can be scaled up to carry 500). And while \$2 million for a pair of wings ain't cheap, WWT says they would likely pay for themselves in fuel savings in less than two years. The company has already run tests on a smaller 42-foot prototype vessel and is now in talks with public and private investors to service the route between San Francisco and Treasure Island. The project could be live by 2020.

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3

COUNTER-WEIGHT

A 200-pound lead beam balances the weight of the wing, making it sensitive to even tiny changes in wind direction.

5

BULKHEAD

Unlike traditional sailboats, these ferries need an interior bulkhead that runs the width of the catamaran. It will evenly disperse the wings' force on the boat—up to 72,000 pounds—between the two hulls to ensure stability.

4

SOLAR CELL

A nine-square-foot photovoltaic cell generates about 50 watts of power to operate the wind sensor, wing controls, GPS, and communication tools.

