

## DRIVING

# Taking Hills in a Single Glide

By CHRIS DIXON

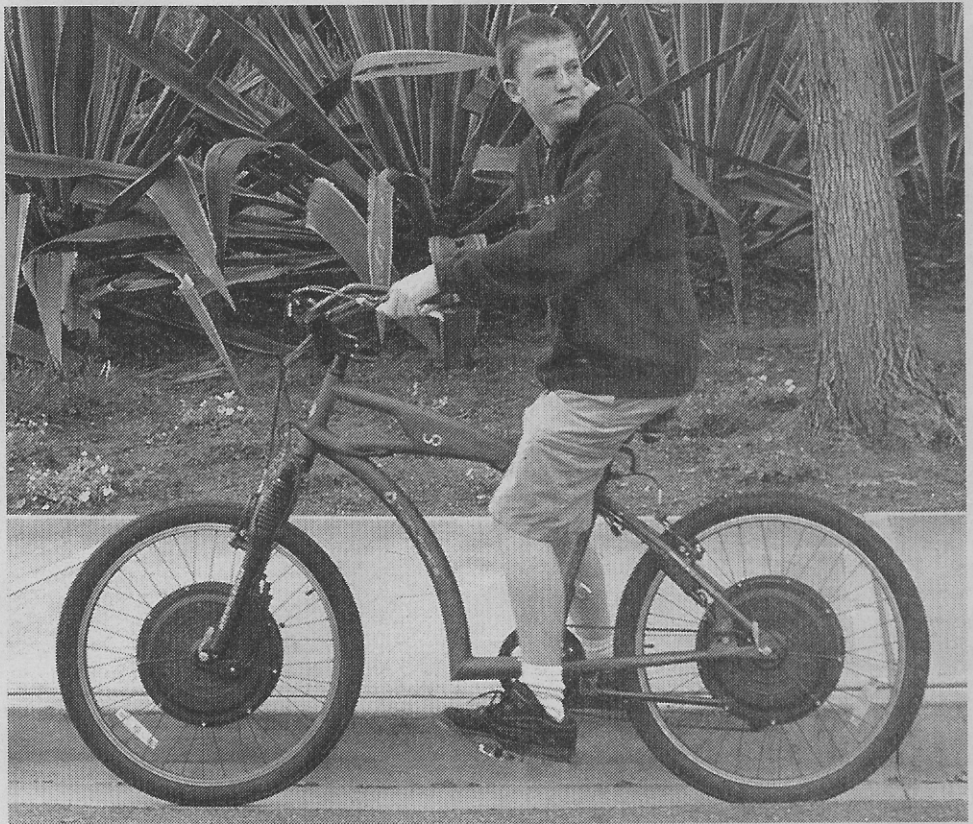
**“Y**OU just turn the key,” said Kevin Penrose, pointing to the L.E.D. controls on a flat-black, well-wired mountain bike outside Electric Cyclery, his tiny, nondescript shop on the Pacific Coast Highway in Laguna Beach, Calif. “The thumb lever is the throttle, and this button is for turbo mode. If you go downhill, the blue light will show when the regenerative charging kicks in.”

These days, a visit to Costco, Wal-Mart, a local auto-parts store or even eBay will present you with what may seem a baffling array of two-wheel electric vehicles that promise to make commuting a breeze, or serve as the best toy a kid ever had. Aside from having two wheels, the common thread among these personal electric vehicles, or P.E.V.’s, is a 24- or 36-volt lead-acid or nickel metal hydride battery, a 250- to 1,500-watt electric motor and the ability to go as fast as 40 miles per hour and as far as 40 miles on a single charge.

Sales of P.E.V.’s, have increased anywhere from 40 to 200 percent annually over the last three or four years in the United States, said Seth Leitman, an alternative transportation consultant for New York State and, more recently, a P.E.V. retailer. And even though much of the market is made up of inexpensive imports that can be unreliable (in September, Target stores announced the recall of nearly 75,000 of its \$200 Chinese-made Red Dragon and E-Scooters), a significant portion of it is composed of more expensive, powerful machines that offer the range, sturdiness and reliability to serve as genuine transportation aids. Mr. Penrose said that at his store he was having no trouble finding customers for his two-wheel stand-up electric scooters, larger, sit-down electric motorcycles and the wired-up mountain bike he was showing, the WaveCrest Tidal Force.

With the exception of its wires and a pair of foot-diameter black disks at the center of each wheel, the Tidal Force is a high-end, front-suspension mountain bike whose folding frame was designed for military use. The front disk holds a 36-volt nickel metal hydride battery, and the rear contains a 750-watt direct-drive motor that runs at 89 percent efficiency.

On a recent test run, the bike almost silently shot up the steep incline of a street near the store with no pedaling whatsoever. Shifted into pedaling gear as it reached the crest of a hill and started on the downgrade, the bike hit around 30 miles an hour. Without pedaling, it easily held 20. Then, on a steeply inclined fire road, the sensation of quietly flying up an unpaved mile-long hill that normally requires a granny gear was amaz-



Jamie Rector for The New York Times

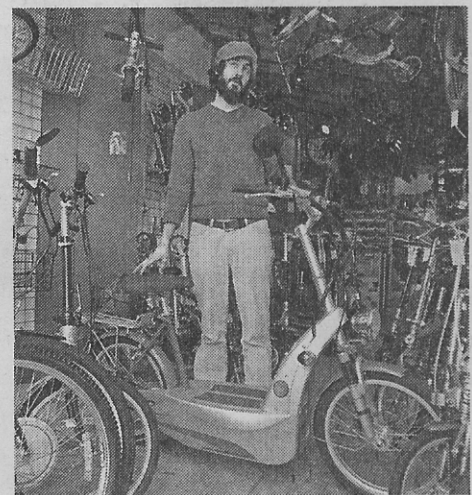
**HOT WHEELS** Scott McKenzie, above, of Newport Beach, Calif., on his electric bike, whose range is 18 to 20 miles. Mike Dolan, right, manager of a New York store, with an electric scooter.

ing. The bike’s solid feel on the way down was just as impressive.

At \$1,500 to \$3,000, a WaveCrest can be an expensive option for those looking for an electric bike. There are many other options, ranging from other electric bicycles to stand-up scooters to Vespa-style e-motorbikes. Miles per charge and power to the ground vary greatly, but a good bike or scooter should take you at least 10 miles on a charge. It should also be able to recharge in three to six hours.

One of the country’s largest P.E.V. dealerships is NYCE Wheels in Manhattan. The manager, Mike Dolan, said that business at the store, which sells and services higher-end P.E.V.’s, is growing. “More people want these,” he said. “Gas prices are going through the roof and taxis are more expensive. Once people realize that they can get anywhere in the city on their own terms, it becomes a really attractive option.”

Mr. Dolan said that he had just sold a WaveCrest 750 mountain bike to a trail rider from New Jersey and a Goped ESR 750



Nicole Bengiveno/The New York Times

stand-up scooter to a city messenger. Both these American-made products and the Taiwanese-made eGo electric motorbike are among Mr. Dolan’s best-sellers.

Although local laws vary, there are generally three legal classifications for P.E.V.’s. The simplest two-wheel P.E.V.’s are small stand-up scooters that occasionally offer seats. In most parts of the country, these machines may be ridden on public roads where the speed limit does not exceed 25



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## Electrified and On the Move

**P**ERSONAL electric vehicles vary from 200-watt scooters to 1,500-watt e-motorbikes capable of a 25-mile trip. Here is a sampling:

### Stand-Up Scooters

**GO-PED ESR750** A 750-watt motor (more than one horsepower), four 12-volt, sealed lead acid batteries, 10-inch tires; disc brakes, a carbon steel frame and excellent maneuverability make this a highly competent urban transport machine. It can be equipped with an optional single seat, as shown below.

Weight: 52 pounds. Price: \$699.95. [www.earthscoters.com](http://www.earthscoters.com).

**CITYBUG E2** This small, lightweight scooter has a 200-watt motor and a compact but rugged design that make it excellent for short commutes and carrying into the office. Its motor is better suited for flat urban commuting than for hilly areas but will still go 8 to 10 miles on a charge.

Weight: 31 pounds. Price: \$250. [www.nycewheels.com](http://www.nycewheels.com).

### Bicycles

**WAVECREST TIDALFORCE iO CRUISER AND M-750** The iO Cruiser around-town machine has seven speeds and a 750-watt motor with regenerative charging. The folding M-750 mountain bike boasts a full 21-speed setup. Each bike will run for up to 20 miles at 20 m.p.h. without pedal

assistance and as many as 40 if pedaled.

Weight: 64 pounds. Prices: \$2,000 (iO) and \$2,500 (M-750). [www.greenspeed.us](http://www.greenspeed.us).

**LASHOUT** Also sold as the Synergy Cycle Electric Bicycle, the full-suspension seven-speed LashOut is a more basic and less expensive design than that offered by WaveCrest. The 600-watt, nonregenerative electric motor will take it as far as 20 miles.

Weight: 74 pounds. Price: \$799. [www.electrikmotion.com](http://www.electrikmotion.com).

### E-Motorbikes

**EGO CYCLE 2 CLASSIC AND LX** Each of these nonpedal e-motorbikes has a built-in charger, a 24-volt 1,500-watt motor, a headlight and regenerative braking. They will go up to 25 miles at 24 m.p.h. The LX has two mirrors, a horn, turn signals and a speedometer.

Weight: 130 and 132 pounds. Prices: \$999 to \$1,399. [www.egovehicles.com](http://www.egovehicles.com).



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m.p.h., so long as their own speed cannot exceed 20 m.p.h.

**I**N New York City, these scooters were nearly outlawed after a rash of miniature "pocket rocket" motorcycle accidents led to an ordinance that outlawed all gas-powered scooters and mini-motorcycles. In a last-minute appeal, electric scooter riders were able to persuade the city to make an exception for riding on public streets so long as speeds were electronically limited to 15 m.p.h. They may not be used on sidewalks.

Depending on the jurisdiction, riders of electric bicycles are generally able to avoid any legal restrictions if their bikes do not exceed 20 or 30 m.p.h., and larger, Vespa-size electric motorbikes must generally be lighted, blinkered, insured and licensed just like their gasoline-powered counterparts.

The Web site [visforvoltage.com](http://visforvoltage.com), perhaps the best clearinghouse for information on P.E.V.'s, and a few calls to Mr. Penrose's customers suggested that range and power are the keys to happy cruising.

For Julie London, 43, of San Juan Capistrano, Calif., a WaveCrest has meant freedom from the ravages of early-onset Par-

kinson's disease. Formerly an avid cyclist and racer, Ms. London was forced off her bike a few years ago by fatigue from Parkinson's. "I was absolutely amazed when I rode one," she said. "I was literally overcome with emotion because it was like getting my life back again. I was laughing uncontrollably for, like, 15 minutes. Now I ride mine pretty much every day. It'll go 20 miles per hour, and if I'm too tired to pedal, I don't have to. It's actually easier for me to ride than driving my car."

Ken Trough, a Web developer from Bellingham, Wash., was so taken with P.E.V. technology that he created the visforvoltage Web site. Mr. Trough makes a five-mile daily trip to work aboard a powerful Badsey Hotscoot stand-up scooter. "I like personal electric vehicles because they don't directly challenge the automotive manufacturing base," he said. "It's very subversive technology. It gets people thinking about electric vehicles. Once people find out what a good product this is, what it can mean in their lives, in their living spaces and what it can do for their transportation budgets and quality of life, I think it's a no-brainer. You get more smiles per mile."