

America at 10 M.P.H.

The Slow But Steady Rise of Segway

A century ago, automobile owners commonly heard skeptics jeer, “Get a horse!” Today, some Segway riders are reporting similar heckling—“Get a bike!”—and taunts about laziness.

The Segway is the motorized people-mover that made a splash in January 2001, months before it was officially unveiled, when word leaked onto the Internet of a looming invention that would “profoundly affect our environment and the way people live worldwide.” Rumors about the nature of the device—was it a hovercraft? a jet-pack? maybe a teleportation machine?—gave way to disappointment in some quarters when its true nature was revealed in December 2001. Some people who had engaged in months of fevered speculation came to deride the real Segway as a “glorified scooter.”

In fact, the device is an impressive technical breakthrough. It uncannily balances on just two wheels, thanks to its sensors, its computerized brain, and its array of five gyroscopes. Those who have ridden on Segways have been nearly unanimous in their enthusiasm about the experience, describing the “magical” balancing of the machine, and its nearly “telepathic”

ability to go where the rider wants it to go: “think ‘forward’ and it goes forward.”

Thanks to its battery-powered engine, the Segway emits no pollution and makes almost no noise. It uses energy efficiently—the equivalent of 450 miles-per-gallon of gasoline, according to a company statistic. But it has quite a limited range (about five to twelve miles per each electrical recharge) and a top operating speed of 12.5 miles per hour.

The article that revealed the existence of the secret invention back in 2001 mentioned that investors thought the invention would bring in “more money in its first year than any start-up in history.” The company’s financial director estimated “projected sales of \$350 million in 2002, the launch year, with substantial profit,” according to *Code Name Ginger*, a book published last year by Steve Kemper, the only reporter given access to the Segway project during its secret development. In fact, real-life sales in its first year were closer to \$30 million. Company officials envisioned two thousand Segways rolling off the assembly line every day, with perhaps 100,000 sold in the first year; in fact, first year sales were only about 6,000.

And weaker-than-expected sales weren't the only problem. In late September 2003, nearly all of the machines sold to date had to be recalled to fix a minor software glitch that had, in a small number of cases, resulted in riders falling off. There were press reports that the Segway company spent all its start-up money, and needed to raise millions more. And there were publicity setbacks when several places banned Segways from sidewalks—such as the city of San Francisco and the Walt Disney World theme park.

All of these problems could be dismissed as merely minor turbulence if Segway seemed poised to fulfill the promise of that initial leaked story—to “sweep over the world and change lives, cities, and ways of thinking.” Kemper's book details the extent to which the creators of Segway actually believed such grand notions. The machine was originally incubated in the mind of Dean Kamen, a brilliant and eccentric inventor whose previous inventions included the world's first wearable drug-infusion and insulin pumps; the first portable kidney dialysis machine; and the model of intravascular stent used in heart patients such as Vice President Cheney. With his company, DEKA, Kamen has also developed a new version of the ultra-efficient Stirling engine; a portable water-purifier that could be useful in the Third World; and a stair-climbing, self-balancing wheelchair called the iBot.

The latter project prompted further inspiration, and soon Kamen's company

had two major divisions working on secret self-balancing projects dubbed Fred (the iBot) and Ginger (the Segway), a nod to the fleet-footed Fred Astaire and Ginger Rogers. Convinced of the historic importance of the Ginger project, Kamen brought Kemper on board to chronicle every step of the fundraising, research, and development. Kemper's book tells of the frustrations and brutal compromises—cost versus creativity, time versus perfection—that went into every design decision, into the curves, colors, fenders, buttons, and even the sound of the motor's hum. Kemper describes Kamen the visionary, who could inspire engineers and investors, but also Kamen the paranoid micromanager, who constantly feared competitors and exasperated his employees.

Kamen told his employees he had “no doubts at all that this will revolutionize the world,” according to Kemper. “The impact of this in the twenty-first century will be just like what Henry Ford did at the beginning of the twentieth century.” But when rumors of the invention first appeared on the Internet—because a publisher had leaked a copy of Kemper's book proposal—Kamen chose to downplay the importance of his invention: “We have a promising project, but nothing of the earth-shattering nature that people are conjuring up.”

So which is it: Is Segway going to revolutionize the world, or is it just a blip in the history of American innovation?

It is, of course, impossible to know the full future import of the Segway,

but a few particulars might give some clues. Segways are presently used for professional purposes by policemen on their beats and mailmen making their rounds; they are used on several college campuses, in a few warehouses, and in at least one case by a professional photographer who steers his Segway while shooting pictures of moving targets. This political season, candidates in several locales used Segways to speed their door-to-door campaigning; one candidate for a Georgia county commission chairmanship rented a half-dozen Segways for himself and his volunteers, according to the *Atlanta Journal-Constitution*.

There is also a new official Segway enthusiasts' group ("Seg America") and there are Segway chatrooms and blogs online. There are games and sports for Segway users, including a form of polo (the machine replaces the horse). There have been a small number of Segway injuries and Segway thefts. Meanwhile, some people with debilitating ailments, like multiple sclerosis, Parkinson's disease, and varieties of paralysis, have found in Segway a liberation from the wheelchair.

As we write this, one Segway owner, Josh Caldwell, is making a 4,300-mile trip across the United States on his Segway, while a small crew of friends records the journey for a documentary called "America at 10 mph." (You can check their progress at 10mph.com.) The trip is expected to take eighty days.

There are now 35 Segway dealerships in 26 states, and this October the company will host its first dealer

meeting. Segway tours are available in cities around the United States (Washington, Chicago, Sarasota, Portland, Minneapolis, Waikiki, etc.) and elsewhere (London, Paris, Nice, Bangkok, etc.). In some cases, the Segway-riding tourists themselves become a tourist attraction. As one group of Segway tourists recently rode in the French Quarter of New Orleans, other "tourists who had focused their cameras on the three-centuries-old St. Louis Cathedral turned their lenses on the hip two-wheeled vehicles with their riders who were viewing the cathedral," according to the *Times Picayune* of New Orleans.

These anecdotes suggest that the Segway is just beginning to catch on, and that its failure to meet initial sales expectations has more to do with unrealistic expectations than with any inherent failings of the product. Concerns remain, of course: A few groups representing senior citizens and pedestrians are worried about people getting run over by Segways on sidewalks, and some doctors have worried about the health effects—one called the Segway an "absurd extension of laziness that will further increase levels of obesity and heart disease in America."

Those who fear Segway will make people lazier, however, are missing the point. Kamen never intended Segway to replace exercise on foot. Instead, Segway is intended to fill the gap between pedestrian travel and car travel; its niche is for those trips that are inconveniently far to walk but

annoyingly close to drive. As Kamen put it, “Why do you put your 150-pound ass in a 4,000-pound vehicle to move around? ... There will soon be 4 billion people living in cities, and there’s no reason that anyone who only needs to move ten or twelve blocks should own a car.”

With even the cheapest Segway models still costing nearly \$3,000, there are more affordable ways to fill that niche. There has recently been an explosion of interest in scooters, both gas- and battery-powered. There are also Segway-imitators, such as the far cheaper “Q-Electric Chariot,” a Segway look-alike upright scooter which solves the problem of stability by adding a third wheel. (Segway aficionados have started calling it the “Fakeway.”) But the Segway company does its best to distance its product from these other machines—they never call theirs a mere “scooter”; the company prefers to call the Segway a “human transporter” or an “electric personal assistive mobility device”—and indeed, there is no motorized scooter quite as small or portable as the Segway.

Nor are scooters as “cool” as the Segway admittedly is. But a transportation revolution can’t be built on cool alone. Segways are, as yet, really only in the possession of “early adopters”—the true technophiles who, in this case, seem largely to include the wealthy, urban, and childless. The reaction of the general public in the next few years will determine Segway’s impact on traffic, pollution, urban design, and a host of related subjects. But it isn’t clear whether the wider public will take to Segway or not. As Kemper puts it, “They might shrug or marginalize it as a toy. They might refuse to pay the asking price. They might not recognize how the machine can fit into their lives. They might decide that the niche ... between walking and driving doesn’t need filling.” There is a chance we will someday look back on Kamen’s hopes for Segway much as we now remember the early days of hype about telecommuting; even though his dreams may largely pan out, the changes will be too slow and modest to be considered revolutionary.