Segway Personal Transporter

Written by Kevin Gordon

Public safety use of the Segway Personal Transporter (PT) continues to grow as both law enforcement and security agencies realize the potential. Initially popular for security at shopping malls, airports terminals and university campuses, the use of personal transporters is earning wider acceptance by agencies across the country and world.

Segway already has a distribution network of 100 U.S. authorized dealers and 38 authorized distributors with dealers in an additional 55 countries. If your agency is small—in other words, the average American police agency—don't think the Segway PT is only for larger agencies; read on.

More than 150 police and security agencies presently use the Segway PT. Recent agencies that have began using the Segway PT or have added to their complement of units include the Italian Police, who just recently bought more than 60 units to patrol Italy's 12 largest passenger rail stations. The Washington D.C. Metro Police are now using Segway PTs in four different regions of the city. Albuquerque PD has six units, one of which is on patrol downtown seven days a week.

In a creative use of Segway PTs, Arlington County, VA Sheriff's Department is using them to deliver all court documents such as subpoenas and motions instead of patrol units. Recently, Segway unveiled the next generation of personal transporters for police use.

The self-balancing, two-wheeled Segway Personal Transporter is the new generic name for all first and second generation Segway units. Previously called the Human Transporter (HT), the name change was made because the PT is a more approachable and easy to remember term, and it works better in international markets.

A Segway PT has two wheels side by side and keeps the rider upright by the use of gyroscopes. The key to the operation is its ability to balance on its own. The model for the unit was the human body, and Segway provides a layman's definition of how this dynamic stabilization works. If you stand up and lean forward far enough that you are out of balance, you will not fall because your brain realizes you are out of balance and tells you to put your leg forward to stop the fall. If you keep leaning forward, your brain will tell you to keep putting your legs forward so you don't fall.

The Segway PT has "wheels instead of legs, a motor instead of muscles, a collection of microprocessors instead of a brain and a set of sophisticated tilt sensors and gyroscopic sensors instead of an inner-ear balancing system." The Segway PT senses that the rider is leaning forward, and in order to maintain balance, it turns the wheels at the proper speed. There is neither throttle nor brakes as the rider's movements control both.

When the driver leans forward, the motors drive both wheels forward to keep the unit from tilting over. Conversely, when the driver leans backward, the motors drive both wheels back. The farther a rider leans forward, the faster he goes. To turn, the rider moves the LeanSteer frame left or right, and the motors drive one wheel faster than the other.

The new Segway Personal Transporters include the new Segway i2 and x2 and the i2 Police Package and the x2 Police Package. The police packages were specifically designed for use in patrol and community policing areas.

"On both domestic and international fronts, we are seeing strong momentum in the police and security sector, and we expect it to continue for the foreseeable future," said Klee Kleber, vice president of marketing, Segway Inc. "The patrol and community policing capabilities of the Segway PT have now been proved by some of the largest police forces in the U.S., and the environmental profile of the product enables agencies to reduce fuel costs and vehicle emissions."

Like the previous models, the new Segway PTs uses Smart Motion Technology, which enables to them move and balance on two wheels. The new PT models have reduced fuel costs and expanded patrol range. The i2, which is suited for urban and suburban transportation, has a range of up to 24 miles or about 480 city blocks. The x2, with its wider wheel track and all-terrain tires, has a range of 12 miles on a single charge; it can travel across rougher terrain such as dirt, gravel or sand. Top speed for the units is about 12.5 mph, and payload is 260 pounds.

LeanSteer, a revolutionary technology, responds to the rider's natural inclination to lean into the direction of travel. With this technology, the rider controls the movement of the Segway PT by leaning the body. The sophisticated software of the PT allows it to distinguish between the changes in terrain from the steering of the rider. This keeps the rider stable when traversing uneven ground. As with anything new, it takes an adjustment, but officers seem to quickly adapt and realize the potential and benefits of Segway PTs use by public safety.

The Segway PT is one of those items you must see and try first hand to truly appreciate. With that in mind, I contacted a local dealer, Jeff Bach,

owner of Segway of St. Louis and set up an opportunity to take it out for a test ride. I really didn't know what to expect, and having fallen off many bikes as a child, I just could not grasp how a two wheel unit could balance itself.

Sales Manager Mike Carroll gave me my introductory operations review of the Segway PT i2. My first step on was, I'm sure, typical of everyone. You expect it to fall over because it has no obvious support other than the two wheels…but it doesn't fall over. You have a natural tendency to lean forward to compensate for the balance displacement you expect to occur, but I quickly realized it wasn't an issue.

It operates as simply as advertised, lean forward to go forward, lean back to go backward, and move the LeanSteer left or right to go either direction. The LeanSteer is truly amazing, and you have to experience it. My ride was short, but I left with a new appreciation of the Segway PT. I left thinking about all the uses of a personally owned unit—trails, camping, golf—in other words, all the reasons I just couldn't live without one!

The Segway Police Package includes reflective police labels, which are visible from the front and rear. Standard equipment also includes an accessory bar that is constructed from cold rolled steel, which acts as a mounting point for accessories as well as lights and sirens. A molded plastic shell handlebar allows the carrying of items including extra batteries, and it easily detaches when an officer leaves the unit. A handlebar bumper protects the handlebar and grips from nicks, scratches and dings.

The LED taillight is a high-output LED light that produces a bright red light. The light comes with two sets of rechargeable AA batteries and a charger, and it installs on either the front or back of the cargo bag. The included Segway Comfort Mat is made of industrial grade rubber and serves to reduce fatigue for officers who ride the Segway PT for an extended time. The cargo frame on the unit assists in lifting the unit and is made of non-corrosive aluminum tubing.

The x2 Police Package comes similarly equipped with the bumper, lights and siren bar, a handlebar gear bag, taillight and cargo frame. The x2 includes a set of two universal cargo plates. They enable additional gear to be attached by use of cargo nets, bungee cords, etc. The manufacturer's suggested retail price for the i2 Police Package is $5,495 and $5,895 for the x2 Police Package. Units come with a one-year warranty.

Both have the InfoKey, a wireless controller, which serves as a key and an anti-theft system, as well as an information center. Each InfoKey controller is programmed to work with only one Segway PT and is used to activate the built-in security features. The key also provides needed information such as battery life; distance covered, speed and performance. The key is small, maybe 1.5 inches across, and at first glance, it resembles a stopwatch. It is easily removed by the operator and can be dropped in to the trouser pocket no different than a set of keys.

The Segway PT weighs about 105 pounds, making it light enough to handle and small enough to store in the trunk of a typical squad. The unit is as wide as an average person's shoulders, and it has the ability to turn in place.

Segway's Kleber said, "More than 150 police departments and security organizations worldwide already use Segway PTs to patrol downtown business districts, airports, shopping malls, parks and college campuses. With the capabilities of the new generation, of Segway PTs and the addition of the new x2 Police Package, we are providing police agencies with tools that will greatly enhance the productivity of patrol officers. And because Segway PTs use no gasoline, they can also greatly reduce fuel costs."

Kleber made one observation that somewhat sums up the potential uses of the Segway PT. "If the officer is traveling on foot, horse, bike or other such alternative transportation, we fit in the mix. If you need to cover lots of ground and you normally do it on foot, Segway PT is an option."

Segway PTs have been used by private industry for promotional events including a unit made up like a phone booth and another as a beer can. Think of the potential if used at a department recruiting event. Anyone involved in career fairs knows how important it is to stand out from the other booths. What better way than a Segway PT. Many tourist areas such as docks and riverfront areas are a natural fit for such units, and think of the possible uses for even the typical, small community.

An officer could use it to visit all the businesses on the main street in the downtown area, regardless of how small that area might be. If you can walk a downtown area or bike it, it is easy to see how a Segway PT might be the better option. I suspect many businesses would be happy to assist in the purchase of such a unit. A Segway PT could be used by a school resource officer who has to get from one end of the school to the other quickly, or for that matter, one could be used by the principal.

Any community, small or large, with a parade or other type of event could put officers on Segway PTs for crowd control, traffic control or passing out candy to the kids. In some parts of the country, they are being used for door-to-door sales as well as door-knocking politicians. The reason is simple: You can cover more ground quicker and faster. One agency said it had to patrol about 10 square urban blocks, and what officers previously covered two times a day on foot, they now cover 10 times.

Segway recently signed its largest municipal contract with the city of Chicago. This five-year contract is for $580,000 to buy Segway PTs, accessories, service and parts. Chicago, which presently has more than 50 units, will buy up to 100 additional Segway PTs for use by the police, fire, airport operations and emergency management personnel.

Commenting on the city of Chicago's use of Segway PTs, William Johnson, president of Segway Experience of Chicago LLC, said, "The Chicago Police and Fire departments have found that Segway PTs enhance patrols and shorten police and EMS response times. They also know that these machines use no gasoline and will play a valuable role in holding down department fuel costs. The big winners are the citizens of Chicago, who will enjoy a superior level of safety and security in the city's airports and downtown."

Officers are finding that the public's interest and curiosity about the new technology enhances community police efforts. Officers are not only more approachable, but citizens are more prone to stop the officer and enquire about the unit, serving both as public relations and community policing benefit, sometimes referred to as the "ultimate icebreaker." Segway PTs operate extremely quietly, and because they use no gasoline, the lack of emissions allows indoor use.

Officers quickly realize they are about eight inches taller (9.5 inches with the x2), providing a better view over crowds and vehicles, and the units are self-balancing even when standing still.

The reverse is also true; the public can find the officer easier. Officers can cover a much greater area than possible on foot. Segway PTs run in rain and cold, and the batteries operate down to 14 deg F. Other than battery recharging, officers have no regular maintenance with which to be concerned.

A variety of independent safety studies have been conducted of the Segway PT and are available for review. The German Federal Board for Road Traffic complete a three-month study that showed very favorable results for the units braking, steering and general handling.

The U.S. Department of Transportation and Federal Highway Administration "characteristics of Emerging Road Users and Their Safety" collected data and reviewed the operational characteristics (such as dimensions, capabilities, acceleration) for both nonmotorized and motorized methods of transportation.

The Segway PT met or exceeded all American Association of State Highway and Transportation Officials (AASHTO) Guide to the Development of Bicycle Facilities. Other studies available include those completed by the Centre for Electric Vehicle Experimentation in Quebec and the Victoria Transport Policy Institute.

The Segway PT is small enough to store in the trunk of a typical squad car, but we all know the typical car has everything but the kitchen sink in the trunk. There are several transport options, including an accessory available from another company that address that issue.

The Segvator, advertised as an "elevator for your Segway PT", allows you to carry the unit on the back of the squad, like a bike on a rack. The Segvator mounts to a standard 2-inch receiver hitch and uses a standard round, seven-way RV-style trailer plug. You simply lower it, drive the Segway PT on and raise it, permitting you to load or unload the unit in less than 30 seconds with no lifting! It can even charge the unit while you drive with a built-in power inverter. One or two units can be carried at one time, depending on the purchase.

Segways are easy to use, easy to transport, and cheap to run. There is simply no reason not to add a Segway PT to the department inventory.

Kevin Gordon spent 25 years in law enforcement and retired as a chief of police. He is a national and regional officer of the International Police Association. He can be reached at Kevin@KGordon.com.

Originally Printed in Police Fleet Manager Magazine, March 2008