



**Proposed Usage Guidelines**  
**For the**  
**Segway Human Transporter**  
**At the**  
**Illinois Institute of Technology**

I PRO 340 TEAM  
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## 1. Introduction

The Segway (HT) is the first of its kind – a short-distance transportation device that integrates the operator into the pedestrian world. It balances upright the way you do, using technology to replicate equilibrium. The result is a machine as intuitive as walking. Dean Kamen, one of the world's most accomplished innovators, founded Segway (<http://www.segway.com>). (Mr. Kamen is also the founder of FIRST Robotics, a robotics national competition for high school student teams, which IIT may support with an IPRO team in the future.)

IIT has been designated a “Segway HT Friendly Campus” -- the first university in the world to do so. This has given us the unique opportunity for a multidisciplinary team of students and faculty to figure out the range of social, policy and technical issues introduced by Segway HTs on the IIT campus. The Segway IPRO team has had access to a pair Segway HT and worked with various representatives from the company. At the beginning of the Fall 2003 school term (August 16 through 18 in the HUB, the IPRO team was trained in the use of the Segway HT and helped to demonstrate it to incoming freshmen and other students, faculty and staff. Students were encouraged to purchase a Segway HT at a discount and bring them to campus. In the mean time, students and faculty with questions have had the opportunity to send inquiries to [IIT@segway.com](mailto:IIT@segway.com).

During the semester, the IPRO team has performed the following tasks:

- Supported IIT in establishing a demonstration and training program for Segway HT use on campus
- Develop policies and rules that should guide use, parking and storage of Segway HTs in relation to pedestrians, bicycles and automobiles
- Explore new uses for Segway HTs on the campus and in Chicago, and interact with Segway users in the Chicago area
- Conceive and demonstrate new accessories and features that can be integrated with the Segway to enhance its utility and appeal for various user populations
- Performed initial investigations into ways to integrate emerging advanced battery, power generation and control technologies to enhance the performance of the Segway.

### 1.1. Handbook Team Objectives

The specific objectives of the handbook team have been to create a handbook/user manual outlining appropriate Segway usage on the IIT campus. The handbook is meant to encompass issues pertaining to: general operating procedures, IIT specifications for approved Segway HTs/accessories and their use, etiquette, safety, storage and security, on campus licensing and penalties for unsafe or improper use.

### 1.2. Methodology

In determining the content and design of the IIT Segway handbook, our group has used several methods: researching the usage of the Segway HT via informal and formal surveys of current owners and through usage by the class members themselves; consulting available sources for information on Illinois bicycle and motor vehicle laws; seeking advice from IIT's general counsel; and considering the content and design of other handbooks and manuals for a wide range of products.

### 1.3. Expected results

The expect results which this document represents were to create a comprehensive handbook outlining proper use of the Segway HT in and around the IIT campus and, as appropriate other local campuses and areas in and around the city of Chicago in general. The length, content and

design of the handbook has been determined by what is believed to be necessary to effectively cover the subject matter.

## **2. Assumptions for the Purpose of the IIT Segway Proposal**

The following are descriptions of assumptions that were made in order to facilitate the realization of this document.

- EnPRO 360: Developing an On-Campus Segway HT Rental and Tour Business, offered in the spring of 2004, will deal with specifics pertaining to the idea of creating a rental business of Segways for the student, faculty and staff. One of the most important basis of this proposal is the idea that IIT will buy a fleet of Segways (20-30) to create this business. Assuming that this is an idea that will be realized in the near future, IPRO 340 is proposing rules and regulations regarding the management of Segway use on the IIT campus.
- Anytime that an “IIT owned Segway” is mentioned, it refers to either one of the Segways from the rentable fleet, or any other Segway purchased by the university for educational, research, and work purposes.
- A “privately owned Segway” is one that is personally owned by any student, faculty and staff member.
- The registration and licensing of Segway HTs and anything else that would have to deal with Segways on the IIT campus will be handled by the Parking Services Office (located in the McCormick Tribune Campus Center) in coordination with Public Safety. For actual future implementation, IIT may consider to create an “IIT Segway Office” that would handle anything (from registration to keeping track of reckless operators) that relates to Segways HTs on the IIT campus.
- Public safety can be called to report a disorderly conductor. They will then forward info to Parking Services to input this information into a database. The Parking Services Office can also be called directly to report a disorderly Segway conductor.
- The software/database mentioned beforehand will handle and store all necessary information for the registration, rental, and maintenance for each Segway HT associated with a user’s general information and violation history.

## **3. Licensing and Registration**

Registration and licensing of Segway HTs for their use on the IIT campus is the similar to the idea of automobiles have license plates for identification, security and safety purposes. In order for any Segway Human Transport to be operated on campus, it *must* be licensed and registered with IIT. This rule applies to both privately owned Segways and IIT owned Segways.

Once the Segway is registered with IIT (information regarding the actual device and/or user is stored into the database), the Office of Parking Services will issue the appropriate license stickers to be placed on the Segway HT.

### **3.1. Registration of the Segway HT**

### 3.1.1.IIT Owned Segway HTs

Each university bought Segway HT will automatically be issued a license sticker. The database will store Segway's serial number and associate a license sticker with it.

### 3.1.2.Privately Owned Segway HTs

The owner must go to the Parking Services Office with the following documents in order to be provided with a licensing sticker: IIT student, faculty, or staff ID card and the Segway HT Proof of Purchase. The database will associate the owner with the serial number of their personal Segway and with the IIT issued license sticker among other important data.

### 3.1.3.Segway HTs Owned by Campus Visitors

Although IIT has been named a Segway friendly campus, for security and safety measures, a visitor must go register their Segway with the Parking Services Office in order to receive a visitor's license sticker. Their information will be temporarily kept in the Segway database so that the visitor avoids being fined for conducting a Segway without a license sticker and helps pedestrians identify the user/Segway in cases of disorderly use.

## 3.2. Licensing of the Segway HT

### 3.2.1.IIT Owned Segway HTs

#### 3.2.1.1.Description of the License Sticker

The license sticker will measure ten inches in length and two inches in width. This was found to be the ideal length and width to fit on the Segway's fender while at the same time being clearly visible from about 5 feet away. The background will be a reflective white and the lettering and logo will be a reflective red. Each individual element of the lettering and IIT logo will have to fit inside a two inch by two inch block. For university owned Segway HTs, the letter used will be "U". Following the letter, will be a three digit number that will be unique to that particular Segway HT. The licensing sticker scheme is designed to reduce the memory load of the Segway user and of people wanting to report a disorderly user. It also provides IIT with stickers for 999 Segways for the time being. The sticker number may be changed for 4 digits in the future to accommodate more Segways. Example is provided in Appendix A.

### 3.2.2.Privately Owned Segway HTs

#### 3.2.2.1.Description of the License Sticker

The license sticker for privately owned Segways is similar to that of IIT owned Segway. The dimensions and colors are the same, with the exception of the licensee sticker number. For student owned Segway HTs, the letter used will be "S". For Faculty owned Segway HTs, the letter used will be "F". For staff owned Segway HTs, the letter used will be "T". Following the letter, will be a three digit number that will be unique to that particular Segway HT. This scheme allows for 999 license stickers for each student, faculty and staff category for a total of 2997 stickers. Again, as Segways become more common and widely used on the IIT campus, the sticker number may be expanded to accommodate more Segways. Example of each type of sticker provided in Appendix A.

### 3.2.3. Placement of the License Sticker:

Each Segway HT will need to have one sticker centrally placed on each fender. This provides visibility of the sticker from all sides of the Segway at all times. Any obstacles obstructing the view to the license stickers should be removed.

#### **4. Campus Segway HT Usage Policy**

According to the Segway Corporation, every Segway HT is designed to work anywhere people walk. In order to support indoor operation, Michelin created a special tire that is non-marring. The Segway HT is narrower than a standard doorway and is clean and quiet. There are zero emissions.

As a safety precaution, however, it is suggested that the Segway HT only be ridden when first entering or exiting a lobby of any IIT building. Upon entering a building the rider should immediately find a parking space for the HT and follow the standard dismounting procedure. If the user must transport an HT through any building beyond the lobby area, it should be done using power-assist mode until the user exits the building. This section provides detailed descriptions of where the Segway can be ridden and isolates potential storage/parking areas in each building.

##### **4.1. Indoor Use**

In academic buildings the Segway HT may be ridden (if necessary) until the user has found a parking space for it. The Segway cannot be ridden beyond the lobbies of the building. If the Segway must be transported throughout the building, it must be done so using power assist mode. The following section provides a description of an area in each campus building where a Segway rack would be installed. A picture and a map of each location within each building is provided with each description. The Segway rack is described in section 7.2.1 and a sketch of it can be found in Appendix B.

##### **4.1.1. Alumni Hall**

Alumni Hall has no elevators and a very high first floor ceiling so it is not desirable to take Segways onto the second floor. There are two large lobbies at either end of the building and both lobbies have ramps leading up to them. The lobbies are both divided into two portions one right inside the door and one under the stairs. The portion just inside the door is largely unused and each lobby has space for at around 20 Segways to be placed in the spaces to the left and right of the door. Segway storage racks can also be placed here if deemed necessary. Since Alumni Hall is small and has a much smaller volume of occupants than many of the other classroom buildings on campus there really is no need for more storage at this time.

##### **4.1.2. Crown Hall**

##### **4.1.3. Engineering 1**

Segway HT use and storage should be allowed in the Engineering 1 (E1) building because its architecture makes it very HT friendly. The hallways and elevator entrance are wide enough to accommodate a Segway without posing a hazard to others.

Regarding possible indoor HT storage areas in E1, one suggested location is the corridor near the west entrance (which now consists of several display cases and bulletin boards). That area measures about 25 ft x 8 ft on each side of the door, adequate enough to comfortably accommodate several Segway HTs. The west corridor of E1 already has electrical outlets, but may need to have a few more installed to charge HTs. Some sort of small bar or rack may also be needed for users to lock their HT to.

An alternate Segway HT storage area in E1 could be in the lobby at the extreme south end of the building, either along the middle windows between the two doors or along the wall outside of Crawford Auditorium. The area near the windows contains “free space” measuring approximately 42 ft x 4 ft, and the alternate storage location outside Crawford Auditorium measures about 34 ft x 6 ft (provided the large plants that are currently located there can be moved).

A third possibility as far as storage in E1 is to put HTs in the two areas on the first floor in the south lobby along the windows between the doors and the walls (leading to the first classroom on each side). Those areas each measure about 8 ft x 8 ft and could accommodate a few Segway HTs. However, it should be noted that any storage area in E1 would possibly require the installation of additional electrical outlets for charging the HTs and some sort of small bar or rack to lock them to.

#### 4.1.4. Farr Hall

Farr Hall does not have an elevator and the hallways are too narrow to ride a Segway HT through. The third floor mosque should also be off limits for Segway HTs. Therefore, it is not a good idea to allow Segway HTs inside Farr Hall. However, provisions for Segway HT storage should be made available outside of Farr Hall under the nearby band shell in the Quad. HTs could be locked to the railing under the band shell so as to protect them from weather conditions. For this suggestion to work, sufficient electrical outlets would need to be installed in that area. The band shell in the Quad seems to be a good location for an outdoor storage space for the Segway HT because it is directly in the middle of Farr Hall, State Street Village and the fraternity and sorority houses—a convenient storage location for any members of the IIT community or visitors who are using a Segway HT on campus and who wish to access those buildings.

#### 4.1.5. Galvin Library

It is not recommended that Segway HT riding be allowed inside the Galvin Library. However, in the interest of protecting the electronic device from Chicago’s inclement weather conditions and from possible theft, it is advised that indoor storage be allowed in the Galvin Library lobby. There is “free space” available on the south end of the first floor lobby (in front of the security gates that are not currently being used). There is also a handicap-accessible door leading from outside directly to that area which would allow a Segway HT user to bring the device into the building using power-assist mode. The space in question measures approximately 11 ft. 10 in. x 14 ft. 8 in., allowing enough room for about 6 Segway HTs to be lined up along the south wall of the lobby or against the rail next to the un-used security gates. To accommodate 6 HTs, the area would have to be equipped with about 3 double-outlets.

#### 4.1.6. Graduate Residence Halls

Baily, Carmen, and Cunning halls have what seems like storage rooms on the 1<sup>st</sup> floor that can be used to store Segways.

##### 4.1.6.1. Baily and Carmen Halls

These buildings have the same structures. They both have a rather small lounge area that leads up to the elevators. Coming in from the south entrance for both buildings, the southeast corner of the lounge can be used. The east side of the corner measures 6ft 7in. There is enough room to fit up to 3 Segways along this wall.

#### 4.1.6.2. Cunning Hall

Has the same structure as the previous two, but is oriented in a different direction. Coming in from the west entrance, the northwest corner of the lounge area can be used. The west side of the wall measures 6ft 10in. There is enough room to fit up to 3 Segways along this wall.

#### 4.1.6.3. Gunsaulus Hall

There is no room in the lounge area nor are the hallways wide enough to place Segways against the walls; therefore a Segway rack cannot be installed in the building.

#### 4.1.7. Herman Union Building

The Hermann Union Building is one of the most Segway HT friendly buildings on this campus. There is an entrance ramp that leads to the handicapped door on the northeast side of the building. Once inside the building, there are two elevators that can be accessed. One elevator is behind the kitchen while the other is towards the southwest entrance of the building. Also, storing the Segway HT inside the HUB could be easily accomplished by utilizing the space in the Gallery Lounge (the wall has 14 outlets and could fit 30 Segway HTs) or the little corner in front of the door to the SOC (the area has two outlets and could comfortably fit six Segway HTs).

#### 4.1.8. Illinois Institute of Technology Research Institute (IITRI)

Like the other buildings on campus, Segway access to IITRI tower is governed by university and building policies. The building does not have stairs that lead to its entrance that would make it easily accessible for Segways. There is a bicycle rack outside on the east side of the building that can be used to secure Segways. There is also a small 38 ½ x 14 ½ ft vestibule on the east side of the building that can house approximately 12 Segways. However, there is no power supply in this space for charging the Segways.

#### 4.1.9. Keating Sports Center

A space for Segways in the main lobby of Keating is a bit hard to locate. We can use the space under the stairs between the pop machines. There are outlets located up against the wall which measures about 15ft (between machines). The maximum height under the base (platform) of the stairs to go up to the basketball courts is 5ft 4in. This would be a good place for the Segways, since it hides them, they are not out in the open. There is room for up to 7 Segways along this wall.

Another space for Segways is at the exact opposite side of the building. The west side of the building is exactly the same as the east with the exception that it has no soda machines against the wall. It does however have a drinking fountain, but room can be made again under the stairs. There is about 26ft of wall space that we can use to prop up the Segways. Unfortunately there are no outlets easily available. Again the maximum height from the floor to the base (platform) of the stairs is about 5ft 4in. There is room for up to 12 Segways along this wall.

#### 4.1.10. Life Sciences

Segway HT use and storage should be allowed in the Life Sciences building. The hallways and elevator entrance are wide enough to accommodate a Segway without posing a hazard to others. The architecture of Life Sciences makes it very Segway HT friendly, as there are ramps at both main entrances (on the west and southeast sides of the building).

Regarding possible storage areas inside the building, the west lobby on the first floor has a space alongside the north wall where a large display case now rests, capable of accommodating 5 to 8 Segway HTs (depending on whether the display case remains in that location). Ample electrical outlets are already available in that location, though some sort of small bar or rack may need to be installed along that wall to provide something for Segway HT users to lock their device to.

An alternate storage space on the first level is along the east wall in the lobby on the southeast end of the building; a rack/bar and electrical outlets would need to be installed for this area to be a viable storage location. The building's elevator entrance is wide enough to accommodate a Segway being transported to another floor (if necessary) either with a rider or using power-assist mode.

#### 4.1.11. Machinery Hall

There is no ideal place to store Segway HTs in Machinery Hall and the hallway is too small and narrow to accommodate the device. There also does not seem to be a need for students to use the Segway in the building, since no classes are held there.

#### 4.1.12. Main Building

It is recommended that Segway storage be allowed in the Main Building, as ample space is available on the lower level. To access the Main Building using a Segway HT, it appears easiest to enter the building through the side entrance on 33<sup>rd</sup> street, which does not require users to traverse any stairways. The side entrance of the building leads directly to the lower level where storage space for up to 10 Segway HTs is available. A suggested location for a Segway HT storage area is just to the north of the stairway on the lower level—an area measuring approximately 11.5 ft x 7 ft. The area in question would need electrical outlets installed, however, to be suitable for storing and charging HTs. Moreover, it should not be necessary for anyone to access the upper levels of the Main Building with a Segway HT; users should be encouraged to store their HT on the lower level since the entrance to the elevator in the main building (about 33 inches across) is too narrow to comfortably accommodate a Segway HT (approximately 32 inches across).

#### 4.1.13. McCormick Student Village

#### 4.1.14. McCormick Tribune Campus Center

The Segway HT may be ridden on any portion of the building that has aluminum flooring. They may not be ridden on any carpet, epoxy, or wood floored areas; the areas where Segways are not allowed include but are not limited to: Center Court Café, University Club dining room, the Barnes and Noble Bookstore, ramps leading to ballroom, University Club and Center Court, and the Student Affairs and Organization areas. The Segway must be ridden using the black key which limits speeds to 6 mph. Any person driving a Segway in a reckless or inappropriate manner may be banned from the MTCC. The easiest ways into the building are through the two sets of sliding doors on State St. and Wabash Ave. but it is also possible to enter through any of the push bar doors located all around the building. It is also possible to enter through the revolving door due to its extra large compartments but this should not be allowed because if someone were to jerk the door there is risk of injury or damage. Due to the architectural nature of the building no permanent Segway storage areas are possible but there is ample wall space throughout the main areas of the building for temporary storage and many outlets available for charging.

While eating in the University Club or using the bathroom, Segways can be left near the reception desk which is always manned by a Public Safety officer. While eating in Center Court Segways can be left against the railing at the top of the stepped seating area or along the railing above the stair/ramp. While eating or drinking around the coffee shop Segways can be placed anywhere around the perimeter of the coffee shop area, the preferred areas being along the railing above the computer terminals or against the raised up area under the tube. There are many outlets placed in the floor throughout this area that can be used for charging. Due to the bookstore's theft detecting equipment Segways should not be ridden inside the store but they can be placed along the railing by the ramp/stairs or above the computer terminals. All the meeting rooms, the ballroom, and the auditorium have ample space along the walls for temporary storage during events and meetings but the Segway must be power assisted into these areas due to either the rooms themselves or the path leading to them being carpeted. The Student Affairs section of the building is carpeted and has very little navigation room so Segways should be left in the aluminum floored areas just outside the three ways to access this area.

#### 4.1.15. Perlstein Hall

Perlstein Hall has a Segway HT friendly entrance located at the northwest corner of 33<sup>rd</sup> and State Streets. There is a ramp that leads to a door that can be opened (with relative ease) by someone on a Segway. Inside, there are places to store the Segway by the main auditorium, or one can store their Segway HTs in the lobby of the west entrance to the building. The only negative is that Perlstein Hall does not have an elevator.

#### 4.1.16. Seigal Hall

Segway HT use and storage should be allowed in Siegel Hall. The hallways and elevator entrance are wide enough to accommodate a Segway without posing a hazard to others. Regarding possible storage areas inside the building, the first floor lobby may be the best storage location, as up to 6 HTs may be stored along the wall outside the A. Montgomery Ward Auditorium. To make that space a practical location for Segway HT storage, however, additional electrical outlets and some sort of small bar or rack may need to be installed against the wall so as to provide something for users to lock HTs to.

#### 4.1.17. State Street Village

State Street Village (SSV) has been designed to be very Segway HT friendly. All residents and visitors should be allowed to store their HT in any one of the first floor lobbies of the State Street Village buildings. Each lobby in SSV contains plenty of "free space" along the walls adjacent to the east-side windows, and contains several electrical outlets (about 12) conducive to charging Segway HTs. Racks, bars or some other sort of simple equipment may need to be installed along the walls so that users will have something to lock their HTs to. If SSV residents prefer to store their HT in their dorm room, that should be allowed provided they do not ride the Segway HT in the buildings but instead take them upstairs and downstairs on the elevators using power-assist mode.

#### 4.1.18. Stuart Building

Coming in from the south entrance on 31<sup>st</sup> St. there is a lounge area on the east side of the building leading into the computer laboratories. The following are two places where Segways can be kept.

The wall that encloses room 115 has one outlet and measures 13ft and 9.5in from the end of the wall to the door of room 115. The outlet is about 2ft 6in from the door and about

10ft 11in from the end of the wall. There is enough space for up to 6 Segways along this wall.

The wall that enclosed room 113, on the southeast side of the building which has two outlets on this wall which measures 24ft 4in from door to door. The outlet located on the east side of the wall 2ft 7in from the end of the wall and the other outlet located on the west side of the wall is 2ft 8.5in from the end of the wall There is enough space for up to 11 Segways along this wall.

Coming into the building from the west side entrance is a lounge outside the auditorium (room 104). There is one outlet found in the middle of the wall. This wall measures about 34ft 2in. The outlet is located at about 16ft 7in from the south end of the wall. We do have to note that this wall is not flat but it is slightly curved. There is enough space for up to 15 Segways along this wall.

#### 4.1.19. Vandercook College of Music

This building is unsuitable for Segway use, even in power assist mode. To begin, there is a set off stairs leading up to the main entrance to this building, which makes it a bit difficult to enter the building. Furthermore, there is no wheelchair-accessible ramp or side entrance that would facilitate entrance to this building. There is a however a loading ramp on the north side of the building, which is meant for freight only. The main lobby is a small room (23 x 23 ft) with power outlets and can be used to store approximately 6 Segways

#### 4.1.20. Wishnick Hall

Wishnick Hall has a Segway HT friendly entrance located at the northwest corner of 33<sup>rd</sup> and State Streets. There is a ramp that leads to a door that can be opened (with relative ease) by someone on a Segway. Inside, there are places to store the Segway by the main auditorium. There is also an elevator that can be utilized to get to all floors of the building.

### 4.2. Outdoor Use

The Segway HT may be ridden on any paved path or sidewalk on campus as long the user follows the safety and etiquette guidelines outlined in section 5. Segways are not permitted to be ridden anywhere pedestrians are not allowed to walk. This includes any “student shortcuts” across grass fields or the street, unless no paved path is provided. Riding a Segway HT or using power-assist mode to guide it across a street is permitted, provided the user obeys all posted signs and pedestrian traffic signals.

## 5. Safety and Etiquette

Safety and etiquette poses important issues regarding the use of Segway on the IIT campus. It is strongly suggested for anyone that owns and/or operates a Segway HT to read the user’s manual that comes with it. The IPRO 340 group, as mentioned in the introduction, will also be responsible for the content of an IIT Segway Handbook. This handbook will cover the majority of the data that can be found in the Segway user’s manual with additional features pertaining specifically to the IIT campus. This handbook will be distributed to owners of Segway HTs that wish to use their machine on IIT’s campus. A student, faculty and staff member will also have to read this handbook prior to renting a Segway out for the first time.

### 5.1. Safety

Following proper etiquette and common sense, the Segway user can avoid accidents from happening. For example swerving in between pedestrians can be dangerous and result in injury of not only the user but the surround pedestrians also. This is also one of the main reasons why the Segway HT should not allowed to be ridden on the grass at IIT, the terrain may be uneven causing a user to tip and fall.

All IIT owned Segways will be fitted with a headlight so as to provide sufficient light for the user to see their terrain. Privately owned Segways will be required to have a headlight as well. Having this headlight also makes the Segway much more visible to pedestrians and vehicles.

The license stickers are another important safety feature because they are suggested to be made with reflective material. Although the Segway's wheels and back part of the platform do have a small reflective strip on them, these may not prove to be sufficient. The license sticker, as described in section 3, will be a 10x2 inch reflective strip located on each fender of the Segway, thus providing further visibility to other pedestrians and vehicles.

Any abuse, blatant neglect and utter disregard for the safety of the conductor and pedestrians and IIT property (including the actual Segway itself) will result in penalties and fines as described in section 6. As mentioned in section 7.1.3, it is at the user's own discretion and risk to operate a Segway HT on the IIT campus.

## 5.2. Operating Speed

The Segway HT is capable of operating at different maximum speeds, depending on which of three keys is used by the rider, as follows:

- Black Key: up to 6 MPH
- Yellow Key: up to 8 MPH
- Red Key: up to 12.5 MPH

It is recommended that Segway HT users must use discretion in choosing an appropriate speed based upon their skill level, weather and sidewalk conditions, and the amount of pedestrian traffic around them. When there is heavy pedestrian traffic nearby, it is advisable to maintain a sidewalk speed below 8 MPH therefore, the use of the Yellow key may be valuable to insure that this "safe" speed is maintained. The only exception to this rule is the MTCC, which enforces an indoor speed of up to 6MPH. Please see section 4.1.14 for more details regarding the MTCC.

## 5.3. Courtesy

Etiquette on a Segway HT should be handled much like one would if they were driving a car or riding a bike:

- If a user comes to an intersection, they should allow the person who was there first to proceed first
- Upon arriving at an intersection at the same time as someone else, the person to the left should yield to the one on the right
- Passing should be done on the left if possible, it is recommended for the user to identify this attempt to pass with a quick "to your left" call to the pedestrians that are being passed from the rear
- The user should always signal their intentions to pass or turn if possible; usually this maybe done simply by saying "Excuse me" or by using a horn or bell attachment (if available)
- The user should not be weaving in between pedestrians while riding the Segway

## 6. Violations, Penalties and Fines

Any person on campus may report a disorderly conductor or accidents to Public Safety or the Parking Services office as long as they have the Segway license number with them. Similar to automobiles, it would be difficult to track down a person without knowing the license number. Public Safety would then forward this information to Parking Services, where it will be kept in a database of reckless conductors and any violations they commit. Keeping track of these people will help Parking Services help take the appropriate actions regarding these conductors, thus keeping pedestrians safe and keeping a good image of the school. If a user feels that they have been wrongfully fined, they may contest.

For the following sections below, towing a Segway refers to the act of taking the Segway HT to the Parking Services Office by means of the user being escorted in power assist mode by a public safety officer or by transporting the Segway and the user in an automobile. In all cases that a Segway is towed, there will be a report to be filled out and stored into the database regarding the nature of the tow.

### 6.1. Licensing and Registration

6.1.1.If a user is found riding on campus with a non-registered Segway for the 1st time, the fine is \$25.

6.1.2.If a user is found riding on campus with a non-registered Segway for the 2<sup>nd</sup> time, the fine is \$50 and given a warning.

6.1.3.If a user is found riding on campus with a non-registered Segway for the 3<sup>rd</sup> time, the fine is \$75. The person's Segway will be towed to the office of Parking Services and will remain there until the owner registers the Segway.

### 6.2. Indoor Use – Privately Owned Segway HTs

6.2.1.If the user is found riding the Segway in the hallways of any building other than the Herman Union Building and the McCormick Tribune Campus Center, for the 1st time, the user will be fined \$25.

6.2.2.If the user is found riding the Segway in the hallways of any building other than the Herman Union Building and the McCormick Tribune Campus Center, for the 2nd time, the user will be fined \$50 and given a warning.

6.2.3.If the user is found riding the Segway in the hallways of any building other than the Herman Union Building and the McCormick Tribune Campus Center, for the 3rd time, the user's Segway will be towed; the user will be fined \$75 to get it back and will be banned from using the Segway on the IIT campus for the remainder of the semester.

6.2.4.If a banned user is found riding a Segway on the IIT campus, their Segway will be towed to the office of Parking Services and will need to pay a fine of \$300 to get it back. The user will be banned from using the Segway on IIT campus for the rest of the academic year.

### 6.3. Indoor Use – IIT Rented Segway HTs

- 6.3.1.If the user is found riding the Segway in the hallways of any building other than the Herman Union Building and the McCormick Tribune Campus Center, for the 1st time, the user will be fined \$25.
- 6.3.2.If the user is found riding the Segway in the hallways of any building other than the Herman Union Building and the McCormick Tribune Campus Center, for the 2nd time, the user will be fined \$50 and given a warning.
- 6.3.3.If the user is found riding the Segway in the hallways of any building other than the Herman Union Building and the McCormick Tribune Campus Center, for the 3rd time, the Segway will be taken away from the user (towed), will be fined \$75 and will be banned from renting and operating a Segway for the rest of the semester.

#### 6.4. Outdoor Use – Privately Owned Segway HTs

- 6.4.1.If the user is found riding recklessly around the IIT campus (dangerously swerving between people and/or riding at 12.5MPH) the 1<sup>st</sup> time, the fine is \$25.
- 6.4.2.If the user is found riding recklessly around the IIT campus (dangerously swerving between people and/or riding at 12.5MPH) the 2<sup>nd</sup> time, the fine is \$50 and the user will be given a warning.
- 6.4.3.If the user is found riding recklessly around the IIT campus (dangerously swerving between people and/or riding at 12.5MPH) the 3<sup>rd</sup> time, the user's Segway will be towed, the user will be fined \$75 to get it back and will be banned from using the Segway on the IIT campus for the remainder of the semester.
- 6.4.4.If a banned user is found riding a Segway on the IIT campus, their Segway will be towed to the office of Parking Services and will need to pay a fine of \$300 to get it back. The user will be banned from using the Segway on IIT campus for the rest of the academic year.

#### 6.5. Outdoor Use – IIT Rented Segway HTs

- 6.5.1.If the user is found riding recklessly around the IIT campus (dangerously swerving between people and/or riding at 12.5MPH) for the 1st time, the user will be fined \$25.
- 6.5.2.If the user is found riding recklessly around the IIT campus (dangerously swerving between people and/or riding at 12.5MPH) for the 2nd time, the user will be fined \$50 and given a warning.
- 6.5.3.If the user is found riding recklessly around the IIT campus (dangerously swerving between people and/or riding at 12.5MPH), for the 3rd time, the Segway will be taken away from the user (towed), will be fined \$75 and will be banned from renting and operating a Segway for the rest of the semester.

#### 6.6. Accidents Involving Pedestrians and IIT Property – Privately Owned Segway HTs

In any case of an accident, the Segway(s) involved will be towed. If the user is at fault, then the fines described below apply. If the user is not at fault, they will not have to pay the fine. For insurance issues involving Segways, please refer to the insurance section (7.1.3) for more information.

- 6.6.1.If the user has no previous record of any violations and they get into their 1st accident involving pedestrians and/or IIT property, the user's Segway will be towed and the user will be fined \$50 to get it back.
- 6.6.2.If the user has been fined once before regarding any type of violation (driving recklessly, no sticker, etc.) and they get into their 1<sup>st</sup> accident involving pedestrians and/or IIT property, then the user's Segway will be towed and the user will be fined \$75 to get it back and will be issued a warning.
- 6.6.3.If the user has an accident on record and they get into their 2<sup>nd</sup> accident involving pedestrians and/or IIT property, then the user's Segway will be towed and the user will be fined \$75 to get it back and will be issued a warning.
- 6.6.4.If the user has been issued a warning of any type previously described and gets into an accident involving pedestrians and/or IIT property, then their Segway will be towed and the user will be fined \$100 to get it back. The user will also be banned from using their Segway on the IIT campus for the remainder of the Semester.
- 6.6.5.If a banned user is found riding a Segway on the IIT campus, the Segway will be towed and the user will need to pay a fine of \$300 to get it back. The user will be banned from using the Segway on IIT campus for the rest of the academic year.

#### 6.7. Accidents Involving Pedestrians and IIT Property – IIT Owned Segway HTs

In any case of an accident, the Segway(s) involved will be towed. If the user is at fault, then the fines described below apply. If the user is not at fault, they will not have to pay the fine. For insurance issues involving Segways, please refer to the insurance section (7.1.3) for more information.

- 6.7.1.If the user has no previous record of any violations and they get into their 1st accident involving pedestrians and/or IIT property, the Segway will be towed and the user will be fined \$50.
- 6.7.2.If the user has been fined once before regarding any type of violation (driving recklessly, no sticker, etc.) and they get into their 1<sup>st</sup> accident involving pedestrians and/or IIT property, then the Segway will be towed, the user will be fined \$75 and will be issued a warning.
- 6.7.3.If the user has an accident on record and they get into their 2<sup>nd</sup> accident involving pedestrians and/or IIT property, then the Segway will be towed, the user will be fined \$75 and will be issued a warning.
- 6.7.4.If the user has been issued a warning of any type previously described and gets into an accident involving pedestrians and/or IIT property, then the Segway will be towed and the user will be fined \$100. The user will also be banned from renting and operating a Segway for the remainder of the semester.

### 7. Security, Storage and Parking

Securing the Segway HT is an important element considering that it is a rather costly piece of technology. Although it does come with its own security features, additional external security

measures should be taken. The Segway racks described in section 7.2.1 provide a secure area to park or store a Segway HT on the IIT campus in a similar fashion to bicycle racks. Student, faculty and staff are encouraged to use these racks instead of locking a Segway to a staircase rail or meter. This section also touches on the important subject of insuring a Segway HT. Two cases present themselves here: individual policies for Segway owners and insurance policies written for an institution like IIT.

## 7.1. Security Devices

### 7.1.1. Built-In Security

Access to the Segway is controlled by a set of encoded smart keys. The 64 bit encoding scheme of the keys makes the Segway very difficult if not close to impossible to crack, thus rendering it useless to thieves. Ordering replacement keys from Segway is not an option either for a thief, since one has to provide proof of ownership to avail of this service. Apart from this, attempting to hack into the Segway requires access to advanced hardware, software and engineering know-how, apart from a significant investment in time, rendering it unattractive to potential thieves. However, the keys can be copied by others if they have access to the original.

### 7.1.2. External Security Options

Even with all the built-in deterrent measures additional security can be provided for the Segway by using regular mechanical locks in a similar manner as in bicycles. Chain Locks or U-Locks can be used, and are strongly recommended, to secure the wheel or the handlebar to permanent structures. Two locks may be employed together to further reduce the chance of theft. Locks with motion sensor alarms are also available to provide an added sense of security.

External locks will be provided with IIT owned Segways to avoid absolutely any possibility of being stolen.

### 7.1.3. Insurance

#### 7.1.3.1. Privately Owned Segway HTs

Segway owners are strongly encouraged to purchase insurance through any insurance company that covers Segways. Some companies that offer competitive rates are Progressive, State Farm and Allstate. Similar to auto insurance, these companies base their rates on the owner's sex, age, location, use of vehicle and driving record. These companies offer both liability and comprehensive and collision coverage. The liability portion of the insurance would cover the other party if a Segway user gets into an accident with pedestrians or other Segway users. The comprehensive portion of the insurance will cover any physical damage afflicted to the Segway in a non-collision scenario. For example if someone accidentally knocks over the Segway or if a tree falls on it. This section also provides some type of protection if theft occurs. The collision insurance portion covers any damage physically caused to the Segway through means of a collision accident, for example if two Segway users crash into each other and the handlebars break. For more details regarding specific coverage, it is recommended to get a quote from an insurance company that insures Segways HTs.

Although insurance is not mandatory and not required to register a Segway, IIT will not be responsible for any loss or damage to any Segway that is not IIT owned. IIT will also not be responsible for personal injuries caused from riding the Segways (this refers

to the conductor and the surrounding pedestrians). The student, faculty, or staff member may use their own personal Segway on campus at their own risk.

#### 7.1.3.2. IIT Owned Segway HTs

Insurance cannot be bought through the insurance companies mentioned in the previous section because these do not offer commercial (business) policies; they specialize in personal, individual policies only. The university would need an insurance policy that would cover not only the Segway itself and anyone involved in an accident, but also any circumstance that can be generated from the use of Segways on the IIT campus.

After conducting some research, it was found that IIT's general liability carrier, United Educators, would in fact cover Segways and Segway related issues. This general liability would cover the university for example in the case of a lawsuit against IIT related to accidents on Segways. One problem posed here is that the general liability is not the only type of insurance the Segways would need. A property damage regarding Segways policy would also have to be written up to protect and restore any IIT property that is damaged in an accident. If the university ever plans for certain staff members to use them on their job, then the workers compensation policy needs to be rewritten to include Segway related issues on top of the other policies that can be involved in a case like this. There are many other different issues that, if the Segway rental is to be established on the IIT campus, will have to be assessed in coordination with any IIT insurance underwriter.

Of course any changes made to any insurance policy at IIT can be done, but for a certain price and circumstances. IIT's underwriters would have to assess what kind of damage could be done on a Segway, who will be riding them, how they will be riding them, what measures can be taken to make them safer, etc. Since the Segway HT is a fairly new technology there are no set rules to go by to establish an insurance policy(s) like the one(s) being described. This can cause any amendment made to the insurance policies become costly. IIT would then have to assess if changing the policies and allowing Segway HTs to be widely used on campus is worth the cost.

#### 7.2. Storage/Parking

Unlike bicycles, the Segway Human Transport is composed of delicate and costly electronic devices. It would therefore be best to provide designated spaces and storage racks inside IIT buildings to park and store Segways, and thereby avoiding the risk of damage to the Segway due to exposure to rain, snow and extreme cold/hot weather. Section 4.1 described ideal areas for Segway racks within all of the buildings on the IIT campus whereas this next section describes the Segway rack in itself.

##### 7.2.1. IIT Segway Rack

The IIT Segway rack is designed to take up a minimal area of space within each building, providing the students, faculty and staff with a secure and convenient place to park the Segway. It also allows for the Segway to be charged while parked.

### 8. IIT Segway HT Student, Faculty and Staff Survey

The survey shown in Appendix C will be used to gather information from the IIT community regarding the Segway HT. Overall the survey will help determine if there is a market for the IIT rental

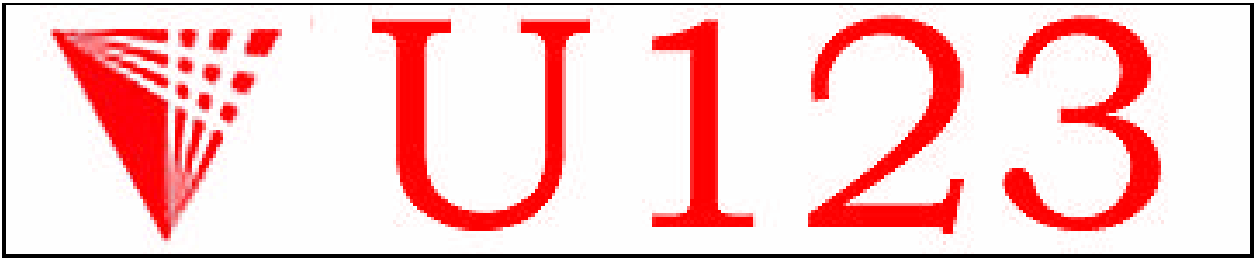
business that EnPRO 360 will further develop. They will be able to continue research based on the results themselves to formulate the business plan for the rental of the Segways. In particular, the survey will gather information regarding the feasibility of the rental idea, the community's opinion of the Segway HT and the range for pricing of the rentals, among other concepts.

The survey will be distributed starting in November 2003 by means of the internet through the IIT Segway website ([www.segway.iit.edu](http://www.segway.iit.edu)) and through e-mail and by publicly circulating a paper version. The survey will most likely be concluded by the EnPro 360 in the spring semester of 2004, giving a large amount of time to collect data to include new students enrolling for the spring semester. The survey results will be analyzed by the EnPRO 360 team to use as they see fit.

## **9. IIT Segway Rental**

Appendix A – IIT License Sticker

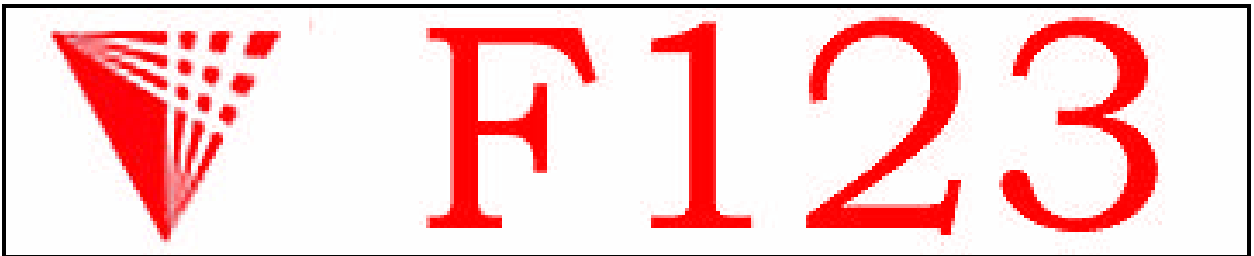
Sticker for University (IIT) owned Segway HTs



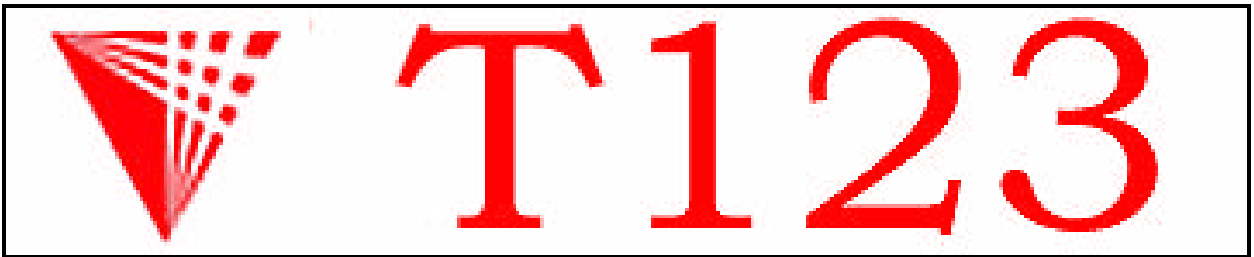
Sticker for Student owned Segway HTs



Sticker for Faculty owned Segway HTs



Sticker for Staff owned Segway HTs



**Appendix B – IIT Segway Rack**

Appendix C – IIT Segway HT Student, Faculty and Staff Survey

**IPRO 340: Exploring Ways to Integrate the Segway Human Transporter into IIT Life for Students, Faculty and Staff**

The Segway Human Transport (Segway HT) is an electric scooter that balances itself and responds to body movement to go forward or backward. You have probably seen some students riding them around campus. IIT has been named the 1<sup>st</sup> Segway friendly campus in the U.S. but what does it mean to be Segway friendly? It is up to us, IPRO 340 to figure this out. To do so, we require feedback from the IIT community. Please fill out the survey below as best as you can. In anticipation we thank you for your time and input.



For questions with choices 1 through 5,

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

Major \_\_\_\_\_

Year \_\_\_\_\_

- |   |       |       |       |   |   |
|---|-------|-------|-------|---|---|
| 1) Have you ridden a Segway HT?   | Yes   | No    |       |   |   |
| 2) Segways are fun to ride  | 1     | 2     | 3     | 4 | 5 |
| 3) Segways are dangerous to ride  | 1     | 2     | 3     | 4 | 5 |
| 4) Segways are dangerous for pedestrians  | 1     | 2     | 3     | 4 | 5 |
| 5) Segway HTs are selling for about \$4,495.00 (shipping and taxes not included) on Amazon.com, but they are available to students for \$3596.00 (shipping and taxes not included). |       |       |       |   |   |
| a) I would buy a Segway for this reduced price  | 1     | 2     | 3     | 4 | 5 |
| b) If financing was available, I would buy a Segway.  | 1     | 2     | 3     | 4 | 5 |
| 6) Pretend that you own a Segway or maybe you currently own one.  |       |       |       |   |   |
| a) I would ride my Segway on campus.  | 1     | 2     | 3     | 4 | 5 |
| b) I would ride my Segway in IIT buildings.   | 1     | 2     | 3     | 4 | 5 |
| 7) Let's say that IIT bought 30 Segway HTs to rent them out to students, faculty and staff.   |       |       |       |   |   |
| a) It would be cool if we could rent Segways  | 1     | 2     | 3     | 4 | 5 |
| b) If available, I would rent a Segway.   | 1     | 2     | 3     | 4 | 5 |
| c) How long would you prefer to rent it for?  | Hour  | Day   | Week  |   |   |
| Semester  |       |       |       |   |   |
| d) How much would you be willing to spend?  |       |       |       |   |   |
| Hourly  | \$1   | \$3   | \$5   |   |   |
| For a Semester  | \$350 | \$500 | \$600 |   |   |

If you would like to learn more about IPRO 340 and the Segway HT, please visit our web page @ <http://segway.iit.edu/> or Segway LLC web page @ <http://www.segway.com/>