**Abstract**

The originator of accessible GPS and a teacher who focuses on effectively applying these navigational concepts discuss GPS options and how to foster travel confidence.

**Extended Abstract**

**Title**

Environmental Literacy: GPS for Visually Impaired Travelers

**Authors**

Craig Phillips

Certified Orientation and Mobility Specialist

Teacher of the Blind and Visually Impaired

cphillips@kssdb.org

Mike May

President, Sendero Group

Email: mikemay@senderogroup.com

**Paper Summary**

**GPS Overview**

The Global Positioning System (GPS) combined with ever-growing location databases, presents the opportunity for those who are blind or visually impaired to “see” location information (street signs, building names, etc.) through an audible and/or Braille representation of the environment. It goes without saying that GPS and Orientation and Mobility (O&M) are made for each other. By providing a “virtual doorway” to the environment, the traveler with a visual impairment now has more opportunities to interact with the environment and develop “environmental literacy.”

With the development of portable information devices, location information is becoming available to an increasing number of blind and visually impaired individuals and should be an essential part of O&M instruction. With this boon in wayfinding technology, blind people are no longer limited to the 1% location information they could previously get from a sighted companion. The blind traveler can now be a co-pilot in a car, not a passive passenger. They can keep the taxi driver honest or enjoy hearing about the sites and businesses being passed while in a car, bus or even on foot.

**GPS Benefits**

The benefit of GPS for outdoor wayfinding has been formally researched by Paul Ponchillia of Western Michigan University. This research consisted of three studies which found that using accessible GPS resulted in the participants reorienting eight times faster, finding locations twice as fast and locating targets with a 95% success rate, compared to 10% success without GPS assistance. (Ponchillia, 2007, 2007a)

It is fair to say that the current GPS technology offers users many benefits bearing in mind that there are also limitations, issues like accuracy and seamless availability. It is best to start integrating location information into our lives rather than waiting for perfect worldwide centimeter accuracy. Those who wait for the perfect solution and don’t start learning how to utilize location information now to further their orientation and understanding of the environment are missing out on an essential tool.

**GPS Options**

Accessible GPS systems have been on the market for over 10 years. The question is no longer if a blind person should have access to the surrounding location information but rather what are one's individual wayfinding requirements and which system best addresses those needs. The great news for consumers is that there are at least eight accessible GPS options. Since one size does not fit all, there is a choice to be made.

The five different types of accessible GPS systems are:

Accessible Portable Data Assistants (PDA) Options

Mobile Phone Options

PC Options

Stand-alone Options

Partially Accessible Options

**Techniques for Teaching and Learning**

Understanding the general parameters of GPS navigation helps the trainer and user to better apply the GPS, where it is beneficial, while avoiding its weaknesses. For example, GPS can be helpful in directing one to a building but not always to a specific doorway. Setting realistic expectations is essential in utilizing GPS as with any tool.

Many questions need to be addressed to integrate electronic "orientation" information effectively into “mobility” for students, clients, and instructors. The following are the “Who?” “What?” “Where?” “Why?” and “How?” frequently asked questions:

• “Who are the best students?”

• “What is the best device to use?”

• “Where do I find support for purchasing a device?”

• “Why is it a necessary part of instruction?”

• “How do I integrate GPS effectively in my Orientation and Mobility instruction?”

Each user has unique orientation and mobility needs. The learning progression for the various aspects of GPS depends on the user's situation. Some users may in fact never use the active pedestrian mode of a GPS while benefiting greatly from the virtual exploration capabilities. Users should not worry about mobility while first learning GPS. This means starting with virtual exploration, then using GPS in a vehicle, then with a sighted guide and finally walking independently with active GPS guidance.

In this presentation, we will discuss the elements of GPS common to all the accessible systems as well as the benefits and weaknesses of GPS common to all devices. We will give an overview of all systems and use the BrailleNote Apex and Trekker as examples of two types of accessible GPS. The value of location information is fundamental to the user having the motivation to learn and actively use whichever GPS device best suits him or her. You will leave this presentation with knowledge of the current accessible GPS products as well as an understanding for the parameters of GPS for the traveler with a visual impairment, examples of how to effectively use the information to nurture the development of travel confidence and experiential knowledge, and tactics to foster the development of control in the environment.

**References**

**Phillips, C.,** *Getting from Here to There and Knowing Where: Teaching Global Positioning Systems to Students with Visual Impairments*. Journal of Visual Impairment and Blindness. 105, 10.

**Ponchillia, P. E., MacKenzie, N., Long., R. L., Denton-Smith. P., Hicks, T. & Miley, P.** (2007). *Finding a target with an accessible GPS*. Journal of Visual Impairment and Blindness. 101, 8.

**Ponchillia, P. E., Rak, E. C., Freeland. A. L., & LaGrow, S. J.,** (2007a). *Accessible GPS: Reorientation and Target Location Among Users with Visual Impairments*. Journal of Visual Impairment and Blindness. 101, 7.