**Global Positioning Systems and the Traveler with a Visual Impairment: “Who?” “What?” “Where?” “Why?” and “How?”**

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Let me just start formally with a welcome to Perkins e-learning's webinar series today. It's Wednesday, February 20 15 my name is Robin and let me welcome you to today's presentation on global positioning systems. The traveler with the visual in Pearman. Our e-learning webinars are presented throughout the year on a monthly basis. You may register to attend life, as you have today, at no fee. You can view recorded webinars at any time or place that suits your schedule. The series is one of the offerings in our professional development program which includes publications, newsletters, webcasts, online and in person classes and self-paced study. You can see our entire listings at our website perkins.elearning@perkins.org today's presentation is also made possible by the whole person of Kansas City Missouri. That offers a broad range of services to individuals with disabilities to increase their ability to perform day-to-day activities, build confidence and improve the many skills they need to live and work in their community. We thank them for their partnership today. Today's presentation by Craig Phillips who is a COMS working in Kansas will cover the parameters of GPS in general for the traveler with a visual impairment provide examples of how to effectively use GPS to nurture the development of travel confidence and experience in learning. I mentioned that I know a lot of you are new here today so let me just explain about how the technology works. You are all muted. It's helps us keep the noise level down. If you are able to use a headset or headphones, or external speakers, you might find that sound is a little stronger than your desktop or laptop device. There is also a live captioning occurring so if you would prefer to have that captioning window made larger, you can enlarge that for yourself. The same is true of the audio. It will enable Craig here in a second. One of you asked in a chat box about being able to access or save the presentation. Yes we do record this event, and it will be available tomorrow on our website. Those of you who registered will be able to get a copy of that. We appreciate your feedback, and your topic suggestions. When you receive that information about the recording you will also receive a survey. We hope you will give us time to let us know other topics you are interested in. Let me go heading introduce today's speaker and invite Craig to enable his video. Craig Phillips is a certified orientation and mobility specialist. And a licensed teacher of the blind and visually impaired. He is recently retired from the Kansas state school for the blind. His teaching experience has been in the public and residential school setting with adults through state rehab services, and as an adjunct instructor for Missouri State University's program to train O&M specialists. His article getting from here to there, and knowing where teaching GPS to students with visual impairments was published in the Journal of visual employment and blindness in November in November 2011. Welcome to Perkins, Craig.

Hello. Hello. Hello. Thank you very much, Perkins, for the opportunity to talk with all of you about GPS. First, many of you are COMS and I always say in my presentation and conferences and I will say the same thing here, it is always a treat to talk with COMS because I firmly believe that we are the salt of the earth. Being in orientation and mobility specialist is the best thing I have ever done. I am sure that all of you would agree. Today we will talk a little about global positioning systems, and the traveler of the visual impairment. I will try and answer the question who? What? Where? Why X and how?. I will read some of the slides in case some of the people in the audience are visually impaired.

We in Kansas City have a lot going for us. We are broadcasting today from the whole person. We are known for our barbecue. It is very, very good. We have the [ NULL ] leagues Museum, and the shuttle in your screen is the Nelson at Ken's using. The slide on your left is the Plaza which is all that the Christmas time. Further to the left, slide, is the World War I Museum also called the liberty Memorial. I want you to think about these locations in that Kansas City area. We will come back to the millisecond. Berthold Lowenfeld said that Ryan Bliss imposes the following limitations. In the range and variety of experiences, and the ability to get about, and in the control of the environment and the self in relation to it. I think that that is one of the keys to using GPS with our clients in our students. I would say that many of our students and clients have very, very little control. They don't have the ability to go to any of those locations in Kansas City without some intervention with others. However, using GPS, gives them the control to go to any one of those places. They may have to hire a driver, they may walk, they may use public transportation. The bottom line is, they could set a route to one of those destinations, and go. Because control is lacking in most of our clients and students. Because my colleague Paul Ehresman said it the best in his theory of relativity. You are only as independent as your relatives allow you to be. The law is very supportive of using a system of technology to take the place of vision and get through - - and use it to supplant vision. In educating blind and visually impaired students in the Federal Register, published in June 8 of 2000. It lays out all of the parameters for educating children who are blind and visually impaired. Assistive technology plays a huge part. Assistance to the states for the education of children with disabilities and preschool grants for children with disabilities published in the Federal Register in August 14 published in the Federal Register in August 14, 2006, is the revision of IDE eight. And also talks about using assistive technology.

The important thing we talk about using any kind of device, in any kind of technology and our business is data will be far more important to your superiors then your opinion. My opinion is about as valuable as a bucket of warm spit. But if I can cite the data that shows that my client or student has difficulty learning the environment, I have a better chance of buying that GPS device. And I - - on the screen right now is a picture of three pick all on a bar and one of them says to the other one argue hissing and moaning, or can you verify what you're saying with data? I would urge you to use data when you're talking about buying any kind of technology. Especially a GPS device. We prepare for using GPS just like we do every other lesson in O&M. We talk about positional concepts, we talk about compass orientation, we use landmarks, use context clues, we use visual maps, and we use tactile maps. I've used the Wheatley on a regular basis. I was one of the field testers for tactile town, and I use wallpaper maps on a rate does regular basis and collage and Braillon. When we talk about GPS. I am presuming that many of you have very limited use with GPS. Although I see by the number of people that are on the list listening and I see a couple of my former students. I know they are tuned into using GPS. GPS, we will take you through a little bit of GPS 101. The first GPS satellite was launched in 1978. It was built to last about 10 years. It weighs approximately 2000 pounds, and there 17 feet across with solar panels. The satellites orbit 12,000 miles above the earth. There are 20 There are 24th - - twice for satellites which are constantly moving. And to complete orbits are complete in less than 24 hours. They travel at speeds of roughly 7000 miles per hour.

Pictured on your screen is a depiction of how this GPS system works. You have orbits going around the earth with satellites in the orbit. There are 24 satellites and six or double planes, for satellites in each plane. The accuracy resolution of GPS is plus or -50 feet. This is the civilian resolution. If it was military resolution it would count the hairs on our head. But it is not military resolution. It is merely civilian. It is the same resolution you get in your automobile which is = or- 50 feet. It works in any weather conditions anywhere in the world. There are no subscription fees for access charges. And it works 24 hours a day. The signals travel by line of sight. Therefore they can go through clouds, glass, plastic but they cannot go through most solid objects such as buildings and mountains. That is why GPS does not work inside buildings. We're getting there, but we're not there yet.

Triangulation is a concept that occurs when it takes three satellites to calculate. HUD position which is latitude and longitude, and track movement. Four or more satellites are used to cattle late - - calculate a 3-D position attitude, longitude and latitude and track movement. And pictured on the screen, is an individual holding a GPS receiver. For satellites are above him. They are measuring the distance from the receiver to the satellite. The algorithm inside of the GPS device then calculates based upon the distance to the satellites, and your position on earth exactly where you are. Think if you will, that those satellites are 12,000 miles above Earth. Is very important when we talk to students about using GPS, and boast of my students are absolutely excited and thrilled and dying to learn about it. That interest is a huge piece. I went to the O&M conference last fall, in San Antonio, and Mickey Emilio talked about creating a curious learner. I think we really need to look at that with our students. And develop that interest in learning what is around them in space as well as where they are. I firmly believe that it should be a constitutional right to know where you are in space. Perceived utility is very important. I have had students that did not embrace the concept of GPS simply for the fact that they had enough vision that they thought they could get by without knowing where they were. Or my one student who comes from a large family, that their houses very huge, which I perceive to include wealth, and he does not seem to think that he will ever need GPS. Maturity is far more important than age. I start generally with students who were three. Depending on their maturity level. I start at age 3. Cognitive ability is very important. Knowing the concepts of what we are talking about is very important. You do have to think when you're out in the street. Dexterity is important because you have to operate the device and there are buttons to push. And in the apps, there are places where your fingers have to be. A route concept is important as well as stamina to create the route. And while techiness is important, it is not essential.

There are Tenney essential features that I think must be included for any traveled with an individual with impairment. Turn by turn, block by Vaclav route directions. They announce your position in space, and the direction of your travel before and after each route segment. Upcoming intersection type and roundabouts are automatically announced. Pedestrian routes created for distance, motorized routes that are created for time. A built-in pedometer is important. Often route detection and route correction within a city block is very essential. The concept of what is around is very important. We talk about what's around we talk about near within 300 m or 500 feet, and far from 500 feet up to 5 miles. Which doesn't preclude that it ends at 5 miles. We could set a route from where I am sitting at the whole person on Main Street in Kansas City, to a building at the University of Kansas by entering address entry and it would take - - it would direct us there. An essential feature is that it automatically and ounces POI's, landmarks and POI's and pedestrian mode. As you walk it automatically tells you what is around you. For incidental learning. It automatically and ounces landmarks and waypoints, personal landmarks and waypoints in motorized marks. When we are talking about using a device for a student, Mike May said it very well. The difficulty or simplicity of learning how to use a system must work for the student first and the teacher second. I am not really good with working with the braille note apex simply for the fact that I don't have a lot of practice with it. It is a dedicated device and so I don't get as much practice with it. But it is incumbent upon me to learn it, because some of my students have it. Because the most essential thing when we teach our students technology is that it's not about us. Sometimes we have to rephrase that and think about that. It's really not about us, and so we have to learn what the student will use the best.

The devices that I'm very familiar with and very well-versed in, are the BrailleNote Apex, the Sendero Trekker Breeze, the seeing eye GPS app, I'm learning. And the Garmin Oregon 450. I will take you through these devices. This is a picture on the screen of the BrailleNote Apex made by the Sendero commission - - company. It has a primary and secondary voice, it has a refresh - - refreshable braille display to screen for the deaf and blind traveler. A Bluetooth receiver, it uses Tom Tom maps, and it's made by Sendero and distributed by Humanware and it costs about $5495 for the BrailleNote itself in an $599 for the GPS. Connection. This is as of a couple weeks ago when I put this together. The Trekker Maestro is on your screen. I will tell you that this is a monument to the stupidity of man. It had 36 buttons, many of them dual function, it had a battery which you had to reset on a regular basis, it was the hardest device I've ever worked with. I only included that because if you have one sitting in a drawer at your office, Humanware will take this back and give you a $200 credit on a Trekker Breeze. So by all means take advantage of it. Otherwise it makes a great paperweight.

The Trekker Breeze is my device of choice. I like it because it has large distinctive buttons, it has a built-in GPS receiver and speaker, as well as a secondary external speaker, it uses Navteq-here maps it has six hours of rechargeable battery life, it's made by Humanware and it sells for $699. The seeing eye GPS app is now out on the market. Mike May makes this for Sendero. I am in the process of learning it and have been playing with it with a student. I have a slide later that will show you one of my students who works with it. It has buttons for POI's location and routes on the lower portion of every screen. It has two choices for map data, foursquare and Tom Tom. It searches the surrounding near area by pointing the phone. It is made by Sendero, and it has a 30 day subscription for $9.99, a three-year subscription for $129.99, and a one year subscription for safety $9.99 it is by far the best that I have found of all of the apps for smartphones.

Pictured on your screen is the Garmin Oregon 450. I came across this when I planned my kayak trips and I needed a GPS device when I paddled down the Buffalo River in northern Arkansas. I started using it with my low vision students, because it has a 3 inch diagonal touchscreen, it has a WAAS enabled deceiver. Meaning that WAAS means wide area augmentative system. So it ties in using the satellites, and using cell phone towers. You get about a 10-20 foot resolution. It has an electronic compass, it uses the Navteq-here maps it has a microSD card slot or additional maps on the side of it. And I found it on Amazon and through REI and eBay for $200-$300. I will also tell you it has a nifty [ Indiscernible ] that is connected to it to the case in my low vision guys absolutely love it. I think more for the [ Indiscernible ] than they do the absolute GPS. There are four stages of learning. Especially when you learn GPS. Some of you are participating in this webinar, and you are unconsciously incompetent. You are clueless about being clueless about GPS. That is okay because we are all there in everything that we learn. You don't know what you don't know. At the end of this webinar, I hope to be able to bring you up that you consciously are incompetent. You know that you don't know. What you can do from there is by getting a device and learning how to use it, you become consciously competent. And for me that took about five years. It took about five years of using it on a regular basis learning how the GPS thinks and interacts with the environment. Learning what it can do and what it can't do. Then after about Malcolm Gladwell calls at the 10,000 hour rule. After about 10 years, you become unconsciously competent. And for some of you out there, who have taught for a long time, this happens quite a lot when we are working with our students. Someone from regular education after we have intervene and become something with their student will look at us and say how did you think of that? And you look at them and say think of what? And only for the fact that you have done it Sony times, you don't think. You just do it. You are unconsciously competent. You don't think about doing it, you just do it.

When we start with GPS, begin at the beginning. Start with the component parts of any of the devices. Take them apart. Because your student will do it anyhow. You might as well show them how to do it and do it safely so they can get the parts back in order. Many of them don't have a lot of parts. But the bottom line is, show them how to do it. Their curiosity will lead them to take it apart. Orient them to the device, use the key describe remote, talk about GPS limits and perimeters, and talk about movement versus static position. When we all went to one of school, we were always taught don't move until you have a plan. Don't get happy fee. What happens with GPS is, it does not do anything until you move. If you are standing there, GPS cannot help you at all. It doesn't pick you up until you move. It will direct you once you start to move. What you have to do is for me hip offices, determine which way you will move, and then once you start moving, GPS will guide you. Start with the familiar. I start on the doorstep of the home environment of my students or the front door of the school, or the backdoor weeding out to the playground. Something that is very familiar so that my students can understand the information they are getting an tight with the physical reference point. Finish you walk, listen and reference. Learn the language of the device, learn how to repeat the message, because the message comes from the device and many times it catches us offguard. So you learn to repeat the message. Think what is the information? Where is it provided? What happens with GPS, with robot speech is it has its own parameters. When the GPS tells me that I'm on, and I know I'm on Minnesota Avenue which is near the school for the blind in Kansas City, GPS tells me I'm on what it sounds like. And if I'm on any of these cities listed here, it tells me that in the city listed to the right. If you drive to the local tourist area you drive down Belleview Avenue. But GPS will have you driving down believe you Avenue. Anytime is my students have - - I've had kids from Rose Hill elementary school which is also called with listed to the right. Around the corner from my home is a street called with you see there and GPS will tell you I'm approaching a different name street it won't even attempt it. Mapping is a huge piece of GPS. There are only two maps. There are street maps, and there are open area mapping. A street map as you see on the screen, has a picture of the street with automobiles on it and buildings. A street is ordered. It is in a grid pattern or a circular pattern. There are numerical reference to the east, to the west, to the north, into the cell. We have to know that on one side is odds and the other side is even. The numbers either a center descent. And POI's called landmarks, and waypoints are used in street mapping. When we aren't open area it's an amorphous. And when we talk about open area, we think of it as being + or - 50 feet from the street. The collections are given to you and clock face or as the directions tell you as the crow five - - flies. I teach my student what a crow is how it flies in my students all tell you it flies anywhere it wants to. They don't have the concept of walking anywhere they want to. Everything in their life is ordered. We find this mostly in parks, parking lots, playgrounds, beaches, campgrounds, college campuses. And it is in open area where we do - - where we give a definition by planting landmarks and waypoints.

As you see on the screen, you have street and open area and an arrow between the two is an Exxon appeared because GPS cannot connect open area and street. It can only connect them if you have plotted a route from the open area to the street or from the street to the open area. Otherwise GPS has no ability to connect the two.

Landmarks and waypoints are things that the user creates. And multiple landmarks can be set at the same time and at the same spot. You can be at one place on earth, one position in space, and be able to set multiple landmarks. And it will announce the multiple landmarks when you walk past it. You have to know where you are. You have to know if you are on the street or in an open area because if you will set a route to them, you need to know that. Always, always, always set a landmark at the beginning of any journey. Because it is very important when we are talking about having our students embrace the technology, that they can get back home. I can't stress this enough, the concept of being able to get back to where you started, is essential. Always set a landmark. At the beginning of any journey. When you are setting landmarks and waypoints pair with physical reference points. When I first heard in working with GPS, we put a landmark in the middle of a two-car driveway. My student and I walked around in circles trying to find this landmark and waiting for it to tell us we were there. Silliness. Now we pair them with a physical reference point here in this case it would've been ideal to pair it with the intersection of the driveway and the sidewalk so that we know exactly where we are - - what we're looking for one week are putting landmarks out in space or and or GPS we want to label them down first and adjective for example Smith High School, you store. And I see one of my students on the list, went to KU, Fraser Hall front stairs. We might have many East or met fronts but we have very limited Frasers or Smith. Always do it now first, then adjective. Address entry results are recorded as personal landmarks are waypoints and then you can rename them to whatever you want to call them in the renaming function.

Only work with landmarks and waypoints we want to nurture environmental literacy. That being knowing what's around. Tony Hynes taught me in northern Illinois to always think of the gestalt of something. To develop the gestalt of the area. If something is not on the GPS map, plant a landmark there so that we learn more about the environment. I just got done teaching a student up at the Inn University of Kansas for two weeks. He had no reference points around the University. On GPS it says University of Kansas. That's quite a big place. What we did was we walked around the campus, and planted landmarks in front of every building. So when he walks down the boulevard, it tells him that Lindley Hall is to his right or Watson Library is to his right. It makes it a whole lot easier to develop that entire concept of the area. We set waypoints before and after hazards, headaches, and irritations. Every time you walk down 12 Avenue, when you are going somewhere there is a dog that barks and scares you. So before you get to that area on your route, plant a waypoint, the same as a landmark, and say be careful of that dog and as you are coming back, you would set a landmark or a waypoint on the other end and then say the same thing. Careful of that dog, so that you know what is coming. Too often what happens is our students walk and hear the dog barking, they don't know if there fences there they don't know that they are protected. Therefore if it's something like that, a hazard, headed near - - and irritation. Plenty waypoint before it this is where we separate landmarks and waypoints. We can rename, delete, or unset as a destination a landmark. If I plant a landmark, it's generally someplace I want to go. If I make it a waypoint, what I have done is done into the settings menu, and unset it as a destination. It is something that will provide information for me out in the environment, but it's not someplace I want to go. Points of interest are just that. Common locations in space. They are preset on the maps, and think businesses schools, restaurants, banks, hospitals, but stops. Have been the latest innovation in GPS. Use POI rich environments to begin instructions to demonstrate the utility of the device. If I take a GPS device, out to town in Western Kansas, that doesn't even have a stoplight, and the GPS doesn't have any POI's on it for that area, my student will question about why this is such a hot item. So take them to an area that has many POI's to show them how the utility of the device. In that example that I use, what I would do is I would go to that environment before hand, and I would lay down landmarks and have them in the environment so that as we walk, it then develops - - my student can then develop a gestalt of the environment. The problem with POI's is you don't know where the spot is. This rectangle on the screen, is a depiction of the public library in Little Rock Wisconsin. - - Little walk - - Little Rock Arkansas. We were walking at the bottom of the screen and on the right side of the slide, is another's street. All of these stars on the rectangle are places that the spot might be put by the surveyor. What we found was it rang us up on the top of the slide up here the letter I. In the heading. And I found that most of the POI's are on corners, for commercial locations, or driveways for schools. It is rare that they are in the middle of the street.

Sometime back, I work a lot with David Wilkinson, and David and I worked a lot with GPS. We talked about the concept of the virtual open doorway. That using GPS, allows you to learn from incidental information and then you the traveler, has the ability to interact with the environment or not. The traveler has the control to determine if they do want to go to that McDonald's across the street which there GPS tells them is there, or not. They do not have to rely upon someone cited to tell them not. The concept is, that incidental information results in incidental learning. And control. We always have to remember that our students learn and a part to whole scheme and that we have to nurture the development of environmental literacy. I will climb up on my soapbox quickly here. We have done a great job in our field with rail literacy. On IEP's if we identify a student is visually impaired, it automatically assess if we have considered rail. I don't think we've done a great job with a environmental literacy. We are very good at buying a book which last year bought a book for one of my students that cost 4000-or dollars that was world geography to tell him that the Nile River was in Egypt. While I support that we could not get funding of $699 to buy a GPS device to tell him not the post office was two blocks from his home. I think we need to do a better job with developing the concept of environmental literacy and the needs because if our students and our clients are literate in the environment, they will become independent - - independent travelers. Or have the ability to become independent travelers which means they can possibly be, employees and as people ask me at every IEP meeting what I want to student to be I always say a taxpayer. That means he has a job, he or she has a job. When we talk about routing modes with GPS, pedestrian routes are made for distance. Motorized routes are made for time parameters. You will get different directions depending on if you are using a pedestrian route, or a motorized route. When we talk about reliability, if we create the route ourselves, started, and it, name it, it will be pretty accurate. Second to that is going to a landmark or if we make a mistake and go to a waypoint, it will be pretty close. We will get within 15 feet to 20 feet. Third most is two points of interest. Plus or -50 feet. And address entry is a misnomer. GPS takes a wild guess that the address is toward the end of the block. We know that blocks our 25 blocks coffee blocks or 100 blocks, so if the address is 48, GPS takes a wild guess and figures it's toward the end of the block. It is a testament by GPS. It is not that accurate.

There are sources of GPS error. It is not foolproof. Sometimes the signal slows as it passes through the atmosphere, the number of satellites visible, the terrain, the electronic interference or sometimes even dense foliage can block signal reception. And signal multi-Pak occurs when the GPS signal is re-- - reflected off of objects such as tall buildings are large rock services before it reaches the receiver. IE is called the canyon effect. Pictured on your screen is a canyon walking through Chicago. I taught a GPS seminar at the AF leadership conference two years ago. It was a total nightmare. Getting that GPS signal in, in between those building to us down the street from 12,000 miles away was quite a task. Problem solving is one of the key elements to what we teach in using GPS. When you are using GPS with a student always turn on the device before you get there. Because it takes a certain amount of time for it to download the satellite information. If you have taken your student out of class, remember if we work and school districts, we are only limited to a certain amount of time. If you are standing out in the street, and you have told your student about this slick device, and you turn it on and it takes two minutes, three minutes, for it to download satellite information, your student starts to question the utility of the device. Always turn it on before hand so that you are ready to go. Practice using the resets. There are two resets we want to use with three GPS. We want to reset our GPS position on a regular basis. If we are getting - - having a difficult day with satellites, reset the position does not hurt device. We also have to sometimes reset the device don't be afraid to do it. All of the devices that use GPS are pretty destructible. You will get routing hiccups when you're out walking the streets. You will hear no GPS coverage. Or turn back, or off route. And my students will stop dead in her tracks when they hear any of these. They will look at me and they say what do I do Mr. Craig, and my answer is keep walking. The GPS will come and go but will always take care of you. The problem is, it happens the same thing in your car but hopefully you are busy watching the cars ahead of you and not the GPS screen, but it loses contact also. That little triangle keeps moving on the screen. Teacher-student no begin. I always ask them what was the original direction, and they will say had North. My answer is, then head north.

William Penrod said recently and I really embrace this concept that I have found over the years that the teaching of orientation and mobility is an art of accepting a proclamation's. We would like GPS to deliver us to the doorstep because then everything is wonderful. It's not. We have to do a lot of teaching. GPS - - using GPS will make you a far better O&M specialist. Because GPS usage demands solid fundamental element skills - - O&M skills. All of you out there who are COMS went to great universities in the US and other places that teach O&M and I bet everyone of you can teach a 50 foot route. GPS gets you close. I will say it again, GPS gets you close. It is your job to be able to teach that final 50 feet. How will we do that? Context clues and concepts must be practiced. You must understand organizational parameters. What is the number? Where we are? Member - - remember often evens are the numbers that a sending or descending. The thing we have to remember is everything is relative. The problem people have told me with GPS in working with the visually impaired his that is not accurate. Wait a minute? The satellites are 12,000 miles above Earth, you are down there looking to get information and you are nothing more than a grain of sand. Everything is relative. The problem with GPS is they are in automobiles. As we drive we say route to the Home Depot. On the screen, it says we are there, we look at the screen of the GPS and it says we are there. We might be 500 feet away. But our vision takes over, we see it across the way, and in our mind we are there. We are not there, were not even close to being there. So keep it all in perspective. Everything is relative with GPS. We are going to get + or - 50 feet. It's your job to teach that final 50 feet. Mike May calls at the frustration of the final 50 feet a great alliteration. Other teaching considerations are to teach time and distance. Teach solicitation of a writer know about you but I have never done a good job with that. Our student gets lost, does not know what to do, here is someone walking by by the time they say excuse me and they look down and start studying their shoes, that person is gone, or if they have turned around and looked at, the student doesn't know it, so I think we need to all teach a better job of solicitation of aid. Do not tell your students when you are out working with GPS, question them. Let them think through the process. Allow them to make mistakes. It's healthy. It's a good thing. If they are making mistakes they are thinking. GPS will always get them to their destination. Sometimes a little securities, sometimes it's a little bit goofy. They have to understand that it will work, and it will take them there. You will have to spend some time before teaching a student to preview the routes for any black holes that are out there. Just like cell phones dropping signals, TPS will do it too. Therefore walked around before hand so you know what to teach when it comes up. By all means take a cheat sheet and lessons and use it. That sounds very simple, and some of us O&M specialists are incredibly hard on themselves. Most of you are all type a people we think we can do anything. Don't be afraid to take a cheat cheat on the lessons and use it. Then most importantly is, your students love the technology. Work together to learn the GPS and how it interacts with the environment. Play the game back and forth with your kids, then it's a cooperative learning environment and it works very well.

When I use GPS and I have a device that uses SD card such as the Trekker Breeze. I have multiple SD cards. Therefore there routes, there landmarks, their waypoints are on one and they don't have to sift through anyone else's. Practice working with the settings menu. They can program the device to have it work exactly how it works for them not anyone else. We never recommend working with earplugs and headphones. We have to be using those ears to listen to traffic and right now I am practicing and playing with those aftershocks headphones that work on the bone conduction in your - - about your ear. I don't know. I will find out and report back to everyone. Learn to think without vision to effectively teach those without vision. It's a huge piece. Huge piece. I had an intern recently who said to a student who was trailing the front of a building, now that you are at the end of the building, what will you do next? I said to her, how does he know he is at the end of the building? He's just at the end of the path. You have to learn to think without vision to effectively teach those without vision.

Showing is far better than telling. It's all about doing when it comes to GPS. Pictured on the screen I am working with a student and guiding his fingers on the device. It works a lot better than my telling him it's at the top of the device. Encourage your students to borrow the devices rarely when I was teaching, I just retired and life is good, but when I was teaching my students are of the devices every week. They never sat on my desk. They were out with a student. Playing with them on the weekends. When you're out with your students, intentionally get lost on lessons. The GPS will say go north, they let see how this works. Let's take a right or let's go east or let's go West and let's see what it does. Show the student the utility. Importantly, teach motorized guidance. Our kids will be transported through space in an automobile, and they will have to tell the driver how to get places. The device will all further them and give them directions just like Google maps in giving a list, Google maps or MapQuest, GPS does the same thing. Teacher students how to go to the next direction. So you don't find yourself going across four lanes of traffic, because your student just said Mr. Craig we have to take a left turn. Have them as soon as you complete a segment, we have made a turn, find out what the next direction is. Have your students show you, not tell you. Again Tony Hynes told me when I had to learn to have a healthy sense of Missouri me. The misery state motto is show me. I think we need to have all of our students show us and show everyone else. Especially when we need our students in service their parents, relatives, teachers, and classmates. Their grandparents, everyone to demonstrate their utility because remember polish men said it well you're only as independent as your relatives allow you to be.

This picture is June of mine is using the Garmin Oregon 450. A low vision student. What we do when we are outside using that, we have to monitor for glare interference. Because he has low vision and that was the length of his vision a working distance of about 10 inches. The students father was a real estate agent. On weekends, he would take the garment and he would plug-in the addresses, and he would direct his dad, to the houses that they need - - that his dad needed to be well-versed in to sell. It was a win-win proposition all the way.

Only talk about curricular integration we have great opportunities to use GPS in conceptual development, literacy, a lot of writing activities, physical education, and they all have pedometers can't younger fee it goes without saying, mathematics and I like to pair a student with low vision any student who is a no vision student. I call them low vision and no vision to use together also them with different GPS devices for a social competency lesson. Here is a good example of how to use GPS. On the screen is my student who for his sixth grade science fair project plodded the difference between going to a POI from the east, from the north, from the South, and from the west, and which would get him closer? The scene if or the Trekker Breeze. His mother, and he measured the difference between the two. The discrepancy. He wrote it all up and on the left is his evaluation sheet. He received 96 out of 100 points. This is his sixth grade project. Last year we did it by going to the POI and finding from where the Trekker Breeze would bring a set and tell us we have reached our destination, to the front door of the POI what was the discrepancy we found that it if we were coming from the West and from the north, a goddess closer than if we approached it from the East or the South. When we worked with the app, we found that the app got him closer because it was WAAS enabled the Trekker Breeze is not. These are things you can do every year. I don't know about your students, but this student is fascinated with GPS. It is important for him to demonstrate his knowledge. This is my second grade student. She is my weekly community familiarity environmental access social interaction GPS lesson student. She sets landmarks, creates a complete routes, enters addresses and directs drivers. Me. She is in second grade. She has a pretty good handle on the environment. She sees may be about 6 feet in front of her clearly.

Only talk about the GPS continuing abuse - - continuum of use. Your student at age 5 that I had, when I ask where the singles came from for GPS she would point to the sky and say outerspace. Outerspace Mr. Craig. Now that made her feel we are to get that sound from outerspace and she wouldn't hold onto the device. Took me a year of pending the external speaker from the Trekker Breeze onto her collar before she would actually acknowledge the fact that the device was also something she could carry. She also knew that if she headed directly out of her school, she was heading north, and if she continued to head north she could get to the North Pole. At age 5 she thought that was cool because she could go see Santa Claus. She also knew that the name of the street in front of the school, the name of the street directly to the east, and the name of the street directly to the west. All by incidental information of the device telling her. The student that I previously pictured with the GPS, was driving home with his mother and she is an orientation mobility specialist. They live about 40 miles outside of Kansas City. She was on her way home and he had used the breeze just listening to the incidental information provided. About a third time, she decided she had to run an errand on the way home, and as she turned and made that turned to go in another direction, he spoke up and said mom we need to turn here. He had learned the route from the incidental information that he was given by the device. Just like children with site look outside and see the street, see the McDonald's and know they need to turn there. Nothing more, nothing less. Incidental information creates incidental knowledge. And control. He was in control at age 7. And he had not even really learned how to use the device. David Wilkinson had to come to Kansas City and do a presentation at North Kansas City high school. When he got and landed at the airport the cab driver put in the direction and somehow got lost and David said to him, would you mind if I gave you directions using my GPS, the cab driver said no thank you I will get it from the dispatcher. They drove around in circles. David finally said I'm paying for the fair, so therefore were going to use my GPS device. He directed the cab driver to the front sidewalk of North Kansas City high school. He said afterwards he told me directing that cab driver to my destination gave me the control. We started talking about control in the beginning, and how GPS allows our students to be able to be independent and have control. This continues - - continuum demonstrates how that control is developed. Lastly, I have a student who is, now she's not a student anymore, but she has a PhD from the University of Kansas. I gave her my breeze device to work with. She used it for about two weeks. She said to me afterwards, I feel like I'm cheating somehow, when I don't have to keep track of what street is what, where it's located, what direction I'm heading, etc. It frees my mind up to concentrate on other aspects of orientation, and then was need to be GPS as I'm riding in a car, realizing the breadth of this world that is outside my car window, I am - - if never been able to gone to interact with. She is 40 and a dog guide user and has worldly experiences. This is not specifically for children or adults. It is for all of our travelers. I will be back up on my soapbox. I am a firm believer that everyone of the travelers out there with a visual impairment who can benefit from using GPS, should be allowed, should be mandated to have a GPS device. So that they know where they are in space.

I am here in Kansas City if you need to get a hold of me. Don't hesitate to call me, shoot me an email. I will be happy to answer any of your questions. Thank you very much for being here today. It has been a treat talking to you. I hope I have got my message across to you clearly.

Thank you so much, Craig. Very good stuff. I appreciate that soapbox at the end about advocating for people to be able to have devices. We do have a couple of minutes for questions and a couple have already come in peer if you do have a question you can enter it in the Q&A box that is on your screen. You will not be able to see the other questions, but don't worry if you have asked a question that someone else has already asked. While questions are coming in let me also add that credits are available for this webinar, and information on that will come in your follow-up email and it's also on our website. Basically you will have a 10 question assessment based on this presentation, and it awards 1.5 ACVRAP credits. The PowerPoint slides will be made available as well as well as a recording of the event. As soon as we have that available for you which usually takes about another business day you will be able to download that and use it as you like.

May put a plug in here, Robin?

Please do.

Mike May and I will be presenting in San Diego the first week of March. And I will be resenting GPS and conducting a breeze seminar at the Pendleton AER conference in Pennsylvania in late April. Mike and I will be presenting also at the IMC 15 conference in MontrÃ©al. If you're in the area stop in and say hi.

That's exactly how we met Craig. I hope some of you will be able to get to local conferences and particularly sees on a fantastic opportunity. A number of people are asking about you use the phrase was - - WAAS enablement?

Yes WAAS means its wide area augmentation system. In other words against the information from the satellite and is transferred from the satellites to the receiver as well as through cell phone towers. You get more triangulation because you are using more receiver distance points so you get a higher resolution.

Thank you. And you have any opinion about other kinds of travel apps that are not necessarily made for people with visual impairment. Something like an app like for driving to you have any comments about those kinds of things?

There are a 10 of them out there. Some of them are better than others Anthony Cleveland and Scott Smith have done a very good job at the Heinz Center and you might want to contact them at Hines VA center. They have done a wonderful job of evaluating a lot of different apps. I'm finding that the Seeing Eye app, Mike's see if is the best for the visually impaired traveler. And that's really been about it. I don't find many other apps good for the visually impaired traveler. I tried Ariadne and I do like. I've tried the Navigon app and I don't like it. It doesn't give you enough information and it doesn't provide incidental information. Which is the key to putting together the fabric of what's out there.

Are you familiar with line square next

I'm not.

A number of people have asked about it. If you guys have feedback directly for Craig about your own experience and go ahead and use his email that you see there on the screen Cleep1700@att.net . There is just a technical question we talked about resetting the device, when you reset the device does it keep the POI and other saved settings?

Great question. All of the POI's are on the SD Carter and the memory of the device. The only thing you lose when you reset the device is all of the devices have a backtrack culture. And that is the RAM memory. You would lose that. But that is why you always set a landmark when you start going anywhere. You can always get home. I can't stress that enough. By setting a landmark before you start, if you have to reset your device, and you lose the track, you can always set a route to your landmark that you started from. You can never ever get lost. And you can know his get home.

Great suggestion.

I can't stress that getting home concept. I had a student who would not leave her porch. She saw maybe 60 in front of her, and her IEP goal was Cain used. That will be tough to work on that porch. So once she saw that by using the device, she could get back home, she was willing to walk with me all over the neighborhood. That concept, how am I going to get home? Am I going to get home? That is terrifying.

We just had someone, thank you make for letting us to the developer of blind square will be presenting at the Virginia AER conference just next month March 18-20 in Fairfax if any of you are attending up your I will actually be there in the exhibit hall. Perhaps we will get a chance to talk to them. Let me just address a couple of more questions that were maybe a little unusual. Devices that are purchased in one country can they be used in another country?

Yes. The maps like for example the Trekker Breeze, we buy it here in America. It's got most of the European countries, I'm aware of. That have the maps on them. You would download them through Humanware. I'm not - - knowing that Mike uses his devices when - - my travels all over the place. I know the fact that he uses his devices everywhere he goes. I think other than Third World countries, yes. The answer is yes.

And we have had a comment about people in developing countries who may not have this kind of a device. Obviously Craig's topic today was specific to this technology. I will reiterate what you said, Craig, it's without a foundation in all of the other skills, and all of the other sensory perceptions. GPS is just a false sense of security. You still have to be an experienced traveler and know how to monitor environment and how to map and things like that in order to make the best use of a device.

Yes. I think there's a misconception out there first that a GPS will take over for O&M specialists your that will never happen. Be if I have a student that needs to be getting through the environment I just get them a device and stick in his hand in life is good. That is not so. It takes a lot of work and knowledge and a lot of practice. I can't stress that enough. I have walked many miles learning how GPS thinks. I hear that from O&M people say well I tried it I had it and I tried it a couple times and I didn't like it. Unity even scratched the surface. You really have to work with it.

Thank you so much Craig. I'm afraid we are out of time. We do have a couple of more Russian specifically about your opinion of certain brands. I will email those to you separately and you can either write back to us and we will put them in a handout on the page for this webinar presentation. I know people are really trying to sort through all of the different devices you showed us. And there are certainly many more. I need to take a couple of points to wrap up. Remember that Craig and Mike May are also presenting at some other conferences coming up that he mentioned. I will ask you all to look out for feedback survey that will calm in a reminder email as soon as the recording is available. We look forward to your feedback. Particularly those who are with us in the first time. Information about ACVRAP credits were already be there. Thank you for your time I know it's precious. Thank for the team he - - here. Thank you to the e-learning team thank you everyone.

[ Event Concluded ]