

Accessible Pedestrian Signals

James Gallagher: Accessible Communities Webinar. Today's Webinar is titled Accessible Pedestrian Signals and we will be speaking with Daniel Carter Senior research associate with the UNC Highway Safety Research Center and Janet Barlow President of Accessible Design for the Blind. My name is James Gallagher, and I am the PBIC communications manager I will be facilitating today's webinar.

SLIDE- "Today's Presentation"

JG: For more information on future webinars or to view the archives of this webinar series and others please visit pedbikeinfo.org/webinars. You can also stay abreast of the PBIC webinars by following us on Facebook at facebook.com/pedbike. In addition to these webinars PBIC offers four different in person training courses, provides technical assistance to professionals and community members in developing pedestrian safety action plans and in improving conditions for walking. These courses can be found at pedbike.org/gettraining.

SLIDE- "Designing and Retrofitting Intersections for Accessible Pedestrian Signals"

Janet Barlow: Alright, advance us a slide or so this is titled Designing and Retrofitting Intersections for Accessible Pedestrian Signals.

SLIDE- "Today's Presenters"

JB: Daniel Carter and I have been working for a number of years now on the NCHRP-3-62 project together.

SLIDE- "Background"

JB: This project basically

SLIDE- "Research Project"

JB: Began with some research on accessible pedestrian signals and what features work well for people who are blind or visually impaired and usability for people who are blind. We did that research in three different cities. After that research was completed and analyzed worked with the access board and the National Committee on Uniform Traffic Control Devices on some recommendations for guidelines for accessible pedestrian signals. And after that, that has resulted in some guidelines being published, changes to the manual on uniform traffic control devices in 2009, and now we've been participating in training to facilitate the implementation of these guidelines and provide more information on how they can be implemented in real life.

SLIDE- "Travel by Pedestrians Who Are Blind or Who Have Low Vision"

JB: I'm going to go from telling you about the research project and how we got to these, we'll talk more about the features and what's required on accessible pedestrian signals now as they're installed, but first I want to talk a little about travel by pedestrians who are blind or who have low vision, because I

think that helps everybody understand better how these devices will be used and helps understand the features when we start talking about the features in a later part of this presentation. Next slide James.

SLIDE-“Prevalence of Blindness and Vision Loss”

JB: Basically, first of all, the prevalence of blindness and vision loss is something that is a little bit in question. We don't have any kind of registry for those who are blind or visually impaired in the US, so it's a little bit taken from census data, from other medical records, but the general definition of blindness as well can vary, so different ways of recording it mean we have some pretty fuzzy numbers about the number of people who are blind or visually impaired in the US. From the census records we have that some degree of vision impairment affects over 10 million Americans. These are pretty old numbers at this point. We know that 1.3 million are legally blind, and we know the incidence of vision loss increases with age. Next slide.

SLIDE-“Visual Impairment”

JB: The census definition of visual impairment is a functional limitation in seeing, and that's with the best possible corrections, so wearing the best glasses somebody can get they're still having difficulty with some aspect of seeing; reading, being able to see features around them. Legal blindness is actually defined by law to determine eligibility for services and that is defined as vision of 20/200 or less in the better eye with the best possible correction. Vision of 20/200 just a simplified explanation is somebody who has vision what's considered normal vision is 20/20 somebody who is legally blind basically sees at 20 feet what someone with normal vision sees at 200 feet, a much reduced visual acuity. A second part of definition legal blindness is related to visual field, so a visual field of 20 degrees or less, sometimes referred to as tunnel vision is also defined as legally blind. Next Slide.

SLIDE-“This Street Crossing”

When you look at the street crossing on this next slide, those of you with normal vision can maybe see a lot of features that you might use or be able to use in making that street crossing. Starting first with maybe the pedestrian signal, the vehicular signal. Look at it for a minute and think about other things you might use as you start to make that crossing, in order to make your decisions about the crossing. I would assume if you were a careful pedestrian you would not just rely on the signal, you would also want to be looking at the traffic. You might also be looking at the crosswalk lines, where you're being directed to go. Where the curb is, the edge of the street, the curb ramp. Other signs that are there at the intersection. You might use the street signs to determine where you are, you might use the edge of the sidewalk or the building line as well. At least you are using those as somewhat reference points for your direction of travel, in addition to the traffic, the signals, and other information. The next slide, the next picture...

SLIDE-“As seen by someone with overall reduced acuity”

JB: (cont.) shows the street crossing as it might be seen by someone with an overall reduced visual acuity, and you'll notice that many of the features that you were using are not so clear anymore. Think

about some of the things that you can't see here that may be important to making that crossing. And what can you see here? A couple of features that still stand out that may be helpful to you. Some of the things that are still visible are crosswalk lines, cars if they contrast well with their background, maybe the edge of the street and the sidewalk if there's different color visual contrasts there, signs possibly if there's visual contrast, can't really read the words on them anymore, you can't though see the pedestrian signal or the vehicle signals in this particular instance, so knowing when the signal is in your favor is definitely more difficult in terms of using vision in this reduced acuity. Next slide.

SLIDE-"As seen by someone with central vision loss"

JB: As this same intersection is seen by someone who has what is called central vision loss, we've got kind a reduced visual ability in the center of their vision, so again can't see that pedestrian signal, can't see what's basically straight in front of them, may still be able to see things around them, see crosswalk lines, the difference between the color of the street and the sidewalk, but missing some of the signal information, the details of ramp. One of the things that I particularly want to point out about this, is that in my experience teaching individuals who are blind or visually impaired travel skills, and that's my background. Many of the people with vision like this did not use a cane, or a dog guide, or any other device that would indicate to you that they are visually impaired and blind. I often talk to individuals who are traffic engineers who say, "well, we don't have any blind people in our area, so I don't know why we would need to do this." But the fact of the matter is that many people who are visually impaired or blind are not necessarily using some kind of device that identifies them to you as visually impaired or blind. Most people with this type of loss, as I said, would be travelling without some kind of device, and again, might be able to see the edge of the streets, some of the cars if they contrast well, but not be able to see the pedestrian signals. Next slide.

SLIDE-"As seen by someone with peripheral vision loss"

JB: The next slide is kind of the opposite condition of the one you just saw. This is someone who has peripheral vision loss, so the vision around the central part of the eye is obliterated in some way. This means that they may have very clear central vision. The central part of your vision is the best part of your vision. Your peripheral vision is never quite as clear. So that this person can, when they're looking straight at it, can maybe see that pedestrian signal across the street, but looking at that pedestrian signal, what are they missing? Think about it for a second. They aren't seeing the edge of the street right at their feet, the car that is right over to the left about to turn the corner in front of them, other features right around them if they're focusing on the pedestrian signal, they can't focus on what they might be about to step into. Most people with vision this bad are using some kind of mobility device, such as a white cane, a dog guide, or other indication that they are blinded or visually impaired. Next slide.

SLIDE-"As seen by someone with total blindness"

JB: The next slide basically as seen by someone with total blindness, you would have none of the features we have just been talking about that might help them make decisions about making the crossing, but there are other techniques and cues that they might use or will use in making street

crossings. People who are totally blind do travel every day and cross streets with some regularity. Talk now a little bit about how people who are blind or are visually impaired do travel. Next slide James.

SLIDE-“How do people who are blind or have low vision travel?”

JB: They may be using what's known as a sighted, or human, guide, a white cane, a dog guide, telescope or other low vision aids, or no aid at all as I mentioned earlier. Sighted guide may be used by anyone who is visually impaired or blind sometimes, but it is not usually their main mobility aid. Somebody may travel with someone else maybe when they're going to a crowded restaurant or just walking together to go to some destination, but most people do not have a dedicated guide all the time to help them go where they need to go. Many people who are blind or visually impaired do use a white cane, as shown in the photo on the right there. It moves in front of them as they travel and detects obstacles, detects drop-offs, and otherwise provides information as well as identification about their vision. Only about 5% of individuals who are blind or visually impaired use a dog guide to assist in travelling. Many people think that, “Oh they're blind, they'll get a dog guide and that will solve all of their problems,” let me mention quickly that dog guides don't decide when to cross the street, they follow the commands of their handler. They also don't decide where they're going, the person needs to give them commands such as forward, right, left, other directions. The dog may know a general route they go on a regular basis every day, but they don't necessarily make the decisions about where to go, the person has to give them directions and keep them in line basically. Someone who is blind or visually impaired may use a telescope or other low vision aid, and as I mentioned some people who are blind or visually impaired don't use any form of aid that would identify them as blind. Next slide.

SLIDE-“Orientation and Mobility Instruction”

JB: Orientation and mobility instruction is provided by an Orientation and Mobility Specialist, that's my background. I'm an orientation and mobility specialist. Basically our job as orientation and mobility specialists is to prepare an individual who has recently lost their vision to travel in a variety of environments. We want to teach them to independently assess new intersections and plan new routes, because basically there is not an opportunity for an Orientation and Mobility Specialist to work on every new intersection they need to cross, or every place they need to go. Just like most of you in the audience who are not blind, people who are visually impaired every day may have a new destination to travel to. They may have a doctor's appointment across town. They may have a work-related meeting that they need to go to at a different building, and they, like the rest of us, may get directions and travel to that new destination. They don't have someone show them how to get to every new destination they need to travel to. I think the assumption by many is that, “oh, well, the blind can just have someone show them how to get there.” That is not correct. People who are blind get directions just like you do, and travel to new locations on a regular basis, and they might travel across town. I've had on many occasions traffic engineers tell me, “just tell me where the blind people live, and I'll fix the area,” but people do travel all of the way across town, in all areas of town, and their routes may change day-to-day depending on whether the kids have swimming lessons they need to take them to or whether they have to go by a different doctor's office or go to a different appointment for their job, so it

is not a situation where you can assume that you know where all people who are blind are going to travel to. In making street crossings, next slide...

SLIDE-“Tasks for non-visual street crossing”

JB: there are a number of tasks that need to be completed in order to make those crossings well for somebody who for somebody without vision. First of all, someone who is blind needs to locate the edge of the street and the crosswalk. They need to figure out the geometry of the intersection and figure out their proper crossing alignment, that's usually done by listening to the traffic. They also need to determine the traffic control, is there a signal, is it stop controlled, what the appropriate time to cross is. And they have to maintain their alignment while crossing. So they're walking across the street hopefully in the appropriate location in proper relation to the cars. Most of that can be done quite well by listening, but it has gotten more and more difficult as signalization schemes have gotten more complex, and more difficult and confusing. So it can be a challenge, but it is one that in my experience many people do take on and do do on a regular basis. I worked for many years in a rehab center with adults who lost their vision as adults and basically people wanted to keep on travelling and keep going places on their own, independently, and they did. So just as a summary, next slide...

SLIDE-“Summary”

JB: ...people who are blind or visually impaired do cross streets every day, and that street crossing task has become more difficult as geometry and signalization has changed. Being familiar with the intersection, and access to more information about the intersection can make the task easier and safer. So that's just a little bit of background on travel by people who are blind or visually impaired. I want to talk very briefly about ADA regulations and MUTCD standards and guidance for pushbutton integrated APS. Next slide James.

SLIDE-“ADA regulations and MUTCD standards and guidance for pushbutton integrated APS”

JB: And some of the standards that we particularly need to look for, you need to look at, in relation to installation of accessible pedestrian signals would be the MUTCD Manual on Uniform Traffic Control Devices and the Access Board for proposed accessibility guidelines for pedestrian facilities in the public right-of-way. Sometimes referred to as, draft PROWAG or rights-of-way guidelines. Next slide.

SLIDE-“Americans with Disabilities Act (ADA)”

JB: Just to kind of review the ADA issues the Americans with Disabilities Act requires that all newly built or altered facilities or programs are “accessible to and usable by” individuals with disabilities. Even though there's not actually finalized public rights-of-way guidelines, it's still a requirement in the implementing regulations of the ADA that any newly built or altered facility are accessible to and usable by individuals with disabilities, even though there are no finalized standards available. Engineers are expected to use their engineering judgment in installing stuff based on what's available and the information available. Next Slide.

SLIDE-“Proposed PROWAG”

JB: The proposed Public Rights-of-Way Guidelines were released July 26, 2011. They are very focused on new construction and they can provide direction regarding ADA requirements for public rights-of-way. I have, as a member of this project, recommended that you understand and use requirements in the proposed PROWAG as your goal in any APS installation, and basically in the proposed PROWAG they require accessible pedestrian signals and pushbuttons wherever pedestrian signals are installed. Next slide.

SLIDE-“Propose PROWAG-R209.1 General”

JB: Then goes on to say that the APS needs to comply with Sections 4E.08 through 4E.13 of the MUTCD, and this is the 2009 MUTCD. Also has a requirement in the proposed PROWAG that all operable parts comply with regulations that are in a different part of those guidelines. So there is a lot of information out there about what the functioning of the accessible pedestrian signals, and as I said before this is not a final rule yet requiring them to be installed wherever signals are installed, but certainly is a recommended practice. Next slide.

SLIDE-“MUTCD 2009”

JB: It refers to the MUTCD 2009, which was published by the Federal Highway Safety Administration, and I’m going to talk a little bit about the slides that are about the changes that are in the 2009 MUTCD related to how APS should function, because there are a number of standards that changed in this 2009 edition. Next slide.

SLIDE-“Pushbutton-integrated APS”

JB: Generally the main thing to first recognize is the type specified in the 2009 MUTCD is referred to as pushbutton-integrated APS. There have been other devices installed in the US that don’t provide the benefits of the pushbutton-integrated devices, such as pedhead-mounted ones, which many people are familiar with the cuckoo and chirp overhead basically were found in research through both what we found in our research project and other research do not really provide as much benefit to individuals who are blind and vision impaired because first of all you have to find the pushbutton, and it is hard to find sometimes, and they didn’t provide a sound throughout the entire pedestrian phase just the walk angle. There were also installed some vibrotactile-only, and some receiver –based devices, both of which are not currently allowed in the US basically under the 2009 MUTCD. Next slide.

SLIDE-“APS Primary Features”

JB: What’s required in the MUTCD are standards are the various features listed on this slide, and I’ll talk a little more about each of those, but let me quickly just run through: required pushbutton locator tone, the sound that comes from the pushbutton, a tactile arrow, an actuation indicator, required to also have an automatic volume adjustment, and the walk indication is supposed to be audible tones and vibrotactile indication and can sometimes be an audible speech message. Let me talk a little about each of those features because they’re important to understand and to understand how people who are blind or visually impaired might use those features. Next slide.

SLIDE-“Pushbutton Locator Tone”

JB: The pushbutton locator tone is basically a repetitive sound that is coming from the pushbutton. It provides information about the fact that there is a pushbutton there that a blind person needs to push, and it also helps somebody find that pushbutton. The pushbutton locator tone is specified by the MUTCD to have one tone per second and that each tone should be less than 0.15 seconds in duration, so a very quick short tone. Part of the specification is the one tone per second so they can be recognized. Different sounds are acceptable, and really the main recognizable feature of it is that one tone per second aspect of it. There's some that are more what I call beep tones, and some that are more click tones. There are different sounds that are acceptable the different types of pushbutton integrated APS do have basically computer chips in them and they can usually be changed to be different sounds based on what's been loaded up on that chip. Besides the pushbutton locator tone, there's a requirement for a tactile arrow, next slide, tactile arrow on the pushbutton.

SLIDE-“Tactile Arrow”

JB: ... and that tactile arrow is raised so that a person who is blind or visually impaired can feel the arrow, feel the direction it is pointing and that arrow is also supposed to be aligned with the direction of travel along the crosswalk controlled by that pushbutton, providing some guidance to the person about the crosswalk orientation, as well as the pushbutton, which road the pushbutton is for, so it has been used somewhat by people to align themselves for a crossing. Aligning that well on the pole as well as the crosswalk is an important part of installation. It can actually be on the pushbutton itself, sometimes on the device somewhat above the pushbutton. The picture on the screen shows one manufacturer's device, there are a number of different devices in the US used that have similar push button orientation arrow on it. Next slide.

SLIDE-“Actuation Indicator”

JB: It's also a requirement in the MUTCD for an actuation indicator, basically an indication to pedestrians that the button has been pressed. This is both a light that might light up for sighted pedestrians to let them know the button has been pressed similar to a light for an elevator. The MUTCD also specifies for an audible Wait for blind or low vision pedestrians, so that when the button is pressed it basically says, wait at the moment it is pressed to let the person who is blind or low vision know that the button has gotten their call. Next feature, next slide.

SLIDE-“Automatic Volume Adjustment”

JB: is automatic volume adjustment, and this is a big change from what was previously installed in the US, and has made a difference in kind of the acceptance of accessible pedestrian signals in many ways. These signals respond to the sounds around them, so they get louder when the traffic is louder, quieter when the traffic is quieter. They do need to be adjusted well, and that's part of the settings that need to be done by installers. But they're just supposed to be heard 6-12 feet from the pushbutton or APS device, they're not intended to be heard all the way across the street or all the way down the block. The idea is to provide a signal at the beginning of the walk indication, and pedestrians who are blind or

visually impaired generally want to hear the traffic that's going around them, they want to hear if there are cars turning in front of them, where the other traffic is moving to provide some alignment cues. They don't want the signal to be so loud that it masks all the sounds of traffic and other things going on around them, so it specifies a quieter signal than many people are used to. There is a possibility of what's called audible beaconing that might provide some information about the direction of the other end of the streets. The specifications in the MUTCD for how to provide audible beaconing, but that's actually supposed to only be used if selected. Usually that is selected by holding the pushbutton in for more than a second to call up additional features. Of course that would only be if that is installed on the device, but it is a standard feature possibility on many of the devices sold in the US now, so that's a possibility that can be provided. Next slide.

SLIDE-"Automatic Volume Adjustment"

JB: I think I already mentioned some of this, the sound is responding to the sound at the intersection. The APS is basically monitoring the volume on a second by second basis and responding. The volume is not supposed to be more than 2 to 5 dB above ambient sound, but as I mentioned, you may need to adjust it when they're installed, because they may be preset for a certain volume range and if you put them in a location that's louder or quieter or next to a building or other things it may need to have that volume adjusted depending on where the speaker is aiming and what's behind it. So automatic volume adjustment does make a difference, but it definitely needs some adjustment when they're installed. Next Slide.

SLIDE-"Vibrotactile WALK Indicator"

JB: Vibrotactile WALK Indication, basically this is a walk indication that is provided through that arrow or some other surface on the pushbutton that vibrates during the walk, so that it's not just an audible indication, but a vibrotactile indication. This communicates information to pedestrians who are blind as well as ones who can't hear well. Also, there are many people who may stand by the button and use that just to confirm they're hearing the right audible indication, but that only works well if it is close to the crosswalk and close to the street because people definitely want to be ready to make their crossing when the walk begins and not waste a lot of time with that. Next slide.

SLIDE-"Audible WALK Indication- Tone or speech message?"

JB: When we get to talking about the audible walk indication there are different requirements in the MUTCD for a tone message in some cases and a speech message in other situations, and this basically depends on the location of the APS pushbuttons. If pushbuttons are separated by more than ten feet from each other the location of the pushbuttons can clarify which crosswalk is being signaled and in that case basically a tone, a rapid tick walk indication is what is recommended and was found in our research to be most detectable in traffic noise to result in faster response from individuals who are blind or visually impaired and to work better in getting correct responses to the right signal. Where it's impossible in retrofit situations to separate the pushbuttons by more than ten feet, a person who is blind or visually impaired or any pedestrian really can't distinguish which one is sounding by the location the sound is coming from, so in that case, additional features, especially programmed speech messages

and other features are needed on the device. So the MUTCD has these two different situations depending on the locations of the devices. Next slide.

SLIDE-“WALK Indication: Rapid Tick”

JB: On this slide we have some sounds attached to this, but we're not going to be able to play, but basically what you hear when you have the walk indication is a rapid tick, because you hear the locator tone during the flashing and steady don't walk that's constantly going once per second a short beep, and the WALK indication during walk is a rapid ticking, 8-10 ticks per second so 'ttttttt,' and quickly during that walk indication to indicate the walk. Next slide.

SLIDE-“WALK Indication: Speech Message”

JB: The other walk indication if you need to use speech messages, there's a pushbutton locator tone, again the locator tone is constantly sounding during the flashing and steady don't walk, and the walk indication during walk is a speech message and there's specific wording for the speech messages that is required in the MUTCD. I'll talk about it in just a minute, but the MUTCD also requires, although it is required otherwise, a tactile arrow on anything using a speech message as well as what's called a pushbutton information message. A pushbutton information message basically gives people information about what street name they should be listening for, because remember how I talked earlier about how a person who is blind or visually impaired might be travelling to a new location, how many times when you give directions do you tell everybody the name of the three streets they have to cross before they turn right or something like that if you're giving directions, you basically say, “go up three streets and turn right,” so they may need to know which street name they need to be listening for as their indication of a crossing. They don't know that the street they're about to cross is Peach Street instead of 4th. They may cross at the wrong time. Next slide.

SLIDE-“WALK Indication: Speech Message”

JB: I want to talk a second about speech messages, because often they seem really user-friendly, people think, “Oh, that's great, I hear the name of the street, I know what's going on,” but what we've found in the research and in feedback in many ways is that they seem really user-friendly, but it's often hard to understand the words on the street in traffic noise. It's an awful lot of potential for misunderstanding in various sound conditions. Users have to know the names of the street in the first place, and we did get slower response from users than we got for the rapid tick walk indication. Next slide.

SLIDE-“ WALK Indication: Speech Message”

JB: If you're using speech messages, or at locations where speech messages are used, there is a recommended, required basically, in the MUTCD, and it is using the street name first, walk sign is on to cross, and street name again, so the recommended walk message would be something like, “Howard, walk sign is on to cross Howard.” At locations with exclusive ped phases, or scramble crossings, you could use a speech message like, “walk sign is on for all crossings,” or rapid tick indication, but again the consistent wording is an important part of it. One of the things that we found was that it was very

important that the street name be the first thing that people hear, and then repeat it. It's a long message because we found that there was some confusion among traffic engineers and blind pedestrians about which street was indicated if you had a sign that said Howard walk sign or walk sign Howard. People who are blind cross Howard and traffic engineers thought it was for travelling along Howard, or whatever street name, but it's a long message for a reason, because we had some confusion in the research related to what it meant, so it's, "Howard, walk sign is on to cross Howard," repeated for the duration of the walk signal. Next slide.

SLIDE-"WALK Indication: Other features needed with speech message"

JB: I think I've talked a little already about the pushbutton information message, it's basically providing the name of the street that's going to be controlled by the pushbutton, and that's the street name that's also used in the speech walk message, and again the tactile arrow distinguishes the crossing signals. So just to kind of summarize the features, next slide.

SLIDE-"Feature Summary"

JB: There's a pushbutton locator tone that's once per second, no specific type of sound recommended, can use different sounds there. A tactile arrow that needs to be raised and on the pushbutton. Automatic volume adjustment, so it changes in response to sounds around it. An actuation indicator that is both audible and visual. Next slide.

SLIDE-"WALK Indication Summary"

JB: A summary of the WALK Indication. First of all, it needs to be quiet, not broadcast across the intersection. It's supposed to be audible at the crosswalk departure point. There's supposed to be a vibrotactile indication in addition to the audible. And at locations on a corner APS can be separated, you want to use the rapid tick indication. Where two APS are located on the same pole or closer than 10 feet to each other, you need to use a speech message along with the tactile arrow and pushbutton information message. That's just a quick summary of the features that are basically required if you're installing APS in the MUTCD at this point, and I'm going to turn it over to Daniel for more about the installation and design guidance.

SLIDE-"Installation and Design Guidance"

Daniel Carter: James if you want to transfer control to my screen we should be good to go to take that now. Pardon me while I scroll to my section. Alright, what Janet just covered is a lot about the features of the APS devices themselves, the audible features, things like tactile arrow and vibrotactile indication, and a lot of time agencies, especially those who are somewhat new to installing APS these are sort of the things they focus on. Rightly so, they are important, but one thing that gets ignored a lot of times is the location of the APS device and so I want to talk to some of the points related to...

SLIDE-"APS Location is Critical"

DC: ...where you're placing these. In fact the location of an APS is critical, and this is sort of maybe counterintuitive, or at least a change in view of the standard non-accessible type pushbutton with the assumption of just sighted pedestrians the position of the pushbutton is a little less important, because if I have full sight, I can see it's over there I'll go push it and come back to wait here, and I can just look and see when the pedestrian signal changes. When we're dealing with APS, the location is much more important.

JG: Daniel, sorry, we're having issues here, we're not getting your full screen, so...

DC: Well, OK

JG: Go back again. Make sure it keeps working, not really sure what's going on today. This is where you need to be, correct?

DC: That is correct. So the newer types, and what I mean by that is what Janet talked about, the pushbutton integrated devices where the sounds are coming from the unit, the arrow and the vibrotactile, everything is with the pushbutton unit. In these kinds of devices, the location is critical, because it provides information through its proximity and its position. In fact when you have the APS located correctly, it's going to give less of a cognitive load to the pedestrian who is visually impaired and making use of the device. I'll show you an image in a minute where these buttons are, but essentially if someone is there on the corner and visually impaired and knows they pushed the button on the right, and they hear a walk indication coming from their right, they can intuitively know that that sound is for the crosswalk they intend to cross. The other part of the location here is that if you have the button near the crosswalk, near the departure point the signal of the APS can be quieter, and that benefits everyone. Next slide.

SLIDE-"MUTCD 2009"

DC: Specifically to the MUTCD, the 2009 version that Janet talked about, there are now specifications for the locations of all pedestrian detectors or pushbuttons, not just for APS and that's in section 4E.08 if you're interested in looking at some of the phrasing and guidance there, and also in 4E.10 it talks about for APS detectors, they should be as close as possible to the curb ramp, so presumably where someone would be waiting to cross, and as close as possible to the crosswalk line furthest from the center of the intersection. Next slide.

SLIDE-"MUTCD: APS Location"

DC: Here are some of those dimensions laid out in the MUTCD about where the APS should be located. It does specify that it needs to be within five feet of the extended crosswalk line, and so there you have an example of where that would be laterally from the crosswalk. Next slide.

SLIDE-"MUTCD Pushbutton Locations"

DC: Back one

SLIDE-“MUTCD: APS Location”

DC: And it also says it needs to be in between a foot and a half and six feet from the face of the curb. So, essentially not too far back, and not too far out of line, we want to keep the APS close to where someone will be using it and departing where they are crossing. Next slide.

SLIDE-“MUTCD Pushbutton Locations”

DC: This is a schematic provided in the MUTCD about the area on the corner where the APS could go to fit these dimensions that are laid out there. It is certainly the case in our one day workshop, we are fairly quick to point out that this is not a to-scale drawing and those of you who do curb ramp and corner design will probably pick up on that pretty quick, but it gives you an idea of the general area that is being talked about with the 5 foot dimension outside the crosswalk line not more than 6 feet back from the curb, kind of showing the general area where the pushbutton could be placed. Next slide.

SLIDE-“MUTCD APS Location”

DC: Also in the MUTCD talking about how the devices should be installed. The face of the device, and I think Janet mentioned this, should be parallel to the crosswalk to be used. This allows that tactile arrow that Janet mentioned to be used by someone who has visual impairments to get alignment information as they line up to start their crossing. Next slide.

SLIDE-“Proposed PROWAG R406”

DC: In the other guidance document that Janet talked about from the US access board, referred to as the proposed PROWAG in section R406 also has some standards and guidance related to reach ranges, where the button should be placed on the pole, so there's dimensions there height-wise, also protrusion of any kind of pedestal, base or curb or whatnot from the button so to allow someone who is using a wheel chair could be able to access the button. Next slide.

SLIDE-“Not in reach range-inaccessible”

DC: And this is an example image of an APS if it is definitely not within the reach range of someone who is in a wheel chair who would not be able to reach that far to the pushbutton. Next slide.

SLIDE-“Within reach range”

DC: Here we have an example of one that would be usable by someone who would be in a wheelchair or not. Placed very close to the departure point, so this one here is not full accessible to pedestrians, but it shows the location it should be placed. And in fact, if you do have that kind of infrastructure, a pole there, you might very well be able to use that to mount the APS on it. Next slide.

SLIDE-“MUTCD: APS Location”

DC: Also in the MUTCD it talks about when you have two pushbuttons on a corner you need to if at all possible to separate them by ten feet or more. And this is an image showing two APS that do have that

kind of separation, a good amount of separation in fact, and in this picture you can also see they are placed close to the curb and close to that crosswalk line furthest from the center of the intersection. Next slide.

SLIDE-“MUTCD: APS Location”

DC: Another picture showing two APS on the corner, smaller radius corner in this picture here, but they did achieve a ten foot separation. Next slide.

SLIDE-“Separated Poles not Possible?”

DC: So you might have, probably will encounter if you're doing this somewhat widely in your city you might have the situation where you can't get the APS separated by ten feet or more as the MUTCD says is the ideal case. Maybe you're just doing a retrofit, where you're just installing an APS on the existing infrastructure. So let's talk a little bit about that, next slide.

SLIDE-“Separated Poles not Possible?”

DC: And we'll talk about it from the MUTCD language, if you're not familiar with this, I will let you know what it says. If you can't get that separation, ten feet or more, than you shall use an APS with the following features, and here we have a list: locator tone, tactile arrow, these are things on all pushbuttons, on all APS, but C. there says a speech walk message, and if you recall, Janet talked about the two types of walk messages, speech or rapid tick, and this is the case where you would use that speech walk message. Along with that you also have to have, says D. there, a speech pushbutton information message as Janet mentioned someone might not be familiar with the intersection, and in order to be able to use the information that is provided the speech walk indicator when it says, “Howard, walk sign is on to cross Howard,” they need to know which street is Howard and so on, but that also needs to be a part of what's provided if you cannot get that kind of separation at the corner. Next slide.

SLIDE-“Pushbutton information message and speech walk message”

DC: So an example photo here showing two APS on this one pole here, so again this situation here where for whatever reason separation wasn't possible. Looks like this is on an island, there may be some issues with that, and so the two pushbuttons would have speech walk messages, and those are given there as examples. First of all the wait message if it's during the don't walk, “wait to cross Grand at Howard,” and for the speech walk indication it would be, “Grand, walk sign is on to cross Grand,” so which starts with the name of the street to be crossed, and then saying walk sign is on to cross, so this is the prescribed language for the speech walk message. Next slide.

SLIDE-“Summary of Ideal Installation”

DC: So to summarize what is your ideal installation, if you can get ideal installation, here is what you want. You definitely want it to be adjacent to a level landing for those in wheel chairs accessing the device. The face of the APS should be oriented parallel to the crosswalk, so take care of how it's

mounted on the pole. Location-wise it shouldn't be more than six feet back from the curb, or more than five feet out of line with the crosswalk, ideally between the curb ramp and the crosswalk line, and then if you have two APS on the same corner no less than ten feet between them. So these are kind of your key metrics to keep in mind when you're designing how a corner should be laid out. Next slide.

SLIDE-"Summary of Ideal Installation"

DC: And this is an image showing that ideal installation here. So we have two APS, shown as the boxes with the arrows here mounted on poles. We're looking at an overhead view of an intersection corner, and the two ramps are serving crosswalks individually, and the devices are separated by ten feet at least. They're placed on the side of the pole toward the center of the intersection, so take note of that, and so as we see here the person who is waiting to cross here if he hears the walk indication coming from his left he knows that's the one for his crosswalk. The location itself is giving that information. So here we have again the reason that location is more important with APS than it is with the standard non-accessible pushbutton. Next slide.

SLIDE-"Design Exercises"

DC: What we'd like to do to finish up here is to look through some design exercises because it is always a case that showing pictures is a good way of getting a point across, so we'll kind of give you some thought exercises, some before and after pictures, and some other ones to kind of think about, and if there's more than just yourself there in your office or conference room, feel free to discuss it with whoever is there. So we'll go into this, and I'll kind of lead, and Janet will chime in with anything that I miss or forget, so why don't you go ahead to the next slide.

SLIDE-"East & Dilworth 'Before'"

DC: So some of these first ones are from agencies that we've worked with as a part of this research study. Here we have an intersection, we're looking at across the street of the intersection and this is the before condition so we have only one pushbutton here on the left side for the crossing that is straight ahead of us, so it's non-APS, and the situation that I pose to you is that you are tasked with retrofitting this intersection with APS for both crossings, the one straight ahead of us and the one to our left. So take a moment to think, where would you put the buttons, and how would they be configured. You've probably noticed the wood utility pole on the right side of the screen. It depends what kind of rules your agency is under, some places they're not allowed to touch the utility poles, in fact in this location, they were able to use that pole for pushbutton needs. And so why don't we go on to the next slide to show you what the agency...

SLIDE-"East & Dilworth 'After'"

DC:...did when they installed APS here. So they used the wooden utility pole there for the pushbutton for the crossing straight ahead of us, which puts it on the correct side, which is the outside away from the intersection side, it is parallel, well-placed parallel to the crosswalk. For the crossing to the left they used the existing metal pole that was there and just took the button and removed the one that was

there, and put one the side facing the intersection, an APS there. So this is a place where they were able to use the existing infrastructure to place pushbuttons in good placement for the crossing, and these were able to be separated by ten feet, and so they used the rapid tick indication here. They did not need to go to the speech walk message. Next slide.

SLIDE-“East & Dilworth ‘Before’”

DC: Looking at another intersection just down the road, or excuse me this is the other corner of the same intersection. We’ll look in a minute at another one from just down the road. So here we have, we’re looking at a difference, we’re kind of across the street a little bit from where the first picture was. So again I present to you a situation where you need to retrofit this corner with APS, two APS, one for each of the crossings that we encounter here. There is a pole on the right, as you see with the button on it, for the crossing to our left, that’s the main street to our left. So take a second to look at where you would put buttons, and how would you do everything at this corner. So one of the differences here is that we only have one existing pole that wooden pole that the pedbuttons, and the pedheads are mounted on right now. So maybe some of you have thought well maybe on the left side for crossing that major street there, maybe there needs to be an additional pole added, and a lot of times this can be a good solution for places where you have this kind of set up. So if you go on to the next slide, we can take a look at what the agency...

SLIDE-“East & Dilworth ‘After’”

DC: ended up doing. They have added a pole there, and that houses the button then for crossing the major street, and that’s been placed near the curb and within the crosswalk extended. The wooden pole then is used for the crossing straight ahead of us. So again, a place where they could get separation of ten feet or more, use the rapid tick, and have buttons that are well-placed for pedestrians to use them. Next Slide.

SLIDE-“East & Euclid ‘Before’”

DC: On down the road here, we have another location, looking across the major street here with the minor street to our right. Same situation, we want to put APS here. You can see in the foreground there is a pole that has the pedbutton for crossing the street ahead of us, the major street. You might be talking about where would you add extra poles if you want to go that route, and in fact the agency did go that route, and you’re probably noticing things like the rutting on the right hand side from turning bus traffic. You might be noticing the small stone wall on the left, and that actually was a constraint here because that wall is historic and cannot be touched, so there’s a few constraints here, but we’ll go ahead and take a look at the next slide and see what the agency did in this location.

SLIDE-“East & Euclid ‘After’”

DC: And they actually did install poles, actually two extra poles since that wooden pole was too far back from the intersection to be useful if you saw how far back from the curb it was, probably was a good fifteen or twenty feet back. So they’ve installed two new poles here that are well-positioned near the

curb, and there was some concern on the agencies part about that turning bus traffic, but in fact I think the bus drivers must have changed what they were doing when there was a pole there, and that pole stood for a number of years. I haven't gone back in a few years to check and see if that pole is still up, but they didn't come down in a month like they expected. So we can see again the device is mounted on the side of the pole that is toward the center of the intersection here. Next slide.

SLIDE-"Two on One Pole"

DC: Wanted to show you a place where the two pushbuttons were put on the same pole and some of the ramifications that can happen when you do go for that kind of installation or solution. So, when we look one way, we're looking across the street with the pole on our right that has the two pushbuttons on it we can see that the pushbutton for the crossing ahead of us is probably within five feet of that crosswalk, it's not that far back from the curb, so locationally it's pretty well-placed, usable for someone, but the effect is that even though it is well-placed for that crossing, when we turn to our right and look across the street the other way, next slide.

SLIDE-No Title

DC: We can look and see what some of the ramifications are for that other button. So here we have a situation where the button is definitely more than five feet away from that crosswalk, so it's farther away, it's going to have to be louder if someones going to wait at the crosswalk. It is, to their credit here, pointing toward the destination curb and so if someone were to follow the alignment of the device they would be able to reach right at the curb ramp actually on the other side. But some of the issues here, in addition to it being farther away from the curb or the ramp, excuse me, is that if someone is waiting next to the button, as someone who is visually impaired might do, not needing to use the curb ramp necessarily, they might really prefer to step down from the curb itself. IF they wait there, they will be very much visually shadowed from vehicles that are turning right. So this is certainly a situation that you don't want to get into either. So, sometimes it is necessary to use the existing infrastructure for whatever reason, and in this case two on one pole, so they're using speech messaging here, but it is certainly worth considering the ramifications of going with something like that. An additional pole to the right certainly would have been helpful in this instance. Next slide.

JB: It also helps a person who is blind or visually impaired ...

SLIDE-"Hillsborough and Enterprise (before)"

JB: know where the crosswalk is to start from the right place instead of some place outside of the crosswalk where drivers may not be looking for them.

DC: Yeah, great point. I had the opportunity here where I live in North Carolina to witness some before and after work on a corridor that was near a college campus, and in the midst of that they were doing also, revising the pedestrian facilities there, and they were adding APS, so I was able to take some before and after shots there. So this is going to be a couple of intersections on this corridor, and so we have, we're looking at an intersection right here that previously had a button you can't see because it's

behind that box mounted on the pole there for crossing the major street, and nothing else. So this is a before shot, and we can take a look at the next slide to see some of the after shots.

SLIDE-“Hillsborough and Enterprise (after)”

DC: After they installed. So this across the major street. They actually did some work on the street itself to do a road conversion there to bring the crossing width down some. On the right side of the picture you can see the metal pole that they've added with the pedhead and the APS on it to put it closer to the crosswalk, so where someone's going to be waiting. If we take a look at the next slide we can look to our left across the minor street.

SLIDE-No Title

DC: And see some improvements there, they added a pole and an APS and actually a whole pedestrian phase for that crossing. It's fairly well situated close to the curb, within five feet of that crosswalk, facing the intersection, so it's going to work well locationally for the person. They've done other improvements here as well, like adding the high visibility crosswalk markings there. Take a look at the next slide, and we can go to the other side of the street.

SLIDE-No Title

DC: Where we're at right now, and look at the other side, where they also added a pole with an APS mounted on it for that crossing back. I have to say on this one, I would probably recommend that they move the pole closer to the curb, and not so up against that wall because they really encroached in the free travel space of someone who is in a wheel chair traversing the sidewalk there. So generally speaking, pretty good, could have used a little bit change up of where they put that pole. Up against the face of the curb would have been probably a better suited location for the half, as the MUTCD would have called it. Next slide.

SLIDE-Hillsborough and Gardner (before)

DC: Down the street some, another intersection here we see we're looking across, mostly we're looking across the major road, and you can see right there in the center the wooden pole pushbutton on it, a nonaccessible pushbutton in the before condition for crossing the major street. This corner particularly has a lot of clutter on it for someone who might be navigating with a white cane would have some difficulty in figuring out where the pushbutton is here, there's a telephone utility thing right there in front of the pushbutton, there's also guide wires coming down, an emergency pole, whatnot. So there's a lot of things going on here. If we take a look at the next slide we can see what they've done...

SLIDE-“Hillsborough and Gardner (after)”

DC: in the post condition here after the corridor was revised. They kept the pole location where it was for crossing the major street, put a pole in with an APS on it, and also added an APS on the other side of the corner for that crossing. They were able to separate them by ten feet, and that is the advantage when you are adding poles as part of a streetscaping project or general pedestrian improvements is

that you can get that kind of separation and not having to work under the restraints of the existing infrastructure, and that is something I try to point out to agencies that are doing revisions to corridors, is that getting poles in the right place when you're out there doing work is very important because if you aren't adding APS there immediately, if you're going to add them later, getting poles in the right place will save you a lot of trouble and money if you have to go back and move poles later, so you certainly don't want to get into that kind of cost. So, consider this, get those poles in the right places when you're out there doing the work and you can really set yourself up better in the long run. Next slide.

SLIDE: "How about this? OK?"

DC: Here's a picture for you to consider and think about some of the things we've talked about here. So we're looking across the street, straight across the crossing there. Curb ramp to our left, pole to our right, that has an APS mounted on it, and my question to you is, what do you think? Is this OK? Some of the requirements of having a pushbutton placed at a crossing is that it needs to have a level area at the pushbutton for someone in a wheel chair, if you go to one click on the slide there James, we can see that it does have this level area that's at the pushbutton so it's accessible that way, and the other stipulation is that it has to have an accessible route to the ramp. One more click there James will show us that there is an accessible path to the ramp. In fact this is okay. This is an installation that works for both those who have visual impairments and for those in wheel chairs. It may very well be the case that someone with visual impairments is going to stand at that pushbutton and start their crossing stepping down from the curb. Going off that curb gives a good indication of where that crossing starts, whereas someone with a wheel chair would just go around and wait there on the ramp. Alright, next slide.

SLIDE-"And this one?"

DC: So here's another one to consider, we're looking across a crossing here, pushbuttons to the left mounted on the pole kind of at the top of the flare of the ramp. So the question here is, is this OK? And for those of you who can see the picture clearly, I think you will very quickly pick up on the fact that there's a set of poles in the foreground there that's actually preventing that level landing. So, as opposed to the one we were looking at previously, this one does not have a level landing that is accessible to the pushbutton, so someone who is in a wheel chair who needs to use this pushbutton would need to hold their wheel chair on the flare of the ramp while trying to do that and push the pushbutton at the same time which is no easy feat, so this one gets an x. This one is not acceptable accessibility-wise. Next slide.

SLIDE-No Title

DC: One of the things to keep in mind when you're using existing infrastructure is you might have poles that are well located, as we see here in this picture we're looking at a crossing, there's a pole to our right, and it's right in line with the crosswalk line, apparently near the curb, so it seems to fit the locational stipulations. One thing to keep in mind though when you're doing this and you're using existing infrastructure is if you look to the top of that pole you'll see the pedhead that's actually for the crossing to the left, for the one perpendicular to the crosswalk ahead of us. So if you're going to be mounting a pushbutton to this pole for the crossing that's ahead of us, just take care in the wiring

basically. Make sure that it's being wired to the pedhead it's operating with. So in this case, not to the pedhead that is shown in the picture. I think if you click once James, it shows the arrows that distinguish what I'm talking about here. So again, think through, and make sure to communicate to those who are going to be doing the installation, the wiring in the field, and be clear about how things need to be configured. Next slide.

SLIDE-"What's wrong?"

DC: We're showing here a picture of a crossing, a pole to the right, APS, two APS mounted on it. Do you see issues here? I think it's pretty quickly apparent that there certainly are issues. We've got the two buttons on one pole, but the pole itself is nowhere near the intersection, so for the crossing that's straight ahead of us certainly outside of the five foot range of that crosswalk. So someone would need to go over and push the button, and then go back to start the crossing. The real detriment here is for the crossing that we can't see to our left. The pushbutton for that crossing is a good twenty or thirty feet back from where the person would be starting their crossing from, from the curb ramp. So, if we think about the MUTCD language, the APS sounds need to be audible from the departure point. In order to be audible from here, the device is going to have to be really, really loud, and in fact it was, and when you're in this kind of area, the sound is really going to bounce around off those surrounding buildings and parking decks and that sort of thing. So, that's just another point to consider if you're using existing infrastructure like they did here. Think about the ramifications, the usability, the fact that the sound is going to have to be louder, and just to repeat that point, Janet touched on it, but louder is not better for anybody, and that's a counterintuitive point sometimes to those who aren't experienced with the issues that surround the travel of those who are blind or visually impaired. They don't want to have booming sounds either from the APS because they want to be able to hear traffic movements, and also those in surrounding businesses and residences don't want to have loud APS sounds either. So, work to get the APS close to the departure points so the sound can be kept down low, within six to twelve feet hearing range as the MUTCD specifies. Next slide.

SLIDE-"What's good? What's bad?"

DC: This is a photo showing a crossing. It's actually got a light rail coming through the middle of it. We see a pole to the left that has the pushbutton, the pedestrian pushbutton mounted on it, and this is actually part of a corridor that had significant revisions done to it I think as part of the light rail if I recall correctly, and so that pole there was actually added fairly recently when we took this picture, and it's actually kind of unfortunate, because they were adding APS at these crossings, and they had the opportunity when they were doing it to get those poles in good locations, and they just missed the opportunity to do it. They didn't really think about that, so even though this has an APS on it, it is farther than five feet from the crosswalk line, and it's questionably more than ten feet back from the curb. Certainly not close to where someone would need to use it. So just another point, when you're putting in poles, get them in good locations, and you'll be set up for having good APS and accessible crossings. Next slide.

SLIDE-"Good?"

DC: So how's this one look to you? Here we're looking across the street. We've got an APS mounted on a pole right in front of us. If you think about distance and location stipulations in the MUTCD, it's within the five feet laterally from the crosswalk. I would say it looks to be within ten feet of the face of that curb, so it's positioned well. The face of the APS is going parallel to the crosswalk, so it's been installed well. Someone can get some alignment information from that. So, yeah, this one works very well. Can't tell what the sound set-up is from this picture of course, and sometimes we have found the way agencies configure sound and whatnot do cause issues depending on location, but locationally, where it's placed, this one does well. Next slide.

SLIDE-"Issues here?"

DC: We see here a picture of an intersection corner that has APS mounted on it, but if you can tell, there is not a level landing nearby, and that certainly is a prime issue here with this crossing that for someone to be in a wheel chair accessing these pushbuttons, this is going to be very difficult. Next slide.

SLIDE-"Two APS on one pole. Speech walk indication is 'Walk sign is on'."

DC: I mentioned that sometimes location can work, but the sound settings an agency goes with can cause a problem, and essentially that's what this situation is. This is a city that Janet and I were in teaching and that this one intersection corner that we're looking at here, a very large intersection, and we're looking at the corner that's got one pole there. It's a master pole that's got both APS mounted to it, which sort of could work, but the way they've got it configured is that the speech walk indication, which is what they're using here, says, "Walk sign is on," and that was it. If you think about a pedestrian waiting at either one of those curb ramps they hear walk sign is on, and they know both pushbuttons are there kind of between the ramps, that's really unhelpful to them. They know that one of the crosswalks is on, but there's no way to tell which it is. They needed to use the MUTCD message, "First street, walk sign is on to cross first street," or, "first, walk sign is on to cross first."

JB: And ideally they would locate those pushbuttons closer to where somebody's going to be crossing from.

DC: Absolutely

JB: Because they're quite a ways back.

DC: You could add small poles to the left and have those pushbuttons, and wire them to the signals, and I know a lot of times that does cause issues with getting into the concrete, tearing up the concrete, whatever is needed to put those poles in, but thinking to the usability of the intention of putting APS at the intersection, you want to get it into places people will be able to actually use it, and will use it. So these are things you really need to think through and consider. Next slide.

SLIDE-"APS Workshop"

DC: Before we close up here, I just wanted to mention a few things about the APS workshop, you can go on to the next slide here James.

SLIDE-“Workshop General Info”

DC: This is the one day workshop that Janet and I teach that we’ve been teaching for a number of years to walk through in more detail all of the points we’ve walked through here, as well as a few other ones. SO it’s a full day workshop, and it’s taught by Janet and myself in person, that’s how we’ve been doing it these past several years. Next slide.

SLIDE-“How to Request a Workshop”

DC: If you’re interested in hosting a workshop, you can get a hold of me, there’s my number, 919-962-8720, or shoot me an email at daniel_carter@unc.edu. We can talk through what you’re looking to have there at your facility. Basically what we ask of the host agency is to provide a room, to do the advertisement for the course, to handle registration. It has been free through the NCHRP program we have been working on through this spring, or excuse me, we have to update that slide, we have an extension, it’s through spring 2014. We will continue to offer it after that, and you’ll just need to talk to me about what the availability is and any costs associated with that, so if you’re interested, please let me know and we can talk more about that. Next slide.

SLIDE-“More Information Available at www.apsguide.org”

DC: And the last, the resource I wanted to leave you with is our website, which is www.apsguide.org. The large guidance document that we produced out of this research project is available there in a PDF form if you want to look at it or print it off. Also, the one day workshop that I just mentioned, we have an online version of it, sort of a walk through by yourself, looking at the slides we present as well as the text of what we typically say with that. So all of that is also on this website, and I encourage you to go check that out if you want to learn more about any of the points we’ve talked about here. Please do take a look at that. Our contact information is also on that website too. And that takes us to the end here.

SLIDE-“Thank You!”

JG: Alright, we’ve got ten minutes left for some Q and A. So already got a bunch of questions, but if you’ve got any additional questions, go ahead and type them in now and we’ll see if we can get to them. The first question I have is, “if retrofitting an existing intersection with pushbutton-integrated APS, is there a requirement to then make the intersection ADA compliant, including existing curb ramps, and also, how do you prioritize given limited funds whether to go with the APS or the curb ramps first?”

DC: You’re taking that one Janet.

JB: Well the first is if you’re retrofitting an intersection in response to a request by an individual who is blind or visually impaired, basically there is, my understanding is if you’re doing a signal project, there is not a requirement that you bring all of the curb ramps up to standards at that time. Certainly should be on your list to do when you do some renovation or work there, but if you don’t tear up the curb ramps, you’re not required to replace them when you’re doing an installation of an Accessible Pedestrian Signal. If you tear it up, certainly you have to put it back right, not like you had it if it’s wrong, but there

is not a requirement to extend beyond the scope of the request that you have. For many people who are blind or visually impaired, they don't really care what the curb ramp is like, they're more concerned with getting the signal information than stepping off a curb. There may be exceptions to that, and certainly need to be asking the person who has made the request what they need, but I would say if you've got a request for an accessible signal only on one crossing at an intersection, you could do that without doing the entire intersection, without doing any of the curb ramps if that is what your request is for. What was the second part of that question, I think there was something else there.

DC: Prioritize.

JB: Prioritize. There is a, if you're doing a lot of intersections, have a lot of requests we did as a part of this project develop prioritization tool to use in prioritizing installation of APS based on the features of the intersection, characteristics of the intersection. I encourage you to look through the document and the website that Daniel mentioned just to find the information on that, or contact us.

JG: OK, my next question, I've gotten several versions of this question. What do you do when you're trying to put a pushbutton within six feet of the curb for the visually impaired person, but you also have to deal with an 8 foot long for a person in a wheel chair, due to a six inch curb? How do you accommodate for both?

DC: As you recall, there was one image of those design examples which kind of refers to this situation. Had the level landing, the accessible path to the ramp, and so that was an instance where they had a reason to do it, they put the pushbutton pretty close to the curb and beyond the flair of the ramp so this might be possible a solution to your situation, where you can put the pushbutton where someone can access it, and a blind or visually impaired person could use it, and someone in a wheel chair could go around. So there's a lot of different situations you might run into with how wide your sidewalk is, and that sort of thing, but it doesn't necessarily always have to be at the top of the curb, there are some places it can be. Janet, do you want to add anything to that?

JB: Well, I just also add the MUTCD has an exception that allows it to be ten feet from the curb because that question was asked in the discussions I believe, or in the response when the MPA was published in the MUTCD, but it is basically as an exception, so the goal was to get it closer to the curb if at all possible. Also depends on your curb ramp design, and you might want to look at the curb ramp examples that are in the APS guide for some different designs because certainly if you've got a sidewalk, backup curb, and you need to use a different type of ramp and different kind of location of installation it depends on what you're doing.

DC: Well, in particular those narrower sidewalks, one thing I've really wondered why agencies don't use more is a parallel curb ramp design where you bring the entire sidewalk down instead of having the ramp come in perpendicular to the sidewalk, so something like that can work better when you have narrower widths for the sidewalks as well.

JG: Alright, great. Can APS be installed partially at intersections, for instance the West and South legs, but not the North and East, to accommodate where associated ramps are compliant for crossings, but not then for others?

JB: I think it depends on why you're installing, and when you're installing. If it's a retrofit in response to a request or part of your transition plan then certainly you can do different things in those kind of situations than if you were already working at that intersection, and renovating, or reconstructing the entire intersection. In retrofit situations, or alter situations, those are referred to in the ADA, you can make some adjustments. The goal is to install them at all locations where you have pedestrian signals. I believe that's the goal of the access board in their draft, or proposed regulations, but certainly in a retrofit situation, you can do other things, and I would encourage anyone making those decisions to document carefully to be sure that they are considering all of the issues there, and remember what we just said about whether the ramps are compliant per say, or not is not always an issue for a person who is blind or visually impaired. It may be that there's one crossing that they want to use that goes between the store and the bus stop, and the ramps aren't compliant, and the ramps are compliant on the other two crossings, but they don't take them where they need to go. So I think if you're responding to a person who is blind that request should be looking at what the needs are, what crossings are needed for that person, not just where the ramps are compliant, because it may not get them where they need to go.

JG: Alright, does the lateral reach range accommodate children in wheel chairs?

JB: I believe that lateral reach range is intended to accommodate children in wheel chairs, but that is not really my area of expertise. Certainly something you should know about and consider in your answering questions such as this is the access board does have a technical assistance phone line that you can call. If you look up the access boards website, it's access-board.gov you can find that number, or their email address to request technical assistance, to ask a question such as that, but I believe that's part of why it's been brought down to 10 inches, and 48 inches as the highest. It's partly to allow for people with smaller stature.

JG: OK, great, getting a lot of questions related to this one. Can you describe how to use an APS at midblock crosswalks that have pedestrian activated flashing beacon systems such as an RRFP?

JB: Yeah, there's not any specific guidelines related to that at this moment because there isn't a pedestrian signal, it's not actually an accessible pedestrian signal you'd be installing there, but certainly what I'm hearing from individuals who are blind or visually impaired is that they want to have access to those devices just as somebody sighted has access to them. There are devices available from various manufacturers that have a locator tone, so a person who is blind could find the pushbutton, because if they're pushbutton activated a blind person needs to first know they're there, and where the pushbutton is. Those devices, at least what I've been recommending, I think now this is what the MUTCD team is recommending is the devices provide a speech message that says something like the yellow lights are flashing during the time when the RRFP's, or whatever they are, are activated, and they are, just provide that, there's not a vibrotactile indication on that type of device because that might

indicate to somebody that they have a walk indication or a more clear, maybe confuse them about it. Also, one of the things I want to say is it needs to say the yellow lights are flashing. I was working with some people who are blind in a location where an RRFP was installed with a message that said something like, "cross with caution, cars may not stop," and they assumed the cars had a red light and that they were just getting warned they should cross carefully. So I think it's really important those messages just say it's yellow lights. That's clear to a person who is blind.

JG: OK, I think we have time for one or two more questions. Let's see. How do you sign or mark a no crossing at a crosswalk?

DC: Go ahead Janet.

JB: Well, the access board in the proposed regs has a little advisory notice in there basically saying where no pedestrian crossing is allowed, you need to have some kind of detectable edge or fence preventing somebody from thinking that's a location to cross. It is not, if I remember correctly, it is not a standard, but it's an advisory notice stating that if you're closing a crossing, you need to really close it to individuals who are blind, not just put up a sign.

DC: Yeah, basically if there's a reason you think that someone crossing on foot at that particular leg is going to be an issue or give you concern, simply putting up a no pedestrian crossing sign, or in one agency I know about, they said they simply didn't paint a crosswalk, that was their way of implying one should not cross there. This is not going to work for someone who has visual impairments. You really need to, if you think there's a problem there, put up something like Janet said is a physically blocking, sort of a hard indication that there's no crossing to be had here.

JG: Alright, well thank you. Unfortunately, that's all the time we have for today for question and answers. I'm sorry if we didn't get to your question today. PDF copies of presentation slides will be available later this week at pedbikeinfo.org/webinars, and a recording of today's program will be posted at that site, as well as to our YouTube channel, which is youtube.com/pedbikeinfo within a couple of weeks. Be sure to follow us on Facebook, again facebook.com/pedbike, for updates. I remind you that a very brief survey will appear once the webinar has ended. We'd very much appreciate you taking a moment to complete it. I mentioned earlier that this webinar has been submitted for AICP credit, and I got several questions about AER credit. We do not have contacts with them, but you will receive a certificate of attendance, and you can submit it to them. Maybe you will get credit there. Finally, I want to thank all of you for attending, and I want to thank our speakers Daniel Carter and Janet Barlow, and I hope you all have a very good day.