# **INTRODUCTION:**

The Temporary Pedestrian Access Route (TPAR) Workshop and Demonstration was conducted on June 23-24, 2010. The event was a joint effort planned and developed by the Minnesota Department of Transportation (Mn/DOT) and the American Traffic Safety Service Association (ATSSA) and the local Northland Chapter of ATSSA. Many devices proposed to help guide people with disabilities through a work zone area were displayed for participants to review and critique.

Comments from participants, including people with disabilities, were collected and have been compiled into a series of reports. The report contained in this document is the following:

### 2010 TEMPORARY PEDESTRIAN ACCESS ROUTE STUDY – WORK ZONE MOBILITY MARKET RESEARCH WITH PEOPLE WHO ARE DISABLED

The attached document also contains a One Pager summary of Key Learnings produced by the Mn/DOT Market Research Section.

**Mn/DOT Report Disclaimer:** Mn/DOT contracted with a third party consultant for the "Work Zone Mobility Market Research Study" with people who are disabled. Mn/DOT has accepted this report as an accurate summary of the comments and opinions expressed by the participants. Attempts were made to associate comments regarding specific device characteristics to the proper device. Since comments were recorded by the consultant team as a participant reviewed each device, some comments regarding a device's attribute may not be repeated for each device sharing that attribute (both critical and/or favorable). The comments and opinions expressed by the participants will be used by Mn/DOT in combination with PROWAG regulations and common work zone operational considerations to develop a guidance document for Temporary Pedestrian Access Routes in the future.



# 2010 TEMPORARY PEDESTRIAN ACCESS ROUTE STUDY

People with physical disabilities as well as people who as professionals provide Orientation and Mobility Training for this community met in St. Paul, MN in June 2010. The purpose was to visit and discuss their reactions to an exhibit of devices which are being designed to provide safe transport in temporary pedestrian detour situations.

# The findings (per Mn/DOT Market Research via Independent Consultant) from this qualitative research study support these KEY LEARNINGS about TPARs:

There are three "over-arching themes" in addition to specific reactions to 16 devices: Trainers and those people with physical disabilities agreed nearly unanimously that temporary pedestrian detours need:

1. **Standards** that are shared with them so that they can teach/navigate on their own, knowing what to expect and having one source to call for questions, reports/updates.

2. This **communication** with them as a community may go through several channels such as state/city/private agencies specific to all of the groups represented (and some not present -such as people with cognitive disabilities). It should include dates or anticipated work on local sidewalks, signage "at" the site for both sighted and unsighted, hearing and non-hearing, with info that tells them what lies ahead so they can make an informed decision on whether or not to continue.

3. Last but not least, most participants totally **dislike asking for help**: they ask that Mn/DOT create a temporary sidewalk which they can travel on their own, the majority of the time. "*Make it so I can do it myself!*" – was often heard.

**Detailed findings on device types:** (see full consultant's report for more info) Preferences from people with disabilities/Trainers for temporary pedestrian detours:

- A sufficiently wide walkway (minimum 48") to allow for safe passage of wheelchairs/motorized carts & service animals if walking alongside. Channelizing devices along the walkway are sturdy & stable: will not tip if one loses their balance and falls into them. Devices are straight up and down versus angled; ones that are free of anything protruding from the sides or from openings along the bottom edge holes, etc. causing a cane or a walker leg to catch and potentially disorient or "trip-up" a person. A continuous railing on the top to allow someone to place their hand on the railing and move their hand along the railing without encountering gaps, slivers or materials too hot or cold to the touch. Orange and white stripes are preferred on rails and barrier sides.
- Surfaces and temporary ramps free of movement/vibrations, made of materials that won't become slippery when wet/frosty, and *not* cause glaring from the sun or other bright light. Again: temperature plays a role – potentially causing injury to the paws of a service animal.
- Transitions between 2 surfaces, perhaps logically so, must be smooth, sturdy & made of non-slippery materials, especially to accommodate elevation changes. If using ramps, must be as wide as the detour walkway surface with an ideal slope of 8 percent or flatter.

Your Destination...Our Driority

#### September, 2010

Market Research for Office of Traffic, Safety and Technology, Mn/DOT

Central Location Test of safety devices at U of MN June 23-24, 2010; followed by Focus Groups of:

- 5 Orientation & Mobility Trainers
- 14 people with physical disabilities of many types

<u>Caveat:</u> - qualitative research is exploratory; directional learnings are uncovered and are best used in combination with technical or quantitative research. These findings may not be projectable to the targeted population as a whole.

#### For More

Information Contact: Chris McMahon Market Research/PARI 651.366.3771 chris.mcmahon@state.mn.us

# 2010 TEMPORARY PEDESTRIAN ACCESS ROUTE STUDY – WORK ZONE MOBILITY MARKET RESEARCH WITH PEOPLE WHO ARE DISABLED

**June 2010** 

Prepared for:	Mn/DOT Office of Traffic, Safety and
	Technology (OTST)
	and
	Mn/DOT Market Research
	St. Paul, MN
Prepared by:	William & Kaye, Inc.
	Victoria, MN

# **TABLE OF CONTENTS**

Page No.

EXECUTIVE SUMMARY	2
BACKGROUND, OBJECTIVES AND METHODOLOGY	4
Background and Objectives Methodology	4 4
SUMMARY OF FINDINGS	5
<b>APPENDIX 1</b>	7
Discussion Guide for People Who Are Disabled	8
Discussion Guide for Orientation and Mobility Trainers	1
<b>APPENDIX 2</b>	5
TPAR Device Demonstration Layout	б
Evaluations of Devices on Display	7

# 2010 TEMPORARY PEDESTRIAN ACCESS ROUTE STUDY

#### **EXECUTIVE SUMMARY:**

People with disabilities (deaf, blind, deaf-blind, people who walk with a cane or walker, people who use a wheelchair or motorized cart or people who have difficulty with balance and walking due to some other reason such as suffering imbalance issues – vertigo, stroke, etc.) as well as people who as professionals provide Orientation and Mobility Training for people with disabilities met in St. Paul, MN in June 2010 for the purpose of visiting and discussing their reactions to an exhibit of devices which are being designed to provide safe transport for people with disabilities when traveling through a temporary pedestrian detour (a temporary route resulting from a blocked or closed sidewalk due to construction or maintenance work). The Mn/DOT Office of Traffic, Safety and Technology (OTST) sponsored this meeting as part of a 2-day conference designed to help better understand what devices are being manufactured and available to transportation-related organizations for help in meeting Accessibility Guidelines mandated under ADAAG and PROWAG. Pedestrian detours which are successfully designed to safely accommodate the needs of people with disabilities are designated as Temporary Pedestrian Access Routes' (TPAR) detours.

People with disabilities and professional Trainers initially discussed the frequency and intensity of problems that are encountered when confronted with a blocked or closed sidewalk, caused by a work zone. People with disabilities must consider the difficulties they may encounter in attempting to navigate through the pedestrian detour and certainly need to determine if they will be able to get through the detour safely. If options such as finding an acceptable or available alternative (going back to find another route, attempting to cross the street and continue on the other side, attempting to locate someone who could help them through the detour, etc.) do not seem feasible, the person with a disability may have to risk potential injury and simply proceed through the detour.

Manufacturers are attempting to provide devices for TPAR detours that will make it possible for persons with disabilities to move through a work zone detour without difficulty or without risk of injuring themselves. To be confident that such devices will be effective and safe for persons with disabilities, Mn/DOT asked the persons with disabilities and the Trainers to visit the exhibit of devices and report their reactions to what they experienced.

# *<u>The findings from this qualitative research study support these key findings</u>: A TPAR detour needs to include the following:*

- Channelizing devices that outline the route and are sufficiently wide (minimum width of 48 inches) to allow for safe passage of someone in a wheelchair or motorized cart, someone accompanied by a service animal, etc.,
- Devices that are sturdy and stable ones that will not tip over if a person should lose their balance and fall into them,
- Channelizing devices that are straight up and down versus angled and ones that are free of anything protruding from the sides of the devices,
- Channelizing devices that do not have holes or openings along the bottom edge holes, etc. can cause a cane or a walker leg to catch and potentially disorient or "trip-up" a person using the cane or walker,
- Channelizing devices that have a continuous railing on the top to allow someone to place their hand on the railing and move their hand along the railing without encountering a gap in the railing or

encountering a railing that could cause an injury -a sliver (from wood) or one that is too hot or cold to the touch,

- Channelizing devices that are properly colored with contrasting orange and white stripes on the top railing with a similarly-colored, corresponding bottom railing that extends to the ground or to whatever surface meets the ground,
- Channelizing devices that provide alternating orange and white stripes can provide maximum visibility for those with low vision and do not cause glaring (as yellow might) nor confusion that black on a channelizer can if it meets a black surface (a contrast from the color of a black surface – such as asphalt – is necessary),
- Surfaces must be stable and free of movement or vibrations,
- Surfaces must be designed of materials that will not become slippery when wet or covered with frost,
- Surfaces must not be designed of materials that will not cause glaring from the sun or other bright light and cannot be made of any material that becomes hot or cold – potentially causing injury to the paws of a service dog,
- Transitions between two surfaces (elevation changes) must be smooth, sturdy and made of non-slippery materials,
- Ramps must be as wide as the detour walkway surface with an ideal slope of 8 percent or flatter,
- Ramps must be constructed of non-slip material but not of a material that would catch a cane or walker,
- Adequate signage signage that is at least as extensive as what motorists encounter when entering a work zone on a road or highway.

Any attempt to communicate information about a scheduled pedestrian detour or an on-going one needs to be extensive and make use of various media – the Internet, radio and TV, area newspapers, phone messaging, etc.

Most importantly, any pedestrian detour that has been set up where a sidewalk has been blocked or closed must make it possible for any person with a disability to be able to navigate the site safely and effectively. As one person with a disability so clearly said on behalf of the others, "*Make it so I can do it myself.*"

### BACKGROUND, OBJECTIVES AND METHODOLOGY

#### **Background and Objectives**

The Office of Traffic, Safety and Technology (OTST) was interested in learning how Mn/DOT customers (those who are pedestrians with disabilities) react to exhibits set up in a mock display of work zone devices that manufacturers provide to show how they (the manufacturers) are working to be compliant with Accessibility Guidelines mandated under ADAAG and PROWAG provisions. When construction or maintenance work causes the closing or blocking of a sidewalk and the pedestrian detour is designed and setup to safely accommodate persons in the disabled community, it is then called a Temporary Pedestrian Access Route (TPAR). While Mn/DOT is interested in ensuring that all pedestrian customers' needs are met concerning work zone safety, this research was designed to determine what work zone devices are needed to provide all pedestrian detours at TPAR status. Members of the disabled community and Orientation and Mobility Trainers (people who train members of the disabled community to navigate through the State's transportation system) were exposed to a mock work zone exhibit where devices were displayed – devices that could be used in such a pedestrian detour.

Information is needed from this market research study to better understand and manage/engineer safe pedestrian movement solutions for the State of Minnesota as they relate to ADA Accessibility Guidelines.

The goal of this research project, then, was to collect information for Mn/DOT's use regarding pedestrian detour-related experiences from users (people with disabilities) and Trainers of the users. Samples from the community of people with disabilities as well as a sample of Orientation and Mobility Trainers were the participants in this research project to measure:

- Research participants' existing perceptions and experiences when a sidewalk is closed or blocked due to construction or maintenance work in progress.
- Research participants' reactions to specific exhibits of devices designed to help meet ADA Accessibility Guidelines when preparing a pedestrian detour to Temporary Pedestrian Access Route (TPAR) standards.

#### Methodology

Over a two-day period (June 23 and 24, 2010), people with disabilities and Orientation and Mobility Trainers were invited by Mn/DOT to tour the display area of the devices, and while doing so, discuss their immediate reactions to what they were viewing/experiencing. Following the tour of the exhibits, a series of three focus groups were conducted to capture the research participants' reactions to the products displayed.

Mn/DOT personnel worked with the community of people with disabilities to identify people with specific disabilities – deaf, blind, deaf-blind, people who walk with a cane or walker, people who use a wheelchair or motorized cart or people who have difficulty with balance and walking due to some other reason, such as suffering from vertigo or stroke. The Orientation and Mobility Trainers were identified by their employment –

hospitals, school districts, organizations designed to provide assistance to the Blind, the Deaf or the DeafBlind. Once identified, a qualified person was invited to participate in this market research study. The study was held at the University of Minnesota Continuing Education Conference Center on the St. Paul Campus with the exhibits set up outdoors. Two focus groups were held with people with disabilities:

- A focus group in the morning of June 24, 2010 with those who were blind, walked with a cane or walker, used a wheelchair or motorized cart. One person was accompanied by a service or guide dog.
- A focus group in the afternoon of June 24, 2010 with those who were deaf, deaf-blind or blind. All but one of the participants in the afternoon focus group was accompanied by those who interpret for them or are service assistants for them. Two of the afternoon participants were accompanied by their service or guide dogs.

In addition to the two focus groups that were held with participants who are people with disabilities, a focus group was held the morning of June 23, 2010 with people who offer Orientation and Mobility Training assistance to people with disabilities.

During the focus groups, the discussions centered on the following topics:

- Initial reactions to the devices that were on display,
- Questions or concerns about the devices that were displayed,
- What they liked, the benefits of the devices,
- What, if anything, they would like to see changed about the devices,
- How they would prefer to be alerted/informed of temporary work zones where a sidewalk has been closed or blocked,
- What advice they would have for Mn/DOT, when Mn/DOT designs a pedestrian detour through or around a closed or blocked sidewalk.

Focus groups were selected for this market research study to collect the comments and observations from the research participants since this style of research is an exploratory technique designed to elicit insights, attitudes and issues, and produces results that while not statistically projectable to the population as a whole, nevertheless, provide results that can offer revealing feedback and directional data on complex topics and ideas. (In this report, feedback provided by the participants regarding their impressions of the manufacturers' devices that were on display during the conference is provided.)

#### **SUMMARY OF FINDINGS**

More than a dozen people with disabilities as well as professionals who provide Orientation and Mobility Training to people with disabilities gathered on the St. Paul Campus of the University of Minnesota on June 23 or 24, 2010 for the purpose of discussing how people with disabilities navigate through temporary pedestrian detours – detours set up to accommodate pedestrians where a sidewalk has been closed or blocked. Included among the people with disabilities who attended were people who are deaf, blind, deaf-blind, people who walk with a cane or walker, people who use a wheelchair or motorized cart or people who have difficulty with balance and walking due to some other reason, such as suffering imbalance issues due to vertigo, stroke, etc. Those who provide Orientation and Mobility Training (*hereafter referred to in this Report as <u>Trainers</u>) are employed at area hospitals, school districts, organizations designed to provide assistance to the Blind, the Deaf or the DeafBlind, etc.* 

The Office of Traffic, Safety and Technology (OTST), a part of the Minnesota Department of Transportation (Mn/DOT), sponsored a 2-day conference called the "Temporary Pedestrian Access Routes' (TPAR) Workshop and Demonstration." The event explored issues related to how to better implement Accessibility Guidelines mandated under ADAAG and PROWAG provisions as they relate to pedestrian detours – detours created when construction or maintenance work has caused a sidewalk to be blocked or closed. As a part of the 2-day conference, manufacturers were invited to display devices they have created to help meet such guidelines which provide safe transport for people with disabilities through work zones. Pedestrian detours which are successfully designed to safely accommodate the needs of people with disabilities are designated as Temporary Pedestrian Access Routes' (TPAR) detours or TPAR compliant. (The devices that were on display can be found, identified and are evaluated in the Appendix Section of this Report.)

The people with disabilities and the Trainers were invited by Mn/DOT for the purpose of discussing how they now deal with closed or blocked sidewalks (or instruct people with disabilities to navigate through such situations). They were also asked to experience the devices provided by manufacturers and to discuss their reactions to what they experienced. The devices were set up outside the place where the conference was held.

#### Current Experiences

A person with a disability who currently comes upon a blocked or closed sidewalk is confronted with a variety of options about how to get around the work area or through a temporary pedestrian detour that has been set up. **Most of the current options are usually inconvenient and some can be potentially dangerous to the person with a disability**.

People who are blind or deaf-blind and are walking by themselves or accompanied by a service animal usually follow known routes. If unaware that a known route will be hindered by a detour, upon encountering the detour, the person with one of these disabilities must determine:

- If there is a safe way to proceed,
- If their service dog be should encouraged to continue,
- If a cane can provide a safe way to continue through the detour,
- If they should go back and find an alternate route,
- If they should attempt to cross the street and continue by walking on the other side,

- If the detour is a 1-way or 2-way detour,
- If there might be someone nearby who could offer them assistance, etc.

The Blind and DeafBlind face numerous challenges; needing to alter a route they have learned to navigate could mean they might compromise their safety – unknown "*raised concrete slabs, roots growing into a sidewalk*" that is not usually taken, are some of their concerns. If accompanied by a service animal, the service animal may be diverted into an area where the animal could be bothered by other animals. A service animal senses that something is wrong when approaching a site where change has occurred and reacts accordingly – "*When my dog stops, I wonder what is the reason; what is the barrier?*" The potential for problems can be great when the Blind or DeafBlind are confronted with walking a new route.

People who use a wheelchair or motorized cart must determine if there is sufficient space in the pedestrian detour to maneuver their chair or cart and not get stuck due to a space that is too narrow or cannot accommodate the size of the chair or cart, etc. Some who use a wheelchair are also accompanied by a service animal, thus further complicating the potential for navigating with ease through a detour site. People with balance issues, ones who walk with a cane or a walker, are also confronted with the same concern – wondering if there is a safe way to get through the pedestrian detour.

The nearly uniform response to coming upon a closed or blocked sidewalk for people with disabilities is to proceed and understand there may be consequences. They enter an "unknown zone" and understand there is the potential for great risk. One of the participants in this study (a man who uses a motorized wheelchair) will often move off the sidewalk, if the sidewalk is closed or blocked, and drive his wheelchair into the street to move among the street traffic, rather then risk trying to go through the detour area. He understands that he puts himself at great risk but feels he is willing to do this, knowing he is more likely to get around the work area this way than being able to get through the pedestrian detour that has been set up! He does this because he, as well as most of the others, mentions that there appears to be no standard way for setting up a pedestrian detour route when there is a closed or blocked sidewalk caused by some construction that is underway.

"Work zones are constantly changing." Both a need and a desire are there to provide uniform standards (standards that are "reasonable" and "consistent") for setting up a safe and navigable way to design pedestrian detours when a sidewalk has been temporarily blocked or closed. For people with disabilities and for those who do Orientation and Mobility Training, "standardization" is so very necessary to help people get through these pedestrian detours in a "known" and "safe" way. People with disabilities who know what to expect are able to or should, with some degree of confidence, be able to enter a pedestrian detour (TPAR compliant) and feel they are reasonably confident of knowing how to get through it! The unknown can cause panic attacks for those with anxiety issues.

Recognizing there is no perceived uniform way that pedestrian detours are currently set up, the Trainers work to alert their clients with disabilities to the alternatives they might consider:

- "*My role is to teach people how to get around in the community.*"
- "We work on looking around and seeing what alternate routes are. We scan and see what the potential barriers are, figure out how we might be able to get around those barriers and if that's not possible or if it's not safe, then look for alternate routes. So, first is just scoping out the situation and coming up with

options, identifying barriers and coming up with options to get around those barriers. Looking at surfaces; also part of that is scanning surfaces. Looking for height changes – rough, broken, slanted, uneven surfaces – that sort of thing."

- Getting around in the community? I would ask what the problem was and depending how much language was used to describe the issues ... a lot of our students have very limited English language skills just being deaf, hard of hearing or using English as their second language. So, I would want to know if there are visual signs set-up, if there were English language signs set-up. It would also be helpful to find a source, like on a website that has a photograph or an image of the situation, so I could sit down with my students and explain how to get around that would be a good thing, too. I would also be talking about safe, alternate routes what's safe, what's not, what's going to take them too far out of their way. Do they understand the detour? Do they understand how long it's going to be like this? Those are the type of questions I'd be working with students on."
- "Based on the premise that the student learner and the instructor come upon a construction zone, what I would do depends on the person's disability; if it's a person who is blind or deaf-blind and this is a new experience, I would have to have them touch all of the obstacles that they're encountering. They can't see it. I would have them touch the tape. I would have them touch the barrels, the orange mesh, cones, signs, portable 'horse' the sawhorse things, just anything that's at the site, just to raise their awareness of what these obstacles are and then it would involve problem solving what to do. Is there a pathway through it? If not, what would be an alternate route that would be safe for somebody who is blind, visually impaired or for other people with other disabilities not visually impaired? I would do what other people are talking about, taking pictures, discussing it at a later date. I would go on a website and present options to them with what they might encounter. But at that moment, oh, let's say for somebody who has a really difficult time with change, when things aren't the same, they don't look right, what do we do? For them, just coping with the emotional aspects of things looks different."
- "Most of our people have been in wheelchairs, have had a disability for a number of years. So, what we do is know you're adding another dimension to your width. If you're in a big power chair, you have to think about where your dog is. So, they're already looking for curb cuts. They're looking for the construction zones and how to maneuver, all that kind of stuff. Most of our people have already experienced maneuvering through the community, but now we're going to add an animal. And the animals can be, the dogs can be, distracted by trash or things flying or whatever, so I help them manage the behavior of the dog in these different environments whether the dog needs to go ahead and or behind them to maneuver through construction zones or whatever. Most of our people are pretty savvy to how to maneuver around the community; it's just now they're wider! Now, they have another beam to kind of be concerned with."

Trainers are faced with the necessity of helping people with disabilities learn how to adjust to all types of potentially adverse situations – one of the most significant being how to navigate through a closed or blocked sidewalk that has been part of a "known" route to a person with a disability. The desired end-result of their training is to equip people with disabilities to be able to move about confidently, independently and safely.

One of the Trainers summarized the dilemma they face and the problems people with disabilities face with a reminder of the work done by Dr. Temple Grandin – work she had done for years to create a more humane way of getting cattle to move safely through chutes. *"I don't want to compare people with animals, but you know* 

Temple Grandin; she does a lot of work. She's a woman with autism and does a lot of work about humane channeling of cattle through chutes, and it's the same concept. There is so much work put into designing humane cattle chutes; why wouldn't there be an equal amount of work done to make this humane and safe for people with disabilities [moving people through work zone detours]? She's been working on that for 30 years, so it's about time to work on something for people with disabilities!"

#### **Essential Elements to Consider for Standardizing TPAR Detours**

Both the Trainers and the people with disabilities suggest the following as essential elements to consider when selecting devices to create a TPAR compliant detour:

<u>Longitudinal Channelizers</u>: Longitudinal Channelizing Devices that are used to outline the two sides of a sidewalk detour need to be much wider than the minimum standards require. A pedestrian detour walkway needs to account for several things, in particular, for those who use a wheelchair or motorized cart:

- Many people are "simply getting bigger!" wider, heavier, taller and the wheelchairs or motorized carts they use are getting wider, partially to accommodate this issue; additional room is needed as well to accommodate those who travel in a wheelchair or motorized cart with their legs extended straight out in a footrest. In addition, many people who use a wheelchair or motorized cart have accessorized their chair or cart, adding width to their original vehicle cup holders, mirrors, etc.
- Some who use a wheelchair or a motorized cart are also accompanied by a service animal most often a larger dog, The service animals are trained to usually walk beside the wheelchairs or motorized carts rather than in front or in back adding the need for additional width to allow the service animals to proceed through the pedestrian detours beside the people with disabilities they serve.
- A 90-degree angle turn is clearly impossible to do when channelizing devices provide an inadequate amount of space a narrow width (36 inches or slightly wider) could mean a person in a wheelchair or disability would need to back down to the starting area if unable to proceed through.

One Trainer summarizes it in this way: "Three feet, a yard, is not much space when you get a wheelchair in there and all the accessories along the sides; that's going to be a one-person thing. Then, the corners can be a problem, turning the corners in a wheelchair; that's because often the footrests are out beyond the person, so they really take up a lot of space, to get around those corners."

The man who was identified earlier as someone who might choose to avoid a pedestrian detour by moving into the street and traveling with the vehicles does so because he often thinks he will not be able to make it through a narrow detour area.

Some also question if the pedestrian detour walkway is expected to be a 1-way or a 2-way detour. If the detour is to be 2-way, most suggest that it is impossible to navigate through a 2-way detour with a wheelchair or motorized cart or walk with a service animal if there are not at least a few "turn-outs" to allow someone to pass when another individual is coming from the other way, also using a wheelchair or motorized cart or walking with a service animal.

# The better alternative is to design a pedestrian detour that is at least 48 inches between two outside, parallel channelizers, but more than 48 inches in width would make navigating such a detour even easier.

One of the concerns expressed about the channelizing devices that are used to define the boundaries of the pedestrian detour walkway relate to anything that protrudes from the devices that are used.

- Bases, railings or other protrusions extending into the detour walkway will cut into the available width for moving through and could ultimately "*cause a person to stumble and possibly fall down*,"
- Bases extending into the detour walkway can mean that there is a potential tripping hazard present,
- Bases extending into the detour walkway can mean that someone using a cane (whether blind, deafblind or sighted but using a cane for stability) could become disoriented,
- Bases extending into the detour walkway can also cause a wheelchair or motorized cart to get stuck.

(Initially, two of the channelizing devices on display were set to provide an opening of 36 inches; they were subsequently re-set to provide an opening of 48 inches to measure the viability of greater width.) One of the people had this to say about the barriers that were on display when the opening was 36 inches. "I thought a lot about width, the width of walking paths, especially assuming that they're 2-way paths. The thing that concerns me, and we were just walking through, just two of us, going one direction – in a real live situation, it could be a really different story and a real problem, especially if you know there are multiple people, people hurrying, people coming in both directions, the possibility of two people, each person using a wheelchair, coming in opposite directions and needing to pass."

Another has this to say about width: "The width – especially I think about downtown Minneapolis at lunch or rush hour. You've got people traveling very fast in both directions, not necessarily looking down, they're looking ahead and you've got a wheelchair in there and possibly a dog, and it gets really congested in some of those spots. I've been in those enclosed plywood places with a dog and people at rush hour and it's awful. I mean it's really hard, and people are not always very kind. So you know that width is very important."

The preferred type of channelizing device set up for people with disabilities is to have both sides of the pedestrian detour walkway "defined" by the same type of device. When a more durable channelizing device is placed adjacent to the traffic side of the detour (such as a pre-cast concrete barrier or a barrier that can be filled with water to gain weight and stability), it needs to be straight up and down – not on an angle – with a railing on the top and one near the bottom that goes all the way to the pavement or the ground. The parallel channelizing device forming the opposite side of the detour route must also be straight up and down (as described above). Anything on an angle may cause people with disabilities to fall into the device and possibly injuring themselves.

<u>**Railings:**</u> Of the channelizing devices that were on display, the people with disabilities and the Trainers prefer the ones that offer straight up-and-down, plastic rails with <u>continuous</u>, <u>solid</u> railings on top and at the bottom – the top rail allows a person with a disability to hold the rail for balance and security, safely running their hand along the top of the rail; the railing at the bottom allows those who use a cane to smoothly move their cane along the base and not be stopped or have their cane snagged by gaps or openings in the rail. (The top rail, often used for holding to help ensure balance and security, cannot pose hazards: wood can cause splinters, a

pipe can be either too hot in the sun or too cold in cool weather to hold onto; a rail that has couplings larger than the rail itself also poses the possibility for injury.)

The value of having a top and bottom rail is discussed in this way: "Because they mark; on the top they just let me know where the path is. On the bottom they let me know where the barricade comes in contact with the sidewalk or street and that's really important to know because that's where the wheels of a chair are, that's where the feet of a walker are. That's where feet are. To me, it's a very important place just for orienting and knowing where you are; knowing where the edge of the pathway is...That's what I liked."

Straight up-and-down rails also mean there are no protrusions that will cause problems for those who use a wheelchair or a motorized cart for their transportation. There is also nothing that could hurt a service animal when there is nothing extending from the device into the pedestrian detour walkway.

In addition to the value of railings discussed above, many people with disabilities check for railings as railings are simply used to "help guide" them along. Being able to hold onto a railing that is firmly attached to the ground or a barrier type channelizing device can give a person a "*real sense of safety*." The fear of falling or the potential to do so is enough to cause panic attacks in many who are blind, deaf-blind, have difficulty walking or suffer from balance problems. Railings attached to any ramp are as valuable to the people with disabilities as they are when attached to devices used to define a detour path.

At the end of each railing, caps must be placed to ensure that no sharp edges are exposed as many people with disabilities reach for a railing as soon as they approach one.

<u>Stability:</u> Of equal importance is <u>stability</u>. Many of the people with disabilities require channelizing devices and walkway surfaces that are stable. Longitudinal channelizers such as barriers or barricades serve as a stabilizing device for those who have balance issues and need something they can use for steadying themselves. A smooth, solid rail that is well secured to a channelizing device is vital to keep someone from losing their balance and possibly falling. According to some of the participants in the research study, a straight up-and-down channelizing device that is very secure versus one that is on a diagonal or is less secure means that if someone does lose their balance and falls into the channelizer, the fall is likely to result in less injury due to the shorter distance to fall.

Ground surface also must be stable. The "horse mat" on display provided a more secure feel to several of the participants than did a metal or wooden surface. Metal and wood can become slippery in wet weather or when wet debris remains on the surfaces. Nodules on a metal surface can cause someone with balance issues to feel insecure. Vibrations from a slightly elevated, wooden walkway surface are very disorienting for anyone with balance issues and can cause a person with this type of disability to fall, risking injury. Yet, the "horse mat" is not an ideal solution to surfaces as it can feel too soft to someone with balance issues. The "horse mat" does, however, pose little problem for those in wheelchairs, and those who walk with a cane could learn how to move their canes across the surface and continue moving forward.

<u>Colors, Contrast and Glaring</u>: Many note that the color, "orange," is already recognized as the "standard color for construction" and is clearly the preferred color for devices used in pedestrian detours. Orange seldom would result in seeing a glare; yellow can be a difficult color because it does cause some with disabilities to see a glare.

- "Blind people with low vision can see the black and the orange, but the yellow that seems bright in the day may be too bright."
- "Orange is a good color for contrast."
- "I would agree, orange is better than yellow for a few reasons. The yellow is 'glary,' so for somebody who has photosensitivity that would be difficult and also a universality. If we're teaching that orange equals construction, that would be good to have some universality there standardization."

Yellow does seem to be an acceptable color for protective fencing rather than orange since yellow signifies "caution," "pay attention" or "do not enter" – just as a yellow tape strung by emergency personnel means that the area is not to be entered. Yellow is also an appropriate color for a street crossing to signify "use caution" as pedestrians are likely to be present. Orange is more indicative of construction that is underway.

Yellow also seems appropriate for a curb ramp because it also signifies that someone should "use caution" while approaching and using the ramp as well as an appropriate color for a temporary truncated dome mat - again, to indicate "use caution" when approaching or using.

When black or white stripes are used with orange or yellow stripes, several suggest this is the best use of color. Most preferable is the use of alternating orange and white stripes. *"The contrast of marking barriers with orange and white stripes – the top and bottom rails and the edges – makes them really stand out and are easy to see."* 

Solid orange or solid white stand out, but the preference is for stripes rather than solid colors. Black stripes can be an effective color when combined with orange stripes, but when used for bottom rails, the black "flows" into the color of asphalt creating difficulty for someone with low vision to determine when one item stops and the other begins.

The most appropriate coloring for longitudinal channelizers is to alternate orange and white stripes – construction is underway and these colored devices "line the detour route."

The overall advice on black is <u>to not color any base black</u> (whether it is a base for a channelizing device or the base for a sign, etc.) due to the inability for several with disabilities to discern there is something that may be a hazard for them since black is often likely to be the color of the surface upon which the item is sitting as well as the color for the base. This can cause someone to trip because of the difficulty of being unable to see a protruding base that cannot be distinguished due to its color.

**<u>Transitions Between Two Surfaces:</u>** For many people with disabilities, "elevation changes are the hardest." Transitions between two surfaces are "a huge deal!" "I think something about transitions between two surfaces...in construction zones that's such a huge deal...having sturdy transitions between two surfaces, between two heights, because if there aren't transitions, if there's just a gap, the wheels of a walker, the wheels of a chair can catch in those areas or people can trip as well."

Poorly built transitions between heights and surfaces can cause several problems – tripping, "*cause you to lose your balance*," cause canes or the wheels of walkers to catch on them, cause a "*wheelchair to be hindered*" or difficult to maneuver.

**The transition between two surfaces needs to be smooth, sturdy and made of non-slippery material.** A metal plate may be elevated even slightly and cause a person to trip or lose their balance. Metal plates can also reflect the light of the sun and cause a glare that could prevent someone with limited sight to not see the transition. The transition area must be free of "ridges" where one surface is slightly higher than the other. "I'd say transitions are really important because if you can't get past the transition, you can't get to the wonderful surface that's after it, so transitions are a big deal."

<u>Surfaces:</u> Need to be made of non-slip materials. Rain or icing (early morning frost) can cause surfaces to become very slippery. Leaves and other debris that can accumulate on such surfaces can also add to slippery conditions. Several people who participated in this research note that they are very sensitive to accumulated debris on surfaces which can make walking (with or without a cane or walker) or using a wheelchair or motorized cart more hazardous.

Often in a construction site, there are no personnel in the area who could clear the detour route of the debris. Several suggest having prominent signage at the detour site listing a telephone number of someone to contact to "*clean up the mess*." (Being able to contact someone would also help in situations where something has fallen or been blown down, etc., affecting a person's ability to continue through a detour site.)

Wood and metal surfaces can be more acceptable if covered with "flush-to-the surface" non-slip material. Metal surfaces can get hot from the sun as well as create a glare when not painted a color; white is never suggested as white can cause glare as well. Small elevated dots on an extended metal surface can be disorienting to some with handicaps because "truncated domes" suggest a change is present – but truncated domes are of a usual, finite length. A metal surface used for the base of sidewalk detour can be "disorienting" when the length is unknown.

When a temporary curb ramp is constructed of wood with a plywood surface, movement vibrations on the surface can become extremely disorienting for anyone with balance issues, possibly causing a person with this type of disability to fall, risking injury.

If a sidewalk is closed or blocked, one person with a disability mentions that she would hope that the sidewalk construction does not mean that a brick sidewalk was being installed – while brick sidewalks may be attractive, the uneven surface causes significant problems for those who use a cane or a walker and particular problems to a person whose disability is blindness.

**<u>Ramps</u>**: Temporary curb ramps need to be as wide as the detour route to prevent someone who is walking or in a wheelchair or motorized cart from falling off a side. A ramp of 8 percent has far more appeal than one of 16 percent. (One motorized wheelchair user whose disability is progressively getting more severe worries that at some time when coming down a too-steep curb ramp, he may fall forward in his chair and not have the strength "to sit back up.") The surface material of a temporary curb ramp must be non-slip but not catch canes or walkers.

**Warning Lights:** Flashing, warning lights signal "caution!" They note that something "different" is ahead and a person needs to "pay attention" more than usual. Flashing lights at the beginning and end of a detour due to the closing or blocking of a sidewalk would be a distinct benefit to some with low vision, some with balance issues, etc.

<u>Illumination Lighting</u>: Lights along a detour route are strongly encouraged as any persons with disabilities who need to be out in lower light hours (early morning/late evening/heavy overcast skies) have difficulty distinguishing surfaces, transitions, etc.

<u>Signage:</u> Of "major importance" to people with disabilities is proper signage! Proper signage to accommodate people with disabilities will need to be "clear and concise," large, clear lettering, high contrast, the addition of Braille for those who use Braille and raised lettering/maps for those who rely on their tactile capabilities for information. Signage at detour routes due to construction work that has closed or blocked a sidewalk should minimally include:

- Signs that are placed well enough before the beginning of the actual work zone site to allow a person to decide whether to continue or seek an alternate route.
- Information about when the work zone construction will begin as well as an anticipated ending date (anticipated amount of time it will take to complete the project) – similar to the signs found at highway construction sites.
- Information about the length of the sidewalk detour.
- A map of the detour on the signs would be highly welcomed.
- Signs identifying both the beginning of the actual detour path and the ending notifying a pedestrian they have "reached the end."
- Signs need to be kept clean at all times.
- When appropriate, due to the area where the sidewalk will be closed the language of the people who live in the general area.
- (As already noted, a contact telephone number of someone or a firm that can be called.)

<u>Audible Warning:</u> The concept of having an audible device present at pedestrian detour sites has great appeal, but an effective device must be able to account for such things as being heard over adjacent construction and traffic noise, loud enough for those with limited hearing to clearly hear the message, clearly spoken, frequently repeated, easily triggered by someone's presence and on a base that is sturdy enough that someone who holds onto the device would not be able to easily "knock it over." For those with "low hearing," there are certain decibel levels of a male or female voice that make it more possible for people with such a hearing disability to hear some speech more clearly than they would at other decibel levels.

One Trainer suggests that an "audible warning" should be as clear as the message heard in Terminal 1 of the Minneapolis/St. Paul Airport as a person approaches the end of a moving walkway.

<u>Communication About Pending and Actual Sidewalk Construction and Resulting Detour:</u> People with disabilities and those who provide Orientation and Mobility Training services to people with disabilities would

welcome the opportunity to learn about pending and actual construction and sidewalk closings. To some, it seems like "such a natural thing to do!"

There are several entities that already provide advance and current information about transportation issues: the City of St. Paul (in particular, communications from the City about sidewalk closings, etc.), the Met Council, bus scheduling and interruptions of service, for example. For all, it only seems "natural" that Mn/DOT (and other appropriate agencies who schedule/manage construction where a sidewalk is closed or blocked) would "post" such information. Most often mentioned is to "post the information on a Website." Other suggestions include:

- Announcements on area TV and radio stations similar to the daily traffic reports (which at peak periods are done as frequently as every 10 minutes),
- Announcements in area newspapers (of lower interest),
- Sending out mass e-mails similar to what is done regarding the plowing of Snow Routes,
- A "Google" map of the site with an address and other identifying information,
- An actual picture of the site, accessed via computer or TV,
- Sending information to organizations providing services to people with disabilities, such as Minnesota DeafBlind Association and others,
- Providing information to the State Services for the Blind where a corps of volunteers keeps Minnesotans updated with access to news, literature and other information,
- Including messages on a radio station for Minnesotans with reading disabilities (State Services for the Blind),
- Phone numbers to contact to seek information about work zone sites and sidewalk interruptions a
  phone number to call similar to the one called for Gopher State One Call,
- Mailing information with utility bills,
- Exploring the viability of a "virtual library" called the Internet Archive (DAISY format or Digital Accessible Information System) a service that is available to print-disabled people.

A suggestion is offered of attempting to send this type of information to Trainers with the thought the Trainers would be able to distribute the information or be a "source" for their clients. However, the role of the Trainer is described as one who helps orient and train people with disabilities about how to get around in their communities and then "*set them free*."

#### "I Want To Be Able To Do It By Myself!"

People with disabilities are encouraged by the current interest in creating TPAR compliant detours that are designed to accommodate all pedestrians. Most people with disabilities have the desire to be able to navigate through a detour "*without calling attention to themselves*." They do not want to fall into a barrier or barricade, do not want to fall to the ground, do not want to get "stuck" in a too narrow detour and do not want to be "helped" through.

There is almost no interest in having someone "on site" to offer assistance to those needing help to get through the detour; their desire to live independently is a major reason to turn down assistance. Others question how such a person could be identified as trustworthy. "You would really need to trust people," but this can be a "real stretch!" For some, being escorted would "make me feel like a child."

Offering a bus, taxi or van to take a person with a disability also is of nearly no interest. The time it would take to wait for a vehicle's arrival, the time it would take someone in a wheelchair or motorized cart to be boarded, "strapped in" and helped off would be unacceptable. Most would rather navigate through the pedestrian detour area "by themselves."

Three of the people who participated in this research study may have well summarized what some of the others were thinking:

- "Make it so I can do it myself."
- "I want to get through by myself."
- "When you become disabled and are in a chair, you already lose part of yourself. You want to 'hang on' to what ability you have left; I prefer to do things by myself."

**APPENDIX 1** 

"2010 Temporary Pedestrian Access Route Study"

#### DISCUSSION GUIDE (for People Who Are Disabled) (W-1041)

#### I. INTRODUCTION

- A. Moderator/Note Taker(s)
- B. Presence of Video Camera & Microphones and of Observers (in Focus Group Room or in Adjacent Room)
- C. Brief Introduction of What We'll Be Doing
- D. Schedule
- E. Introduction of Participants

#### II. CURRENT KNOWLEDGE OF / EXPERIENCE WHEN ENCOUNTERING A PEDESTRIAN, WORK ZONE DETOUR AREA (AN AREA WHERE A SIDEWALK HAS BEEN TEMPORARILY BLOCKED DUE TO CONSTRUCTION)

- A. Just as a way of getting acquainted, tell us briefly your impressions of what you do when you come upon a place where construction is going on a place where a sidewalk has been temporarily blocked due to construction; a detour area for pedestrians going through the work zone area.
  - 1) BRIEFLY DESCRIBE A PEDESTRIAN, WORK ZONE DETOUR AN AREA WHERE A SIDEWALK HAS BEEN TEMPORARILY BLOCKED.
  - 2) Have you ever been in an area where there was construction going on, where a sidewalk had been temporarily blocked due to construction requiring pedestrians to go through a work zone detour?
  - 3) What did you do when you came upon this kind of area?
- B. Let's leave now and visit an area outside in the parking lot where some devices have been set up in an exhibit area to allow you to experience what it could be like when you come upon a pedestrian, work zone detour. While we're experiencing the work zone detour devices in the exhibit, we'll want to know what you are thinking. What difference would it make, if any, if you came upon the blocked sidewalk when there are people working at the construction site versus times when no one is working there? (During the evening and overnight, it is likely that there will not be any construction present at the site.) But, for the most part, we'll wait until we come back to this room and, then, have the opportunity to discuss your impressions of the devices on exhibit. If, while we are visiting the devices on exhibit, any questions come to mind, please tell Chris, Cindy or me, and we'll write them down. Then, when we return to our meeting room, we'll talk about your questions. Any questions about what we're going to do?

#### III. (WHEN BACK) IMPRESSIONS OF PEDESTRIAN, WORK ZONE DETOUR DEVICES

- A. Let's spend some time learning of your impressions of the devices we just visited in the exhibit area.
  - 1) While we were there, what were you thinking about how the devices that were exhibited would allow you to get through a work zone detour where a sidewalk has been temporarily blocked due to some construction that is going on? *Please keep in mind the whole area from what you would experience upon entering the detour to what you would experience as you leave the detour and continue on the regular sidewalk where no construction is taking place.* What impressions came to mind while we were visiting the devices in the exhibit area? Why do you say that? What else?
  - 2) When coming upon a pedestrian work zone detour (where a sidewalk has been temporarily blocked due to construction), tell me what you think you would do. <u>In other words, if a sidewalk is blocked due to construction, what alternatives would be acceptable to you?</u>
    - a) Would you simply go through the area? How would you do that? Why do you say that? What else?
    - b) Would you try to find an alternate way to continue down the street where the work zone detour was set up? What would that be? Why do you say that? What else?
    - c) IF NOT MENTIONED: Would you go back to where you started and find another street or way to get to your destination? Would you cross the street to avoid the construction, work zone area and the blocked sidewalk? Why? Why not?
    - d) IF NOT MENTIONED: Would you try to find someone who could help you get through the work zone detour area? Such as a construction worker? A nearby pedestrian? Why? Why not?
      - i) How comfortable would you be if someone who was working at the construction site approached you and asked if they could help you get through the work zone, construction detour area? Why do you say that?
      - ii) Would you feel comfortable with them assisting you? Why? Why not?
    - e) Would you have any concerns about moving through the work zone, construction detour area? IF "YES" What would they be? Why do you say that?
  - 3) Assume for a bit that a very close friend of yours, *a person with a disability similar to yours*, learned there was a pedestrian work zone, construction detour that you had come upon (where a sidewalk has been temporarily blocked due to construction) and the friend of yours needed to be on that same street while the area was still being worked on. If that friend knew nothing about how to get through the detour area and asked you to tell them about how to get through the work zone detour, what would you tell them? What else? Why do you say that?

- 4) We've spent some time discussing coming upon a, pedestrian work zone, construction detour where a sidewalk has been temporarily blocked due to construction. In the past, how have you learned to safely go through a work zone detour like the one we've been talking about? Is there anyone, in particular, who does that kind of "teaching?" Who? What else?
- 5) [IF BLIND PERSON WITH SERVICE DOG IS PRESENT: What would your service dog do to help you go through the work zone detour safely? What else?]
- 6) [IF BLIND PERSON WITH A CANE IS PRESENT: How would you learn to walk through/around the work zone detour area when the sidewalk has been temporarily blocked? What else?]
- 7) [IF PERSON IN A MANUAL OR POWER WHEELCHAIR, A MOTORIZED CART OR USING A WALKER IS PRESENT: How would you determine if you could safely go through a construction work zone detour when the sidewalk has been temporarily blocked due to construction? What else?]
- 8) [IF DEAF OR DEAF-BLIND PERSON IS PRESENT: Does any noise you might be able to hear or do vibrations help you determine if you can safely go through a construction work zone detour when the sidewalk has been temporarily blocked? What else?]
- 9) We've discussed construction, work zone detours; what is an acceptable length, in feet, for a construction, work zone detour when the detour has be set up for pedestrians to use when a sidewalk has been blocked? Why do you say that? What else?
- 10) If a van, bus or taxi were available to help pedestrians get around the blocked sidewalk construction zone, how long would you be willing to wait for a vehicle to show up to help you through? Why do you say that? What else?
- B. Now, let's think specifically about the devices in the exhibit area that was set up in the parking lot.
  - 1) What do you like, in particular, about the devices that were in the exhibit? Why do you say that? What else?
    - a) Which one or two devices that were in the exhibit did you think would be particularly helpful to you when you needed to move through a construction, work zone area (a place where the sidewalk has been blocked due to construction)? Why do you say that? What else?
    - b) Any others that would be of help to you? Which? Why do you say that? What else?
  - 2) What, if anything, do you not like so well about any of the devices that were exhibited? Why do you say that? What else?

#### DISCUSSION GUIDE (Orientation and Mobility Trainers) W-1041

#### I. INTRODUCTION

- A. Moderator/Note Taker(s)
- B. Presence of Video Camera & Microphones and of Observers, if any
- C. Brief Introduction of What We'll Be Doing
- D. Schedule
- E. Introduction of Participants

#### II. WHAT IS TOLD TO A PERSON WHO IS DISABLED ABOUT HOW TO NAVIGATE THROUGH A PEDESTRIAN, WORK ZONE DETOUR AREA (AN AREA WHERE CONSTRUCTION IS TEMPORARILY BLOCKING A SIDEWALK)

- A. The topic for today is how people with disabilities learn to navigate through a pedestrian, work zone detour area (an area where a sidewalk has been temporarily blocked due to construction) when being confronted with one. We'll be having some adults with disabilities join us tomorrow. Today, however, it is important for us to learn what you would have to say to a client of yours a person with a disability about how to deal with a pedestrian, work zone detour, where a sidewalk has been temporarily blocked due to construction.
  - 1) In particular, we're thinking about persons who are blind, deaf, deaf-blind or mobility impaired (using a cane, a walker, crutches, a manual or power wheelchair, a motorized cart, etc.). What is your role in helping people with disabilities understand how to navigate through a detour, such as this? What else?
  - 2) IF NEEDED, BRIEFLY DESCRIBE A PEDESTRIAN, WORK ZONE DETOUR AN AREA WHERE A SIDEWALK HAS BEEN TEMPORARILY BLOCKED DUE TO CONSTRUCTION.
  - 3) Briefly tell me your impressions of what a person with a disability should do when encountering a pedestrian, work zone detour area (where a sidewalk has been temporarily blocked due to construction). What difference does it make, if at all, when there are people working at the construction site versus times when no one is working there? (*During the evening and overnight, it is likely that there will not be any construction people present at the site.*) Why do you say that?
- B. Let's leave now and visit an area outside in the parking lot where some devices are on exhibit, having been set up to allow you to experience what it could be like when a person with a disability comes when confronted with a pedestrian, work zone detour. As you go through the exhibit of devices, please keep in mind the impact, if any, when a person with a disability would come upon a blocked

sidewalk due to construction where there were workers present at the construction site versus time when no worker is present – something we'll call an "attended work zone" versus an "unattended" one. While we're going through the work zone detour exhibit of devices, we'll want to know what you are thinking. But, we'll also want to discuss your impressions when we come back to this room and have the opportunity to hear what each of you think about the devices in the exhibit. If, while we are visiting the exhibit of devices, any questions come to mind, please tell Chris, Cindy or me, and we'll write them down. Then, when we return to our meeting room, we'll talk about your questions. Any questions about what we're going to do?

#### III. (WHEN BACK) IMPRESSIONS OF PEDESTRIAN, WORK ZONE DETOUR DEVICES

- A. Let's spend some time learning of your impressions of the devices that were exhibited.
  - 1) While we were there, what were you thinking about how the devices that were exhibited would allow a person with a disability to <u>safely</u> get through a pedestrian, work zone detour where a sidewalk has been temporarily blocked due to construction? *Keep in mind the whole area from what a person with a disability would experience upon entering the detour to what that person would experience as they leave the detour and continue on the sidewalk.* What impressions came to mind while we were visiting the exhibit of the devices? Why do you say that? What else?
  - 2) What advice would you give to a person with a disability who would be approaching a pedestrian, work zone detour (where a sidewalk has been temporarily blocked due to construction)? What would you advise that person to do? What would they need to know to allow them to move through the work zone safely?
    - a) Would you suggest they try to find an alternate way to continue down the street where the construction, work zone detour was set up? Why do you say that? What else?
    - b) IF NOT MENTIONED: Would you advise them to go back to where they started and find another street or way to get to their destination? Would you advise them to find a way to cross the street to avoid the pedestrian, work zone area and the blocked sidewalk? Why? Why not?
    - c) Would the noise that might be present at the construction site have any impact on how a person with a disability would move through a construction, work zone detour? Why do you say that?
    - d) IF NOT MENTIONED: Would you suggest they try to find someone that could help them get through the work zone detour? Why? Why not? [*If there were construction personnel working at the work zone site, would you encourage a person with a disability to ask for help to safely go through the construction work zone detour? Why? Why not?*]

- e) Would you have any concerns if they chose to move through the construction, work zone detour instead of finding some other way to get to their destination? IF "YES" What would they be? Why do you say that?
- 3) [IF TRAINING A BLIND PERSON WITH SERVICE DOG: What would you advise someone with a service dog do to help them go through the short-term work zone detour safely? What else?]
- 4) [IF TRAINING A BLIND PERSON WITH A CANE: How would you advise this person to walk through/around the short-term work zone detour area when the sidewalk has been temporarily blocked? What else?]
- 5) [IF TRAINING A PERSON IN A MANUAL OR POWER WHEELCHAIR, A MOTORIZED CART OR USING A WALKER: How would you advise such a person to safely go through a construction, work zone detour when the sidewalk has been temporarily blocked? What else?]
- B. Now, let's think specifically about the devices that were set up in the exhibit area in the parking lot.
  - 1) What do you like, in particular, about the devices that were in the exhibit? Why do you say that? What else?
    - a) Which one or two devices that were in the exhibit did you think would be particularly helpful to a person with a disability when they needed to move through a pedestrian, work zone area (a place where the sidewalk has been blocked)? ASK FOR: *A person who is blind. A person who is deaf-blind. A person who is deaf. A person who is using a cane, crutches, a walker, a manual or power wheelchair, a motorized cart.* FOR EACH, ASK: Why do you say that? What else?
    - b) Any others that would be of help? Which? Why do you say that? What else?
  - 2) What, if anything, do you not like so well about any of the devices that were exhibited? Why do you say that? What else?
    - a) Which one or two items that were in the exhibit did you think would <u>not</u> be particularly helpful to any person with a disability when they needed to move through a pedestrian, work zone area (a place where the sidewalk has been blocked due to construction)? Why do you say that? What else?
    - b) Any others that would **not** be of help? Which? Why do you say that? What else?
  - 3) IF NEEDED: Let's identify all of the devices that were on exhibit. READ THROUGH LIST; FOR EACH ASK: Would this be of value? Would this help? Why do you say that? What else?
  - 4) IF NOT MENTIONED: Do you think any of the devices that were exhibited <u>would help a</u> <u>person with a disability **more safely** get through</u> a construction, work zone detour? Which one(s)? Why do you say that? What else?

- 5) The "goal" is to find devices that would provide an on-going "reasonable and consistent" way to set up construction, pedestrian work zone areas. Would any of the devices that were on exhibit be appropriate for adopting to meet this "reasonable and consistent" goal? Why do you say that? What else?
- C. What type of information, if any, could or should be provided prior to setting up a construction, pedestrian work zone detour (where a sidewalk will be blocked due to construction) that would help persons with disabilities be better prepared to plan what to do when the work zone area would affect a sidewalk they would need to use?
  - 1) A message on an Internet site? Why? Why not?
  - 2) Messages or alerts on radio or TV stations? Why? Why not?
  - 3) Articles in area newspapers? Why? Why not?
  - 4) Providing information about upcoming construction, work zone detour sites to you as Orientation Trainers? Why? Why not? [IF POSITIVE: How would you as the Orientation Trainer(s) get the information to your clients with disabilities? What else?]
    - a) In your role, are you a "Go To" person for people with disabilities to learn about changes that might affect their ability to get around their neighborhood? The community where they live? Why do you say that?
    - b) In addition to hearing Mn/DOT, are there other agencies (state, local or private that are sources of information for you that you can then share with your clients with disabilities? IF "YES": Which ones? Any others?
  - 5) *What else*? Why do you say that? What else?
- D. Thinking about what we've discussed today, what advice would you like to give to Mn/DOT about designing construction, pedestrian work zone detours that hasn't already been mentioned? Why do you say that? What else?
- E. Anything else I should know? What? Why do you say that?

#### IV. THANK AND END

**APPENDIX 2** 

"2010 Temporary Pedestrian Access Route Study"



16. PLASTIC SAFETY SYSTEMS - Railing System

# **TPAR DEVICE DEMONSTRATION LAYOUT**

9. YODOCK WALL - Barrier

"2010 Temporary Pedestrian Access Route Study"

Longitudinal Channelizing Devices (Barriers, Barricades and Railing Systems)



#1 on the TPAR Device Demonstration Layout – <u>Contractor Supplied Type IV Barricade</u>

This device is a typical TYPE III barricade often seen to announce the closure of a road or sidewalk, but with a fourth horizontal panel placed near the ground surface. The device could pose several hazards for people with disabilities, such as protruding metal stabilizers (called "foot rails" by two of the research participants) which could easily cause someone to trip or stop and confuse a blind person or someone with low vision who uses a cane to help find their way.

Not at all stable – someone with balance problems could fall into this barricade and likely collapse the device while the person ends up falling to the ground.

The sign on this device, which says "SIDEWALK CLOSED," does not communicate a sufficient amount of information about the pedestrian detour: the length of the detour, how many days/weeks the pedestrian detour will be in effect, does not provide information in Braille for the blind or deaf-blind, does not contain a raised map for those who rely on their tactile sense to orient themselves, does not have a picture of the detour route for those who are sighted, needs much larger and clearer lettering.

Should have flashing lights attached to the top to indicate that "caution" needs to be followed when advancing into the pedestrian detour.

#3 on the TPAR Device Demonstration Layout – <u>ADDGARDS Pedestrian Barricades</u>



If used to outline an area that should not be entered, this barricade with yellow and black stripes suggests that the area is "off limits!" – not unlike the message communicated by yellow tape that has been placed around an accident site or a crime scene. If the colors are orange and white (the colors that indicate "caution" construction ahead), it does not seem appropriate for use at a work zone site because it is not very stable. If a person with a disability were to reach out to use the device as a "steadying" source, it is likely that the device could be knocked down.

If the bases extend beyond the rails, they might create a potential tripping hazard. The black bases are likely to be unnoticed by many people because black is also the color of asphalt, etc. and cannot be easily distinguished.

#4 on the TPAR Device Demonstration Layout - <u>Contractor Supplied - Pre-cast Concrete Barrier</u>



Widely noticed surrounding construction sites where traffic is present; often noticed as a channelizing device separating pedestrians and traffic. "*Cement barriers suggest the presence of cars*." The concrete barriers do offer a level of confidence that other devices do not – concrete barriers give pedestrians a degree of confidence that traffic will not be able to penetrate beyond the device and into the pedestrian area on the other side.

This type of channelizing device provides a recognizable steady and solid barrier; however, the openings at the bottom which allow for lifting by a forklift pose a hazard to those using a cane or a walker. People who are blind and use a cane will search for a solid (and seemingly safe) side or surface to guide them. The presence of periodic holes in a line of pre-cast concrete barriers could be extremely disorienting.

Made on an angle rather that straight up and down is another shortcoming with this type of device. People with disabilities feel much safer with devices that are straight up and down – the possibility of losing one's balance and falling into an angled device increases the likelihood of a more serious injury to the person who fell. A line of these concrete barriers would also allow someone who places their hand on the top the device to guide themselves along continually finding an ending to one concrete barrier and the beginning of another. A long, solid top (free of obstacles or items that could injure a hand) is what is needed.

#### #5 on the TPAR Device Demonstration Layout - <u>TrafFix Railing System</u>



Some of the people with disabilities report feeling uncomfortable with the stability of this channelizer thinking they might tip it over if they were to lose their balance and fall into the channelizer.

The top railing works well and is appropriately colored with orange and white stripes. The brightness would be easy to see, even by those with low vision; alternating orange and white stand out. If two or more of the channelizing sections are connected to form a barricade, the connecting area of the top rail must allow for a "seamless" transition from section to section – if there is a slight gap, etc, it is possible that someone who is moving their hand along the top rail could sustain some type of injury if the rails are not smoothly connected. The bottom rail should go down to the ground; otherwise, any open space at the bottom could be a hindrance to a cane or a walker. Plus, a bottom rail that extends down to the street or sidewalk provides better perspective about where the barrier ends. A bottom rail of all-white does not appeal to the participants; a rail that is colored similar to the top rail (alternating orange and white stripes) is clearly preferred. A solid barrier that covers the entire height and width of the space might be preferable to one that is open (a person could not fall through the opening).

Some type of finished ends is also needed to avoid possible injury.

#### #6 on the TPAR Device Demonstration Layout – <u>TrafFix Water-Wall<sup>TM</sup> Barrier</u>



The top railing is appreciated and would help someone who needs to move their hand along a smooth, uninterrupted surface. When combining the sections of this device to form a barrier, the connecting portions of the top railing must allow for a "seamless" transition from section to section – a slight gap, etc, could possibly mean that someone who is moving their hand along the top railing could sustain some type of injury if the railing sections are not smoothly connected.

Alternating between orange and white sections may allow for this barrier system to provide good visibility to those with disabilities; however, the solid white sections could cause glaring in the "right light" and create problems for persons who experience a visibility disability.

Top and bottom railings that are parallel are appreciated, minimizing any concern about a barrier that is not straight up and down. While the participants in this research study note a preference for a straight up and down barrier system, this one is acceptable because of the parallel top and bottom railings.

Color at the bottom of this device is a "good" contrast between the color of the device and the color of the ground or street. The preferred colors for the bottom rail would match the colors of the top rail – alternating, diagonal stripes of orange and white.

When filled with water, the water-wall barrier is expected to be stable enough to break someone's fall should a person lose their balance and fall into the device.

#7 on the TPAR Device Demonstration Layout – <u>PEXCO O-Frame Parade Style Barricades</u>



While some recall seeing this type of device used as a temporary barricade at parades, etc., it is not deemed as appropriate for a pedestrian detour when a sidewalk has been closed or blocked. This type of device is clearly not sturdy enough for any more than short-time usage. The angle of the protruding legs invites a person with disabilities to trip and fall; it is not at all sturdy and stable. Color is appropriate.

#### #8 on the TPAR Device Demonstration Layout - <u>'RoadRunner' Water Fillable Barricades</u>



Each section is independent breaking from one to the next and "would confuse me; I prefer a solid, long rail to hold onto and run my hand along." A solid, long rail helps this person with a disability walk through an area with a degree of confidence. Interruptions disrupt this person's balance and equilibrium. As with some of the other devices, a straight up and down device is clearly the preferred style; any angled device does not meet the standards the people with disabilities hope will be created and met. The angle of this device does not meet that standard.

Orange as a color does suggest construction, and the top rail with orange and white stripes is color-appropriate. Alternating between orange and white sections allows for this barrier system to provide good visibility to those with disabilities; however, solid white sections might cause glaring in the "right light" and create problems for persons who experience a visibility.

#9 on the TPAR Device Demonstration Layout – <u>The Yodock<sup>TM</sup> Traffic Control System Barrier Wall</u>



Participants in this research study show a strong preference for a straight up and down wall-type system. While this channelizer has a wall that is angled, the presence of a continuous railing at a "great height for a handrail for walking or those in a chair or cart" helps compensate for the angling of this one.. This channelizer feels "steady and solid." "I feel secure walking and holding onto the railing." The touch of the device is "smooth."

The concept of a hand railing is a distinct positive; however, a metal railing suggests problems: too hot in the bright sun, too cold in cool weather. A covering of some type is preferred, but a foam cover will soon deteriorate or be stripped off by someone who finds it easy to vandalize. A black cover will absorb heat from the sun and could be uncomfortable to hold. In addition, the metal rail is not smooth as the joint connecters are larger around than is the railing itself.

There are no protruding parts that could cause someone to trip; a solid bottom railing with alternating orange and white strips would help ensure there are "no tripping hazards" on this device.

End pieces are clearly needed to help prevent any injury.

#16 on the TPAR Device Demonstration Layout – <u>Plastic Safety Systems, Inc. Safety Rail/Pedestrian</u> <u>Barricades</u>



The participants express a clear preference for a channelizing device that is straight up and down. This device provides what it preferred. *"Smooth edges, nothing to catch your skin." "No sharp edges and straight on the inside."* 

Top and bottom railings allow those with disabilities to move through a channelizing device with ease. "*The lower rail is helpful to those in a wheelchair. If your foot is off the chair, you won't get your foot caught in an open area.*" "*The orange and white stripe on the bottom is very important. It helps me identify where the barricade comes into contact with the street. Very important for orientation.*"

The alternating colors (diagonal stripes of orange and white) on the top and bottom railing are appreciated. "*I like the stripes on both the top and bottom*." However, the remaining parts of the device are white; white as a color for a channelizing device can cause a "glaring" problem for those with a vision disability.

*"It needs to be sturdier."* This is a concern expressed about this device. If a person were to fall into the device, would it be able to stop the fall, or would the falling person cause the device to tip over or move out of place?

When combining sections of this device to form a barrier, connecting portions of the top railing must allow for a "seamless" transition from section to section – a slight gap, etc, could possibly mean that someone who is moving their hand along the top railing could sustain some type of injury if the railing sections are not smoothly connected.

#### **Elevation Changes, Ramps and Surfaces**

#10A on the TPAR Device Demonstration Layout – <u>Advance Traffic Markings - Truncated Dome Mat (Yellow)</u>



Truncated Domes are well known and recognized by people with disabilities and serve an important function – signifying a change in elevation. This "*is advance notice of an upcoming change; a great indicator that something is coming up.*" "*I know these well; you can feel it with your cane.*" "A signal there will be a *change.*" The previous comments offered by some who walked across the Dome Mat indicate how helpful Truncated Domes have become.

The color – "dull" yellow – is appreciated for the contrast it provides from a surface that might be black or dark; it is easy to see and does not glare.

Even those in a wheelchair or a motorized cart do not have trouble moving across this Dome Mat.

#### #11 on the TPAR Device Demonstration Layout – <u>Handi-Ramp® Curb Cut Ramp</u>



A curb cut ramp is appreciated if the slope is a preferred 8 percent or less. The slope of this curb cut ramp is 16 percent. Most indicate this steeper slope could cause severe problems for people with disabilities while attempting to go up or down the ramp. A wheelchair could spin out of control; a person could fall forward out of a wheelchair or motorized cart.

The yellow color ("good for low vision") helps highlight the presence of the ramp; adding black stripes to highlight where the ramp angles downward would improve visibility and provide better direction about how to use the ramp. "*The wings slope to the side with no visual distinction between the platform and the wings. Tape or something to distinguish between the two is needed.*"

However, this ramp is considered too narrow to be effective. The one on exhibit was not as wide as the detour sidewalk; the slanting sides could easily cause a person to lose balance and fall. The ramp needs to be wider before angling down. The presence of handrails could help with balance and a feeling of security. Handrails could also help keep someone using a wheelchair of motorized cart from moving too far to one side and risking tipping over.

Any change in elevation, such as the ramp introduces, needs to be clearly marked. "I have extremely low vision and other handicaps that are invisible to most people (anxiety attacks, a feeling that I am dying). Changes in elevation, if not seen or anticipated, make me likely to fall down, thus, triggering an anxiety attack. If I slow down, I feel bad that I'm being noticed as 'different.'"

#12 on the TPAR Device Demonstration Layout – <u>Handi-Ramp® Temporary Walking Surface(1/8" thick</u> <u>metal)</u>



As a surface, this is not well received. The metal is expected to absorb sun and become hot – creating a very real problem for the tender paws of service animals. *"The dog might balk if too hot and could burn the paws."* Those with photophobia would be disoriented by glare and find it difficult to walk across the surface. Many would expect this surface to become slippery if wet.

#13 on the TPAR Device Demonstration Layout – <u>Horse Mat – Temporary Walking Surface (3/4" thick</u> <u>rubber)</u>



While there is some concern about the black rubber absorbing the heat of the sun and causing problems for the paws of service animals, this surface is preferred over the metal surface (#12 on the TPAR Device Demonstration Layout) and may be better for dogs. It might be somewhat difficult to slide a cane or walker on the rubber mat, but the surface does provide "*a better walking surface*" than metal.

For those with balance issues, the rubber mat may mean that a person could lose their balance, but it is preferred by a person with balance issues over the "metal one" as it provides better traction.

### #14 on the TPAR Device Demonstration Layout – <u>Temporary Curb Ramp – with handrail, detectable edges</u> <u>and anti-slip surfaces</u>



This wooden ramp suggests problems to several of the participants – slippery when wet because "wood can be slippery," expect to get slivers from running hands across the wood railing, difficult to navigate transitions from the street/sidewalk to the wooden surface, an elevated wooden surface vibrates with people walking on it. Painting this could help some of this problem if a non-slip paint is used.

The anti-slip surfaces do help; the "sandpaper-like one" is clearly preferred over the metal. The metal is not smooth to the surface and could cause canes and walkers to get caught; a wheelchair or motorized cart is much less likely to slip on the "sandpaper-like one."

The temporary ramp was constructed to be 48 inches wide and is effective. Even wider would be preferred for ease of movement!

#### **Miscellaneous Devices**

#### #2 on the TPAR Device Demonstration Layout - <u>Empco-Lite® Audible Information Device System</u>



The concept is appreciated – having an audible device present at a construction site to notify pedestrians of the potential for a "hazard" when entering a construction site. However, to be truly effective, an audible device needs to be much louder than this one – to allow for construction and traffic noise – must make use of a voice that reflects an improved, clearer sound quality and provides more information than just a brief message. To learn that a person is approaching a work zone with information about the actual length (size) of the pedestrian detour would certainly help. In addition, an audible device would be of more value if it could be activated sooner (at a distance that is farther away) than the display device provides. (An effective audible device is identified as the one used to notify travelers in Terminal 1 of the Minneapolis/St. Paul Airport of the approaching end of a moving walkway – clear, loud enough, repeated frequently enough, etc.)

A sturdier mounting base is also necessary as people with disabilities may reach out to hold onto the device while listening to the message. The propensity to tip over easily could cause someone to lose their balance and fall.

#### #15 on the TPAR Device Demonstration Layout – *Impact Recovery Systems Non-Trip Sign Base*



One of the standards that would be most meaningful to people with disabilities is to have a contrasting color between a base and a street or sidewalk. Streets are most often made of asphalt – black. To have a sign base that is black would be inappropriate. However, the sign base that is a small, metal circle and bolted into the bottom surface may be acceptable. There is some – but little likelihood – that someone could trip over the base. A cane might detect the heads of the bolts, but the base could be avoided because it is