SECTION 7

Determining ADA Paratransit Eligibility for Persons with Vision Disabilities.

Introduction

This section contains the following materials:

- A summary of "How People Who Area Visually-Impaired or Blind Travel." This discussion presents some of the issues and complexities involved in assessing the abilities of persons with vision disabilities to use fixed route services;

- A summary of travel issues for persons who have low vision titled "Low Vision and Mobility;"

- A brief test to ensure your understanding of some of the issues addressed in the initial discussion papers;

- The "Suggested Process for Determining ADA Paratransit Eligibility for Individuals Who Are Blind or Visually-Impaired;" and

- Several attachments that provide forms to be used in implementing the suggested process.

For the purpose of this document, the term "vision disability" refers to an individual who has any level of visual impairment. Individuals with some vision and who meet the minimum legal criteria for legal blindness are considered to have "low vision." Individuals who cannot see at all, or who have only light perception are considered "blind."

Trainees should first read the initial guidance on travel by persons with vision disabilities and take the brief test to ensure that they have an understanding of the types of issues and barriers faced by travelers with vision disabilities. This basic knowledge of issues and barriers is important for then understanding the suggested process for determining ADA paratransit eligibility for persons with vision disabilities.

It is also highly recommended that you order the video "Touch 'N' Go" produced by the Braille Institute. This video provides an excellent overview of how people with visual disabilities travel. Single copies are free, and can be ordered by calling the Braille Institute at 1-800-BRAILLE (272-4553) or at their web site: www.brailleinstutute.org.

Other good sources of information include national service and advocacy organizations including:

- The American Council of the Blind www.acb.org
- The American Foundation for the Blind www.afb.org
- The National Federation of the Blind www.nfb.org

How People Who are Visually Impaired or Blind Travel

The following provides information about the types of travel issues faced by persons with vision disabilities and the various techniques used by these individuals when traveling in the community and using fixed route transit services. It is intended to provide a general understanding of these issues to persons who are involved in determining ADA paratransit eligibility for individuals with vision disabilities. A summary of the types of mobility aids used is first presented. A discussion of the types of travel barriers that affect people with vision disabilities is then provided. Finally, information about Orientation and Mobility (O&M) training and O&M Specialists is provided.

Several Choices

People who are blind or visually impaired have choices when it comes to traveling within the community. At any time, they can travel using any of these:

- A human guide (called sighted guide)
- A long, white cane to identify and avoid obstacles
- A dog guide
- Special optical or electronic aids, or
- Not using a travel tool or aid.

The choice of tools depends on the extent and nature of visual impairment, personal preference, lighting, and familiarity with the area.

In order to travel independently, people with visual impairments use whatever vision they have, auditory and tactual clues, and other information they know about an area to keep track of their location and to make travel decisions. Many persons receive mobility instruction from an Orientation and Mobility (O&M) Specialist.

Travel Using a Sighted Guide

At one time or another, most blind people will use a sighted (human) guide to assist with travel. A sighted person serves as a guide to a person who is blind, leading him or her around obstacles and informing them of the presence of steps, curbs, etc. The person who is blind holds onto the guide's arm, following the movements of the guide's body.

There are specific sighted guide techniques for negotiating steps, curbs, narrow spaces, and closed doors. Sometimes a pedestrian who is blind will ask for assistance to cross streets at unfamiliar intersections or at difficult or dangerous intersections.

Long White Cane

By law, a cane that is white with a red tip signifies that the user is blind or visually impaired. The cane is longer than a support cane, hence, it is called a long white cane. In the most common technique, the cane is extended and swung back and forth on the ground across the user's body width in rhythm with the user's steps. The long white cane is used for 3 purposes:

1. to protect the user from bumping into obstacles and to locate steps, curbs, and other drop-offs;
2. to provide tactual information about walking surface; and
3. to make drivers and other pedestrians aware of the user's visual disability.

Protection

If used properly, the cane finds obstacles in the pedestrian's path of travel. The user will feel the shaft or body of the cane contact an obstacle such as a pole or trash can. She must then decide whether to find a clear path around the obstacle or to explore the obstacle in order to identify it. Pedestrians can figure out the type of obstacle the cane touches by exploring the obstacle with either their cane, their hand, or both. The sound made when the cane contacts the obstacle also gives the user cues as to what material the object is made from (i.e., metal, wood, glass, fabric, etc).

The cane tip contacts the ground in order to detect changes in the level of the sidewalk or other walking surface. The user will feel the hand that is grasping the cane drop when the cane tip falls off a curb or step. The cane also finds cracks in the sidewalk or slabs of concrete that are raised due to tree roots. This decreases the user's chances of tripping.

The cane protects the user from the waist down to the ground. Thus, obstacles that are high off the ground, such as telephones mounted on poles, traffic control boxes, tree branches, and some signs will not be detected with a cane. The cane will go underneath high objects and the user may bump into the object with his/her upper body or face.

Information

The cane, in conjunction with the feet, can help the user to identify the type of walking surface (sidewalk, grass, gravel, dirt, brick, etc). This helps the cane user to walk straight down the sidewalk. When the cane touches the grass to the right of the pedestrian, the person will turn or move slightly to his left in order to stay on the sidewalk. Some people follow along the edge of texture changes - for example the "lip" or seam between a sidewalk and a parking lot - in order to maintain a straight line of travel across an open area. Pedestrians use a cane technique called shorelining to find intersecting sidewalks.

Orientation and Mobility (O&M) Specialists teach persons who are blind how to travel with a long cane.

Identification

A white cane with a red tip signifies that the user is visually impaired or blind. Although drivers MAY be more cautious when they see a pedestrian with a long white cane, pedestrians who are blind should not expect special treatment when crossing streets.

Dog Guides

Dog guides have been assisting pedestrians who are blind in travel tasks for over 70 years. Dog guides lead persons around obstacles in the path of travel and stop or hesitate at level changes. Less than 10% of persons who are blind use dog guides.

Dog guide instructors prepare dogs to work as guides and teach persons who are blind how to travel with a dog guide. A person who is blind attends a 3-4 week long training sessions or classes at a dog guide school. The individual, or "handler", lives at the school during this time. Most dog guide schools set a minimum age of 16-18 years of age for handlers.

The Working Team

A dog guide is a working dog that has been carefully trained to guide its owner safely to his or her destination. The owner, a pedestrian who is blind, is referred to as the handler. Dog guides do not make decisions about where to go and when to cross the street. Dogs follow the commands given by the handler.

It is the responsibility of the person who is blind (handler) to:

- Maintain orientation, knowing where s/he wants to go and how to get there;
- Give commands and directions to the dog (such as forward, left, right, go faster, or halt);
- Make street crossing decisions; and
- Use consistent handling techniques for commands, praise and correction.

The dog guide will:

- Negotiate the handler around obstacles in the directed path safely, stopping or pausing at all level changes along the travel path;
- Refuse commands (intelligent disobedience) that place the dog and its handler in danger.

In familiar areas the handler directs the dogs wherever s/he wants to go. In a new location, pedestrians who are blind, like sighted people, ask for directions. Then they communicate these to the dog by using the proper commands.

Remember, dog guides move only in response to directions from their handlers, who must know where they're going and make decisions about the proper time to begin a street crossing.

Street Crossing Procedures Using a Dog Guide

A dog guide does not watch traffic lights when it crosses streets. The handler learns to judge the movement of traffic by its sounds. At the appropriate time, he or she will command the dog "forward." The dog will disobey a command that puts its handler in danger. This does NOT mean the dog keeps its handler safe at all times. Handlers who make poor decisions frequently will confuse their dog guides. This may cause serious problems for the working team.

The handler must align himself and the dog prior to crossing. Although the dog walks generally straight to the destination corner, pedestrians who use dog guides may still have veering problems. While a good dog guide should be able to compensate somewhat for slightly incorrect alignment, very few dogs will compensate for gross alignment errors. The likelihood of veering increases when the handler is uncertain about the direction of the destination corner.

Low Vision Aids

Persons with some usable vision may use:

- Sunglasses and visors to reduce glare;
- Telescopes to magnify signage and other information viewed from distances; or
- Hand-held lights, and other low vision aids for outdoor travel purposes.

No Aid or Travel Tool

Not all persons who are legally blind use a long white cane, dog guide or low vision aid. People with low vision often rely on their remaining sight and auditory and tactile cues in their surroundings for orientation and travel.

How Does a Person Who is Blind Find His Way?

Like all pedestrians, pedestrians who are blind memorize a sequence of landmarks and turns along travel paths to destinations. The difference is that pedestrians who are blind cannot read street signs or rely on visual landmarks. Landmarks must be able to be heard or felt with a cane or one's foot. Fewer times, smells linked to certain places can be used as landmarks.

Pedestrians who are blind count blocks and may use the sun to keep track of which compass direction they are walking. They use cues such as the sound of traffic to help them stay oriented. They walk parallel to the sound of traffic on the street next to them to assist them in walking straight down the block and in walking straight across the street.

Environmental Barriers

Much has been written about environmental barriers which prevent a blind pedestrian from using fixed route transit. Basically, the main reasons pedestrians who are blind and who have learned to travel independently under most conditions request paratransit services are unsafe travel paths, crossing at complex or dangerous intersections, unfamiliarity with a route or area, and snow/ice on the sidewalks. Following is a discussion of each of these common travel barriers.

Street Crossings

The nature of street crossings is highly variable. Traffic volumes and movement patterns vary, the signal phases of the traffic light may vary, the presence of nearby pedestrians varies, and environmental conditions such as wind and lighting change. Thus, some pedestrians who are blind may cross a particular street with confidence, safety, and ease at one time of the day only to have problems crossing the same street later in the day, when the traffic volume is much greater or lesser. At some intersections, one street crossing may be accessible, but a different street crossing at the same intersection may not be accessible.

The best professional to evaluate a pedestrian who is blind's ability to cross streets at an intersection is an Orientation or Mobility Specialist. Due to the variability in traffic, the need to auditorily track movements of vehicles, the intersection geometry, and environmental factors such as rain and wind (which effect one's ability to interpret auditory cues), developing a complete simulation of a street crossing would be extremely difficult.

How People with Visual Impairments Cross Streets

Techniques and cues used in crossing streets are diverse and vary by the type of location and by the individual and his or her level of vision and travel aid. In general, pedestrians who are unable to see the crosswalk lines, pedestrian signal heads (WALK, DON'T WALK), traffic lights, and vehicles rely on traffic sounds to make street crossing decisions.

All pedestrians must locate the street, wait in a safe place to cross, determine when it is time to cross, and move into the street, across it, and back onto the sidewalk at the destination corner in a timely manner. Without sight, most of these tasks must be done through interpretation of traffic sounds. Signalized intersections have become more complex as traffic signal phases become more varied.

In general, the most accessible intersection for pedestrians who are blind have:

- Two streets (+ shaped) that meet at perpendicular angles;
- Curbs or curb ramps with steep slopes;
- Fixed time traffic signals;
- A steady vehicular flow on the street parallel to the pedestrian; and
- Quiet, narrow streets with stop signs.

Below is a list of common strategies utilized by pedestrians who are blind to cross streets. Challenges for each crossing task are noted. For some pedestrians, these challenges can be overcome. For others, they are barriers that prevent safe, independent street crossings.

Detecting the Street

<u>Strategies Used</u>

Pedestrians who are blind use a combination of cues to recognize the street edge, including:

- Curb or slope of curb ramp
- End of the building line and "open" sound of the intersection
- Sound of traffic stopping on the street beside them (parallel street)
- Sound of traffic on the street they are approaching (perpendicular street)
- Presence of pedestrians waiting at the street corner

<u>Challenges</u>

Sometimes blind pedestrians cannot detect the street when the curb ramp is gradual or sidewalk blends into street. They may unknowingly walk into the street.

Analyzing Intersection Geometry

Strategies Used

Pedestrians who are blind listen to traffic sounds to answer the following questions:

- Is my destination curb straight in front of me, or must I angle to the left or to the right to reach it?
- How many streets intersect at this intersection?
- Is this a four-way (plus shaped) or T shaped intersection? If not, what is the shape?
- How wide is the street I will cross?
- Will I encounter any islands or medians as I cross this street?
- Am I standing within the crosswalk?

Challenges

It is often impossible to detect islands or medians while standing at the corner analyzing the traffic sounds. Finding an unexpected island or median sometimes confuses persons. Some pedestrians unknowingly walk through refuge islands, continuing to cross. Often the pedestrian phase ends and the light turns green on the street being crossed. These islands were designed to enable pedestrians to cross part of the street, and wait for the next light cycle to complete the crossing.

Another challenge is offset intersections. This means the destination corner is not in a straight line with the sidewalk that approaches the departure corner. In some instances, the crosswalk does not run parallel to the traffic on the street parallel to the pedestrian. Thus, pedestrians do not cross directly to the opposite corner. It may take awhile to find the desired corner, which means the pedestrian who is blind is in the street too long, often after the traffic light has changed.

Analyzing the Traffic Control System

Strategies Used

Pedestrians who are bind listen to traffic sounds and search the sidewalk area for poles with pushbuttons to answer the following questions:

- What controls traffic movements at this intersection (traffic signal, stop sign)?
- Do I need to push a button to actuate the WALK interval? If yes, where is the button for this crosswalk?
- During the pedestrian phase, does the signal stop traffic on one street or all streets (exclusive pedestrian phase)?
- Do cars still turn during the WALK interval? If yes, can they turn left or right or both ways to enter the crosswalk while I am crossing?
- Will there be a surge of parallel traffic to tell me the WALK interval has begun? Will I be able to hear it reliably over other traffic sounds?

Challenges

Traffic signal phases have become quite complex. If the traffic signal is actuated by the number of vehicles in turning lanes or straight through lanes, the pattern of traffic movement may change. At some intersections the WALK sign does not light unless a pedestrian pushes a button to activate a pedestrian phase. IF the pedestrian does not realize there is a pushbutton, he may cross with parallel traffic surge, thinking this is the WALK interval, when it is not. If the pushbutton is not used, depending upon the number of vehicles on the parallel street, the light may change to green on the street being crossed just a few seconds after the pedestrian has stepped into the street. This results in the pedestrian being in the crosswalk at an unsafe time, with cars approaching him. If the pushbutton can be located and utilized, many pedestrian phases are timed such that the WALK and flashing DON'T WALK are lit for a long enough time to allow the pedestrian to cross the street at the rate of 4 feet per second.

At some intersections, it is difficult and sometimes impossible to detect the appropriate time to initiate crossing. As intersection signal timing plans become more complex, this problem is increasing.

Using Pedestrian Pushbuttons

Strategies

Pedestrians who are blind search the corner area for poles with pushbuttons, starting near the street edge and crosswalk area, moving progressively further away. After finding the pushbutton, the next step is to identify which crosswalk it serves. Then the pedestrian must push the button and return to the crosswalk area to align self to cross the street.

Challenges

The major challenges to finding and using pedestrian pushbutton include:

- Can't tell if they need to push a button;
- Unable to find pushbuttons in atypical locations;
- Can't tell which button serves which crosswalk;
- Knowing if the button was pushed;
- Having enough time to get back to the street edge and realign self before WALK signal lights up; and
- Traveling between pushbutton and crosswalk throws off alignment.

Aligning Self to Cross Street

Strategies Used

Cues that help blind travelers align themselves to face directly toward the destination corner include:

- Sounds of traffic movements on the parallel street;
- Tactile cues on the walking surface; and
- Mental projection of continuation of straight line of travel that was used to walk down the block.

It is easier to establish a heading toward the destination corner under the following conditions:

- Intersection has 2 streets that cross in perpendicular angles;
- Crosswalk is parallel to the street beside the pedestrian;
- Steady flow of through traffic on the street parallel to the pedestrian; and
- Single curb ramp oriented directly toward the crosswalk.

Challenges

Offset intersections may cause pedestrians to veer (walk outside the crosswalk lines). Again, this places the pedestrian in the street for a longer time, which increases safety risks.

Crossing the top part (usually the busier street) at a T shaped intersection may be difficult, as all cars must turn from the minor street (stem of the T) onto the major through street. Thus, there is no through traffic on the street beside or parallel to the pedestrian as she crosses and many cars turning and moving through the crosswalk at the same time the pedestrian is crossing. T intersections may look easy to cross but they often pose significant problems for pedestrians who cannot see the WALK signals or traffic lights.

Identifying the WALK Interval

Strategies Used

After analyzing the intersection, many pedestrians focus their attention on the stopped cars on the parallel street. They begin to cross the street when there is a surge of traffic moving straight on the street parallel to their direction of travel. Pedestrians must wait until the first vehicles begin to move straight through the intersection to insure the traffic signal changed to green. The through traffic confirms that vehicles are not turning right on red.

It is often easier to detect the WALK interval under the following conditions:

- Steady flow of traffic on the parallel street;
- High volumes of vehicles moving straight through the intersection, especially those moving in the same direction as the pedestrian;
- Intersections with NO right turn on red; or
- Fixed time intersections (pre-timed for specified length that does not vary).

Challenges

It is difficult to know when to begin crossing when:

The surge of traffic is masked by free flow or high volumes of right turning traffic;
Intersections is too noisy;
Parallel traffic flow is intermittent; or
The surge of traffic is too far away – wider streets.

Maintaining Crossing Alignment

Strategies Used

Pedestrians must continue to monitor traffic and to mentally project a straight line of travel to the destination curb. Traffic moving straight through the intersection on the parallel street provides helpful auditory guidance. Stopped traffic on the street being crossed may be helpful.

Challenges

Some pedestrians, despite mobility instruction, continue to have problems with veering. Veering means that a person walks to the left or the right (outside) of the marked crosswalk area.

It is more difficult to walk straight under these conditions:

- High volumes of turning vehicles;
- Little or no traffic on the parallel street;
- Wide streets; or
- Offset intersections.

Stop Sign Controlled Intersections

Strategies Used

It is easiest if there is a stop sign for the street the pedestrian will cross. In most instances, it is easier to cross at intersections with four stop signs or to cross the side street that has a stop sign along a busy road that has no traffic signal or stop sign.

Depending upon the volume of traffic, some pedestrians will cross when there are no vehicles approaching the intersection on the street they will cross. Some pedestrians cross when a vehicle on the parallel street begins to move straight through the intersection at a 4 way stop. Persons cross quieter side streets at T intersections when there is a steady flow of traffic on the busy street. They know cars cannot pull out from the side street but still have to listen for cars turning off the busy street onto the side street. Being assertive is a must when crossing the street.

Challenges

It is most difficult to cross at intersections that do not have a stop sign for all approaches. At busy intersections, it is difficult to cross a street for which traffic never stops.

Mid-Block Crossings – No Traffic Control

Strategies Used

Pedestrians who are blind listen for traffic from both directions and cross when there are no vehicles nearby approaching the crosswalk.

Challenges

It is more difficult or impossible to cross streets that have no traffic control, under the following conditions:

- Wide streets with heavy traffic volumes;
- Curve in the roadway or hills reducing driver's ability to see pedestrians from safe stopping distance; or
- Higher speed limits.

Roundabouts

Strategies Used

Pedestrians who are blind listen for gaps in traffic, then cross when there are no cars close to the crosswalk.

Challenges

Roundabouts cause access problems because they are unsignalized, the crosswalks are not in "standardized" locations, and they require pedestrians to make judgments about traffic speeds and movements in a circular roadway. The crosswalks are hard to find and not parallel to the flow of traffic. These problems are more pronounced during heavy traffic times. Heavy traffic flows in roundabouts cause greater problems because the blind traveler is likely to experience delays in detecting gaps in traffic and will miss gaps more often than sighted pedestrians.

Finding the Bus Stop

When looking for bus stops it is important to know the directional corner at which the bus stop is located and the direction of travel of the bus. For example, if a person is looking for a bus that is heading North, the bus stop would typically be on the SE corner of the intersection since busses typically stop before the intersection. A cane user would walk to the curb or ramp at the end of the block, then turn around and walk back a little, using his cane to find the pole for the bus sign. If there is a tactual landmark, such as a texture change or bump in the sidewalk near to the bus stop, a cane user can learn the distance between that landmark and the shelter so she knows when to move closer to the curb line to look for the bus stop pole with her cane. The nearby landmark eliminates the need for persons to walk all the way to the corner and backtrack.

Bus shelters are easier to find because they are bigger and can be detected by touch or by the sound of echoes. Also, when a blind pedestrian walks behind the bus shelter, he can hear the sound of vehicles being masked by the shelter. Dog guide users who use the same shelters frequently can train the dog to lead them to the bus stop area or shelter.

Using a Bus – Boarding, Paying the Fare, and Seat Selection

A blind pedestrian must perform the same tasks to board and exit a bus as a sighted person. It is typically the path getting to the stop or the physical constraints of the stop itself that prevent a person who is blind from riding the bus, not the procedures involved in boarding, fare paying, seat selection, and disembarking.

In regards to paying the fare, people who are blind have the same options as all bus riders. The fare box can be located by moving one's hand up the steps along the railing to tactually locate the fare box. Pedestrians who are blind can count the exact fare prior to boarding. Bus passes can be marked so the person shows the front side of the pass to the driver.

Most busses have some seats in the front of the bus designated for use by riders with disabilities. Many blind persons opt to sit close to the driver on the same side as the door for the following reasons: (1) they can hear the driver call out their stop; (2) each time the driver looks toward the door, he sees the visually impaired rider, which may increase likelihood that driver will remember to announce the requested stop; and (3) less movement is required within the bus before sitting.

Finding the Correct Bus

Many legally blind pedestrians are not able to read the bus route name/number on the header. They need assistance in order to locate their bus. An applicant's claim that s/he cannot find the correct bus without help might not, however, warrant paratransit

eligibility. The USDOT's ADA regulations require that "where vehicles or other conveyances for more than one route serve the same stop, (transit systems) shall provide a means by which an individual with a visual impairment or other disability can identify the proper vehicle to enter or be identified to the vehicle operator as a person seeking to ride on the particular route" (Section 37.167(c). Many transit systems require that operators make external route announcements at stops that are served by multiple routes. Traveling with a long white cane or dog guide does help drivers know that the rider has a visual impairment. Drivers should not assume, however, that because waiting passengers do not have a long cane or dog guide that they do not have a vision impairment.

It is easy to find the correct bus if a particular bus stop only serves one route. At bus stops or transfer points that serve many routes, it is difficult or impossible for pedestrians who are legally blind to move between various busses stacked at the bus stop in order to hear all of the route announcements. This is why it is important for each driver to pull up to a designated stop area, open the door, and announce the route. Blind pedestrians may also ask for assistance from other persons waiting at the stop, but this does not relieve the transit agency from having some other system in place to allow for correct bus identification.

Finding the correct bus can also be a significant problem in systems that employ "flag stops." In these systems, bus operators may be waiting for a signal from the rider who is waiting at a stop. If the individual does not "flag" the bus, the driver may not pull over.

Even in systems that do not use "flag stops," operators may sometimes assume that riders waiting at a stop will be able to recognize the approaching bus and will signal if it is the bus they need to use. Without a signal, operators some times slow down but fail to pull over and stop at the stop. Such operating policies and practices create significant problems for riders who are blind or visually impaired.

Finding the Exit Stop

The USDOT's ADA regulations require transit operators to announce stops at least at transfer points, major intersections, and destination points as well as at intervals along the route sufficient to allow riders with vision disabilities to be oriented to their location. Operators must also announce other stops if requested by riders with disabilities. On some routes, there may be a discernable landmark close to the exit stop, such as railroad tracks or a right or left turn after the bus has headed in the same direction for quite awhile. On other routes it may be impossible for the individual to know when the driver is approaching the desired stop.

Orientation and Mobility (O&M) Instruction

Many visually impaired pedestrians have received Orientation and Mobility (O&M) instruction, provided by an Orientation and Mobility (O&M) Specialist. O&M Specialists usually have an undergraduate or graduate degree in teaching travel skills to persons who have visual impairments.

"Orientation" is the ability to understand where one is located in space and "Mobility" is being able to travel thorough that space safely. The goal of most O&M training is to prepare a person who is visually impaired to travel in a variety of environments. Individuals are taught strategies used to assess new intersections and to travel unfamiliar routes. Instruction is individualized and geared toward each person's abilities and travel needs.

Orientation is not provided to blind people for every travel path or transit route they need to travel. Many people who are legally blind have not received O&M instruction because they do not know this instruction exists, they may not understand the benefits of O&M instruction, or there may not be an O&M Specialist in their area due to the shortage of O&M personnel.

O&M Specialists may work with pedestrians who use dog guides. They may orient these dog guide handlers to a new route, intersection, or area. However, O&M Specialists do NOT teach persons who are blind and visually impaired how to use a dog guide. This instruction is taught by Dog Guide Instructors. A small number of Dog Guide Instructors are also trained as O&M Specialists.

Working with O&M Specialists

Paratransit staff are encouraged to work with O&M specialists in their area to learn more about the travel needs of persons with visual impairments and blindness. There are several organizations that can assist in locating certified O&M Specialists. These include the Association for Education and Rehabilitation of the Blind and Visually Impaired (AER), a professional membership organization. AER can be contacted at www.aerbvi.org or (703) 823-9690. The Orientation and Mobility (O&M) Division of AER has an Environmental Access Committee (EAC). EAC members are O&M Specialists with interest and specialized training in APS and other environmental access areas.

The Academy for Certification of Vision Rehabilitation Professionals (ACVREP) maintains a directory of Certified O&M Specialists (COMS). ACVREP can be contacted at www.acvrep.org.

Also, Dr. Ron Ferguson, Chairman of the National Blindness Professional Certification Board (at ferguson@lcb-ruston.com) can be contacted for a list of persons who have National Orientation and Mobility Certification (NOMC).

Low Vision and Mobility

The term low vision has many definitions, all of which depend on the purpose for which the definition was developed: legal, clinical, or educational. This document uses the term "low vision" to refer to persons who are at least legally blind.

Visual impairments can be caused by damage or disease in the eye, optic nerve, or visual processing center in the brain. The functional implications for people who are legally blind can be quite different. Whether or not a person has problems reading the newspaper or seeing a bump in the sidewalk often depends upon which type of eye disease the person has. Some people can read the newspaper or find telephone numbers in the phone directory, yet fall off a curb or bump into a parking meter. For persons not familiar with the issues of low vision, this can seem inconsistent as the legally blind person can see very small things but not larger things. Other people who are legally blind walk around outdoors and see steps, other pedestrians, and traffic signals, but cannot read large print. Basically, the functional implications of a person's vision loss depend upon the diagnosis, or type of eye disease or condition.

Persons with low vision must decide when visual information is reliable and when a combination of visual, auditory, and tactile information is the best way to make safe decisions for travel tasks.

It must be noted that vision is not a requirement for safe, independent mobility within the community. Significant differences exist in the way information is obtained by those who are sighted, partially sighted, or blind. In a mobility context, it is important to understand the techniques and strategies used to collect information to make mobility decisions. People who are sighted use a different style of travel from people who are blind. One style is not necessarily better than the other, they are just different.

Legal Blindness

Legal blindness is a level of visual impairment that has been defined by law to determine eligibility for certain benefits. Vision correctable to 20/20 acuity with at least a 180-degree field is considered "normal". Legal blindness is defined as

- Central visual acuity loss of 20/200 or less in the better eye with the best possible correction (as measured on a Snellen vision chart); OR
- A visual field of 20 degrees or less

Acuity - A person with 20/200 acuity sees at approximately 20 feet what a person with normal vision sees at 200 feet or more. Thus, a person who is legally blind must be much closer to see objects than a person with normal vision.

Visual Field -A person who meets the field limitation for legal blindness sees no more than a 20-degree field without scanning.

A pedestrian with low vision could have a reduced visual acuity, restricted visual field, or both. Different types of vision loss have different mobility implications.

There is a wide range of visual functioning within the population of persons who are legally blind. Some persons who are legally blind may travel without a long white cane, relying mostly on visual cues to direct their travel. Others may use a cane only at night or in other situations with low lighting. Some persons rely upon a long cane, in combination with tactile and auditory cues to direct their travel. It is important to remember that pedestrians who are legally blind are a diverse group in regards to their ability to see crosswalks, traffic signals, vehicles, and signage.

General Types of Vision Loss

General types of vision loss include:

- Total blindness or light perception
- Reduced acuity; and
- Restricted fields (central or peripheral)

Some eye diseases or conditions cause both a reduced acuity loss and a restricted field. Following is a discussion of each of these types of vision loss.

Total Blindness or Light Perception

Individuals who are considered totally blind usually cannot see any difference in light and dark. Individuals who have light perception may be able to tell if it is dark or light and the direction of the light source, but do not have vision that is usable for discerning objects or the travel path. These persons use auditory and tactile cues to identify a street and to make street crossing decisions.

Reduced Acuity

Some people have full visual fields. However, they have a problem with the clarity of vision such that they cannot see certain sized objects at various distances. They may be able to see and even identify an object from certain distances but they cannot see the details on the object. Each time someone goes to the eye doctor, his or her visual acuity is measured. Near acuity relates to reading or seeing things close to one's eyes. Distance acuity relates to seeing objects beyond arm's reach and is measured across the room with an eye chart on the wall. Mobility tasks are mainly related to distance visual acuity.

Reduced acuity can refer to a large range of functional vision from vision tested as less than 20/20 to totally blind. Lighting and contrast affect functional vision and are not reflected in clinical measurements. Remember, visual acuity refers to the clarity of vision and the ability to see/identify different size objects at various distances. Clinical acuity measurements are obtained indoors in a setting with controlled lighting. Ability to

see outdoor travel paths and objects in that path is, however, affected by lighting and contrast.

The ability to see and to recognize objects such as the curb, crosswalk lines, pedestrian signals, vehicles, etc for travel tasks, is highly dependent upon several factors, including:

- Size of the object being viewed and its distance from the person;
- Amount, type, and position of lighting;
- Contrast between the object being viewed and its background; and
- Glare.

One equation used to describe this is:

Visibility = size & distance + illumination + contrast – glare

A person with an acuity loss may be able to see a large object at a close distance, if there is sufficient lighting and good contrast. If the person is further away, if the lighting is dimmer, or if there is glare reflecting off the object, they may not be able to identify that same object.

Figure 7-1. Street crossing as a person with general reduced visual acuity might see it. (from Barlow, Bentzen, and Tabor, ***APS Synthesis & Guide to Best Practice,*** 2002)

Persons with visual impairments may experience an increased level of variability in their ability to see objects in the outdoor environment due to implications of their eye disease, fatigue, and other factors. An overall loss of acuity, increased sensitivity to glare, and loss of contrast sensitivity is common in the elderly population.

A person with a visual acuity loss also may function quite differently on sunny days versus cloudy days or in well lit versus dimly lit areas. For example:

- A person with a 20/600 acuity looking at a pedestrian signal head with the sun behind it may not be able to identify WALK under these conditions, but can identify WALK on cloudy days or at night

- A curb that is painted bright yellow would be easier to see than a curb that is the same color as the sidewalk, as the painted curb has increased contrast

Restricted Fields

The general category of restricted fields can be further divided into

- Central field loss – unable to see things directly in front;
- Peripheral field loss – problems seeing things off to the side, above, and/or below; and
- Hemianopia – inability to see in one-half of the field of vision in one or both eyes.

Central Field Loss

A central field loss is caused by damage to the central part of the retina. This part of the retina is responsible for detailed vision at close distances (i.e. reading, sewing). People with a central field loss probably cannot read a bus schedule or identify numbers on bills.

A common type of age related vision loss is macular degeneration, the leading cause of blindness in those over age 60. This disease causes a central field loss. This means the central part of the retina is damaged, causing blind spots right in the center of a person's vision. Many people with advanced macular degeneration cannot see print so they can no longer read. However, they may be able to see the sidewalk, people, traffic signals, and objects in their path of travel, even from a distance. Some people with macular degeneration carry a cane to identify themselves as a person with a visual impairment. They may also use their canes to check the height of curbs and steps. However, macular degeneration and other types of diseases that cause a central field loss are not generally the types of vision loss that cause significant mobility problems.

Figure 7-2. The photograph below represents the same street crossing as a person with a central field loss might see it
(from Barlow, Bentzen, and Tabor, ***APS Synthesis & Guide to Best Practice,*** 2002).

Peripheral Field Loss

Peripheral field losses cause significant mobility problems. Individuals with peripheral field loss, sometimes referred to as tunnel vision, may see objects and details of things directly in front of them clearly, but have difficulty seeing objects and signs off to the side. In addition, depth perception, or the ability to see changes in the level of the walking surface, is often impaired. Thus the person may not see steps, curbs or drop-offs both in front of them and beside them.

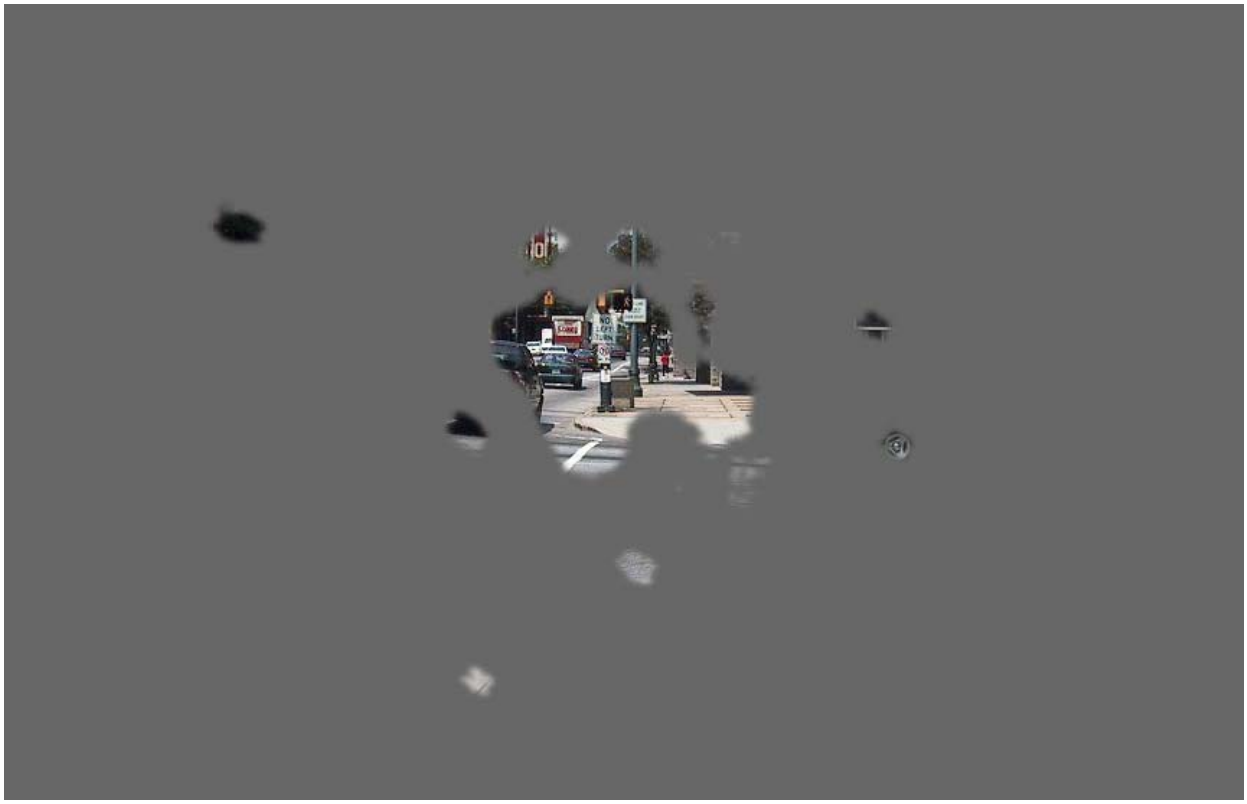
One way to get an idea of a peripheral field loss is to close one eye, then look through a funnel or a paper towel roll with the other eye. The narrower the visual field, the more difficult it is to see things that are not directly in front of you and below or above eye level.

A peripheral field loss involves damage to the peripheral retina. This part of the retina is responsible for seeing movements, large objects at distances, and movements and larger objects in dim lighting.

One example of a disease that causes a peripheral field loss is Retinitis Pigmentosa (RP). People with RP see much worse when the lighting is low so travel at night or on overcast days is much different than walking outdoors in the daytime. A person with RP may be able to walk outdoors, cross streets, take the bus, shop, etc by using their limited vision in the daytime. They might compensate for their peripheral field loss by turning their heads frequently in an organized manner in order to see things from the side. After the sun goes down, this same person may use a cane to find curbs, steps, bumps in the sidewalk and other objects. Things he could see on a sunny day cannot be seen at night. Others do not use a cane. Some people with low vision have learned to compensate for reduced visual input by focusing and relying on auditory and tactile information when necessary. Others have not learned effective compensatory strategies, requiring assistance for those situations in which their vision is not reliable for mobility tasks.

Glaucoma and Retinitis Pigmentosa (RP) are the main causes of peripheral field loss.

Figure 7-3. The photograph below represents the same street crossing as a person with a peripheral field loss might see it.
(from Barlow, Bentzen, and Tabor, ***APS Synthesis & Guide to Best Practice,*** 2002).



Concomitant Disabilities

Some persons with visual impairments have other physical, cognitive, emotional, or sensory impairments. Again, there is a great deal of variability in the degree of hearing loss, cognitive impairment, or other type of disability. Consequently, it is difficult to talk about them as a "group" of persons as each person is an individual with his or her own abilities or limitations in regards to independent travel in the community. However, it is safe to say that the potential exists for independence to be limited more due to the concomitant disability.

Some common examples of concomitant disabilities and the possible travel issues include the following:

- Concomitant disabilities may affect the individual's ability to travel outdoors and to cross streets at signalized intersections independently. Persons with hearing loss who cannot see vehicles or localize traffic sounds require assistance to cross busy streets.

- The largest population of persons with visual impairments is persons age 65 and older. Many of these individuals have other impairments such as age-related upper frequency hearing loss, or physical limitations.

- Persons with low vision who have cognitive disabilities may be able to learn one or a few simple transit routes if given much instruction by an O&M specialist. Strategies for problem solving when atypical situations arise are often limited.

- For some persons, the combination of a cognitive disability and blindness may prevent any independent travel within the community.

- Some low vision or blind persons with psychiatric disabilities indicate they are very anxious traveling on crowded busses, traveling in unfamiliar areas, or handling unforeseen situations.

- Persons with low vision who use ambulatory devices are at risk of not seeing a crack in the sidewalk or level change such as steps or curbs. Missing these have potential to cause great harm to the individual. If these individuals cannot see far enough away to negotiate around obstacles, maintain their balance, and stop at level changes, they probably cannot travel alone safely within the community.

To fully understand travel abilities and limitations, detailed information about concomitant disabilities and their effects must be obtained in addition to information about visual impairments. In these circumstances, professional verification from therapists, teachers, caseworkers, or others familiar with the person and his or her functional abilities is often very helpful.

Travel Abilities Vary

Some pedestrians with visual impairments travel independently along familiar routes they have memorized through instruction and repeated practice along these specific routes. Other pedestrians travel to new neighborhoods and cities throughout their region and beyond. They expect the same freedom of movement that pedestrians without disabilities have. It is important to note that many persons with visual impairments do NOT receive Orientation and Mobility instruction at all intersections they use.

Vision Can Fluctuate

Persons with low vision typically experience fluctuations in the quality and clarity of what they see. Examples of changes in vision caused by internal factors include diseases such as diabetes or retinitis pigmentosa, visual fatigue caused by continuous visual demands, and side effects from ocular or systemic medications. External factors resulting in visual changes include changes in lighting, glare, and contrast.

Functional Low Vision Mobility Problems

Pedestrians who are totally blind and pedestrians with low vision do experience some of the same mobility problems. Major challenges for both groups include detecting changes in terrain and depth, avoiding bumping into objects, negotiating street crossings, and having insufficient sensory information for decision making. One unique problem area for pedestrians with low vision is dealing with the effects of changing lighting conditions and glare.

Lighting Conditions and Glare

The most frequently reported and highest rated mobility problem area for pedestrians with low vision is lighting. Lighting includes glare, light adaptation from indoors to outdoors and vice versa, dim and night lighting, and frequent changes in lighting while moving through the same or within different environments. Glare and dim lighting conditions have negative effects on mobility for many persons with low vision. It takes pedestrians with low vision significantly longer than those with normal vision to adapt to a change in the level of light. Some eye diseases, such as retinitis pigmentosa (RP) and glaucoma, result in decreased visual functioning to total blindness, depending upon the level of lighting and the extent of their pathology. Some persons with RP can travel independently, using systematic scanning to compensate for their restricted visual field, in daylight. At nighttime or in low lighting situations, this person may use a cane and make the majority of travel decisions based on auditory and tactile information. Thus, evaluating the functional travel vision of persons with RP requires getting information about travel in the daytime as well as at night.

Conversely, some eye diseases, such as ocular albinism or cataracts, are adversely affected by sunny or brightly-lit conditions. Pedestrians who have problems with bright lighting can wear sunglasses, hats, and/or visors to reduce the amount of light entering the eye. However, often they cannot eliminate problems with glare entirely.

Daylight examples of glare include light reflection from a shiny floor or metal object and walking while facing in the direction of the late afternoon sun. Nighttime examples include glare from oncoming headlights or streetlight reflecting off storefront windows. Typically, conditions of dim lighting have a greater impact on mobility than conditions of bright lighting.

Too much or too little light or frequently or quickly changing light can be disabling. Thus, a mobility evaluation for persons with low vision needs to consider the person's travel under various lighting conditions.

Changes in Terrain or Depth

Pedestrians with low vision frequently report problems detecting and negotiating a change in depth, such as stairs, curbs, or uneven terrain. Sometimes pedestrians with low vision report that steps and curbs sometimes appear as flat surfaces and other times appear as blended ramps. Persons with low vision also can have problems identifying raised slabs of sidewalk and may have difficulty interpreting puddles, shadows, and terrain changes. Persons with lower visual field losses find low lying objects and changes in the level of the walking surface particularly hazardous. Misjudging depth and missing level changes can result in falls.

Bumping into Objects

Bumping into objects is a frequently reported mobility problem for those who are totally blind and for those with low vision. This problem increases when walking in crowded or when the area being traveled is cluttered. Studies of low vision mobility indicate both head-height and low-lying objects cause the greatest difficulty. Both can result in bodily injury.

Street Crossings

Determining when to cross the street, directing one's body toward the destination corner, and getting across within the time allotted for the pedestrian phase are the primary tasks all persons must complete to cross a street. People who are totally blind gather information by listening to the movements of traffic, in conjunction with other auditory and tactile cues. Sometimes, there is sufficient and reliable information without visual input. Sometimes it is difficult or impossible for persons who are blind to cross the street due to the lack of environmental information. Crossing streets that do not have traffic control devices involves making judgments about the speed and distance of moving vehicles.

Some persons with low vision can rely on vision to see the traffic lights and pedestrian signals under some conditions, (e.g. on a cloudy day), while at other times they are not able to distinguish the color (e.g. when they are facing toward the sun) or to see the level change of the curb at all. The ability to visually identify the crosswalk lines and to see the opposite corner depends upon the quality of the lines and contrast with the street and the width of the street. Persons need to know how to interpret the traffic sounds and tactile clues for those times and places when their vision is insufficient to collect street crossing information.

Section 7 Test
Understanding How People Who are Visually Impaired Travel

Indicate whether each of the statements below is true or false, and why.

1. Someone who has had orientation and mobility instruction will never seek out the assistance of another person when traveling

2. A long white cane is used to detect obstacles in the path of travel which are then explored by the person using the cane – never their hand.

3. Long white cane users can always cross the street with confidence, since motorists can tell by their canes that they are blind or visually impaired and will yield to them.

4. To walk in a straight line of travel through an open area, some people will use their cane to follow along the edge of texture changes, like grass and pavement.

5. Most people who are blind use a dog guide.

6. Dog guides are trained to know when it is safe to cross the street.

7. When crossing the street, the dog guide is trained to keep it's handler safe at all times.

8. Even with a dog guide, a traveler who is blind may have problems veering if they are not properly aligned for a street crossing.

9. Someone who is legally blind has either a reduced visual acuity or reduced vision field but not necessarily both.

10. Clinical visual acuity measures all vision issues.

11. Someone who travels outdoors but never uses a long white cane or a dog guide would not be considered blind or visually impaired.

12. Pedestrians who are blind cannot travel by using landmarks.

13. The sound of traffic is distracting to the traveler who is blind – quiet is needed to know when it is safe to cross.

14. High curbs and curb ramps with steep slopes can be helpful to the pedestrian who is blind.

15. Intersections with pedestrian push buttons are always safe and can be crossed by anyone.

16. Evaluating a four-way intersection (a "+" intersection) involves looking at eight different crossing possibilities.

17. Transit systems that use "flag stops" can be easier for travelers with vision disabilities to use since they do not have to locate an exact stop.

18. It is possible to be able to read the newspaper and be legally blind.

19. People with low vision can eliminate the effect of glare with the use of sunglasses or a hat.

20. A person with 20/400 acuity sees at 20 feet what a person with normal vision sees at 2 feet.

Please answer the following questions and then discuss your answers with the instructor.

Describe the types of travel issues that would likely be experienced by someone with macular degeneration.

_____

_____

_____

What would be some of the contingency issues of a traveler who uses a wheelchair and has peripheral field loss?

_____

_____

_____

Describe the effects that changes in lighting and glare can have on a individual with Retinitis Pigmentosa.

_____

_____

_____

_____

Suggested Process for Determining ADA Paratransit Eligibility for Individuals Who Are Blind or Visually-Impaired

Assessing the abilities of applicants with vision disabilities to use fixed route public transit services poses significant challenges. There currently are no known assessment tools that have been validated to accurately predict the fixed route travel abilities of persons with vision disabilities. Further, while the success or failure of an applicant with a vision disability to perform certain tasks in a simulation of a bus trip might be observed, this might not accurately reflect a person's abilities to travel under other conditions and circumstances. As detailed in the previous guidance material in this section of the workbook, travel abilities depend on many factors that will vary by day and time. This can include changes in lighting, changes in weather, and changes in traffic volumes.

For these reasons, if persons who are blind are asked to participate in an in-person functional assessment, it is recommended that the assessment only be conducted by an Orientation and Mobility (O&M) Specialist. For persons who are legally blind (but not totally blind) in-person functional assessments should be conducted by O&M Specialists or other qualified professionals as described in the competencies section below. If transit systems do not have access to these professionals, an alternative process that relies on input from the applicant and professionals familiar with the functional travel abilities of the applicant be used instead.

It may, however, be appropriate to ask individuals who indicate issues with vision but who are not legally or totally blind to participate in an assessment similar to the one described in Section 5 of this workbook. This would also be appropriate if applicants who note problems with vision (but who are not legally or totally blind) also have other physical disabilities or health conditions. Observation related to vision could then be made as part of the overall simulation of making a trip on the fixed route service.

Following is a discussion of alternative approaches for assessing the travel abilities of persons with vision disabilities.

Option 1: In-Person Functional Assessment

Two possible approaches for determining the travel abilities of applicants with vision disabilities are proposed. The first approach would involve having an O&M Specialist or other qualified professional conduct an individual assessment of the applicant.

Prior to the in-person assessment, the professional would obtain and review the information provided by the applicant in the paper application. Because travel issues for persons with vision disabilities are significantly different from those for persons with

other types of disabilities, a separate paper application form for applicants with vision disabilities is recommended. A sample application form is provided in Section 3 of this workbook. When individuals call to request information about eligibility for ADA paratransit services, staff should inquire in general terms about their disability and travel issues. Persons who indicate that their most limiting condition or only disability is blindness or legal blindness would be sent this specific application form.

It is also recommended that a visual acuity statement be obtained to verify the degree of vision impairment. This can be provided as part of the application form or obtained through follow-up with a professional identified by the applicant. The person conducting the assessment should review the results of this clinical examination.

A comprehensive mobility assessment would then be conducted. This assessment should be conducted in the real environment as appropriate and should thoroughly consider all of the travel issues noted previously in this section. The assessment should involve observation of a person traveling in:

- both familiar and unfamiliar environments;
- indoor and outdoor settings;
- varying lighting conditions;
- along routes with different terrain; and
- at various types of intersections.

Because the assessment would be an observation of abilities in a specific set of environmental conditions, the O&M Specialist would then need to consider how the person might perform at other times of day or in other environmental conditions.

Follow-up with other professionals who have worked with the applicant or are familiar with the applicant should then be conducted. An eligibility recommendation should then be made based on all of the information collected – information provided by the applicant, information from other professionals, and observations made during the assessment.

Competencies of Persons Conducting Functional Assessments

O&M Specialists are the best professionals to conduct a functional mobility assessment for persons who are totally blind or legally blind. If O&M Specialists are available in the area, it is strongly recommended that they be used to conduct these assessments. O&M Specialists are the only professionals who possess the competency to evaluate the functional community mobility of an individual who is blind. If other professionals are used to evaluate the ability of applicants with low vision due to a lack of availability of O&M Specialists, it is strongly recommended that they possess the following competencies, at a minimum:

Knowledge of:

- Basic anatomy and pathology of the eye
- Functional mobility problems associated with each pathology.
- Implications of reduced visual acuity on mobility tasks
- Implications of reduced visual field on mobility tasks
- Effects of lighting conditions and glare on person's ability to see visual stimuli
- Effects of low lighting, and abrupt changes in lighting
- How visibility of an object or area is effected by contrast, size, distance and lighting.
- Techniques used by persons with low vision to cross streets at intersections with stop signs, traffic lights, or at crossing with no traffic control
- Strategies used for public transportation

Ability to:

- Interpret clinical eye report
- Interpret written information on application regarding applicant's functional vision
- Monitor a person's safety without interfering with their ability to complete the assessment tasks

Option 2:
Identification of Eligibility Conditions Using Information Provided by the Applicant and Appropriate Professionals

In some transit systems, it may not be feasible to have certified O&M Specialists or other qualified professionals conduct functional assessments of applicants who are blind or legally blind. This may be the case due to the lack of availability of O&M Specialists in the area. It may also be too expensive to conduct assessments that might take several hours and involve observations in a wide variety of conditions.

The following alternate process for determining ADA paratransit eligibility is therefore recommended. This alternate process would involve granting a minimum level of conditional eligibility to applicants who are blind or legally blind. Providing at least conditional eligibility for applicants who document a level of vision disability that at least meets the federal definition of legal blindness is based on the notion of "most limiting conditions." It suggests that virtually every blind or legally blind traveler, regardless of his or her personal skill level, would be prevented from safely navigating to and from transit stops under some conditions. In this situation, as when determining eligibility for applicants with other disabilities, it is important to ensure that any individual is not denied a level of eligibility to which he or she may be entitled, even if it is minimal. This process would then use information from the applicant and professionals familiar with the applicant to identify the specific barriers that would limit that person's travel.

Following is an outline of the steps that would be involved in this approach.

STEP 1: Obtain and Review Information from Applicants

When individuals call and request application materials, determine if their primary disability is a vision disability. If so, send them an application form designed to address the travel issues of persons with vision disabilities. Use the sample application for persons with vision disabilities provided in Section 3 of this workbook to develop a similar application that is tested and appropriate for your area.

Have each applicant participate in an in-person interview. Ask follow-up questions as appropriate. Suggestions of follow-up questions are provided in Section 4 of this workbook.

Be sure to obtain information about all concomitant disabilities and health conditions and the impacts of these on travel.

STEP 2: Obtain and Review Information from Professionals

Obtain verification of disability. A visual acuity statement as well as other appropriate documentation is recommended. This documentation could be requested as part of the application form. If not, it should be requested as part of follow-up with named professionals.

If the applicant notes that she has worked with an O&M Specialist, obtain input from that professional. An "Orientation & Mobility Instruction History" form is provided as Attachment A at the end of this section of the workbook. If the applicant has not worked with an O&M Specialist, it might still be helpful to send this form to another named professional.

When obtaining information from other professionals, it is first necessary to obtain a Release of Information from the applicant. Be sure to ask the professional about all concomitant disabilities and health conditions and the impacts of these on travel.

STEP 3: Have Applicants Participate in a Physical Functional Assessment (if appropriate)

If information from applicants and/or professionals indicates some level of vision impairment but the impairment does not meet the federal definition of legal blindness, determine if the applicant has other physical disabilities or health conditions. This information might be obtained from the paper application, from other professionals, or might be based on information collected in the in-person interview. If another health condition or physical disability is noted or observed, it may be appropriate to have the applicant participate in a physical functional assessment similar to the one detailed in

Section 5 of this workbook. As part of that assessment, general observations of issues related to the noted vision disability can be observed and evaluated.

Again, use of a general physical functional assessment such as the one in Section 5 of this workbook that is conducted by professionals such as physical therapists and occupational therapists is recommended only for persons with vision disabilities that do not meet the criteria of legal blindness. For example, many elderly applicants may have some vision loss in addition to one or more health conditions or physical disabilities. It would be appropriate to have these individuals participate in the physical functional assessment, where the professional would carefully document how vision loss affected the applicant's overall ability to navigate the environment.

In-person functional assessments for people who are legally or totally blind would be excluded in this model, unless they were to the standard described in Option 1.

STEP 4: Make the Determination

Consider all information collected. For applicants with some vision impairment but who are not blind or legally blind (and who may have other health conditions or disabilities), the decision would consider information provided in the application form, information obtained from the in-person interview, information from other professionals, and observations made in any functional assessments that might be appropriate. An appropriate level of eligibility – conditional, unconditional, or temporary should then be considered.

Barring the level of functional assessment described in Option 1, applicants who are blind or legally blind would be granted a minimum level of conditional eligibility. These conditions would include eligibility for trips that involve:

- crossing the street at intersections that are not accessible either due to signalization barriers, lack of reliable auditory cues, lack of traffic control or intersection geometry barriers (see "Features of an Accessible Intersection" provided as Attachment B at the end of this section).

- having to wait for buses at stops that are not on a sidewalk and less than three feet from moving traffic along a busy roadway.

- having to walk to or from stops or stations along a path with no sidewalk that is less than three feet from moving traffic. This path can be the shoulder of a busy roadway or a large parking lot with no detectable path of travel.

For applicants who are blind or legally blind, conditions of eligibility beyond the minimum would be established based on input from the individual regarding his or her mobility skills and challenges, knowledge of the particular eye condition, and

professional verification of any training that the individual has received. For example, this might include eligibility from dusk to dawn for someone with night blindness.

Additional conditions of eligibility should also consider the actual orientation and travel skills of the applicant and any issues related to concomitant disabilities. It might, for example include eligibility for unfamiliar trips for which travel instruction has not been provided if the applicant has limited general orientation and wayfinding skills. Or, it may include eligibility when streets of more than two lanes must be crossed if the applicant's walking speed is very slow due to the combination of vision and other disabilities.

Attachment A
Sample Form for Collecting Information About Orientation and Mobility Instruction History

Name of Applicant has applied for eligibility to use the ADA paratransit (van/taxi) services provided by Name of Transit System and has indicated that they received Orientation and Mobility Instruction from you or your agency. To assist us in determining this person's eligibility for ADA paratransit services, please provide the following information about the instruction that was provided.

Agency _____

Instruction was provided from _____ to _____

Approximate total hours of training _____

O&M Instructor _____

BUS TRAVEL

1. Did you teach individual to use the bus system? ____ Yes ____ No

   If NO, skip to question #2

   If YES, answer the following questions:

   a. Was the training route specific? ____ Yes ____ No

   b. Was the training successful? ____ Yes ____ No

      If NO, skip to question #2

   c. Which routes/destinations were mastered?

	Bus Route Number	Destination
1.		
2.		
3.		

d. Note any concerns you have regarding independent travel on buses by this person.

_____

_____

_____

_____

2. Why was training in use of bus service not provided? (check all that apply)

_____ Individual did not want to learn to ride a bus

_____ Individual's family/staff did not want him/her to ride a bus

_____ Individual lacked prerequisite skills

_____ Environmental barriers along intended route
(explain in question #5 below)

_____ Other. Please explain _____

_____

_____

3. At this time, I feel the individual's travel abilities (with training) in regard to use of fixed route bus service best fit into the following category: (check only one)

_____ Community mobile (able to use all bus routes under all conditions)

_____ Can manage several bus route transfers

_____ Can manage one specific bus route transfer

_____ Can manage several simple bus routes (no transfers)

_____ Can manage one specific simple bus route

_____ Cannot ride independently on any bus route

4. What modifications (by the bus system) would be required in order for this individual to be able to ride the bus alone?

_____

_____

_____

5. Note environmental barriers between bus stops/home/destination entrance that would prevent the individual from safely traveling a route alone? (no sidewalks, complex intersections, crossing parking lots, etc.) Please note bus route number if these barriers prevent travel on a particular route.

_____

_____

_____

6. Note personal barriers (poor balance in inclement weather, problems with attention to long routes, slow speed of travel, etc.) which would prevent the individual from traveling a route safely.

_____

_____

_____

7. Describe street crossing skills (at stop signs, traffic lights, etc.)

_____

_____

_____

8. Other comments?

_____

_____

_____

Mailing Address _____

_____

Phone _____ Fax _____

Completed by _____ Date _____

Attachment B
Features of an Accessible Intersection

For paratransit eligibility purposes, one should not assume that all pedestrians who are blind are able to cross streets at intersections that have these accessibility features. This list simply describes those intersection features that have proven to be less problematic. Intersections that do NOT have these accessible features may be considered barriers.

Reference Information

"ADA Public Rights of Way (PROW) Draft Guidelines," released by U.S. Access Board on June 17, 2002.

"Building a True Community: Final Report of the Public Rights-of-Way Access Advisory Committee," U.S. Access Board. January 2001.

STREET/SIDEWALK TRANSITIONS

Curb Ramps

Maximum slope of 1:12
Aligned to hit street at a perpendicular angle or with minimum amount of warping
Aligned with sidewalk and crosswalk intended for its use
Must have a level landing
Surface must be clear of obstructions/grates/doors
Detectable warnings required
Two separate curb ramps preferred (instead of single ramp that opens diagonally onto an intersection)

Medians and Pedestrian Refuge Islands

Compliant cut-throughs or curb ramps are required
Detectable warnings required.

Detectable Warnings

On all curb ramps, alleys, and blended transitions (where ramp is 1:15 or less)
At cut-through medians and islands
Full width of ramp and 24 inches deep at the edge where the ramp, landing, or blended transition connects to a crosswalk.

CROSSWALKS & CROSSING TIME

Crosswalks

Cross slope (road grade) shall be a maximum of 1:48
Crosswalk running grade (road crown) maximum of 5 percent.
High contrast crosswalk markings required at signalized intersections
Minimum crosswalk width is 8 feet.

Pedestrian Phase Timing

Calculated with 3.5 feet per second pedestrian walk speed.
Crossing distances, when calculating timing, shall include the length of the crosswalk and one curb ramp.

ACCESSIBLE PEDESTRIAN SIGNALS (APS)

An APS is a device that communicates information about pedestrian signal timing in non-visual format, through the use of audible tones, or verbal messages, and vibrating surfaces.

APS required at intersections with:

Leading pedestrian intervals
Pedestrian phase timing is pedestrian actuated (by pushbutton)
Pretimed signal with pedestrian signal heads (WALK, DON'T WALK)

APS Requirements

Indicate unambiguous directionality in audible & vibrotactile format
Locator tone (if pedestrian activated)
Audible from beginning of WALK interval
2-5 dB greater than ambient noise
Not limited in operational hours

Refer to pedestrian pushbutton requirements on the next page.

PEDESTRIAN PUSHBUTTONS

Pushbutton Operation and Features

Operate with a closed fist
Size – 2 inch minimum across
Maximum needed force – 3.5 pounds
Emit a locator tone
Visual contrast from the body of the unit
Give visual and audible indication button has been pressed

Pushbutton Location

On smooth, clear level surface
Adjacent to the landing of curb ramp
Control face should be parallel with the crosswalk
Mounting height – 42 inches maximum
Within 5 feet of the crosswalk lines extended
Within 10 feet of the curb edge
Minimum of 10 foot separation from another pushbutton OR speech messaging if 2 buttons are on the same pole.

Pushbutton Signage

Tactile arrows oriented parallel to the crosswalk controlled by the button (to indicate directionality)
Tactile symbol on the button to indicate that it controls an accessible signal
Raised print and Braille sign with street name
Optional – tactile crosswalk map

Turn Lanes at Intersections

Cue provided to locate the pedestrian crosswalk
Pedestrian activate traffic signal must be provided at pedestrian crossings

Roundabouts

Physical separation between walk and street with landscaping, fences, or guide rails to direct the pedestrian flow
Pedestrian actuated signals at crosswalks – should be APS with locator tone