

ACCESSIBLE PEDESTRIAN SIGNALS (APS) INTERSECTION EVALUATION PROCEDURE

BACKGROUND

Accessible Pedestrian Signals (APS), also known as audible pedestrian signals, are devices that communicate information about pedestrian timing in non-visual format such as audible tones, verbal messages, and/or vibrating surfaces. APS are used in conjunction with standard pedestrian activated traffic signals to provide the following information to pedestrians:

- Existence of and location of the pedestrian pushbutton
- Beginning of the pedestrian WALK interval
- Direction of the crosswalk and location of the destination curb
- Clearance signal interval

They are used to assist blind and visually impaired persons and other persons with disabilities of all ages to cross at designated streets and intersections.

PURPOSE

The purpose of this evaluation policy is to set forth factors to be used by the City of Fresno's Public Works Department, in cooperation with the City of Fresno's Disability Advisory Commission, in developing a priority listing of signalized intersection candidates to be retrofitted with audible devices that will provide guidance for the blind community and visually impaired persons and other persons with disabilities of all ages to cross certain streets.

POLICY

It is the policy of the City Council that the retrofitting of existing traffic signals with APS shall be based on factors established herein and that such measurements and computations as may be required in determining priority rating of candidate locations shall be the responsibility of the Public Works Department.

It should be noted that in special situations, an APS should not be installed because of the adverse affect it could have on pedestrian safety as a result of the overall traffic circulation pattern of an area, or unusual geometric conditions where an APS would not provide the safety benefits necessary for the blind or visually impaired individuals to cross a street. It should also be noted that some traffic signals cannot be retrofitted with APS without major costly modifications. Retrofitting of traffic signals with APS shall be subject to approval by the City Engineer.

Important: APS are utilized to help blind and visually impaired travelers recognize when a WALK signal is operating in a given direction. An APS may enhance the safety of blind travelers in two ways:

1. Lessens the chance of a blind or visually impaired pedestrian misjudging when the walk phase is operating, thereby lessening the chance of accidentally crossing against a signal.

2. Helps blind and visually impaired pedestrians recognize immediately when the walk phase begins, permitting them to cross the street in a timely fashion, thereby lessening the chance of being in the intersection when the signal changes.

However, it is important to recognize that the APS does not and cannot assure the blind and visually impaired pedestrians that there will be no potential traffic conflicts while crossing when the APS is operating. In particular, the blind and visually impaired pedestrians should be aware of at least four possible conflicts.

1. Vehicles may be still clearing the intersection when the APS comes on.
2. Vehicles may fail to stop for the red light. This is particularly common for motorists attempting to enter on a yellow light.
3. Motorists may stop and make a right turn on red while watching traffic on their left but may fail to notice pedestrians on their right.
4. Vehicles may have right and left turns on the same phase as the pedestrian.

Because of these potential conflicts, it is important that the blind or visually impaired traveler exercise due caution for his or her well-being when crossing a street, whether or not it is equipped with APS. It is especially important that blind and visually impaired travelers be properly trained by certified orientation and mobility specialists in safe travel techniques on the public right-of-way.

EVALUATION PROCEDURE (See attached "Evaluation Form.")

The following basic considerations and evaluation factors shall be utilized to determine whether a location is eligible to be a candidate for APS and to determine its relative position on the priority list. Evaluation and scoring of factors will be conducted by an evaluation team consisting of a certified orientation-mobility specialist, a visually impaired/blind traveler and a traffic engineer. Candidate locations shall be requested by the City of Fresno Disability Advisory Commission, its working groups, and constituent requests to the ADA Coordinator's office. Candidate locations will be evaluated by means of the sample evaluation sheet attached.

I. BASIC CONSIDERATIONS:

APS normally will be considered for installation only if the following conditions are met:

- A. Intersections must be signalized.
- B. Signals must be susceptible to retrofitting.
- C. Signals should be equipped with pedestrian signal actuations. (See also section on "Signals without Pedestrian Actuations.")
- D. Location must be suitable to installation of audible signals, in terms of surrounding land use, noise level and neighborhood acceptance.
- E. There must be a demonstrated need for the audible signals in the form of a request from an individual or group that would use the audible signal.

II EVALUATION FACTORS

The following factors shall be used to establish a priority listing for potential audible traffic signal candidates. Candidates will be arranged in priority order of those with the highest total points (100 points maximum) on top and then in descending order. The scoring of factors will be

conducted by an evaluation team consisting of a mobility specialist, a visually impaired/blind traveler and a traffic engineer. If the request for an APS was made by a deaf blind individual, or by representative of an organization serving deaf blind pedestrians in order to improve access in their geographic area, the evaluation team may also include a deaf blind rater. The decision whether to include a deaf blind rater will be made by the City Engineer.

A. Intersection Safety

1. Accident Records: Past pedestrian accident experience at the intersection will be used as an indication of potential safety performance. Points will be based on pedestrian accidents reported by the City of Fresno's Police Department.

Pedestrian Accidents	Period	Points
1	4 years	1
2	4 years	2
3	4 years	3
4	4 years	4
5 or more	4 years	5

2. Intersection Configuration: The number of approaches to an intersection and their geometric configuration (offset, skewed, etc.) affect the ability of the blind and visually impaired persons crossing the roadway. In particular, traffic at 3-leg intersections tends not to provide adequate audible clues for the blind to permit them to effectively judge the signal phase.

Configuration	Points
4-leg right angle intersection	1
3-leg T-intersection	2
3 or 4-leg skewed intersection	3
4-leg offset intersection	4
Other complex or multiple leg intersections	5

Note: Intersections with 5 or more legs will require special design.

3. Intersection Signalization: Pre-timed intersections are the easiest for the blind pedestrian because the phase interval is constant and can be observed over time. Vehicle actuated intersections are more difficult, because the pedestrian interval may be of different lengths or skipped all together. Split-phasing can provide confusing auditory information, as a traveler may interpret left-turning vehicles as a parallel traffic surge.

Signalization	Points
Pre-timed	0
Vehicle Actuated	2
Split Phasing	4
Exclusive Ped Phase <i>(for future reference)</i>	5

4. Width of Crossing: Wider streets are more difficult for blind travelers to cross. If each leg of the intersection has a different width, points will be assigned on the basis of the widest street on which pedestrians are permitted to cross. Crossing width will be measured at the point pedestrians normally cross the street. Islands and medians will be included in the total crossing distance even if they are equipped with

separate pedestrian signal actuators. These points will be apportioned based upon the greatest width of the crossing at the subject intersection.

Width of Crossing	Points
40 feet or less	0
40 to 59 feet	1
60 to 79 feet	2
80 to 99 feet	3
100 -119	4
120 feet or more	5

5. Vehicle Speed: The speed of approaching traffic reflects the ability of approaching traffic to stop for a pedestrian clearing the intersection as the lights change. Audible signals help blind pedestrians get a timely start at the beginning of the walk phase, thereby permitting clearing the intersection in a timely manner. Points are assigned on the basis of the 85 percentile speed on the fastest approach leg. More points are assigned on the basis of higher speeds.

Speed Range	Points
0 – 25 mph	1
26 – 30 mph	2
31 – 35 mph	3
36 – 40 mph	4
41 mph or over	5

B. Crosswalk Characteristics

These points will be apportioned based upon the highest-scoring characteristics of any of the crosswalks at the intersection. For example, if any of the crosswalks at an intersection have a median island protruding into an intersection, then the intersection will receive the two points allotted for that characteristic.

1. Location of Pedestrian Push Button. Pedestrian push buttons that are too far from the intersection can present difficulties for blind pedestrians. They may make it harder for an individual to use the button as a cue for alignment and/or to push the button and cross in the same cycle.

Location of Pedestrian Actuators	Points
One or more ped pushbuttons located > 10 ft from curb	1
One or more ped pushbuttons located > 5 ft from crosswalk extended	2
One or more ped pushbuttons out of alignment with direction of travel	2

2. Median Islands. Blind pedestrians have difficulties interpreting traffic clues at medians and islands. Efforts should be made to permit the blind to cross in one continuous movement. In such cases, signal timing should be extended to accommodate the full crossing. Divided streets, with or without a pedestrian signal actuator in the median, will be handled as a single crossing, with the width measured across the entire street.

Median Island	Points
Protruding into crosswalk, or cut through.	2

3. **Alignment of Crosswalk.** A skewed crosswalk is one in which the direction of travel on the crosswalk differs from that on the approaching sidewalk. In this context, skew is not defined as the angle at which streets intersect. If a blind pedestrian walking a straight line from the approaching sidewalk is headed toward parallel traffic lanes, the crosswalk is skewed. If the pedestrian would end up deviating from the crosswalk, but would still arrive at the opposite corner, the crosswalk is not defined as skewed for this purpose.

	Points
Skewed Crosswalk	4

4. **Distance to Alternative APS**

Distance to Alternative APS Crosswalk	Points
1 block	0
2 blocks	0
3 blocks	2
4 blocks	2
5 or more blocks	3

5. **Requests for APS**

New requests for APS will be recorded by the ADA Coordinator. Requestors will be asked to specify the reason for the request (e.g. proximity on a route to school or work), the difficulty they encounter at the intersection, and the time of day that presents the greatest difficulty. This information may be used by the Orientation and Mobility Evaluation team in assessing the intersection.

APS Requests	Points
1 request	1
2 recent documented requests	2
3 or more recent, documented requests	3-4

C. **Pedestrian Usage**

Blind pedestrians share many characteristics with the sighted population in that they go to public places, business, social, educational and medical facilities. At the same time they have special needs. For example, they may have a greater reliance on public transportation than sighted persons. Audible signals should be placed with the view of improving mobility of blind persons and making more facilities accessible to them. Proximity of signals to these facilities may assure a greater degree of utilization.

1. Proximity to facilities for people who are blind or visually impaired: This includes the Department of Rehabilitation, Social Security offices, Valley Center for the Blind and other similar facilities. Special consideration may be given to senior citizens complexes or public housing facilities that have one or more blind or visually impaired persons in residence. Points are assigned on the basis of blocks or

distance (1 block equals 400 feet) from proposed APS site to subject facility. The closer the two are, the more points are assigned.

Proximity	Points
4 to 6 blocks	2
3 blocks	4
2 blocks	6
1 block	8
At subject facility	10

2. Proximity to key facilities utilized by all pedestrians (blind and sighted): This includes medical, educational, social, recreational, shopping, commercial, business, public and governmental facilities. Points are assigned on the basis of blocks or distance (1 block equals 400 feet) from proposed APS site to subject facility. In case of multiple facilities, points will be assigned on the basis of the closest facility.

Proximity	Points
4 to 6 blocks	1
3 blocks	2
2 blocks	3
1 block	4
At subject facility	5

3. Access to public transit: Because blind and visually impaired persons rely heavily upon public transportation (bus or trolley), special consideration will be given to those proposed APS sites that have heavy general use, serves any of the facilities indicated above (Ref. B-1 and B-2), or serves as a transfer point and serves 2 or more transit routes within a one-block walking distance.

- (a) Number of transit stops and/or transit routes within one block of proposed audible signal site.

Number of Routes and Stops	Points
1 – 2 routes and 1 stop	1
3 or more routes and 1 stop	2
1 – 2 routes and 2 stops	3
3 or more routes and 2 stops	4
2 or more routes and more than 2 stops	5

- (b) Passenger usage is based upon the total passengers boarding and debarking each day at a transit stop or transfer point within a one-block walking distance.

Passengers Boarding and Debarking Each Day	Points
0 – 49	0
50-149	1
150-249	2
250-499	3
500-999	4
1,000 and over	5

D. Traffic Conditions

Vehicle volumes, traffic distribution, traffic congestion and flow characteristics may assist or impede the blind traveler in crossing an intersection. Blind pedestrians can function best when crossing signalized intersections that are at right angles with a moderate but steady flow of traffic through the intersection on each leg and with a minimum of turning movements (right or left turns). Traffic that stops on each leg during each signal cycle is particularly helpful. Traffic that is either light, or very heavy, or erratic in its flow makes it difficult for the blind traveler to pick up audible clues as to whether the light is red or green. In such cases, audible signals will assist in determining when it is possible to cross the street. Points may be assigned by the evaluation team based upon their perception of the relative importance of each of these factors (which are not necessarily dependent upon the total average daily traffic). Candidate locations may score up to a maximum of 5 points for each of the following factors depending upon overall traffic distribution.

Heavy Traffic Flow Direction 1	Vehicles per hour	Points
Approach traffic on two legs is in excess of 2,000 vehicles per hour during any peak hour.	2,000 – 2,999	1
	3,000 – 3,999	2
	4,000 – 4,999	3
	5,000 – 5,999	4
	6,000 and over	5

Heavy Traffic Flow Direction 2	Vehicles per hour	Points
Approach traffic on two legs is in excess of 2,000 vehicles per hour during any peak hour.	2,000 – 2,999	1
	3,000 – 3,999	2
	4,000 – 4,999	3
	5,000 – 5,999	4
	6,000 and over	5

Off Peak Traffic Presence Direction 1		Points
At least two vehicles present on both directions on parallel street, expressed as a percentage of ten cycles.	Constant ($\geq 90\%$)	0
	Heavy (70-80%)	1
	Moderate (50-60%)	2
	Light (30-40%)	3
	Occasional ($<30\%$)	4
	None (no through lanes to create surge noise).	5

Off Peak Traffic Presence Direction 2		Points
At least two vehicles present on both directions on parallel	Constant ($\geq 90\%$)	0
	Heavy (70-80%)	1

street, expressed as a percentage of ten cycles.	Moderate (50-60%)	2
	Light (30-40%)	3
	Occasional (<30%)	4
	None (no through lanes to create surge noise).	5

E. Mobility Evaluation

Each intersection being considered for audible signals should be evaluated by a certified orientation and mobility specialist. Based on the judgment of the O-M specialist and the evaluation team, additional points may be assigned based on observed or special conditions not adequately covered by any of the previous factors. This may include a heavy right-turn volume, right-turn island, right-turn signals, limited cone of “visibility”, etc.

	Points
Mobility and miscellaneous factors	0-15

Signals without Pedestrian Actuators

Signalized intersections without pedestrian actuators may be considered for evaluation under this priority system, provided the following conditions are met:

1. There must be a demonstrated problem or need that can be alleviated by the installation of an audible signal in the form of a request from an individual or group that would use the audible signal.
2. The evaluation team must unanimously concur with the need.
3. Appropriate pedestrian actuation buttons and circuits must be provided as part of the APS installation.

Accessible Signals at New Signal Installations

Accessible signals will be considered for new signal installation if it is determined that installation is warranted by the criteria established above.

Public Notice of Installation of Accessible Signals

The City recognizes that the installation of APS may be of interest to the community, especially residents in the immediate vicinity of the candidate intersection. In addition, research has indicated that APS are more effectively used by blind and visually impaired pedestrians if they have notice of its location and a basic understanding of the type of signal installed. Accordingly, the Director of Public Works will provide a notice to neighbors in a 350 feet radius from the intersection of the proposed installation of APS at that site, and invite concerned citizens to contact him in writing. In addition, the Department of Public Works will also issue press releases and informing the public and organizations serving people with disabilities, especially visual impairments, of the type and location of proposed and installed APS.