# THE FEASBILITY OF ACCOMMODATING PHYSICALLY HANDICAPPED INDMDUALS ON PEEESTRIAN OVER AND UNDERCROSSSNG STRUCTURES 

## September 1980

Final Report
Appendix





Prepared for
FEDERAL HIGHWAY ADMINISTRATION
Offices of Research \& Development
Evirronmertal Division
Wastingtion, D.C. 20590

## FORETOP)

This report describes the evaluation of a sampling of over- and madercrossing structures to identify major and minor access barriers for the physically handicapped. From this evaluation, it was determined that it is feasible to accomodate the physically handicapped on crossing structures. However, further research on specific design problems (ramp gradients, lengths, etc.) is needed before recommendations for the design or retrofitting of over- and undercrossing structures can be developed.

Research in pedestrian safety is included in the Federally Coordinated Program of Highway Research and Development as Task 1 of Project 1E, "Safety of Pedestrians and Abutting Property Occupants." Mr. John C. Megan is the Project Manager.

One copy of this report is being distributed to each FTh regional and division office.


Director, Office of Research
Federal Highway Administration

NOTICE

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United states Government assumes no liability for its contents or use thereof.

The contents of this report reflect the views of the contracking organization, mich is responsible for the facts and the accuracy of the data presented herein. the contents do not necessarily reflect the official views or policy of the Department of Transportation. This" report does not constr. Wat a standard, specification, or regulation.

The United States Government does not endorse products or manufacturers. trade ox manufacturers' names appear herein only because they are considered essential to the object of this document.

# FEDERAL LEGISLATION REVIEW 

The first national legislation directea at the elimination of arehitectural barriers has been enacted only within the past two decades. For the elderly and handicapped pedestrian, the legislation has had little impact up to now because it has been primarily directed at buildings and, in particular, at buildings financed in whole, or in part, with Federal Eunds. The sidewalks, streets, street crossings, public open spaces, parking lots, building sites, shopping centers, parks and recreation axeas that are under the legal control of cities, towns, countries and local authorities remain substantially inacesssable.

This report is a review of federal legislation and regulations which pertain to the provision of crossing structures for pedestrians and the accepsability of structures to handicapped individuals. A major information source for this review was the survey of legislation previously conducted by researchers of the Pedestrian Research Laboratory entitled, "Provisions for Elderly and Hondicapped pedestrians: Volume 2, Hazards, Barriers, Froblems, and the Law. That review covered legislation enacted through the middle of 1977, plus certain significant laws passed later in 1977 and during 1978 , is broader in scope than the present review. This report includes legislation enacted through May 31, 1979.

Several significant laws have contained reference to the needs and rights of elderly and handicapped citizens. Although none of these laws identify crossm ing structures specifically, they do refer to the removal of axchitectural barriers in public buildings and facilities. The "Axchitectural Berxiexs Act of $1968^{\prime \prime}$ as amented requires the establishment of minimum accessibility standards for builcings and facilities constructed with Federal funds. The zequirements for the elimination of architectural barriers also include transportam tion systems, housing and commity development (the Urban Mass Transportation Act of 1964 as amended, the Federal-Aid Highway Act of 1973 as amended, the Surface Txansportation Assistance Act of 1978), and "services to assist physically and mental impaired older people to lead more independent lives" (The Older Americans Act of 1965 as amended). The Surface Transportation Assistance Act of 1978 includes specific reference to pedestrian provisions. It allows Federal afd highway funds to be used for construction or improvement of pedestrian walkways and grants authority to the states to purchase adequate rights-of-way to accomodate bicycle and pedestrian travel. The Federal-iic gighway Act of 1973 initially permittea Federal-aid highway funds to be used for bicyclist and pedestrian travel.

## Definitions

The American Association of State highway and Transportation officials' policy on Design of Urban Highways and Arterial Streets 1973 defines over and undercrossings as follows: "A grade separation is defined as a crossing of two highways, or highway and a railroa, at different levels. The terms "overpass" and "oyercrossing" are used to designate the grade separation where the subject highway passes over an intersecting street or railroad. The tems "underpass" and "wndercrossing" apply where the subject highway passes under
the street on railroad." ${ }^{1}$ This definition is directed toward vehicular crossings and is somewhat limited when applied to the pedestrian situation.
For the puxposes of this report this defitition has been expanded to include crossings over or under natural features such as rivers, crossings which pass through buildings and air-rights structures. The crossings themselves axe those which accomodate vehicular, bicycle, and/or pedestrian traffic.

For the purposes of this report the definintion of a handicapped individual will be "any person who (a) has a physical or mental impairment which substantially limits one or more of such person's major life activities; ( $b$ ) has a record of such impairment, or (c) is regarded as having such impairment." This definition appears in the Rehabilitation Act Amendments of 1974, U.S.C. 706(6). For further diseussion of the definition of handicapped refer to the report, "Provisions for Elderly and Handicapped Pedestrians: Volume 2, Hazards, Barriers, Problems and the Law.r

## Federal Legislation

1. Architectural Barriers Act (Public Law 90-480, 1968). An Act to Ensure that Certain Buildings Financed with Federal Funds areso Designed and Constructed as to be Accessible to the Physically Handicapped. August 12, 1968. (42 USC 4151 et seq.)

Congress recognized that approximately twenty-two milion physically handicapped people were restricted in their movements and that these people were a valuable asset to society and must be afforded every opportunity to enter the mainstream of American life, Congress also realized that it had to mandate minimum accessibility standards since voluntary barrier-free standards had not assured disabled people total accessibility to and utilization of Federal Government facilities. The Architectural Barriers Act of 1968 states:
"... the term building' means any building of facility (other than (A) a privately owned residential structure and (B) any building or facility on a military installation designed and constructed primarily for use by able-badied military personnel) the intended use for which either will require that such building or facility be accessible to the public, or may result in the employment or residence therein of physically handicapped persons ... to be constructed or altered by or on behaif of the United States, leased in whole or in part by the United States or to be financed in whole or in part by a grant or loan made by the United States subject to this Act."

Section 2 states the Administrator of General Services, in consultation with the Secretary of Health, Education, and Welfare, shall prescribe standards for the design, construetion, and alteration of certain Federal buildings to insure whenever possible that physically handicapped persons will have ready access to, and use of, such buildings. The GSA has issued regulations as requited (Regulations at 41 C.F.R. 10119.6, effective September 12, 1969).

Section 5 states every building designed, constructed, or altered after the effective date of a standard issued under this Act which is applicable to such building, shall be designed, constructed, or altered in accordance with such standard.

[^0](1) is authorized to modify or waive any such standard, on a case-by-case basis, upon application made by the head of the department, agency or instrumentality of the United States concerned upon a determination by the Administrator or Secretary, as the case may be, that such modification or waiver is clearly necessary, and
(2) shall establish a system of continuing surveys and investigations to insure compliance with such standards.
2. Rehabilitation Act of 1973 (Public Law 93-112) as amended through December 31. 1978. (29 USC 792)

Section 502 established the Federal Architectural and Transportation Barriers Compliance Board ${ }^{4}$ which shall be composed as follows:

1. Eleven members shall be appointed by the President from among members of the general public of whom five shall be handicapped individuals.
2. The remaining 10 members shall be heads of each of the following departments or agencies (or their designees): Department of Health, Education, and Welfare, Department of Transportation, Department of Housing and Urban Development, Department of Labor, Department of the Interior, Department of Deferise, Department of Justice, General Services Administration, Veterans Administration, and United States Postal Service.

It shall be the function of the Board to:
(1) insure compliance with the standards preseribed pursuant to the Architectural Barriers Act of 1968, as amended, including but not limited to enforcing all standards under that Act, and insuring that all waivers and modifications of standards are based upon findings of fact and are not inconsistent with the provisions of such Act;
(2) investigate and examine alternative approaches to the architectural, transportation, communication, and attitudinal barriers confronting handieapped individuals, particularly with respect to telecommuniction devices, publie buildings and monuments, parks and parkland, public transportation, and residential and institutional housing;
(3) determine what measures are being taken by Federal, State, and local governments and by other public or nomprofit agencies to eliminate the barriers deseribed in clause (2) above;
(4) promote the use of the International Accessibility Symbol in all public facilities that are in compliance with the standards preseribed by the Administrator of the General Services Administration, the Seeretary of Defense, and the Secretary of Housing and Urban Development pursuant to the Architectural Barriers Aet of 1968;
(5) make to the President and Congress reports on results of investigations and
recommendations for legislation and administration which it deems necessary or desirable to eliminate barriers;
(6) establish minimum gudelines and requirements for the standards issued pursuant to the Architectural Bartiers Act of 1968, as amended.

In earrying out its functions, the Board shall conduct investigations, hold public hearings, and issue orders as it deems necessary to insure complianee with other provisions of the applicable law. An order of compliance issued by the Board shall be a final order for purposes of judicial review. Any such order affecting any Federal department, agency, or instrumentality of the United States shall be final and binding on such department, agency, of instrumentality. An order of compliance may include the withholding or suspension of Federal funds with respect to any buiding or public conveyance or rolling stock found not to be in compliance with standards enforced under the Board's jurisdiction. Pursuant to Chapter $\%$ of Title 5 , United States Code, any complaint or participant in a Board proceeding may obtain review of a final order issued by the Board.

In December 1977, the Board issued a citation against the Federal Highway Administration (FHWA) and the Department of Transportation (DOT) alleging that a pedestrian overpass paid for in part by Federal-aid highway funds, had not been built in accordance with the American National Standards Institute standards. The Board, through its Exenutive Director, claimed that this overpass was not in conformance with the Architectural Barriers Act; the FHW A asserted that the structure had been built in accordance with its approved construction criteria. Without determining if laws were violated and to end this dispute the parties entered into an Agreement which was accepted by the administrative law judge, who dismissed the citation, in March 1979. The Agreement set forth the following pertinent stipulations and provisions:

WHEREAS the Department of Transportation and the Federal Highway Administration desire to assure continued progress in making Federal-aid highway facilities aecessible to physically handicapped persons; and

WHEREAS the Architectural and Transportation Barriers Compliance Board is charged with determining what measures are being taken to eliminate architectural and transportation barriers to physically disabled persons and insuring compliance with standards issued under the Architectural Barriers Act of 1966 , as amended; and

WHEREAS the parties wish to cooperate in achieving their mutual goals; and
WHEREAS it is agreed by the parties that for purposes of this agreement the following terms shall bear the following definitions:

Overpasses and underpasses are pathways designated for pedestrians, which pass over and under, respectively, through lanes for motor vehieles, and which are constructed in whole or in part with Federal-aid funds.

Physianlly handicapped person is an individual who has a physical impairment that substantailly limits one or more major life activities.

The FHWA agreed that until further regulations are issued, Pederal funds would not be spent on structures unless the design met certain specific provisions of the ANSI standards.

The FHWA is working to develop standards for the design and construction of pedestrian overpasses and underpasses for accessibility and usability by physically handicapped persons, which standards will supplement and clarify the ANSI standards. The new standards will be consistent with DOT's 504 regulations, as they apply to overpasses and underpasses. Any variance in design from the standards or regulations, proposed for new projects must be approved by the Federal Highway Administrator or designee, after notifying the Executive Director and finding that the variance is clearly necessary.

In addition, the FHWA has agreed to continue or consider certain actions to enhance accessibility and usablity of overpasses and underpasses. This will include research and development, feasible dernonstration projects, exchanges of information and consultations with the Board, and exchanges of technical assistance.

The FHWA agreed to issue a notice urging States to develop an inventory identifying certain overpasses and underpasses. The States are asked to pinpoint in such inventory thase mast in need of modification, according to eriteria such as steepness of grade, seriousness of hazard, potential frequency of use, and location. States are urged to establish a timetable for modification by altering intersections and correctly ramping existing facilities. The FHWA and the Board will jointly develop guidelines for the modifieations and the Statets progress will be reported and reviewed.

Further portions of the Agreement address training in the needs of physically handicapped persons and consultation with their representative groups. The Agreement provides for a procedure between FHWA and the Board for processing complaints regarding aceessibility of overpasses and underpasses. The Board will not initiate proceedings against FHWA if they plan to modify the particular overpass or underpass, or the State in whieh it is located is making reasonable progress towards modifying on a priority basis its overpasses and underpasses. The agreement is viewed by the Board as atep to provide increased accessibility of highway overpasses and underpasses.
3. Department of Transportation law affecting transportation for elderly and handicapped persons.

## United States Code, Title 23: Highways

## 23 USC 109(a)

The Secretary shall not approve plans and specifications for proposed projects on any Federal-aid system if they fail to provide for a facility ... that will be designed and constructed in accordance with standards best suited to aecomplish the ... objectives and conform to the particular needs of each locality.

23USC 217(a)
To encourage the multiple use of highway ... States may ... on Federal-aid highway projects, include to the extent practicable, suitable, and feasible, the construction of separate ... and pedestrian walkways....

23 USC 402 (b) (1) (F)
The Secretary shall not approve any State highway safety program under their section which does not ... provide adequate and reasonable access for the safe and convenient movernent of phsycially handicapped persons, including those in wheelchairs, across curbs construeted or replaced on or after July 1, 1976, at all pedestrian crosswalks throughout the State.

Surface Transportation Assistance Act of 1978 . Title 1, Federal-aid Highway Act of 1978. Section 168 (a) Section 152 of Title 23, USC, is amended to read: "Each state shall conduct and systematically maintain an engineering survey of all public roads to identify hazardous locations, seetions and elements, including roadside obstacles and unmarked or poorly marked roads, which may constitute a danger to motorists and pedestrians, assign priorities for the correction of such locations, sections and elements, and establish and implement a schedule of projeets for their improvement."

Urban Mass Transportation Aet of 1964, as amended, Public Law 88-365* An amendment in 1970 Public Law $91-453$, seetion 16 , declared that it is a "national poliey that elderly and handicapped persons have the same right as other persons to utilize mass transportation facilities and services." Under Section $6,11 / 2 \%$ of funds may be set aside and used to increase information and technology for eldarly and handicapped mass transportation needs. Section 16(b) of this Act states that UMTA under the Secretary "may" set aside $2 \%$ of funds to finance programs:
(1) to states for local public roads and for providing mass transportation services;
(2) to private non-profit corporations which provide transportation services meeting the speeial needs of elderly and handicapped people.

## Executive Order

On April 28, 1976, the President issued Executive Order 11914 (41 FR 17871) (29 USC 794) which states: The Secretary of Health, Education, and Welfare shall coordinate the implementation of Section 504 of the Rehabilitation Act of 1973, as amended, for all Federal departments and agencies empowered to extend financial assistance to any Federal program or activity.

The Exectuive Order directs the Secretary of HEW to establish certain standards and guidelines, as well as the procedures to guide other Federal departments or agencies in implementing Section 504, Standards and procedures and guidelines were issued by HEW on January $13,1978,43$ FR 2132, to provide the framework for a comprehensive government effort to elininate discrimination against the handicapped.

The Department of Transportation's final rule implementing Section 504 was published in the Eederal Register of May 31, 1979. Section 27.75, Federal Highway Administration m Highways, states ...*
(2) Curb cuts. All pedestrain crosswalks constructed with Federal financial assistance shall have eurb cuts or ramps to eccommodate persons in wheelchairs.
(3) Pedestrain overpasses, underpasses and ramps. Pedestrain overpasses, underpasses and ramps, canstructed with Federal financial assistanee, shall be accessible to handicapped persons, including having gradients no steeper than 10 pereent, unless:
(i) Alternate safe means are provided to enable mobility-limited persons to cross the roadway at that location; or
(ii) It would be infeasible for mobility-limited persons to reach the overpasses, underpasses or ramps because of unusual topographical or architectural obstacles unrelated to the federally assisted facility.

American National Standards Institute Standard Specifieations for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped, (American National Standards Institute Standard Specifications) A117.1-1961 (ANSI).

The ANSI specifications include general principles and considerations regarding barrierfree design, and address the specifie problems and potentials of site development and buildings. They do not include specifications for waiks, streets, or erossings.

The Standards have been widely followed in both federal and state statutes since their preparation in 1961. However, they no longer adequately meet the needs of today's handicapped population. For this reason, Syracuse Umiversity was awarded a contract by the Department of Housing and Urban Development to prepare revisions and additions to the ANSI Standards and to bring them up to the state-of-the-art to date and submit them to the American National Standards Institute. Although the revisions currently under preparation will update and expand the scope of the ANSI Standards, no reference is made specifically to over- or undercrossing structures.

## REFERENCES

1. American Association of State Highway and Transportation Officials, A Poliey on Design of Urban Highways and Arterial Streets, Washington, D.C., 1973, p. 499.
2. Rehabilitation Act Amendments of 1974, P.L. 93-516.
3. "Architectural Barriers Act", P.L. 90-480, An Aet to Ensure that Certain Buildings Financed with Federal Funds are so Designed and Constructed as to be Accessible to the Phsysically Handieapped, 1968 .
4. Legislative Mandate of the Architectural and Transportation Compliance Board, 1977.
5. Urban Mass Transportation Assistance Act of 1964 as Amended in 1970, P.L. 91453.
6. American National Standards Institute, Inc, American National Standards Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped, A117.1, (R71) New York, ANSI, 1961.

## DATA COLLECTION FORM

## Location:

Date:

## Time:

Yeather:

| Portions of walkway are hidden from view (crime potential). |  |
| :---: | :---: |
| Over/underpass is not close to publie transportation stop. |  |
| No sidewalk at end condition. |  |
| Parked eans restrict appronch. |  |
| Parked cars obstruet view of approach. |  |
| No aceessible parking. |  |
| No detectable pedestrian crosswalk to approach. |  |
| Driverts view of pedestrian blocked. |  |
| Pedestrian walkway on only one side. |  |
| Walkway less than $48^{\prime \prime}$ (too narrow). |  |
| Head room below $6^{\prime \prime} 10^{\circ \prime}$. |  |
| Walkway through "long" tunnel (over 40). |  |
| Structure vibrates (traitie). |  |
| Abrasive or perferated material on vertical surface adjacent to walkway. |  |
| Objects project into walkway (signs, trees, ete.). |  |
| Manhole covers and gratings in walkway. |  |
| Highly reflective surface materials. |  |


| Grooves and patterns (cast into walkways or caused by small paving units). | $\sim$ |
| :---: | :---: |
| Large, deep expansion joints. |  |
| Uneven and irregular surfaces. |  |
| Loose and soft surfaces (gravel, sanc, ete.). |  |
| Rough surfaces. |  |
| Discontinuous surface materials. |  |
| Depris from erosion on walkway. |  |
| Disrepair (i.e., frost heaves, potholes, ete.). |  |
| Disrepair from vandalism or aceident handrails, guardraits, ete.). |  |
| Stairway is only means of access to structure. |  |
| Stairway only on one side of structure. |  |
| Poorly lighted steps, stairs, ramps. |  |
| Treads less than 114 (too small). |  |
| Projecting nosings. |  |
| Open risers. |  |
| Risers greater than ${ }^{\prime \prime}$ (too high). |  |
| Curb grester than 6" (too high). |  |
| Step (settlement) between approseh and structure. |  |
| Dangerous stair location. |  |
| Only ramps provided. |  |


| Only ramps provided on one side of structure. |  |
| :---: | :---: |
| Pathwey leading to over/undercrossing too steep and long. |  |
| Ramp too long (exceeds 30 feet). |  |
| Ramp too steep (slope greater than 1:12), |  |
| Ramp too narrow (less than 48"). |  |
| Cross slope greater than $1: 50$ (too steep). |  |
| No curb cuts. |  |
| Helical ramp. |  |
| Ramp layout inconvenient. |  |
| Abrupt transition to connecting walkways. |  |
| Ramp exits directly into street or parking area (less than $6^{\prime}$ clearance at bottom of ramp). |  |
| Bollards in the middle of entrance to the ramp. |  |
| Steps in the middle of the ramp. |  |
| Handrailm higher than $36^{\prime \prime}$ (too high). |  |
| Handrails lower than $32^{\text {a }}$ (toolow). |  |
| No handralls. |  |
| Handrails inadequate for comfortable grasp. |  |
| Handrail material metal or aluminum (hot in hot weather, cold in eold). | $\cdot$ |
| Handrails not continuous. |  |


| Handrails don't extend far enough <br> (1' at top and bottom of stairs and <br> ramps). |  |
| :--- | :--- |
| No handrails on ramps. |  |
| Barricades not detectable (blind <br> cane). |  |
| Guardrails not continuous. |  |
| Guardrails too low (less than 42". |  |
| No pedestrian guardrails. |  |
| Inadecuate guardrails. |  |
| Guardrail mesh hazardous. |  |
| No detectable separation between <br> bikeway and pedestrian way. |  |
| No detectable separation between <br> roadway and walkway. |  |
| No detectable separation between <br> walkway and parking lot. |  |
| Unprotected sidewalks (cars, edges, <br> etc.l. |  |
| Esealators. |  |
| Elevators. |  |
| No provision for scenic overlook. |  |
| Nesting places not under cover |  |
| (wind, rain, sun). |  |
| Not enough places to stop and rest. |  |
| too deep or shallow or with nornative route for flood eon- |  |
| armrest. |  |


| No pedestrian emergency provi- <br> sions. |  |
| :--- | :--- |
| Significant chrage of light level in <br> tunnel at entrance. |  |
| Interior lighting not adjusted to <br> outside light conditions. |  |
| Glare at end of tunnel. |  |
| Tunnel too dark. |  |
| Glare and flashing lights from vehi- <br> cles. |  |
| Poor illumination. |  |
| No signage indicating location of |  |
| rest areas. |  |


| Traffie noise. |  |
| :--- | :--- |
| High wind gusts present. |  |
| Wind generated by traffic. |  |
| Inadequate provision for rain water <br> run off. |  |
| Walkways and sidewalks not kept <br> elear of snow, ice and debris. |  |

## BARRIERS MATRIX

This appendix correlated environmental barriers with groups of people with various handicapping conditions. Environmental barriers are listed across the top of each sheet while the handicapping conditions are enumerated along the left hand column of the matrix. The list of handicapping conditions is four pages long; on the fifth page of the matrix it begins again, linking the list with the next group of environmental barriers.

For example, the effect of different environmental barriers on people with the handicapping condition, "Difficulty with environmental orientation" is found in matrix sections A1, B1, C1, ete. However, the different effeets of the envrionmental barrier entitled, "Driver's view of pedestrian blocked" on all groups of people can be found in the matrix sections A1, A2, A3, and A4 tmatrix section numbers are found in the top right hand corner of each page).

|  | Lootation and End Condition（mE） |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Rey: N = No mobility problem F= Inconvenient D =" Causes considerable dufficulty B=an impossible barrier``` |  |  | 㗊 <br> 告 <br>  |  |  | No accessible psrking. |  |
| Difficulty with environ－ mental orientation． | I | I | D／B | N | $\pm$ | N | I |
| Understanding teficit． | N | 1 | D／B | 1 | I | N | 7 |
| Limited attention span． | I | 1 | D | I | T | N | I． |
| Memory deficit． | 4 | 1 | 1／D | 1 | I | N | 1 |
| Decteased ability to sequence，judge time， \＆irection，distance． size． | 1 | $N$ | 1／0 | I | L | N | 1 |
| Impaired niglt vision． | D | D | I／D | 0 | D | N | I |
| Impaired cutaneous sensetion detection． | I | $I$ | v | 1 | 1 | N | 1 |
| Chronic stooped postut゙e． | I | I | I | 1 | I | N | I |
| Difficulty in mann－ taining equilibriam． | I | D | 1 | Y | I | D | I |
| Moves at show speed． | 1 | I | I | I | I | I | $I$ |
| Swaying，shuffing， uneven，eratic or stag－ gering gait． | I | I | I／D | 1 | 1 | I | $I$ |
| Frequent need to rest during exercise． | $\underline{1}$ | D | 1／D | 1 | 1 | 0 | I |



| Key: <br> $N=N o$ mobility problem <br> $I=$ Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=A n$ impossible barrier | Location and End Condition (LEC) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | - zuphred aqquscase on |  |
| Limited manual dexterity. | N | N | N | N | N | N | N |
| Inability to turn bead. | 1 | N | N | 1 | D | 1 | I |
| Decteased ability to stoop. | N | N | N | k | N | N | N |
| Defficulty standing frow sitting position, or in steting down. | N | N | N | N | N | N | N |
| Limited vertical motion with legs and feet. | 1 | I | I/D | I | I | I | I |
| Limited horizontal motion with legs and feet. | 1 | I | 1 | 1 | I | 1 | I |
| Decreased ability to tolerate beat and cold. | N | D | N | N | N | N | N |
| Speech disorder. | N | ${ }^{\text {N }}$ | N | N | N | N | N |
| Loss of normal speed in motor coordination/slowed reflexes, | I | $I$ | I/D | $\underline{1}$ | I | I | I |
| Fear of crime. | 0 | I | N | N | N | N | N |
| Fear of heights (vertigo). | N | N | N | N | N | N | N |
| Agoraphobia. | N | N | N | N | N | N | N |
| Claustrophobia. | 1 | N | N | N | N | N | N |
| Fear of loud noises. | N | N | N | N | N | N | N |


|  | Location and Eas Oundition (Lem) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rey: <br> N * No mobility problen <br> I = Inconvenient <br> $\mathrm{D}=$ Cause considerable ditituctuty <br> $B=A x$ mpossible <br> barmier |  |  |  |  <br> 0 | $\begin{aligned} & \text { Parked cars obstruct } \\ & \text { vew of approach. } \end{aligned}$ | - gupured arqusseoze on |  |
| Uses white cane for guidance (visually impaired). | D | I | I/ 1 | 1 | I |  | D |
| Uses guide dog. | 1 | 1 | 1/0 | 1 | I |  | L |
| Limited abllity to acquixe or process viaual stimulit. | D | I | D | I | I | 1 | I |
| Limited ability wo perceive or process anditory stimulu. | 2 | $\mathrm{N}$ | N | N | N | I | I |


| Key: <br> $N=$ No mobility problem <br> I = Inconventent <br> D = Causes considerable difficulty <br> $B=A n$ impossible barrier | (LEC) | Walkways |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Difficulty with environmental orientation. | N | I | N | N | D | N | N | N |
| Understanding deficit. | N | 1 | N | N | 1 | I | N | N |
| Limited attention span. | N | 1 | N | N | 1 | N | N | 1 |
| Memory defielt. | N | I | N | N | I | N | N | N |
| Decreased ability to sequence, judge time, direction, distance, size. | I | I | D | N | I | N | N | 1 |
| Impaired night vision. | D | I | $I$ | N | D | N | I | D |
| Impaired cutaneous sensation detection. | 1 | 1 | N | N | N | N | I | N |
| Chronic stooped posture. | I | 1 | N | N | N | N | N | $\cdots$ |
| Difficulty in maintaining equilibrium. | 1 | I | D | N | I | I | N | I |
| Moves at slow speed. | I | I | \% | N | N | N | $N$ | $N$ |
| Swaying: shufling, uneven, eratic or staggering gait. | I | D | D | N | N | 1 | N | 1 |
| Frequent need to rest during exercise. | N | N | N | N | I | N | N | N |


|  | （LEC） | Walkways |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Xey： <br> $\mathrm{N}=$ No mobillty problem <br> I＝Inconvenient <br> D＝Causes considerable difficulty <br> $B=A n$ impossible basrier |  | 营 <br> 皆总 5 <br>  ${ }_{5}$ |  |  |  |  |  |  |
| Reduced tolerance to brisk exercise（need to move slowly）． | N | N | N | N | 1 | N | N | N |
| Limited abdlity to stand for long periods． | N | N | N | N | 1 | N | N | $N$ |
| Impaired blader control． | $N$ | N | N | $N$ | I | N | N | N |
| Extreme of size（dwarfism， giantisti，obesity，etc．）． | I | N | 0 | D | N | N | $N$ | N |
| Cardiac Pacemaker affected by electrical interference． | N | N | N | N | N | $N$ | N | N |
| Uses powered or menual wheelchair． | I | I | D | N | $\pm$ | 1 | 1 | I |
| Uses walker，crutches， orthopedic cane． | I | I | 1 | N | I | I | I | I |
| Prosthesis（including braces）for lower extreaities． | I | 0 | N | N | I | I | I | 1 |
| Decreased ability to tole－ rate smoke，dust，chemicals， poliens，colu winds． | N | N | N | N | N | N | N | N |
| Limited ability to grasp， release or manipulate with upper extremities（arms， wrist，hands）． | N | N | N | N | N | N | N | N |
| Limited reach． | N | N | N | N | N | $N$ | N | N |


| Key: <br> $\mathrm{N}=$ No mobility problem <br> I = Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=A n$ impossible barrier | (LEC) | Walkways |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | $$ |  |  |  |  |
| Limited manual dexterity. | N | N | N | N | N | N | N | N |
| Inability to turn head. | I | I | N | N | N | N | N | I |
| Decreased ability to stoop. | N | N | N | N | N | N | N | N |
| Difficulty standing from sitting position, or in sitting down. | N | N | N | N | N | N | N | N |
| Limited vertical motion with legs and feet. | I | N | N | N | I | N | I | I |
| Limited horizontal motion with legs and feet. | I | N | N | N | I | N | I | I |
| Decreased ability to tolerate heat and cold. | N | N | N | N | N | N | N | N |
| Speech disorder. | N | N | . N | N | N | N | N | N |
| Loss of normal speed in motor coordination/slowed reflexes. | I | N | N | N | 1 | I | N | I |
| Fear of crime. | N | N | N | N | I/D | N | N | N |
| Fear of heights (vertigo). | N | N | N | N | N | N | N | N |
| Agoraphobia. | N | N | N | N | N | N | N | N |
| Claustrophobia. | N | N | I | N | D/B | N | N | N |
| Fear of loud noises. | N | N | N | N | N | I | N | N |



| Rey: <br> $\mathrm{N}=$ No mobility probiem <br> $\mathrm{I}=$ Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=A n i m p o s s i b l e$ barrier | Surface Materials |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  <br> 9 4 4 |  |  |  |  |
| Difificulty with environmental orientation. | N | I | N | N | N | N | N | N |
| Understanding deficit. | N | I | N | I/D | 1 | N | N | N |
| Limited attention span. | I | I | N | I | I | N | N | N |
| Memory deficit. | N | N | N | N | N | N | N | N |
| Decreased ability to sequence, judge time, direction, distance, size. | I | N | N | 1/0 | N | N | N | I |
| Impaired night vision. | D | 1 | I | $\mathrm{D} / \mathrm{B}$ | I | I/D | \%/D | I/D |
| Impaired cutaneous sensation detection. | N | N | N | N | $N$ | I | I | 1 |
| Chronic stooped posture. | $N$ | N | N | D/B | N | N | N | N |
| Difficuley in mántaining equilubrium. | I | N | N | B | $\pm$ | I | 1 | I |
| Moves at slow speed. | N | N | N | I/D | N | N | N | N |
| Swaying, shuffling, uneven, eratic or staggering galt. | I | N | N | D/B | I | I/D | I/D | 1/0 |
| Frequent need to rest during exercise. | N | N | N | 1/D | N | N | N | N |


| Key： <br> $N=N o$ mobility problem <br> I m Inconvenient <br> D $m$ Causes considerable difficulty <br> B＝An impossible barrier | Sumface Matarials |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Reduced tolerance to trisk <br> exercise（need to move <br> slowly）． | N | N | ＊ | $1 / 0$ | N | N | N | ＊ |
| Limited ability to stanc for long periods． | N | N | N | N | N | N | N | N |
| mpaired bladdex control． | N | N | N | N | N | N | N | N |
| Extreme of size（cwarfism， ghantism，obesity，etc．）． | N | N | N | D | N | N | N | N |
| Cardiac Pacemaker affected by electrical interference． | N | N | N | N | N | N | N | N |
| Uses powered or manual wheelchair． | Lif | N | 1. | B | D／L | 1／L | I／0 | 1／D |
| Uses walker，crutches， orthopedic cane． | D／I | N | $N$ | E | D／T | 1／0 | $1 / 1$ | 15 |
| ```Prosthesis (ineluding braces) for lower extremities.``` | I | N | N | D／8 | 1 | I／D | I／D | I／D |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winas． | N | N | N | N | N | N | N | 管 |
| Limeted ability to grasp， release or manipulate mith upper extremities（arms， wrist，hands）． | N | 䈅 | N | 10 | N | N | N | N |
| Limitad reach． | N | N | N | 1／1 | N | N | N | N |


| Key: <br> $\mathrm{N}=\mathrm{No}$ moblifty problem <br> $I=$ Inconvenient <br> $D=$ Cases considerable difficuity <br> $B=$ An lupossible barrler | Suriace Materials |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  | $\begin{aligned} & \text { Duscontinuous surface } \\ & \text { materials. } \end{aligned}$ |
| Limited manual dexterity | N | N | N | $1 / \mathrm{D}$ | N | N | N | N |
| Inability to turn head. | I | N | N | 1/0 | N | N | N | N |
| Decreased ability to scoop. | N | N | N | N | N | N | N | N |
| ```Difficulzy standing from sitting position, or in gitting dowm.``` | $N$ | N | N | N | N | N | N | N |
| Limited vextica袁motion with legs ant feet. | I | N | N | $1 / 0$ | I | I | I | 1 |
| Limived horizontal motion with legs and feet. | 1 | N | N | B | I | I | I | I |
| Decreased abilixy to colerate heat and cold. | N | N | N | N | N | N | N | N |
| Speech disorder. | N | N | N | N | N | N | N | N |
| Loss of normal speed in motor coordination/slowed reflexes. | $\underline{1}$ | N | N | I/ | I | 1 | T | 1 |
| Fear of crime. | N | N | N | N | N | N | N | N |
| Fear of heights (vertigot | $1)$ | N | N | N | N | N | N | N |
| Agoraphobia. | N | N | N | N | N | N | N | N |
| Clauttrophobia. | $N$ | N | N | N | N | N | N | $N$ |
| Feak of loud moises. | N | N | N | N | N | N | N | N |


|  |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: |
| \% | $5$ | H | - | Manhole covers and gratings in walkway. |
| z | $\theta$ | 1 m | $\underline{2}$ | Highly reflective surface materials. |
| 2 | * | $H$ | - | Groves and patterns (cast into walkways or caused by small paving unfts). |
| 24 | $\pm$ | $\stackrel{H}{b}$ | $\theta$ | Large, deep expansion joints. |
| $z$ | - | - | :-1 | Uneven and fremilar surfaces. |
| z | $\cdots$ | $\cdots$ | F-4 | wose and soft surfaces (grayel, sand, etc.). |
| z | + | + | + | $\begin{aligned} & \text { Rough } \\ & \text { surfaces. } \end{aligned}$ |
| 2 | 5is | H | H | Discontinuous surface materlals. |


| Key： <br> $\mathrm{N}=\mathrm{No}$ mobility problem <br> I＝Inconverient <br> D＝Causes considerable difficulty <br> $B=A n$ impossible barrier | Maintenance |  |  | Stairways |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Difficulty with environ－ mental orientation． | N | N | N | N | N | I | N | N |
| Understanding deficit． | N | N | N | N | $N$ | N | N | N |
| Limited attention span． | N | N | $N$ | N | N | N | N | $N$ |
| Memory deficit． | N | N | $N$ | N | I | N | N | N |
| Decreased ability to sequence，judge time， direction，distance， size． | I | N | $N$ | $N$ | 1 | N | I | 1 |
| Impaired night vision． | 1／D | $1 / \mathrm{D}$ | I／0 | I／D | $I$ | D | 1／D | 1／0 |
| Impaired cutaneous sensation detection． | I | 1. | I | I | N | 1 | I | I |
| Chronic stooped posture． | N | N | N | N | $I$ | N | N | N |
| Difficulty in main－ talning equilibrium． | I | 1 | I | I | I | In | 1 | 1 |
| Moves at slow speed． | N | N | N | I | N | I | N | N |
| Swaying，shuffiing， theven，eratic or stag－ gering gait． | 1／D | 1／D | I／D | I／D | N | T／b | 1／0 | I／D |
| Frequent need to rest during exercise． | N | N | N | I | N | I | N | N |


|  | Matrcenande |  |  | Stairwaya |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Kev: N = No mobillawy problem I = Inconvenfent D = Cau*es considerable dzyficulty E = An impossible barrier``` |  |  |  |  |  |  |  |  |
| ```Reduced tolerance to brisk exercise (need to move slowly).``` | N | N | N | 1 | $\underline{1}$ | 1 | N | N |
| Limited ability to stand for long periods． | N | N | N | I | N | I | N | N |
| Mapaired bladder control． | N | N | N | N | N | N | N | N |
| Extreme of size（owarism， ghantian，obesity，etc，）． | N | N | N | I | N | \％ | I | N |
| Gardiac Pacemaker affected by electrical interference． | N | N | N | N | N | N | N | 17 |
| Uses powered or manual． wheelchatr． | 1／D | $\mathrm{T} / \mathrm{D}$ | I／D | B | B | I | 8 | 8 |
| Uses walker，crutches． orthopedic cane． | I／D | $\mathrm{I} / \mathrm{D}$ | $1 / 0$ | Dis | 1 | I | D／ | 1／3 |
| ```Prosthesis (including braces) for lower extremities.``` | $1 / 0$ | T／D | 1／7 | 1／D | 1／D | I | 1／1 | ID |
| Decreased ability to tole－ rate swoke，dust，chemicals pollens，cold winds． | （ | N | N | N | N | N | N | N |
| Linited ability to grasp， release or manipulate with upper extremities（arms， wrist，hands）． | N | N | N | N | N | N | N | N |
| Limited meach． | N | N | N | N | N | N | N | N |


| Key: <br> $N$ No mobllity problem <br> $I=$ Inconventent <br> $D=$ Catuses considerable duffeulty <br> $B=A n$ impossible barrier | Maintenance |  |  | Stairway |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Limited manual dexterity. | N | N | N | N | N | N | N | N |
| Tnability to turn head. | N | N | N | N | N | I | N | N |
| Decreased abllity to stoop. | N | N | N | N | N | N | N | N |
| ```Difficulty standing from sitting position, ox in sitting down.``` | N | N | N | N | 老 | N | N | N |
| Limited vertical motion with legs and feet. | 1 | I | I | 1 | I/D | I | I | 1 |
| Limited horizontal motion with legs and feet. | 1 | I | I | I/D | N | I | 1 | I |
| Decreased ability to tolerate heat and cold. | N | N | N | N | N | N | N | N |
| Speech disorder. | N | N | N | N | N | N | N | N |
| Loss of normal speed in motor coordination/slowed reflexes. | I | I | I | I | N | 1 | I | 1 |
| Fear of crime. | N | N | N | N | N | I | N | N |
| Fear of heights (vertigo) | N | W | 1 | N | N | 1 | N | $N$ |
| Agoraphobla. | N | N | N | N | * | $N$ | N | N |
| Claustrophobia. | N | N | N | N | N | N | N | N |
| Fear of loud noises. | N | N | N | N | N | N | N | N |



| Rey: <br> $\mathrm{N}=$ No mob11ity probiem <br> I = Inconvenient <br> D = Causes considerable difficulty <br> $B=$ An impossible barrier | Stairways |  |  |  |  | Ramps |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Difficulty with environmental orientation. | N | N | $N$ | N | N | N | N | N |
| Understanding deficit. | N | N | N | N | I | N | N | N |
| Limited attention span. | N | N | N | N | D/B | N | N | I |
| Memory deficit. | N | N | N | N | I/D | N | 1 | I |
| Decreased ability to sequence, judge time, direction, distance, size. | N | N | N | N | I/D | N | I | 1/D |
| Impaired night vision. | N | N | N | N | D/3 | N | I | I |
| Impaired cutaneous sensation detection. | I | I | I | 1 | N | N | N | N |
| Chronic stooped posture. | N | N | N | N | $1 / 0$ | N | I | D/B |
| Difficulty in maintaining equilibrium. | I/D | I/D | I | I | D/B | N | I | D/B |
| Moves at slow speed. | N | N | N | N | N | N | $\pm$ | $D / B$ |
| Swaying, shuffiling, uneven, eratic or staggering gait. | I | I | I | I | D/B | N | N | 18 |
| Frequent need to rest during exercise. | N | I | N | N | 1 | N | N | D/B |


| Key : <br> $\mathrm{N}=\mathrm{No}$ mobility problem <br> I $=$ Inconvenient <br> D = Causes considerable difficulty <br> $8=$ An $x$ mpossible barrier | Stairways |  |  |  |  | Ramps |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Reduced colerance to brisk exercise (need to move slowly). | N | I | N | N | $\underline{T}$ | N | I | D/B |
| Limited ability to stand for long periods. | N | N | N | N | $\pm$ | N | 1 | D/B |
| Impaired bladder control. | N | N | N | N | N | N | N | $1 / 0$ |
| Extreme of size (dwarfism, giantism, obesity, etc.). | I | I | I | I | N | N | N | D/E |
| Cardiac Pacemaker affected by electrical interference. | N | N | N | N | N | N | N | D |
| Uses powered or manual wheelchair. | B | B | B | $\mathrm{D} / \mathrm{B}$ | B | N | B | $B$ |
| Uses walker crutches, oxthopedic cane. | D/8 | D/B | D | I | D | N | 1/D | D/B |
| Prosthesis (including braces) for lower extremities. | D | D | 1) | I | I/D | N | I/D | D/B |
| Decreased ability to tolerate smoke, dust, chemicals pollens, cold winds. | N | N | N | N | N | N | $N$ | N |
| Limited ability to grasp, release or manipulate with upper extremities (arms, wrist, hands). | N | N | N | N | I | N | N | $N$ |
| Limited reach. | N | N | N | N | I | N | N | N |


|  | Statrways |  |  |  |  | Ramps |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Key： <br> $\mathrm{N}=$ No mobility problem <br> $I=I n c o n v e n i e n t$ <br> D＊Gatses conslderable difticulty <br> $B=A n$ imposstble <br> barrier |  |  |  |  |  |  |  |  |
| Limited manual dexterity． | N | N | N | N | 1 | N | N | N |
| Inablixty to mm head． | N | N | N | N | $1 / 0$ | N | N | N |
| Decreased abiluty to stoop． | N | N | N | N | N | N | N | N |
| Difisient ty standing from sitcing position，of in sitting down． | N | N | N | N | N | N | N | N |
| Limited vertical motion with legs and feet． | N | I | 1 | N | D／B | N | T／ 1 | D／B |
| Limited horizontal motion with legs and feet． | D | 1 | D | D | D | N | I／D | Dib |
| Decreased ability to tolerate heat and cold． | N | N | N | N | N | N | N | V |
| Speech disarder． | N | N | N | N | N | N | N | N |
| Loss of normal speed in motor coordination／slowed reflexes． | N | N | N | N | D／B | N | N | D／B |
| Fear of crime． | N | N | N | N | I | N | N | N |
| Fear of heights（vertigol | 1 | D | N | N | N | N | N | N |
| Agoraphobia． | I／D | $\cdots$ | N | N | N | N | N | N |
| Clawstrophobia． | N | N | k | N | N | N | N | N |
| Fear of loud notses． | N | N | N | N | N | N | N | N |


|  | Stairways |  |  |  |  | Rawps |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Key： <br> $N=N o$ mobility problem <br> $I=$ Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=A n$ impossible barrier |  |  |  |  |  |  |  |  |
| Uses white cane for guidance （visually impaired）． | N | N | N | N | D | N | I／D | I／D |
| Uses guide dog， | N | N | N | N | 1／0 | N | 1 | I |
| Limited ability to acquire or process visual stimuli． | N | N | N | N | D | N | I | 1／0 |
| Limited ability to per－ ceive or process auditory stimuli． | N | N | N | N | N | N | \％ | N |


| Key： <br> N＝No mobility problem <br> I＝Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=A n$ impossible barrier | Ramps |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | 若 0 0 |  |  |
| Difficulty with environ－ mental orientation． | N | N | N | N | N | N | 1 | $N$ |
| Understanding deficit． | N | N | N | N | N | N | N | N |
| Limited attention span． | N | N | N | N | I | N | N | N |
| Memory deficit． | N | N | N | $N$ | I | N | N | N |
| Decreased ability to sequence，judge time， direction，distance， size． | N | N | N | N | I／D | N | $N$ | N |
| Impaired night vision． | N | N | N | N | I | N | N | N |
| Impaired cutaneous sensation detection． | N | I | 1 | I | N | N | N | N |
| Chronic stooped posture． | N | N | N | N | D／E | N | N | N |
| Difficulty in main－ taining equilibrium． | N | I | N | I／D | D／8 | N | 1 | I |
| Moves at slow speed． | N | N | N | N | D／B | N | N | $N$ |
| Swaying，shuffling， uneven，eratic or stag－ gering gait． | N | I | N | I | D／B | N | I | $N$ |
| Frequent need to rest during exercise． | I | I | N | I | b／b | N | I | I． |



|  | Ramps |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 童ey: <br> $N=$ No moblitity problem <br> I = Inconvemient <br> $D=$ Causes considerable ditficulty <br> $B=A n$ impossible barsler |  | $\begin{aligned} & \text { Ramp too steep (slope } \\ & \text { greater than } 1: 12 \text { ). } \end{aligned}$ |  |  | Slope across structure too long and steep. |  |  |  |
| Limited manual dexterity. | N | N | N | N | N | N | N | N |
| Inebility to turn head. | N | N | N | N | N | N | N | N |
| Decreased ability to stoop. | N | $N$ | N | N | N | $N$ | N | N |
| Difficulty standing from sitting position, or in sitting down. | N | N | N | N | N | N | N | N |
| Limited vertical motion with legs and feet. | I | D | N | 1 | D/B | I | D | 1 |
| Limited horizontal motion with legs and feet. | N | 1 | N | 1 | $D / B$ | I | D | 1 |
| Decreased ability to tolerate beat and cold. | N | N | N | N | N | N | N | N |
| Speech itisorder. | N | N | N | $N$ | N | N | N | N |
| Loss of normal speed in motor coordination/slowed reflexes. | N | N | N | N | 1 | N | N | N |
| Fear of crime. | N | N | N | N | N | N | N | N |
| Fear of heights (vertigo) | N | N | N | N | N | N | D | N |
| Agoraphobla. | N | N | N | N | N | N | N | N |
| Claustrophobia, | N | N | 1 | N | N | N | N | N |
| Fear of loud noises. | N | N | N | N | N | N | N | N |


|  | Ramps |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Key： <br> $N=N o$ mobility problem <br> $I=$ Inconvenient <br> $D=$ Causes constderable difticulty <br> $B=$ An impossible barrier |  |  |  |  |  | E E 0 0 |  |  |
| Uses white cane for guidanc （visually impaired）． | N | N | N | I | $I$ | N | N | 1 |
| Uses guide dog． | N | N | $N$ | I | I | N | N | I． |
| Limited ability to acquire or process visual stimil． | N | n | $N$ | N | 1／D | N | N | $I$ |
| Limited abillty to per－ ceive or process anditory stimuli． | N | N | N | N | N | N | N | N |


| Key： <br> $\mathrm{N}=$ No mobility problem <br> $I=$ Inconvenient <br> D＝Causes considerable difficulty <br> $B=A n$ impossible barrier | Ramps |  |  |  | Handrails |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Difficulty with environ． mental orientation． | N | I | N | I／D | N | N | N | N |
| Understanding deficit． | N | N | I | ＋ | N | N | N | N |
| Limited attention span． | N | $N$ | H | $\pm$ | N | N | N | N |
| Memory deficit． | N | N | N | $N$ | N | N | N | N |
| Decreased ability to sequence，judge time， direction，distance， size． | N | N | N | 1 | N | N | N | N |
| Impaired night vision． | I | I | 1 | I／D | $N$ | N | N | N |
| Impaired cutaneous sensation decection． | $N$ | N | N | N | N | N | N | $N$ |
| Chronic stooped posture． | N | N | N | N | N | N | N | N |
| Difficulty in main－ taiaing equilibximm． | I | $\pm$ | N | $I$ | I | D | I | 1 |
| Moves at slow speed． | N | N | $N$ | N | N | I | N | N |
| Swaying，shuffling， uneven，eratic or stag－ gering gait． | N | N | I／D | N | N | I | N | N |
| Frequent need to rest during exercise． | N | N | N | N | N | $N$ | N | N |


|  | Ranps |  |  |  | Handrails |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Key＊ <br> $N=$ No mobility problem <br> $I=$ Inconvenient <br> $D=$ Causes considerable difficulty <br> $B=$ An impossible barrier |  |  |  |  |  |  |  |  |
| Reduced tolerance to brisk exercise（need to move slow 1 y ）． | N | N | N | N | N | $N$ | N | N |
| Limited ability to stand for long periods． | I | N | N | N | I． | I | 1 | I |
| Impaired bladier control． | $N$ | N | N | N | N | N | N | N |
| Extreme of size（dwarfistr， giantism，obesity，etc．）． | N | N | N | $N$ | D | I | D | I |
| Candiac Pacenaker affected by electrical interference． | N | N | N | $N$ | $N$ | N | N | N |
| Uses powered or manual wheelchair． | D | D | $N$ | B | I | 1 | 1 | I |
| Uses walker，erutches， orthopedic cane． | 1 | N | N | D／B | I | I | I | I |
| Prosthesis（including braces）for lower extremithes． | 1 | N | N | N | 1 | I | I | 1 |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winds． | N | N | N | N | N | N | N | N |
| Limited ahility to grasp， release or tanipulate with upper extremities（arms， wist，hands）． | N | N | N | 1 | v | D | D | p |
| Limited reach． | N | N | N | 1 | B／D | $N$ | B／D | b／b |


| Key： <br> $\mathrm{N}=$ No mobility problem <br> I＝Inconvenient <br> $\mathrm{b}=$ Causes considerable difficulty <br> $B=A n$ impossible barrier | Ramps |  |  |  | Handratls |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| timited manual dexterity． | N | N | N | N | 1 | I | I | D |
| Inability to turn head． | N | N／I | N | N | N | N | N | $N$ |
| Decreased ability to stoop． | N | N | N | N | N | N | N | N |
| Difficulty standing from sitting position，or in sitting down． | N | N | N | N | N | N | \＄ | N |
| Limited vertical motion with legs and feet． | D | 1 | N | 1 | 1 | I | I | I |
| Limited horizontal motion with legs and feet． | D | I | N | 1 | N | N | N | N |
| Decreased ability to tolerate heat and cold． | N | N | N | N | N | N | N | N |
| Speech disorder＊ | $N$ | N | N | $N$ | N | N | צ | N |
| Loss of normal speed in motor coordination／slowed reflexes． | I | 1 | N | D | I | I | I | I |
| Fear of crime． | N | N | N | N | N | N | N | N |
| Fear of heights（vertigo）． | N | N | N | N | N | N | N | $N$ |
| Agoraphobia． | N | N | N | N | N | N | N | N |
| Claustrophobia． | N | N | N | N | N | N | N | N |
| Fear of loud noises． | N | N | N | $N$ | N | N | N | N |


|  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $z$ $z$ $z$ $z$ | $H$ $\theta$ $8$ | H <br> M <br> $H$ | $\square$ | Abrupt transitan to emmecting walkways． <br> Ramp exits directly into street or parking area （less than $6^{\circ}$ clearance at bottom of ramy）． <br> Bollards in the modde of entrance to the ramp． <br> Steps in the middie of the ramp． | 㜢 |
| $z$ $z$ $z$ | 为 <br> 丞 <br> z <br> 28 | $z$ <br> 2 <br> ＂ | 2 <br> 2 <br> $z$ <br> Z | Handrails higher than 36＂（too high）． <br> Handrans lower than $32^{\prime \prime}$（too low）． <br> Na <br> handrails． <br> Handrapl inadequate for comfortable grasp． |  |


| Key: <br> $N=$ No mobility problem <br> I = Inconvenient <br> $D=$ Causes considerable difficulty <br> $B=$ An impossible barrier | Handrails |  |  |  | Guardrails, Barricades |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Difflculty with environ mental orientation. | N | N | N | N | D | N | N | N |
| Understanding deficit. | N | $N$ | N | N | D | N | N | \% |
| Limited attention span. | N | N | N | N | N | N | N | N |
| Memory deficit. | N | N | N | N | N | N | N | N |
| Decreased ability to sequerce, judge time, direction, distance, size. | N | N | N | N | 0 | I | N | I |
| Impaired night vision. | N | N/I | N | N | D | I | 1 | I |
| Impaired eutaneous sensation detection. | N | N | N | N | I | N | N | $N$ |
| Chronic stooped posture. | N | N | N | N | N | $N$ | $N$ | N |
| Difficulty in maintaining equilibrium. | I | I | I | D | N | I | I | I |
| Moves at slow speed. | N | I | $N$ | N | N | N | N | N |
| Swaying, shuffling. uneven, eratic or staggering gait. | N | I | I | I | I | N | N | N |
| Frequent need to rest during exercise. | N | N | I | I | N | N | N | N |


|  | Handxails |  |  |  | Guardrails, Barricades |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Key: <br> $\mathrm{N}=$ No mobility problem <br> $I=\operatorname{Inconvenient~}$ <br> D = Causes considerable dxfficulty <br> $B=A n$ impossible barrier |  |  |  |  |  |  |  |  |
| Reduces tolerance to brisk exercise (need to move slowly). | N | N | I | I | N | N | N | N |
| Limited ability to stand for long periods. | 1 | I | I | D | N | N | N | N |
| Impaired bladder control. | N | N | N | N | N | N | $N$ | N |
| Extrene of size (dwarfism, giantism, obesity, etc.). | I | N | N | I | N | N | N | N |
| Cardiac Pacemaker affected by electrical interference. | N | N | N | $N$ | N | N | N | N |
| Uses powered or manual wheelchair. | \% | I | $N$ | N | N | 1 | 1 | I |
| Uses walker, crutches, orthopedic cane. | $\underline{1}$ | I | 1 | I | N | N | N | N |
| Prasthesis (including braces) for lower extremities. | I | 1 | 1 | I | N | N | $N$ | N |
| Decreased ability to tolerate smoke, dust, chemicals pollens, cold winds. | N | N | N | N | N | N | N | N |
| Limited ability to grasp, release or manipulate with upper extremitieg (arms, wrist, hands). | I | D | I | 1 | N | N | N | N |
| Limited reach. | N | D/E | 1 | N | N | N | N | N |


|  | Handralls |  |  |  | Guardrails, Barrieades |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Key: N = No mobility problem I = Inconvenient D = Causes considerable difficulty B=An impossibla barrier``` |  |  |  |  |  |  |  |  |
| Limited mamal dexterity* | I | I | I | I | N | N | N | N |
| Inabialty to turn head. | N | $N$ | N | N | V | N | N | N |
| Decreased ability to stoop. | ( | N | N | N | N | N | N | N |
| Disficulty standing from siftion positions or in situtag down. | N | N | N | N | N | N | N | N |
| Limited vertical motion with iegs and feet. | I | $I$ | N | I | N | N | N | N |
| Limited horizontal motion whth legs and feet. | \% | N | I | 1) | N | N | N | N |
| Decreased ability to tolerate heat and cold. | N | N | N | N | N | N | N | N |
| Speech disorder* | N | N | $\mathrm{NH}^{+}$ | * | N | N | \# | N |
| Loss of normal speed in motor cooreination/stowed reflexes. | I | I | 0 | $1]$ | N | 0 | D | 1 |
| Sear of crime* | N | N | N | N | N | N | $N$ | N |
| Fear of heights (vertigo) | N | N | N | 1/D | N | N | N | $1 / 0$ |
| Agoraphobia. | N | N | N | N | N | $\mathbf{N}$ | N | N |
| claustrophobia. | N | N | N | N | N | $n$ | N | N |
| Fear of loud noises. | N | N | N | N | N | N | N | N |


|  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $z$ $z$ $z$ | H <br> $z$ <br> H <br> $\stackrel{B}{8}$ | $H$ <br> $z$ <br> $z$ | $-4$ <br> $H$ <br> 1- | Handrall materfal metal or aluminum (hot in hot weather. cold in cold). <br> Handrails not contimuous. <br> Handralls don"t extend far enough (1' at top and bottom of stairs and ramps). <br> No handrails <br> on ramps. | 罭 |
| $=$ <br> 7 |  <br> $\stackrel{3}{3}$ <br>  <br> $\bullet$ | $z$ <br> $z$ <br> $z$ <br> + | $\theta$ <br> $\sigma$ <br> $z$ <br> $\square$ | Barricades not detectable (blind cane). <br> Guardrails not. continuous. <br> Guardxails too low (less than 42"). <br> No pedestrian guardrails. |  |


| Key: <br> $\mathrm{N}=$ No mobility problem <br> I = Inconvenient <br> $\mathrm{D}=$ Causes consfderable difficulty <br> $B=\mathrm{An}$ ftmpossible barrier | Guardrails, Barricades Pedestrian/Vehicular Separation |  |  |  |  |  | Escalators |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Difficulty with environmental orientation. | 1/D | N | I | I | 1 | I | N | N |
| Understanding deficit. | 1/D | N | N | $N$ | N | $\pm$ | $\mathrm{I} / \mathrm{N}$ | N |
| Limited attention span. | I/D | N | N | N | N | D | * | N |
| Menory deficit. | I/D | N | $N$ | N | N | N/I | N | N |
| Decreased abllity to sequence, judge time, direction, distance, size. | I/D | N | 1 | I | I | B | I | N |
| Impaired night viston. | D/B | I | I | I | I | D/B | N | N |
| Impaired cutaneous sensation detection. | N | $I$ | N | N | N | 1/D | N | N |
| Chronic stooped posture. | I/D | N | H | N | $N$ | I | N | N |
| Difficulty in maintaining equilibrium. | D/B | I | I | I | I/D | B | N | N |
| Moves at slow speed. | N | N | N | N | N | 1 | D/3 | 1 |
| Swaying, shuffling, uneven, eratic or staggering gait. | D/B | N | I | I | I | B/D | 1/0 | N |
| Frequent need to rest. during exercise. | N | N | N | N | N | N | $N$ | N |


| Key; <br> $\mathrm{N}=\mathrm{No}$ mobility problem <br> $I=I n c o n v e n i e n t$ <br> $y=$ Cautes consldexable diffleulty <br> $B=$ An impossible batrier | Guardradis, Barricades Pedestrian/Vehicular Separation |  |  |  |  |  | Escalatora |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Feduced tolerance to brisk exercise (reed to move slowiy). | N | 薙 | N | N | N | I | I | N |
| Limited ability to stand for long periods. | V | N | N | N | N | D ${ }^{\text {咼 }}$ | I/D | N |
| Impared bladder control. | N | N | N | N | N | N | N | N |
| Extreme of size (dwarisism, giantism, obesity, etc.). | N | N | N | N | N | N | N/L | N/I |
| Cardiac Pacemaker affected by electrical interference. | N | N | $N$ | N | N | N | N | N |
| Uses powered ox manual wheelchair. | 1/10 | I | I | D | $I$ | D/E | B | I |
| Uses walker, crutches, orthopedic cane. | I | N | 1 | D | 1 | D/B | 10 | N |
| ```Prosthesis (including braces) for lower excremities.``` | 1 | N | N | N | N | T/ | D/E | N |
| Decreased ability to tolerate smoke, dust, chemicals, pollens, cold winds. | N | N | N | \} | N | N | N | $1 / \mathrm{D}$ |
| Lumited ability to grasp. release or manipulate with upper extremities (amms, wrist, hands). | $I$ | N | N | N | N | N | 1/0 | I |
| Limited rexeh. | I | N | N | N | N | N | I/D | 1/D |


| Key: <br> $\mathrm{N}=$ No mobility problem <br> I = Inconvenient <br> 1 - Causes considerable difficulty <br> $\mathrm{E}=\mathrm{An}$ impossible barrier | Guardrails, Baryicades Pedestrian/Vehicular Separation |  |  |  |  |  | Escalators |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Limited manual dexterity, | I | N | N | $\stackrel{1}{4}$ | N | N | I | I |
| Inability to turn head. | 1/0 | N | 0 | D | D | 1/D | N | N |
| Decreased ability to stoop. | N | N | N | N | N | N | N | N |
| Difficulty standing from sitting position, or in sitting down. | N | $\mathbb{N}$ | N | N | N | N | N | $N$ |
| Limited vertical motion with legs and feet. | N | N | N | N | $N$ | D | D | N |
| Limited horizontal motion with legs and feet. | N | N | N | N | N | $I$ | D | I |
| Decreased ability to tolerate keat and cold. | N | N | N | N | N | N | N | N |
| Speech disorder. | N | N | N | N | N | N | N | N |
| Loss of normal speed in motor coordination/slowed reflexes. | N | I | N | N | N | I/D | I/D | I/D |
| Fear of crime. | N | $N$ | N | N | N | $N$ | N | B |
| Fear of heights (vertigo). | D/B | I | N | N | $N$ | B | I/D | I |
| Agoraphobia. | N | $N$ | N | I | 1 | D | N | $N$ |
| Claustrophobia. | N | N | N | N | $N$ | N | N | B |
| Fear of loud noises. | N | N | N | 1/D | 1/D | I | N | N |


| Key: <br> $\mathrm{N}=$ No mobility problem <br> $I=$ Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $p_{1}=$ Ar impossible barrier | Guardrails, Barricades <br> Pedestrian/Vehicular Separation |  |  |  |  |  | Escalators |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
| Uses white cane for guidan (visually impaired). | D/ | I | D | D | 1 | E | 1 | N |
| Uses guide dog. |  | I | I/D | I/D | I/D | $\mathrm{D} / \mathrm{B}$ | B | N |
| Limited ability to acquire or process visual stimuli. | D/B | I | D | D | D | D/8 | I | N |
| hinited ability to perceive or process audicory stimuli. |  | N | 1 | I | I | I | N | \% |


| Key： <br> $\mathrm{N}=$ No mobility problem <br> $I=$ Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=$ An impossible barrier | Rest Areas／Benches |  |  |  | Emergency Provisions |  | Lighting， Illumination |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | ${ }_{-1}^{3}$ <br> 5 ${ }^{\circ}$ <br>  |  |  |  |  |
| Difficulty with environ－ mental orientation． | N | N | I | N | I | N | I | I |
| Understanding deficit． | N | N | N | N | D／B | N | I | N |
| Limited attention span． | N | N | N | N | D | N | N | N |
| Memory deficit． | N | N | N | N | D／B | D／B | I | N |
| Decreased ability to sequence，judge time， direction，distance， size． | N | D | N | N | B | D | D／B | I／D |
| Impaired night vision． | N | N | N | N | D／B | N | D | D |
| Impaired cutaneous sensation detection． | I | N | N | N | N | N | N | N |
| Chronic stooped posture． | N | $I$ | N | I | I | N | I | N |
| Difficulty in main－ taining equilibrium． | N | I | N | I | D | N | D／B | D／B |
| Moves at slow speed． | N | D／B | N | I | D／B | I | N | N |
| Swaying，shuffling， uneven，eratic or stag－ gering gait． | N | I／D | N | I | I／N | N | D | D |
| Frequent need to rest during exercise． | D／B | B | N | D／B | D／B | D／B | N | N |


| Key： <br> $\mathrm{N}=\mathrm{No}$ mobility problem <br> I＝Tnconvenient <br> $D=$ Causes considerable difficulty <br> $\mathrm{E}=\mathrm{An}$ impossible barrier | Rest Areas／Benches |  |  |  | Emergency Provisions |  | Liginting， Il lumination |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | 禺 4 4 4 4 0 0 0 0 |  |  |  |
| Reduced toierance to brisk exercise（need to move slowly）． | $D / B$ | D／B | N | I | D／B | N | ： | N |
| Limited ability to stand for long periods． | D／B | E | N | D／E | 1.0 | D／3 | I | I |
| Impaired bladder control． | ID | $1 / \mathrm{D}$ | N | N | N | I／D | N | $N$ |
| Extreme of stze（dwartism， giantisw，obesity，etc．）． |  | N／I | 縎 | 1／0 | N | N | $\mathrm{N} / \mathrm{L}$ | N／T |
| Cardiac Pacemaker affected by electrical interference． |  | D／B | N | N／I | N | D | I | I |
| Hses powered or manual wheelchair． | I／D | D／B | N | N | B／D | 1 | D | 1 |
| Uses walker，crutches， orthopedic cane． | I／D | B／D | N | I／D | D／B | I | 1／0 | 1.10 |
| Prosthesis（including braces）for lower extremities． |  | D／B | N | D／B | B | I | I／D | $1 / \mathrm{D}$ |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winds． | D／B | 1 | N | $N$ | N | I | N | N |
| Limited ability to grasp， release or manipulate with upper extremities（ams， wrist，hands）． |  | N | N | N | N | N | I | 1 |
| Limited reach． | N | N | N | N | N | N | I | I |


| Key： <br> $\mathrm{N}=$ No mobility problem <br> I＊Inconvenient <br> $D=$ Causes considerable difficulty <br> \＃＝An impossible barrier | Rest Areas／Benches |  |  |  | Emergency Provisions |  | Lighting， T11umination |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 莫 <br> 安管 <br> 旨蕾 <br> $\begin{array}{ll}2 \\ 8 & 0 \\ 8 & 0 \\ 0\end{array}$ <br>  |  |  |  |  |
| Limited manual dexterity． | N | N | N | N | N | N | I | I． |
| Inability to turn head． |  | N | N | N | N | N | I | I |
| Decreased ability to stoop． | N | N | N | I／D | N | N | 1 | I |
| Difficulty standing from sitting position，or in sitting down． | I | I | N | D／B | N | N | N | N |
| Limited vertical motion with legs and feet． |  | I | N | I | $N$ | N | I | I／D |
| Limited horizontal motion with legs and feet． | N | D | N | N | B | $N$ | N | N |
| Decreased ability to tolerate heat and cold． | B | 10 | N | N | N | D | N | N |
| Speech disorder． | N | N | N | N | N | N | N | N |
| Loss of normal speed in motor coordination／slowed reflexes． | N | N | N | $1 / \mathrm{D}$ | B | I | I／D | D |
| Fear of crime． | N | N | N | N | N | N | D | D |
| Fear of heights（vertigo） | N | N | N | N | N | N | N | N |
| Agoraphobia． | N | N | N | N | N | N | N | N |
| Claustrophobia． | N | N | N | N | N | N | D | D／B |
| Fear of loud noises． | N | N | N | N | $N$ | N | N | N |

\begin{tabular}{|c|c|c|c|c|c|}
\hline  \&  \& Uses guide dog. \&  \&  \& \\
\hline \begin{tabular}{l}
z \\
品 \\
\(z\) \\

\end{tabular} \& \begin{tabular}{l}
z \\
\(z\) \\
舜 \\
\(-4\)
\end{tabular} \& z \& \begin{tabular}{l}
\(x\) \\
\(z\) \\
2
\end{tabular} \& \begin{tabular}{l}
Resting places not under cover (wind, rain, sum) \\
Not enough places to stop and rest. \\
No provision fow secnic overlook. \\
Benches too high or 1 ou* too deep ar shallow, or with no armrest.
\end{tabular} \&  \\
\hline \begin{tabular}{l}
\(z\) \\
z
\end{tabular} \& \[
\begin{aligned}
\& x \\
\& y \\
\& z
\end{aligned}
\] \& \begin{tabular}{l}
\[
\underset{\sim}{P}
\] \\
\%
\end{tabular} \& \[
\begin{aligned}
\& E \\
\& -\infty
\end{aligned}
\] \& \begin{tabular}{l}
No alternative route for flood condtion structures. \\
No pedestrian earacency pravision.
\end{tabular} \&  \\
\hline \begin{tabular}{l}
\(z\) \\
"
\end{tabular} \& \(\varphi\) \& H

mi \& 0 \& | Significant change of light level in tumel at entrance. |
| :--- |
| Tnterior lighting not adjusted to outsinte Light eonditions. | \&  <br>

\hline
\end{tabular}

| Key： <br> Y＝No mobility problem <br> $I=$ Inconventent <br> $D=$ Causes considerable difficulty <br> $B=A n$ impossible barrier | Lighting，Illumination |  |  |  | Signage／Media Cues |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  <br> 8㐫 <br> 等出 8 |  |  |  |
| Difficulty with environ－ mental orientation． | I | I | D／B | I | D／B | D | N | 1 | D／B |
| Understanding defleit． | N | I | D／B | N | D | D／B | N | N | D／B |
| Limited attention span． | N | I／D | 1／0 | I／D | D／B | D | N | N | $0 / 6$ |
| Memory deficit． | $N$ | I． | I／D | I | D | D／B | N | N | D） B |
| Decreased ability to sequence，judge time， direction，distance， size． | I | 1／8 | D／B | D | D／B | D／B | N | D／B | D／B |
| Impaired night vision． | D | D／B | I | D／E | I | 1 | N | I | 1／D |
| Impaired cutaneous sensation detection． | N | I | N | I | N | N | N | N | N |
| Chronic stooped posture． | $N$ | I | N | I | D | D | N | ） | D |
| Difficulty in main－ taining equilibrium． | D／B | D／E | D／B | D／B | N | N | N | 1 | I |
| Moves at slow speed． | $N$ | N | N | N | $\mathrm{D} / \mathrm{B}$ | D／B | $N$ | 5／0 | D／B |
| Swaying，shuffling， uneven，eratic or stag－ gering galt． | D | D | D） | D | 1／D | 1 | N | D | D |
| Frequent need to rest during exercise． | N | D | N | D | B | D／B | N | B | D／B |


|  | Lighting, Illumination |  |  |  | Signage/Media Cues |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & N= \text { No mobility problem } \\ & I= \text { Inconvenient } \\ & D= \text { Canses considerable } \\ & \text { difficulty } \\ & B= \text { An impossible } \\ & \text { barrier } \end{aligned}$ |  |  |  |  |  |  |  |  | soorzonatsut peatorts vor |
| Reduced tolerance to brisk exercise (need to move slowly). | N | 1 | N | 1 | I | I | N | B | D/E |
| Limited ability to stand for long periods. | 1 | D | N | D | B | D | N | D | D 0 |
| Mmpaired bladder control. | N | $N$ | N | \% | D/B | 1 | N | N | N |
| Extreme of size (dwarfism, giantism, obesity, etc.). |  | I/D | N | 1/b | N | I | N | I/D | N |
| Cardiac Pacenaker affected by electrical interference. |  | 1.0 | 1/D | $2 / 0$ | D | I | N | 1/D | N |
| Uses powered or mamal wheelchair. | 1 | D | 1 | D | D | D | N | D/ 1 | I/D |
| Uses walker, crutches, orthopedic cane. | I/D | D | I/D | D | D | 1/D | $N$ | D/ | D/B |
| Prosthesis (including braces) for lower extremities. | 10 | D | I/D | D | D | I/D | N | D/B | $0 / 8$ |
| Decreased ability to tolerats smoke, dust, chemiceis, pollens, cold winds. | N | N | N | N | I/D | 1 | N | N | N |
| Linited abiaity to grasp, release or manipuiate with upper extremities (arms, wrist, hands). | N | I | N | 1 | N | N | N | N | N |
| Limited reach. | N | I | N | I | N | N | N | N | N |


|  <br> N＝No mobility problem <br> I ．Inconvenient <br> $\mathrm{D}=\mathrm{Causes}$ considerable disuculty <br> $\mathrm{B}=\mathrm{An}$ impossible barrier | Lighting，TILumination |  |  |  | Signage／Media Cues |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  | 范 |  |
| Limited manual dexterity． | N | 1 | N | 1 | N | N | N | N | N |
| Inability zo turn neata． | I | 1／D | I／D | I／D | N | 1／3 | N | n | 5 |
| Decreased ability to stoop． | 1 | 1 | I | I | I | N | N | N | N |
| ```Difitculty atandlng from sitting pasition, or in sitting dowm.``` | N | N | N | N | N | N | N | N | N |
| Limited vertical motion with legs and feet． | I | D | I | I | I／D | I／3 | N | D／ 6 | 1 |
| Limited horizontal motion with legs and feet． | 1 | 3） | I | I | 1 | ＊ | N | $\mathrm{D} / \mathrm{B}$ | I／D |
| Decreased ability to tolerate heat and cold． | 1 | N | N | N | I | N | N | N | N |
| Speech disorder． | N | N | N | N | N | N | \％ | N | I／D |
| Loss of nomal speed in motor coordination／slowed reflexes． | 1 | D | D | D | I | $\pm$ | N | D／B | 7／D |
| Fear of crime． | D | 8 | I | E | N | N | N | N | D |
| Hear of heights（vertigo）． | N | N | N | N | V | N | N | N | 1 |
| Agoxaphobia． | N | N | $N$ | N | N | N | N | N | 1 |
| Clauncrophobia． | N | B | N | D／D | N | N | N | N | I |
| Hear of loud notses． | N | N | N | N | N | $N$ | N | N | N |


|  | Lighting, illumination |  |  |  | Signage/Mexia Cues |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Key: <br> $\mathrm{N}=$ No mobility problem <br> I = Inconvenient <br> $\mathrm{D}=$ Causes considerable difficulty <br> $B=A n$ impossible barrier |  |  |  |  |  |  |  |  |  |
| Uses white cane for guidance (visually impaired). | D | I | D | I | I | D | D/3 | D/B | D/B |
| Uses guide dog. | I | D | D | I | I | 1 | D/3 | 1 | D/E |
| Limited ability to acquire or process visual stimuli. | D | D | b | D | 0 | D | D/B | D I I | D/B |
| limited ability to percelve or process auditory stimuli. |  |  | I | I | 1 | D | * | N | I/D |


| Rey: <br> $\mathrm{N}=$ No mobility problem <br> $I=$ Inconvenient <br> $\mathrm{p}=$ Causes considerable difficulty <br> $B=$ An impossible barrier | Signage/media Cues |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |
| Difficulty with environmental orientation. | D/E | D/I | D/B | 1/D | I/D | I | I/D |
| Understanding deficit. | D/B | D | D/8 | 1/D | I | I/D | I/D |
| Límited attention span. | T/D | 10 | D/B | N | N | 1 | I/D |
| Memory deficit. | I/D | I/D | $B$ | I/D | 1/D | 1 | N |
| Decreased ability to sequence, judge time, direction, distance, size. | D/B | D | D/B | I | D | I | N |
| Impaired might vision. | $1 / 0$ | 1/D | 1/D | $N$ | N/I | N/I | N |
| Impaired cutaneous sensation detection. | N | N | N | N | N | N | N |
| Chronic stooped posture. | D/B | D | D | 1 | D | 1 | N |
| Difficulty in maintaining equilibrium. | D/B | 1/0 | I | N | N | N | N |
| Moves at slow speed. | D | 0 | D | N | I/D | I | N |
| Swaying, shufiling, uneven, eratic or staggering gait. | D/B | I/D | 1) | N | I/D | 1/5 | N |
| Frequent need to rest during exercise. | D/B | D/B | $D / B$ | . N | D | N | N |


| Rey： <br> $\mathbb{N}=$ No mobility problem <br> $I=$ Inconvenient <br> $D=$ Causes considerabie difficulty <br> $B=A n$ impossible barrier | Signage／Media Cues |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  | $\begin{aligned} & \text { 世 } \\ & \text { 世 } \\ & \text { 世 } \\ & \hline \end{aligned}$ |
| Reduced tolerance to brisk exercise（need to move slowly）． | D | D | D | N | I／D | 1 | N |
| Limited abjlity to stand for long periods． | D／B | D／E | D／B | N | D | N | N |
| Impaired bladder control． | N | N | 1／0 | N | I／D | N | N |
| Extreme of size（dwarfism， giantism，obesity，etc．）． | I | N | N | N | N | N | § |
| Cardiac Pacemaker affected by exectrical interference． | D／3 | N | I | $N$ | N | N | ＊ |
| Uses powered or manual wheelchair． | D／E | 1／D | 1／8 | I | 1 | N | N |
| Uses walker，crutches， orthopedic cane． | D／B | I／D | D／B | $N$ | 1 | N | N |
| Prasthesis（incluoing braces）for lower extremities． | D／B | I／D | $\mathrm{D} / \mathrm{B}$ | N | I | N | N |
| Decreased ability to tole－ rate smoke，dust，chemicals pollens，cold winds． | N | N | I | N | N | N | K |
| Limited ability to grasp， Telease or manipulate with upper extremities（arms， wrist，hands）． | 1 | N | I | N | N | N | N |
| Limited reach． | $\pm$ | N | I | N | N | N | N |


| Key: <br> $\mathrm{N}=\mathrm{No}$ mobility problem <br> $\mathrm{I}=$ Inconvenient <br> D = Causes considerable difficulty <br> $B=A n$ impossible barrier | Signage/Media Cues |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |
| Limited manual dexterity. | I | N | I | N | N | N | N |
| Inability to turn head. | I/D | I/D | I/D | N | N | N | I/D |
| Decreased ability to stoop. | I | N | I | N | N | N | N |
| Difficulty standing from sitting position, or in sitting down. | I | N | I | N | N | N | N |
| Limited vertical motion with legs and feet. | D | I/D | D/B | N | I/D | N | N |
| Limited horizontal motion with legs and feet. | D/B | D | D/B | N | I | N | N |
| Decreased ability to tolerate heat and cold. | N | N | N | N | N | N | N |
| Speech disorder. | N | I/D | D/B | N | N | N | N |
| Loss of normal speed in motor coordination/slowed refiexes. | D/B | D | I/D | N | I | N | N |
| Fear of crime. | D | D/B | D/B | N | I | N | N |
| Fear of heights (vertigo). | D/B | I/D | D/B | N | N | N | N |
| Agoraphobia. | D/B | I/D | D/B | N | N | N | N |
| Claustrophobia. | D/B | I/D | D/B | N | N | N | N |
| Fear of loud noises. | D/B | I | D/B | N | N | N | B |


| Key: <br> $\mathrm{N}=$ No mobility problem <br> $I=$ Inconvenient <br> $\mathrm{D}=$ Causes considerable difeiculty <br> $B=$ An impossible barrie: | Signage/Media Cues |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  | 岩 |
| Uses white cane for guicance (visually impaired). | D/B | B/8 | $D / B$ | I/D | D | D | $1 / \mathrm{D}$ |
| Uses guide dog. | D/8 | D/B | D/B | 1/D | D | D | I |
| Limited ability to acquire or process visual stimuli. | D/B | D/B | D/B | I/D | D | D | I/D |
| Limited ability to perceive or process auditory stimuli. | D/E | I | 1/0 | N | I | N | 1/0 |


| Key: <br> $\mathrm{N}=$ No moblitity problem <br> $I=$ Inconvenient: <br> D = Causes considerable difficulty <br> $B=$ An inpossible barrier | Micro-Climatic Factors. Weather/Pollution |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |
| Difficulty with environmental orientation. | I | I | I | 1 |
| Understanding deficit, | I/D | I/1 | D/E | D/E |
| Limited attention span. | 1/D | I | I | I/D |
| Memory deticit. |  | N | I/0 | 1/D |
| Decreased ability to sequence, juige time, direction, distance, size. | D/B | D/B | D/B | D/E |
| Impaired night vision. | D/B | D/B | D | D/B |
| Impaired cutaneous sensation detaction. | N | N | I/D | I/D |
| Chronic stooped posture. | D | D | 1/0 | D/B |
| Difficulty in maintaining equilibrium. | D/ B | B | $D / B$ | D/B |
| Moves at slow speed. | Die | N | D/B | D/B |
| Swaying, shuffling, uneven, eratic or staggering gait. | $\mathrm{D} / \mathrm{B}$ | B | D/B | D/B |
| Frequent need to rest. during exercise. | D/b | $D / B$ | D/B | D/B |


| Key: <br> N = No mobility problem <br> $I$ = Inconvenient <br> $y=$ Causes conslderable defetculty <br> $B=$ An impossible bamrier | Micro-Climatic Factors, Weather/Pollution |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | 2 <br> B <br>  <br> $\infty$ <br> 若 <br> 2 |  |  |
| ```Reduced tolerance to bribk exereise (need to move slowly).``` | D/B | $D / \mathrm{B}$ | U/B | $D / B$ |
| Limited ability to stand for long periods. | D/3 | D/B | D/3 | D/ 13 |
| Tmpatred bladder control. | N | $N$ | N | T |
| Extreme of size (dwarexsm. giantism, bbesity, etc.). | 1 | 1 | I/ 1 | D/B |
| Caxdiac facemaker affected by electrical interference. | N | N | N | I/D |
| Uses powered or mantul wheelchair. | $\mathrm{T} / \mathrm{D}$ | I | B | B |
| Uses walker, crutches, orthopedic cane. | 10/B | I/D | D/B | B |
| ```Prosthesis fincluding braces) for lower extremities.``` | $\mathrm{D} / \mathrm{C}$ | I/D | $\mathrm{D} / \mathrm{B}$ | D/B* |
| Decreased ability to tolerate smoke, cust, chemicals, pollens, cold winds. | $D / B$ | D/3 | N | N |
| Limited abllity to grasp, release or mampulate with upper extremities (arms, whist, hands). | N | N | $1 / 2$ | $D / B$ |
| Limited reach. | N | N | 1/D | I/D |


| Key: <br> $\mathrm{N}=$ No mobility problem <br> I Inconvenient <br> D - Causes considerable difficulty <br> $B=\mathrm{An}$ impossible barriex | Micro-Climatic Factors: Weather/Pollution |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |
| Limited mantal dexterity* | N | N | I/D | I/D |
| Inability to tumn head. |  | I | I/D | D/B |
| Decreased abslity to stoop. | N | N | N | I/b |
| Difficulty standing from sitting position, or in sitting down. | N | N | I | D/B |
| Limited vertical motion with legs and feet. | 1 | I | D/E | D/B |
| Limited horizontal motion with legs and feet. | I | I | D | D/B |
| Decreased abluity to tolerate heat and cold. | D | I | N | D |
| Speech disorder. | N | N | N | N |
| Loss of normal speed in motor coordinatian/slowed reflexes. | D | D/B | D | D/B |
| Fear of crime. | N | N | N | N |
| Fear of heights (vertigo) | N | N | N | N |
| Agoraphobia. | N | N | N | N |
| Claustrophobia. | N | N | N | $N$ |
| Fear of loud noises. | N | N | N | N |


|  | Micro－Climatic Factors， Weather／Pollution |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| ```Kev: N = No mobilitey problem I = Inconventent. D = Causes considerable difreculty # = An lmposssble barrier``` |  |  |  |  |
| Uses white cane for guidance （visually impaired）． | 0 | D | 1 | $\mathrm{D} / \mathrm{B}$ |
| Unes guide dog． | I | 1 | D | I／D |
| Limited ability to acouire or proeess visual stimuli． | 170 | $I / \mathrm{D}$ | D | D |
| Limited ability to per－ ceive or process auditory stimulis． | 1 | N | N | N |

## CITY MATRICES

| 4 | 5 | $\frac{4}{3}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $\frac{4}{8}$ | $\begin{aligned} & 4 \\ & \text { 霖 } \end{aligned}$ | $\begin{aligned} & 4 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { 鄀 } \\ & \hline \end{aligned}$ | $\begin{aligned} & \frac{4}{8} \\ & 8 \end{aligned}$ | $\begin{aligned} & \text { H } \\ & \tilde{8} \end{aligned}$ | 爰 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATYON\＆END CONDITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |
| Portions of walkway are hidden from view （crime potential）． | X | X | X | X |  |  |  |  |  | 4 |
| Dvercrossing／undercrassing is not close to public transportation stop． |  |  | X |  |  |  |  |  |  | 1 |
| No sldewalk at end condition． |  |  |  |  | X | X | X | x |  | 4 |
| Parked cars restrict approach，＊ |  |  |  |  |  |  |  |  |  |  |
| Parked cars obstruct wiew of approach．＊ |  |  |  |  |  |  |  |  |  |  |
| No accessible parking．＊＊ |  | X |  |  |  |  |  |  |  | 1 |
| Wo detectable pedestrian crosswalk to approach． |  | X |  | X | X | X | X | X |  | 6 |
| Driver＇s view of pedestrian blocked．＊ |  |  |  |  |  |  |  |  |  |  |
| WALKWAYS |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side． |  |  |  |  |  |  |  |  |  |  |
| Walkway less than 48＂（too narrow）．＊＊ |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{\prime \prime}: * * \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |
| Walkway through ＂long＂tumel （over 40，）． | $x$ |  |  |  |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Structure vibrates } \\ & \text { (traffic). } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |
| Abrasive or perforated naterial on vertical surm face adjacent to walkway． |  |  |  | X |  |  |  |  |  | 1 |
| ojects project into walkway（signs，trees，etc．） |  |  |  |  |  |  |  |  |  |  |
| SURFACE Matertals |  |  |  |  |  |  |  |  |  |  |
| Manhole covers and gratinge in walkway． |  |  |  | X |  | X |  |  |  | 2 |
| Highly reflective surface materials． |  |  |  |  |  |  |  |  |  |  |
| Grooves and patterns（cast into walkways or caused by amall paving units）． |  |  |  |  |  |  |  |  |  |  |


| 4 | 等 | $8$ | $\frac{4}{4}$ | $\frac{4}{6}$ | 管 | $\frac{5}{8}$ | $\frac{4}{8}$ | $8$ | $\frac{8}{8}$ | 感 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |
| Large，deep expansion joints．＊＊ |  | X | X | X |  |  | ${ }^{8}$ | X |  | 5 |
| Uneven and irregular surfaces． |  |  |  |  |  | X | X |  | \％ | 3 |
| Loose and soft surfaces （gravel，sand，etc．）． |  | X |  | X | X | X |  |  |  | 4 |
| Rough surfaces． |  |  |  |  |  |  |  |  | X | I |
| Discontinuous surface materials． |  |  |  |  | X |  |  |  | X | 2 |
| MATNTENANCE |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on malkway． |  |  |  |  |  |  |  |  |  |  |
| Disrepair（frost heaves， potholes，etc．）． |  |  |  | X |  |  |  |  |  | 1 |
| Disrepair from vandalism or accident thandrails， guardrails，etc．）． |  |  |  | X |  |  |  |  |  | 1 |
| STATRWAYS |  |  |  |  |  |  |  |  |  |  |
| Stairway is only means of access to structure＊＊ | X | X | X |  |  |  |  |  |  | 3 |
| stainway only on one side of structure．＊＊ |  |  |  |  |  |  |  |  |  |  |
| Poorly lighted steps． stairs，ramps． |  | X | X | X |  |  |  |  |  | 3 |
| Treads Less than $11^{\prime \prime}$ （too smell）． |  |  |  |  |  |  |  |  |  |  |
| Projecting nosings． |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Open } \\ & \text { risers. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |
| Risers greater than $7^{\prime \prime}$（too high）．＊＊ |  |  |  |  |  |  |  |  |  |  |
| Curs greater than 6＂（too high）． |  |  |  |  |  |  |  |  |  |  |
| Step（settiement）between approach and structure．＊＊ |  |  |  |  |  |  |  |  | X | 1 |
| Dangerous stair location． |  |  |  |  |  |  |  |  |  |  |


| ／ | 4 | \％ | $\frac{4}{4}$ | 2 |  | 范 | 易 | 等 | H |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Whprs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |
| Only ramps provided． |  |  |  | X |  |  |  |  |  | 1 |
| only ramps provided on one side of structure． |  |  |  |  |  |  |  |  | X | 1 |
| Pathway leading to over－ undercrossing too steep and long．＊＊ | X |  |  | X |  |  | X |  | X | 4 |
| Ramp too long（exceeds 30 feet）．＊＊ |  |  |  | \％ |  |  |  |  |  | 1 |
| Ranp too steep（slope greater than 1：12）．＊＊ |  |  |  | X |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Ramp too narrow (less } \\ & \text { than } 48^{\prime \prime} \text { ), ** } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |
| Cross slope greater than 1：50（too steep）． |  |  |  | X | X |  | X |  |  | 3 |
| Slope acrose structure too lons and steep．${ }^{\frac{1}{2} *}$ |  |  |  | X |  |  |  |  |  | L |
| No curb cuts．${ }^{\text {＊}}$＊ |  |  |  | X | X | X | X |  | X | 5 |
| Helical rawp． |  |  |  |  |  |  |  |  |  |  |
| Ramp layout inconvenient． |  |  |  |  |  |  |  |  |  |  |
| Abrupt transition to conecting walkways． |  |  |  |  |  |  |  |  |  |  |
| Ramp exits directiy into street or paxking area fless than 6＂clearance at bottom of ramp）． |  |  |  |  |  |  |  |  |  |  |
| Bollards in the middle of entrance to the rame． |  |  |  |  |  |  |  |  |  |  |
| Steps in the midale of the ramp． |  |  |  |  |  |  |  |  |  |  |
| HANDRATLS |  |  |  |  |  |  |  |  |  |  |
| Hamdrails higher than $36^{\prime \prime}$（ $500 \mathrm{~h} \mathrm{~g}_{\mathrm{gh}}$ ）． | X |  |  |  |  |  |  |  |  | 1 |
| Handralls lower than $32^{\prime \prime}$（ 00010 w ），＊＊ |  |  |  | X |  |  |  |  |  | 1 |


| I | 皆 | d 8 8 |  | 号 | 塞 | 等 | 4 | 4 <br> 0 <br> 0 | 6 8 | 5 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |
| $\begin{aligned} & \text { No } \\ & \text { hangralis,** } \end{aligned}$ |  |  |  |  | X | X | X | X | X | 5 |
| Mandrail inadequete for comfoxtable grasp． |  |  | x |  |  |  |  |  |  | 1 |
| Handrati material metal or alumitum（hot in hot weather，cold in cold）． | X | X | X | X |  |  |  |  |  | 4 |
| Handrajis not continuous． |  | X | X | X |  |  |  |  |  | 2 |
| ```Handrails दon't extend far enough (i' at top and bottom of stairs and rampe).**``` | 䍂 |  |  | X |  |  |  |  |  | 2 |
| No handrails on rames． |  |  |  |  |  |  |  |  | X | 1 |
| GUARDRALSS，BARRICADES： <br> PEDESTRUAN／VEALCUAK SERARATION |  |  |  |  |  |  |  |  |  |  |
| Barricades not detectable （dind cane）． |  | X |  |  |  |  |  |  |  | 1 |
| Guaxerats wot continnous． |  |  |  |  |  |  |  |  | X | 1 |
| Guardrais 100 10w （less than $42^{\prime \prime}$ ）． |  |  |  |  |  | X | X |  |  | 2 |
| No pedestrian guareraiss． |  |  |  |  | X |  |  | 4 |  | 2 |
| Inadequate guardrails． |  |  |  |  |  |  |  |  | X | I |
| Guardrail mesh hazardous． |  |  |  | X |  |  |  |  |  | 1 |
| No detectable separation berween bikeway and pedestrian way． |  |  |  | X |  | X | X |  | X | 4 |
| Nu detectable seperation bewween roadway and walkway． |  |  |  |  |  |  |  | $\chi$ |  | 1 |
| No tetectable separation between walkway and paxking 1．ot． |  |  |  |  |  |  |  |  |  |  |
| Lnyroteeted aidewalks （cans，edges，etc．）． |  |  |  |  | X |  | X | X |  | 3 |
| ESCALATORS／ELEVATORS |  |  |  |  |  |  |  |  |  |  |
| Escalators． |  |  |  |  |  |  |  |  |  |  |
| Elevators． |  |  |  |  |  |  |  |  |  |  |


| $\boldsymbol{I}$ | 迢 | 碞 | 景 | \％ $\begin{array}{r}4 \\ 8 \\ 8\end{array}$ | 苞 | $\begin{aligned} & 4 \\ & 8 \\ & 8 \end{aligned}$ | $\begin{aligned} & 4 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \\ & \hline \end{aligned}$ | 或 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCHES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8. | 9 |  |
| Resting places not mder cover（wind，rain，sun）． |  |  |  |  |  |  |  |  | X | 1 |
| Not enough places to stop and rest． |  |  |  | X | X | X | X | X |  | 5 |
| No provision for scenic overlook． |  |  |  |  |  |  |  |  |  |  |
| Benches too high or low， too deep or shallow，or with no armest． |  |  |  |  |  |  |  |  | X | 1 |
| EMERGENCY PROVISIONS |  |  |  |  |  |  |  |  |  |  |
| No altemative route for flood condition structures． |  |  |  |  |  |  |  |  |  |  |
| No pedestrian emergency provisions． | X | X | X | X | X | X | X | X | X | 9 |
| Liguting illumination Significant change of light level in tumel at entrance． |  |  |  |  | X |  |  |  |  | 1 |
| Interfor Lighting not adjusted to outside light conditions． | X |  |  |  | X |  |  |  |  | 2 |
| Glare at end of tume 1．＊ | X |  |  |  |  |  |  |  |  | 1 |
| Tunnel too dark．＊ |  |  |  |  | X |  |  |  |  | 1 |
| Glare and flashing <br> lights from vehicles，＊ |  | X |  |  | X |  |  |  |  | 2 |
| Poor 111unination．＊ |  |  | X | X | X | X | X | X |  | 6 |
| SIGNAGE／MEDLA CUES |  |  |  |  |  |  |  |  |  |  |
| No signage indicating location of rest areas． | X | X |  |  | X |  |  | X | X | 5 |
| Street signs too highx too low or far． |  |  |  |  |  |  |  |  |  |  |
| No special signage for the visually impaired． | X | X | X | X | X | X | $x$ | X | X | 9 |
| Traffec lights with short green cycle． |  |  |  |  |  |  |  |  |  |  |
| Complicated instructions on signs． |  |  | X |  |  |  |  |  |  | 1 |
| No warning of potential hazards． |  | x |  |  |  | X | X |  |  | 3 |


| $A$ | 苂 | W | 4 <br> 0 <br> 8 | 岕 | $\begin{array}{\|l} \text { y } \\ \text { g } \\ \hline \end{array}$ | $\begin{array}{\|c} 4 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $\begin{gathered} \ddot{0} \\ \stackrel{y}{2} \end{gathered}$ | $\begin{array}{r} H \\ 3 \\ \hline \end{array}$ | 蓇 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ， | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |
| No orfentation cue as to start of approach． |  | X |  | X | X | X | X | X | X | 7 |
| Lack of orientation cues generally． |  | X | X | X | X |  | X | X | X | 7 |
| Pathway junctions which are not at $90^{\circ}$ angle or which curve． |  |  |  | X |  |  |  |  | X | 2 |
| No detectable orientation cue as to start of channelization． | X |  |  |  |  |  |  |  |  | 1 |
| Walkway not channelized． |  | X |  | X | X | X | X | X | X | 7 |
| $\begin{array}{\|l} \text { Traffic } \\ \text { noise. } \end{array}$ |  |  | X | X | X | X | X | X | X | 7 |
| MICRO－CLIMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present．＊ |  | X | X | X |  |  |  |  |  | 3 |
| Wind generated by traffic．＊ |  |  |  |  |  | X |  |  |  | 1 |
| Inadequate provisíon for rain－water runoff． |  |  |  |  |  |  |  |  |  |  |
| Walkways and sidewalks not kept clear of snow， ice and debris． |  |  |  | X | X |  |  |  |  | 2 |

[^1]＊＊Based on the 1961 ANSI Standards．

|  | 5 | \％ |  | 京 | 边 | 8 | 8 | 8 | 近 | $\begin{aligned} & 5 \\ & \hline \\ & 8 \\ & \hline \end{aligned}$ | $\begin{aligned} & \mu \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 6 \\ & 6 \end{aligned}$ |  | 这 | $\begin{aligned} & 2 \\ & 2 \\ & 2 \end{aligned}$ | 告 | 4 8 | hi 0 8 | 最 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOGATION \＆END CONDITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1314 | 15 | 16 | 17 | 18 | 19 |  |
| Portions of walkway are hidden from visw （cxime potential）． |  |  | I |  |  |  |  |  |  |  |  | X | $X$ | X |  | X | X |  | 6 |
| overcrossing？ undercrossing is not close to public transportation stop． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No sidewalk at end condition． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parket cars restrict approach，＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parzed cars obstruct view of approach＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Wo accessible parking．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ${ }^{\text {x }}$ |  | ${ }^{1}$ |
| No detectable pedesturan crossm walk to approach． |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 6 |
| Driver＇s view of peafestrian blocked．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WALKWA思S <br> Peaestrian walkway on only ore side． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | 1 |
| Walkway less tham 48＂（too narrow）＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | 1 |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{\prime \prime} . * * \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  | \％ |  |  |  |  |  |  |
| Walkway through ＂long＂tunnel （over 40＇）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | 2 |
| Structure vibrates （traffic）． $\qquad$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bar{X}$ |  | 1 |
| Abrasive of per－ forated material on vertical surface afjacent to walkway． |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  | 4 |
| ```Objects project into walkway (signs, trees. etc,).``` |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  | 3 |


|  |  |  |  |  | $\begin{aligned} & 4 \\ & 0 \\ & 0 \\ & 8 \\ & \hline \end{aligned}$ | $\begin{array}{l\|l\|} \hline \\ 3 \\ 8 \\ \hline \end{array}$ | $\begin{aligned} & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \\ & 8 \end{aligned}$ | 苟 | $\begin{aligned} & \text { H } \\ & 0 \\ & \hline \end{aligned}$ | $\frac{6}{8}$ | $\frac{y}{\xi}$ | $\left\|\begin{array}{c} 5 \\ 0 \\ 5 \end{array}\right\|$ | $\begin{array}{\|c} 4 \\ 0 \\ 0 \end{array}$ | $\begin{aligned} & \text { H } \\ & \text { B } \\ & \hline \end{aligned}$ | $6$ | \% | 䂞 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SURFACE MATERTALS | 12 | 34 | 45 | 56 | 6.7 | 78 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 36 | 17 | 18 | 19 |  |
| Manhole covers and gratings in walkway. | $\mathrm{X}^{1 \times 1}$ |  | X |  |  |  | X |  |  |  |  |  |  |  |  | X | $\times$ | 8 |
| Highly reflective surface materials. | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Grooves and patterns (cast into walkways or caused by small pavins unts). |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  | X |  | 2 |
| Latge, deep expansion joints. ** |  |  |  | $\mathrm{X} \times$ | $\mathrm{X} \times$ | $\mathrm{X} \times$ | X |  |  |  | X |  | X |  |  |  |  | 11 |
| Uneven and irtegular surfaces. |  |  |  |  |  |  |  |  |  |  |  |  | X | ${ }^{\text {x }}$ |  |  | $X$ | 4 |
| loose and sost surfaces (gravei, sand, etc.). |  |  |  |  | $x$ | $\bar{X}$ |  |  |  |  |  | X | X | X |  |  |  | 5 |
| Rough: Surfaces. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Discontinuous surface materials. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Matntenamce |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on walkway. |  |  |  |  |  | $\mathrm{X} \mid \mathrm{X}$ | X |  |  |  |  |  |  |  |  |  |  | 3 |
| Diskepair (frost heaves, potholes, etc.). | $x$ |  |  |  | $x$ | 8 |  |  |  |  |  |  |  |  |  |  | X | 4 |
| Disrepair from vandalism or aceldent (handrails, guardrails, etc.). |  |  |  | $\mathrm{X} \times$ | $X$ |  |  |  |  | $x$ | x |  |  |  |  |  |  | 6 |
| STAIRWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stajrway is only means of access to structure** |  |  |  |  |  |  |  |  | X |  | X |  |  |  |  |  |  | 2 |
| Stainway only on one side of structure. |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| Pootly lighted steps, stairs, ramps. $\qquad$ |  |  |  |  | $x \times$ | ¢ |  |  |  | X | X | X | X | X |  |  |  | 9 |
| Treads less than I1" (too smanl). |  |  |  |  | x |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Projecting nosings. |  |  |  |  |  |  |  | X | X | x | X |  |  |  |  |  |  | 4 |
| $\begin{aligned} & \text { Open } \\ & \text { risers. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Risers greater than $7^{\prime \prime}$ (too high).** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Curb greater than $\theta^{\prime \prime}$ (too high). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | $\begin{aligned} & 6 \\ & 8 \\ & 5 \end{aligned}$ | 5 | E. | 8 | M | \% | 86 | \% | \% | $\frac{6}{6}$ | $\begin{aligned} & 6 \\ & 6 \\ & 6 \end{aligned}$ | $\begin{aligned} & 6 \\ & E \\ & \text { E } \end{aligned}$ | $\frac{4}{8}$ | $\frac{1}{3}$ | 忈 | \% | 4 | 5 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1. | 2 | 3 | 45 | 516 | 7 | 819 | 10 | 11 | 121 | 13 | 14 | 15 |  | 117 | 18 | 19 |  |
| Step (settlement) betwekn approach and structure.** | X. | $x^{\top}$ | X | X |  | X |  |  |  |  |  | $\frac{14}{\text { X }}$ | X |  |  | 18 | 19. | 7 |
| Dangerous stale location. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RAMPS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Only ramps provided. | X | X |  | X |  | * |  |  |  |  |  | X | X |  |  | X | $X$ | 8 |
| Only ramps provided on one side of structure. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fathway leading to over-mndercrossing too steep and leng.** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ramp too long (exceeds 30 feet ). ** | X | X | X | X | X | X |  |  |  |  | X | X | X |  |  | X | X | 11 |
| Eamp too steep (slope greater than $1: 12) . * *$ | X | \% |  | X | X | X |  |  |  |  | X | X | X |  |  | X | X | 10 |
|  |  | , |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cross slope greater <br> than 1:50 (toc steep). |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  |  |  | 2 |
| Slope across structure too 10 g g and steep.** |  | \% |  | X |  |  |  |  |  |  | X |  | X |  |  |  |  | 5 |
| No curb cuts.** |  |  |  | x ${ }^{\text {x }}$ |  |  |  |  |  |  | X |  | \% |  |  | X |  | 6 |
| Helical ramp. |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  | 1 |
| Ramp layout inconvenient. |  | $1$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Abrupt transition to connecting walkways. |  |  |  |  | , |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ramp exits directly into street or parking area (iess than $6^{*}$ clearance at bottom of ramp) . |  |  | $8$ | ${ }^{8}$ |  | $1 \times$ | $X \mid X$ |  |  |  |  |  |  |  |  |  |  | 5 |
| Bollards in the midm dik of entrance to the ramp. |  |  | X |  | x | $\mathrm{X}$ |  |  | X |  |  |  |  |  |  |  |  | 4 |
| Steps in the modde of the ramp. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HENDREALS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hambails higher than 36 ( 500 high ). |  |  |  |  |  |  |  | X | X | X |  | X | X |  |  |  |  | 5 |
| handrails lower than 32" (too low),** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | $8$ |  |  | $\frac{1}{8}$ | $\begin{aligned} & 2 \\ & 3 \\ & 0 \end{aligned}$ | $\mathrm{l}$ |  | 8 |  | $\frac{4}{0}$ | 出 | $\begin{aligned} & 4 \\ & 8 \\ & 8 \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \\ & \hline \end{aligned}$ | $8$ | $\frac{6}{6}$ | $\begin{aligned} & \text { 等 } \\ & \hline \end{aligned}$ | W | H | 㚣 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8. |  | 10 | 11 | 12 | 13 | 14 | 15 | 1.6 | 17 | 18 | 19 |  |
| Ne Fanctrails．＊＊ | X | X | X | X | $\overline{\mathrm{X}}$ |  | $X$ | X X |  |  |  |  | \％ |  |  | X | X | X | X | 13 |
| Handrail inadegqate for comfortable grasp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Handratl material metal or aluminum fhot in hot weather，cold in cold）． |  |  |  |  |  | X |  |  |  | X | X | \％ |  | $\times$ | X |  |  |  |  | 6 |
| Handeras not contiruous． |  |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |  | 3 |
| Handrails don＇t extend fax erough（ 1 ＇at top and bottom of stairs and ramps）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No hamdrails on ratnps． |  | X | X | X |  |  | X |  |  |  |  |  |  |  |  |  |  | X | X | 6 |
| GUARDRALLS，BARRICADES， PEDESTRTAN／VEHICULAR SEPARATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Barricades mot detect－ able（blind cane）． |  |  |  |  |  |  |  |  |  | X |  | X |  |  |  |  |  |  |  | 2 |
| Guardratls not continuous． |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Guardrais too low （less than 42＂）． |  |  |  |  |  |  |  |  |  |  | X | $X$ |  |  |  |  |  | X |  | 3 |
| No perestrian guardwails． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Intadequat guarctrails． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guattraz mesh hazardousw | X |  |  |  |  | X | X | X |  |  |  |  | 区 |  |  |  |  |  |  | 3 |
| No detactabel sep－ aration between bike－ way and pedestrian way． | X |  | $x$ | $x$ | X | X | $\chi$ | X |  |  |  |  |  | X | X | X | X | X | X | 15 |
| No detectable sep－ atation between road－ way and walkway． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | 1 |
| No detwetable sep－ aration between walkway and parking lot． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Unprotected sidewalks （cars，edges，etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | X | 2 |
| ESCALATORS／ ELEVATORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators． |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| Exevators． |  |  |  |  |  |  |  |  |  | X |  | X |  |  |  |  |  |  |  | 2 |


| $\pm$ | \％ |  | S | 14 | $8$ | $\frac{5}{v} \frac{x}{0}$ | $\begin{gathered} a \\ 5 \\ 5 \end{gathered}$ | $8$ | 8 | $\begin{aligned} & \text { 世 } \\ & \text { 8 } \\ & 8 \end{aligned}$ | E | $\frac{5}{4}$ | $\frac{4}{8}$ | $\begin{aligned} & \text { t } \\ & \text { E } \end{aligned}$ | $\frac{4}{8}$ | $\begin{aligned} & 4 \\ & 6 \\ & 6 \end{aligned}$ | $\begin{gathered} \text { 炭 } \\ \text { c } \\ \hline \end{gathered}$ | $\stackrel{4}{8}$ | 8 | 云 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| KEST AREAS／EENCHES | 1 | 2 | 23 | $3{ }^{4}$ | 5 | 36 | 67 | 78 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 116 | 17 | 18 | 19 |  |
| Resting places not undex cover（wind， rain，sun）． | X |  |  |  |  |  |  | X | X |  | X | X | X |  |  | X |  |  | X | 8 |
| Not enough places to stop and rest． |  |  | X | \％ | X | X ${ }^{\text {X }}$ | X |  |  |  |  |  |  | X | X |  | X | X |  | 9 |
| No provision for scenic overlook． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Benches too high or low，too deep or shallow，or witt －no armrest． | X |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 3 |
| EMERGENCY PROVISIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No alternative route for flood condition structures． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No pedestrian emergency provisions． | $\mathbf{X}$ | X | X | X | X | X | $\mathrm{X} \times$ | X | X | X | X | X | X | ＊ | X | X | X | X | X | 19 |
| LLGHTEMG LLLUTNATLON |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Significant change of light level in tunnel at entrance． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Interior lighting not adjusted to outside light conditions． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Glare at end of tunnel．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Tunnel too dark，＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Glare and flashing <br> lights from vehicles．＊ | X |  | $X$ | X | X | X | X 8 |  |  |  | X |  |  | X | X |  | X |  | X | 11 |
| Poor <br> 11．umination．＊ |  |  |  |  |  | X | X ${ }^{8}$ |  |  |  |  | X | X | X | X | X | X | X |  | 9 |
| SIGNAGE／MEDLA CUES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating lacation of rest areas． | X | X | X | ＊ | X |  | 88 | X | X | X | X | X | X | X | X | X | X | X | X | 19 |
| Street signs too high，too low or far． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No special signage for the visually impaired． | X | X | X | X | X | X | X ${ }^{\text {x }}$ | X | X | X | X | X | X | X | X | $X$ | X | X | \％ | 19 |
| Traffic lifgts with shoxt green cycle． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Complicated instruc－ tions on sign． |  |  |  |  |  |  |  |  |  | \％ |  |  |  |  |  |  |  |  |  |  |


| 8 | $\left[\begin{array}{c} 4 \\ 0 \\ \hline \end{array}\right.$ |  |  |  |  |  |  |  |  | $\begin{array}{\|c\|} 8 \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $\frac{H}{8}$ | $\begin{array}{\|} 4 \\ \mathbf{y} \\ \hline \end{array}$ | $\begin{aligned} & 4 \\ & 0 \\ & \hline \end{aligned}$ | $5$ | $\frac{4}{2}$ | $\begin{aligned} & \text { H } \\ & \text { 品 } \end{aligned}$ | $\begin{gathered} 6 \\ 8 \\ \hline \end{gathered}$ | $5$ | 发 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 34 | 4.5 | 56 |  | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 15 | 17 | 18 | 19 |  |
| No warning of potential hazards． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No or entation cue as to start of approach． | X |  | \％ | 8 |  | X X | T | X | X | X | X | X | X | X | ז | X | X | X | X | 19 |
| Lack of orientation cues generally | X |  |  | 8 |  | $\mathrm{X} \times$ | 8 | X | X | X | 又 | X | x | X | X | X | X | X | X | 19 |
| Pathway junctions which are not at 90 degree angle or which curve． | $X$ | X |  |  |  | ${ }^{\mathrm{X}}$ |  |  |  |  |  |  |  |  |  |  |  | X | X | 5 |
| No detectable orienta－ tion cue as to start of channelization． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway not channelized， | x | X |  | $8 \times$ | X ${ }^{\text {x }}$ | x ${ }^{1}$ | $x^{1}$ | x | x |  |  |  | X | X | X | X | X | X | X | 15 |
| $\begin{aligned} & \text { Traffic } \\ & \text { nosse. } \end{aligned}$ |  |  |  |  |  |  | $x$ |  |  |  |  |  |  |  |  |  |  | X |  | 2 |
| MICRO－CLTMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present．＊ |  | X |  | x |  | x | $x^{1}$ | X | X | X | X | x |  | X | x |  |  | X | x | 14 |
| Wind generated by traffic．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | 1 |
| Inadequare provision for rain－water rumoff． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkways and sidewalks not kept clear of snow， kce and debris． |  | $x$ |  |  |  |  | X x | x | x |  |  | X |  |  |  |  |  |  | X | 10 |

＊Response to these probleas may not indicate that the problem definately exists，but rather，in the opintion of the observor，that the problem probably exists quite frequently．
＊＊Based on the 1961 ANSI Standards．

| C $\begin{aligned} & 4 \\ & \vdots \\ & \hline \end{aligned}$ | 4 | $\begin{aligned} & 4 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  |  | $\begin{aligned} & 4 \\ & 0 \\ & \vdots \\ & \vdots \end{aligned}$ | $\begin{array}{l\|l} 4 \\ 0 \\ \hline \end{array}$ |  |  | $\begin{aligned} & 4 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { y } \\ & 8 \end{aligned}$ | $\begin{aligned} & 4 \\ & \Sigma \end{aligned}$ | $\left\lvert\, \begin{aligned} & 4 \\ & 0 \\ & 0 \end{aligned}\right.$ | 菦 | $\left\lvert\, \begin{aligned} & \text { H } \\ & \text { 合 } \end{aligned}\right.$ | 嵩 | $\begin{aligned} & N \\ & 0 \end{aligned}$ | 宕 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATION \＆END CONDITION | 2 |  | 5 | 6 |  | 8.9 | 910 |  | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |  |
| Portions of walkway are hidden from view （crime potential）． |  |  |  | X |  |  |  |  |  | X |  | X | X |  | X |  | X | 6 |
| Overcrossing／ undercrossing is not close to public transportation stop． |  |  |  |  |  |  | X |  |  |  | － |  |  |  |  |  |  | 2 |
| No sidewalk at end condition． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cars restrict approach．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cars obstruct view of approach．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No accessible parking．＊＊ |  |  |  |  |  |  |  |  |  |  | X |  |  | X |  |  |  | 2 |
| No detectable pedestrian cross－ walk to approach． |  |  |  |  |  |  | X |  |  |  | X |  |  | X |  |  |  | 3 |
| Driver＇s view of pedestrian blocked．＊ |  |  |  |  |  |  |  |  |  |  | － |  |  |  |  |  |  | 2 |
| WALKWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway less than 48＂（too narrow）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{\prime \prime} . * * \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway through ＂long＂tunnel （over 40＇）． |  |  |  |  |  |  | X |  |  |  |  |  |  |  | X |  |  | 2 |
| Structure vibrates （traffic）． |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | T |
| Abrasive or per－ forated material on vertical surface adjacent to walkway． |  |  | X |  |  |  |  |  |  | $\overline{8}$ |  | $\bar{\chi}$ |  |  |  | $\bar{X}$ | $\bar{\chi}$ | 5 |
| objects project into walkway（signs，trees， etc．）． |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | 1 |


|  | 8 | 8 |  | － | 2 | 16 | 5 | \％ | 5 | 管 | $\frac{1}{8}$ | $\frac{6}{80}$ | $s$ | $\begin{aligned} & 4 \\ & 4 \\ & 8 \end{aligned}$ | \％ | $8$ | 妟 | 5 | \％ | 管 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SUREACE MATERTALS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 18 | 9 | 110 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |  |
| Manhole ewers and gratings in walkway． |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Highly refiective surface materials． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grooves and patterns （cast into walkways or caused by small paving units）． |  |  |  |  |  |  | X | X |  |  |  |  |  | X | x |  |  | X |  | 5 |
| Large，deep expan－ sion joints，＊＊ | X |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  | 睪 | X | 4 |
| Dreven and irreg ular surfaces． |  |  |  |  |  |  | X | X |  |  |  |  |  | X | \％ |  |  | X |  | 5 |
| Loose and soft surfaces Gravel． sand，etc．）． |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  | 1 |
| Rough Surfaces． |  |  |  |  |  |  | X | X |  |  |  |  |  | X | X |  |  |  |  | 4 |
| Discontinuows sur tace materiats． |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  | 1 |
| MATHTEMANCE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Debtis trom zrosion on walkway． |  |  |  |  |  |  |  |  |  |  |  | \％ |  | X | X |  |  |  |  | 3 |
|  heaves，potholes，etc． |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | X | X |  | 3 |
| Disrepair from vandali or accident（handrails guardrails，etc．）． |  |  | X |  | X |  |  |  |  |  |  |  |  | X | X |  |  | X | X | 6 |
| STATRWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stainway is only means of access to structure |  |  |  |  |  |  | X |  |  |  | X |  | X |  |  |  |  |  |  | 3 |
| Stairway only on one side of structure．＊＊ |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  | 1 |
| Poorly lighted steps， stairs，ramps， |  |  |  |  | $\bar{X}$ | X |  |  |  |  | X |  |  | X | ${ }^{\text {x }}$ |  |  | X |  | 5 |
| Treads less than $11^{\prime \prime}$ （too small）． |  | X |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  | ＊ | 3 |
| Projecting wastu築。 |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | X | 2 |
| Open risers． |  | X |  |  | X | x |  |  | X |  |  |  |  |  |  |  |  |  | \％ | 4 |
|  $7^{7 \prime}$（土ळم High）＊＊ |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | K |  | 4 |
| Curb greatex than $6^{\prime \prime}$（too bigh）． |  |  |  |  |  |  |  |  |  |  |  |  | \％ |  |  |  |  |  |  | 1 |


|  |  |  |  | 㚱 |  |  | $8$ |  | $\begin{aligned} & \mathrm{N} \\ & \mathrm{~B} \\ & \hline \end{aligned}$ | $\begin{aligned} & 4 \\ & 0 \\ & 5 \end{aligned}$ | $\begin{aligned} & 4 \\ & 8 \\ & \hline \end{aligned}$ | $8$ | 岗 | $\begin{gathered} 5 \\ 0 \\ \hline \end{gathered}$ | 名 | $\begin{aligned} & 4 \\ & 0 \\ & \hline \end{aligned}$ | $5$ | $\frac{1}{v}$ | $8$ | 垦 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 3 | 4 | 5 | 6 | ， | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |  |
| Step（settlement） between approach and structure．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | X |  |  |  | 2 |
| Dangerous stair location． |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| RAMPS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Only ramps provided． |  |  | X |  |  | X |  | X |  |  |  |  |  |  |  | X |  |  |  | 4 |
| Only ramps provided on one side of structure． |  |  |  |  |  |  |  |  | X |  |  |  |  |  | X |  |  |  |  | 2 |
| Pathway leading to over－undercrossing too steep and long．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  | 1 |
| $\begin{array}{\|l} \text { Ramp too long (ex- } \\ \text { ceeds } 30 \text { feet). } \\ \hline \end{array}$ | $x$ | $x$ | ${ }_{4}{ }^{1}$ |  | X | x |  |  | X |  |  |  |  |  | X | X |  | X | X | 10 |
| Ramp too steep （slope greater than 1：12）．＊＊ | $x$ |  |  |  |  |  |  |  | x |  |  |  |  |  | X | x |  | X |  | 6 |
| Ramp too narrow （less than $48^{\prime}$ ）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cross slope greater than 1：50（too steep）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Slope across structure too long and steep．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No curb cuts．＊＊ |  |  |  |  |  |  |  |  | x |  |  |  | X |  |  | X |  |  |  | 3. |
| Helical ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Kamp layout inconvenient． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | 1 |
| Abrupt transition to comnecting walkways． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  | 1 |
| Ramp exits directly into street or park－ ing area（less than $6^{*}$ clearance at botton of ramp）． |  |  |  |  | X |  |  |  |  |  |  |  | X |  |  | X |  |  | X | 7 |
| Bollards in the mid－ die of entrance to the ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Steps in the middie of the ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HANDRAILS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Handrails higher than $36^{\prime \prime}$（ $\cos$ high）． |  |  |  |  |  |  |  |  | I |  | X |  |  | X |  |  |  | X | X | 11 |
| $\begin{aligned} & \text { Handrails lower than } \\ & 32^{\prime \prime} \text { (too low).** } \\ & \hline \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | $\frac{4}{6}$ | $8$ | 18 | E |  |  | W | ${ }_{4}^{4}$ | $E$ |  | 告 | $\frac{6}{8}$ | ¢ | $\frac{1}{E}$ | 者 | $\frac{4}{9}$ | E | 4 8 8 5 | 5 | 5 | \％ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | ， 5 |  | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |  |
| No handrailes．＊＊ |  |  |  | X | － |  | X |  |  |  |  |  |  | \％ |  | X | X | X |  |  | 6 |
| handrall inadequate for comortable grasp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  | 1 |
| hatideal material metal or alumentu（hot in hot weawher，cold in cold）． | X | $X$ | X |  | X |  |  | X | X | \％ |  | X | X |  | X |  |  |  | X | X | 12 |
| Randrafls not contimuts． |  | $\mathrm{X}^{\frac{1}{1}}$ |  |  | X |  |  | X |  |  |  | X |  | X | y |  |  |  | ＊ | x | 9 |
| hatruatls dion＇t extert far erough（1．ar top and bottom of stairs anc ramps）＊＊ | X |  |  |  | $\mathrm{X}$ |  |  |  |  |  |  | X |  |  |  |  |  |  | 2 |  | 6 |
| No hardrails on remps． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  | 1 |
| GUARDRAILS，BARRICADES， PEDESTRLAN／VEHICUAAR SEPARATION |  |  |  |  | ！ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Barricades not detect－ able（blind cane）． |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  | 1 |
| Guardrails not continuous． |  |  |  |  |  |  |  |  |  | X |  |  |  | X |  |  |  |  |  |  | 2 |
| Guardxails too low （1ess than $42^{\circ}$ ）． |  |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1. |
| No pedestrjan guardrails． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequare <br> 世uaxdrails． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guardxail mesh hazardous．＊ |  |  |  |  | X |  |  |  |  |  |  | X | X | X |  |  |  |  | \％ | X | 6 |
| Ho detectabel sep－ aration between bike－ way sud pedestrian way． | X | X |  | $\mathrm{X}^{\text {X }}$ | X ${ }^{1}$ | X | $\bar{X}$ | X |  |  |  |  | X |  | X |  |  | X |  |  | 13 |
| No detemtable sepm aration betwentroatim way and walkway． |  |  |  |  |  |  |  |  |  |  | $\mathrm{X}^{\mathrm{X}}$ |  |  |  |  |  |  |  |  |  | 1 |
| No afrectable sep aration between waikway and parking lot． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Unprotected sidewalks （cars，edges，etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ESCALATORS <br> ELEVATORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 交tevators． | ！ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | $8$ |  |  | $5 \begin{aligned} & 4 \\ & 2 \times 2 \\ & 2 \end{aligned}$ |  | ¢ 46 | $58$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ | $\frac{4}{3}$ | $8$ | 㞻 | $8$ | $\frac{5}{5}$ | $\frac{5}{8}$ | $\begin{aligned} & \text { ku} \\ & \stackrel{\circ}{8} \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathrm{a} \\ & \text { 3 } \\ & 5 \end{aligned}$ | $\begin{aligned} & 6 \\ & 8 \\ & 8 \end{aligned}$ | 告 | $6$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCHES | 1 | 2 | 3 | 34 | 5 | 56 | 617 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |  |
| Resting places not under cover（wind， rain，sun）． | X |  | X | \％ |  |  |  | X | X | X |  |  | X |  |  |  |  |  |  |  | 6 |
| Not enough places to stop and rest． |  | X | ［ | $\overline{1}$ | X | X |  |  |  | $X$ | X | X | X | X | X |  | X | X | x | \％ | 14 |
| No provision for scenic overlook． | $\bar{X}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Benches too high or Low，too deep or shallow，or with no armrest． |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  | I |
| EMERGENCY PROVISTONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No alternative route for flood condition structures． | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | 2 |
| No pedestrian emergency provisions． |  |  | X | x x | X | X X | X X | X | X | X | X | X | X | \％ | X | 齐 | X | X | X | X | 18 |
| LIGUTING 1 LLUMENATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Significant change of light level in tunnel at entrance． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $x$ |  |  | 1 |
| Interior lighting not adjusted to outside light conditions． |  |  |  |  |  |  |  |  |  |  | $\overline{\mathrm{X}}$ |  |  |  |  |  |  |  |  |  | 1 |
| Glare at end of tunnel．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Tunne } t 00 \\ & \text { daxk. }^{*} \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\bar{X}$ |  |  | I |
| Glare and flashing lights from vehicles．＊ | X | \％ | X ${ }^{\text {x }}$ | X ${ }^{\text {x }}$ |  | $\mathrm{x}^{+} \mathrm{X}$ | X |  |  | X | 8 |  | \％ | X |  |  | X |  | X | X | 13 |
| $\begin{aligned} & \text { Poor } \\ & \text { illumation. * } \end{aligned}$ | X |  |  |  |  | X |  |  |  |  | \％ |  |  |  | 8 | \％ | X | X | X |  | 8 |
| SIGMAGE／MEDTA CUES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating Iocation of rest areas． | X | X | X X | $X X$ |  |  | X X | X | X | X |  | ＊ | $\mathbf{X}$ |  | X | X |  | X | X | \％ | 16 |
| Street signs tno high，too low or fax． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No special signage for the visually impaired． | X |  | X X | X X |  |  |  | x | X | X | X | $x$ | X | X | X | X | X | X | X | 7 | 19 |
| Traffic lights with short green cycle． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Complicated instruc－ tions on sign． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  |  |  |  |  | $56$ | $86$ | $86$ |  |  | E | $\frac{1}{8}$ | $\begin{aligned} & 4 \\ & 8 \end{aligned}$ |  |  |  | $\frac{x}{8}$ | $5$ | $\frac{5}{5}$ | $\begin{aligned} & 4 \\ & 8 \\ & \hline \end{aligned}$ | $8$ | 军 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 |  | 23 | 34 | 45 | 56 | 6 | 6 | 9 | 10 | 11 | 12 |  | 3 | 4 | 15 | 16 | 17 | 18 | 19 |  |
| No warning of totential hazards． |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  | 1 |
| No orientation cue as to start of approach． | X |  | X X | X． X | x ${ }^{1}$ | $x^{x}$ | $\times 1$ | X | X | X | X | X |  | X | X | X | x | X | X | X | 19 |
| Lack of orientation cues generally | X | $x$ | $x$ | x $\times$ | X X | X ${ }^{\text {X }}$ | X X | x | X | X | X | X |  | X | X | X | x | X | X | X | 19 |
| Fathway junctions which are not at 90 degzee angle or which curve． | x |  | X |  |  |  |  |  |  |  |  | X |  | X | X | X | X |  |  |  | 7 |
| No detectable orienta－ tion cue as to start of chamelization． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway not channelized， | X |  | X ${ }^{\text {x }}$ | X X | X ${ }^{\text {x }}$ | X ${ }^{1}$ | X X | X | X |  |  | x |  |  | X | X |  | X | X | X | 15 |
| $\begin{aligned} & \text { Traffic } \\ & \text { noise. } \end{aligned}$ |  |  |  |  |  |  |  |  | X |  |  | X |  | X |  |  |  | X | X | $\pm$ | 8 |
| MICRO－CLIMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present．＊ | X |  | $x{ }^{1}$ | x |  |  |  | X | X |  | X | x |  | X |  |  | X |  | X | 碞 | 14 |
| Wind generated by traffic．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Inadeouate provision for rain－water runoff． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | x | x |  | 3 |
| Walkways and sidewalks not kept clear of snow， ice and cebris． |  |  |  | X |  | ${ }^{\mathrm{X}}$ | ${ }^{\mathrm{X}}$ |  |  |  |  |  |  |  | X | \％ |  | X |  |  | 6 |

＊中esponse to these problams may not indicate that the problem definately exists，but rather，in the opinion of the observor，that the problem probably exists quate frequemtly．
＊＊Based on the 1961 ANSI Standards．

| $\square$ | H | 嵩 | \% | \% | ${ }_{6}$ | 感 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATLON \& END CONDTTTON | 1 | 2 | 3 | 4 | 5 |  |
| Portions of walkway are <br> hidden from view <br> (crime potential). |  | X |  |  |  | 1 |
| Overcrossing/underceossing is not close to public transportation stop. |  |  |  |  |  |  |
| No sfdewalk at end condition. | X | X | X |  |  | 3 |
| Parked cars restrict approach. * |  |  |  |  |  |  |
| Pariked cars obstruct yiew of approach.* |  |  |  |  |  |  |
| No accessible parking,** |  |  |  |  |  |  |
| No detectable pedestrian crosswalk to approach. |  | X |  |  |  | 1 |
| DHiver's view of pedestrian blocked.* |  |  |  |  |  |  |
| WALKWAYS |  |  |  |  |  |  |
| Pedestrian walkway on only one slide. |  |  |  |  |  |  |
| Walkway less than $48^{\prime \prime}$ ( 100 narrow). ** |  |  |  |  |  |  |
| Headroon below $6^{\prime} 10^{\prime \prime} \cdot{ }^{k}$ |  |  |  |  |  |  |
| Walkway thraugh "long" tumel (over $40^{\prime}$ ). |  |  |  |  |  |  |
| Structure vibrates (traffic). |  |  |  |  |  |  |
| ```Abrasive or perforated material on vertical sur- face adjacent to walkway.``` |  |  | X |  |  | , |
| $\begin{aligned} & \text { Ojects project into } \\ & \text { walkway (signs, trees, etc.). } \end{aligned}$ |  |  |  |  |  |  |
| SUTRACE MATERIALS |  |  |  |  |  |  |
| Manhole covers and gratings in walkway. |  |  |  |  |  |  |
| Highly reflecefve surface materials. |  |  |  |  |  |  |
| Grooves and patterns (cast into walkways or caused by small paving units). |  |  | X |  |  | 1 |


|  | S | - | 管 | $\underline{3}$ | 5 | E |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | + | 5 |  |  |
| Large, deep expansion joints. ** | X |  |  |  | X |  |  |
| Uneven and irregular surfaces. |  |  | X | X |  |  | 2 |
| Loose and soft surfaces (grave3, sand, etc.). |  |  |  |  |  |  |  |
| Rough surfaces. |  |  | X | X |  |  | 2 |
| Discantimuous surface materials. |  |  | X | X |  |  | 2 |
| MAINTENANCE |  |  |  |  |  |  |  |
| Debris from erosion on walkway. |  |  |  |  |  |  |  |
| ```Disrepair (frost heaves, potholes, etc.).``` |  |  |  |  | X |  | 1 |
| Disrepair from vandalism or accident (handrails, guardralls, ete.). | X | X |  |  |  |  | 2 |
| STARSWAYS |  |  |  |  |  |  |  |
| Stairway is only means of access to structure. ** |  |  | X | X |  |  | 2 |
| Stairway only on one side of structure.** |  |  |  |  |  |  |  |
| Doonly lighted steps, stairs, raxaps. |  |  |  | X |  |  | 1 |
| Treads less than $11^{\prime \prime}$ (too smanl). |  |  | X | X |  |  | 2 |
| Projecting nosintes. |  |  |  | X |  |  | 1 |
| Open risers. |  |  | X | X |  |  | 2 |
| Risers greater than $7^{\prime \prime}$ (too high).** |  |  | X |  |  |  | I |
| Gurb greatex than $6^{\prime \prime}($ too hish $)$. |  |  |  |  |  |  |  |
| Step (settlement) betwean approsch and structure.** |  |  |  |  |  |  |  |
| Dangerous stair location. |  |  |  |  |  |  |  |


| $D$ | W | $\frac{4}{4}$ | 号 | 嗷 | ${ }^{4}$ | 长 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RAMPS | 1 | 2 | 3 | 4 | 5 |  |
| Only xamps provided． |  | X |  |  |  | 1 |
| only ramps provided on one side of structure． |  |  |  |  | X | 1 |
| Fathway leading to over－ undercrossing too steep and long．＊＊ |  |  |  |  |  |  |
| ```Ramp too long (exceeds``` 30 feet). ** |  | X |  |  | X | 2 |
| Ramp too steep（slope greater than 1：12）．＊＊ |  | X |  |  | X | 2 |
| Ramp too narrow（less than $48^{\prime \prime}$ ）．$k$＊ |  |  |  |  |  |  |
| Cross slope greater than 1：50（too steep）． |  |  |  |  |  |  |
| Slope across structure too long and steep．＊＊ |  |  |  |  |  |  |
| No curb cuts．＊ | X | X |  |  |  | 2 |
| Helical ramp． |  | X |  |  |  | 1 |
| Ramp layout inconvenient． |  |  |  |  |  |  |
| Abrupt transition to connecting walkways． |  |  |  |  |  |  |
| Ramp exits directly into street or parking area（less than 6＇clearance at bottom of ramp）． |  |  |  |  |  |  |
| Bollards in the middle of entrance to the ramp． |  |  |  |  |  |  |
| Steps in the middle of the ramp． |  |  |  |  |  |  |
| HANDRATLS |  |  |  |  |  |  |
| Handrails higher than $36^{\prime \prime}$（too high）． |  | X |  | X |  | 2 |
| Handrails lower than 32＂（too low）．＊＊ |  |  |  |  |  |  |



| $D$ | $\begin{array}{\|} \dot{y} \\ \hline \end{array}$ | $\frac{6}{8}$ | $\frac{18}{8}$ | 岕 |  | 莫 | 帯 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCHES | 1 | 2 | 3 | 4 | 4 | 5 |  |
| Resting places not under cover（wind rain sun）． |  |  |  |  |  |  |  |
| Not enough places to stop and rest． | X | x | X | X | x | X | 5 |
| Mo provision for scenic overlook． |  |  |  |  |  |  |  |
| Benches too high or low， too deep or shallow，or with no armiest． |  |  |  |  |  |  |  |
| EMERGENCY PROVISTONS |  |  |  |  |  |  |  |
| No alternative route for flood condition structures． |  |  |  |  |  |  |  |
| No pedestrian emergency provisions． | X | x | x | ＊ | x | X | 5 |
| LIGHTING LLLUMINATION |  |  |  |  |  |  |  |
| Sigrificant change of light level in tumel at entrance． |  |  |  |  |  |  |  |
| Interior lighting not adjusted to outside light conditions． |  |  |  |  |  |  |  |
| Glare at end of tunnel．＊ |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Tunne1 too } \\ & \text { dark.* } \end{aligned}$ |  |  |  |  |  |  |  |
| Glare and flashing lights from vehicles．＊ |  |  |  |  | X |  | 1 |
| $\begin{aligned} & \text { Poor } \\ & \text { illumination. * } \end{aligned}$ | x | \％ | x |  | X |  | 4 |
| SINAGE MEDIA CUES |  |  |  |  |  |  |  |
| No signage indicating location of rest areas． |  |  | x |  |  | X | 2 |
| Street signs too high， too low or far． |  |  |  |  |  |  |  |
| No special signage for the visually impaired． | X | X | X |  | X | X | 5 |
| Traffic lights with short green cycle． |  |  |  |  |  |  |  |
| Complicated instructions on signs． |  |  |  |  |  |  |  |
| No warming of potential hazards． |  | x |  |  | X | X | 3 |


| 5 | － | 出 |  | 吕 | \％ | 安 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 |  |
| No orientation cue as to start of approach． | X | X | X | X | X | 5 |
| Lack of oríentation cues generally． | X | X | X | X | X | 5 |
| ```Pathway junceions which are not at 90% angle or which curve.``` |  |  |  |  |  |  |
| No detectabie orientation cue as to start of chanetization． |  |  |  |  |  |  |
| मalkway not fhannelized． | X | X |  |  |  | 2 |
| Trafinc noise． | X |  |  |  |  | 1 |
| MLCEOCLIMATIC FACTORS |  |  |  |  |  |  |
| High wind gusts present．＊ |  |  |  |  |  |  |
| Nind generated by Eraffic．＊ |  |  |  |  |  |  |
| Tnadequate provision foz rain－water runoff． |  |  |  |  |  |  |
| ```Walkways and sidewalks not kept clear of snow, kce and debris.``` |  | X |  |  |  | 1 |

[^2]| E | $\frac{1}{4}$ | 容 | $\begin{aligned} & 4 \\ & 0 \\ & 0 \end{aligned}$ | $H$ <br> $\stackrel{H}{3}$ | $\begin{aligned} & \text { 名 } \\ & \text { B } \end{aligned}$ | 苞 | 锓 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOEATION \＆END CONDITION | 1 | 2 | 3 | 4 | 5 | 6 |  |
| Portions of walkway are hidden from view （crime potential）． |  |  | ， |  |  |  |  |
| overcrossing undercrossing is not close to public transportation stop． |  |  |  |  |  |  |  |
| No sidewalk at end condition． |  |  |  |  |  |  |  |
| Parked cars restrict approach＊＊ |  |  |  |  |  |  |  |
| Parked cars obstruct view of approach．＊ |  |  |  |  |  |  |  |
| No accessible parking．＊＊ |  |  |  |  |  |  |  |
| No detectable pedestrian crosswalk to approach． | X |  |  |  |  |  | 1 |
| Driver＇s view of pedestrian blocked．＊ |  |  |  |  |  |  |  |
| WALKWAYS |  |  |  |  |  |  |  |
| pedestrian walkway on only one side． |  |  |  |  |  |  |  |
| Walkway less than 48＂（too narrow）．＊＊ |  |  |  |  |  | X | 1 |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{\prime \prime} . * * \end{aligned}$ |  |  |  |  |  | X | 1 |
| Walkway through ＂long＂tumnei （over 40＇）． |  |  |  | X |  |  | 1 |
| Structure vibrates （traffic）． |  |  |  |  |  |  |  |
| Abrasive or perforated material on vertical sur－ face adjacent to walkway． | X |  |  |  |  |  | 1 |
| objects project into walkway（signs，trees，etc． |  |  |  |  |  |  |  |
| SURFACE MATERLALS |  |  |  |  |  |  |  |
| Manhole covers and gratings in walkway． |  |  |  |  |  |  |  |
| Highly reflective surface materials． |  |  |  |  |  |  |  |
| Grooves and patterns（cast into walkways or caused by small paving units）． |  |  | x |  | X |  | 2 |


| mim | 㙖 |  |  | 訔 | 4 <br> 8 <br> 8 | 震 | 药 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 |  |
| Large，deep expansion foints．＊＊ |  |  |  |  |  |  |  |
| Heven and Ixqegular surtaces． |  |  | X |  | X |  | 2 |
| Loose and soft surfaces （gravel，sar d，etc．）． |  |  |  |  |  |  |  |
| Rough surfaces， |  | X |  |  | X |  | 2 |
| Discontinuous surface materials． |  |  | X |  | X |  | 2 |
| MATNTENANCE |  |  |  |  |  |  |  |
| Debris 世rom erosion on walkway． |  |  |  |  |  |  |  |
| Disrepair（frost heaves． potholes，etc．）， |  |  |  |  |  |  |  |
| ```Disrepair from vandalism or accldent (handrails, guardrails, etc.).``` |  |  |  |  |  |  |  |
| STAXRWAYS |  |  |  |  |  |  |  |
| 3cairway is oniy means of accests to structure＊＊ |  |  |  |  |  |  |  |
| Staifatay oniy on one side of structure．＊＊ |  |  |  |  |  |  |  |
| Poorly lighted steps， stairs，ramps． |  |  |  |  |  |  |  |
| ```Traads less than 11" (too small).``` |  |  |  |  |  |  |  |
| Projecring nosings． |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { open } \\ & \text { risers. } \end{aligned}$ |  |  |  |  |  |  |  |
| Risers greater tham 7＇（too high）．＊＊ |  |  |  |  |  |  |  |
| Curb greater than （6＂（too high）． |  |  |  |  |  |  |  |
| Feq（settlement）betwean proach and structure＊＊ |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Dangerous stair } \\ & \text { location. } \end{aligned}$ |  |  |  |  |  |  |  |


| E | 号 | 咎 | 年 | W | 号 | 娄 | 管 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RAMPS | 1 | 2 | 3 | 4 | 5 | 6 |  |
| Only ramps provided． |  |  | X |  |  |  | 1 |
| Only ramps provided on one side of structure． |  |  |  |  |  |  |  |
| Pathway leading to overm undercrossing too steep and long．＊＊ |  |  |  | X |  |  | 1 |
| Ramp too long（exceeds 30 feet）．＊＊ |  |  |  |  |  |  |  |
| Ramp too steep（slope greater than 1：12），＊＊ |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Ramp too narrow (less } \\ & \text { than } 48^{\prime \prime} \text { ). }{ }^{* *} \end{aligned}$ |  |  |  |  |  |  |  |
| Cross slope greater chan 1：50（too steep）． |  |  |  |  |  |  |  |
| Slope across structure too long and steep．＊＊ |  |  | X |  | X |  | 2 |
| No curb cuts．＊＊ |  |  |  |  |  |  |  |
| Helleal ramp． |  |  |  |  |  |  |  |
| Ramp layout inconvenient． |  |  |  |  |  |  |  |
| Abrupt transition to connecting walkways． |  |  |  |  |  |  |  |
| Ramp exits directly into street or parking area（less than 6＇clearance at bottom of ramp）． |  |  |  |  |  |  |  |
| Bollards in the middle of entrance to the ramp． |  |  |  |  |  |  |  |
| Steps in the middle of the ramp． |  |  |  |  |  |  |  |
| handrails |  |  | ． |  |  |  |  |
| Handrails higher than $36^{\prime \prime}$（ 500 high ）． |  |  | x |  | X |  | 2 |
| Kandrails lower than $32^{11}(\text { too } 10 \mathrm{w}) . * *$ |  |  |  |  |  |  |  |


| 5 | $\begin{aligned} & 6 \\ & 8 \\ & \hline \end{aligned}$ | 免 | 岩 | $\begin{aligned} & \text { H } \\ & \text { \% } \end{aligned}$ | 皆 | 管 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 3 | 4 | 5 | 6 |  |
| No handrails．$k$ |  |  | X |  |  | 1 |
| Handrail inadequate for comfortable grasp． |  | X |  | X |  | 2 |
| Handrail material metal or aluminum thot in hot weather，cold in cold）． |  |  |  |  |  | 1 |
| handraíls not continuous． |  |  |  |  |  |  |
| Handrails don＇t extend far enough（ 1 ＇at top and bottom of stairs and ramps）． |  |  |  | X |  | 1 |
| No bandrafls on ramps． |  |  |  |  |  |  |
| GUARDRAILS，BARMICADES， PEDESTRIAN／VEHICULAR SEPARATION |  |  |  |  |  |  |
| Barricades not detectable （blind cane）． |  |  |  |  |  |  |
| Guardxalls not continuous． |  |  |  |  |  |  |
| Guazdrails too low （less than $42^{\prime \prime}$ ）． |  |  |  |  |  |  |
| No pedestrian guardrails． | X |  | X |  |  | 2 |
| inadequate guardralls． |  |  |  |  |  |  |
| Guardrail mesh hazardous．＊ |  |  |  |  |  |  |
| Wo detectable separation between bikeway and pedestrian way． | X | X |  | X |  | 4 |
| No cetectable seperation betwen roadway and walkway． |  |  |  |  |  |  |
| To detectable separation tetween walkway and parking xot． |  |  |  |  |  |  |
| Enprotected sidewalks frars，edges，etc．）． | X |  | x |  |  | 2 |
| ESCALATORS／ELEVATORS |  |  |  |  |  |  |
| Escalators． |  |  |  |  |  |  |
| Eievators． |  |  |  |  |  |  |


| E | 烒 | H | 8 | 烒 | 苟 | 硭 | 战 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCHES | 1 | 2 | 3 | 4 | 5 | 6 |  |
| Resting places not under cover（wind，rain，sun）． |  |  |  |  |  |  |  |
| Not enough places to stop and rest． | X |  | 区 | X | X |  | 4 |
| No provision for scenic overlook． |  |  |  |  |  |  |  |
| Benches too high or low； too deep or shallow，or with no armrest． |  |  |  |  |  |  |  |
| EMERGENCY PROUISIONS |  |  |  |  |  |  |  |
| No alternative route for Llood condition structures． |  |  |  |  |  |  |  |
| No pedestrian emergency provisions． | X | X | X | X | X |  | 5 |
| LTGHTInG Illumination |  |  |  |  |  |  |  |
| Significant change of light Level in tumel at entrance． |  |  |  |  |  |  |  |
| Interior lighting not adjusted to outside light conditions． |  |  |  | X |  |  | 1 1 |
| clare at end of tumnel．＊ |  |  |  | X |  |  | 1 |
| $\begin{aligned} & \text { Tunnel too } \\ & \text { dark, * } \end{aligned}$ |  |  |  | X |  |  | 1 |
| Glare and flashing <br> lights from vehicles，＊ |  |  |  |  |  |  |  |
| Poor <br> illumination．＊ |  |  |  | X |  |  | 1 |
| SICNAGE／MEDTA CUES |  |  |  |  |  |  |  |
| No signage indicating location of rest areas． |  |  |  | X |  |  | 1 |
| Street signs too high， too low or far． |  |  |  |  |  |  |  |
| No spectal signage for the visually impaired． | X | X | X | X | X |  | 5 |
| Traffie lights with short green cycle． |  |  |  |  |  |  |  |
| Complicated instructious on signs． |  |  |  |  |  |  |  |
| Ko warming of potentilal hazards． |  |  |  |  |  |  |  |


| $\underline{\square}$ | 䱏 | $\frac{5}{8}$ | \％ | 旨 | 出 | 总 | 岩 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | $\stackrel{5}{2}$ | 6 |  |
| No orientation cue as to start of approach． | X |  | x |  | X |  | 3 |
| Lack of orientation cues generally． | X | X | X | X | X |  | 5 |
| Fathway junctions which are not at $90^{\circ}$ angle or which curve． |  |  |  |  |  |  |  |
| No detectable orientation cue as to start of channeiization． |  | ． |  |  |  |  |  |
| Walkway not channelized． | X | X | X | X | \％ |  | 5 |
| Traffle noise． |  |  |  |  |  |  |  |
| MICRO－CLIMATIC FACTORS |  |  |  |  |  |  |  |
| High wind gusts present．＊ |  |  |  |  |  |  |  |
| Wind generated by traffic．＊ |  |  |  |  |  |  |  |
| Inadequate provision for rain－water runoff， |  |  |  |  |  |  |  |
| Walkways and bidewalks not kept clear of snow， ice and debris． | X |  |  |  |  |  | 1 |

[^3]| m | 䍞 |  | \％ |  | 枵 |  | H | $\frac{5}{6}$ |  | $\begin{aligned} & \text { 合 } \end{aligned}$ | $8$ | $\frac{H}{E}$ | $15$ | $\underset{8}{5}$ | $\begin{aligned} & \text { W } \\ & \text { W } \\ & \text { 号 } \end{aligned}$ | 㦰 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATION \＆END CONDITION | 1 |  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |  |
| Portions of walkway are hidden from view （crime potential）． |  |  |  |  | X |  |  |  | x | x |  |  |  |  | x | 4 |
| Overcrossing／ undercrossing is not close to public transportation stop． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No sidewalk at end condition． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cars restrict approach，＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Farked cars obstruct wiew of approach．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No accessible parking．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No detectable pedestrian cross－ walk to approach． |  |  |  |  |  |  |  |  | X |  |  |  |  |  | X | 2 |
| Driver＇s view of pedestrian blocked．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WALKWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side． |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  | 1 |
| Walkway less than $48^{* \prime}$（too narrow），＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{\prime \prime}, * * \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway through ＂1ong＂tunnel （over $40^{\circ}$ ）． |  |  |  |  | X |  |  |  | X |  |  |  |  |  | x | 3 |
| Structure vibrates （trafice） |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Abrasive or per－ forated material on vertical surface adjacent to walkway． | X | X | X | X |  | X | X | X |  |  | X | X | X | \％ |  | 11 |
| Objects project into walkway（signs，trees， etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | $\frac{5}{5}$ | 感 | 8 | $\frac{4}{4}$ | 818 |  | ¢ | － | － | 娄 | $\frac{6}{6}$ | 边 | 5 | \％ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SURY要CE HATERLALS | 1 | 2 | 314 | 51 | 617 | 78 | 9 | 19 | 12 | 12 | 1.3 | 114 | 15 |  |
| Manbole covers and gratings in walkway． |  |  |  |  |  | x |  |  |  | X |  |  |  | 2 |
| Highiy reflective surface materials． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grooves and pattems （caat inte walkways or caused by small paving units）． |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Large，deep expan－ sion jolnts．＊＊ |  | ＊ |  |  | X X | X ${ }^{\text {X }}$ |  | X |  |  | X | X |  | 7 |
| Uneven and Irreg－ ular sutfaces． | X |  | X | $X$ | $\mathrm{x} \times$ | X |  |  |  |  | X |  |  | 6 |
| Loose and seft surfaces tgravel， sand，etc．）， |  |  |  |  |  | X |  |  |  |  |  |  |  | 1 |
| Rougn Surames． |  |  | X |  |  |  |  |  |  |  | ${ }^{\text { }}$ X |  |  | 2 |
| Discontinuous sum－ face thaterials． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MAINTENANCE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on walkway． |  |  |  | X |  |  | \％ |  |  | X |  |  | 8 | 4 |
| Dfermpair（trost heaves，potholes，etc．）． | X |  |  |  | X ${ }^{\text {x }}$ | x |  |  |  |  |  |  |  | 3 |
| ```Disrepair Exom vandalism or aceident (handrails, guardmails, etc.).``` | $x$ |  |  |  |  | $x$ |  |  |  |  | X |  |  | 5 |
| STATEWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stairway is oniy means of access to structure．＊＊ |  |  | $x$ |  |  | ＊ |  |  |  |  | X |  |  | 3 |
| Stairway anly on one side of structure．＊＊ |  |  |  |  |  |  |  |  |  |  | X |  |  | 1 |
| Poorly Iighted steps， staits，ramps． |  | x | X |  |  | x ${ }^{*}$ |  |  |  | X |  |  |  | 6 |
| Treads less than $1^{17}$ （too small）． |  |  |  |  |  |  |  | X |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Yojecring } \\ & \text { nosings. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  | X |  |  | 1 |
| open <br> xisers． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Rusers greater than $7^{\prime \prime}(t 00$ high）＊＊＊ | X |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Curb greater than 6＂（5o high）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | $5$ |  | ¢ ${ }^{5}$ | ${ }_{5}^{4}$ |  | \％ 68 | $5$ | 餢 | $\frac{5}{5}$ | $8$ | $\frac{6}{6}$ | 茕 | E |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Step（settlement） between approach and structure．＊＊ | $x^{1}{ }^{2}$ | $2 \backslash 3$ |  | $5 \begin{aligned} & 6 \\ & \times\end{aligned}$ |  | $8_{8}^{8}{ }^{9}$ | 10 | 11 | 12 | 13 | 14 | 15 | 3 |
| $\begin{aligned} & \text { Dangerous stair } \\ & \text { location. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Rasps |  |  |  |  |  |  |  |  |  |  |  |  |  |
| only ramps provided． | $\mathrm{X} \times$ |  |  |  |  | x |  | X |  |  | X |  | 5 |
| only ramps provided on one side of stracture． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pathway leading to over－undercrossing too steep and long，＊＊ |  |  |  |  |  | 区 |  |  |  |  |  | X | 3 |
| Ramp too long（ex－ ceeds 30 feet）．＊＊ |  | x |  |  |  | x | $x$ | X |  |  | X |  | 6 |
| $\begin{aligned} & \text { Ramp too steep } \\ & \text { (slope greater than } \\ & 1: 12) \text {.** } \end{aligned}$ |  | $x$ | X |  |  | X |  | X |  |  | X |  | 6 |
| $\begin{aligned} & \text { Ramp too narrow } \\ & \text { (less than } 48^{\prime} \text { ). }{ }^{\star *} \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cross slope greater than 1：50（too steep）． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Slope across structure too long and steep．＊＊ |  |  |  |  |  |  |  | X |  |  |  |  | I |
| No curb cuts＊＊ |  | X |  | X |  |  |  |  |  |  |  |  | 2 |
| Eelical ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ramp layout inconvenient． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Abrupt transition to connecting walkways． |  |  |  | X |  |  |  |  |  |  |  |  | 1 |
| Ramp exits directly into street or park－ ing area（less than $6^{\prime}$ clearance at bottom of rampl． | $x$ |  |  |  |  | X |  |  |  | $\mathrm{X}^{\prime}$ | X | X | 5 |
| Bollards in the mid－ dle of entrance to the ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Steps in the middle of the ramp． | ${ }^{\mathrm{X}}$ |  |  |  |  |  |  |  |  |  |  |  | ${ }^{1}$ |
| HRNDRATLS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Handxalls Migher than $36^{\prime \prime}$（too high）． |  |  |  | x |  |  |  |  |  |  | x |  | 4 |
| Handrails lower than 32＂（too low）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |


| m | \％ | 5 | 0 | \％ | $\begin{aligned} & 4 \\ & 4 \\ & 5 \end{aligned}$ | 2 0 0 | 2 <br> 8 |  | e | E | 等 | $\begin{aligned} & 4 \\ & \frac{1}{2} \\ & \underline{E} \\ & \hline \end{aligned}$ | 8 | 号 | 号 | 5 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1. | 2 | 3 | 4 | 5 | 6 | 78 | 89 | 9 | 10 | 11. | 12 | 13 | 14 | 15 |  |
| No Fandrails． | X |  |  | X | X |  |  |  | X |  | X | X |  |  | X | 7 |
| Handrail inadequate for comfortable grasp． |  | X． |  | X |  | X |  |  |  |  |  |  |  | X |  | 4 |
| handrail material metal or aluminum（hot in hot weather，cold in cold）． |  | A | X | $x^{2}$ |  |  | X | X |  | X |  |  | X | X |  | 8 |
| handrails not． continuous． |  | X | X |  |  |  |  | X |  | X |  |  | X | X |  | 6 |
| Handrails don＇t extend far enough（l＇at top and botton of stairs and ramps）．＊ |  | X |  |  |  | X |  | X |  |  |  |  |  | X |  | 4 |
| No handraiis on ＂amo |  |  |  | X |  |  |  |  | X |  |  |  |  |  | X | 3 |
| GUARDRALLS，BARRICADES， PEDESTRLAN／VEHICULAR SERARATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| batricaces not setect－ able（blind cane）． |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Goardrails not conciruous． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guardraile too low （Jess than 42＂）． | X |  |  |  |  |  |  |  |  |  |  |  | X |  |  | 2 |
| No pedestrian をuaxarails． |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| Inadequate guardrajls． |  | T］ | X |  |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Guardrail mesh hazardous， |  | X | X | X |  | x | X | X |  |  | X |  |  | X |  | 8 |
| No datectabel sep－ aration between biexem way and pedestrian way． | X | X |  | X |  | X |  | X | X |  | ${ }^{1}$ | X |  | X | X | 11 |
| No detertable sep aration between road－ way and watkway． |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| No detectable sepm aration between walkway and parking lot． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Unprotected sidewalks （cars，edges，etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | 1 |
| ESCALATORS： <br> ELEVATORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Elevators． |  |  |  |  |  |  |  |  |  | \％ |  |  |  |  |  | 1 |


| $F$ | 感 |  |  |  | ${ }_{5}^{4}$ |  | 号 |  |  | $\begin{aligned} & 8 \\ & \hline \end{aligned}$ | $1 \frac{1}{6}$ | 娄 | $\frac{4}{4}$ | $\frac{4}{8}$ | $\frac{1}{4}$ | \％ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCHES | 1 | 2 | 3 | 34 | 5 | 56 | 7 | 8 | 19 | 10 | 11 | 12 | 13 | 14 | 15 |  |
| Resting places not under cover（wind， rain，sun）． |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Not enough places to stop and rest． |  | X |  | ${ }^{\text {X }}$ | \％ |  | X | $\bar{\square}$ | X | X | X | X | X | \％ | X | 15 |
| No provision for scenic overlook． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Benches too high or low，too deep or shallow，or with no armrest． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EMERGENCY PROVISIONS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No alternative route for flood condition structures． |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  | 2 |
| No pedestrian emergency provisions． | X | X | X | X | $\mathrm{x} \times$ | X X | X | X | X | X | X | X | x | X | X | 15 |
| LIGHTING ILlumination |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Significant change of light level in tumel at entrance． |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  | 1 |
| Interior lighting not adjusted to outside light conditions． |  |  |  |  | x |  |  |  |  |  |  |  |  |  |  | 1 |
| Glare at end of tunne1．＊ |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Turnel too } \\ & \text { dark. * } \end{aligned}$ |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  | 1 |
| Glare and flashing <br> lights from vehicles．＊ | $x$ | 8 | x | x |  |  | X | X |  |  | X | X | X | $x$ |  | 10 |
| Poor <br> illumination．＊ |  | X | x |  | X |  |  | X |  |  | X | x | 8 |  |  | 8 |
| SIGNage／medta cues |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating location of rest areas． |  |  |  | x | X ${ }^{\text {x }}$ |  |  |  | X | X | X | X | X | x | x | 15 |
| Street signs too high，too low or fax． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fo special signage for the visually impaired． | X | X |  | X X |  |  |  | $\overline{\mathrm{X}}$ | X | X | X | X | X | x | X | 15 |
| Traffic lights with short green cycle． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Complicated instruc－ tions on sign． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


| Im | $5$ |  |  | $5$ | $8$ | 28 |  |  | 炭 | $\frac{6}{8}$ | $\frac{6}{6}$ | $\underline{E}$ | 荌 | $\begin{aligned} & 4 \\ & \hline \\ & \hline \end{aligned}$ | 㫛 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 45 | 516 | 7 | 819 | ， | 10 | 11 | 12 | 13 | 14 | 15 |  |
| No warning of potential hazards． |  |  | － |  |  |  |  |  |  |  |  |  |  |  |  |
| No orientation cue as to start of approach． |  | X | X |  | X 8 | X | X | X | X | X | X | X | X | X | 15 |
| Lack of orientation cues generally | X | X ${ }^{\text {x }}$ | X | $\mathrm{X} \mid \mathrm{X}$ | X x | X | X $\mathrm{X}^{\text {P }}$ | X | X | \％ | X | X | X | X | 15 |
| Pathway functions which are not at 90 degree angle or which curve． |  |  |  |  | ${ }^{x} \mid{ }^{\text {x }}$ |  |  | X |  |  | x | x |  | X | 6 |
| No detectable orienta－ tion cue as to start of chanmelization． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway not chamelized． | X | X | x |  | X |  | X ${ }^{\text {x }}$ | x |  | X | X |  | X | X | 11 |
| Traffic noise． |  |  |  |  | X | x | x |  |  |  | X | X | X |  | 6 |
| MiCRO－CLTMATLC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Righ wind gusts present．＊ |  |  | X |  |  |  |  |  |  | X |  | x | X |  | 8 |
| Wind generated by traffic，＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate provision for rain－water runoff． |  |  |  |  | $\bar{X}$ |  |  | 8 |  |  | X |  |  | $X$ | 4 |
| Walkways and sidewalks not kept clear of snow， ice and debris． |  |  |  |  |  | $\mathrm{x}$ |  |  |  |  | X | x |  | X | 7 |

＊hesponse to these problems may not indicate that the problem definately exists，but rather，in the opinion of the observor，that the problem probably exists quite frequently．
＊＊Based on the 1961 ANSI Standards．

| $3$ | 宕 | $\frac{4}{0}$ | $\stackrel{\text { U }}{\stackrel{W}{E}}$ | $\frac{6}{8}$ | $\begin{aligned} & H \\ & 8 \\ & 8 \end{aligned}$ | 晨 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATION \& END CONDITION | 1 | 2 | 3 | 4 | 5 |  |
| Portions of walkway are hjiden from view (ctime potential). |  | x |  |  |  | 1 |
| Overcrossing/ndercrossing is not close to pubiic transportation stop. |  |  |  |  |  |  |
| No sidewalk at end condition. |  |  |  |  |  |  |
| Parked cars restrict approach.* |  |  |  |  |  |  |
| parked cars obstruct view of approach.* |  |  |  |  |  |  |
| No accessible parking, ** |  |  |  |  |  |  |
| No detectable pedestrian crosswalk to approach. | X | X | X | X | X | 5 |
| Driver's view of pedestrian blocked.* |  |  |  |  |  |  |
| WALKWAYS |  |  |  |  |  |  |
| Pedestrian walkway on only one side. | X |  |  |  |  | 1 |
| Walkway less than 48 ${ }^{11}$ (too narrow)** |  |  |  |  |  |  |
| $\begin{aligned} & \text { headroom below } \\ & 6^{\prime} 10^{\prime \prime} . * * \end{aligned}$ |  |  |  |  |  |  |
| Walkway through "long" tumel (over 40'). | X |  | X |  |  | 2 |
| Structure vibrates (traffic). |  |  |  |  |  |  |
| Abrasive or perforated material on vertical surface adjacent to walkway. |  |  |  | X |  | 1 |
| Oojects project into walkway (signs, trees, etc.). |  |  |  |  |  |  |
| SURFACE MatERIALS |  |  |  |  |  |  |
| Manhole covers and gratings in walkway. |  |  |  |  |  |  |
| Highy reflective surface materials. |  |  |  |  |  |  |
| Grooves and patterns (cast fnto walkways or caused by small paving units). |  |  |  |  |  |  |


| $+$ | H <br> W <br> W <br> E | 管 | 边 | 号 | $\frac{1}{6}$ | 塞 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1. | 2 | 3 | 4 | 5 |  |
| Large，dees expansion foints． |  |  |  |  |  |  |
| Uneven and irregalax surfaces． |  |  |  |  |  |  |
| Loose and soft surfaces （gravel，sand，stc．）． |  |  |  |  |  |  |
| Fough surfaces． |  |  |  |  |  |  |
| Discontinuous surface materials． |  |  |  |  |  |  |
| MAINTEAANCE |  |  |  |  |  |  |
| Debris from erosion on walkway． |  |  |  |  |  |  |
| Disrepair（frost heaves， potholes，ete．）． |  |  |  |  |  |  |
| ```Disrepalr from vandalism or accident (handrails. guardrails, etc.).``` |  |  |  |  |  |  |
| STATGWAYS |  |  |  |  |  |  |
| Staimay is only means of access to structure．＊＊ |  |  |  |  |  |  |
| Stedrway only on one side of seructure，＊＊ |  |  |  |  |  |  |
| Poorly Ifghted steps， stairs，ramps． |  |  |  |  |  |  |
| ```mreads less than 14n``` |  |  |  |  |  |  |
| Fojecting nosings． |  |  |  |  |  |  |
| Opent risers． |  |  |  |  |  |  |
| Risers greater than $7^{\text {r }}$（too high）．＊＊ |  |  |  |  |  |  |
| Curb greater than $6^{\prime \prime}$（too high）． |  |  |  |  |  |  |
| Step（settlement）between approach and structure． |  |  |  |  |  |  |
| Dangerous staix location． |  |  |  |  |  |  |


| 5 | 皆 | $\begin{aligned} & 4 \\ & \frac{4}{8} \end{aligned}$ | 烒 | 8 | 4 | 会 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RAMPS | 1 | 2 | 3 | 4 | 5 |  |
| Only ramps provided． |  | X | X | 品 |  | 3 |
| only ramps provided on one side of structure． |  |  |  |  |  |  |
| Pathway leading to over－ undererossing too steep and long．＊＊ |  |  |  |  |  |  |
| Ramp too long（exceeds 30 feet．）．＊＊ |  | X |  |  |  | 1 |
| Ramp too steep（slope greater than 1：12）．＊＊ |  | X |  |  |  | 1 |
| ```Ramp too narrow (less than 48')***``` |  |  |  |  |  |  |
| Cross slope greater than $1: 50$（too steep）． |  |  |  |  |  |  |
| Slope across structure too long and steep． |  | x |  | X |  | 2 |
| No curb cuts．＊＊ | X | X | x | \％ | X | 5 |
| Helical ramp． |  | X |  |  |  | 1 |
| Ramp layout inconvenient． |  |  |  |  |  |  |
| Abrupt transition to connecting walkways． |  |  |  |  |  |  |
| Ramp exits directly into street or parking area（less than $6^{\prime}$ clearance at bottom of ramp）． |  |  |  |  |  |  |
| Bollards in the middle of entrance to the ramp． |  |  |  |  |  |  |
| Steps in the middle of the ramp． |  |  |  |  |  |  |
| Handratls |  |  |  |  |  |  |
| Handrails highet than $36^{13}$（too high）． |  |  |  |  |  |  |
| Handralls lower than 32＂（too low）．＊＊ |  |  |  |  |  |  |


| $5$ | 药 | $\frac{5}{8}$ | 菏 | 免 | $\frac{5}{5}$ | 或 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 |  |
| No handrails.** | X | X | X | X | X | 5 |
| Handrail inadequate for comfortable grasp． |  |  |  |  |  |  |
| Hancratal matarial metal or alumitum（hot in hot weather，cold in eold）． |  |  |  |  |  |  |
| Handrails not continuous． |  |  |  |  |  |  |
| ```Handxails don＇t extend far enough（ \(1^{\prime}\) at top and bottom of stalrs and ramps）．＊＊``` |  |  |  |  |  |  |
| No handrails on ramps． |  | X |  | \％ |  | 2 |
| GDARDRATLS BARRICADES， FEDESTRIAN／VEHICULAR SEPARATION |  |  |  |  |  |  |
| Barricades not detectable （blind cane）． |  |  |  |  |  |  |
| Guardrails not contimitous． |  |  |  |  |  |  |
| Guardrails too low （less than 42＂）． |  |  |  |  |  |  |
| No pedestrian guarirails． | X |  |  |  |  | 1 |
| Inadequata guardrails． |  | X |  |  |  | 1 |
| Guardrail mesh hazardous，＊ |  |  |  | X |  | 1 |
| No detectable separation between bikeway and pedestrian way． | X |  | \％ |  | X | 3 |
| No detectable seperation between roadway and walkway． |  |  |  |  |  |  |
| No detectable separation between walkway and parking iot． |  |  |  |  |  |  |
| Unprotected sidewalks （cars，edges，etc．）． |  | X |  |  |  | 1 |
| ESCALATORS／ELEVATORS |  |  |  |  |  |  |
| Escalators． |  |  |  |  |  |  |
| Elevators． |  |  |  |  |  |  |


|  | 華 | 雨 | 茄 | 䒼 | 8 | 受 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCHES | ， | 2 |  | 4 | 5 |  |
| Resting places not under cover（wind，rain，sun）． |  |  |  |  |  |  |
| Not enough places to stop and rest． | X | $\bar{X}$ | X | $\stackrel{\square}{8}$ | \％ | 5 |
| No provision for scenic overlook． |  |  |  |  |  |  |
| Benches too high or low， too deep or shallow，or with no armrest． |  |  |  |  |  |  |
| EMERGENCY PROVISTONS |  |  |  |  |  |  |
| No alternative route for fload condition structures． |  |  |  |  |  |  |
| No pedestrian emergency provisions． | X | X | X |  |  | 3 |
| LIGHTING THLLMHATION |  |  |  |  |  |  |
| Significant change of light level in tumel at entrance． |  |  | X |  |  | 1 |
| Interion lighting not adjusted to outside light conditions． | X |  | X |  |  | 2 |
| Glare at end of tume．．＊ |  |  | X |  |  | 1 |
| $\begin{aligned} & \text { Tunnel too } \\ & \text { dark,* } \end{aligned}$ |  |  | X |  |  | 1 |
| Glare and flashing <br> lights from vehicles．＊ |  |  |  |  |  |  |
| Poor <br> illumination．＊ | X | X | X | X | X | 5 |
| STGNAGE／MEDTA CUES |  |  |  |  |  |  |
| No signage indicating location of rest areas． | X | X |  |  |  | 2 |
| Street 5 fg gs too high， too low or fat． |  |  |  |  |  |  |
| No special signage for the visually impaired． | $\bar{X}$ | X | X | X |  | 4 |
| Traffic lights with short green cycle． |  |  |  |  |  |  |
| Complicated instructions on signs． |  |  |  |  |  |  |
| No waming of potential hazards． | X | 8 | X |  | X | 4 |


| 3 | 呂 | 岁 | 号 | \％ | 3 | 5 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 |  |
| No orientation cue as to start of approach． | X | X | X | X |  | 4 |
| $\begin{aligned} & \text { Lack of orientation } \\ & \text { cues generally. } \end{aligned}$ | X | X | x | X |  | 4 |
| Fathway jumetions which are not at $90^{\circ}$ angle or which eurve． |  |  |  |  |  |  |
| No detectable orientation cue as to start of channelization． |  |  |  |  |  |  |
| Walkway not channelized． | X | x | X | X |  | 4 |
| Traffic noise． | X |  |  |  |  | 1 |
| MICRO－CLIMATIC FACTORS |  |  |  |  |  |  |
| $\begin{aligned} & \text { High wind gusts } \\ & \text { present.* } \end{aligned}$ |  | X |  |  |  | 1 |
| Wind generated by traffic．＊ |  |  |  |  |  |  |
| Inadequate provision for rain－water runoff． |  |  |  |  |  |  |
| Walkways and sldewalks not kept clear of snow， ice and debris． |  |  |  |  |  |  |

＊Responses to these problems may not indicate that the problex definately exists，but rather，in the opinion of the observor，that the problem probably exists quite frequently．
＊＊Based on the 1961 ANST Standards，

| 1－1 | $\left[\begin{array}{l} 4 \\ 0 \\ 0 \\ \hline \end{array}\right.$ | 5 | 呂菏 | 或亳 | 8 |  |  |  | $\begin{aligned} & 4 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} 5 \\ \hline \end{array}$ |  | $\begin{aligned} & \text { W } \\ & \text { E } \end{aligned}$ | $\frac{5}{5}$ | $\frac{H}{0}$ | $\begin{aligned} & \stackrel{y}{0} \\ & \text { 要 } \end{aligned}$ | $\begin{array}{\|c} 4 \\ 0 \\ 0 \end{array}$ | 岩 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATRON \＆END CONDLLION |  | 2 | 34 | 45 |  | 7 |  | 9 | 10 | 11 |  | 12 | 13 | 14 | 15 | 16 |  |
| Portions of walkway are hidden from view （crime potential）． |  | \％ |  |  |  |  |  |  |  |  |  |  |  | X |  | X | 4 |
| Overcrossing／ undercrossing is not alose to public transportation stop． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No sidewalk at end condition． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cars restrict approach．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cars obstruct view of approach．＊ | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| No accessible parking．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No detectable pedestrian cross－ walk to approach． | $\bar{X}$ |  |  | $\mathrm{x}$ | X |  |  | X | X |  | x | X | X | X | X | X | 13 |
| Driver＇s view of pedestrian blocked．＊ | X |  |  |  |  |  |  | X |  |  |  |  |  |  | X |  | 5 |
| WALKWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway less than $48^{\prime \prime}$（too narrow）．＊＊ |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{\prime \prime} . * * \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway through ＂Long tunnel （over 40＇）． | X |  |  |  |  |  |  |  |  |  | X | X |  |  | X |  | 5 |
| Structure vibrates （trafile）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Abrasive or per forated material on vertical surface adjacent to walkway． |  |  |  | $x$ |  |  |  |  |  |  |  | X |  |  |  | X | 3 |
| objects project into walkway（signs，trees， ecc．）． | $\stackrel{\square}{\mathrm{X}}$ |  | $\sqrt{x}^{x}$ |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 |


| 1 | 星 | 号 | \％ | 号 | 耑 | 2 | ＋ | － | $\xrightarrow{4}$ | H |  | － | ¢ | O | 易 | 4 0 8 | 会 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SURFACE MATERIALS | 1 | 2 | 3 | 4. | 5 | 6 | 7 | 8. | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |  |
| Manhole covers and gratings in walkway． |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| Highly reflective surface materials． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grooves and patterns （cast into walkways or caused by small paving units）． |  |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  | 2 |
| Large，deep expan－ sion joints．＊＊ | X |  |  |  | X |  |  | X |  |  |  |  |  |  |  |  | 3 |
| Uneven and irreg－ ular surfaces． |  |  |  |  |  |  |  | X |  |  |  |  | X | X |  |  | 3 |
| Loose and soft surfaces（gravel， sand，etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | 1 |
| Rough Surfaces． |  |  |  |  |  |  |  | X |  |  |  |  | X |  |  |  | 2 |
| Discontinuous sur－ face materials． |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | 1 |
| MAINTENANCE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on walkway． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Disrepair（frost heaves，potholes，etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | 1 |
| ```Disrepair from vandalism or accident (handrails, guardrails, etc.).``` |  | X |  | X |  |  |  |  |  |  |  |  |  |  |  |  | 2 |
| STAIRWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stairway is only means of access to structure．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Stairway only on one side of structure． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Poorly lighted steps， stairs，ramps． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Treads less than 11＂ <br> （too small）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Projecting nosings． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Open risers． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | I |
| Risers greater than 7＂（too high）． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Curb greater than 6＂（too high）． |  |  |  |  | X |  |  |  |  |  | X |  |  |  |  |  | 2 |


|  | 苞 |  |  | $5$ |  |  | $5{ }^{5}$ |  | $8$ | 荡 | $\frac{1}{4}$ | $\dot{W}$ | 号 | $\begin{aligned} & 4 \\ & 4 \\ & 5 \end{aligned}$ | $\mid \stackrel{4}{0}$ | 矣 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | ， |  | \％ | 10 | \％ 11 | 12 | 13 | 14 | 15 | 16 |  |
| Step（settienent） between approach and structure．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Dangerous stair location． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RAMPS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| only ramps provided． |  | X |  |  | x |  |  |  |  |  |  |  | X |  | X | 5 |
| Only ramps provided on one sida of structure． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pathway leading to over－undercrossing too steep and long．＊＊ |  |  |  |  |  |  |  | X |  | X |  |  |  |  |  | 4 |
| Ramp too long（ex－ ceeds 30 feet．）．＊＊ | X | $\bar{x}$ |  |  | X |  |  | X |  |  |  |  | X |  | X | 6 |
| $\begin{aligned} & \text { Famp too steep } \\ & \text { (slope greater than } \\ & 1.12) \text {. * } \end{aligned}$ | x | X |  |  |  |  |  | X |  |  |  |  |  |  | X | 5 |
| $\begin{aligned} & \text { Ramp too narrow } \\ & \left(\text { less than } 48^{\prime}\right), * * \end{aligned}$ |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  | 1 |
| Cross slope greatex than 1：50（too steep）． |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Slope across stracture too long and steep．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No curb cuts．＊＊ |  | X | x | X ${ }^{\text {x }}$ | X | x |  |  | x | X |  | X | X |  |  | 10 |
| Helical ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ramp layout inconvenient． |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | 1 |
| Abrupt transition to connectine walkways． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Eanp exits directly into street or park－ ing area（less than 6＇ clearance at bottom of ramp）． |  |  |  |  |  |  |  | $x$ |  |  |  |  |  |  | X | 4 |
| Bollards in the midm die of entrance to the ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Steps in the middle of the ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HANDEAILS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Handrails Kigher than $36^{\prime \prime}$（too high）． |  |  | $x$ |  |  |  | X |  |  | X |  |  |  |  |  | 7 |
| Handrấls lower than <br> 32＂（too low）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


| I | $\begin{gathered} 5 \\ S \\ S \\ S \end{gathered}$ |  |  |  |  | $56$ |  | $5$ |  |  | $5 \sqrt{5}$ | $\sqrt{\frac{4}{8}}$ |  | $\frac{1}{2}$ | $14$ | \% | $\sqrt{4}$ | $\underset{\mathrm{E}}{2}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  | 11 | 12 | 13 | 114 | 15 | 16 |  |
| $\begin{aligned} & \text { No } \\ & \text { handrails.** } \end{aligned}$ |  |  |  | X |  |  |  |  |  |  |  | X | X |  |  |  |  | 3 |
| Hartitail inadequate for comfortable grasp. | X |  | X |  |  |  |  |  |  | X |  |  |  | X | X |  |  | 8 |
| Handrall material metal or aluminum (hot in hot weather, cold in cold). | X |  | X |  | X |  |  |  |  | X | X |  |  |  | X |  | X | 11 |
| Handrails not continuous. | X $1 \times$ |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  | X | 4 |
| Handrails don't extend far enough ( 1 ' at top and bottom of stairs and ramps).** |  |  |  |  |  |  |  |  |  | X | $\bar{\chi}$ |  |  | x |  |  | X | 7 |
| No handrails on ramps. |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | 5 |
| ClARDRAILS, BARRICADES, PEDESTRIAN/VEHICULAR SEPARATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Barricades not detectable (blind cane). Guardrails not contimueus. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guardrails too low (less than 42"). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No pedestrian guararails. |  |  |  | (x |  |  |  |  |  |  |  | $\overline{\mathrm{X}}$ |  |  |  |  |  | 2 |
| Inadequate guardrails. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guardrail mesti hazardous. ${ }^{\text {² }}$ |  |  | ${ }^{\text {x }}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| No detectabel sepm axation between bikeway and pedestrían way. |  |  | X | X | X |  |  | $\mathrm{X}$ |  |  | X | X | X |  | X | X | X | 15 |
| No detectable separation between roadway and walkway. |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  | X |  | 4 |
| No detectable separation between walkway and parking lot. Unprotected sidewalks (cars, edges, etc.). |  |  |  | $x$ |  | X | $\mathrm{x} \times$ | x | X |  | X | X | X |  |  | X |  | 9 |
| ESCALATORS/ Elevators |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Elevators. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


|  | 4 <br> 总 | 造 |  | $\begin{aligned} & 1+ \\ & \hline \\ & \hline \end{aligned}$ | \％ | 敢 | 8 | 号 | $\stackrel{4}{8}$ | 近 | 业 | $\frac{4}{5}$ | ¢ | \％ | 名 | $\frac{5}{2}$ | 蕆 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS／BENCEES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |  |
| Resting places not under cover（wind， rain，sun）． |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  | 1 |
| Not enowizh places to stop and rest． | X | X |  | X | \％ |  | X | X |  |  | \％ | X |  | X | X | X | 11 |
| No provision for scenic overlook． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Benches too high or low，too deep on shallow，or with no armuest． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ERERGENCW PROVISIONS No altermaltue route for flood condition structuress． | $X$ | 睪 |  | \％ |  | X |  | \％ |  |  |  |  |  |  |  |  | 5 |
| No pedestrian emergency provisions． | X | X | X | X | X | X | X | X | X | X | X | W | X | X | X | X | 16 |
| LIGHTING ILLUMINATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Significant change of light level in tunnel at entrance． | X |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Interior inghting not adjusted to outside iight conditions． | X |  |  | ＊ | \％ |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Glare at end of tunnel．＊ | X |  |  | \％ | 8 |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Tunnel too dark．＊ | X |  |  | X | \％ |  |  |  |  |  | X |  |  |  |  |  | 3 |
| Glare and flashing lights from vehicles，＊ |  | X | X | X | 又 ${ }^{1}$ | X | X | X | X | X |  |  |  |  |  |  | 9 |
| Poor <br> 211mination＊＊ | X |  |  | \％ | \％ |  | X |  |  |  | X |  |  |  | X |  | 5 |
| SIGNAGE／MEDLA CUES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating location of rest areas． | X | X | X | \＄ |  | X | X | X | X | X |  | $X$ |  |  |  |  | II |
| Street signs too high，too low or far． |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| No special signage for the visually impaired． | X | X | \％ | \％ | $x$ | X | X | X | \％ | X | X | X | X | X | X | X | 16 |
| Tratefic lights with short green cycle． |  |  |  |  |  | X |  |  | $x$ | X |  |  |  |  |  |  | 3 |
| Complicated instruc－ tions on sign． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


| 1 | $\frac{5}{5}$ |  |  |  |  |  |  | $\begin{aligned} & H \\ & B \end{aligned}$ |  |  |  |  | $\frac{1}{5}$ | $15$ | $8$ | $\frac{4}{E}$ | $\begin{aligned} & 1 \\ & 0 \\ & \hline \end{aligned}$ | E |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 2 | 23 | 34 | 5 | 6 | 7 |  | 0 | 10 | 01 | 1 | 12 | 13 | 14 | 15 | 16 |  |
| Te wamang of potential hazards. |  |  |  |  |  | X |  |  | X |  | X |  | X |  |  |  |  | 4 |
| No orientation cue as to start of approach. | x | $x$ | $x$ | X | x | x | X | X | X |  | X | X | X | X | X | X | X | 16 |
| Lack of orientation cues generally. | X | X | x | X | X | x |  | X |  |  |  | X | X | X | X | X | X | 13 |
| Pethway junctions which are not at 90 degree angle or which curve. |  |  |  |  |  |  |  |  |  |  |  |  | x |  | X |  | X | 3 |
| No detectable orientation cue as to start of channelization. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway not chamelized. | $\bar{x}$ | X | X X | X | IX | I | X | X | X |  | X | X | X | X | X | X | \% | 16 |
| Traffic nolse. |  |  |  | X | x | X | X | X | X |  | X | X | X |  |  | X | X | 12 |
| MLCRO-CLIMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present.* |  |  | X X |  |  | X | X | x | X |  | \% | X |  |  |  | X | X | 11 |
| Wind generated by traffic.* |  |  | X |  |  | X |  |  |  |  |  |  | X |  |  |  |  | 3 |
| inadequate provision for rain-water runoff. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkways and sidewalks not kept clear of snow, ice and lebris. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |

*Response to these problems may not indicate that the problem definately exists, but rather, in the opinion of the observor, that the problem probably exists quite frequently.
**Based on the 1961 ANSI Standards.

| 1 | 就 |  |  | 号 | 8 | 3 | 8 | b | 8 | $6$ | 5 | 者 | 感 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATION END COMDITTION | 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |  |
| Portions of walkway are <br> hidde：from view <br> （crime potentiaz）． | X | X | ＊ |  |  |  |  |  |  |  |  |  | 2 |
| ```Overcrossinglundercrossing is not close to public transportation stop.``` | 癸 | X |  |  |  |  |  | X |  |  | x | X | 5 |
| No sidewalk at end condition． | X |  |  |  |  |  |  |  |  |  |  |  | I |
| Parked cars restrict approxach．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cars obscruct view of approach．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No accessible parking．＊＊ |  | X | x | ＊ |  |  | X | X |  |  |  | x | 6 |
| No detectable pedestxian crosswalk to approach． | X | ＊ |  |  |  | X |  |  | X |  |  |  | 4 |
| Driver＇s view of pedestrian blocked．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WALKWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway less than 48＊（too narrow）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Headroom below $6^{1} 10^{\prime \prime}$＊＊ |  |  |  |  |  | X |  |  |  |  |  |  | 1 |
| Walkeray through ＂long＂tumnel （over $40^{\circ}$ ）． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Structure vibrates （traffic）． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Abrasive or perforated material on vercical sur- face adjacent to walkway.``` | \％ | X | X |  |  |  |  |  |  |  |  | X | 3 |
| ```Ojects project into walkway (sitmas, trees, etc.),``` |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SUREACE MATEXIALS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Manhole covers and gratings in walkway． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Highly reflective surface materials． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Groover and patterns（cast tnto walkways or eaused by small paving umits）． |  |  |  |  |  |  |  |  |  |  |  |  |  |


| E | 3 | 0 | 寿 | 3 | $4$ | 合 | 18 | \％ | 近 | $\left[\begin{array}{l}4 \\ 3\end{array}\right.$ | 雨 | 5 | 要 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 51 | 6. | 7 | 8 | 9 | 10 |  | 12 |  |
| Large，deep expansion joints．＊＊ | X ． |  | X |  |  |  |  |  |  |  |  |  | 2 |
| Theven and irregular sutfaces． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Loose and soft surfaces （gravel，sand，etc．）． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Rough： sumfaces． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Discontinuous surface materials． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MAINTENANCE |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion or wal kway． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Disrepair (frost heaves,``` |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Disrepalr from vandalism or accident (handrails, guardrails, etc.).``` |  |  |  |  |  |  |  |  |  |  |  |  |  |
| STAIPWAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Swanway is only means of access to structure． |  | X |  |  | X |  |  |  |  |  |  |  | 2 |
| Stainway only on one side of etructure．＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Poorly lighted steps， stalys，ramps． |  | X | X |  |  |  | X |  |  |  | X | X | 5 |
| Treads less than II＂ （too small）． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Frojecting nosinge． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Open <br> risers． |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Risers greater tham $7^{7 \prime}$（too high）＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Curb greater than $6^{*+}(t 00$ nigh）． | X |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Step（sentlement）between agneosch and strueture，＊＊ |  |  | X |  |  |  |  |  |  |  |  |  | 1 |
| Dangerous stain location． |  |  |  |  |  |  |  |  |  |  |  |  |  |


| I | $\begin{gathered} 4 \\ 0 \\ 0 \\ \hline \end{gathered}$ |  |  |  |  | $\begin{aligned} & 4 \\ & 8 \\ & 8 \end{aligned}$ |  | $\frac{d}{6} \sqrt{6}$ |  |  | $\begin{array}{r} 4 \\ 8 \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & 4 \\ & 0 \\ & 8 \end{aligned}\right.$ | 鲳 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RAMPS | 1 | 2 | 3 |  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |  |
| Only ramps provided. | X |  | X | X |  | X | x | X |  | X | X | X | 9 |
| one side of structure. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pathway leading to overundercrossing too steep and long.** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Ramp too long (exceeds 30 feet).**``` | X |  | X | X |  | X | $x$ | X | X | X | X | X | 10 |
| Ramp too steep (slope greater than 1:12).** | $x$ |  | x | X |  | K | X | X | X | X | X |  | 9 |
| Ramp too narrow (less than $48^{\prime \prime}$ ). ${ }^{* *}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cross slope grearer than 1:50 (too steep). |  |  | x |  |  |  |  |  |  |  |  |  | 1 |
| Slope across structure too long and steep. ** | X | x | x | x |  |  |  |  |  | x |  |  | 5 |
| No curb cuts.** | X | X | X | x |  |  |  | x |  |  |  | X | 6 |
| Helical ramp. |  |  | \% | x |  |  | x | x | X |  |  |  | 5 |
| inconvenient. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Abrupt transition to connecting walkways. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ratap exits directly into street or parking area less than 6' clearance at bottom of ramp). |  |  |  |  |  |  |  |  |  | X |  |  | 3 |
| Bollards in the midde of entrance to the ramp. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Steps in the middle of the ramp. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HANDRAILS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Handrails higher than $36^{\prime \prime}$ (too high). |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { Handrails lower than } \\ & 32^{" \prime} \text { (too low).** } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |


| d |  |  |  |  |  | \% |  | $\begin{aligned} & 4 \\ & 85 \\ & \hline \end{aligned}$ | $3$ | $\begin{aligned} & 4 \\ & 8 \\ & \hline \end{aligned}$ | $14$ | $\frac{1}{6}$ | $\frac{4}{5}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 23 | 4 | 5 | 6 |  | 789 | - | 10 | 11 | 12 |  |
| No handrails. ** |  |  | X |  |  |  |  | X |  | X |  | X | 4 |
| Handrail inadequate for comfortable grasp. |  |  |  | X |  |  |  |  |  |  |  |  | 1 |
| Handrail materfal metal or aluminmm (hot in hot weather, cold in cold). |  | x | $x$ | X | X | X |  |  |  |  | X |  | 8 |
| Handrails not continuous. |  |  |  | X |  | X |  | x |  |  | X |  | 4 |
| Handrails don't extend far enough ( $1^{\prime}$ at top and bottom of stairs and ramps). |  |  |  |  |  |  |  | $\mathrm{x} \times$ |  |  |  |  | 3 |
| No handrails on ramps. |  |  |  | X |  |  |  | x |  | X |  | X | 5 |
| GUARDRATLS, BARRICADES, PEDESTRTAN/VEHICULAR SEPARAT |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Barricades not detectable (blind cane). |  |  |  | X |  | X |  | X |  |  |  |  | 3 |
| Guardrails not continuous. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guardrafls too low (less than 42"). |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No pedestrian guardrails. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate guardrails. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Guardrail mesh hazardous,* |  |  | X |  | x |  |  | x |  |  |  | X | 5 |
| No detectable separation between bikeway and pedestrian way. |  |  |  |  | X |  |  |  |  |  |  |  | 1 |
| Wo decectable seperation between roadway and walkway. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No detectable separation between walkway and parking Lot. |  |  |  |  |  | X |  |  |  | 8 |  |  | 2 |
| Unprotected sidewalks (cars, edges, etc.). |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ESCALATORS/ELEVATORS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Elevators. |  |  |  |  |  |  |  |  |  |  |  |  |  |


| 1 | $\begin{array}{\|c\|c\|} \hline 6 \\ \hline \end{array}$ |  | $6$ | $58$ |  | $5$ |  | $8$ | $8$ | $8$ | $\begin{array}{\|c\|} \hline 4 \\ \hline 8 \\ \hline 12 \\ \hline \end{array}$ | $\begin{array}{\|l} \frac{2}{6} \\ \hline \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| REST AREAS/BENCHES |  | 2 | 3 | 4 | 56 | 617 | 8 | 9 | 10 | 11 |  |  |
| Resting places not under cover (wind, rain, sum). |  |  |  | X |  |  |  |  |  |  |  | 2 |
| Not enough places to stop and rest. | X | X |  | X | $\mathrm{x} \times$ | $\times \mathrm{X}$ | X | X |  | X |  | 9 |
| No provision for scentc overlook. |  |  |  |  |  |  |  |  |  |  |  |  |
| Benches too high or 10 w , too deep or shallow, or with no armrest. |  |  | X |  |  |  |  |  |  |  |  | 1 |
| EMERGEXCY PROUISTONS |  |  |  |  |  |  |  |  |  |  |  |  |
| No alternative route for flood condition structures. |  |  | $x$ |  |  |  |  |  |  |  |  | 1 |
| No pedestrian emergency provisions. | x | X |  |  | $x$ | $x x$ | X | \% | \% | X | x | 10 |
| LIGHTEMG ILLUMNATIOS |  |  |  |  |  |  |  |  |  |  |  |  |
| Significant change of light level in tunnel at entrance. |  |  |  |  |  |  |  |  |  |  |  |  |
| Interior Iighting not adjusted to outside light conditions. |  |  |  |  |  |  |  |  |  |  |  |  |
| Glare at end of tumne?.* |  |  |  |  |  |  |  |  |  |  |  |  |
| $\text { Tume } 1 \text { too }$dark, * |  |  |  |  |  |  |  |  |  |  |  |  |
| Glare and flashing <br> lights from vehicles.* | X | X |  |  |  | $x$ | 8 | X |  | X | X | 8 |
| Poor <br> illumination.* |  | X |  |  |  |  | $\mathrm{X}$ |  |  |  | X | 3 |
| SIGMAGE/MEDLA CUES |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating location of rest areas. |  | \% |  |  |  |  | X |  |  |  |  | 3 |
| Street signs too high. too low or far. |  |  |  |  |  |  |  |  |  |  |  |  |
| No special signage for the visually impaired. |  | X |  | X | x x | $\mathrm{x} \times$ | $\mathrm{x} \times$ | X | X | X | X | 10 |
| Traffic lights with short green cycle. |  |  |  |  |  |  |  |  |  |  |  |  |
| Complicated instructions on signs. |  |  |  |  |  |  |  |  |  |  |  |  |
| No warning of potential hazards. |  |  |  |  |  |  |  |  |  |  |  |  |


| 1 | $8$ | \％ | \％ | $\$$ | $\begin{aligned} & m \\ & \hline \\ & \hline \end{aligned}$ |  | 8 | ${ }^{6}$ | \％ | 苞 | 号 | 妟 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 12 | 3 |  | 5 | 6 | 17 | 8 | 9 | 10 | 11 | 12 |  |
| No orientation cue as to start of approach． | X X | X | X | X | X | 18 | X | 罢 | x | X | x | 12 |
| Lack of orinntation cues generally． | $x{ }^{1}$ | X | x | X | X | X | X | X | X | X | X | 12 |
| Pathway junctions wheh are not at $90^{\circ}$ angle or which curve． |  | X |  |  |  |  |  | X |  |  | X | 3 |
| No betectable orientation cue as to start of channelization． |  | － | X |  |  |  |  |  |  |  |  | ＊ |
| Walkway not chanmelized． |  |  |  |  |  |  |  |  |  |  |  |  |
| Txafic nolise． |  |  |  |  |  |  |  |  |  |  |  |  |
| MICNO－CEIMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |
| high wind gxatis present．＊ |  |  |  |  | X | X | X | \％ |  |  |  | 4 |
| Wind generated by traffic＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate provision for rain－water runotif． |  |  |  |  |  |  |  |  |  |  |  |  |
| Wzalkwys and \＄idewalks not kept clear of snow， i．ce and debris． |  |  |  |  |  |  |  |  |  |  |  |  |

[^4]|  | 4 0 0 | \％ | ${ }^{1}$ | \％ | \％ | \％ | 4 | ¢ | ｜ | $\dot{8}$ | $\frac{4}{8}$ | $\frac{1}{0} 8$ | $\frac{H}{0}$ | $5$ | $5$ | 算 | \％ | 颜 | 感 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATION 6 END CONDETION | 1 | 2 | 3 | 4. | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |  |
| Portions of walkway are hidden from viek （crime potential）． | X | X | X |  | X | X | X | X | X | ＊ | X | X |  | X | X | X |  |  | 14 |
| $\begin{aligned} & \text { Overcrossing } \\ & \text { undercrossing is } \\ & \text { not close opoblic } \\ & \text { transportation stop. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No sidewalk at end condition． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Parked cazs restrict approach．＊ |  |  | X |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  | 2 |
| ```Parked cars obstruct view of approach.*``` |  | X |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  | 2 |
| No accessibie parking，＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | 1 |
| No detectable pedestrian exoss－ walk to approach． | X | X |  | X | \％ | X |  | X | X |  | X |  | X | X | X | X |  |  | 12 |
| Drivers view of pedestrian blocked．＊ |  | X | X |  |  |  |  | X |  |  |  | 8 |  |  |  |  |  |  | 4 |
| WALKWA ${ }^{\text {S }}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway less than 48＂（too narrow）${ }^{\text {t }}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Headroom below $6^{*} 10^{\prime \prime} \cdot x$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Walkway through "long"tunnel (over 40').``` |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | 1 |
| Stricture vibrates （traffic） |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Abrasive orper- gorated matertal on vertical surface adjacent to walkway.``` | X | X | X |  | X |  | X |  |  | X | X |  |  |  |  |  |  |  | 7 |
| ```Objects project into walkway (signs, trees, etc.).``` |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


| - |  | \% | - | ${ }_{5}^{5}$ | $\underline{4}$ | E | \% | \% | $0$ | \% | $\frac{4}{2}$ | $\begin{aligned} & 2 \\ & 6 \\ & 8 \end{aligned}$ | \% |  | \% | 号 | \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SUR ${ }^{\text {F ACE }}$ MATERTALS | 12 | 23 | 4 | 516 | 7 | 8 |  | 10 | 111 | 12 | 13 | 114 | 15 | 16 | 17 | 18 |  |
| Manhole covers and gratings in walkway. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Highly reflective surface materials. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Grooves ant patterns (cast into walkways or caused by small paving untis). |  |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  | 2 |
| Large, deep expansion joints, ** | $X$ | X |  |  | X | IX |  | X |  |  |  |  |  |  |  |  | 5 |
| Uneven and irregwhar surtaces. |  |  |  |  |  | X |  | X | X |  |  |  |  |  |  |  | 3 |
| ```Looge and soft surfaces (gravel, sand, ete.).``` |  |  |  | X |  |  |  |  |  |  |  |  |  | X |  |  | 2 |
| kough Surfaces. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Discontinuous sur face matarials. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MAINTENANCE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on walkway. |  |  |  | \% |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Disrepair (frost heaves, potholes. ete.). |  |  |  |  |  | $\times$ |  |  |  |  |  |  |  |  |  |  | 1 |
| ```Disrepair from vandalism or accitent (handrails, guartmails, etc.).``` |  | $1$ |  | X ${ }^{\text {x }}$ |  |  |  |  | X |  | X | X |  | X | X | X | 8 |
| STATRUAYS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Státray is only means of access to structure** |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  | 1 |
| Stainway moly on one side of structure. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pooriy lighted steps, stairs, ramps. |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  | 1 |
| Traads less than II" $^{\prime \prime}$ (too small). |  |  |  |  |  |  |  |  |  |  |  |  |  |  | * |  | 1 |
| Frojecting nosings. |  |  |  |  |  |  |  |  |  | \% |  |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Open } \\ & \text { risers. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Risets greater har $7^{74}($ too hagh)** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Curb greater than $6^{\prime \prime}$ (too high). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |


|  | $6$ | $\frac{8}{8}$ | 亚 | W | 5 | 5 | $6$ | $18$ | $E$ | $\begin{aligned} & \text { 等 } \end{aligned}$ | $\begin{aligned} & 4 \\ & 6 \\ & \vdots \\ & 6 \end{aligned}$ | $\frac{4}{2}$ | 4 | $\begin{aligned} & \grave{y} \\ & \vdots \end{aligned}$ | $\begin{aligned} & \text { W } \\ & 0 \\ & 5 \end{aligned}$ | 制 | 等 | $\begin{gathered} 4 \\ \vdots \\ E \end{gathered}$ | 令 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 12 |  | ， | 5 | 4 | 7 | 8 | 9 | 10 | 111 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |  |
| Step（settlement） between approach and structume．＊＊ | X |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | 2 |
| Dangerous staix Iocation． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RAMPS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Only wamps provided． |  | X |  | dx | X | X | X | X | X | X | X |  | X | X | X |  |  | X | 呈 |
| Only ramps provided th one side of structure． | X |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  | X |  | 4 |
| Pantiway leading to over－undercrossing too steen and long． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ramp too lons（ex－ ceeds 30 feet），＊＊ | X | X | X | X | \％ | X | X | X |  | \％ | X |  | X | X | X |  | X | X | 15 |
| ```Ramp too steep (slope greacer than 1:12).**``` | X | X | X | \％ | X | X | X | X | X |  | X |  |  | X | X |  | X | X | 14 |
| Ramp too naxrow （less than $48^{*}$ ）．＊k |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cross slope greater than $2: 50$（too steep）． |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Slope across structure too long and steep． |  | X | x | X | X |  | X | X | X | X | X | X |  | x | 昂 |  |  | X | 13 |
| No curb cuts，＊＊ | X | x | x | ． x | － | X | X | X | X | X | X | X | X | X | X | X |  |  | 16 |
| Helical ramp． | X |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | \％ |  | 3 |
| Namp layout <br> inconvenient． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Abrupt Leansition to connecting walkways． |  | X | X | X |  |  |  | X | X |  |  |  |  |  |  |  |  |  | 5 |
| Ramp exits directly into street or park－ ine area（less than $6^{+}$ clearance at bottom of ramp）． |  |  | X |  | X |  | X | X | X | X | X |  |  | X | 区 |  |  |  | 9 |
| Ballards in the mid－ dle of entrance to the ramp． |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Steps in the middle of the ramp． |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HANDRATLS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Handrails higlter than $36^{\prime \prime}$（too high）． | x |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | 2 |
| handrails lower than $32^{\prime \prime}$（coo low）．＊＊ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |


| $\square$ | \% |  |  |  |  |  |  |  |  | $\begin{aligned} & \stackrel{\rightharpoonup}{\Delta} \\ & \stackrel{~}{8} \end{aligned}$ | $g$ | 8 | $8$ | $10$ | $\frac{1}{6}$ | 苞 | $\begin{aligned} & 4 \\ & 5 \\ & \hline \end{aligned}$ | $\begin{aligned} & 4 \\ & 0 \\ & 0 \end{aligned}$ | 䂞 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 2 | 3 | 4 | 5 |  | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |  |
| $\begin{aligned} & \text { No } \\ & \text { handrails. ** } \end{aligned}$ |  | X |  | x |  |  |  |  |  |  |  | X | X | X | X |  |  |  | 6 |
| Handrail inadequate for comfortable grasp. | X |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  | 2 |
| Hadrail material metal or aluminuz (hot in hot weather, cold in cold). | x |  | X |  |  |  | X | x |  | X | $x$ |  |  |  |  |  | X |  | 10 |
| Handrails not continuous. | $x$ |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  | x |  | 5 |
| Handrails don't extend far enough (1' at top and bottom of stairs and ramps). ** |  |  |  |  | $x$ |  |  | X |  |  | X |  |  |  |  |  | X |  | 6 |
| No handrails on ramps. |  |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  |  |  | 5 |
| CUARDRAILS, BARRICADES, PEDESTRLAN/VEHICULAR SEPARATION |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Barricades not detect able (blind cane). |  |  |  | x |  |  |  | ! |  |  |  |  |  |  |  |  |  |  | 1 |
| Guardrails not continuous. |  |  |  |  | X |  |  |  |  |  |  | ; |  |  |  |  |  |  | 1 |
| $\begin{aligned} & \text { Guardraile too low } \\ & \text { (less than } 42^{\prime \prime} \text { ). } \end{aligned}$ |  |  |  |  |  |  |  | ! |  |  |  |  |  |  |  |  |  |  |  |
| No pedestrian guardrails. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate gardrails. |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |
| Guardrail mesh hazardous.* |  |  | X |  |  |  | $\mathrm{X}_{1}$ |  | X | X |  |  |  |  |  |  |  |  | 7 |
| No detectabel separation between bikeway and pedestrian way. | x | X | X | X | X |  |  |  | X | X | X |  |  | X | x | X | X | X | - 16 |
| $\begin{aligned} & \text { No detectable sep } \\ & \text { aration between road- } \\ & \text { way and walkway. } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No detectable sep- aration between walkway and parking lot |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Unprotected sidewalks (cars, edges, etc.). |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { ESCALATORS/ } \\ & \text { ELEYATORS } \end{aligned}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Elevators. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ! |  |  |  |


| l |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |


| d |  |  | $\begin{gathered} 5 \\ 58 \\ 8 \end{gathered}$ |  | Esg |  |  | $\frac{6}{6}$ | $\begin{aligned} & H \\ & B \end{aligned}$ | $\frac{4}{8}$ | $18$ | $\frac{4}{8}$ | $\left\|\begin{array}{l} N \\ 0 \\ 0 \end{array}\right\|$ | $\begin{aligned} & \text { H } \\ & \text { B } \\ & \hline \end{aligned}$ | $\frac{4}{6}$ | $18$ | $\stackrel{H}{4}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 12 | 23 | 4 |  | 5.7 | 78 | 89 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |  |
| No warning of potential hazards. | x |  |  |  | X ${ }^{\text {x }}$ | x X | x | X |  | X |  |  |  |  |  |  | 7 |
| No orientation cue as to start of approach. | X | x | $x$ | $\mathrm{x} \times$ | $\mathrm{X} \times$ | $\mathrm{X} \times$ | ${ }^{1}$ | X | X | x | X | X | X | X | X | X | 17 |
| Lack of orientation cues generally | X | X |  |  | $\mathrm{x}^{\mathrm{x}}$ | $\mathrm{x} \mid \mathrm{X}$ | x | X | X | X | X | X | X | X | x | X | 17 |
| Pathway junctions which are not at 90 degree angle or which curve. | x |  |  | X | 矿 |  |  |  |  | X |  |  | X |  | X |  | 7 |
| No detectable orienta tion cue as to start of chamnelization. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkway not channelized. |  | $x \mathrm{x}$ | IX | X | $\mathrm{x} \times$ | $\mathrm{x} \times$ | I 8 | 8 | X | X | X | X | X | X | X | X | 18 |
| $\begin{aligned} & \text { Traffie } \\ & \text { noise. } \end{aligned}$ |  | x |  |  | $\mathrm{X}^{1} \mathrm{x}$ | $\times 1$ |  | X | X |  |  |  | X |  | X | X | 13 |
| MICRO-CLIMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present.* |  |  |  | X | X ${ }^{\text {x }}$ | X ${ }^{\text {P }}$ | I ${ }^{\text {P }}$ | X | X |  |  | X | X |  |  | X | 14 |
| Wind generated by traffic.* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inadequate provision for rain-water runoff. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Walkways and sidewalks not kept clear of snow, ice and debris. |  |  |  |  | ${ }^{x}$ | $8$ |  |  |  |  |  |  |  | x |  |  | 3 |

*Response to these problems may not indicate that the problem definately exists, but rather, in the opinion of the observor, that the problem probably exists quite frequently.
**Rased on the 1961 ANSI Standards.

## CUMULATIVE MATRIX: OVERCROSSINGS

|  |  |  |  |  |  |  |  |  |  |  |  | $\begin{gathered} 5 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATLON \& END CONDITION |  |  |  |  |  |  |  |  |  |  |  |  |
| Portions of walkway are hidden from view (crime potential). | 3 | 5 | 5 | 1 |  | 1 | 1 | 3 | 2 | 13 | 34 | 33.0 |
| overcrossing is not close to public transportation stop. | 1 |  | 1 |  |  |  |  |  | 5 |  | 7 | 4.8 |
| No sickevalk at end condition. | 3 |  |  | 3 |  |  |  | 2 | 1 |  | 9 | 8.7 |
| Barked caxs restríct approach.* |  |  |  |  |  |  |  |  |  | 2 | 2 | 1.9 |
| Parked cars obstruet view of approach.* |  |  |  |  |  |  |  |  |  | 2 | 2 | 1.2 |
| No accessible parkinte ** | 1 | 1. | 2 |  |  |  |  |  | 6 |  | 10 | 9.7 |
| No detectable pedestrian crosswall to approach. | 5 | 6 | 2 | 1 |  |  | 4 | 8 | 4 | 11 | 41 | 39.9 |
| Driver's view of pedestrian blocked.* |  |  | 2 |  |  |  |  | 3 |  |  | 9 | 8.7 |
| WALKWAYS |  |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian walkway on only one side. |  | 1 |  |  |  |  |  |  |  |  | 1 | 1.0 |
| Walkway less than $48^{\text {Bi }}$ (too narrow).** |  | 1 |  |  |  |  |  | 1 |  |  | 2 | 1.9 |
| $\begin{aligned} & \text { Headroom below } \\ & 6^{\prime} 10^{t} . * * \end{aligned}$ |  |  |  |  |  |  |  |  | 1 |  | 1 | 1.0 |
| Structure yibrates (traffic). |  | 1 | 1 |  |  |  |  |  |  |  | 2 | 1.9 |
| ```Abrasive or perforated material on vertical sur- face adjacent to walkway.``` | 1 | 4 | 5 | 1 |  | 10 | 1 | 1 | 3 | 7 | 33 | 32.0 |
| Objects profect into wallway-signs, trees, etc. |  | 3 | 1 |  |  |  |  | 1 |  |  | 5 | 4.9 |
| SURFACE MATERIALS |  |  |  |  |  |  |  |  |  |  |  |  |
| Manfole covers and gratings in walkway. | 2 | 8 | 1 |  |  | 1 |  | 1 |  |  | 13 | 12.7 |


|  | Area A (7 Structures) |  |  | $\left\|\begin{array}{r} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  |  |  |  |  |  | 7 5 0 0 0 0 0 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Highly reflective surface materials |  | 1 |  |  |  |  |  |  |  |  | 1 | 1.0 |
| Grooves and patterns (cast into walkways or caused by small paving units). |  | 2 | 5 | 1 | 2 | 2 |  | 2 |  | 2 | 16 | 15.5 |
| large, deep expansion joints.** | 5 | 11 | 4 | 2 |  | 7 |  | 2 | 2 | 5 | 38 | 36.9 |
| Uneven and irregular surfaces. | 3 | 4 | 5 | 2 | 2 | 5 |  | 3 |  | 3 | 27 | 26.2 |
| Loose and soft surfaces (gravel, sand, ete.) | 3 | 5 | 1. |  |  | 1 |  |  |  | 1 | 11 | 10.7 |
| Kough Surfaces. | 1. | 1. | 4 | 2 | 2 | 2 |  | 2 |  |  | 14 | 13.6 |
| Discontinuous surface materials. | 1. |  | 1. | 2 | 2 |  |  | 1 |  |  | 7 | 6.8 |
| Maintenance |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on walkway. |  | 3 | 3 |  |  |  |  |  |  | 1 | 7 | 6.8 |
| Disrepair (frost heaves. potholes, etc.). | 13 | 4 | 2 | 1 |  | 3 |  | 1 |  | 1 | 13 | 12.6 |
| Disrepair from vandalism or accident (handrails, guardrails, etc.). | 1 | 6 | 6 | 2 |  | 5 |  | 1 |  | 7 | 28 | 27.2 |
| STAIRWAYS |  |  |  |  |  |  |  |  |  |  |  |  |
| Stairway is only means of access to structure.** | 2 | 2 | 3 | 2 |  | 3 |  |  | 2. | 1 | 15 | 14.6 |
| stairway only on one side of structure. |  | 1 | 1. |  |  | 1 |  |  |  |  | 3 | 2.9 |
| Foorly lighted steps, stalrs, ramps. | 3 | 9 | 5 | 1 |  | 5 |  |  | 5 | 1. | $\underline{29}$ | 28.2 |
| Treads less than $11^{11}$ (too small). |  | 1 | 3 | 2 |  | 1 |  |  |  |  | 8 | 7.8 |
| Projecting nosings. |  | 4 | 2 | 1 |  | 1. |  |  |  |  | 9 | 8.7 |
| open Risers: |  |  | 4 | 2 |  |  |  |  |  |  | 6 | 5.8 |


|  |  |  |  |  |  |  |  |  |  |  |  | $\begin{aligned} & 4 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 4 \\ & 4 \\ & 0 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Risers greater than $7^{\prime \prime}$ (too high). ** |  |  | 4 | 1 |  | 1 |  |  |  |  | 6 | 5.8 |
| Curb greater than $6^{\prime \prime}$ (too high). |  |  | 1 |  |  |  |  | 1 | 1 | 1 | 4 | 3.9 |
| Step (sectlement) between approach and structure.** | 1 | 7 | 2 |  |  | 3 |  |  | 1 | 2 | 16 | 15.5 |
| $\begin{aligned} & \text { Dangerous stalx } \\ & \text { location. } \end{aligned}$ |  |  | 1 |  |  |  |  |  |  |  | 1 | 1.0 |
| RAMPS |  |  |  |  |  |  |  |  |  |  |  |  |
| Only ramps provided. | 1 | 8 | 4 | 1 | 1 | 5 | 2 | 5 | 9 | 14 | 50 | 48.5 |
| Only ramps provided on one side of structure. | 1 |  | 2 | 1 |  |  |  |  |  | 4 | 4 | 7.8 |
| Pathway leading to overcrossing too steep and long.** | 3 |  | 1 |  |  |  |  | 4 |  |  | 8 | 7.8 |
| $\begin{aligned} & \text { RatIq too long (exceeds } \\ & 30^{\circ} \text { ). } \% \text {. } \end{aligned}$ | 1 | 11 | 10 | 2 |  | 6. | 1 | 5 | 10 | 15 | 5161 | 59.2 |
| Ramp too steep (slope greater than 1:12),** | 1 | 10 | 6 | 2. |  | 6 | 1 | 4 | 9 | 14 | 453 | 51.5 |
| $\begin{aligned} & \text { Ramp too narrow } \\ & \text { (less than } \left.48^{\prime \prime}\right), * * \end{aligned}$ |  |  |  |  |  |  |  | 1 |  |  | 1 | 1.0 |
| Cross slope greater than 1:50 (coo steep). | 2 | 2 |  |  |  |  |  |  | 1. | 1 | 16 | 5.8 |
| Slope across structure too long and steep.** | 1 | 5 |  |  | 2 | 1 | 2 |  | 5 | 13 | 29 | 28.2 |
| No eurb cuts** | 4 | 6 | 3 | 2 |  | 2 | 3 | 8 | 6 | 15 | 549 | 47.6 |
| Helical ramp. |  | 1 |  | 1 |  |  | 1 |  | 5 | 3 | 311 | 10.7 |
| Ramp layout inconvenient. |  |  | 1 |  |  |  |  | 1 |  |  | 2 | 1.9 |
| Abrupt eransition to connecting walkways. |  |  | 1 |  |  | 1. |  |  |  | 5 | 57 | 6.8 |
| Ramp exits directiy into street or parking area (less than $6^{\prime}$ clearance at bottom of ramp). |  | 5 | 7 |  |  | 3 |  | 4 | 3 |  | 931 | 30.1 |


|  |  |  |  |  |  |  |  |  |  |  |  | $\begin{gathered} \text { ت } \\ \stackrel{7}{4} \\ 5 \\ 5 \\ 5 \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| mollarós in the madde of the antrance to the ramp. |  | 4 |  |  |  | ]. |  |  |  | 1 | 3 | 4.9 |
| Steps in the midde of the ramp, |  |  | 1 |  |  | 1. |  |  |  |  | 2 | 1.9 |
| HANDRAILS |  |  |  |  |  |  |  |  |  |  |  |  |
| Handrails higher than $36^{\prime \prime}$ (too high). |  | 5 | 11 | 2 | 2 | 4 |  | 7 |  | 2 | 33 | 32.0 |
| Handrails lower than 32" (too low). ${ }^{\text {sh }}$ | 1 |  |  |  |  |  |  |  |  | 1 | 2 | 1.9 |
| $\begin{aligned} & \text { Mo } \\ & \text { handrats.t. } \end{aligned}$ | 4 | 12 | 4 | 2 |  | 3 | 3 |  | 4 | 6 | 38 | 36.9 |
| Mandrall inadequate for confortable grasp. | 1 |  | 1 |  | 2 | 4 |  | 7 | 1 | 2 | 18 | 17.5 |
| Handrail material metal or aluminum (hot in hot weather, cold in cold), | 3 | 6 | 12 | 2 |  | 8 |  | 10 | 8 | 10 | 59 | 57.3 |
| Handraile not continuous. | 2 | 3 | 9 | 2 |  | 6 |  | 3. | 4 | 5 | 34 | 33.0 |
| Handrails don't extend far enough (l' at top and botton of stairs and ramps)..** | 1 |  | 6 | 1 | 1 | 4 |  | 7 | 3 | 61 | 29 | 28. |
| No handrails on ranges. | 1 | 6 | 1 |  |  | 1. | 2 | 4 | 5 | 5 | 25 | 24.3 |
| GUARDRALLS, BARRICADES, PEDESTRLAN/VEHTCULAR SEPARATIDN |  |  |  |  |  |  |  |  |  |  |  |  |
| Barricades not detectable (blind cane) | 1 | 2 | 1 |  |  | 1 |  |  | 3 | 1 | 9 | 8.7 |
| cuardrails not contimuous. | 1. | 1 | 2 |  |  |  |  |  |  | 1. | 5 | 4.9 |
| Guardrails too 10w (less than 42童). | 2 | 3 |  | 3 |  | 2 |  |  |  |  | 10 | 9. 3 |
| No pedeatrian guardralls. | 1 |  |  |  | 1 | 1 | ] |  |  |  | 3 | 2.9 |


|  |  |  | $\begin{aligned} & \text { Area C } \\ & \text { (16 Structures) } \end{aligned}$ |  |  | $\left[\begin{array}{c} 3 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 5 \\ 5 \end{array}\right.$ |  |  | $\begin{array}{r} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Inadequata guardrails. | 1 |  |  |  |  | 2 | 1 |  |  |  | 3 | 2.9 |
| Guardrail mest hazardous.* | 1 | 7 | 6. | 1 |  | 8 | 1 | 1 | 5 | 7 | 37 | 36.0 |
| No detectable separation between bikeway and pedestrian way. | 4 | 14 | 1 | 2 | 3 | 7 | 1 | 10 | 1 | 15 | 58 | 56.3 |
| No detectable separation between roadway and walkway. | 1 | 1 | 10 |  |  | 1 |  | 2 |  |  | 15 | 14.6 |
| No detectable separation between waikway and parking lot. |  |  |  |  |  |  |  |  | 2 |  | 2 | 1.9 |
| thprotected sidewalks (cars edges, etc.). | 2 | 1 |  |  | 1 | 1 | 1 | 5 |  |  | 11 | 10.7 |
| ESCALATORS /ELEVATORS |  |  |  |  |  |  |  |  |  |  |  |  |
| Escalators. |  | 1 |  |  |  |  |  |  |  |  | 1 | 1.6 |
| Elevators. |  | 2 |  |  |  | 1 |  |  |  |  | 3 | 2.9 |
| REST AREAS/BENCHES |  |  |  |  |  |  |  |  |  |  |  |  |
| Kesting places not under cover (wind, rain, sun). | 1 | 8 | 6 |  |  | 1 |  | 1 | 2 | 2 | 21 | 20.4 |
| Not enough places to stop and rest. | 4 | 8 | 11 | 5 | 2 | 11 | 3 | 6 | 9 | 15 | 74 | 71.8 |
| No provision for scenic overlook. |  |  | 2 |  |  |  |  |  |  |  | 2 | 1.9 |
| Benches too high or low, too deep or shallow, or with no armest. | 1 | 3 | 1 |  |  |  |  |  | 1 | 1 | 7 | 6.8 |
| EMERGENCY PROVISIONS |  |  |  |  |  |  |  |  |  |  |  |  |
| No alternative route for flood condition structures |  |  | 1 |  |  |  |  | 3 | 1 |  | 5 | 4.9 |
| No pedestrian emergency provisions. | 7 | 18 | 15 | 5 | 3 | 11 | 1 | 11. | 10 | 17 | 98 | 95.1 |
| LIGHTING, ILLUMINATION |  |  |  |  |  |  |  |  |  |  |  |  |
| Glare and flashing lights from vehicles. | 1 | 10 | 11 | 1 |  | 9 |  | 8 | 8 | 7 | 57 | 55.3 |


|  |  |  |  |  |  |  |  |  |  | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ - \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  | $\begin{aligned} & 6 \\ & \frac{6}{6} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Poor illumination.* | 5 | 8 | 6 | 4 |  |  | 6 | 3 | 1 | 3 | - 8 | 44 | 4.2 .7 |
| SIGNAGE/MEDTA CUES |  |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating location of rest areas. | 3 | 18 | 14 | 2 |  |  | 11. | 1 | 8 | 3 | 9 | 69 | 67.0 |
| Street signs too high; too low, or too far. |  |  |  |  |  |  |  |  | 1 |  |  | 1 | 1.0 |
| No special signage for the visually impaired. | 7 | 18 | 16 | 5 |  | 3 | 11 | 2 | 11 | 10 | 17 | 100 | 97.1 |
| Complicated instructions on signs. | 1. |  |  |  |  |  |  |  |  |  |  | 1 | 1.0 |
| No warning of potential hazards. | 3 |  | 1 | 3 |  |  |  | 2 | 3 |  | 7 | 19 | 18,4 |
| No arientation cue as to start of approach. | 6 | 18 | 16 | 5 |  | 2 | 11 | 2 | 11 | 12 | 16 | 99 | 96.1 |
| Lack of orfentation cues generally. | 6 | 18 | 16 | 5 |  | 3 | 11 | 2 | 8 | 12 | 16 | 97 | 94.2 |
| Pathway junctiong which are not at 90 degree angle or which curve. | 2 | 5 | 7 |  |  |  | 2 |  | 2 | 3 | 7 | 28 | 27.2 |
| No detectable orientation cue as to start of channelization. |  |  |  |  |  |  |  |  |  | 1 |  | 1 | 1.0 |
| Walkway not: channelized. | 6 | 15 | 13 | 2 |  | 3 | 7 | 2 | 11 |  | 17 | 76 | 73.8 |
| Taffic moise. | 6 | 2 | 6 | 1 |  |  | 5 |  | 8 |  | 13 | 41 | 39.9 |
| MICRO-CLTMATIC FACTORS |  |  |  |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present.* | 3 | 14 | 14 |  |  |  | 8 | 1 | 9 | 4 | 14 | 67 | 65.0 |
| ```Wind generated by traffic.* Inadequate provision for rasin-water runoff.``` | 1 | 1 |  |  |  |  |  |  | 2 |  |  | 4 | 3.9 |
|  |  |  | 2 |  |  |  |  |  |  |  |  | 2 | 1.9 |
| Walkways and sidewalks not kept clear of snow, ice and debris. | 1 | 10 | 5 | 1 |  |  | 3 |  | 1 |  | 2 | 23 | 22.3 |
| *Responses to these problems may not exists, but rather, in the opinion probably exists quite frequentiy. <br> **Based on the 1961 ANSI Standards. |  |  |  |  |  |  |  |  |  |  |  |  |  |

## CUMULATIVE MATRIX: UNDERCROSSINGS

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOCATION 表 END CONDITION |  |  |  |  |  |  |  |  |  |  |  |  |
| Portions of walkway are hidden from view (crime potential). | 1 | 1 | 1 |  |  | 3 |  | 1 |  | 1 | 8 | 38.1 |
| Undercrossing not close wa prblic transpartation stop. |  |  | 1 |  |  |  |  |  | . |  | 1 | 4.8 |
| No sidewalk at end condition. | 1 |  |  |  |  |  |  |  |  |  | 1 | 4.8 |
| Parked cars obstruct view of approach.* |  |  |  |  |  |  |  | 1 |  |  | 1 | 4.8 |
| No accessible parkíng. |  |  |  |  |  |  |  |  |  | 1 | 1. | 4.8 |
| No detectable pedestrian crosswalk to approach. | 1 |  | 1 |  | 1 | 2 | 1 | 5 |  | 1 | 12 | 57.1 |
| Driver's view of pedestrian blocked.* |  |  |  |  |  |  |  | 2 |  |  | 2 | 9.5 |
| WALKDAYS |  |  |  |  |  |  |  |  |  |  |  |  |
| Fedestrian walkway on only one side, |  |  |  |  |  | 1 | 1 |  |  |  | 2 | 9.3 |
| Walkway less than $4^{\prime \prime}$ (t.00 narrow).** |  |  |  | * | 1 |  |  |  |  |  | 1 | 4.8 |
| Keadroom below $6^{*} 10^{\prime \prime}$.** |  |  |  |  | 1. |  |  |  |  |  | 1 | 4.81 |
| Walkway through "long" tunnel (over 40'). | 1 | 1 | 2 |  | 1 | 3 | 2 | 5 |  | 1 | 15 | 71.4 |
| Abrasive or pextorated material on vertical surface adjacent co walkway. |  |  |  |  | 1 | 1 |  | 2 |  |  | 4 | 19.0 |
| Objects project into walk way (signs, trees, etc.) |  |  |  |  |  |  |  | 1. |  |  | 1 | 4.8 |
| SURFACE MATERLALS |  |  |  |  |  |  |  |  |  |  |  |  |
| Manhole covers and gratings in wallway. |  |  |  |  |  | 1 |  |  |  |  | 1 | 4,8 |
| Large, deep expansion foints.** |  |  |  |  |  |  |  | 1 |  |  | 1 | 4,8 |
| Uneven and inregular murfaces. |  |  |  |  |  | 1 |  |  |  |  | l | 4.8 |


|  |  |  |  |  | $\left[\begin{array}{c} 8 \\ 5 \\ 5 \\ 5 \\ 5 \\ 6 \\ 0 \\ 4 \\ 4 \\ 4 \end{array}\right.$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Loose and soft surfaces (gravel, sand, etc.). | 1 |  |  |  |  |  |  | 1 |  | 1 | 3 | 14.3 |
| Discontinuous surface materials. | 1 |  |  |  |  |  |  |  |  |  | 1 | 4.8 |
| MALNTENANCE |  |  |  |  |  |  |  |  |  |  |  |  |
| Debris from erosion on walkway. |  |  |  |  |  | 4 |  |  |  |  | 4 | 19.0 |
| Disrepair (frost heaves, potholes). |  |  | 1 |  |  |  |  |  |  |  | 1 | 4.8 |
| Disreqair from vandalism or accident (handrails, guardrails, etc.). |  |  |  |  |  |  |  | 1 |  | 1 | 2 | 9.5 |
| STAIRWAYS |  |  |  |  |  |  |  |  |  |  |  |  |
| Stairway is only means of aecess to structure.** | 1 |  |  |  |  |  |  |  |  |  | 1 | 4.8 |
| Poorly Ilghted steps, stairs, ramps. |  |  |  |  |  | $\pm$ |  |  |  |  | 1 | 4.8 |
| $\begin{aligned} & \text { Open } \\ & \text { zisers. } \end{aligned}$ |  |  |  |  |  |  |  | 1 |  |  | 1 | 4.8 |
| $\begin{aligned} & \text { Curb greater than } 6^{\prime \prime} \\ & \text { (too high). } \end{aligned}$ |  |  |  | - |  |  |  | 1 |  |  | 1 | 4,8 |
| LAMPS |  |  |  |  |  |  |  |  |  |  |  |  |
| only ramp provided. |  |  |  |  |  |  | 1 |  |  |  | 1 | 4.8 |
| Pathway leading to struc- ture too long and steep, | 1 |  |  |  | 1 | 3 |  |  |  |  | 5 | 23.8 |
| $\begin{aligned} & \text { Ramp too long (exceeds } \\ & 30^{\prime} \text { ),** } \\ & \hline \end{aligned}$ |  |  |  |  |  |  |  | 1 |  |  | 1 | 4.8 |
| Ramp too steep (slope |  |  |  |  |  |  |  | 1 |  |  | 1 | 4.8 |
| Croas slope greater than $1: 50$ (too steep). | 1 |  |  |  |  |  |  | 1 |  |  | 2 | 9.5 |
| $\begin{aligned} & \text { Ro curb } \\ & \text { cuts. ** } \end{aligned}$ | 1 |  |  |  |  |  | 2 | 2 |  | 1 | 6 | 28.6 |
| Ramp exits directly into street or parking area (less than 6'clearance at bottom of ramp). |  |  |  |  |  | 2 | \% |  |  |  | 2 | 9.5 |


|  |  |  |  |  |  |  |  |  |  |  |  | $\begin{aligned} & \text { W } \\ & \text { C0 } \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MAMDRAILS |  |  |  |  |  |  |  |  |  |  |  |  |
| Handrails higher than 36" (too high). | 1 |  |  |  |  |  |  |  |  |  | 1 | 4.8 |
| No handrails. ** | 1 | 1 | 2 |  | 1 | 4 | 2. | 3 |  |  | 14 | 66.7 |
| Handrails inadequate for comportable grasp. |  |  |  |  |  |  |  | 1 |  |  | 1 | 4.8 |
| Handrail material metal or aluminum thot in hot weather, cold in cold). | 1 |  |  |  | 1 |  |  | 1 |  |  | 3 | 14.3 |
| Handrail not continuous. |  |  |  |  |  |  |  | 1 |  |  | 1 | 4.8 |
| Hendrafls don't extend far mough (1' at top and bottom of ramps).** | 1 |  |  |  |  |  |  |  |  |  | 1 | 4.8 |
| No handrails on ramps. |  |  |  |  |  | 2 |  | 1 |  |  | 3 | 14.3 |
| GUARDRAILS, BARRICADES, PEDESTRLAN/VEHICULAR separation |  |  |  |  |  |  |  |  |  |  |  |  |
| ```Guardrails less than 42" (too low).``` |  |  | 1 |  |  |  |  |  |  |  | 1 | 4.8 |
| No pedestrian guardrails. | 1 |  |  |  | 1 |  | 1 | 2 |  |  | 5 | 23.8 |
| No detectable separation between bikeway and pedestrian way. |  | 1 |  |  | 1 | 4 | 2 | 5 |  | 1 | 14 | 66.7 |
| No detectable separation between roadway and walkwa |  |  | 2 |  |  |  |  | 2 |  |  | 4 | 19.0 |
| No detectable separation between walkway and parking lot. |  |  | 1 |  |  |  |  |  |  |  | 1 | 4.8 |
| Unprotected sidewalks (car edges, etc.). | $1 ; 1$ | 1 |  |  | 1 |  |  | 4 |  |  | 7 | 33.3 |
| REST AREAS/BENCHES |  |  |  |  |  |  |  |  |  |  |  |  |
| Not enough places to stop and rest. | 1 | 1 | 3 |  | 2 | 4 | 2 | 15 |  | 1 | 19 | 90.5 |


|  | $\left.\begin{array}{r} 6 \\ 0 \\ 0 \\ 0 \\ 4 \\ 4 \\ 0 \\ 0 \\ 6 \\ 4 \\ 4 \\ 0 \end{array} \right\rvert\,$ | $\begin{array}{r} 7 \\ 3 \\ 0 \\ 0 \\ 4 \\ 0 \\ 0 \\ 0 \end{array}$ |  |  |  |  |  |  | 0 0 5 5 4 5 5 0 0 4 4 |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| EMERGENCY PROVISTONS |  |  |  |  |  |  |  |  |  |  |  |  |
| No alternative route for flood condition structures. |  |  | 1 |  |  | 2 |  | 2 |  |  | 5 | 23.8 |
| No pedestrían emergency proyisions. | 2 | 1 | 3 |  | 2 | 4 | 2 | 5 |  | 1 | 20 | 95.2 |
| LIGHTLNG, ILLUMINATION |  |  |  |  |  |  |  |  |  |  |  |  |
| Significant change of light levei in tunnel at entrance. | 1 |  | 1 |  |  | 1 | 1 | 2 |  | 1 | 7 | 33.3 |
| Interior lighting not adjusted to outside light conditions. | 2 |  | 1 |  | 1 | 1 | 2 | 2 |  | 1 | 10 | 47.6 |
| Glare at end of tunnel.* | 1 |  |  |  | 1 | 1 | 1 | 2 |  | 1 | 7 | 33.3 |
| $\begin{aligned} & \text { Tunne1 too } \\ & \text { dark.* } \end{aligned}$ | 1. |  | 1 |  | 1 | 1 | 1 | 3 |  | 1 | 9 | 42.9 |
| Glare and flashing lights from vehicles. | 1 | 1 | 2 |  |  | 1. |  | 1 |  |  | 6 | 28.1 |
| Poor <br> illumination,* | 1. | 1 | 2 |  | 1 | 2 | 2 | 2.4 |  | 1 | 14 | 66.7 |
| SIGNAGE/MEDIA CUES |  |  |  |  |  |  |  |  |  |  |  |  |
| No signage indicating location of rest areas. | 2 | 1 | 2 |  | 1 | 4 | 1 | 1.3 |  | + | 15 | 71.4 |
| No special signage for the visually impaired. | 2 | 1 | 3 |  |  | 4 | 2 | 25 |  | 1 | 20 | 95.2 |
| Traffic lights with short green cycle. |  |  |  |  |  |  |  | 3 |  |  | 3 | 14.3 |
| No warning of potential hazards. |  |  |  |  |  |  | 2 | 2.1 |  |  | 3 | 14.3 |
| No orientation cue as to start of approach. | 1 | 1 | 3 | 3 | 1 | 4 | 2 | 2 |  | 1 | 18 | 85.7 |
| Lack of orientation cues generally. | 1. | 1. | 3 | . | 2 | 4. | 2 | 2.5 |  | 1 | 19 | 90.5 |
| Pathway junctions which are not at 90 degree angle or which curve. |  |  |  |  |  | 4 |  | 1 |  |  | 5 | 23.8 |


|  |  |  |  |  | $\left[\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right.$ |  |  |  |  |  |  | $\begin{aligned} & \text { 世0 } \\ & 0 \\ & 0 \\ & \text { en } \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| No detectable oríentation cue as co start of chanmeltzacion. | 1. |  |  |  |  |  | : |  |  |  | 1 | 4.8 |
| Walkway not channelized. | 1. | 1 | 2 |  | 2 | 4 | 2 | 5 |  | 1 | 18 | 85.7 |
| Traffic nolse. | 1 |  | 2 |  |  | 1 | 1 | 4 |  |  | 9 | 42.9 |
| MICRO-CLIMATIC EACPORS |  |  |  |  |  |  |  |  |  |  |  |  |
| High wind gusts present.* |  |  |  |  |  |  |  | 2 |  |  | 2 | 9.5 |
| Wind generated by traffic.* |  |  | 1 | ) |  |  |  | 1 |  |  | 2 | 9.5 |
| Inadequate provision for rafnwwater runoff, |  |  | 1 | 1 |  | 4 |  |  |  |  | 5 | 23.8 |
| ```Walkways and sidewalks not kept clear of snow, ice and debris.``` | 1 |  | 1 | 1 |  | 4 |  |  |  | 1 | 営 | 38.1 |
| *Responses to these problems may not Indicate that the problem definately exists, but rather, in the opinion of the observor, that the problem probably exists quite frequently. <br> **Based on the 1961 ANSI Standards. |  |  |  |  |  |  |  |  |  |  |  |  |

This appendix correlated environmental barriers with groups of people with various handicapping conditions. Environmental barriers are listed across the top of each sheet while the handicapping conditions are enumerated along the left hand column of the matrix. The list of handicapping conditions is four pages long; on the fifth page of the matrix it begins again, linking the list with the next group of environmental barriers.

For example, the effect of different environmental barriers on people with the handicapping condition, "Difficulty with environmental orientation" is found in matrix sections $\mathrm{A} 1, \mathrm{~B} 1, \mathrm{C} 1$, etc. However, the different effects of the envrionmental barrier entitied, "Driver's view of pedestrian blocked" on all groups of people can be found in the matrix sections A1, A2, A3, and A4 (matrix section numbers are found in the top right hand eorner of each page).

| KEX <br> $X=$ No Problem for this group. <br> $s=$ Solution for this problem is known. <br> - Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | 玺 | * | X | X | * | X | $X$ | x |
| Understanding deficti. | * | 6 | X | 跌 | * | $\leqslant$ | X | X |
| Limited attention span* | X | * | X | \% | X | X | 8 | S |
| Memory deficit. | X | S | X | X | X | X | X | X |
| Decreased ability to sequence, judge time direction, distance. size. | 5 | S | 5 | X | * | X | X | 5 |
| Tepaired night vision. | S | S | S | X | \% | X | 5 | S |
| Impaired cutaneous sensation detection. | X | 8 | X | X | X | X | 5 | X |
| Chronic stooped posture. | X | X | X | X | * X | $X$ | X | X |
| Difficulty in main* taining equilibrium. | S | X | $\mathbf{S}$ | X | X | S | S | 5 |
| Moves at slow speed. | 8 | X | X | X | X | $X$ | X | X |
| Swaying, shuffling, uneven, eratic or staggering gait. | 5 | X | S | * | X | 5 | S | 5 |
| Frequent need to rest during exexcise. | X | X | X | X | S | X | X | X |


| hey <br> $X=$ No Problem for this group. <br> $S=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Reduced tolerance to brisk exercise (need to move siowly).``` | X | X | X | X | S | X | X | X |
| Limited ability to stand for long periods. | X | X | X | X | S | X | X | X |
| Impaired bladder control. | X | X | X | X | X | X | X | X |
| Extreme of size (dwarfism, ¿台tism, obesity, etc.). | S | X | S | S | X | X | X | X |
| Cardiac Pacemaker affected :- electrical interference. | X | X | X | X | X | X | X | X |
| Uses powered or manual theelchair. | S | S | S | X | X | X | S | S |
| ises walker, crutches, orthopedic cane. | S | S | S | X | S | X | S | S |
| ```Frosthesis (including braces) for lower &:%remities.``` | S | X | 5 | X | S | X | S | S |
| ```Ssureased ability to tole- are smoke, dust, chemicals, \1ens, cold winds.``` | X | X | X | X | X | X | X | X |
| ```#nited ability to grasp, zease or manipulate with per extremities (arms, mst, hands).``` | X | X | Y | X | X | X | X | X |
| $\therefore$ irited reach. | X | X | X | X | X | X | X | X |


| KEY <br> $X$ No Problem for this group. <br> $S=$ Solution for this problem is known. <br> - Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity. | X | X | X | X | X | x | X | X |
| Inability to turn head. | S | $s$ | X | X | X | X | X | X |
| Decreased ability to stoop. | x | X | X | X | X | X | X | X |
| Difficulty standing from sitting position, or in sitting down. | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet. | 8 | X | X | X | X | X | X | * |
| Ltoited horizontal motion with legs and feet. | s | X | X | X | s | X | X | X |
| Decreased ability to tolerate heat and cold. | X | X | X | X | X | X | X | X |
| Speech disorder. | x | X | X | X | X | X | X | X |
| Loss of normal speed in motor coordination/slowed reflexes. | S | X | X | X | X | X | X | 5 |
| Fear of crime. | X | x | X | X | - | * | X | \% |
| Fear of heights (vertigo). | x | X | X | X | X | X | X | X |
| Agoraphobia. | X | X | X | X | X | X | X | X |
| Claustrophobia. | X | X | s | X | - | X | X | X |
| Fear of loud nolses. | X | X | X | X | X | X | X | X |



| ```KEY X m No Problem for this gronp. S = Solution for this problem is known. " Solution for this problem is not known.``` |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environ－ mental orientation． | \％ | \＄ | $S$ | X | 5 | X | 5 | ＊ |
| Understanding deficit， | X | 5 | 5 | 5 | S | X | 3 | $\bullet$ |
| Limited attention span． | － | 5 | 5 | \＄ | 5 | X | \＄ | ＊ |
| Memory aeficit． | X | S | 5 | S | S | X | 5 | $\cdots$ |
| Decreased ability to sequence，fudge time； direction，distance， size． | X | X | S | 3 | S | X | $S$ | X |
| Impaired night vision． | X | S | \＄ | 5 | S | X | S | $\leqslant$ |
| Impaired cutaneous sensation detection． | X | S | X | $S$ | 5 | X | X | X |
| Chronic stooped posture． | X | 5 | S | 5 | S | X | X | X |
| Difficulty in main－ taining equilubrium． | X | S | S | 5 | $s$ | S | 5 | X |
| Moves at slow speed． | X | $\$$ | S | 5 | $S$ | 5 | S | X |
| Swaying，shuffling， uneven，eratic or stag gering gati．． | x | 5 | 5 | \＄ | S | \＄ | $S$ | X |
| Frequent need to rest during exercise． | X | S | $\$$ | S | 5 | 5 | S | X |


| KEY <br> $X=$ No Problem for this group. <br> $\mathrm{S}=$ Solution for this problem is known. <br> = Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise (need to move slowly). | X | X | 5 | X | X | x | X | x |
| Limited ability to stand for long periods. | X | S | S | X | x | 5 | S | X |
| Impaired blader control. | X | X | X | X | X | S | x | X |
| Extreme of size (dwarfism, giantism, obesity, etc.). | X | X | 5 | S | X | X | X | X |
| Cardiac Facemaker affected by electrical interference. | X | \% | X | X | 8 | X | X | X |
| Uses powered or manual wheelchair. | X | 3 | S | S | $s$ | 5 | S | X |
| Uses walker, crutches, orthopeaic cane. | X | S | $s$ | 5 | S | S | \$ | X |
| Prosthesis (incluaing braces) for lower extremities. | X | 5 | S | S | \$ | 5 | S | X |
| Decreased ability to tolerate smoke, dust, chemicals, pollene, cold winds. | X | X | X | X | X | X | x | X |
| Liaited ability to grasp, release or manipulate with upper extremities (arms, wrist, hands). | X | X | s | * | X | X | X | X |
| Lixaited reach. | X | X | 8 | X | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No Problen for this group. <br> $s=$ Solution for this problem is known. <br> - Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity. | X | X | X | X | X | X | X | X |
| Inability to turn head. | X | X | X | $\$$ | s | X | X | X |
| Decreased ability to stoop. | X | X | \% | X | X | X | X | X |
| Difficulty standing from sitting position, or in sitting down. | X | x | X | x | X | X | X | X |
| Limited vertical motion with legs and feet. | X | $s$ | S | $s$ | S | \$ | S | X |
| Limited horizontal motion with legs and feet. | X | 8 | S | $s$ | 5 | 5 | s | X |
| Decreased ability to tolerate heat and cold. | X | S | X | X | K | 5 | X | X |
| Speech disorder. | X | X | X | X | X | X | X | X |
| Loss of normal speed in motor cootdination/slowed reflexes. | X | S | \$ | S | $s$ | S | S | X |
| Fear of crime. | * | s | X | $s$ | 5 | X | X | * |
| Fear of beights (vertigo). | X | X | X | X | X | X | X | X |
| Agoraphobia. | X | x | X | $x$ | X | X | X | X |
| claustrophobia. | x | X | $\chi$ | X | * | X | X | X |
| Fear of loud noises. | x | X | X | X | X | X | X | X |


|  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| A | $\infty$ | $\cdots$ | $\pm$ | Portions of walkway are bidden from view (crime potential). |
| $\star$ | $\cdots$ | un | cos | ```Overcrossing/under-- crossing is not close to public transportation stop.``` |
| be | cos | un | 0 | No sidewalk at end condition. |
| $x$ | $\infty$ | on | cos | Parked cars restrict approach. |
| $\pm$ | os | on | $\omega$ | Parked cars obstruct view of approach. |
| * | $x$ | $\times$ | $\infty$ | No accessible parking. |
| $\bigcirc$ | 08 | $\triangle$ | $\infty$ | No detectable pedestrian crosswalk to approach. |
| > | $\bullet$ | $\bullet$ | - | ```Crossing approach and entramee not wasy to find (hudden from view).``` |


| KEY <br> $X=$ No problem for this group. <br> $s=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. | $\begin{array}{r} \dot{8} \\ 5 \\ 5 \\ 8 \\ 8 \\ \hline \end{array}$ |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | X | X | X | X | X | X | X | X |
| Understanding deficit. | X | X | X | X | * | X | X | X |
| Limited attention span. | X | X | X | X | - | X | X | S |
| Memory deficit. | X | X | X | X | * | X | s | 5 |
| Decreased ability to sequence, judge time, direction, distance, size. | X | X | X | X | - | X | $s$ | S |
| Impaired night vision. | X | X | X | X | - | X | S | $s$ |
| Impaired cutaneous sensation detection. | S | S | S | S | X | X | X | X |
| Chronic stooped posture. | X | X | X | X | S | X | s | - |
| Difficulty in maintaining equilibrium. | S | S | S | S | S | $s$ | S | $\bullet$ |
| Moves at slow speed. | X | X | X | X | X | X | S | - |
| Swaying, shuffling, uneven, eratic or staggering gait. | 5 | S | S | S | S | X | X | - |
| Frequent need to rest during exercise. | X | S | X | X | S | X | X | * |


| KEY <br> $X=$ No problem for this group． <br> $s=$ solution for this problet is knowi． <br> $=$ Solution for this problem is not known． |  |  |  | Step（isettement）between approach and structure． |  |  | 5 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Reduc&m rolerance to brisk exarcise (need to move slowiy).``` | X | 8 | X | X | 5 | X | $s$ | ¢ |
| Limited ability Lo stand For long periods． | X | X | X | X | $\$$ | 学 | 5 | ＊ |
| Impaixed bjaduer conemol． | X | X | X | X | X | X | X | ¢ |
| Extreme of size（dwarfism， giantism，obesfty，etc．）． | S | \＄ | 5 | S | X | X | X | ¢ |
| Cardiac Pacemaker affected by electrical interference． | X | X | X | X | X | X | X | － |
| Uses powered or manal wheelchair． | S | S | S | 5 | 5 | X | S | 6 |
| Uses walker，crutches， orthopedic cane． | 5 | 5 | 5 | \＄ | 5 | \＄ | S | ＊ |
| ```Mrosthesis fincluting braces) for lower extremitues.``` | 5 | 5 | 5 | 3 | \＄ | 5 | 5 | ＊ |
| Decreased ablisty to tole Fata smoke，duse，chemicals， pollens，cole winds． | X | X | X | X | X | X | \％ | X |
| Limited ability to grasp， release or manipulate with upper extremitites（arms， wrist，hands）． | X | X | X | X | 5 | X | X | X |
| Limited reach． | X | X | X | X | S | X | X | X |


| KEY <br> $X=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． | \|r |  | $\begin{aligned} & \text { Curb greater than } \\ & 6^{\prime \prime}(\text { too } h \mathrm{~h} h \mathrm{~g}) \text {. } \end{aligned}$ |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity． | X | X | X | X | s | X | X | X |
| Inability to turn head． | X | X | X | X | 5 | ＊ | X | X |
| Decreased ability to stoop． | X | X | X | X | X | X | X | X |
| Difficulty standing from sitting position，or in sitting down． | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet． | X | \＄ | S | X | $s$ | X | S | ＊ |
| Limited horizontal motion with legs and feet． | S | S | \＄ | S | \＄ | X | $s$ | ＊ |
| Decreased ability to tolerate heat and cold． | X | X | X | X | X | X | X | X |
| Speech disorder． | X | x | X | \％ | X | X | X | X |
| Loss of normal speed in motor coordination／slowed reflexes． | X | X | x | X | 5 | X | X | X |
| Feax of crime． | X | X | X | X | X | X | X | X |
| Fear of heights（vertigo）． | － | ＊ | X | X | X | X | X | X |
| Agoraphobia． | － | x | X | X | $x$ | X | X | X |
| Claustrophobla． | X | X | X | X | X | X | X | X |
| Fear of loud noises． | X | X | X | X | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $s=$ Solution for this problem is known. <br> - Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guldance (visually impaired). | X | X | X | X | - | X | S | X |
| Uses guide dog. | X | X | X | X | * | X | $s$ | X |
| Limited ability to acquire or process visual stimuli. | x | X | X | X | - | X | S | X |
| Limited ability to perceive or process auditory stimuli. | X | X | X | X | X | X | X | X |


| KEY <br> $X=$ No problem for this group. <br> $s$ = Solution for this problem is known. <br> $=$ Solution for this problem ia not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | X | X | X | X | X | 8 | X | X |
| Understanding deficit. | X | X | X | X | \% | X | X | x |
| Limited attention span. | X | X | X | x | X | X | X | X |
| Memory deficit. | \% | X | X | X | \$ | X | X | X |
| Decreased ability to sequence, judge time, direction, distance, size. | 5 | X | X | X | 5 | S | 5 | \$ |
| Impaired night vision. | S | \$ | 5 | * | S | 3 | S | s |
| Impaired cutaneous sensation detection. | S | S | 5 | X | X | S | \$ | 5 |
| Chronic stooped posture. | X | X | X | X | 5 | X | X | X |
| Difficulty in maintaining equilibrium. | s | S | S | 5 | $s$ | s | S | S |
| Moves at slow speed. | X | x | $x$ | s | X | $s$ | X | \% |
| Swaying, shuffling, uneven, eratic or stag gering gait. | s | S | S | 5 | X | S | \$ | S |
| Frequent need to rest during exercise. | X | X | X | S | X | X | X | X |


| KEY <br> $X=$ No problem for this group. <br> $s=$ Solution for this problem is knowm. <br> = Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise (need to move slowly). | X | X | X | S | 3 | X | X | X |
| Limited ability to stand for long periods. | X | X | X | S | X | X | x | X |
| Impaired bladder contro. | X | X | X | X | X | X | X | x |
| Extreme of size (dwarfism, giantism, obesity, etc.). | \% | X | X | S | X | X | 3 | X |
| Cardiac Pacmaker affected by electrical interference. | X | X | X | X | $X$ | X | X | x |
| Uses powered or manual whee1chair. | 5 | S | $s$ | \$ | S | S | 5 | S |
| Uses walker, crutches, orthopedic cane. | 5 | 5 | \$ | S | S | 3 | S | $s$ |
| Prosthests (including braces) for Iower extremities. | 5 | S | S | S | 5 | \% | $s$ | $s$ |
| Decreased ability to tolerate smoke, dust, chemicals pollene, cold winds. | X | X | X | X | X | X | X | X |
| Limited ability to grasp, release or manipulate with upper extremities (arms, wrist, hands). | X | X | X | X | X | X | * | X |
| Limited reach. | X | x | X | x | x | X | X | x |


| $\begin{aligned} & \text { KEY } \\ & X= \text { No problem for } \\ & \text { this group. } \\ & S= \text { Solution for this } \\ & \text { problem in known. } \\ &= \text { Solution for this } \\ & \text { problem is not known } \end{aligned}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity | x | X | X | 8 | X | X | X | X |
| Inability to turn head． | X | X | X | X | X | S | X | X |
| Decreased ability to stoop． | X | ＊ | X | X | X | X | X | X |
| Di吾iculty कtanding from sitting positian，or in sitting down． | \％ | X | X | X | X | 8 | X | ＊ |
| Limited vertical motion with legs and feet． | 5 | \＄ | S | S | 9 | S | S | S |
| Limited horizoutal motion with legs and feet． | 5 | 5 | S | 9 | \％ | 5 | \＄ | \＄ |
| Decreased ability to tolerate heat and cold． | X | X | X | X | 癷 | X | X | X |
| Speech disorder． | X | X | X | X | X | X | X | X |
| Loss of normal speed in motor coordination／slowed reflexes． | S | 5 | S | S | X | S | S | § |
| Fear of crime． | X | X | $X$ | \％ | X | ＊ | X | ＊ |
| Fear of heights（vertigo ． | X | X | 5 | X | X | 5 | X | X |
| Agoraphobia． | X | X | X | $X$ | X | X | X | X |
| Claustrophobia． | X | X | X | X | X | X | X | X |
| Fear of lowd noises． | X | 踽 | X | X | X | X | X | x |


| KEY <br> $x=$ No problem for this group. <br> $S=$ Solution for this <br> - problem is known. <br> - Solution for this probien is nct known. |  |  |  |  |  |  <br>  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance (visually impaired). | S | S | \$ | - | S | X | S | x |
| Uses guide dog. | S | $s$ | $s$ | s | \$ | X | $s$ | X |
| Limited ability to acquire or process visual stimuli. | S | S | S | - | 5 | 5 | $s$ | X |
| Limited ability to perceive or process auditory stimuli. | X | X | X | X | X | X | X | X |


| KEY $\begin{aligned} \mathrm{X}= & \text { No problem for } \\ & \text { this group. } \\ \mathrm{S}= & \text { Solution for this } \\ & \text { problem is known. } \\ = & \text { Solution for timis } \\ & \text { problem is not known. } \end{aligned}$ |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | X | X | X | X | X | X | \% | X |
| Understanding dedicit* | x | X | X | S | X | X | * | X |
| Limited attention span. | \$ | S | X | 5 | S | * | * | X |
| Memory deficit. | X | X | X | X | X | * | * | $X$ |
| Decreased ablluty to sequence, judge cime, direction, distance, size. | 5 | X | X | S | X | X | $\checkmark$ | S |
| Impaired night vision. | 5 | S | S | S | 5 | 0 | e | S |
| Impaired cutaneous sensation detection. | X | X | X | X | $\chi$ | 0 | - | S |
| Chronic stooped posture. | X | X | X | S | X | X | X | X |
| Diesteuley in mann taining equilibrikm. | 5 | X | X | 5 | 5 | * | 6 | 5 |
| Moves at slow speed. | X | $x$ | X | 5 | X | \% | X | $X$ |
|  uneven, eratic or stagm gering gatt, | S | $X$ | X | \$ | \$ | \% | * | S |
| Frequent need to rest during exercise. | X | X | X | S | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise（need to move slowly）． | X | X | X | S | X | X | X | X |
| Limited ability to stand for long periods． | X | X | X | X | X | X | $X$ | X |
| Impaired bladder control． | X | X | X | X | X | X | X | X |
| Extreme of size（dwarfism， giantism，obesity，etc．）． | X | X | X | S | X | X | X | X |
| Cardiac Pacemaker affected by electrical interference． | X | X | X | X | स | X | X | X |
| Uses powered or manual wheelchair． | S | X | S | S | 5 | $\leqslant$ | － | $s$ |
| Uses walker，crutches， orthopedie cane． | S | X | S | s | S | $\bullet$ | ＊ | s |
| Prosthesis（including braces）for lower extremities． | S | X | S | $s$ | S | － | ＊ | \＄ |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winds． | X | X | X | X | X | X | X | ＊ |
| Fimited abllity to grasp， release or manipulate with upper extremities（arms， zist，hands）． | X | X | X | S | X | X | 8 | 区 |
| Limited reach． | X | X | X | \＄ | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $S=$ Solution for this problem is known. <br> = Solution for this problem is not known |  |  |  | $\begin{aligned} & 5 \\ & 0 \\ & 0 \\ & 0 \\ & \tilde{0} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity. | X | X | X | S | X | X | X | X |
| Inability to turn head. | S | X | X | S | X | X | X | X |
| Decreased ability to stoop. | X | X | X | X | X | X | X | X |
| Difficulty standing from sitting position, or in sitting down. | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet. | S | X | X | S | S | - | $\bullet$ | S |
| Limited horizontal motion with legs and feet. | S | X | X | S | S | $\bullet$ | $\bullet$ | S |
| Decreased ability to tolerate heat and cold. | X | X | X | X | X | X | X | X |
| Speech disorder. | X | X | X | X | X | X | X | X |
| Loss of normal speed in motor coordination/slowed reflexes. | S | X | X | S | S | $\bullet$ | $\bullet$ | S |
| Fear of crime. | X | X | X | X | X | X | X | X |
| Fear of heights (vertigo). | X | X | X | X | X | X | X | X |
| Agoraphobia. | X | X | X | X | X | X | X | X |
| Claustrophobia. | X | X | X | X | X | X | X | $X$ |
| Fear of loud noises. | X | X | X | X | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> ＝Soultion for this problem is not known． |  |  |  <br> 名 <br> H <br> 品 <br> 8 <br> 髹总 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environ－ mental orientation． | X | X | X | X | X | X | － | X |
| Understanding defieit． | X | X | X | X | x | X | X | X |
| Limited attention span． | X | X | x | x | x | X | X | X |
| Memory deficit． | x | X | X | X | X | X | X | x |
| Decreased ability to sequence，judge time， direction，distance， size． | X | X | X | x | $\cdots$ | X | X | X |
| Impaired night vision． | x | x | X | X | X | X | X | X |
| Tmpaired cutaneous sensation detection． | X | ＊ | X | ＊ | X | X | X | X |
| Chronie stooped posture． | X | X | X | X | ＊ | X | X | X |
| Difficulty in main－ taining equilibrium． | － | $\bullet$ | X | － | － | X | S | S |
| Moves at slow speed． | X | X | X | X | 0 | X | X | X |
| Swaying，shuffling， uneven，eratic or stag－ gering gait． | － | ＊ | X | ＊ | － | X | S | X |
| Frequent need to rest during exercise． | － | － | X | － | ＊ | X | 5 | S |


| KEY <br> $X=$ No problem for this group. <br> $S=$ Solution for this problem is known. <br> = Solution for this problem is not known. |  |  |  | $\begin{aligned} & \text { E} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  | $\begin{array}{r} \cdot(\cdot כ 7 a \text { 'pues 'fənexi } \\ \text { səכefins fjos pue əsoot } \end{array}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance (visually impaired). | S | X | S | S | S | $\bullet$ | - | S |
| Uses guide dog. | S | S | S | S | S | - | - | S |
| Limited ability to acquire or process visual stimuli. | S | S | S | S | S | - | - | S |
| Limited ability to perceive or process auditory stimuli. | X | X | X | X | X | X | X | X |


| ```X=No problem for this group. S =emolution for this problem js knowm. * Solution for this problem is not known.``` |  <br> 0 <br> 8 <br>  <br>  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Reduced tolerance to brisk exercise (need to move slowly)*``` | * | - | X | $*$ | $\theta$ | 登 | 5 | 5 |
| Limited ability to stand for long periods. | * | X | X | X | * | X | \$ | S |
| Impatied bladder control. | X | X | \% | \% | ¢ | X | \% | X |
| Extreme of size (dwarfism, giantism, obesity, etc*). | X | * | 5 | * | $\bullet$ | X | X | X |
| Cardiac Pacemaker affected by electrical interference. | X | X | X | X | $\bigcirc$ | X | X | X |
| Uses powered or mandal wheelchatw. | 参 | ¢ | 5 | 6 | E | $S$ | - | 5 |
| Uses walker, crutches, orthopedic cane. | - | * | X | $\cdots$ | 0 | 5 | $\cdots$ | S |
| ```Prosthesis (including braces) for lower extremities.``` | 6 | - | * | * | - | X | $\bullet$ | S |
| Decreased ability to cole rate smoke, tust, chemicals, pollens, cold winds. | X | X | * | X | X | X | K | X |
| Limited ability to grasp, release or manipulate with upper extremities (arms, wrist, hands). | X | X | * | X | X | X | X | X |
| Livitued reach. | \% | X | * | X | X | X | X | X |


| KEY <br> $X=$ No problem for this group． <br> $s=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  |  | 篤 0 0 <br> ह <br> 总 <br> $8 气$ <br> 言皆 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity． | X | X | X | X | X | X | X | X |
| Inability to turn head． | x | X | X | X | X | \％ | x | X |
| Decreased ability to stoop． | X | X | X | X | X | X | X | X |
| Difficulty standing from sitting position，or in sitting down． | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet． | － | ＊ | X | ＊ | － | $\$$ | ＊ | \＄ |
| Limited horizontal motion with legs and feet． | X | ＊ | X | ＊ | ＊ | 5 | － | 5 |
| Decreased ability to tolerate heat and cold． | X | X | X | X | X | X | X | X |
| Speech disorder， | X | X | X | X | X | X | x | x |
| Loss of normal speed in motor coordination／slowed reflexes． | X | X | X | X | x | X | X | X |
| Fear of crime． | X | X | X | X | X | x | X | X |
| Fear of heights（vertigo）． | X | X | X | X | X | x | － | X |
| Agoraphobia． | X | x | X | X | X | X | X | X |
| Claustrophobia． | X | X | － | X | X | \％ | X | X |
| Fear of loud notses． | $x$ | X | x | X | X． | X | x | x |


| KEY <br> $\mathrm{X}=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  <br> 0 $\stackrel{0}{5}$ -1 <br> 옹 <br> 0 <br> $\underset{\sim}{0}$ |  |  <br> 3 <br> ت゙ $\stackrel{0}{6}$弟婜 |  |  | 品 0 0 을 3 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance （visually impaired）． | X | X | X | $\bullet$ | X | X | X | － |
| Uses guide dog． | X | X | X | － | X | X | X | $\bullet$ |
| Limited ability to acquire or process visual stimuli． | X | X | X | $\bullet$ | X | X | X | － |
| Limited ability to per－ ceive or process auditory stimuli． | X | X | X | X | X | X | X | X |


| KEX <br> $X=$ No problem for this group, <br> $S=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | X | X | X | X | \$ | K | \% | X |
| Understanding defieit. | X | x | X | X | - s | X | X | X |
| Limited attention span. | X | X | X | X | 8 | \% | X | X |
| Nemory deficit. | X | X | \% | X | X | X | 4 | X |
| Decreased abllity to sequence, judge time, direction, distance, size. | X | X | $\pm$ | X | $\$$ | \$ | X | \$ |
| Impaired night vision. | X | X | x | X | S | 5 | S | S |
| Tmpaired cutaneous sensation detection. | S | X | X | X | S | X | X | * |
| Chronic stooped posture. | X | X | X | X | X | X | \% | X |
| Difficulty in maintaining equilibrium. | $s$ | S | S | - | X | S | 3 | \$ |
| Moves at slow speed. | X | S | X | x | X | X | X | x |
| Swaying, shuffling, uneven, eratic or staggering gait. | X | S | 5 | - | S | X | X | X |
| Frequent need to rest during exercise. | X | X | S | $\cdots$ | X | X | X | X |


| KEY <br> $X=$ No problem for the group. <br> $s=$ Solution for this problem is know. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise (need to move slowly). | X | X | \$ | * | X | X | X | X |
| Limited ability to stand for long periods. | S | 5 | S | - | X | X | X | X |
| Impaired bladder control. | X | X | X | X | X | x | x | \% |
| Extreme of size (dwarfism, giantism, obesity, etc.). | S | X | X | * | X | X | X | X |
| Cardiac Pacemaker affected by electrical interference. | X | X | X | X | X | X | X | X |
| Uses powered or manual wherlchair. | s | S | X | X | X | \$ | S | 5 |
| Uses walker, crutches, orthopedic cane. | $s$ | 5 | S | * | X | * | X | X |
| Prcsthesis (including braces) for lower extremities. | 5 | 5 | \$ | - | X | X | X | X |
| Decreased abillty to tolerate smoke, dust, chemicals, pollens, cold winds. | X | X | X | X | x | X | X | * |
| Limited ability to grasp, release or manipulate with upper extremities (arms, rist, hands). | S | S | $s$ | $\bullet$ | X | X | X | X |
| Limited reach. | X | 5 | s | x | X | * | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $S=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  | Barricades not detectable (blind cane). | $\stackrel{\rightharpoonup}{\text { en }}$ <br>  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity. | S | S | S | - | X | X | X | \% |
| Inability to turn head. | X | x | X | X | X | X | X | x |
| Decreased ability to stoop. | x | X | X | X | X | X | X | X |
| Difficulty standing from sitting position, or in sitting down. | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet. | 8 | S | X | - | X | x | X | X |
| Limited horizontal motion with legs and feet. | X | X | S | - | X | X | X | X |
| Decreased ability to tolerate heat and cold. | 又 | X | X | X | X | X | X | \% |
| Speech disorder. | x | x | X | X | X | X | X | X |
| Loss of normal speed in motor coordination/slowed reflexes. | 5 | 8 | \$ | - | x | \$ | S | \$ |
| Fear of crime. | x | x | X | x | X | X | X | X |
| Fear of heights (vertigo). | X | X | X | - | X | X | X | * |
| Agoraphobia. | X | X | X | X | X | X | X | X |
| claustrophobia. | X | X | X | X | X | X | x | X |
| Fear of loud noises. | X | X | X | X | X | X | X | X |


| ```KEY X =m No problem for thus group. S Solution tor this problam is known. "Solutaon for this prodien is not known.``` |  |  |  |  |  |  |  | $\begin{aligned} & \text { No pedestrian } \\ & \text { guardrallat. } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance (visually impaired). | S | 5 | S | $\cdots$ | S | \$ | X | 5 |
| Useg guide dog. | S | 5 | X | X | X | X | X | $\$$ |
| Limited ability to acquire or process visual stimuli. | S | X | S | $\cdots$ | 5 | S | S | 8 |
| Limited abllity to percetve or process auditory stimuli. | X | X | X | X | \% | X | X | X |


| KEY ```X = No problem for this group. 3 = Salution for this problem is known. = Solution for this problem is not known.``` |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environ－ mental orientation． | ＊ | － | X | S | X | X | X | X |
| Understanding deficit． | X | X | 5 | 5 | X | X | X | X |
| Limited attention span， | $X$ | X | X | 5 | X | X | X | X |
| Memory defxelt． | $x$ | X | X | X | X | X | X | X |
| Decreased ability to sequence，julge time， direction，distance， size． | X | X | X | 3 | X | X | X | 永 |
| Impaired night viston． | S | $\bullet$ | S | 5 | X | $X$ | X | X |
| Impaired cutaneous sensation detection． | X | X | X | X | X | X | X | X |
| Chronic stooped poature． | X | X | $X$ | X | X | X | \％ | $X$ |
| Difficulty in main－ taining equilibrium． | S | 5 | X | S | 薥 | 4 | $\checkmark$ | S |
| Woves at slow speed． | X | X | X | 8 | X | X | $\cdots$ | X |
| Swaying，shufting， uneven，eratic or stag－ gering gatt． | 哭 | X | X | X | X | X | ＊ | X |
| Frequent need to rest during exercise＊ | X | X | X | X | X | 䎓 | X | X |


| ```KEW X No problem for this group. S = Solution for this problem is known* = Soluthon for thim problem is not knowm.``` |  |  |  | $\begin{aligned} & \text { Steps in the middle } \\ & \text { of the ramp. } \end{aligned}$ |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise（need to move slawly）． | X | ＊ | X | x | X | X | X | X |
| Limited ablifty to stand fow long periods． | $\%$ | X | X | X | ＊ | 4 | 6 | 8 |
| Tmpared bladder control． | X | \％ | X | 䝉 | X | ＊ | X | X |
| Extreme of size（dwarfism， giantism，obesity，etc．）． | X | X | \％ | X | ＊ | $\cdots$ | ＊ | 8 |
| Cardiak Pacemaker atected by electrical interterence． | 界 | X | X | \％ | X | X | X | X |
| Uses powered ox manual wheelchair． | \＄ | $s$ | X | 5 | 0 | 0 | 0 | 5 |
| Uses walker，crutches， orthopedic cane． | 5 | X | X | $\$$ | ＊ | － | ＊ | S |
| ```Prosthesiss (including braces) for lower extsemities.``` | 5 | K | X | X | $\bullet$ | $\cdots$ | $\bullet$ | 5 |
| Lecreased ability to cole－ rate smoke，dust，chemicals， pollens，cold winds． | X | X | X | X | X | 8 | 盛 | X |
| Limited ability to grasp： release or manipulate with upper extremíties（arms， wrist，hamels） | X | X | X | 3 | $\bullet$ | ＊ | ¢ | 5 |
| Limited reach． | x | X | X | S | ＊ | ＊ | X | X |


| KEY <br> $X=$ No problem for this group． <br> $\mathrm{S}=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity． | x | X | X | X | ＊ | ＊ | $\bullet$ | $s$ |
| Inability to turn head． | X | X | X | X | X | X | X | X |
| Decreased ability to stoop． | X | ＊ | X | X | X | X | X | X |
| Difficulty standing from sitting position，or in sitting down． | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet． | S | s | X | S | 0 | 0 | 0 | $s$ |
| Limited horizontal motion with legs and feet． | S | S | X | 5 | X | X | X | X |
| Decreased ability to tolerate heat and cold． | X | ＊ | X | X | X | X | x | X |
| Speech disorder． | X | X | X | X | X | X | X | X |
| Loss of normal speed in motor coordination／slowed reflexes． | 3 | S | X | S | － | － | ＊ | S |
| Fear of crime． | X | x | X | x | X | x | $X$ | X |
| Fear of heights（vertigo）． | x | X | X | X | X | X | X | X |
| Agoraphobia． | X | X | X | X | X | X | X | X |
| Claustrophobia． | X | X | X | X | X | X | $\chi$ | X |
| Fear of loud noises． | $X$ | X | X | X | X | X | X | X |


| KEY <br> $X=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problen is not knowz． |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance （visually impaired）． | － | － | $s$ | 5 | X | X | X | X |
| Uses guide dog． | － | － | S | S | X | X | X | X |
| Limited ability to acquire or process visual stimuli． | － | $\bullet$ | $s$ | S | X | X | X | X |
| Limited ability to per－ ceive or process auditory stimuli． | X | X | X | X | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $\mathrm{S}=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | S | X | - | S | - | S | X | X |
| Understanding deficit. | S | X | X | X | x | S | - | X |
| Limited attention span. | S | X | X | x | X | S | X | X |
| Memory deficit. | S | X | X | X | X | S | X | X |
| Decreased ability to sequence, judge time, direction, distance, size. | S | X | $\bullet$ | S | - | S | S | X |
| Impaired night vision. | S | - | - | S | - | S | X | X |
| Impaired cutaneous sensation detection. | X | - | X | X | X | S | X | X |
| Chronic stooped posture. | S | X | X | X | X | S | X | X |
| Difficulty in maintaining equilibrium. | S | $\bullet$ | $\bullet$ | S | S | S | X | X |
| Moves at slow speed. | x | X | x | X | X | S | S | S |
| Swaying, shuffling, uneven, eratic or staggering gait. | S | X | - | S | S | S | S | X |
| Frequent need to rest during exercise. | X | X | X | X | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $S=$ Solution for this problen is known. <br> = Solution for this problem is not known. |  |  |  |  |  | Unprotected sidewalks (cars, edges, etc.). |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Reduced tolerance to brisk exercise (need to move slowly)*``` | X | X | X | X | X | S | 5 | X |
| Limited ability to stand for long periods. | X | X | X | X | X | S | s | X |
| Impaired bladder control. | X | X | X | x | X | X | X | X |
| Extreme of size (dwartism, giantism, obesity, etc.). | X | X | X | X | X | X | $s$ | S |
| Cardiac Pacemaker affected by electrical interference. | X | X | X | X | X | X | X | X |
| Uses powered or manual wheelchair. | S | - | * | 8 | $s$ | \$ | \$ | S |
| Uses walker, crutches, orthopedic cane. | S | X | $*$ | S | S | $s$ | \$ | X |
| Prosthesis (including braces) for lower extremities. | S | X | X | X | X | 5 | S | X |
| Decreased ability to tolem rate smoke, dust, cheraicals pollens, cold winds. | X | X | X | X | X | X | X | X |
| Limited ability to grasp, release or manipulate with upper extremities (arms, wrist, hands). | 5 | X | X | X | X | X | 3 | § |
| Limited reach. | s | X | X | X | X | X | S | S |


| KEY <br> $X=$ No problem for this group. <br> $s=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  | 品 <br> i |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity. | s | X | X | X | X | X | $s$ | 5 |
| Inability to turn head. | s | X | - | $s$ | S | 5 | X | X |
| Decreased ability to stoop. | X | X | X | X | X | X | X | X |
| Difficulty standing from sitting position, or in sitting down. | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet. | X | X | X | X | X | $s$ | S | X |
| Limited horizontal motion with legs and feet. | x | X | X | x | X | S | S | S |
| Decreased ability to tolerate heat and cold. | x | X | X | X | X | X | X | X |
| Speech disorder. | X | X | X | x | 8 | X | X | X |
| Loss of normal speed in motor coordination/slowed reflexes. | X | * | X | X | X | 8 | 5 | 5 |
| Fear of crime. | X | X | X | X | \% | X | X | * |
| Fear of heights (vertigo). | s | * | X | x | X | S | s | $\bullet$ |
| Agoraphobia. | x | X | X | - | * | $s$ | X | X. |
| Claustrophobia. | X | x | X | X | X | X | X | S |
| Fear of loud noises. | x | X | X | - | - | - | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $S=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance (visually impaired). | 8 | - | * | s | - | S | 5 | X |
| Uses guide dog. | S | * | * | 5 | - | $s$ | 5 | X |
| Limited ability to acquire or process visual stimuli. | S | * | - | s | - | 5 | 5 | X |
| Limited ability to perceive or process auditory stimuli. | X | X | * | s | $s$ | $s$ | X | X |


| KEY <br> \％No problew for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environ－ mental orientation． | X | X | 5 | X | $\leqslant$ | X | S | S |
| Undermtanding deficit． | X | 8 | X | X | 5 | X | 8 | X |
| Limited aftention span． | X | X | \％ | X | 8 | $X$ | X | X |
| Memory deficit＊ | X | X | X | X | S | 争 | S | $x$ |
| Decreased abtlity to sequence，judge time， direction，distance， size． | X | 5 | X | X | S | － | 8 | \＄ |
| Impaired night vision． | \％ | X | x | X | S | X | 5 | 5 |
| Impaired cutaneous sensation detection． | $\$$ | X | X | X | \％ | X | X | X |
| Chronic stooped posture． | X | $s$ | X | 8 | S | X | S | X |
| Dufinculty in mainm tainirg equilibrium． | X | S | X | S | 5 | $\leqslant$ | 5 | 5 |
| Moves at slow speed． | X | 5 | X | S | 5 | － | X | x |
| Swaying，shuffling， uneven，eratic or stag－ gering gait． | X | S | X | S | 3 | X | S | S |
| Frequent need to rest during exexeise． | S | 3 | X | 5 | \＄ | － | X | X |


| KEY <br> $X=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  |  |  | 害 <br> 苔 <br> 눈 <br> 管昜 <br> 옹․․․ <br>  |  | 8 6 6 6 6 <br>  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise（need to move slowly）． | S | s | X | S | s | X | X | X |
| Limited ability to stand for long periods． | $s$ | $s$ | X | $s$ | S | － | X | X |
| Impaired bladder control． | s | 5 | x | X | X | － | X | X |
| Extreme of size（dwarfism， giantism，obesity，etc．）． | X | S | X | S | X | X | X | X |
| Cardiac Pacemaker affected by electrical interference． | $s$ | S | X | S | X | － | X | X |
| Uses powered or manual wheelchatr． | S | S | X | X | S | ＊ | X | X |
| Uses walker，crutches， orthopedic cane． | S | 5 | X | 5 | S | － | X | X |
| Prosthesis（including braces）for lower extremities． | S | S | X | S | S | ＊ | X | X |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winds． | s | s | x | X | x | ＊ | X | ＊ |
| Limited ability to grasp， release or manipulate with upper extremities（arms， wrist，hands）． | X | X | X | X | X | X | X | X |
| Limited reach． | x | X | X | X | X | $x$ | X | ＊ |


| kEY <br> X－No problem for this group． <br> $\mathrm{S}=$ Solution for this problem is known． <br> －Solution for this problem is not known． |  | $\stackrel{8}{8}$令花点若葉会 |  |  |  |  <br>  |  | 会 <br> 巷品品 표 \％出等等㤩㖇 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity． | X | X | X | X | X | X | X | X |
| Inability to turn head． | x | X | x | X | X | X | X | X |
| Decreased ability to stoop． | X | X | X | S | X | X | X | X |
| Difficulty standing from sitting position，or in sitting down． | S | S | X | S | X | X | X | X |
| Limited vertical motion with legs and feet． | x | s | X | S | X | X | X | K |
| Limited horizontal motion with legs and feet． | X | S | X | X | s | X | X | X |
| Decreased ability to tolerate heat and cold． | S | S | X | x | X | ＊ | X | x |
| Speech disorder． | X | x | X | X | X | X | X | X |
| Loss of normal speed in motor coordination／slowed reflexes． | X | X | X | S | $s$ | － | S | S |
| Fear of crime． | X | X | X | X | x | \％ | ＊ | － |
| Fear of heights（vertigo）． | X | X | X | X | X | X | X | X |
| Agoraphobia． | X | X | X | X | X | X | X | X |
| chaustrophobia． | x | X | X | X | X | X | － | － |
| Fear of loud noises． | $X$ | X | x | X | X | X | x | X |


|  |  | Unes guide dog. |  |  |
| :---: | :---: | :---: | :---: | :---: |
| * | m | N | 浐 | Resting places not under cover (wind, rain, sun). |
| $\cdots$ | $\cdots$ | $\pm$ | 凶 | Not enough places to stop and rest. |
| St | * | * | d | No provistion for semic overlook. |
| $x$ | $\omega$ | th | ts | Benches too high or low, too deep or shallow, or with no armrest. |
| $\cdots$ | 4 | * | n | No alternative route for flood condition structures. |
| $\geqslant$ | $\mathrm{Na}_{4}$ | * | - | No pedestrian emergency provistons. |
| * | th | $\pm$ | $\infty$ | Signtifleant change of light: level in tmmel at entrance. |
| $x$ | th | $x$ | $\cdots$ | Intertor Llighting not adjusted to outside light conditions. |


| KEY <br> $x=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． | 崇 <br> 茄 <br> 敞． <br>  | $\begin{gathered} \stackrel{8}{\Xi} \\ \text { H } \\ \text { E } \\ \text { E } \\ \text { B } \end{gathered}$ |  |  |  | 俞 <br> 8． <br> 等 <br> 䓜 8 |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environ－ mental orientation． | 8 | s | － | S | ＊ | 5 | X | ＊ | ＊ |
| Understandigg deficit． | X | S | － | X | ＊ | \＄ | x | \％ | ＊ |
| Limited attention span． | X | S | － | \＄ | ＊ | 8 | ＊ | X | － |
| Memory deficit． | X | S | ＊ | $s$ | － | S | X | X | ＊ |
| Decreased ability to sequence，judge time， direction，distance， size． | \＄ | s | ＊ | S | 8 | S | X | － | ＊ |
| Impaired night vision． | S | S | － | S | s | － | － | ＊ | － |
| Impaired cutaneous sensation detection． | X | 8 | X | S | X | X | X | X | X |
| Chronic stooped posture． | X | \＄ | X | S | 9 | 5 | X | ＊ | S |
| Difficulty in main－ taining equilibrium． | \＄ | \＄ | ＊ | $s$ | x | X | X | ＊ | s |
| Moves at slow speed． | x | X | X | x | s | 5 | x | ＊ | $s$ |
| Swaying，shuffing， uneven，eratic or stag＂ gering gatt． | s | \＄ | ＊ | S | S | $s$ | X | ＊ | \＄ |
| Frequent need to rest during exercise． | X | 5 | X | s | S | S | X | － | $s$ |


| REY <br> $X=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> $=$ Solution for this problem is not known． |  |  |  |  |  | 荡 <br> 8 药盆出出管点 |  | $\frac{4}{4}$ $\frac{8}{6}$ <br> 畾 <br> H $\frac{5}{60}$ － 0出需 H |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise（need to move slowly）． | X | S | X | \＄ | \＄ | $s$ | X | $\bullet$ | 8 |
| Limited abillty to stand for long periods． | 5 | S | X | 5 | \＄ | s | X | － | \＄ |
| Impaired bladder control． | X | X | X | X | 5 | S | X | x | X |
| Extreme of size（dwarfism， giantism，obesity，etc．）． | X | S | X | S | X | 5 | X | － | X |
| Cardiac Pacemaker affected by electrical interference． | X | S | － | S | S | S | X | $\cdots$ | X |
| Uses powered or manual wheelchair． | X | S | ＊ | 5 | 5 | 5 | X | ＊ | S |
| Uses walker，crutches， orthopedic cane． | X | S | ＊ | S | 5 | $s$ | X | － | S |
| Prosthesis（including braces）for lower extremities． | X | S | $\cdots$ | 8 | 8 | 5 | X | ＊ | 5 |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winds． | X | X | X | X | 5 | \＄ | X | X | X |
| Limited ability to grasp， release or manipulate with upper extremities（arms， wrist，hands）． | X | S | X | S | X | X | X | X | X |
| Limited reach． | X | $s$ | X | S | X | X | X | X | X |


| KEY <br> $\mathrm{X}=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> －Solution for this problem is not known． |  | $\begin{aligned} & 8 \\ & 8 \\ & \text { ت } \\ & \text { g } \\ & \text { E } \\ & \hline \end{aligned}$ |  |  | No signage fndicating location of test areas． |  |  | $\begin{array}{r}4 \\ \frac{2}{6} \\ \hline\end{array}$ <br> $\frac{5}{3}$ <br> 梁皆 $-1$ $\stackrel{0}{0}$ <br> 萢 <br> H |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity． | X | S | X | 5 | X | X | X | X | X |
| Inability to turn head． | X | S | ＊ | S | X | S | X | $\cdots$ | S |
| Decreased ability to stoop． | X | 5 | ＊ | $s$ | S | X | X | X | X |
| Difficulty standing from sitting position，or in sutting down． | X | X | X | X | X | X | X | X | X |
| Limited vertical motion with legs and feet． | X | \＄ | － | \＄ | S | § | X | － | 5 |
| Limited horizontal motion with legs and feet． | 5 | S | － | S | \＄ | X | X | ＊ | s |
| Decreased ability to tolerate heat and cold． | X | X | X | X | S | X | X | X | X |
| Speech disorder． | X | X | X | X | X | X | X | X | － |
| Loss of normal speed in motor coordination／slowed reflexes． | S | \＄ | ＊ | 5 | S | S | X | ＊ | S |
| Fear of crime． | － | － | ＊ | ＊ | X | X | X | X | 5 |
| Fear of heights（vertigo）． | X | X | X | X | X | X | X | X | $\bigcirc$ |
| Agoraphobia， | x | $x$ | X | \％ | X | X | X | x | － |
| Claustrophobia． | X | － | X | － | X | X | X | X | ＊ |
| Fear of loud noises． | X | x | X | X | X | X | X | X | X |


|  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| \% | $\omega$ | $\cdots$ | b | Glare at end of tunnel. |
| $\infty$ | 5 | $\cdots$ | $\star$ | Tunel too dark. |
| * | $\bullet$ | - | * | Glare and flashing <br> 1ights from vehicles. |
| $\omega$ | a | $\infty$ | 0 | Poor <br> 114matation. |
| to | - | - | - | No signage indicating location of rest areas. |
| - | * |  | - | Street signs too high, too low or far. |
| ¢ $\times$ |  |  | * | No spectal signage for the visually impaired. |
| $\cdots$ |  |  | - | Traffle lights with short green cycle. |
| n | - |  | - | Complicated instructions on signs. |


| KEY <br> $X=$ No problem for this group. <br> $S=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | - | - | - | $\bullet$ | - | - | * |
| Understanding deficit. | - | - | - | - | - | * | $\cdots$ |
| Limited attention span. | * | - | * | x | X | - | - |
| Memory deficit. | * | * | - | $\cdots$ | - | - | X |
| Decreased ability to sequence, judge time, direction, distance, size. | * | - | * | 8 | * | S | X |
| Impaired night vision. | - | * | - | X | * | - | x |
| Impaired cutaneous sensation detection. | X | X | X | X | X | X | X |
| Chronic stooped posture. | - | \$ | $s$ | \$ | S | S | X |
| Difficulty in maintaining equilibríum. | 5 | S | S | X | X | X | X |
| Moves at slow speed. | s | S | $s$ | X | $s$ | S | X |
| Swaying, shuftling, uneven, eratic or staggering gait. | 5 | \$ | 5 | X | \$ | S | X |
| Frequent need to rest during exercise. | S | S | S | X | S | X | X |


| KEY <br> $X=$ No problem for this group． <br> $S=$ Solution for this problem is known． <br> ＝Solution for this problem is not known． |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| ```Reduced toleranca to brisk exercise (need to move slowly).``` | § | 5 | S | X | 9 | \＄ | X |
| Limited ability to stand for long periods． | S | 3 | S | X | 3 | X | X |
| Impaired bladder control． | X | X | 5 | X | S | X | X |
| Extreme of size（dwayfism， giantism，obesity，etc．）． | § | X | X | X | $x$ | X | X |
| Cardiac Pacemaker aftected by electxical interference． | 5 | X | 5 | X | X | \％ | X |
| Uses powered or manual wheelchair． | 5 | \＄ | \＄ | $S$ | 5 | X | X |
| Uses walker，crutches， orthopedie cane． | 5 | S | S | X | 5 | X | $X$ |
| ```Prosthesis (including braces) for lower extremities.``` | 5 | 8 | 5 | X | S | \％ | X |
| Decreased ability to tole－ rate smoke，dust，chemicals， pollens，cold winds． | X | X | S | X | X | X | X |
| Limited ability mo grasp， release or maniptlate with upper extremities（arms， wrist，hands）． | \＄ | $x$ | 5 | ＊ | x | X | X |
| Limited seach． | 5 | X | 5 | X | 等 | X | X |


| KEY <br> $X=$ No problem for this group. <br> $S=$ Solution for this problem is known. <br> " Solution for this probletu ls not known. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Limited manmal dexterity. | S | X | S | X | X | X | x |
| Tnability to turn head. | S | S | 3 | X | X | X | * |
| Decreased ability to stoop. | \$ | X | S | * | X | 景 | X |
| Difficulty standing from sittting position, or in sitting down. | S | X | \$ | X | X | * | * |
| Limited vertical motion with legs and feet. | 5 | S | S | X | $S$ | X | X |
| Limited horizontal motion witin legs and feet. | S | § | S | X | 5 | $X$ | X |
| Decreased ablluty to tolerate heat and cold. | X | X | X | X | X | X | X |
| Speech disordez. | $X$ | 5 | S | X | X | X | X |
| Loss of normal speed in motor cordination/showed reflexes. | 5 | $\mathfrak{\$}$ | S | X | S | X | X |
| +ear of crime. | 3 | $\bullet$ | * | X | S | X | X |
| Fear of heights (vertigo). | S | * | 5 | X | $X$ | X | X |
| Agoraphobia. | 5 | - | $\$$ | X | X | X | X |
| CLeustrophobia. | 3 | * | S | X | X | X | X |
| Fear of loud noises. | 5 | 5 | * | 8 | \% | X | * |


| KEX <br> $\mathrm{X}=$ No problem for this group. <br> $S=$ Solution for this probiem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance (visually impaired). | * | * | * | - | * | * | - |
| Uses guide dog. | - | * | - | - | * | - | * |
| Limited ability to acquire or process visual stimuli. | - | - | * | * | - | - | - |
| Limited ability to perceive or process auditory stimuli. | $s$ | S | S | X | $s$ | X | - |


| KEY <br> $X=$ No problem for this group. <br> $s=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Difficulty with environmental orientation. | - | - | S | S |
| Understanding deficit. | - | * | 5 | $s$ |
| Limited attention span. | * | - | 8 | S |
| Memory deficit. | X | X | S | s |
| Decreased ability to sequence, judge time, direction, distance, size. | - | $\bullet$ | § | S |
| Impaired night vision. | - | * | S | \$ |
| Impaired cutaneous sensation detection. | X | X | s | \$ |
| Chronic stooped posture. | - | * | S | § |
| Difficulty in maintaining equilibrium. | - | - | 5 | S |
| Moves at slow speed. | * | - | s | 5 |
| swaying, shuffling, uneven, eratic or staggeting gait. | - | * | \$ | 5 |
| Frequent need to rest during exercise. | * | * | S | S |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $s=$ Solution for this problem is known. <br> $=$ Solution for this problem is not known. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Reduced tolerance to brisk exercise (need to move slowly). | * | * | 8 | \$ |
| Limited ability to stand for long periods. | - | - | S | S |
| Impaired bladder control. | x | X | X | s |
| Extreme of size (dwarfism, glantism, obesity, etc.). | - | - | S | S |
| Cardiac Pacemaker affected by electrical interference. | X | X | X | S |
| Uses powered or manual wheelchair. | - | * | S | S |
| Vses walker, erutches, ofthopedic cane. | - | * | 5 | 3 |
| Prosthesis (including braces) for lower extremities. | - | $\cdots$ | S | S |
| Decxeased ability to tolerate smoke, dust, chemieals, pollens, cold winds. | - | * | X | x |
| limited ability to grasp, release or manipulate with upper extremities (arms, wrist, hands). | X | X | S | \$ |
| Limited reach. | X | X | $s$ | \$ |


| KEY <br> $\mathrm{X}=$ No problem for this group. <br> $s$ m Solution for this problem is known. <br> = Solution for this problem is not known. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Limited manual dexterity. | X | X | S | S |
| Inability to turn head. | * | - | S | S |
| Decreased ability to stoop. | X | X | X | S |
| Difficulty standing from sitting position, or in sitting down. | X | X | S | S |
| Limited vertical motion with legs and feet. | - | - | S | S |
| Lixited horizontal motion with legs and feet. | - | $\bullet$ | 5 | $s$ |
| Decreased abjlity to tolerate heat and cold. | * | * | X | S |
| Speech disorder. | $x$ | X | X | X |
| Loss of normal speed in motor coordination/slowed reflexes. | * | * | S | s |
| Fear of crime. | X | X | X | X |
| Fear of heights (vertigo). | X | X | X | X |
| Agoraphobia. | x | X | \% | X |
| Claustrophobia* | X | X | X | X |
| Fear of loud noises. | X | X | X | X |


| XeY <br> $\mathrm{X}=$ No problem for this groug. <br> $S=$ Solution for this problem is known. <br> $=$ Solurion for this problem is not known. |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Uses white cane for guidance (visually impaired). | * | * | S | S |
| Uses guide dog. | * | - | S | $s$ |
| Limited ability to acquire or process visual stimuli. | - | - | S | S |
| Limited ability to perceive or process auditory stimuli. | - | X | X | x |

## COST ESTIMATES

MPEDIMENTS TO REACHING END CONDITION

Alternative 1-Install signing, striping and curb cuts

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Painted X-walk stripes | 40 1.f. | \$ .09/1.f. | \$ 4 |
| Curb euts | 2 ea. | $700.00 / \mathrm{es}$. | 1,400 |
| Sidewalk | . 6 e.y. | 200.00/e.y. | 120 |
| Traffie sign and post | 1 ea. | 100.00/ea. | 100 |
|  | Contingenc |  | $\begin{array}{r} \$ 1,624 \\ 476 \end{array}$ |
|  | Total 1979 |  | \$2,100 |
| 1.f. $=$ lineal feet c.y. $=$ cubic yards. |  |  |  |

## Alternative 2-Install Traffic Signal

## COST ESTIMATE

The cost for a pedestrian acturted signal installation controlling a one-lane off ramp is $\$ 10,000$ assuming power is readily available. An isolated pedestrian actuated signal controlling a midblock crosswalk of a 4-lane roadway would cost approximately $\$ 15,000$. Fully actuated signalization of an intersection of a four lane and a two-lane road would amount to $\$ 64,000$.

## Alternative 3 - Construct Ramp Undercrossing

COST ESTIMATE


PATHWAY LEADING TO OVERCROSSING IS TOO STEEP AND/OR TOO LONG

## (2

Alternative 1-Construct new ramp with rest areas

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Construct off-path rest areas | 2 | \$500 es | \$1,000 |
| Remove existing 12.5\% grade ramp | 920 s.f. | 1/s.f. | 920 |
| Construct new ramp | 1,530 | 2/5.f | 3,060 |
| Grading and compacting | Lump sum | 500 | 500 |
| Handrail along new ramp | 360 1.f. | 15.501 .7. | 5,580 |
| Handrail along existing 8.33\% grade ramp | $1701 . f$. | 15.50/1.f. | 2,635 |
|  | Contingeneies |  | $\begin{gathered} \$ 13,695 \\ 3,405 \end{gathered}$ |
|  | Total |  | \$17,100 |
| s.f. $=$ square feet | 1.f. $=$ lineal feet |  |  |

Alternative 2-Overlay and extend ramp with rest areas

COST ESTIMATE


## Alternative 3 - Install an elevator

COST ESTIMATE


STAIRS ONLY ON APPROACH TO OVERCROSSING: STRAIGHT FLIGHT SPACE FOR RAMP ON BOTH SIDES

## Altemative 1-Construct ramp to supplement stairs

COST ESTIMATE
Assume one ramp at 8 runs.

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$ 4,500 |
| Cleaning | 1,500 s.f. | . $50 / \mathrm{s} . \mathrm{f}$. | 750 |
| Excervation | $50 \mathrm{e} . \mathrm{y}$, | 12.00/e.y. | 600 |
| Backfill | 32 c.y. | 12.00/c.y. | 384 |
| Concrete | $180 \mathrm{c} . \mathrm{y}$. | $300.00 / \mathrm{e} . \mathrm{y}$ * | 54,000 |
| Reinforcing | 54,000 lbs | . $40 / \mathrm{lb}$ | 21,600 |
| Finishes | 4,000 s.f. | . $30 / \mathrm{s}$ f. | 1,200 |
| Railings | 500 1.f. | 15.00/1.f. | 7,500 |
| Sidewalk | 400 s.f. | 1.20/s.f. | 480 |
| Landscaping/drainage | 1,500 s.f. | . $50 / \mathrm{s.f}$. | 750 |
|  |  |  | \$ 81,764 |
|  | Contingencies |  | 19,736 |
|  | Total 1979 C |  | \$111,500 |
| 1.f. = lineal feet | c.y. = cubic yards $\quad$ s.f. $=$ square feet |  |  |

Alternative 2-Install elevators to supplement stairs

COST ESTMAATE

| Item |  | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: | :---: |
| Mobilization |  | Lump sum |  | \$ 5,000 |
| Drilling |  | 40 1.f. | \$ 15.00/2. C . | 600 |
| Excavation |  | $54 \mathrm{c} . \mathrm{y}$. | 8.00/e.y. | 432 |
| Backfill |  | 32 e.y. | 12.00/e.y, | 384 |
| Concrete |  | 6 ey. | 400.00/c.y. | 2,400 |
| Reinforcing |  | 1,000 lb | $.50 / \mathrm{lb}$ | 500 |
| Structural steel |  | 18,000 lb | $1.50 / \mathrm{lb}$ | 27,000 |
| Enclosure (wire) |  | 2,000 s,f. | 5.00s.f. | 10,000 |
| Elevator (complete) |  | 2 ea | 15,000,00 ea | 30,000 |
| Equipment enclosure |  | Lump sum |  | 4,000 |
| Power hook-up |  | Lump sum |  | 1,000 |
|  |  | Contingenci |  | $\begin{aligned} & 81,316 \\ & 19,684 \end{aligned}$ |
|  |  | Total 1979 |  | \$101,000 |
| 1.f. = lineal feet s.f. $=$ square feet |  | c.y. = cubic yards |  |  |

STAIRS ONLY ON APPROACH TO OVERCROSSING: STRAIGHT FLIGHT SPACE FOR RAMP ON BOTH SIDES ONLY

Alternative 1 - Construct ramp to supplement stairs

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Curb removal | 60 l. f . | \$ 3/l.f. | \$ 180 |
| Sidewalk (remove/replace) | $150 \mathrm{~s}, \mathrm{f}$. | 2.50/1.f. | 380 |
| Ramp construction | $605 s . f$. | 2/s.f. | 1,200 |
| Railings | $2001 . f$. | 15.50/.f. | 3,100 |
| Retaining walls (Reinf. Conc.) | $1381 . \mathrm{f}$ | 116.1.\%. | 16,000 |
|  |  |  | \$20,860 |
|  | Contingencies |  | 5,240 |
|  | TOTAL 1979 |  | \$26.100 |
| 1.f. = linesl feet s.f. = square feet |  |  |  |

## STAIRS ONLY ON APPROACH TO OVERCROSSING:

STRAIGHT FLIGHT SPACE FOR RAMP ON ONE END AND ONE SIDE

Alternative 1 - Construct ramp to supplement stairs

COST ESTIMATE
The cost estimate assumes ramp construction to serve one side of the structure.


Alternative 2-Install elevator to supplement stairs

COST ESTIMATE

| 1tem | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$2,500 |
| Drilling | $201 . f$. | \$ 15.00\%1.f. | 300 |
| Excavation | 27 e.y. | 8.00/e.y | 216 |
| Baekfill | $16 \mathrm{c} . \mathrm{y}$. | 12.00/e.y | 192 |
| Concrete | 3 e.y. | $400.00 / \mathrm{c} .9$ | 1,200 |
| Reinforeing | 500 lbs. | . $50 / \mathrm{lb}$. | 250 |
| Struetural steel | 9,000 lbs. | $1.50 / \mathrm{b}$. | 13,500 |
| Enclosure (wire) | 1,000 s.f. | 5.00/5.f. | 5,000 |
| Elevator (complete) | 1 er. | 15,000.00/ea | 15,000 |
| Equipment enclosure | Lump sum |  | 2,000 |
| Power hook-up | Lump sum |  | 500 |
|  |  |  | \$40,858 |
|  | Contingenc |  | 10,342 |
|  | Total 1979 |  | \$51,000 |
| l.f f = lineal feet | c. $\mathrm{y}_{*}=$ cubic yard $\quad$ s.f. $=$ square feet |  |  |

RAMP ON APPROACH TOO LONG AND/OR TOO STEEP: STRAIGHT RAMP: SPACE AT END AND AT LEAST ONE SIDE

Alternative 1-Overlay and extend ramp with rest areas

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Embankment | 860 | \$ 5/c.y. | \$4,300 |
| Paving | 2,480 | 1/s.f. | 2,900 |
| Railing | 720 | 15.50/. $\mathrm{f}^{\text {f }}$ | 11,200 |
|  |  |  | \$18,400 |
|  | Contingen |  | 4,600 |
|  | TOTAL 1 |  | \$23,000 |
| s.f. = square feet c.y. $=$ cubie yards |  |  |  |

Alternative 2-Overlay and extend ramp with off-ramp rest areas

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Embankment | 750 c.y. | \$ 5/e.y. | \$3,750 |
| Paving | 2,560 s.f. | * 1/s.i. | 2,560 |
| Rest Areas | 9 | 500/ea | 4,500 |
| Railing | 730 1.f. | 15.50/1.f. | 8,395 |
|  |  |  | \$19,205 |
|  | Contingencies |  | 4,795 |
|  | TOTAL 1979 |  | \$24,000 |
| f. $=$ square feet 1.f. $=$ lineal feet $\quad$ c.y. $\#$ cubic yards |  |  |  |

## Alternative 3 - Construct new ramp with rest areas

COST ESTIMATE

| Item | Quantity | Unit <br> Price | Total |
| :---: | :---: | :---: | :---: |
| Same costs as Problem 6 ( Alt. 1) |  |  | \$18,400 |
| Wooden $2^{\prime \prime} \mathrm{x} 6^{\prime \prime}$ Headers | 370 1.f. | \$2/1.f. | 1,800 |
|  |  |  | \$20, 200 |
| Deduet most of embankment |  |  | -3,800 |
|  |  |  | \$16,400 |
|  | Continge |  | 4,100 |
|  | TOTAL |  | \$20,500 |
| 1.f. $=$ lineal feet |  |  |  |

## Alternative 1 - Construct new ramp V Pattern

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Grading Allowance |  | Lump sum | \$ 500 |
| Wooden $2^{\prime \prime} \times 6^{\prime \prime}$ headers | 460 1.f. | \$2.50/s.f. | 1,150 |
| Paving | 1,840 s.f. | 1.00/1.f. | 1,800 |
| Failing | 480 1.f. | 15.50/1.f. | 7,400 |
|  | Contingenc |  | $\begin{array}{r} \$ 10,850 \\ 2,750 \end{array}$ |
|  | TOTAL 19 |  | \$13,600 |
| 1.f. = lineal feet s.f. $=$ square feet |  |  |  |

## Alternative 2-Construct new ramp M Pattern

COST ESTIMATE

| Item | Quantity | Unit <br> Price | Total |
| :--- | :--- | :--- | ---: |
| Same cost as Problem 7 (Alt. 1) |  | $\cdots$ | $\$ 10,850$ |
| Additional Length | $20 \mathrm{ft}$. | $\$ 13,00 / \mathrm{ft}$. | 260 |
|  |  | $\$ 11,110$ |  |
|  | Contingencies | 2,790 |  |
|  | TOTAL 1979 cost | $\$ 13,900$ |  |

RAMPS ON APPROACH TOO LONG AND/OR TOO STEEP: STRAIGHT RAMP; SPACE AT END ONLY

Alternative 1 - Construct new ramp over existing ramp

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Remove Existing Railing | 80 1.f. | \$ 5/f.f. | \$ 400 |
| New Railing | 140 L.f. | 15.50/h.f. | 2,200 |
| Concrete Overlay | 7 c.y. | 300/e.y. | 2,100 |
| Ramp Extention | 5 cm . | 200/c.y. | 1,000 |
| Grading Allowance |  | Lump sum | 500 |
|  |  |  | \$6,200 |
|  | Contingenc |  | 1,100 |
|  | Total 1970 |  | \$7,300 |
| 1.f. = lineal feet o.y. = cubic feet | e.y. = cubic feet |  |  |

## Alternative 2 - Demolish existing ramp and construct new ramp

COST ESTIMATE

| Item | Quentity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Demolish Existing Ramp |  | Lump sum | \$ 500 |
| Construet Sidewall | $901 . \mathrm{f}$. | \$115/.f. | 5,800 |
| Paving | 910 s.f. | 2/s.f. | 1,200 |
| Railing | 140 1.f. | 15.30/.f. | 2:200 |
| Grading Allowance |  | Lump sum | 800 |
|  |  |  | \$10,500 |
|  | Continge |  | 2,600 |
|  | TOTAL |  | \$13,100 |
| 1.f. $=$ lineal feet s.f. square feet |  |  |  |

STRAIGHT RAMPS ON APPROACH TOO LONG, BUT NOT TOO STEEP

Alternative 1 - Construct of - ramp rest areas

COST ESTIMATE


## Alternative 2-Overlay existing ramp to create rest areas

COST ESTIMATE

| Item | Quantity | Unit <br> Price | Total |
| :---: | :---: | :---: | :---: |
| Rest Areas | 5 ea | \$150/ea | \$ 750 |
| Railing | 318/.f. | . 15.50/h.f. | 4,929 |
|  |  |  | \$5,679 |
|  | Continge |  | 1,421 |
|  | TOTAL 1 |  | \$7,100 |
| 1.f. $=$ lineal feet |  |  |  |

## Alternative 3-Construct on-ramp rest areas (Partial width)

COST ESTIMATE


RAMPS ON APPROACH TOO LONG AND/OR TOO STEEP: DOGLEG RAMP: SPACE AT ENDS ONLY

Alternative 1-Demolish and construct new ramp at one end

COST ESTMMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump Sum |  | \$ 9,000 |
| Demolition | 200 c.y. | \$70.00/c.y. | 14,000 |
| Excavation | 260 c.y. | 10.00/e.y. | 2,600 |
| Backfill | 170 e.y. | 12.00/e.y. | 2,040 |
| Fill | $10 \mathrm{e} . \mathrm{y}$. | 25.00/c.y. | 250 |
| Feinforeing | 74,000 lbs. | . $40 / \mathrm{lb}$. | 29,600 |
| Concrete | 300 c.y. | $300.00 / \mathrm{c} . \mathrm{y}$. | 90,000 |
| Finishes | 7,000 s.t. | . $30 / 5.4$. | 2,100 |
| Hailings | 270 s.f. | 15.001.f. | 4,050 |
| Sidewalk | 400 S.f. | 1.20/s.f. | 480 |
| Landscape/drainage | 2,000 s.f. | . $50 / \mathrm{s.f}$. | 1,000 |
|  |  |  | \$155,120 |
|  | Contingencies | - | 38,880 |
|  | TOTAL 1979 Cos |  | \$194,000 |
| c. $\mathrm{y} .=$ cubic yards | s.f. $=$ square feet $\quad$ l.f. $=$ lineal feet |  |  |

## Alternative 2-Rebuild existing ramp

## COST ESTIMATE

Reconstruction would include construeting additional columns and walls to support the raised ramp. Estimated total cost would be 50 percent of demolishing the existing ramp - and rebuilding a new one or approximately $\$ 100,000$.

## Alternative 3-Install an elevator

## COST ESTIMATE

Basic equipment cost remain the same as those developed for Problem 5-Alternative 2 which equals $\$ 51,000$.

RAMPS ON APPROACH TOO LONG AND /OR TOO STEEP:
DOGLEG RAMP: SPACE AT ONE END ONLY AND ONE SIDE

Alternative 1-Jack End of Existing Ramp

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$4,000 |
| Demolition | 50 c.y. | \$100.00/c.y. | 5,000 |
| Shoring | 2,000 s.f. | 3.00/s.f. | 6,000 |
| Excavation | 100 c.y. | 15.00/c.y. | 1,650 |
| Backfill | 80 c.y. | 20.00/c.y. | 1,600 |
| Fill | 240 c.y. | 20.00/c.y. | 4,800 |
| Jacking | Lump sum |  | 4,000 |
| Concrete | 62 c.y. | 400.00/c.y. | 24,800 |
| Reinforcing | 22,000 lbs. | . $50 / \mathrm{lb}$. | 11,000 |
| Finishes | $600 \mathrm{s.f}$. | 1.00/s.f. | 600 |
| Railings | 200 1.f. | 15.00/l.f. | 3,000 |
| Sidewalk | 800 s.f. | 1.20/s.f. | 960 |
| Landscaping/drainage | 3,000 s.f. | . $50 / \mathrm{s.f}$. | 1,500 |
|  |  |  | \$68,910 |
|  | Contingencies |  | 17,090 |
|  | TOTAL 1979 |  | \$86,000 |
| c.y. = cubic yards | s.f. = square feet l.f. = lineal feet |  |  |

## Alternative 2 - Demolish and rebuild ramps

COST ESTIMATE
The work requirements and construction quantities are essentially identical to those detalled for prototypioal Problem 10 - Alternative 1 . Therefore, the cost can be assumed to be the same or $\$ 194,000$.

## Alternative 3-Install an elevator

## COST ESTIMATE

The work requirements and construction quantities are essentially identical to those detailed for prototypical Problem 5-Alternative 2. Therefore, the cost can be assumed to be the same or $\$ 51,000$.

RAMPS ON APPROACH TOO LONG AND/OR TOO STEEP; MULTHLEVEL DOGLEG RAMP; SPACE AT BOTH ENDS

## Alternative 1 - Demolish and rebuild ramps

COST ESTIMATE
Review of the major items of work shows that basic quantities almost double quantities developed for a similar situation detailed in Problem 10-Alternative 1. Therefore, the cost estimated is 1.8 times $\$ 194,000$ (Problem 10 - Alternative 1) or $\$ 349,200$.

## Alternative 2-Install an elevator

## COST ESTIMATE

Basic equipment costs remain the same as those developed from Problem 5 Alternative 2; however, the structure portrayed in Problem 12 is higher. Estimated inerease in cost can be found by multiplying elevator cost detailed in Problem 5 by a factor of $1.15(1.15 \times \$ 51,000=\$ 59,000)$.

RAMPS ON APPROACH TOO LONG AND/OR TOO STEEP: DOGLEG RAMPS WITH HELICAL ENDS INSTEAD OF LANDINGS

Altemative 1 - Demalish and rebuild

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | - 9,000 |
| Demolition | 200 e.y. | \$ $70.00 / \mathrm{c} . \mathrm{y}$. | 14,000 |
| Excavation | 260 c.y. | 10.00/e.g. | 2,600 |
| Backfill | 170 e.y. | 12,00/e.y. | 2,040 |
| Fill | 10 c.y. | 25,00/e.y. | 250 |
| Reinforcing | 74,000 lbs. | . $40 / \mathrm{lb}$. | 29,600 |
| Conerete | 300 c.y. | 300.00/e.y. | 90,000 |
| Finishes | 7,000 s.f. | . $30 / \mathrm{s} . \mathrm{f}$. | 2,100 |
| Reilings | 270 1.f. | 15.00/.f. | 4,050 |
| Sidewalk | 400 s.f. | 1.20/s.f. | 480 |
| Landscape/drainage | 2,000 s.f. | . $50 / 5.1$. | 1,000 |
|  |  |  | \$155,120 |
|  | Contingenc |  | 38,880 |
|  | Total 1979 |  | \$194,000 |
| 1.f. $=$ lineal feet | s.f. $=$ square feet $\quad$ c.y* $=$ eubic yards |  |  |

## Alternative 2-Install an elevator

| Item | Quantity | Unit <br> Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$2,500 |
| Drilling | 20 1.f. | \$ 15.00/1.f. | 300 |
| Excavation | 27 e.y. | 8.00/c.y. | 216 |
| Backfill | 16 e . y . | 12.00/e.y. | 192 |
| Concrete | $3 \mathrm{c}, \mathrm{y}$. | 400.00/e.y. | 1,200 |
| Reinforcing | 500 lbs . | . $50 / \mathrm{lb}$. | 250 |
| Structural steel | 9,000 lbs. | $1.50 / \mathrm{lb}$. | 13,500 |
| Enclosure (wire) | 1,000 s.f. | 5.00/s.f. | 5,000 |
| Elevator (complete) | 1 ea. | 15,000.00/ea. | 15,000 |
| Equipment enclosure | Lump sum |  | 2,000 |
| Power hook-up | Lump sum |  | 500 |
|  |  |  | \$40,658 |
|  | Contingenci |  | 10,342 |
|  | Total 1979 |  | \$51,000 |
| 1.f. $=$ lineal feet $\quad$ s.f. $=$ square feet $\quad$ e.y. $=$ cubic yards. |  |  |  |

## RAMPS ON APPROACH TOO LONG AND/OR TOO STEEP: RANDOM RAMP CONFIGURATION SOMETIMES FOLLOWS GROUND CONTOUR

Alternative 1 - Overlay portion of existing ramp and construet new ramp extension

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Demolition | Lump sum |  | \$ 1,000 |
| Grading allowance | Lump sum |  | 1,000 |
| Concrete overlay | 11 e.y. | \$300.00/c.y. | 3,300 |
| Ramp extension | 19 e.y. | 200.00/e.y. | 3,800 |
| Railing | 360 1.f. | 15.50^.f. | 5,600 |
|  |  |  | \$14,700 |
|  | Contingenc |  | 3,700 |
|  | Total 1979 |  | \$18,400 |
| l.f. $=$ lineal feet c.y* = cubic yards. |  |  |  |

Alternative 2-Install an elevator

## COST ESTIMATE

Basic equipment costs remain the same as those developed from Problem 5 Alternative 2 which equals $\$ \$ 1,000$

HELICAL APPROACH RAMPS TOO LONG AND/OR TOO STEEP

Alternative 1 - Demolish and rebuild helical ramp

COST ESTIMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$ 10,000 |
| Demolition | 200 c.y. | * 60.00/c.y. | 12,000 |
| Site preparation | 2,500 s.f. | 1.00/s.t. | 2,500 |
| Excavation | $150 \mathrm{c} . \mathrm{y}$, | 10.00/c.y. | 1,500 |
| Backfill | 100 e.y. | 15.00/c.y. | 1,500 |
| Concrete | $300 \mathrm{c.y}$. | 300.00/e.y. | 96,000 |
| Reinforcing | 94, 000 lbs . | . $40 / 1 \mathrm{~b}$. | 37,600 |
| Finishes | 4,800 s.f. | . $30 / \mathrm{s} . \mathrm{f}$. | 1,440 |
| Railing | 800 1.f. | 15.00^.f. | 12,000 |
| Sidewalk | $800 \mathrm{s.f}$. | 1.20/8.f. | 960 |
| Landscaping/drainage | 2,500 s.f. | .50/s.f. | 1,250 |
|  |  |  | \$176,750 |
|  | Contingencies |  | 44,250 |
|  | TOTAL 1979 C |  | \$221,000 |
| s.f. = square feet 1.f. = lineal feet e.y. = cubic yards |  |  |  |

## Alternative 2 - Install elevator

## COST ESTIMATE

Basic equipment costs remain the same as those developed from Problem 5 Alternative 2; however, the structure portrayed in Problem 15 is higher. Estimated increase in cost can be found by multiplying elevator cost detailed in Problem 5 by a factor of $1.15(1.15 \times \$ 51,000=\$ 59,000)$.

## Alternative 3 - Constrcut new ramp to supplement existing helical ramp

## COST ESTIMATE

Quantities and costs are similar though slightly less than those listed for Alternative 1. The major portion of the cost savings accrue by not demolishing the existing helical ramp. The cost estimate for a new box ramp structure amounts to $\$ 200,000$ as compared to $\$ 220,000$ required to demolish and rebuild the helical ramp.

STEEP CROSS SLOPE ON RAMP

Alternative 1 - Overlay existing ramp

## COST ESTIMATE

Material cost to construct an overlay of the type shown in the sketch amounts to approximately $\$ 300.00$ per 100 lineal feet of an eight-fgot wide ramp. Cost of installation could vary widely depending upon whether the overlay is built by local forces or a contractor and whether the project is only for the individual site or is an element of a larger or on-going contract where the contractor is already working in the area and therefore would not need to charge a relatively high price for mobilization.

STAIRS ON APPROACH TO UNDERCROSSING (ROOM FOR RAMP)

Alternative 1-Construct new ramp to supplement stairs

COST ESTIMATE


STAIRS ONLY ON APPROACH TO UNDERCROSSING (RESTRICTED SPACE

Alternative 1 Install elevator to supplement stairs

COST ESTMATE


## Alternative 2 - Replace stairs with new ramp

COST ESTIMATE


Alternative 3 - Install pedestrian actuated traffie signal

## COST EsTMMATE

Installation of a new pedestrian-actuated signal at a typical four-legged intersection, including all striping, signing and surb cuts for wheelchair aceess, will cost approximately $\$ 64,000$ including design.

RAMP ONLY ON APPROACH

Alternative 1 - Construet ztairs to supplement ramp

COST ESTMMATE

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$ 2,000 |
| Excavation | 50 e.y. | \$ 10.00/0.9. | 500 |
| Backfill | 16 c.y. | 12.00/0.y. | 192 |
| Conerete | 60 c.y. | $350.00 / \mathrm{c} . \mathrm{y}$. | 21,000 |
| Reinforcing | 17,000 lb | . $45 / \mathrm{s}$.f. | 7,650 |
| Finishes | 2,100 s, f. | .40/s.f. | 840 |
| Railings | 160 l.f. | 15.00/1.f. | 2,400 |
|  |  |  | \$34,582 |
|  | Contingene |  | 9,418 |
|  | TOTAL 197 |  | \$44,000 |
| e.y. $=$ cubic yards | s.f. = square feet | 1.f. $=$ lineal feet |  |

STDEWALK TOO NARROW ACROSS OVERCROSSING

Alternative 1 - Widen sidewalk within original structure

COST ESTIMATE
Alternative $1(a)$-Assuming 100 foot length of structure

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | - 500 |
| Prepare concrete surface | 500 s.f. | \$ 1.00/s.f. | 500 |
| Bonding agent | 500 s.f. | .70/s.f. | 350 |
| Conerete/finish | 20 e.y. | 75.00/e.y. | 1,500 |
| New barrier rail | 100 1.f. | 25.00^.f. | 2,500 |
| Restripe | 200 1.f. | 2.00/1.f. | 400 |
|  |  |  | \$5,750 |
|  | Contingene |  | 1,550 |
|  | Total 1979 |  | \$7,300 |
|  | Equivalent | .00/lineal foot | ueture |
| 1.f* $=$ lineal feet s.f. = square feet c.y. $=$ cuble yards. |  |  |  |

COST ESTIMATE
Alternative 1 (b)-Assuming 100 foot length of structure

| Item | Quantity | Unit Price | Total |
| :---: | :---: | :---: | :---: |
| Mobilization | Lump sum |  | \$ 500 |
| Remove existing railing | $100 \mathrm{l} . \mathrm{f}$ | \$ 5.00/l.f. | 500 |
| Prepare concrete | $100 \mathrm{s.f}$. | 1.00/s.f. | 100 |
| New railing base | 200 s.f. | 20.00/s.f. | 4,000 |
| New railing | 100 L f. | 25.00/.f. | 2,500 |
|  |  |  | \$7,600 |
|  | Contingenc |  | 1,900 |
|  | TOTAL 19 |  | \$9,500 |
|  | Equivalent | $5.00 / \mathrm{lineal}$ f | structure |
| 1.f. = lineal feet s.f. = square feet e,y. = cubic yards. |  |  |  |

Alternative 2-Widen original structure to accommodate sidewalk

COST ESTIMATE
Alternative 2 Assuming 100 foot length of structure


## Alternative 1 - Construct off ramp rest areas

COST ESTIMATE
Cost of inplementing the nleove seats is $\$ 2,100$ to $\$ 2,400$ each (see Appendix I): A cantilevered landing four feet wide and six feet long would be in the aame cost range. However, this may vary depending upon the type of structure being apyended.

## Alternative 2-Overlay existing ramp to ereate rest areas

COST ESTIMATE
The cost of an individual rest area of this type is approximately $\$ 200$.

Alternative 3 - Construct on-ramp rest areas (partial width)
COST ESTIMATE
The cost of an individual rest area of this type is approximately $\$ 400$.

## Alternative 4-Demolish and rebuild

COST ESTIMATES
Cost of building a new structure varies depending upon sit. anditions, therefore no cost breakdown was made.

## REST AREA ALTERNATIVES


(a) Indented Sitting Place


Plan View
No Estimate



Cost Estimate $\$ 2100$

Cantilevered Alcove


Cost Estimate $\$ 2400$

$$
\because
$$

## FEDERALLY COORDINATED PROGRAM (FCP) OF HIGHWAY RESEARCH AND DEVELOPMENT

The Offices of Research and Development (RED) of the Federal Highway Administration (FHWA) are responsible for a broad program of staff and contract researeb and development and a Federal-aid program, ounduted by or through the State highway ransportation agencees, that includes the Highway Planning and Research (HP\&R) program and the National Cooperative Highway Researel Program (NCHRP) managet by the Tramoportation Research Board. The FCe is a carafully selected group of projects that uses research and development resources to obtain tumely solutions to urgent national huktway engimeering problems.*

The diagonal donble stripe on the cover af this report repersents a highway and is solor-coded to identify the FCP category that the report falls under. A red stripe is used for category 1 , dark bhe for category 2 , light bue for eategory 3, brown tor eategory 4, tray for category $S$, green for categories 6 and 7 , and an orange stripe identifies categery 0.

## FCP Category Descriptions

1. Improved Highway Design and Operation for Bafety
Safety R\&D addresses problems associated with the responsibitities of the FHW under the Highway Safety Aet and íncledes investagation of appropriate design standards, roadside hartiware, signint, and physical and scientific data for the formulathon of improved safety regulations.
2. Reduction of Traffic Congestion, and Improved Operational Efficiency
Traffic R E D is concerned with increasing the operational efficiency of existing highways by advancing technoloty, by improving designs for existing as well as new facilities, and by balancing the demand capacity relationship through taffic management eechniques such as bus and carpool preferential treament, motorist information, and retouting of traffe.
3. Environmental Considerations in Highway Desikn, Location, Construction, and Operation
Envirommental R\&D is macted toward identify. ing and evaluating highway clements that affect

[^5]the quality of the human environment, The goals are reduction of ativerse highway and traffic impaess, and protection and enhancement of the environment.
4. Improved Materials Utilization and Durability
Materials R\&D is concerned with expanding the knowledge and iechnology of materials properties, using available natural materifils, improving structural foundation materials, rececliag highway materials, converting industrial wastes into useful highws products, deyeloping extender or substitute materials for those in short supply, and developing more rapid and reliable cesting procedures. The gouls are lower highway construction costs and extended maintenavce-free operation.
5. Improved Design to Reduce Costs, Extend Life Expectaney, and Insure Structural Safety
Structural R\&D is concerned with furthering the Itest technological advanees in structural and hydraulic designs, fabrication processes, and construction techniques to provids safe, efficient highways at reasonable costs.
6. Improved Technology for Highway Construction
This category is concerned with the research, development, and implementation of highway construction technology to increase productivity, reduce energy consumption, conserve dwinding resourees, and reduce cost while improving the quality and methods of construction.
7. Improved Technology for Highway Maintenance
This category addresses problems in preserving the Nation's bighways and includes activities in physical maintenance, traffic services, management, and equipment. The goal is to maximize operational efficiency and safety to the traveling public while conserving resources.

## 0. Other New Studies

This category, not included in the seven:wolume official statement of the FCP, is concerned with HP\&R and NCHRP studies not specifically related to FCP projects. These studies involye R\&D support of other FHWA progran office researeh.


[^0]:    Section 6 states the Administrator of General Services, with respect to standards issued under Section 2 of this Aet, and the Secretary of Housing and Urban Development, with respect to standards issued under Section 3 of this Aet, and the Secretary of Defense with respeet to standards issued under Section 4 of this Aat, and the United States Postal Service with respect to standards issued under Section 4 of this Aet:

[^1]:    ＊Responses to these problems may not indicate that the problem definately exists，but rather，in the opinion of the observor，that the problem probably exists quite frequently．

[^2]:    ＊Responses to these problems may not indicate that the problem definately exists，but rather，in the opinion of the observor，that the problem probably exists quite frequentiy．
    ＊＊Based on the 1961 ANSI Standards．

[^3]:    ＊Responses to these problems may not indicate that the problem definately exists，but rather，in the opinion of the observor，that the problem probably exists quite frequently．
    ＊＊Based on the 1961 ANSI Standards．

[^4]:    ＊Responses to these problems may not indicate that the problem definately exists，bue rather，in the opinion of the observor，that the problem probably exists quite frequently．
    ＊＊Sased on the 1961 ANSI Standards．

[^5]:    
    
    
     Actunisursion, Washiogtoa, D.C. socen

