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PEDESTRIAN GRADE SEPARATION LOCATIONS - A PRIORITY RANKING SYSTEM

VOLUME II

FINAL REPORT

BY

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16 Abstract

This report describes the development of a priority ranking system for locations where the installation of a pedestrian grade separation is proposed. The system considers two categories of locations; i.e. where pedestrian activity is possible and where pedestrian activity is not possible.

The system is based on subjective weights applied to parameters which are measured in the field. There are five parameters for locations where pedestrian activity is possible. These are pedestrian-vehicle volume, sight distance or pedestrian crossing, school crossing, distance to alternate crossing, and judgement. There are three parameters for locations where pedestrian activity is not possible. These are trip generation, distance to alternate crossing, and judgement. The procedure permits locations to be evaluated in a consistent manner and allows the expenditure of limited construction funds in the most technically, efficient manner.

Computer programs have been developed for performing the necessary mathematical operations to give the final listing in priority ranking. A manual method utilizing graphs has also been developed.

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DATA COLLECTION

Consistent procedures in the collection of data are necessary for comparing sites from different areas to determine the relative need for a pedestrian grade separation. Thus, set rules must be followed in the data collection.

Data collection should start with a field inspection of each site. The exact placement of the proposed pedestrian grade separation must be decided so that physical measurements can be made. Also, specific characteristics for the site should be found to determine what day of the week and time of the day to do the required field studies. For example, if the peak pedestrian trip generator is a church, the actual field studies should be performed on a Sunday when the church is holding services.

After this inspection, a more detailed site description is obtained. This includes the route number, milepost designation, if available, and the county and municipality. Also, a detailed map, such as a tax map, or sketch of the area should be obtained for later use in the field.

At this point, an initial field study must be done. Figure A-1 shows a suggested form for tabulating data for a site where pedestrian activity exists. First, it must be determined whether the site is to be studied as a signalized or unsignalized site. If the proposed location of the pedestrian grade separation is within fifty feet of a signal, the site will be studied as a signalized site.

Seven pieces of field data must be collected during the initial study for a signalized site where pedestrian activity is possible. The first is the annual average daily traffic (AADT). Second, a twelve-hour pedestrian crossing count must be performed. This is the number of pedestrians crossing the roadway at the proposed pedestrian grade separation site tabulated by hour so that the peak pedestrian hour can be easily identified.

SITE WHERE PEDESTRIAN ACTIVITY EXISTS

INITIAL STUDY

Route_____ Milepost_____

County and Municipality_____

Date_____ Recorder_____

A. Signalized_____

1. AADT_____

2. Twelve-Hour Pedestrian Count_____

   Occurrences Per Week_____

3. Roadway Width_____ft.

4. Distance to Alternate Crossing 50 ft.

5. Protection at Alternate Crossing Signal

6. Is a School in the Vicinity?_____

7. Notes:_____

B. Unsignalized_____

1. AADT_____

2. Twelve-Hour Pedestrian Count_____

   Occurrences Per Week_____

3. Roadway Width_____ft.

4. Posted Speed Limit_____mph

5. Minimum Actual Sight Distance_____ft.

6. Distance to Alternate Crossing_____ft.

7. Protection at Alternate Crossing (Check One)

   _____Passive Protection (Flashing Signal, Signs Only, or No Signs)

   _____Active Protection (Traffic Signal)

   _____Grade Separation (Underpass or Overpass)

8. Is a School in the Vicinity?_____

9. Notes:_____

FIGURE A-1: SITES WHERE PEDESTRIAN ACTIVITY EXISTS
INITIAL FIELD STUDY DATA SHEET

Also, bicyclists and the ages of pedestrians are classified for possible future use in the design of the grade separation. The sketch of the location can be used for tabulating this count. Figure A-2 shows a suggested layout for this sketch.

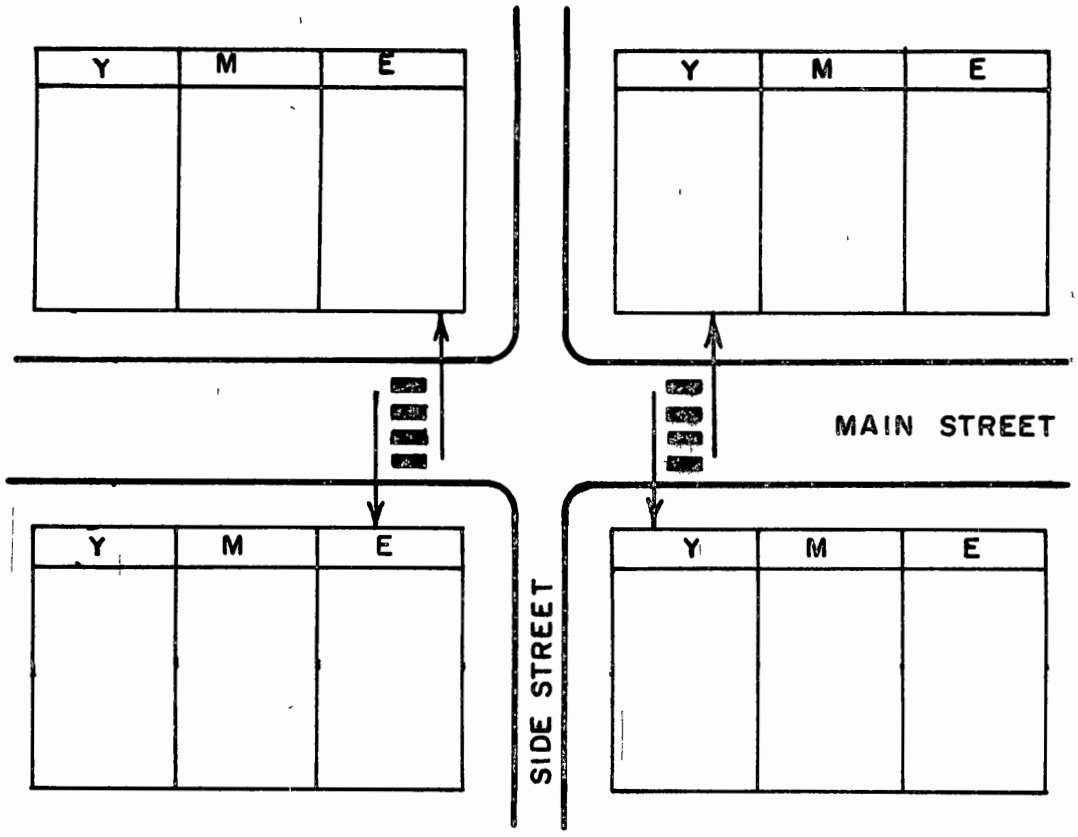
The number of times a week the pedestrian count is expected to occur must be recorded, i.e. if a church is the only trip attractor, the pedestrian count would be expected to occur once a week. The engineer will use this number later to adjust the pedestrian count so that it is comparable to other sites' pedestrian counts.

Roadway width must be measured either from curb-to-curb or from curb to pedestrian refuge island[45], if one exists. Next, distance to the alternate legal crossing is assumed to be fifty feet for a signalized site. This is based on a subjective decision that the grade separation location is not likely to be exactly at the intersection but not further than fifty feet away. The protection at the alternate crossing will be a signal in this case.

The presence of a school in the vicinity or the use of the crossing by school children should be noted and anything unusual about the site should be noted during the initial study.

After this data is collected, the twelve-hour pedestrian count must be checked to determine the pedestrian peak hour. This is the hour with the highest number of pedestrian crossings. The pedestrian delay study must subsequently be done during this hour and on the same day of the week as the initial study was performed.

For a signalized site, four pieces of data must be collected during the pedestrian delay study. Figure A-3 shows a suggested form for tabulating this data. The red time of the side street (street parallel to the proposed facility) is measured and recorded for each signal cycle



Y = Youth - 16 years old or younger.

M = Middle-Aged - 17 to 65 years old.

E = Elderly - 65 years old or older.

Place tic mark in appropriate age group box for each pedestrian.

Place "B" in appropriate age group box for each bicyclist.

Arrows indicate direction of pedestrian crossings to be counted.

Location:_____at_____ Milepost:_____

County:_____ Municipality:_____

Time: From_____to_____ Date:_____

Recorder:_____ Weather:_____

Note anything unusual on reverse side.

FIGURE A-2. HOURLY PEDESTRIAN COUNT FIELD STUDY DATA SHEET

SITE WHERE PEDESTRIAN ACTIVITY EXISTS

SIGNALIZED LOCATION

PEDESTRIAN DELAY STUDY

Route_____ Milepost_____

County and Municipality_____

Time Begin_____ Time End_____

Date_____ Recorder_____

Signal Cycle	Pedestrians Waiting at Beginning of Green	Pedestrians Crossing During Green	Red Time (sec.)	Cycle Time (sec.)
1				
2				
3				
.				
.				
N				

FIGURE A-3. SIGNALIZED SITE'S PEDESTRIAN DELAY FIELD STUDY DATA SHEET

during the peak hour. When the signal turns green for the side street, the number of pedestrians waiting to cross the street over which the proposed grade separation is to be located are counted and recorded. During this green, the number of pedestrians crossing are counted and at the end of this green phase the total number of pedestrians that have crossed is recorded, along with the total cycle length. This is done for every signal cycle during the pedestrian peak hour.

If school children were observed crossing at the site or a school was detected in the vicinity during the twelve-hour pedestrian count, a separate school children count field study must be performed. If the school was determined to be the peak pedestrian trip generator during the site inspection phase, this study could be done during the twelve-hour pedestrian count. The school children count is done either in the morning just before school begins or in the afternoon just after school ends. The time to obtain this data is during the entire duration of the period that the arriving or departing school children are present. Also, the protection afforded these school children must be noted. Figure A-4 is an example of a school children count field study data sheet.

If the site where pedestrian activity exists is to be studied as an unsignalized site, the following nine pieces of data would be collected during the initial field study. Figure A-1 shows the suggested form for tabulating this data. The first data indicated is the annual average daily traffic.

A twelve-hour pedestrian count, also previously described, must also be performed by hour so that the peak pedestrian hour can be determined. Again, Figure A-2 can be used for tabulating this count.

Roadway width must be measured either from curb-to-curb or from curb-to-pedestrian refuge island, if one exists.

SITE WHERE PEDESTRIAN ACTIVITY EXISTS

SCHOOL CHILDREN COUNT

Route_____ Milepost_____

County and Municipality_____

Time Begin_____ Time End_____

Date_____ Recorder_____

School Children Crossing_____

Protection at School Children Crossing (Check One)

_____Not Protected (No School Crossing Signs)

_____Passive Protection (School Crossing Signs)

_____Active Protection (Flashing Lights)

_____Signal

_____Guard on Duty

FIGURE A-4. SCHOOL CHILDREN COUNT
FIELD STUDY DATA SHEET

The posted speed limit must be recorded. It may be determined that the posted speed limit does not accurately reflect the actual speeds of vehicles. For this case, the prevailing speed could be used.

The minimum actual sight distance must be measured. This is the shortest distance at which a pedestrian, waiting to cross the roadway, can first detect an approaching vehicle.

Distance to the nearest alternate legal crossing must be measured. The definition of a legal crossing may vary from state to state, but is unusually consistent within a state. A more detailed discussion about the legality of pedestrian crossings can be found in the Traffic Engineering Handbook. Also, the protection at this alternate crossing must be recorded.

The presence of a school in the vicinity or the use of the crossing by school children should be noted.

Finally, anything unusual about the site should be noted during the initial study.

After this data is collected, the twelve-hour pedestrian count is checked to determine the pedestrian peak hour. This again is the hour during which the most pedestrian crossings were recorded. A pedestrian delay study is then done for this hour.

The following pedestrian peak hour delay study must be done when the site is unsignalized. During each minute of the pedestrian peak hour, the number of pedestrians waiting to cross the roadway at fifteen-second intervals are counted and recorded individually. Also counted and recorded once each minute is the total number of pedestrians that crossed the roadway during that minute. A suggested field data sheet for unsignalized sites is shown in Figure A-5.

A separate school children count must be performed if school children have been observed to cross at the site or a school was detected in the vicinity during the initial study. Also, the protection afforded these

SITE WHERE PEDESTRIAN ACTIVITY EXISTS

Unsignalized Location

Pedestrian Delay Study

Route _____ Mile Post _____

County and Municipality _____

Time Begin _____ Time End _____

Date _____ Recorder _____

Pedestrians waiting at

Time of Day (hour & minute)	15 sec.	30 sec.	45 sec.	60 sec.	Pedestrians crossing during minute

FIGURE A-5. UNSIGNALIZED SITE'S PEDESTRIAN DELAY FIELD STUDY DATA SHEET

school children must be noted. The procedure for this study is the same as for a signalized site. The suggested form in Figure A-4 can again be used for the school children count field study.

The last type of site is where pedestrian activity is not possible. To evaluate this type of site, the trip generation procedure must be performed. In order to perform this procedure, the following data must be collected. First, the detailed map as described earlier, is utilized. With this map, a one-quarter mile circle is defined about the proposed location. This circle is then split into two roughly semi-circular zones which are divided by the location of the controlled access highway. Figure A-6 shows an example of such a map.

After this map is completed, the actual field study can be performed. A suggested initial field study data sheet for sites where pedestrian activity is not possible is shown in Figure A-7. Using the detailed map, the streets within the circle are surveyed and the number of households, including apartments, are counted for each zone. A survey of trip attractors must also be performed. For each zone, commercial establishments, recreational facilities, institutions, and any schools present are recorded. It should also be noted when a bus stop exists at the proposed pedestrian grade separation site.

As previously discussed for the other proposed grade separation location types, the distance to the nearest alternate legal crossing must be measured and the protection at this alternate crossing must be recorded. If the alternate crossing is a grade separation, the presence of sidewalks and whether or not a roadway surface must be crossed in getting to the alternate crossing must be noted.

Finally, anything unusual about the site should be noted during the initial study.

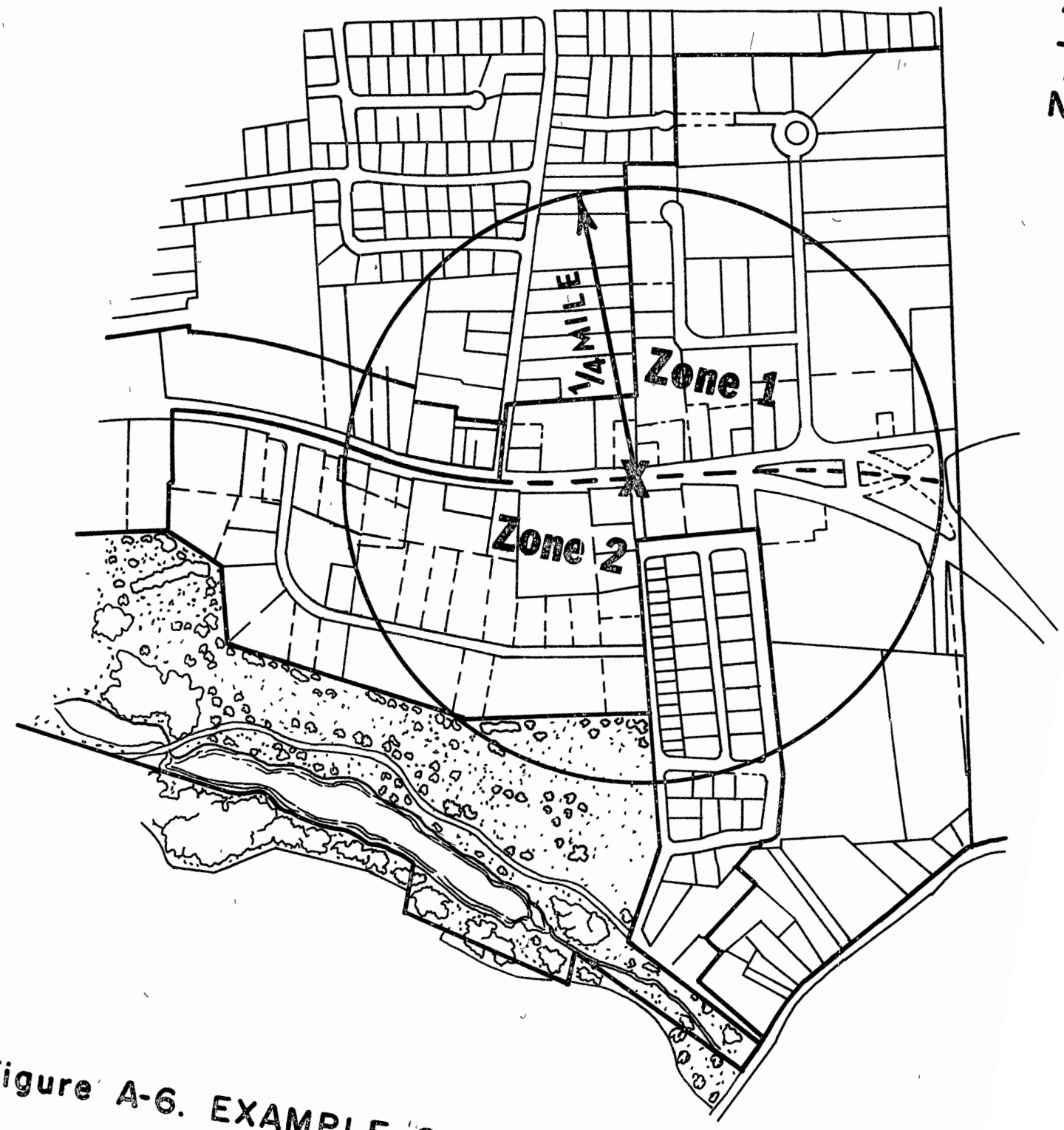


Figure A-6. EXAMPLE OF TRIP GENERATION MAP

SITES WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE

Route_____ Mile Post_____

County and Municipality_____

Date _____ Recorder_____

Zone 1	Zone 2
Number of Households_____	Number of Households_____
Commercial Establishments:	Commercial Establishments:
Institutions:	Institutions:
Recreational Facilities:	Recreational Facilities:
Schools:	Schools:
Does Bus Stop Exist at Study Location_____	Does Bus Stop Exist at Study Location_____

Distance to Alternate Crossing_____feet

Protection at Alternate Crossing (check one)

_____Passive Protection (Flashing signal, sign only, or no signs)

_____Active Protection (Traffic signal)

_____Grade Separation (Overpass or underpass)

Are Sidewalks Present on Grade Separation?_____

Must at grade road surface be crossed to get from proposed site to grade separated alternate crossing? _____

Notes:_____

_____

_____

FIGURE A-7. SITES WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE INITIAL FIELD DATA SHEET

If a school was detected in the initial study, an estimate of the number of school children who could use a pedestrian grade separation should be determined. This could be accomplished by contacting the particular school district to obtain the number of school children who live in one zone and attend school in the other.

Also, if a bus stop was detected in the initial study, a twelve-hour bus stop user count must be performed. Figure A-8 is a suggested form for tabulating the follow-up study data. The bus stop study should be done from early in the morning to late in the evening so that the peak hours of use are included in the study.

SITES WHERE PEDESTRIAN ACTIVITY NOT POSSIBLE

Twelve Hour Bus Stop User Count

Location_____ Mile Post_____

County and Municipality _____

Date_____ Recorder_____

Hour	Bus Stop Users

FIGURE A-8. BUS STOP USER DATA SHEET

APPENDIX B

MANUAL METHOD FOR THE PEDESTRIAN GRADE SEPARATION LOCATION PRIORITY RANKING SYSTEM

The parameter evaluation sheets and figures that are used in manually calculating the priority point score for a pedestrian grade separation location are at the end of this Appendix, pages 30 to 49.

A. LOCATIONS WITH EXISTING PEDESTRIAN ACTIVITY

For locations with existing pedestrian activity, page 30 lists the five parameters which are used to determine the need for a pedestrian grade separation and the point ranges for each.

I. PEDESTRIAN AND VEHICLE VOLUME WITH PEAK HOUR DELAY FACTOR

This parameter requires four items of field data, average 24-hour vehicle volume, 12-hour pedestrian volume, pedestrian count occurrence per week, and average pedestrian delay observed during pedestrian peak hour, as shown on page 31 .

1. The first thing to be done is to multiply the 12-hour pedestrian volume by the pedestrian count occurrence per week. This product is then divided by five days to determine the "average day" pedestrian volume for the site.

2. The next step is to add the average 24-hour vehicle volume to the "average day" pedestrian volume. This total is divided into the "average day" pedestrian volume to calculate the percent pedestrians. Using total pedestrian and vehicle volume and percent pedestrians, the pedestrian-vehicle volume points are found from Figure B-1, page 32 .

   (a) If the site is unsignalized, the average pedestrian delay observed during the pedestrian peak hour is needed. This delay, which must be in units of seconds, is calculated by the following equation:

$$\text{Average Pedestrian Delay Observed During Pedestrian Peak Hour} = \frac{\text{Total Number of Pedestrians Waiting to Cross at 15-Second Intervals} \times 15 \text{ Seconds}}{\text{Total Number of Pedestrians Crossing During Pedestrian Peak Hour}} \quad (1)$$

The average pedestrian delay observed during the pedestrian peak hour is then used in Figure B-2, page 33 , to find the peak hour delay factor.

(b) If the site is signalized, the average pedestrian delay observed during pedestrian peak hour must first be found. To obtain this, the total pedestrian delay in seconds must be calculated. The following equation is used:

$$\text{Total Pedestrian Delay} = \text{Total Number of Pedestrians Waiting to Cross at the Beginning of Green During Pedestrian Peak Hour} \times \frac{\text{Average Red Time During Pedestrian Peak Hour}}{2} \quad (2)$$

This equation is valid only when all pedestrians waiting at the beginning of green,cross during that cycle's green time. If all pedestrians don't cross during the cycle in which they arrived, the total pedestrian delay must be done cycle by cycle with some alterations. The delay for the pedestrians who did not cross during their initial cycle at the signal would be an additional cycle length for each cycle waited. Also, the additional pedestrians waiting at the beginning of green during the next cycle would have a delay of at least one-half the cycle length and even longer if additional cycles are waited. If pedestrians are held over for more than one cycle, it is recommended that the COMDEL computer program be used because of the difficulty in manually calculating the total pedestrian delay.

Using this total delay, the average pedestrian delay observed during pedestrian peak hour, which must be in units of signal cycles for a signalized site, can be found. The following equation is used:

$$\text{Average Pedestrian Delay Observed During Pedestrian Peak Hour} = \frac{\text{Total Delay} \div \text{Number of Pedestrians Crossing During Pedestrian Peak Hour}}{\text{Average Cycle Length During Pedestrian Peak Hour}} \quad (3)$$

The average pedestrian delay observed during pedestrian peak hour is then used in Figure B-3, page 34, to find the peak hour delay factor.

3. The pedestrian-vehicle volume points from Figure B-1 are then multiplied by the peak hour delay factor to calculate the POINTS AWARDED for the PEDESTRIAN AND VEHICLE VOLUME WITH PEAK HOUR DELAY FACTOR parameter.

II. ACTUAL SIGHT DISTANCE/DESIRABLE SIGHT DISTANCE OR PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN

This parameter involves two separate methods for determining its point score. When the site is unsignalized the ACTUAL SIGHT DISTANCE/DESIRABLE SIGHT DISTANCE parameter's method is used, and when the site is signalized the PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN parameter's method is used. Both methods compare the time needed by the pedestrian to cross the roadway to the maximum time that is actually given the pedestrian to cross.

1. The field data required for the parameter, ACTUAL SIGHT DISTANCE/DESIRABLE SIGHT DISTANCE, are roadway width in feet, posted speed limit, and minimum actual sight distance, as shown on page 35.

(a) Using the roadway width in feet and the posted speed limit, Figure B-4, page 36, is used and a desirable sight distance in feet is determined.

(b) The desirable sight distance in feet and the shortest actual sight distance in feet are then used to find the POINTS AWARDED for this parameter from Figure B-5, page 37 .

2. The field data required for the parameter, PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN, is roadway width in feet and maximum vehicle green and yellow, as shown on page 35 . The maximum vehicle green and yellow is the side street vehicle green and yellow portions of the cycle length during which pedestrians are allowed to cross.

(a) First the roadway width in feet is divided by four feet per second which is the average pedestrian walking speed and a clearance interval of seven seconds[41] is added to the resultant walking time. This calculation produces the total pedestrian crossing time needed.

(b) Using the total pedestrian crossing time needed and maximum vehicle green and yellow, the POINTS AWARDED can be found from Figure B-6, page 38.

III. SCHOOL CROSSING

The field data needed for this parameter is the number of school children crossings and protection at the crossing, as shown on page 39 . The school children crossings acquired from the field data is multiplied by two to obtain the total number of crossings made by the school children. Using the total volume of school children crossings and school children protection at the crossing in Figure B-7, page 40, the POINTS AWARDED can be found.

IV. DISTANCE TO NEAREST ALTERNATE CROSSING

The field data necessary for this parameter are the distance to the crossing in feet and the type of protection at the alternate crossing, as shown on page 39 . "Average day" pedestrian volume, calculated for the first parameter, is also needed. Using these three pieces of data, the POINTS AWARDED is found from Figure B-8, page 41 .

V. JUDGEMENT

The POINTS AWARDED are for uniqueness of location and are to account for any circumstances which are not covered by the other four parameters, as indicated on page 42 .

VI. TOTAL POINTS

The POINTS AWARDED for the appropriate five parameters are entered on page 30 and summed to yield a total point score for the evaluated location.

VII. EXAMPLES OF METHOD

Table B-1 shows three sites' field data and point scores for the five parameters. Sites A and B are unsignalized and Site C is signalized.

The first parameter, PEDESTRIAN-VEHICLE VOLUME, seems contradictory. The pedestrian volume for Site B is more than three times that for Site A. However, Site A receives a larger score. This is because both sites are awarded the maximum or forty points from Figure B-1, but Site A receives a larger peak hour delay factor from Figure B-2 because of the larger pedestrian delay. Site C also has a smaller pedestrian volume than Site B but it also receives a larger peak hour delay factor from Figure B-3.

The SIGHT DISTANCE parameter scores also show a large difference in scores. Site A and B have similar roadway widths and speed limits

PARAMETERS	MEASURES	FIELD CONDITIONS			POINT SCORE		
		Site A	Site B	Site C	Site A	Site B	Site C
Pedestrian-Vehicle Volume	Pedestrian Volume (ppd) Vehicle Volume (vpd) Delay (sec) Delay (cycles)	296 36700 52.9 --	922 31200 22.9 --	147 66300 -- .50	31.4	15.3	18.7
Sight Distance or Maximum Vehicle Green	Actual Sight Distance (ft) Speed Limit (mph) Roadway Width (ft) Maximum Vehicle Green (sec)	424 45 48 --	1080 50 48 --	-- -- 80 25	40.2	4.3	11.4
School Crossing	Number of School Children School Children Protection	88 crossing guard	0.0 --	184 crossing guard	7.3	0.0	9.6
Alternate Crossing	Pedestrian Volume (ppd) Distance to Alternate Crossing (ft) Protection at Alternate Crossing	296 1000 signal	922 400 signal	147 50 signal	16.4	13.1	0.2
Judgement	Judgement				10.0	10.0	0.0
TOTAL					105.3	42.7	39.9

TABLE B-1: DATA FOR THREE SITES WHERE PEDESTRIAN ACTIVITY IS POSSIBLE

which are used in Figure B-4. However, the actual sight distance is less for Site A than Site B. Therefore, Site A is awarded a larger score from Figure B-5. The score for Site C can be obtained from Figure B-6.

The scores awarded for the SCHOOL CROSSING parameter are straight forward. Site B has no school children, thus no points. Sites A and C both have a crossing guard as the protection at the crossing, but Site C has more school children and, therefore, a larger score from Figure B-7.

The ALTERNATE CROSSING parameter also seems somewhat contradictory because of the large difference in pedestrian volumes between Sites A and B. However, both sites have a signal as the protection at the crossing and the distance to the alternate crossing for Site A is larger than that for Site B. Because of the shape of the curves in Figure B-8, therefore, Site A receives a larger point score.

Sites A and B receive ten additional points for the JUDGEMENT parameter. This means there is something unusual about these sites which was not taken into account by the other parameters.

Finally, the total point scores show that Site A would appear much higher on a priority list than Sites B and C which have similar total scores.

B. LOCATIONS WITH NO PEDESTRIAN ACTIVITY POSSIBLE

Page 43 lists the three parameters which are used to determine the need for a pedestrian grade separation and the point ranges for each when no pedestrian activity is possible. They are TRIP GENERATION, DISTANCE TO NEAREST ALTERNATE CROSSING, and JUDGEMENT.

I. TRIP GENERATION

The proposed locations for this group are along controlled access roadways or non-controlled access roadways with a center barrier where grade crossings are not allowed. Therefore, a model had to be devised to determine the demand of pedestrians to cross the roadway. The following trip generation model is used.

1. The number of households in each zone are recorded, as shown on pages 44 and 45 .

2. The Trips/Day/Household is now assigned for the trip attractors. If two identical attractors are located, one in each zone, see Section (e).

(a) If a school exists in a zone, the Trips/Day/Household is 1.0, if one does not exist, the Trips/Day/Household is zero. If the actual number of school children for either zone is known, see Section (f).

(b) Commercial activity is the next trip attractor. For a zone, if there are:

13 or more commercial establishments, Trips/Day/Household is 0.4;
9 to 12 commercial establishments, Trips/Day/Household is 0.3;
5 to 8 commercial establishments, Trips/Day/Household is 0.2;
1 to 4 commercial establishments, Trips/Day/Household is 0.1;
and no commercial establishments, Trips/Day/Household is zero.

(c) The third attractor is Institutional activity. If an institution, such as a church or museum exists in a zone, the Trips/Day/Household is 0.3, if one does not exist, the Trips/Day/Household is zero.

(d) The fourth attractor is Recreational activity. If a recreational area such as a park or playground exists in a zone, the Trips/Day/Household is 0.3, if one does not exist, the Trips/Day/Household is zero.

(e) If an attractor in Zone 1 is identical to an attractor in Zone 2, they cancel each other. For example, if there is a playground in Zone 1 and no playground in Zone 2, Trips/Day/Household for recreational activity in Zone 1 is 0.3 and for Zone 2 is zero. However, if there is an identical playground in Zone 2, they would not be used in the study and the Trips/Day/Household for both zones is zero.

(f) If the actual number of school children is known for either zone, this number is multiplied by two and used as the total Trips/Day for the school attractor. If this is done, the school Trips/Day/Household is not used.

3. The Trips/Day/Household for each of the four categories for Zone 1 are then multiplied by the number of households in Zone 2 to find the total Trips/Day from Zone 2 to Zone 1.

4. The Trips/Day/Household for each of the four categories for Zone 2 are multiplied by the number of households in Zone 1 to find the total Trips/Day from Zone 1 to Zone 2.

5. If there is a bus stop located at the site, an estimated bus stop trips per day is determined. Because it was assumed that a commuting pedestrian would cross the non-access highway either in the morning to get to the bus stop or in the evening to get back to their home for a total of one crossing, the number of bus riders found during the field study is divided by two.

6. The total Trips/Day from Zone 1 to Zone 2, total Trips/Day from Zone 2 to Zone 1, and the bus stop Trips/Day are added to obtain total trips. If total trips are more than 700, only 700 are used for this parameter. The remaining trips are noted and may be used later in the JUDGEMENT parameter.

7. Using the total trips, the POINTS AWARDED for this parameter is found from Figure B-9, page 46 .

II. DISTANCE TO NEAREST ALTERNATE CROSSING

The field data needed for this parameter are distance to crossing in feet and type of protection at alternate crossing, as shown on page 47. Along with the two pieces of field data, the total trips calculated for the first parameter is used to find the POINTS AWARDED from Figure B-10, page 48 .

III. JUDGEMENT

This parameter has three sections, as shown on page 49 .

1. The first section is Safety of Alternate Crossing. If the alternate crossing is a grade separation which has no sidewalk, five points are awarded. If the alternate crossing is a grade separation which has sidewalks, but a roadway surface, such as an entrance or exit ramp, must be crossed to get to the alternate crossing, three points are awarded.

2. The second section is Surplus Trip Generation. The POINTS AWARDED is found by taking the number of total trips in excess of 700, as found in the TRIP GENERATION parameter, and dividing it by fifteen. If the number of excess trips is three hundred or more, 20 points are awarded. If the evaluator decides that the site does not warrant these additional points, he may elect not to include them into the total point score.

3. The last section is Uniqueness of Location. The POINTS AWARDED is the point score given to account for any circumstances which are not covered by the other two parameters. The POINTS AWARDED for the three sections are summed to obtain the TOTAL POINTS AWARDED for this parameter.

IV. TOTAL POINTS

Finally, the POINTS AWARDED for the three parameters are entered as on page 43 and summed to give the TOTAL POINTS used to rank a LOCATION WITH NO PEDESTRIAN ACTIVITY POSSIBLE.

V. EXAMPLES OF METHOD

Table B-2 shows two sites' field data and point scores for the three parameters.

The first parameter, TRIP GENERATION, shows the number of households in the two zones and whether the trip attractors are in each zone. The numbers in parenthesis are the attraction factors which are multiplied by the number of households to obtain the generated pedestrian trips. Because of the larger number of households and trip attraction factor at Site A, more pedestrian trips are generated. However, there is a bus stop located at Site B. This causes the point scores for both sites obtained from Figure B-9 to be fairly close for this parameter.

Site A point score for the ALTERNATE CROSSING parameter is at its maximum for the grade separation protection. This is because of the large number of generated trips and the distance to the alternate crossing. Site B has a much lower total score because of the shorter distance to the alternate crossing.

The third parameter, JUDGEMENT, has three parts. Neither site has more than seven hundred generated pedestrian trips, and, therefore, receive no points. A roadway surface must be crossed to get to the

PARAMETERS	MEASURES	FIELD CONDITIONS		POINT SCORE	
		SITE A	SITE B	SITE A	SITE B
	Households in Zone 1	258	96		
TRIP GENERATION	Zone 2's				
	School	no	no		
	Commercial facility	yes (.2)	no		
	Institution	no	no	55.2	6.8
	Recreational facility	no	yes (.3)		
	Households in Zone 2	417	66		
	Zone 1's				
	School	yes (1.0)	no		
	Commercial facility	yes (.2)	yes (.3)		
	Institution	no	no		
	Recreational facility	no	yes (.3)		
	Bus Stop Trips (ppd)	0	330	0.0	33.0
ALTERNATE CROSSING	Generated Pedestrian Trips (ppd)	552	398		
	Distance to Alternate Crossing (ft)	1430	450	50.0	13.2
	Protection at Alternate Crossing	grade separation	grade separation		
JUDGEMENT	Surplus Trips Generated (ppd)	0	0		
	Adequacy at Alternate Crossing	0	3	5.0	8.0
	Uniqueness of Location	5	5		
TOTAL				110.2	61.0

TABLE B-2: DATA FOR TWO SITES WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE

alternate crossing for Site B. Thus, it receives three points for adequacy at alternate crossing while A receives none. Finally, both sites receive five points for uniqueness of location. This means there is something unusual about both sites which is not taken into account in any other parameter.

It can be seen from the total score that Site A would be higher on the priority list than Site B.

LOCATIONS WITH EXISTING PEDESTRIAN ACTIVITY

		Points	Points Awarded
I.	Pedestrian and Vehicle Volume with Peak Hour Delay Factor	(0 to 80)	_____
II.	Actual Sight Distance/Desirable Sight Distance or Pedestrian Crossing/ Maximum Vehicle Green and Yellow	(0 to 50)	_____
III.	School Crossing	(0 to 30)	_____
IV.	Distance to Nearest Alternate Crossing	(0 to 30)	_____
V.	Judgement	(0 to 10)	_____
VI.	TOTAL POINTS	(0 to 200)	_____

I. PEDESTRIAN AND VEHICLE VOLUME WITH PEAK HOUR DELAY FACTOR

12-Hour Pedestrian Volume _____

Pedestrian Count Occurrence Per Week _____

"Average Day" Pedestrian Volume _____

Average 24-Hour Vehicle Volume _____

TOTAL _____

Percent Pedestrian Crossing _____

Pedestrian-Vehicle Volume Points Awarded from Figure B-1 _____

Average Pedestrian Delay Observed During Pedestrian Peak Hour _____

Peak Hour Delay Factor Awarded from Figure B-2 (Unsignalized) or B-3 (Signalized) _____

POINTS AWARDED (Pedestrian-Vehicle Volume Points X Peak Hour Delay Factor) _____

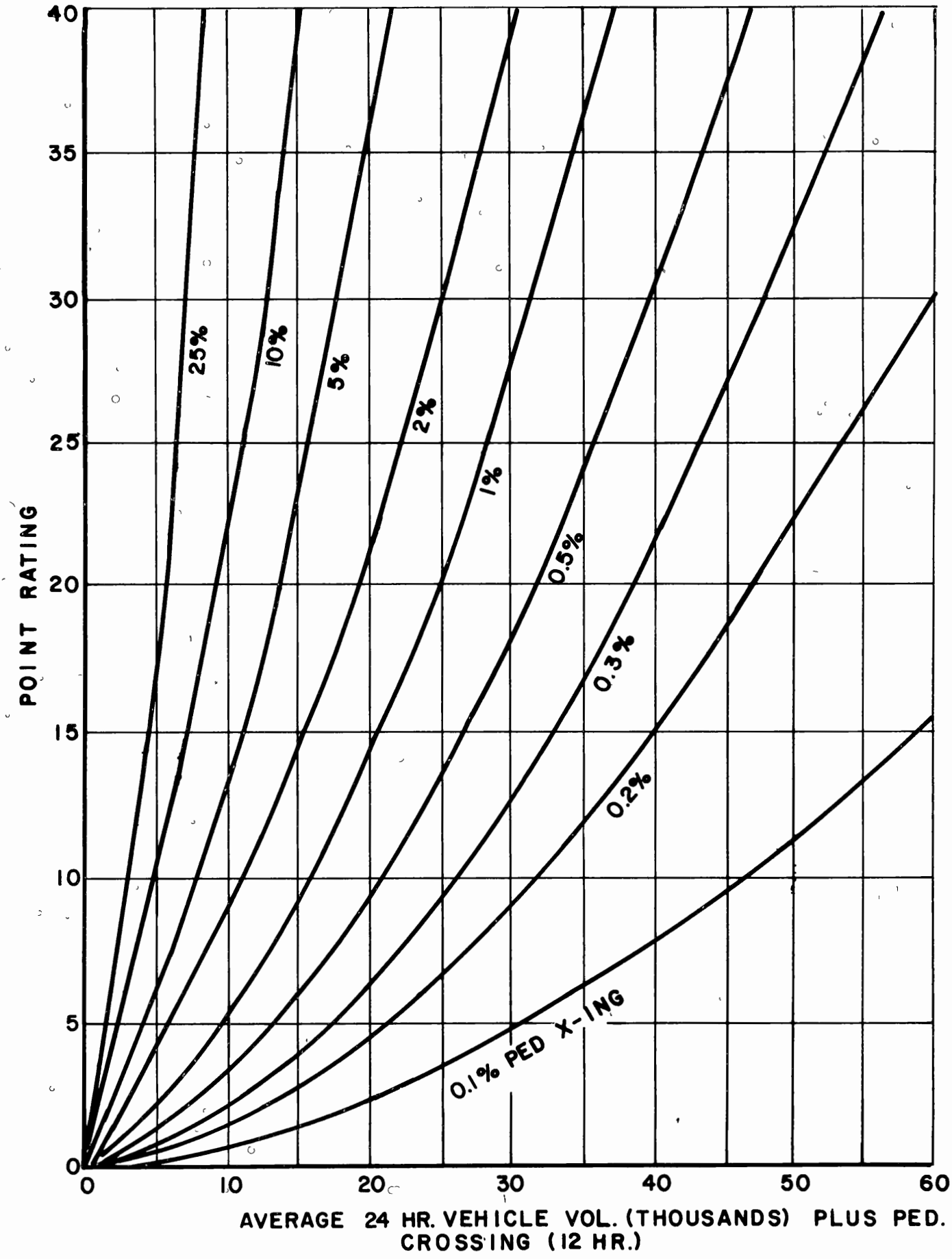


Figure B-I. PEDESTRIAN VEHICLE VOLUME POINTS

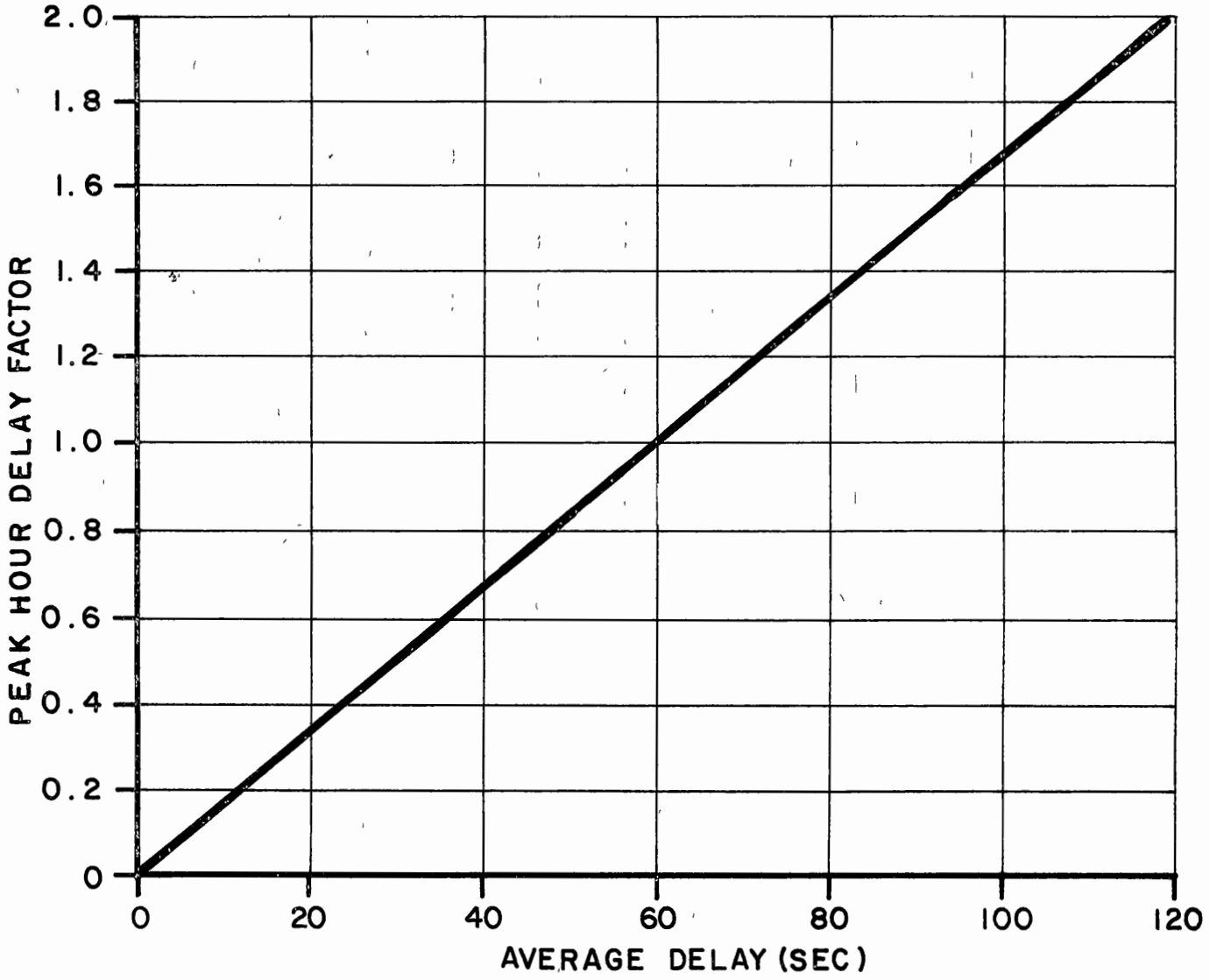


Figure B-2. PEAK HOUR DELAY FACTOR (NON-SIGNALIZED LOCATION)

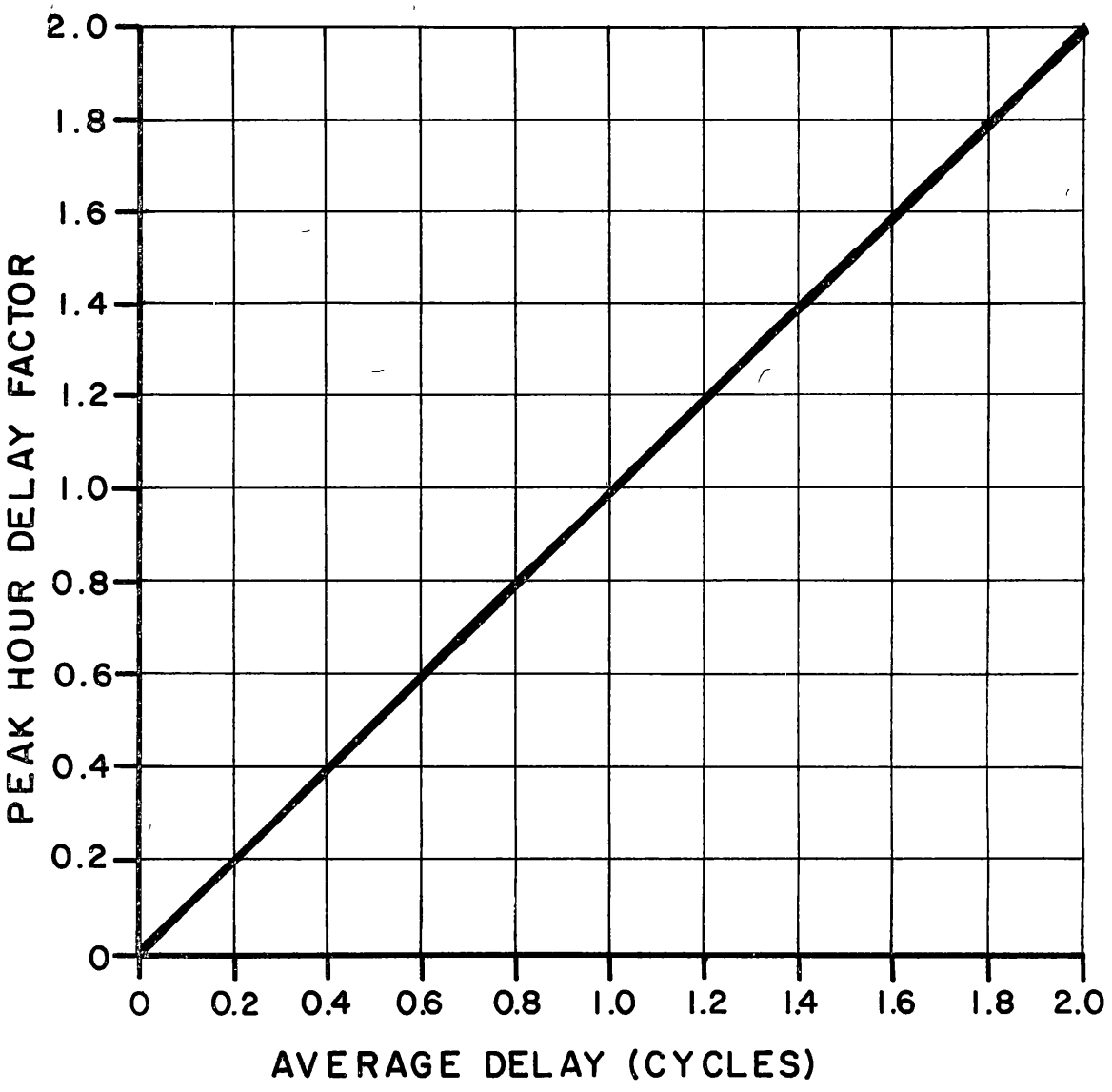


Figure B-3. PEAK HOUR DELAY FACTOR (SIGNALIZED LOCATION)

II. ACTUAL SIGHT DISTANCE/DESIRABLE SIGHT DISTANCE OR PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN

A. UNSIGNALIZED LOCATION

Roadway Width in Feet (Curb-to-Curb or Curb-to-Island if Present) _____

Posted Speed Limit _____

Desirable Sight Distance Obtained from Figure B-4 _____

Minimum Actual Sight Distance _____

POINTS AWARDED FROM FIGURE B-5 _____

B. SIGNALIZED LOCATION

Roadway Width in Feet (Curb-to-Curb or Curb-to-Island if Present) _____

Pedestrian Crossing Time Needed Plus Seven (7) Seconds _____

Maximum Vehicle Green and Yellow _____

POINTS AWARDED FROM FIGURE B-6 _____

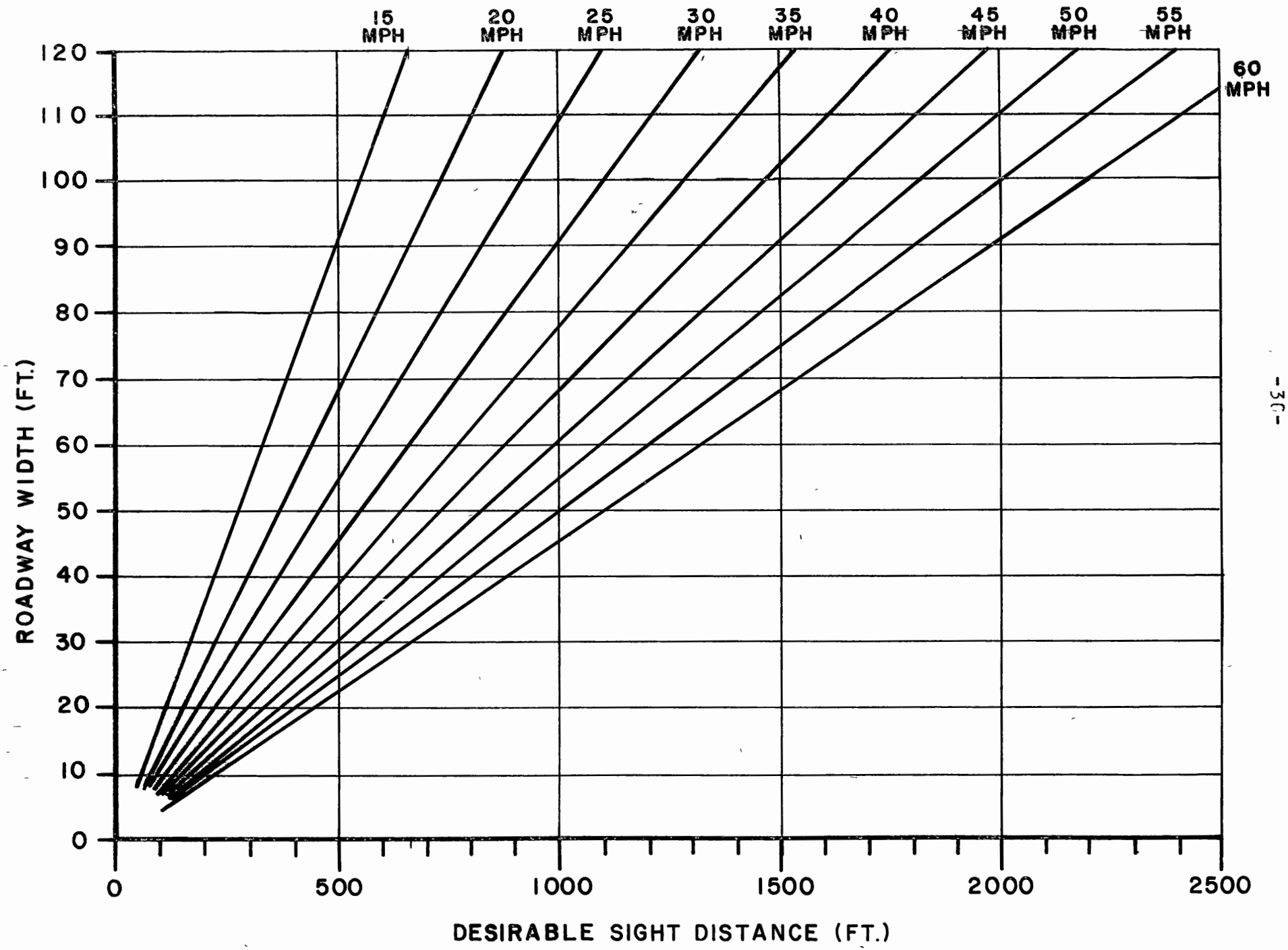


Figure B-4. DESIRABLE SIGHT DISTANCE

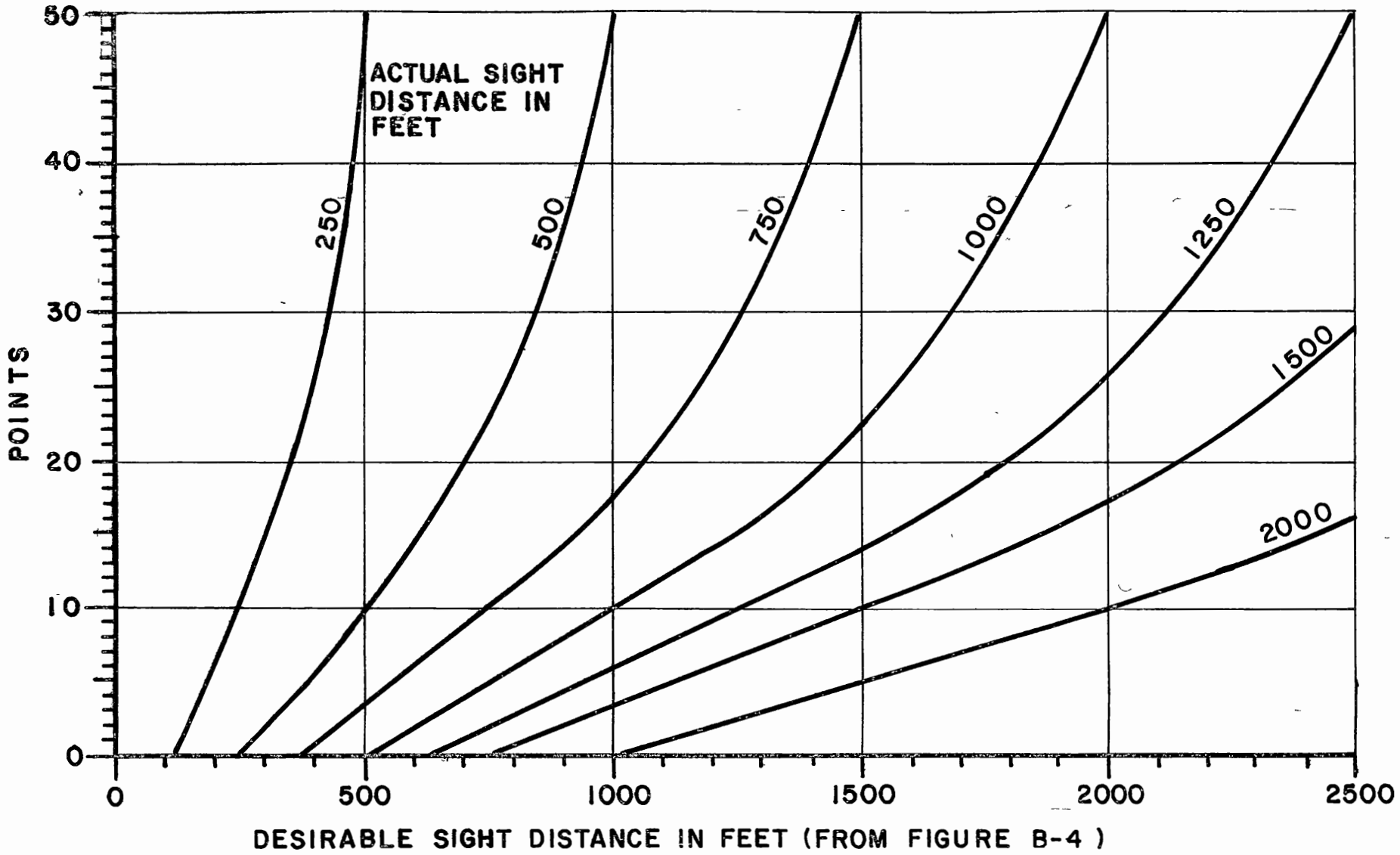


Figure B-5. COMBINED SIGHT DISTANCE

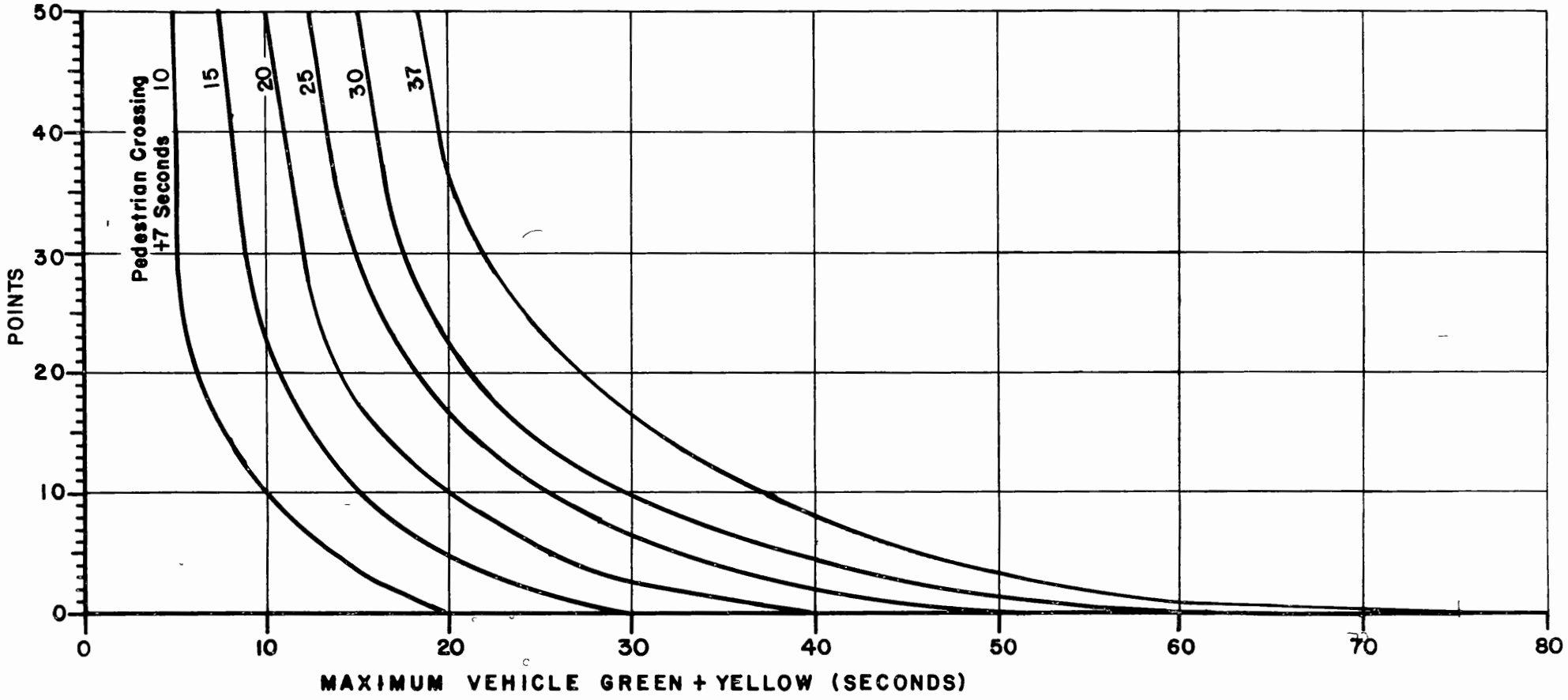


Figure B-6. PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN

III. SCHOOL CROSSING

Volume of School Children Crossing _____

School Children Protection at Crossing (check one of the following)

_____Not Protected (No School Crossing Signs)

_____Passive Protection (School Crossing Signs)

_____Active Protection (Flashing Lights)

_____Signal

_____Guard on Duty

POINTS AWARDED FROM FIGURE B-7 _____

IV. DISTANCE TO NEAREST ALTERNATE CROSSING

Distance to Crossing in Feet _____

"Average Day" Pedestrian Volume _____

Type of Protection at Alternate Crossing (check one of the following)

_____Passive Protection (Flashing Signal, Signs Only, or No Signs)

_____Active Protection (Traffic Signal)

_____Grade Separation (Overpass or Underpass)

POINTS AWARDED FROM FIGURE B-8 _____

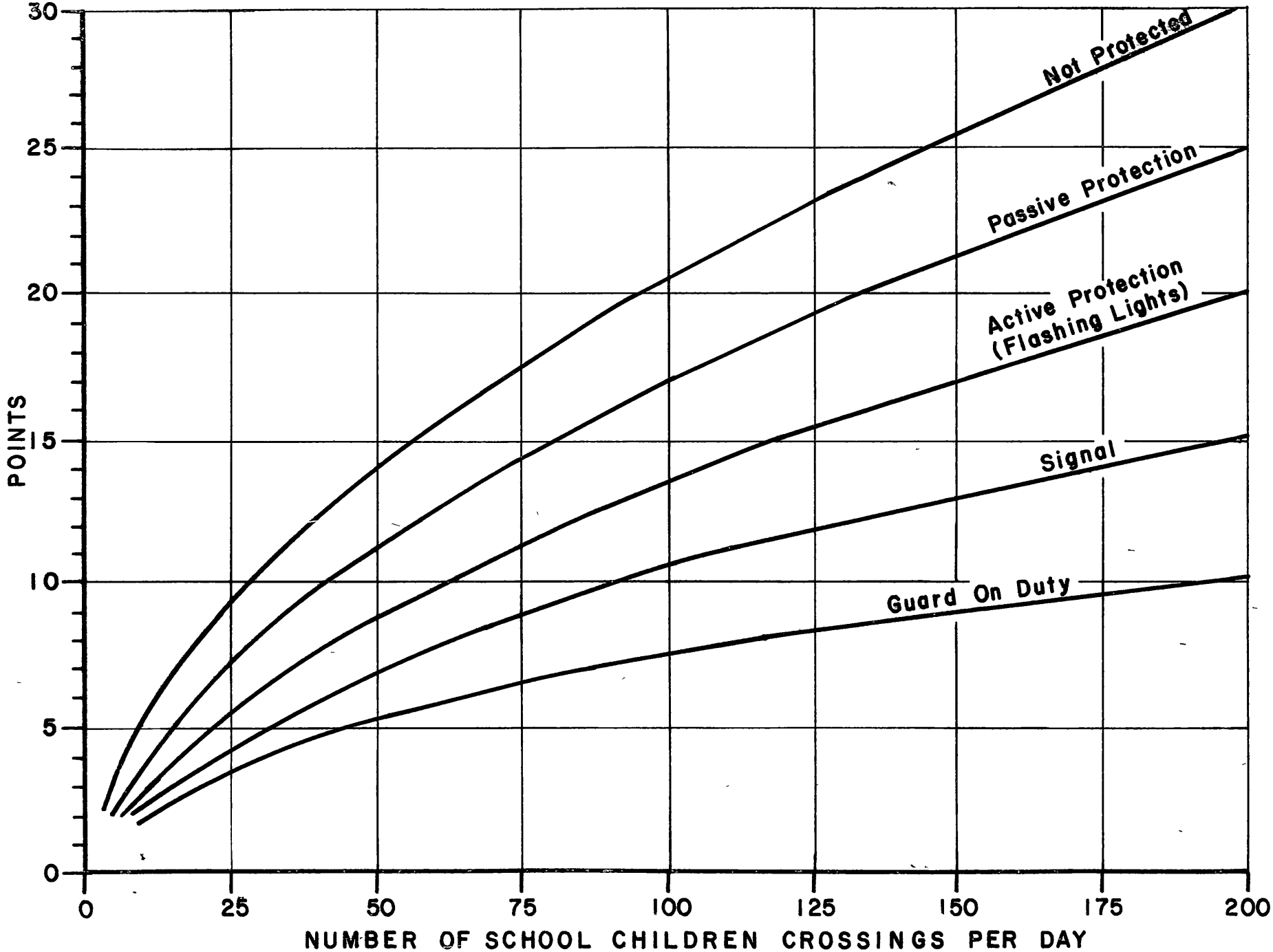


Figure B-7. SCHOOL CROSSING PROTECTION

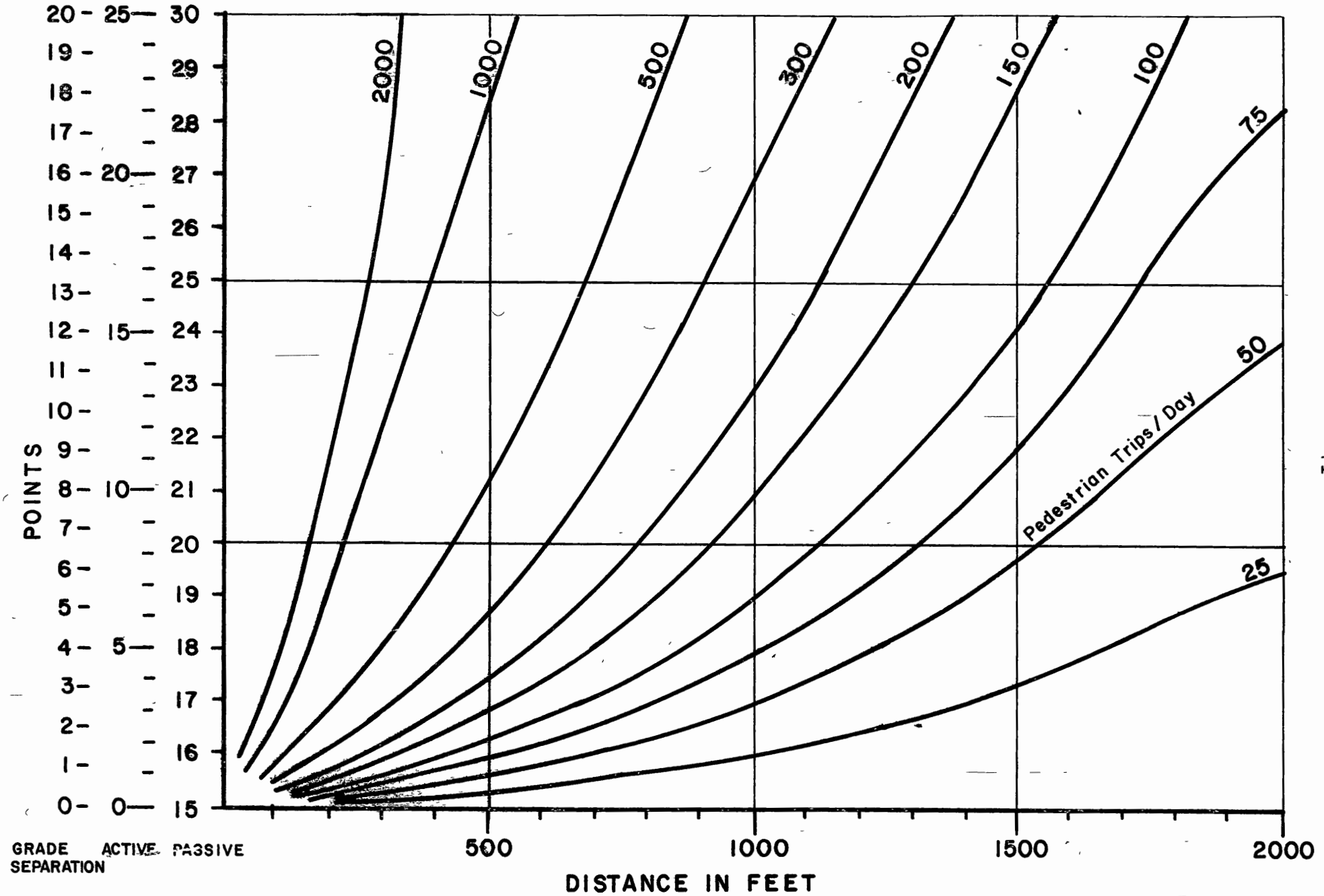


Figure B-8. DISTANCE TO ALTERNATE CROSSING (NON-CONTROLLED ACCESS LOCATION)

V. JUDGEMENT

Uniqueness of Location - Is there something unusual or different about this location that is not shown in any other point score? Make explanation below. Limit ten points.

POINTS AWARDED _____

LOCATIONS WITH NO PEDESTRIAN ACTIVITY POSSIBLE

		Points.	Points Awarded
I.	Trip Generation	(0 to 70)	_____
II.	Distance to Nearest Alternate Crossing	(0 to 70)	_____
III.	Judgement	(0 to 60)	_____
IV.	TOTAL POINTS	(0 to 200)	_____

I. TRIP GENERATION

Number of Households: Zone 1_____ Zone 2_____

Attractions In Zone 1	Trips/Day/Household Assigned		Number of Households in Zone 2		Total Trips/Day Zone 2 to Zone 1
*School	(0 or 1.0)	____ x	____	=	____
**Commercial	(0 to 0.4)	____ x	____	=	____
Institutional	(0 or 0.3)	____ x	____	=	____
Recreational	(0 or 0.3)	____ x	____	=	____
TOTAL		____			____

Attractions In Zone 2	Trips/Day/Household Assigned		Number of Households in Zone 1		Total Trips/Day Zone 1 to Zone 2
*School	(0 or 1.0)	____ x	____	=	____
**Commercial	(0 to 0.4)	____ x	____	=	____
Institutional	(0 or 0.3)	____ x	____	=	____
Recreational	(0 or 0.3)	____ x	____	=	____
TOTAL		____			____

Total Trips Per Day - Zone 2 to Zone 1	____
Total Trips Per Day - Zone 1 to Zone 2	____
Bus Stop Trips Per Day	____
Total Trips (maximum - 700)	____
POINTS AWARDED FROM FIGURE B-9	____

* If the actual number of school children is known for either zone, multiply by two and use that number for Total Trips Per Day.

(cont'd)

** If Commercial Activity exists:

Trips/Day/Household = 0.1, if there are 1 to 4 establishments,

Trips/Day/Household = 0.2, if there are 5 to 8 establishments,

Trips/Day/Household = 0.3, if there are 9 to 12 establishments,

Trips/Day/Household = 0.4, if there are 13 or more establishments.

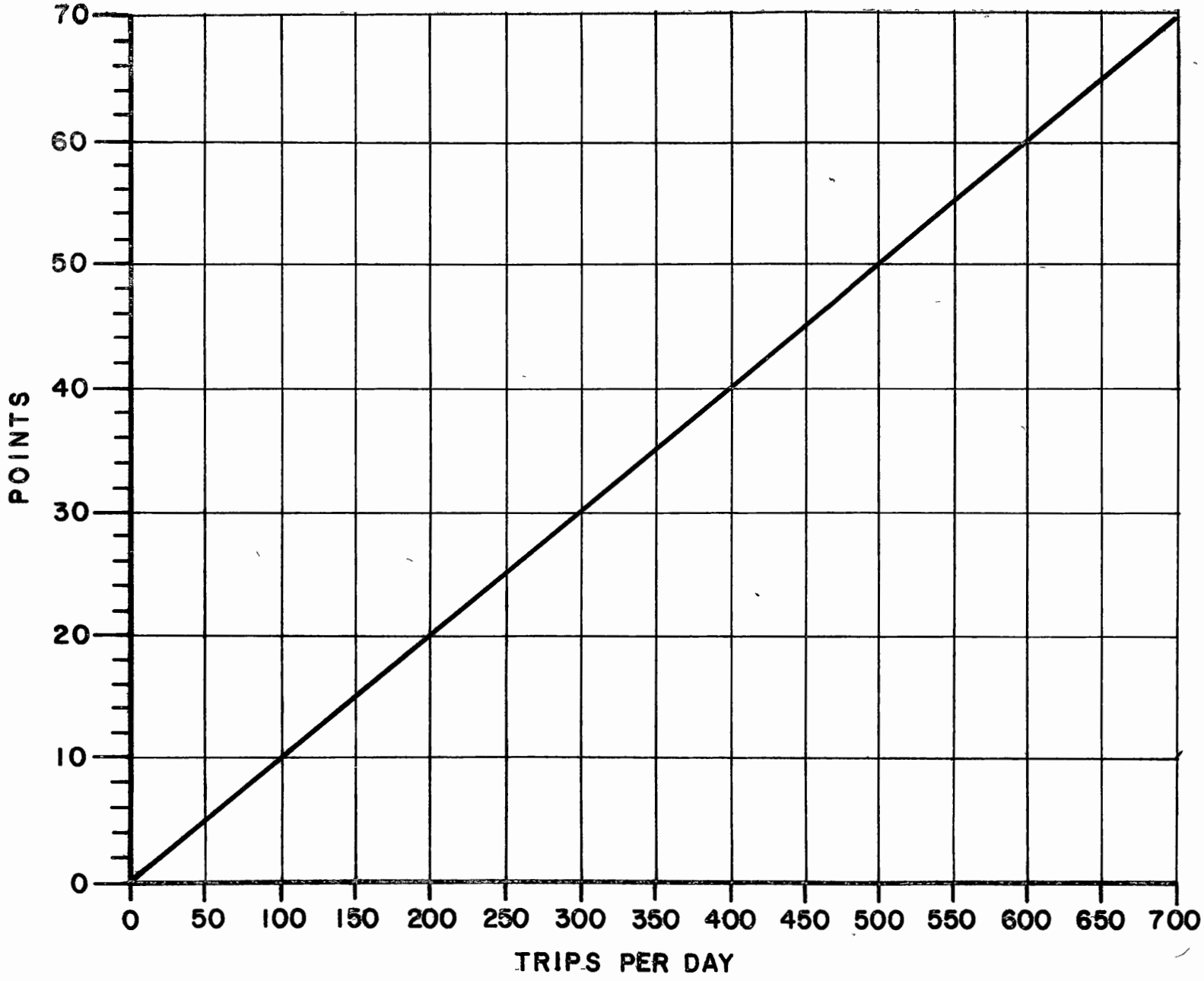


Figure B-9. TRIP GENERATION

II. DISTANCE TO NEAREST ALTERNATE CROSSING

Distance to Crossing in Feet _____

Total Trips _____

Type of Protection at Alternate Crossing
(Check one of the Following)

_____Passive Protections (Flashing Signal, Signs Only, or No Signs)

_____Active Protections (Traffic Signal)

_____Grade Separation (Overpass or Underpass)

POINTS AWARDED FROM FIGURE B-10 _____

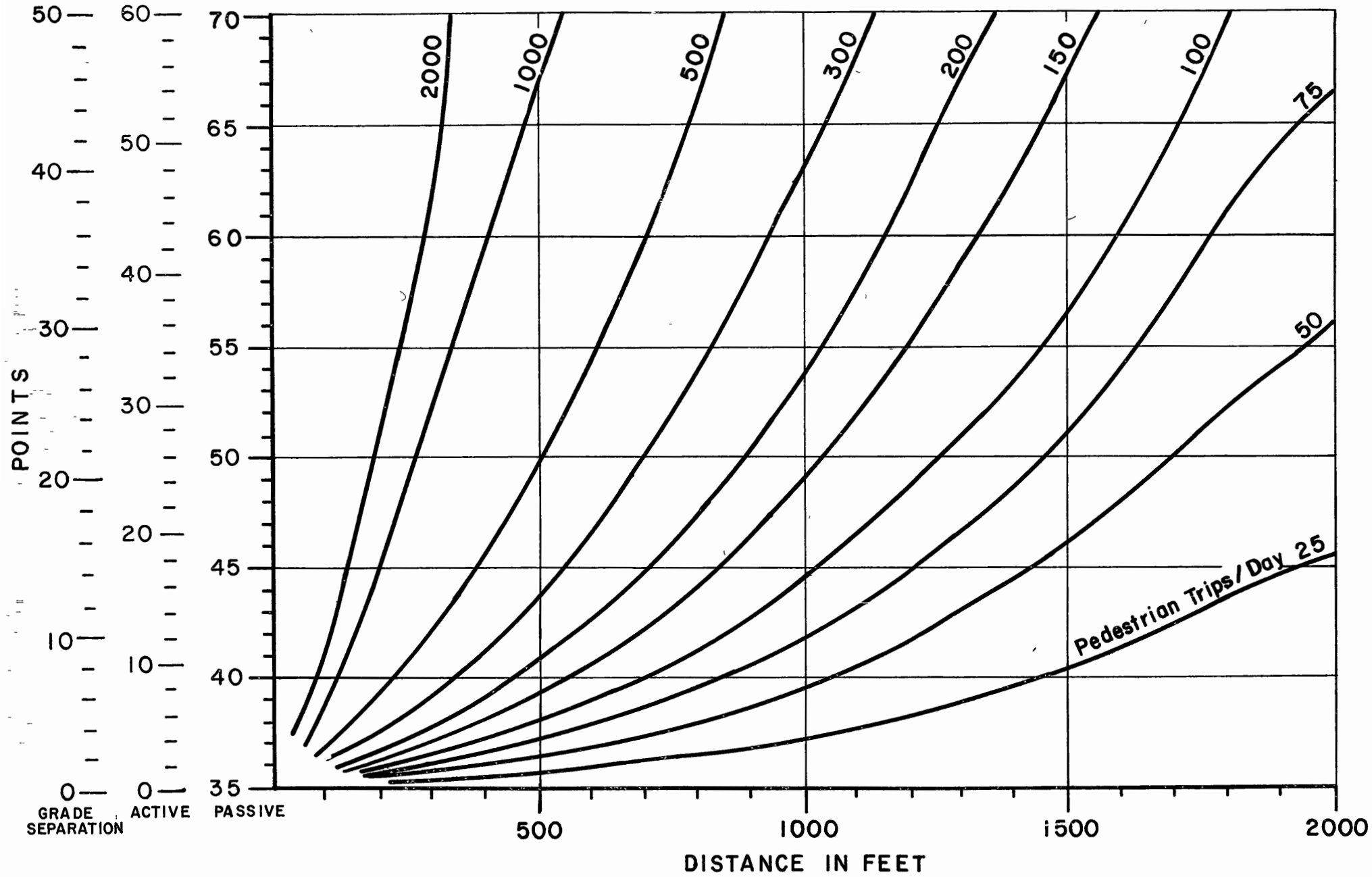


Figure B-10. DISTANCE TO ALTERNATE CROSSING (CONTROLLED ACCESS LOCATION)

III. JUDGEMENT

1. Safety of Alternate Crossing - Limit 5 points

   If the alternate crossing is a grade separation which has no sidewalks, five points are awarded.

   If the alternate crossing is a grade separation which has sidewalks, but a roadway surface must be crossed to get to the sidewalk, three points are awarded.

   POINTS AWARDED _____

2. Surplus Trip Generation - Assign one point for each 15 trips generated in excess of 700. If evaluator decides that the site does not warrant these additional points, he may elect not to include them into the total point score. Record explanation on reverse side.

   POINTS AWARDED _____

3. Uniqueness of Location - Is there something unusual or different about this location that is not shown in any other point score. Make explanation on reverse. Limit 35 points.

   POINTS AWARDED _____

   TOTAL POINTS AWARDED - JUDGEMENT _____

APPENDIX C

COMPUTER PROGRAM METHOD FOR THE PEDESTRIAN GRADE SEPARATION LOCATION PRIORITY RANKING SYSTEM

The three computer programs, COMDEL, PEDOP1, and PEDOP2, developed during this project, are written in Fortran language and are listed in Appendices D, E, and F, respectively. These programs were prepared for use on an IBM 370 computer system with terminals. The examples of input and output were printed as they appear on a terminal. Conversion for batch operation would involve adding job control cards, preparing a data deck, and changing READ and WRITE statements.

A. LOCATIONS WITH EXISTING PEDESTRIAN ACTIVITY

I. COMDEL

The first program used is COMDEL. This program calculates the total pedestrian delay in seconds for a signalized location. Equation (2), described on page 18 , is used first. If pedestrians did not cross the roadway during the cycle that they arrived, the program will use a group of equations based on cycle times rather than red times to determine this delay as previously discussed on page 18 . When all cycles have been examined, COMDEL uses Equation (3) on page 19, in the manual method description in Appendix B, to calculate the average pedestrian delay in cycles observed during the pedestrian peak hour for a signalized location.

Figure C-1 shows an example of input and output data for the COMDEL computer program. COMDEL uses five items of field data collected during the pedestrian peak hour delay study. The first is the number of signal cycles in the peak hour. The input format is I3. If the number of cycles exceed 100, the program will terminate. If this circumstance ever actually occurs, the dimension statement for this variable would have to be increased.

The remaining four items of data are the observations of pedestrians waiting to cross at the beginning of the green phase for each cycle, the observations of pedestrians crossing during the green phase for each cycle, the pedestrian red time in seconds for each cycle, and the total cycle length in seconds for each cycle. All four of these are input in a free format. This means that these numbers can follow each other in the input with the only requirement being a blank space separating each variable. The output from the program is the average pedestrian delay observed during the pedestrian peak hour in signal cycles.

```
 RUN COMDEL TEXT
*EXECUTION BEGINS....
*ENTER NUMBER OF CYCLES IN HOUR. > 100 = END OF DATA

  34
*ENTER 34 OBSERVATIONS OF PEOPLE AT START OF GREEN.
  0 0 0 0 0 0 0 0 2 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
*ENTER 34 OBSERVATIONS OF PEOPLE CROSSING IN GREEN.
  0 0 0 0 0 0 4 0 2 0 0 0 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0
*ENTER 34 RED TIME (SECONDS).
  73 72 73 79 71 73 68 71 77 68 79 76 70 68 77 73 77 75 68 66 64 63
  65 74 75 67 60 74 79 71 70 79 73 74
*ENTER 34 CYCLE LENGTH (SECONDS).
  95 96 95 96 81 95 81 81 97 71 90 91 92 77 90 91 92 100 83 90 90 89
  77 88 90 94 75 84 97 89 90 88 90

*DELAY IS 0.20 CYCLE PER PEDESTRIAN
```

*Indicates typed by computer program

FIGURE C-1: COMDEL COMPUTER PROGRAM INPUT AND OUTPUT DATA

II. PEDOP1

PEDOP1 is then used to obtain the TOTAL POINTS for a site, performing the computations as in Section A of the manual method description, Appendix B, pages 17 to 23. For existing pedestrian activity sites, the number one must be coded in the first column of the first line of the input to signify that the site to be examined is one where pedestrian activity exists. The remaining input data would then be coded starting with the second line, using one line for each site. Figure C-2 is a listing of the actual input data for the thirteen sites evaluated in the study where pedestrian activity exists. Figure C-3a shows the input format used to code the site data.

On the terminal system, after all the data has been coded, PEDOP1 must be called.

The calculations to be done by PEDOP1 are only accurate when the input is within certain ranges. Therefore, a check of the input variables should be done. An optional input variable edit routine has been included in the PEDOP1 computer program to perform this check. This check need not be done once all errors have been corrected. In this case, the number 2 must be typed to indicate the check is not to be performed. PEDOP1 will then calculate the parameter scores, store these scores in an array, indicate which columns are to be used to sort the array, and then terminate. Shown in Figure C-4a is the terminal display when this procedure is followed.

The number one must be typed in the first column when requested if the input edit routine is to be used.

When required, the edit routine will check each variable, one site at a time, to make sure that they are within their designated limits. If any variables are not within their limits, the edit routine will print

```
1
 1 64700  192 .32 119 50    0  34   0 4   50 2  0 1204  RT  18 MP 39.3
 1 34000  253 .10  64 50    0  35 110 5   50 2  4 0426  RT 130 MP 32.6
 1 37100  293 .31  82 50    0  28 174 5   50 2  4 0309  RT 130 MP 37.1
 1 24400   83 .23  34 55    0  30 330 5   50 2  6 1817  RT 202 MP 24.6
 2 36700  29652.9  48 45  424   0  88 5 1000 2 10 0305  RT 130 MP 46.0
 2 31200  92222.9  48 50 1080   0   0 1  400 2 10 1507  RT  37 MP 38.4
 2 21400 154816.6  52 30  687   0   0 1  496 2  2 1109  RT  27 MP 00.2
 1 59200   64   0  80 50    0  15   0 4   50 2  0 2016  RT  22 MP 48.5
 1 35000  346 .23  41 40    0  29   0 4   50 2  2 0908  RT 1-9 MP 59.7
 1 66300  147 .50  80 50    0  25 184 5   50 2  0 2008  RT 1-9 MP 41.2
 1 33600  119 .20  95 45    0  27   0 4   50 2  0 0226  RT  46 MP 68.5
 1 33600  222 .31  34 50    0  36 102 4   50 2  4 0259  RT  46 MP 65.7
 2 38000  195  34  34 55  400   0 218 5 2112 3 10 1208  RT  18 MP 33.7
9999999
```

FIGURE C-2. PEDOP1 PROGRAM INPUT DATA FOR SITES WHERE PEDESTRIAN ACTIVITY EXISTS

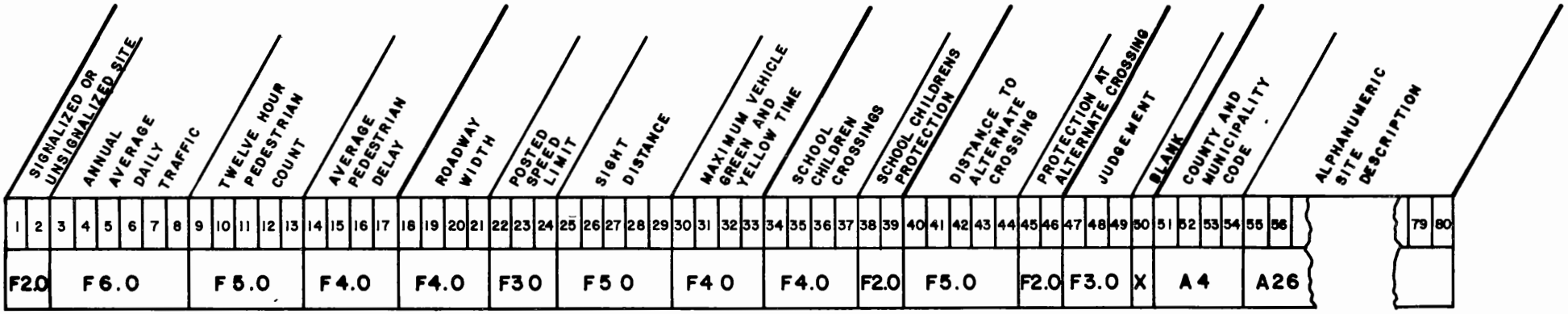


Figure C-3a. INPUT FORMAT FOR PEDOP1 COMPUTER PROGRAM.
SITES WHERE PEDESTRIAN ACTIVITY EXISTS.

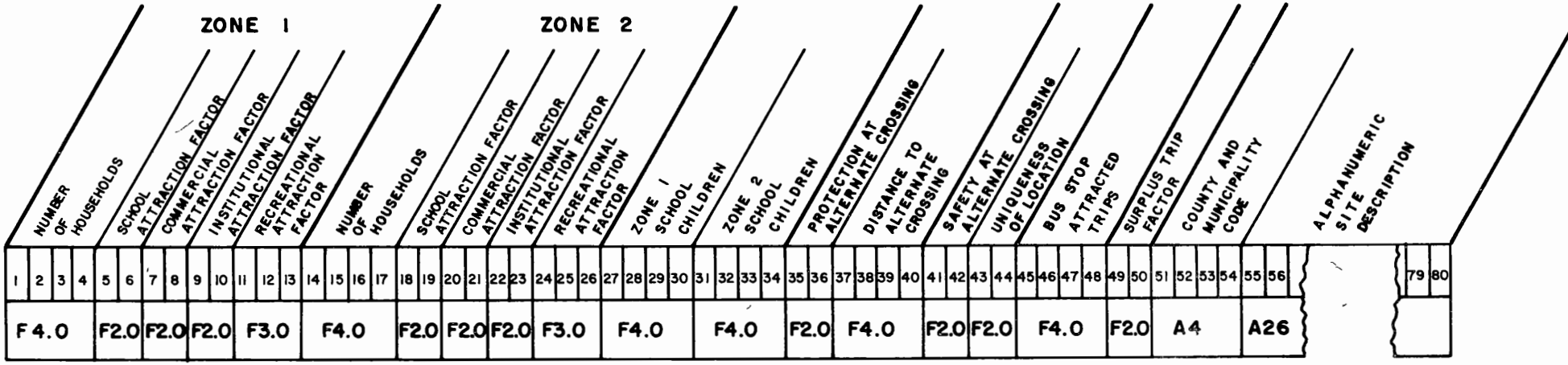


Figure C-3b. INPUT FORMAT FOR PEDOP1 COMPUTER PROGRAM.
SITES WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE.

```
 RUN PEDOP1 TEXT
*EXECUTION BEGINS...
*TYPE 1 FOR EDIT, 2 FOR NO EDIT.

 2

*SORT OUTPUT OF THIS PROGRAM ON COLUMSN 43 THROUGH 49 FOR EXISTING PEDESTRIAN ACTIVITY.
*R;
```

FIGURE C-4a - PEDOP1 OUTPUT (INPUT VARIABLE CHECK NOT DONE)

```
 RUN PEDOP1 TEXT
*EXECUTION BEGINS...
*TYPE 1 FOR EDIT, 2 FOR NO EDIT.

 1

*ERROR IN VARIBLES  3                                  AT SITE 1208 RT 18 MP 33.7
*R;
```

FIGURE C-4b - PEDOP1 OUTPUT (INPUT VARIABLLS CHECK DONE - ONE ERROR)

```
 RUN PEDOP1 TEXT
*EXECUTION BEGINS...
*TYPE 1 FOR EDIT, 2 FOR NO EDIT.

 1

*NO INPUT ERRORS DETECTED.

*SORT OUTPUT OF THIS PROGRAM ON COLUMNS 43 THROUGH 49 FOR EXISTING PEDESTRIAN ACTIVITY.
*R;
```

FIGURE C-4c - PEDOP1 OUTPUT (INPUT VARIABLES CHECK DONE - NO ERRORS)

*Indicates typed by computer program

out the number of the variables that are incorrect and the site description for every site with an incorrect variable. PEDOP1 will then terminate. Figure C-4b shows an example of the terminal display for this procedure.

However, when the variables for all sites are within their limits, the message "NO INPUT ERRORS DETECTED" is output by the terminal. The calculations for the parameter scores are then performed, these scores are stored in an array, and the columns which are to be used to sort the array are indicated. PEDOP1 will then terminate. Shown in Figure C-4c is the terminal display when this procedure is followed.

The equations used by PEDOP1 to calculate point scores are only valid within the boundaries described by the limits of the graphs used in the manual method. These graphs are used to calculate the respective equivalent point scores as described in Appendix B. For locations where pedestrian activity exists, Table C-1 summarizes these boundaries and defines the thirteen input variables and their limits, as used in the edit routine.

The following is a discussion of the calculations performed by PEDOP1 for sites where pedestrian activity exists.

1. The computer uses the annual average daily traffic, average day pedestrian count, and the average pedestrian delay to calculate the point score for the PEDESTRIAN AND VEHICLE VOLUME parameter. Average pedestrian delay is calculated either by COMDEL for a signalized location or by equation (1), page 18 of the manual method description, Appendix B, for an unsignalized location. The POINTS AWARDED are determined the same way as Figures B-1, B-2, and B-3 are used in the manual method.

EDIT ROUTINE VARIABLE NAME	LIMITS LOWER	LIMITS UPPER	DEFINITION
VAR(1)	1	2	Protection at Crossing (Signalized or Unsignalized) (Must be Integer)
VAR(2)	1	none*	Average 24 Hour Vehicle Volume
VAR(3)	1	none*	Average 12 Hour Pedestrian Volume
VAR(4)	0	none*	Average Pedestrian Delay
VAR(5)	8	120	Roadway Width
VAR(6)	1	none*	Posted Speed Limit
VAR(7)	0	none*	Minimum Actual Sight Distance
VAR(8)	0	74	Maximum Vehicle Green and Yellow
VAR(9)	0	none*	School Children Crossing
VAR(10)	1	5	School Children Protection (Must be Integer)
VAR(11)	1	none*	Distance to Alternate Crossing
VAR(12)	1	3	Alternate Crossing Protection (Must be Integer)
VAR(13)	0	10	Judgement

* Limited by input format

TABLE C-1. LIMITS OF INPUT VARIABLES FOR LOCATIONS WHERE PEDESTRIAN ACTIVITY EXISTS

2. The signalized or unsignalized site indicator, which is 1 for a signalized site, informs the computer that the calculations for the PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN parameter need to be performed. The computer uses the roadway width and maximum vehicle green and yellow variables to calculate the point score for the PEDESTRIAN CROSSING/MAXIMUM VEHICLE GREEN parameter for a signalized site. The POINTS AWARDED are obtained the same way as Figure B-6 is used in the manual method.

3. The signalized or unsignalized site indicator, which is 2 for an unsignalized site, informs the computer that the calculations for the SIGHT DISTANCE parameter need to be performed. The computer uses the roadway width, posted speed limit, and sight distance variables to calculate the point score for the SIGHT DISTANCE parameter for an unsignalized location. The POINTS AWARDED are obtained the same way as Figures B-4 and B-5 are used in the manual method.

4. The computer uses the school children crossings and school childrens' protection variables to calculate the point score for the SCHOOL CROSSING parameter. The POINTS AWARDED are obtained the same way as Figure B-7 is used in the manual method.

5. The computer uses the distance to alternate crossing and protection at alternate crossing variables to calculate the point score for the ALTERNATE CROSSING parameter. The POINTS AWARDED are obtained the same way as Figure B-8 is used in the manual method.

6. The POINTS AWARDED for the JUDGEMENT parameter is determined by the manual method and the POINTS AWARDED is the input for this program.

The county and municipality code is a four digit number used in the State of New Jersey for identification purposes. This indicator will be used later in the PEDOP2 computer program.

An alphanumeric site description is also included to allow for the identification of a site's route number, milepost designation, and date of the field study.

The point scores for the five parameters, the total priority point score for the site, the difference between 200 points and the total priority point score, the county and municipality code, and the alphanumeric site description are stored in an array by PEDOP1.

III. PEDOP2

Before using the PEDOP2 program, the stored array from PEDOP1 must be run through a sort program. The sort program used for this project is a canned program on the New Jersey Department of Transportation computer system. This program uses the difference between 200 points and the total priority point score variable, columns 43 through 49 of PEDOP1 output, as the sorting base. This is because the sort program lists in ascending order and the priority list is wanted in descending order.

1. As a result of running the sort program, the stored output array from PEDOP1 is now arranged in a priority order. This stored array is used as the input for the PEDOP2 computer program. This program is used to output the PEDOP1 array in an orderly fashion as to easily pick out the top priority sites. The number of sites is dimensionally limited to one hundred. Therefore, if there are more than one hundred sites, the dimension statement will need to be increased.

2. One of three format options must be chosen when the PEDOP2 program is run. Figure C-5 shows examples of each of the three options for the output from PEDOP2 for the thirteen LOCATIONS WITH EXISTING PEDESTRIAN ACTIVITY that were evaluated during this study.

(a) The first option is if a list of all sites in order of priority is wanted, the number one, format I1, must be coded. Under this option the five parameter scores, the total score, the county and municipality code, and the site description will be outputted for all the sites which have been evaluated. They will be ranked in order from the site with the highest total score to the site with the lowest total score.

(b) The second option is if the PEDOP2 output for a single site is desired, the number two, format I1, must be coded. The county and municipality code for the specific site would then be inputted. The scores, description, and also the actual rank from the ranked list of all evaluated sites is outputted.

(c) Finally, the number three, format I1, must be coded to cause the program to terminate.

B. LOCATIONS WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE

I. PEDOP1

For sites where pedestrian activity is not possible, PEDOP1 is used first to obtain the TOTAL POINTS for a site, performing the computations as in Section B of the manual method description, Appendix B, pages 23 to 29. For no pedestrian activity sites, the number two must be coded in the first column of the first line of input to signify that the site to be examined is one where pedestrian activity is not possible. The remaining input data would then be coded starting with the second line, using one line for each site.

```
 RUN PEDOP2 TEXT
*EXECUTION BEGINS....

*TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN FINISHED.

 1

*LOCATIONS WHERE PEDESTRIAN ACTIVITY CAN OCCUR.

*PED + VEH  SIGHT  SCHOOL  ALTER.  JUDGE-  TOTAL  CNTY
*  SCORE     DIST.  CROSS.  CROSS.   MENT   SCORE  MUN   SITE DESCRIPTION

*   31.4     40.2     7.3    16.4    10.0   105.3  0305   RT 130 MP 46.0
*   16.1     31.6    10.0    30.0    10.0    97.7  1208   RT  18 MP 33.7
*   11.1      4.6     0.0    25.0     2.0    42.7  1109   RT  27 MP 00.2
*   15.3      4.3     0.0    13.1    10.0    42.7  1507   RT  37 MP 38.4
*   18.7     11.4     9.6     0.2     0.0    39.9  2008   RT 1-9 MP 41.2
*    0.0     36.2     0.0     0.1     0.0    36.3  2016   RT  22 MP 48.5
*   11.1      9.2     9.4     0.4     4.0    34.1  0309   RT 130 MP 37.1
*    8.4      0.7    10.9     0.3     4.0    24.3  0259   RT  46 MP 65.7
*   10.6     11.4     0.0     0.2     0.0    22.2  1204   RT  18 MP 39.3
*    2.3      1.1    10.0     0.1     6.0    19.5  1817   RT 202 MP 24.6
*    3.0      2.1     8.0     0.4     4.0    17.5  0426   RT 130 MP 32.6
*    3.6     12.5     0.0     0.2     0.0    16.3  0226   RT  46 MP 68.5
*    8.5      1.5     0.0     0.5     2.0    12.5  0908   RT 1-9 MP 59.7

*TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN FINISHED.

 2

*TYPE COUNTY AND MUNICIPALITY CODE FOR DESIRED SITE AS XXXX

 2016

*LOCATION WHERE PEDESTRIAN ACTIVITY CAN OCCUR

*     PED + VEH SIGHT SCHOOL ALTER. JUDGE- TOTAL CNTY
*RNK    SCORE   DIST. CROSS. CROSS.  MENT  SCORE  MUN  SITE DESCRIPTION

* 6      0.0    36.2   0.0    0.1    0.0   36.3  2016   RT 22 MP 48.5

*TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN FINISHED.
 3
*R;
```

*Indicates typed by computer program.

FIGURE C-5. PEDOP2 PROGRAM OUTPUT DATA FOR SITES WHERE PEDESTRIAN ACTIVITY EXISTS

Figure C-6 is a listing of the actual input data for the six sites evaluated in the study where pedestrian activity is not possible. Figure C-3b shows the input format used to code the site data.

Again, an edit option is in PEDOP1. Refer to discussion on page for the required action. The only variation in the input edit routine is due to the number of input variables to be checked. For locations where pedestrian activity is not possible, Table C-2 summarizes the boundaries and defines the eighteen input variables and their limits, as used in this routine.

The following is a discussion of the calculations performed by PEDOP1 for sites where pedestrian activity is not possible.

1. The computer uses the number of households, school attraction factor, commercial attraction factor, institutional attraction factor, recreational attraction factor, school children for both zones, and bus stop attracted trips variables to calculate the point score for the TRIP GENERATION parameter. These variables are determined by using the method in Section B (for parameter I) of the manual method, Appendix B, pages 24 to 26. The POINTS AWARDED are obtained the same way as Figure B-9 is used in the manual method.

2. The computer uses the protection at alternate crossing and distance to alternate crossing variables to calculate the point score for the ALTERNATE CROSSING parameter. The POINTS AWARDED are obtained the same way as Figure B-10 is used in the manual method.

3. The computer uses the safety at alternate crossing, uniqueness of location variables, surplus trips factor, plus trips generated to calculate the point score for the JUDGEMENT parameter. These variables are determined by using the method in Section B III of the manual method for this parameter in Appendix B, Page 26. The surplus

```
2
 292 0.1 0  0 349 1.3  0   0   0   0 11071 3 5   0 01616 RT  80 MP 56.5
 882 0.1 0  01286 0.3  0   0   0   0 1 862 0 5   0 00908 RT 495 MP  1.2
  96 0.3 0 .3  66 0 0  0  .3   0   0 1 450 3 5 330 00247 RT  17 MP 15.5
 334 0.3 0 .0 250 0 0 .3  .3   0   0 11215 0 5 205 00261 RT   4 MP  7.9
   0 0 0 0 .3 763 0.4  0   0   0   0 12640 0 5   0 01111 RT  29 MP  1.9
 258 1.2 0  0 417 0.2  0   0   0   0 11430 0 5   0 00909 RT   3 MP  8.8

99999999
```

FIGURE C-6. PEDOP1 PROGRAM INPUT DATA FOR SITES WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE

EDIT ROUTINE VARIABLE NAME	LIMITS* LOWER	UPPER	DEFINITION
VAR(1)	0	none*	Number of Households in Zone 1
VAR(2)	0	1	School Attraction Factor for Zone 1
VAR(3)	0	0.4	Commercial Attraction Factor for Zone 1
VAR(4)	0	0.3	Institutional Attraction Factor for Zone 1
VAR(5)	0	0.3	Recreational Attraction Factor for Zone 1
VAR(6)	0	none*	Number of Households in Zone 2
VAR(7)	0	1	School Attraction Factor for Zone 2
VAR(8)	0	0.4	Commercial Attraction Factor for Zone 2
VAR(9)	0	0.3	Institutional Attraction Factor for Zone 2
VAR(10)	0	0.3	Recreational Attraction Factor for Zone 2
VAR(11)	0	none*	School Children in Zone 1
VAR(12)	0	none*	School Children in Zone 2
VAR(13)	1	3	Alternate Crossing Protection (Must be Integer)
VAR(14)	1	none*	Distance to Alternate Crossing
VAR(15)	0	5	Safety at Alternate Crossing
VAR(16)	0	35	Uniqueness of Location
VAR(17)	0	none*	Bus Stop Trips Generated
VAR(18)	0	1	Surplus Trip Factor (Must be Integer)

* Limited by input format.

TABLE C-2. LIMITS OF INPUT VARIABLES FOR LOCATIONS WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE

trip factor allows the evaluator to elect not to include the additional points received from this section. If the surplus trip factor is zero, the points are included; if the surplus trip factor is one, the points are not included. The POINTS AWARDED for the JUDGEMENT parameter are obtained the same way they are obtained in the manual method, Appendix B. The county and municipality code and the alphanumeric site description are to be included in the input.

The point scores for the three parameters, the total priority point score, the difference between 200 points and the total priority point score, the county and municipality code, and the alphanumeric site description are stored in an array by PEDOP1.

II. PEDOP2

Before using the PEDOP2 program, the stored array from PEDOP1 is run through the sort program as described earlier on page 60. The sort program uses the difference between 200 points and the total priority point score variable, which are now columns 29 through 35 of PEDOP1 output, as a sorting base.

As a result of running the sort program, the stored output array from PEDOP1 is not arranged in a priority order. This stored array is now used as input for the PEDOP2 computer program. The program outputs the PEDOP1 array in an orderly fashion as to easily pick out the top priority sites.

The procedure, format, and options for the PEDOP2 program for locations where pedestrian activity is not possible are the same as those discussed earlier on page 61.

Figure C-7 shows the PEDOP2 output for the six LOCATIONS WITH NO PEDESTRIAN ACTIVITY POSSIBLE that were evaluated during this study.

```
 RUN PEDOP2 TEXT
*EXECUTION BEGINS...

*TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN FINISHED


 1

*LOCATIONS WHERE PEDESTRIAN ACTIVITY CANNOT OCCUR

*   TRIP  ALTER.  JUDGE-  TOTAL  CNTY
*   GEN.  CROSS.   MENT   SCORE   MUN  SITE DESCRIPTION

*   55.2  50.0     5.0    110.2  0909   RT   3 MP  8.8
*   41.4  50.0     8.0     99.4  1616   RT  80 MP 56.5
*   41.1  50.0     5.0     96.1  0261   RT   4 MP  7.9
*   39.3  33.7     5.0     78.0  0908   RT 495 MP  1.2
*   22.9  50.0     5.0     77.9  1111   RT  29 MP  1.9
*   39.8  13.2     8.0     61.0  0247   RT  17 MP 15.5

*TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN FINISHED

 2

*TYPE COUNTY AND MUNICIPALITY CODE FOR DESIRED SITE AS XXXX

 1111

*LOCATION WHERE PEDESTRIAN ACTIVITY CANNOT OCCUR

*     TRIP  ALTER.  JUDGE-  TOTAL  CNTY
*RNK  GEN.  CROSS.   MENT   SCORE   MUN  SITE DESCRIPTION

* 5   22.9   50.0    5.0     77.9  1111   RT 29 MP 1.9

*TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN FINISHED
 3
*R;
```

*Indicates typed by computer program

FIGURE C-7. PEDOP2 PROGRAM OUTPUT DATA FOR SITES WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE

APPENDIX D

COMDEL COMPUTER PROGRAM

```
C       PROGRAM COMDEL                                                  COM00010
C       THIS PROGRAM CALCULATES THE AVERAGE PEDESTRIAN DELAY IN CYCLES  COM00020
C       FOR A SIGNALIZED INTERSECTION.                                  COM00030
        DIMENSION A(100),B(100),C(100),R(100)                           COM00040
C       N= NUMBER OF SIGNAL CYCLES IN PEDESTRIAN PEAK HOUR              COM00050
C       A= NUMBER OF PEDESTRIANS WAITING AT THE BEGINNING OF GREEN TIME COM00060
C       B= NUMBER OF PEDESTRIANS CROSSING DURING GREEN TIME             COM00070
C       R= RED TIME IN SECONDS                                          COM00080
C       C= CYCLE TIME IN SECONDS                                        COM00090
 1000   WRITE(6,505)                                                    COM00100
        READ(5,500) N                                                   COM00110
        IF(N.GT.100)CALL EXIT                                           COM00120
        WRITE(6,501) N                                                  COM00130
        CALL FREERD(N,A)                                                COM00140
        WRITE(6,502) N                                                  COM00150
        CALL FREERD(N,B)                                                COM00160
        WRITE(6,503) N                                                  COM00170
        CALL FREERD(N,R)                                                COM00180
        WRITE(6,504) N                                                  COM00190
        CALL FREERD(N,C)                                                COM00200
C       THIS PART OF PROGRAM CALCULATES TOTAL DELAY IN SECONDS          COM00210
        DELAY=0.                                                        COM00220
        I=0                                                             COM00230
  100   I=I+1                                                           COM00240
        IF(I.EQ.N)GO TO 300                                             COM00250
C       WHEN I=N, GO TO 300 TO CALCULATE THE TOTAL DELAY FOR THE LAST   COM00260
C       CYCLE IN THE PEDESTRIAN PEAK HOUR AND ADD THIS TO THE PREVIOUS  COM00270
C       CYCLES TOTAL DELAY                                              COM00280
        IF(A(I)-B(I))110,110,120                                        COM00290
C       THIS EQUATION CALCULATES THE TOTAL DELAY FOR ONE CYCLE WHEN THE COM00300
C       NUMBER OF PEDESTRIANS WAITING AT THE BEGINNING OF GREEN IS LESS COM00310
C       THAN OR EQUAL TO THE NUMBER OF PEDESTRIANS CROSSING DURING GREEN COM00320
C       AND ADDS THIS TO THE PREVIOUS CYCLES TOTAL DELAY                COM00330
  110   DELAY=DELAY+(A(I)*R(I)/2.)                                      COM00340
        GO TO 100                                                       COM00350
C       THIS EQUATION CALCULATES THE TOTAL DELAY FOR ONE CYCLE WHEN THE COM00360
C       THE NUMBER OF PEDESTRIANS WAITING AT THE BEGINNING OF GREEN IS  COM00370
C       LESS THAN THE NUMBER OF PEDESTRIANS CROSSING DURING GREEN AND   COM00380
C       ADDS THIS TO THE PREVIOUS CYCLES TOTAL DELAY                    COM00390
  120   DELAY=DELAY+(A(I)*R(I)/2.)+((A(I)-B(I))*C(I)/2.)               COM00400
  200   I=I+1                                                           COM00410
        IF(I.EQ.N)GO TO 310                                             COM00420
C       WHEN I=N, GO TO 310 TO CALCULATE THE TOTAL DELAY FOR THE LAST   COM00430
C       CYCLE IN THE PEDESTRIAN PEAK HOUR AND ADD THIS TO THE PREVIOUS  COM00440
C       CYCLES TOTAL DELAY                                              COM00450
        IF(A(I)-B(I))210,210,220                                        COM00460
  210   DELAY=DELAY+(A(I)*C(I)/2.)                                      COM00470
        GO TO 100                                                       COM00480
  220   DELAY=DELAY+(A(I)*C(I)/2.)+((A(I)-B(I))*C(I)/2.)                COM00490
        GO TO 200                                                       COM00500
  300   DELAY=DELAY+(A(I)*R(I)/2.)                                      COM00510
        GO TO 100                                                       COM00520
  310     DELAY=DELAY+(B(I)*C(I)/2.)                                    COM00530
C       THIS PART OF PROGRAM CALCULATES AVERAGE DELAY IN CYCLES         COM00540
C       SUM = TOTAL NUMBER OF PEDESTRIANS CROSSING DURING PEDESTRIAN    COM00550
C       PEAK HOUR                                                       COM00560
C       TIME = TOTAL OF ALL CYCLE TIMES IN SECONDS                      COM00570
        D=0.                                                            COM00580
        SUM=0.                                                          COM00590
        DO 700 I=1,N                                                    COM00600
```

```
      PED=PED+B(I)                                                        COM00610
      CYCLE=CYCLE+C(I)                                                    COM00620
  700 CONTINUE                                                            COM00630
      D=N                                                                 COM00640
      DELAY=(DELAY/PED)/(CYCLE/D)                                         COM00650
      WRITE(6,600)DELAY                                                   COM00660
      GO TO 1000                                                          COM00670
  500 FORMAT(I3)                                                          COM00680
  501 FORMAT(' ENTER',I4,' OBSERVATIONS OF PEOPLE AT START OF GREEN.'/)    COM00690
  502 FORMAT(' ENTER',I4,' OBSERVATIONS OF PEOPLE CROSSING IN GREEN.'/)   COM00700
  503 FORMAT(' ENTER',I4,' RED TIME(SECONDS).'/)                          COM00710
  504 FORMAT(' ENTER',I4,' CYCLE LENGTH(SECONDS).'/)                      COM00720
  505 FORMAT(' ENTER NUMBER OF CYCLES IN HOUR. >100=END OF DATA.'/)       COM00730
  600 FORMAT(/////'  DELAY IS ',F4.2,' CYCLE PER PEDESTRIAN'/////)        COM00740
      END                                                                 COM00750
```

APPENDIX E

PEDOP1 COMPUTER PROGRAM

```
C     PROGRAM PEDOP1T                                                   PED00010
C     THIS PROGRAM CALCULATES A POINT VALUE TO BE USED TO WARRENT       PED00020
C     THE NEED FOR PEDESTRIAN GRADE SEPARATIONS.  BOTH, SITES           PED00030
C     WHERE PEDESTRIAN ACTIVITY EXISTS AND SITES WHERE PEDESTRIAN       PED00040
C     ACTIVITY IS NOT POSSIBLE ARE ANALYZED, USING DATA COLLECTED       PED00050
C     IN THE FIELD.                                                     PED00060
      DIMENSION A(10),B(10),C(10,3),D(10,3),SCORE(2),VAR(18)            PED00070
      DIMENSION SITE(8),IX(18),IY(18)                                   PED00080
C     THE FUNCTION A IS THE PERCENTAGES OF PEDESTRIANS CROSSING USED TO PED00090
C     DESCRIBE THE FAMILY OF CURVES                                     PED00100
      DATA A/.01,.1,.2,.3,.5,1.,2.,5.,10.,25./                          PED00110
C     THE FUNCTION B IS THE VOLUMES USED AS THE CUT-OFF POINTS BETWEEN  PED00120
C     THE LINEAR AND QUADRATIC PORTIONS OF THE CURVES                   PED00130
      DATA B/0.,0.,47.,43.,36.,28.,0.,0.,0.,0./                         PED00140
C     THE FUNCTION C IS THE COEFFICIENTS USED TO DESCRIBE THE LINEAR    PED00150
C     PORTION OF THE CURVES                                             PED00160
      DATA C/0.,0.,.7706642E-2,.1465187,.1187115,-.1929188E-1,0.,0.,0., PED00170
     10.,0.,0.,.7273412E-1,.7820207E-1,.1741671,.3629156,0.,0.,0.,0.,0.,PED00180
     20.,.7535934E-2,.1141384E-1,.1418167E-1,.1773418E-1,0.,0.,0.,0./   PED00190
C     THE FUNCTION D IS THE COEFFICIENTS USED TO DESCRIBE THE QUADRATIC PED00200
C     PORTION OF THE CURVES                                             PED00210
      DATA D/0.,-.9413147E-1,-.1615385E+2,-.2461538E+2,-.2409091E+2,    PED00220
     1-.2166667E+2,.2166290,.6937389,.3912830,.2495947,0.,.7501346E-1,  PED00230
     2.7692308,.1153846E+1,.1363636E+1,.1666667E+1,.6170825,.6432457,   PED00240
     3.1539962E+1,.1538107E+1,0.,.2984180E-2,0.,0.,0.,0.,.2340030E-1,   PED00250
     4.5674098E-1,.6915808E-1,.4829107/                                 PED00260
C     INPUT EDIT ROUTINE.                                               PED00270
C     THIS PART OF PROGRAM CHECKS THE INPUT VARIABLES TO SEE IF THEY    PED00280
C     ARE WITHIN THEIR DESIGNATED LIMITS.                               PED00290
C     IF EDIT ROUTINE IS NOT TO BE USED, TYPE IN 2.  THIS WILL MAKE THE PED00300
C     PROGRAM BEGIN THE COMPUTATIONS STARTING WITH STATEMENT 12.        PED00310
C     IF EDIT ROUTINE IS TO BE USED, TYPE IN 1.                         PED00320
      WRITE(6,501)                                                      PED00330
      READ(5,500) ICONT                                                 PED00340
      IF(ICONT .GT. 1) GO TO 12                                         PED00350
       CALL ZEROS(1)                                                    PED00360
       J=0                                                              PED00370
       READ(8,500)KASE                                                  PED00380
       IF(KASE.GT.1) GO TO 8                                            PED00390
       IKASE=13                                                         PED00400
    2  READ(8,510)(VAR(I),I=1,13),(SITE(M),M=1,8)                       PED00410
       IF(VAR(1).GE.9) GO TO 7                                          PED00420
       DO 3 I=1,13                                                      PED00430
       IX(I)=0                                                          PED00440
    3  IY(I)=0                                                          PED00450
C     THIS PART OF PROGRAM CHECKS THE THIRTEEN INPUT VARIABLES FOR      PED00460
C     LOCATIONS WHERE PEDESTRIAN ACTIVITY EXISTS.                       PED00470
C     PROTECTION AT THE CROSSING MUST BE ONE OR TWO.                    PED00480
       IF(VAR(1).GT.2.OR.VAR(1).LT.1) IX(1)=1                           PED00490
C     AVERAGE 24 HOUR VEHICLE VOLUME MUST BE GREATER THAN ZERO.         PED00500
       IF(VAR(2).LE.0)IX(2)=1                                           PED00510
C     AVERAGE 12 HOUR PEDESTRIAN VOLUME MUST BE GREATER THAN ZERO.      PED00520
       IF(VAR(3).LE.0)IX(3)=1                                           PED00530
C     AVERAGE PEDESTRIAN DELAY MUST BE GREATER THAN OR EQUAL TO ZERO.   PED00540
       IF(VAR(4).LT.0)IX(4)=1                                           PED00550
C     ROADWAY WIDTH MUST BE GREATER THAN OR EQUAL TO EIGHT AND          PED00560
C     LESS THAN OR EQUAL TO ONE HUNDRED AND TWENTY.                     PED00570
       IF(VAR(5).LT.8.OR.VAR(5).GT.120)IX(5)=1                          PED00580
C     POSTED SPEED LIMIT MUST BE GREATER THAN ZERO.                     PED00590
       IF(VAR(6).LE.0)IX(6)=1                                           PED00600
```

```
C      MINIMUM ACTUAL SIGHT DISTANCE MUST BE GREATER THAN                    PED00610
C      OR EQUAL TO ZERO.                                                     PED00620
       IF(VAR(7).LT.0)IX(7)=1                                                PED00630
C      MAXIMUM VEHICLE GREEN AND YELLOW MUST BE GREATER THAN                 PED00640
C      OR EQUAL TO ZERO AND LESS THAN OR EQUAL TO SEVENTY FOUR.              PED00650
       IF(VAR(8).LT.0.OR.VAR(8).GT.74)IX(8)=1                                PED00660
C      SCHOOL CHILDREN CROSSINGS MUST BE GREATER THAN OR EQUAL TO ZERO.      PED00670
       IF(VAR(9).LT.0)IX(9)=1                                                PED00680
C      SCHOOL CHILDREN PROTECTION MUST BE ONE, TWO, THREE, FOUR, OR FIVE.    PED00690
       IF(VAR(10).GT.5.OR.VAR(10).LT.1)IX(10)=1                              PED00700
C      DISTANCE TO ALTERNATE CROSSING MUST BE GREATER THAN ZERO.             PED00710
       IF(VAR(11).LE.0)IX(11)=1                                              PED00720
C      ALTERNATE CROSSING PROTECTION MUST BE ONE, TWO, OR THREE.             PED00730
       IF(VAR(12).GT.3.OR.VAR(12).LT.1)IX(12)=1                              PED00740
C      JUDGEMENT MUST BE GREATER THAN OR EQUAL TO ZERO                       PED00750
C      AND LESS THAN OR EQUAL TO TEN.                                        PED00760
       IF(VAR(13).GT.10.OR.VAR(13).LT.0)IX(13)=1                             PED00770
    4  LL=1                                                                  PED00780
       DO 5 I=1,IKASE                                                        PED00790
       IF(IX(I).LE.0) GO TO 5                                                PED00800
       IY(LL)=I                                                              PED00810
       LL=LL+1                                                               PED00820
    5  CONTINUE                                                              PED00830
       LL=LL-1                                                               PED00840
C      IF NO INPUT ERRORS HAVE BEEN DETECTED FOR THIS SITE,                  PED00850
C      CHECK THE NEXT SITE'S INPUT VARIABLES.                                PED00860
       IF(LL.LE.0) GO TO 6                                                   PED00870
C      IF INPUT ERRORS HAVE BEEN DETECTED FOR THIS SITE,                     PED00880
C      WRITE THE NUMBER AND SITE DESCRIPTION OF THE VARIABLES.               PED00890
C      THEN CHECK THE NEXT SITE'S INPUT VARIABLES.                           PED00900
       WRITE(6,503)(IY(I),I=1,18),(SITE(M),M=1,8)                            PED00910
       J=1                                                                   PED00920
    6  IF(KASE.GT.1) GO TO 11                                                PED00930
       GO TO 2                                                               PED00940
C      IF ANY INPUT ERRORS HAVE BEEN DETECTED, CALL EXIT.                    PED00950
    7  IF(J.GT.0) CALL EXIT                                                  PED00960
C      IF NO INPUT ERRORS HAVE BEEN DETECTED, PRINT THIS MESSAGE             PED00970
       AND BEGIN THE COMPUTATIONS STARTING WITH STATEMENT 12.                PED00980
       WRITE(6,502)                                                          PED00990
       GO TO 12                                                              PED01000
    8  IKASE=18                                                              PED01010
   11  READ(8,520)(VAR(I),I=1,18),(SITE(M),M=1,8)                           PED01020
       IF(VAR(1).GE.9999.) GO TO 7                                           PED01030
       DO 9 I=1,18                                                           PED01040
       IX(I)=0                                                               PED01050
    9  IY(I)=0                                                               PED01060
       THIS PART OF PROGRAM CHECKS THE EIGHTEEN INPUT VARIABLES FOR          PED01070
       LOCATIONS WHERE PEDESTRIAN ACTIVITY IS NOT POSSIBLE.                  PED01080
       NUMBER OF HOUSEHOLDS IN ZONE 1 MUST BE                                PED01090
C      GREATER THAN OR EQUAL TO ZERO.                                        PED01100
       IF(VAR(1).LT.0)IX(1)=1                                                PED01110
       SCHOOL ATTRACTION FACTOR FOR ZONE 1 MUST BE ONE OR ZERO.              PED01120
       IF(VAR(2).GT.1.OR.VAR(2).LT.0)IX(2)=1                                 PED01130
C      COMMERCIAL ATTRACTION FACTOR FOR ZONE 1 MUST BE                       PED01140
C      0.1, 0.2, 0.3, 0.4, OR ZERO.                                          PED01150
       IF(VAR(3).GT.0.4.OR.VAR(3).LT.0)IX(3)=1                               PED01160
C      INSTITUTIONAL ATTRACTION FACTOR FOR ZONE 1 MUST BE 0.3 OR ZERO.       PED01170
       IF(VAR(4).GT.0.3.OR.VAR(4).LT.0)IX(4)=1                               PED01180
C      RECREATIONAL ATTRACTION FACTOR FOR ZONE 1 MUST BE 0.3 OR ZERO.        PED01190
       IF(VAR(5).GT.0.3.OR.VAR(5).LT.0)IX(5)=1                               PED01200
```

```
C     NUMBER OF HOUSEHOLDS IN ZONE 2 MUST BE                                PED01210
C     GREATER THAN OR EQUAL TO ZERO.                                        PED01220
      IF(VAR(6).LT.0)IX(6)=1                                                PED01230
C     SCHOOL ATTRACTION FACTOR FOR ZONE 2 MUST BE ONE OR ZERO.              PED01240
      IF(VAR(7).GT.1.OR.VAR(7).LT.0)IX(7)=1                                 PED01250
C     COMMERCIAL ATTRACTION FACTOR FOR ZONE 2 MUST BE                       PED01260
C     0.1, 0.2, 0.3, 0.4, OR ZERO.                                          PED01270
      IF(VAR(8).GT.0.4.OR.VAR(8).LT.0)IX(8)=1                               PED01280
C     INSTITUTIONAL ATTRACTION FACTOR FOR ZONE 2 MUST BE 0.3 OR ZERO.       PED01290
      IF(VAR(9).GT.0.3.OR.VAR(9).LT.0)IX(9)=1                               PED01300
C     RECREATIONAL ATTRACTION FACTOR FOR ZONE 2 MUST BE 0.3 OR ZERO.        PED01310
      IF(VAR(10).GT.0.3.OR.VAR(10).LT.0)IX(10)=1                            PED01320
C     SCHOOL CHILDREN IN ZONE 1 MUST BE GREATER THAN OR EQUAL TO ZERO.      PED01330
      IF(VAR(11).LT.0)IX(11)=1                                              PED01340
C     SCHOOL CHILDREN IN ZONE 2 MUST BE GREATER THAN OR EQUAL TO ZERO.      PED01350
      IF(VAR(12).LT.0)IX(12)=1                                              PED01360
C     ALTERNATE CROSSING PROTECTION MUST BE ONE, TWO, OR THREE.             PED01370
      IF(VAR(13).GT.3.OR.VAR(13).LT.1)IX(13)=1                              PED01380
C     DISTANCE TO ALTERNATE CROSSING MUST BE GREATER THAN ZERO.             PED01390
      IF(VAR(14).LE.0)IX(14)=1                                              PED01400
C     ADEQUACY AND SAFETY AT ALTERNATE CROSSING MUST BE GREATER THAN OR     PED01410
C     EQUAL TO ZERO AND LESS THAN OR EQUAL TO FIVE.                         PED01420
      IF(VAR(15).GT.5.OR.VAR(15).LT.0)IX(15)=1                              PED01430
C     UNIQUENESS OF LOCATION MUST BE GREATER THAN OR EQUAL TO ZERO          PED01440
C     AND LESS THAN OR EQUAL TO THIRTY FIVE.                                PED01450
      IF(VAR(16).GT.35.OR.VAR(16).LT.0)IX(16)=1                             PED01460
C     BUS STOP TRIPS GENERATED MUST BE GREATER THAN OR EQUAL TO ZERO.       PED01470
      IF(VAR(17).LT.0)IX(17)=1                                              PED01480
C     SURPLUS TRIP FACTOR MUST BE ZERO OR ONE.                              PED01490
      IF(VAR(18).GT.1.OR.VAR(18).LT.0)IX(18)=1                              PED01500
      GO TO 4                                                               PED01510
C     KASE=1 SIGNIFIES PEDESTRIAN ACTIVITY                                  PED01520
C     KASE=2 SIGNIFIES NO PEDESTRIAN ACTIVITY POSSIBLE                      PED01530
   12 READ(1,500)KASE                                                       PED01540
      WRITE(2,500) KASE                                                     PED01550
      IF(KASE.EQ.2)GO TO 300                                                PED01560
    1 READ(1,510)(VAR(I),I=1,13),SITE                                       PED01570
C     IF VAR(1) EQUALS 9, ALL DATA HAS BEEN READ.                           PED01580
      IF(VAR(1) .GE. 9.) GO TO 999                                          PED01590
C     THIS PART OF PROGRAM IS FOR LOCATIONS WHERE PEDESTRIAN                PED01600
C     ACTIVITY EXISTS.                                                      PED01610
C     IPROT REFERS TO THE PROTECTION AT THE CROSSING IN QUESTION            PED01620
C     IPROT=1=SIGNALIZED CROSSING                                           PED01630
C     IPROT=2=UNSIGNALIZED CROSSING                                         PED01640
      IPROT=VAR(1)                                                          PED01650
C     VEH=AVERAGE 24 HOUR VEHICLE VOLUME                                    PED01660
      VEH=VAR(2)                                                            PED01670
C     PED=AVERAGE 12 HOUR PEDESTRIAN VOLUME                                 PED01680
      PED=VAR(3)                                                            PED01690
C     DELAY=AVERAGE DELAY DURING THE PEDESTRIAN PEAK HOUR MEASURED IN       PED01700
C     SECONDS(UNSIGNALIZED) OR CYCLES(SIGNALIZED)                           PED01710
      DELAY=VAR(4)                                                          PED01720
C     RW=ROADWAY WIDTH IN FEET (CURB-TO-CURB OR CURB-TO-ISLAND)             PED01730
      RW=VAR(5)                                                             PED01740
C     SPD=POSTED SPEED IN MILES PER HOUR                                    PED01750
      SPD=VAR(6)                                                            PED01760
C     SD=THE MINIMUM ACTUAL SIGHT DISTANCE                                  PED01770
      SD=VAR(7)                                                             PED01780
C     VGY=THE MAXIMUM VEHICLE GREEN AND YELLOW ALLOWED BY THE               PED01790
C     SIGNAL TIMING                                                         PED01800
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      VGY=VAR(8)                                                        PED01810
C     SC=NUMBER OF SCHOOL CHILDREN CROSSINGS PER DAY                    PED01820
      SC=VAR(9)                                                         PED01830
C     JPROT REFERS TO THE PROTECTION AFFORDED SCHOOL CHILDREN           PED01840
C     JPROT=1=NO PROTECTION                                             PED01850
C     JPROT=2=PASSIVE PROTECTION(SIGNS)                                 PED01860
C     JPROT=3=FLASHING SCHOOL SIGN                                      PED01870
C     JPROT=4=SIGNAL                                                    PED01880
C     JPROT=5=CROSSING GUARD                                            PED01890
      JPROT=VAR(10)                                                     PED01900
C     DALT=DISTANCE TO NEAREST ALTERNATE LEGAL CROSSING                 PED01910
      DALT=VAR(11)                                                      PED01920
C     KPROT REFERS TO THE PROTECTION AT THE ALTERNATE CROSSING          PED01930
C     KPROT=1=GRADE SEPARATION                                          PED01940
C     KPROT=2=ACTIVE PROTECTION(SIGNAL)                                 PED01950
C     KPROT=3=PASSIVE PROTECTION (SIGNS)                                PED01960
      KPROT=VAR(12)                                                     PED01970
C     EJ= JUDGEMENT                                                     PED01980
      EJ=VAR(13)                                                        PED01990
      PVV=PED+VEH                                                       PED02000
      PCT=(PED/PVV)*100.                                                PED02010
      IF(PVV.GT.60000.)PVV=60000.                                       PED02020
      IF(PCT.GE.25.)PCT=25.                                             PED02030
      PVV=PVV/1000.                                                     PED02040
      DO 10 I=1,9                                                       PED02050
      N=I                                                               PED02060
      M=N+1                                                             PED02070
C     THIS SECTION DETERMINES THE TWO KNOWN PERCENTAGE CURVES WHICH     PED02080
C     BOUND THE POINT IN QUESTION                                       PED02090
      IF(PCT.GT.A(N).AND.PCT.LE.A(M))GO TO 20                           PED02100
   10 CONTINUE                                                          PED02110
   20 K=1                                                               PED02120
C     THIS SECTION DETERMINES THE CONSTANT VOLUME POINT PROJECTIONS ON   PED02130
C     THE UPPER AND LOWER BOUNDARY CURVES                               PED02140
   21 IF(PVV.GT.B(N))GO TO 22                                           PED02150
      SCORE(K)=C(N,1)+C(N,2)*PVV+C(N,3)*PVV**2                          PED02160
      GO TO 23                                                          PED02170
   22 SCORE(K)=D(N,1)+D(N,2)*PVV+D(N,3)*PVV**2                          PED02180
   23 IF(K.EQ.2)GO TO 24                                                PED02190
      K=K+1                                                             PED02200
      N=N+1                                                             PED02210
      GO TO 21                                                          PED02220
C     THIS SECTION INTERPOLATES BETWEEN THE TWO CALCULATED POINT VALUES PED02230
   24 XSCORE=((ALOG10(PCT*100.)-ALOG10((A(N-1))*100.))/(ALOG10((A(N))*10PED02240
     10.)-ALOG10((A(N-1))*100.))*(SCORE(2)-SCORE(1)))+SCORE(1)          PED02250
      IF(XSCORE.GT.40.)XSCORE=40.                                       PED02260
      IF(RW.GT.120.)RW=120.                                             PED02270
      IF(IPROT.EQ.2)GO TO 50                                            PED02280
      IF(DELAY.GT.2.)DELAY=2.                                           PED02290
C     PT1=SCORE FOR PEDESTRIAN AND VEHICLE VOLUME WITH PEAK HOUR DELAY  PED02300
C     FACTOR PARAMETER                                                  PED02310
      PT1=XSCORE*DELAY                                                  PED02320
C     THIS SECTION COMPARES THE DESIRED PEDESTRIAN SIGNAL TIME WITH     PED02330
C     THE ACTUAL TIME                                                   PED02340
      PCH=RW/4.+7.                                                      PED02350
      IF(VGY.GT.74.)VGY=74.                                             PED02360
      IF(PCH/VGY-1.)30,30,40                                            PED02370
C     PT2=SCORE FOR PEDESTRIAN CHANGE/MAXIMUM VEHICLE GREEN AND YELLOW  PED02380
C     PARAMETER FOR SIGNALIZED CROSSINGS                                PED02390
   30 PT2=10.**(2.*(PCH/VGY-.5))                                        PED02400
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      GO TO 80                                                          PED02410
   40 PT2=10.**(1.+.699*(PCH/VGY-1.))                                   PED02420
      GO TO 80                                                          PED02430
C     THIS SECTION COMPARES THE DESIRED SIGHT DISTANCE WITH THE ACTUAL  PED02440
C     SIGHT DISTANCE                                                    PED02450
   50 IF(DELAY.GT.120.)DELAY=120.                                       PED02460
      PT1=XSCORE*DELAY/60.                                              PED02470
      DG=(RW/4.)*SPD*1.467                                              PED02480
      IF(DG.GT.2500.)DG=2500.                                           PED02490
      IF(SD.GT.2000.)SD=2000.                                           PED02500
      IF(DG/SD-1.)60,60,70                                              PED02510
C     PT2=SCORE FOR ACTUAL SIGHT DISTANCE/DESIRABLE SIGHT DISTANCE      PED02520
C     PARAMETER FOR UNSIGNALIZED CROSSINGS                              PED02530
   60 PT2=10.**(2.*(DG/SD-.5))                                          PED02540
      GO TO 80                                                          PED02550
   70 PT2=10.**(1.+.699*(DG/SD-1.))                                     PED02560
   80 CONTINUE                                                          PED02570
      IF(PT2.GT.50.)PT2=50.                                             PED02580
C     THIS SECTION COMPARES THE NUMBER OF SCHOOL CHILDREN WITH THE      PED02590
C     FORM OF PROTECTION                                                PED02600
      IF(SC.EQ.0.)GO TO 149                                             PED02610
      GO TO (100,110,120,130,140),JPROT                                 PED02620
  100 IF(SC-125.)101,102,102                                            PED02630
C     PT3=SCORE FOR THE SCHOOL CROSSING PARAMETER                       PED02640
  101 PT3=.85+.32*SC-(.11E-2)*SC**2                                     PED02650
      GO TO 150                                                         PED02660
  102 PT3=23.+.093*(SC-125.)                                            PED02670
      IF(PT3.GT.30.)PT3=30.                                             PED02680
      GO TO 150                                                         PED02690
  110 IF(SC-125.)111,112,112                                            PED02700
  111 PT3=.58+.25*SC-(.8E-3)*SC**2                                      PED02710
      GO TO 150                                                         PED02720
  112 PT3=19.2+.08*(SC-125.)                                            PED02730
      IF(PT3.GT.25.)PT3=25.                                             PED02740
      GO TO 150                                                         PED02750
  120 IF(SC-125.)121,122,122                                            PED02760
  121 PT3=.406+.197*SC-(.637E-3)*SC**2                                  PED02770
      GO TO 150                                                         PED02780
  122 PT3=15.6+.0586*(SC-125.)                                          PED02790
      IF(PT3.GT.20.)PT3=20.                                             PED02800
      GO TO 150                                                         PED02810
  130 IF(SC-125.)131,132,132                                            PED02820
  131 PT3=.327+.155*SC-(.502E-3)*SC**2                                  PED02830
      GO TO 150                                                         PED02840
  132 PT3=11.8+.0426*(SC-125.)                                          PED02850
      IF(PT3.GT.15.)PT3=15.                                             PED02860
      GO TO 150                                                         PED02870
  140 IF(SC-125.)141,142,142                                            PED02880
  141 PT3=.413+.116*SC-(.43E-3)*SC**2                                   PED02890
      GO TO 150                                                         PED02900
  142 PT3=8.2+.024*(SC-125.)                                            PED02910
      IF(PT3.GT.10.)PT3=10.                                             PED02920
      GO TO 150                                                         PED02930
  149 PT3=0.                                                            PED02940
  150 CONTINUE                                                          PED02950
C     THIS SECTION COMPARES THE NUMBER OF PEDESTRIANS WITH THE DISTANCE PED02960
C     TO THE NEAREST ALTERNATE LEGAL CROSSING                           PED02970
  350 IF(PED.GT.2000.)PED=2000.                                         PED02980
      IF(DALT.GT.2000.)DALT=2000.                                       PED02990
C     THE DENOMINATOR IS A CONVENIENCE FACTOR ASSOCIATED WITH THE       PED03000
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C     PROPENSITY TO WALK A CERTAIN DISTANCE                                  PED03010
      SCALE=PED*DALT*100./(90.17192-(.05304016*DALT)+(.7866165E-5)*(DALTPED03020
     1**2))                                                                  PED03030
      IF(SCALE.GT.1.0E+6)SCALE=1.0E+6                                        PED03040
      IF(KASE.EQ.2)GO TO 360                                                 PED03050
      GO TO(151,160,170),KPROT                                               PED03060
C     PT4=SCORE FOR DISTANCE TO NEAREST ALTERNATE CROSSING PARAMETER         PED03070
  151 PT4=(2.0E-5)*SCALE                                                     PED03080
      GO TO 180                                                              PED03090
  160 PT4=(2.5E-5)*SCALE                                                     PED03100
      GO TO 180                                                              PED03110
  170 PT4=15.+(1.5E-5)*SCALE                                                 PED03120
  180 CONTINUE                                                               PED03130
C     PT5=SCORE FOR JUDGEMENT PARAMETER                                      PED03140
      PT5=EJ                                                                 PED03150
C     PTOT=FINAL SCORE USED TO RANK LOCATIONS WITH EXISTING PEDESTRIAN       PED03160
C     ACTIVITY.                                                              PED03170
      IF(PT5.GT.10.)PT5=10.                                                  PED03180
C     SRTTOT=PTOT SUBTRACTED FROM MAX. POSSIBLE SCORE SO THAT SORTING        PED03190
C        WILL PUT LOCATIONS IN PROPER ORDER.                                 PED03200
      PTOT=PT1+PT2+PT3+PT4+PT5                                               PED03210
      SRTTOT=200. - PTOT                                                     PED03220
      WRITE(2,600)PT1,PT2,PT3,PT4,PT5,PTOT,SRTTOT,SITE                       PED03230
      GO TO 1                                                                PED03240
C     THIS PART OF THE PROGRAM IS FOR LOCATIONS WHERE PEDESTRIAN             PED03250
C     ACTIVITY IS NOT POSSIBLE                                               PED03260
  300 READ(1,520)(VAR(I),I=1,18),SITE                                        PED03270
      IF(VAR(1) .GE. 9999.) GO TO 999                                        PED03280
C     ZH1 IS THE NUMBER OF HOUSEHOLDS IN ZONE 1                              PED03290
      ZH1=VAR(1)                                                             PED03300
C     ATS1 REFERS TO THE EXISTENCE OF A SCHOOL IN ZONE 1                     PED03310
C     IF A SCHOOL EXISTS ATS1=1.0                                            PED03320
C     IF A SCHOOL DOES NOT EXIST ATS1=0.0                                    PED03330
      ATS1=VAR(2)                                                            PED03340
C     ATC1 REFERS TO THE EXISTENCE OF COMMERCIAL ACTIVITY IN ZONE 1          PED03350
C     IF COMMERCIAL ACTIVITY EXISTS:                                         PED03360
C          ATC1=0.1, IF THERE ARE 1 TO 4 ESTABLISHMENTS,                     PED03370
C          ATC1=0.2, IF THERE ARE 5 TO 8 ESTABLISHMENTS,                     PED03380
C          ATC1=0.3, IF THERE ARE 9 TO 12 ESTABLISHMENTS,                    PED03390
C          ATC1=0.4, IF THERE ARE 13 OR MORE ESTABLISHMENTS.                 PED03400
C     IF COMMERCIAL ACTIVITY DOES NOT EXIST, ATC1=0.0                        PED03410
      ATC1=VAR(3)                                                            PED03420
C     ATI1 REFERS TO THE EXISTENCE OF INSTITUTIONAL ACTIVITY IN ZONE 1       PED03430
C     IF INSTITUTIONAL ACTIVITY EXISTS ATI1=0.3                              PED03440
C     IF INSTITUTIONAL ACTIVITY DOES NOT EXIST ATI1=0.0                      PED03450
      ATI1=VAR(4)                                                            PED03460
C     ATR1 REFERS TO THE EXISTENCE OF RECREATIONAL ACTIVITY IN ZONE 1        PED03470
C     IF RECREATIONAL ACTIVITY EXISTS ATR1=0.3                               PED03480
C     IF RECREATIONAL ACTIVITY DOES NOT EXIST ATR1=0.0                       PED03490
      ATR1=VAR(5)                                                            PED03500
C     ZH2,ATS2,ATC2,ATI2,AND ATR2 ARE DEFINED AS ABOVE EXCEPT THAT           PED03510
C     VARIABLES APPLY TO ZONE 2                                              PED03520
      ZH2=VAR(6)                                                             PED03530
      ATS2=VAR(7)                                                            PED03540
      ATC2=VAR(8)                                                            PED03550
      ATI2=VAR(9)                                                            PED03560
      ATR2=VAR(10)                                                           PED03570
C     SC1 IS THE ACTUAL NUMBER OF SCHOOL CHILDREN IN ZONE 1 IF KNOWN.        PED03580
C     IF NOT KNOWN SC1=0.0                                                   PED03590
      SC1=VAR(11)                                                            PED03600
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C       SC2 APPLIES TO ZONE 2 AS DESCRIBED IN SC1                          PED03610
        SC2=VAR(12)                                                        PED03620
C       KPROT REFERS TO THE FORM OF PROTECTION AVAILABLE AT THE NEAREST    PED03630
C       ALTERNATE LEGAL CROSSING                                           PED03640
C       KPROT=1=GRADE SEPARATION                                           PED03650
C       KPROT=2=ACTIVE PROTECTION                                          PED03660
C       KPROT=3=PASSIVE PROTECTION                                         PED03670
        KPROT=VAR(13)                                                      PED03680
C       DALT IS THE DISTANCE TO THE NEAREST ALTERNATE LEGAL CROSSING       PED03690
        DALT=VAR(14)                                                       PED03700
C       ASAC=ADEQUACY AND SAFETY AT ALTERNATE CROSSING.                    PED03710
        ASAC=VAR(15)                                                       PED03720
C       UL IS UNIQUENESS OF LOCATION                                       PED03730
        UL=VAR(16)                                                         PED03740
C       BUS=NUMBER OF PEDESTRIAN TRIPS GENERATED BY A BUS STOP.            PED03750
        BUS=VAR(17)                                                        PED03760
C        STF=SURPLUS TRIP FACTOR.                                          PED03770
C        IF STF=0, SURPLUS TRIPS GENERATED POINTS WILL BE INCLUDED.        PED03780
C        IF STF=1, SURPLUS TRIPS GENERATED POINTS WILL NOT BE INCLUDED.    PED03790
         STF=VAR(18)                                                       PED03800
        IF(SC1.EQ.0.)GO TO 310                                             PED03810
C       PTA CALCULATES THE NUMBER OF TRIPS GENERATED IN ZONE 1 BY          PED03820
C       ATTRACTIONS IN ZONE 2                                              PED03830
        PTA=ZH1*(ATC2+ATI2+ATR2)+2.*SC1                                    PED03840
        GO TO 320                                                          PED03850
  310   PTA=ZH1*(ATS2+ATC2+ATI2+ATR2)                                      PED03860
  320   IF(SC2.EQ.0.)GO TO 330                                             PED03870
C       PTB CALCULATES THE NUMBER OF TRIPS GENERATED IN ZONE 2 BY          PED03880
C       ATTRACTIONS IN ZONE 1                                              PED03890
        PTB=ZH2*(ATC1+ATI1+ATR1)+2.*SC2                                    PED03900
        GO TO 340                                                          PED03910
  330   PTB=ZH2*(ATS1+ATC1+ATI1+ATR1)                                      PED03920
  340   PED=PTA+PTB+BUS                                                    PED03930
C       PT1=SCORE FOR TRIP GENERATION PARAMETER                            PED03940
        PT1=PED/10.                                                        PED03950
        IF(PT1.GT.70.)PT1=70.                                              PED03960
C       THE DISTANCE TO ALTERNATE CROSSING PARAMETER IS CALCULATED IN THE  PED03970
C       FIRST PART OF THE PROGRAM                                          PED03980
        GO TO 350                                                          PED03990
  360   GO TO (370,371,380),KPROT                                          PED04000
C       PT2=SCORE FOR DISTANCE TO ALTERNATE CROSSING PARAMETER             PED04010
  370   PT2=(5.0E-5)*SCALE                                                 PED04020
        GO TO 390                                                          PED04030
  371   PT2=(6.0E-5)*SCALE                                                 PED04040
        GO TO 390                                                          PED04050
  380   PT2=35+(3.5E-5)*SCALE                                              PED04060
  390   CONTINUE                                                           PED04070
         IF(STF.EQ.1.)GO TO 391                                            PED04080
        IF(PED.LT.700.)GO TO 391                                           PED04090
C       STG (SURPLUS TRIP GENERATION) IS THE NUMBER OF TRIPS GENERATED     PED04100
C       IN EXCESS OF THE 700 USED IN PT1 DIVIDED BY 15                     PED04110
        STG=(PED-700.)/15.                                                 PED04120
        IF(STG.GT.20.)STG=20.                                              PED04130
        GO TO 392                                                          PED04140
  391   STG=0.                                                             PED04150
  392   IF(ASAC.GT.5.)ASAC=5.                                              PED04160
        IF(UL.GT.35.)UL=35.                                                PED04170
C       PT3=SCORE FOR JUDGEMENT PARAMETER.                                 PED04180
        PT3=ASAC+STG+UL                                                    PED04190
C       PTOT=FINAL SCORE USED TO RANK LOCATIONS WITH NO PEDESTRIAN         PED04200
```

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C      ACTIVITY POSSIBLE IN ORDER OF PRIORITY                          PED04210
       PTOT=PT1+PT2+PT3                                                PED04220
       SRTTOT=200. - PTOT                                              PED04230
       WRITE(2,610)PT1,PT2,PT3,PTOT,SRTTOT,SITE                        PED04240
 2000  GO TO 300                                                       PED04250
C      WRITE INSTRUCTIONS FOR SORTING AND CALL EXIT.                   PED04260
  999  IF(KASE .EQ. 2) GO TO 900                                       PED04270
       WRITE(6,530)                                                    PED04280
       GO TO 901                                                       PED04290
  900  WRITE(6,531)                                                    PED04300
  901  CALL EXIT                                                       PED04310
  500  FORMAT(I1)                                                      PED04320
  501  FORMAT(' TYPE 1 FOR EDIT, 2 FOR NO EDIT.'/)                     PED04330
  510  FORMAT(F2.0,F6.0,F5.0,2F4.0,F3.0,F5.0,2F4.0,F2.0,F5.0,F2.0,F3.0,  PED04340
     11X,7A4,A2)                                                       PED04350
  600  FORMAT(7F7.1,T51,7A4,A2)                                        PED04360
  610  FORMAT(5F7.1,T51,7A4,A2)                                        PED04370
  520  FORMAT(2(F4.0,3F2.0,F3.0),2F4.0,F2.0,F4.0,2F2.0,F4.0,F2.0,7A4,A2) PED04380
  530  FORMAT(1H ,//' SORT OUTPUT OF THIS PROGRAM ON COLUMNS 43 THRU 49 FPED04390
     1OR EXISTING PED. ACTIVITY.'//)                                   PED04400
  531  FORMAT(1H ,//' SORT OUTPUT OF THIS PROGRAM ON COLUMNS 29 THRU 35 FPED04410
     1OR NO EXISTING PED. ACTIVITY.'//)                                PED04420
  503   FORMAT(1H,'ERROR IN VARIABLES ',17I3,' AT SITE ',7A4,A2)       PED04430
  502   FORMAT(1H,'NO INPUT ERRORS DETECTED.')                         PED04440
       END                                                             PED04450
```

APPENDIX F

PEDOP2 COMPUTER PROGRAM

```
C     PROGRAM PEDOP2                                                    PED00010
C     THIS PROGRAM TAKES THE SORTED OUTPUT OF PROGRAM PEDOP1 AND        PED00020
C     FORMATS IT FOR OUTPUT. IT ALSO SEARCHES FOR SPECIFIC LOCATIONS    PED00030
C     ON THE BASIS OF THE COUNTY AND MUNICIPALITY CODES, IF DESIRED.    PED00040
C                                                                       PED00050
C     JCNT    NUMBER OF SITES INPUTTED.                                 PED00060
C     KASE    1=LOCATIONS WHERE PEDESTRIAN ACTIVITY CANNOT OCCUR.       PED00070
C             2=LOCATIONS WHERE PEDESTRIAN ACTIVITY CAN OCCUR.          PED00080
C     IOPT    1=TYPE ALL SITES WITH THEIR CORRESPONDING SCORES.         PED00090
C             2=SEARCH FOR SITE BY COUNTY AND MUNICIPALITY.             PED00100
C             3=END OF JOB.                                             PED00110
C     VAR     INPUT FOR PROGRAM,SCORE BY PARAMETER. PARAMETERS ARE      PED00120
C              DIFFERENT DEPENDING ON THE VALUE FOR KASE.               PED00130
C     VAR(1) PED AND VEH. SCORE OR TRIP GENERATION SCORE.               PED00140
C     VAR(2) SIGHT DISTANCE OR DIST. TO ALTERNATE CROSSING SCORE.       PED00150
C     VAR(3) SCHOOL CROSSING OR JUDGEMENT SCORE.                        PED00160
C     VAR(4) DISTANCE TO ALTERNATE CROSSING OR TOTAL SCORE.             PED00170
C     VAR(5) JUDGEMENT SCORE(PED. ACTIVITY CAN OCCUR KASE)              PED00180
C     VAR(6) TOTAL SCORE(PED. ACTIVITY CAN OCCUR KASE).                 PED00190
C     SITE    LOCATION OF SITE AND SITE DESCRIPTION.                    PED00200
C     SITE(1) COUNTY AND MUNICIPALITY CODE.                             PED00210
C     SITE(2) THRU SITE(8) SITE DESCRIPTION.                            PED00220
C     COMUN   COUNTY AND MUNICIPALITY CODE INPUTTED TO BE SEARCHED FOR. PED00230
C                                                                       PED00240
C     ********************************************************************PED00250
C                                                                       PED00260
      DIMENSION SITE(100,8),VAR(100,6)                                  PED00270
      JCNT=1                                                            PED00280
C     READ KASE TO DETERMINE WHAT SECTION OF PROGRAM IS TO BE USED.     PED00290
      READ(1,500) KASE                                                  PED00300
C     READ DATA AND STORE.                                              PED00310
  110 READ(1,501,END=111)(VAR(JCNT,I),I=1,6),(SITE(JCNT,I),I=1,8)       PED00320
C     INCREMENT SITE COUNT AND CHECK FOR TOO MANY SITES.                PED00330
      JCNT=JCNT+1                                                       PED00340
      IF(JCNT .GT. 101) GO TO 112                                       PED00350
      GO TO 110                                                         PED00360
C     DECREMENT JCNT TO COMPENSATE FOR LAST INCREMENT.                  PED00370
  111 JCNT=JCNT-1                                                       PED00380
C     IF KASE = 2, PEDESTRIAN ACTIVITY CAN NOT OCCUR,GO TO THAT SECTION PED00390
C     OF THE PROGRAM.                                                   PED00400
      IF(KASE .EQ. 2) GO TO 300                                         PED00410
C     ENTER CODE FOR TYPE OF OUTPUT AND TYPE HEADINGS.                  PED00420
    1 WRITE(6,508)                                                      PED00430
      READ(5,500) IOPT                                                  PED00440
      IF(IOPT .GT. 2) CALL EXIT                                         PED00450
      IF(IOPT .GT. 1) GO TO 100                                         PED00460
      WRITE(6,510)                                                      PED00470
      DO 101  J=1,JCNT                                                  PED00480
  101 WRITE(6,502)(VAR(J,I),I=1,6),(SITE(J,I),I=1,8)                    PED00490
      GO TO 1                                                           PED00500
C     ENTER COUNTY AND MUNICIPALITY CODE,SEARCH FOR PROPER SITE(S),     PED00510
C     AND WRITE THE OUTPUT.                                             PED00520
  100 WRITE(6,509)                                                      PED00530
      READ(5,503) COMUN                                                 PED00540
      WRITE(6,513)                                                      PED00550
      DO 102  J=1,JCNT                                                  PED00560
      IF(SITE(J,1) .NE. COMUN) GO TO 102                                PED00570
      WRITE(6,504) J,(VAR(J,I),I=1,6),(SITE(J,I),I=1,8)                 PED00580
  102 CONTINUE                                                          PED00590
      GO TO 1                                                           PED00600
```

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C     THIS SECTION OF THE PROGRAM DOES THE SAME FUNCTION AS THE PART    PED00610
C     BEGINNING AT STATEMENT 1, BUT FOR LOCATIONS WHERE PEDESTRIAN      PED00620
C     ACTIVITY CAN NOT OCCUR.                                           PED00630
  300 WRITE(6,508)                                                      PED00640
      READ(5,500) IOPT                                                  PED00650
      IF(IOPT .GT. 2) CALL EXIT                                         PED00660
      IF(IOPT .GT. 1) GO TO 103                                         PED00670
      WRITE(6,511)                                                      PED00680
      DO 104  J=1,JCNT                                                  PED00690
  104 WRITE(6,506)(VAR(J,I),I=1,4),(SITE(J,I),I=1,8)                    PED00700
      GO TO 300                                                         PED00710
  103 WRITE(6,509)                                                      PED00720
      READ(5,503) COMUN                                                 PED00730
      WRITE(6,514)                                                      PED00740
      DO 105  J=1,JCNT                                                  PED00750
      IF(SITE(J,1) .NE. COMUN) GO TO 105                                PED00760
      WRITE(6,507) J,(VAR(J,I),I=1,4),(SITE(J,I),I=1,8)                 PED00770
  105 CONTINUE                                                          PED00780
      GO TO 300                                                         PED00790
C     TOO MANY SITES HAVE BEEN READ IN.WRITE ERROR MESSAGE INDICATING   PED00800
C     THAT DIMENSION MUST BE INCREASED AND CALL EXIT.                   PED00810
  112 WRITE(6,512)                                                      PED00820
      CALL EXIT                                                         PED00830
  500 FORMAT(I1)                                                        PED00840
  501 FORMAT(6F7.1,T51,7A4,A2)                                          PED00850
  502 FORMAT(1H ,6F7.1,5X,A4,4X,6A4,A2)                                 PED00860
  503 FORMAT(A4)                                                        PED00870
  504 FORMAT(1H ,I4,6F7.1,5X,A4,4X,6A4,A2)                              PED00880
  505 FORMAT(4F7.1,T51,7A4,A2)                                          PED00890
  506 FORMAT(1H ,4F7.1,5X,A4,4X,6A4,A2)                                 PED00900
  507 FORMAT(1H ,I4,4F7.1,5X,A4,4X,6A4,A2)                              PED00910
  508 FORMAT(//////' TYPE 1 FOR ALL SITES, 2 FOR SELECTED SITES, 3 WHEN PED00920
     1FINISHED.'/)                                                      PED00930
  509 FORMAT(' TYPE COUNTY AND MUNICIPALITY CODE FOR DESIRED SITE AS XXXPED00940
     1X'/)                                                              PED00950
  510 FORMAT(1H ,'LOCATIONS WHERE PEDESTRIAN ACTIVITY CAN OCCUR.'///    PED00960
     1' PED+VEH SIGHT  SCHOOL ALTER. JUDGE-  TOTAL',5X,'CNTY'/          PED00970
     2'  SCORE  DIST.  CROSS. CROSS.  MENT   SCORE',6X,'MUN    SITE DESCPED00980
     3RIPTION'/)                                                        PED00990
  511 FORMAT(1H ,'LOCATIONS WHERE PEDESTRIAN ACTIVITY CAN NOT OCCUR.'///PED01000
     1'    TRIP ALTER. JUDGE-  TOTAL',5X,'CNTY'/'    GEN. CROSS.  MENT  PED01010
     2 SCORE',6X,'MUN    SITE DESCRIPTION'/)                            PED01020
  512 FORMAT(' MORE THAN 100 SITES. DIMENSION MUST BE INCREASED. GOODBY.PED01030
     1')                                                                PED01040
  513 FORMAT(1H ,'LOCATIONS WHERE PEDESTRIAN ACTIVITY CAN OCCUR.'///    PED01050
     1'     PED+VEH SIGHT  SCHOOL ALTER. JUDGE-  TOTAL',5X,'CNTY'/     PED01060
     2' RNK  SCORE  DIST.  CROSS. CROSS.  MENT   SCORE',6X,'MUN    SITE PED01070
     3DESCRIPTION'/)                                                    PED01080
  514 FORMAT(1H ,'LOCATIONS WHERE PEDESTRIAN ACTIVITY CAN NOT OCCUR.'///PED01090
     1'         TRIP ALTER. JUDGE-  TOTAL',5X,'CNTY'/' RNK    GEN. CROSS.PED01100
     2  MENT   SCORE',6X,'MUN    SITE DESCRIPTION'/)                   PED01110
      END                                                               PED01120
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