APPENDIX C

Part 2 – Criteria For Establishing School Crossing Patrol Sites

1.0 BACKGROUND

1.1 The Need for Criteria

When the SCP service was first set up few guidelines were available to those who were responsible for its operation and management. Nor was advice provided by any of the Government departments. Most decisions were based on one (or more) person's views of the safety or danger of sites.

No matter how skilled the Manager, the situation had the potential for unsound decisions to be made and was unprofessional. Sites that were justified might well be refused an SCP, whereas sites that did not justify one could well have SCPs approved.

These criteria are not meant to be prescriptive, and managers should make their own informed decisions appropriate to their local circumstances and policies.

1.2 Development of the Criteria

Criteria were developed which incorporated elements from the existing proven and widely adopted criteria for assessing potential zebra and pelican crossing sites. The SCP criteria used the PV^2 formula as its basis (P =Number of Pedestrians, V= Number of Vehicles)

The relationship PV^2 provided a measure of both the potential conflict and the delays experienced by pedestrians. It also accounted for the need to help small numbers of pedestrians to cross roads safely when traffic flows were heavy and the delays long; and conversely, large numbers of pedestrians when traffic was lighter and the delays shorter.

The criteria also incorporated factors to reflect the special conditions at sites during school opening and closing times when the numbers of child pedestrians were concentrated over a fairly short period of time. Environmental differences between sites and the varying levels of traffic awareness between children in rural areas and those in large urban areas also needed to be considered.

A series of 'Adjustment' factors was produced based on examples of known site conditions (other than the basic vehicle and pedestrian flows). The criteria were tried out at a series of 80 existing sites, and have been used (often with local amendments) by most Authorities for many years.

2.0 GUIDELINES FOR TRAFFIC AND PEDESTRIAN COUNTS

2.1 INTRODUCTION

2.1.1 Flows of child pedestrians (P) crossing the road on their way to and from school are generally concentrated into short periods of time. The heaviest pedestrian and vehicle flows usually occur during morning journeys between 08.15 and 09.15. Because of this, site surveys should generally be conducted during this period, unless it is proven that the afternoon period is busier, in which case counts should be carried out during that period.

2.1.2 Surveys must be site specific, taking into account the start and finish times and relevant activities of the school(s) served by the SCP. Data should be recorded in 5-minute consecutive periods. This procedure is described in detail on page 35.

2.2 CRITERIA

The procedure for determining whether an SCP site is justified comprises six parts:

1. Count of pedestrians and vehicles.
2. Calculation of PV^2 Rating.
3. Comparison with adopted criteria threshold level.
4. Consideration of 'Adjustment Factors' and selection of 'Multipliers' (where appropriate).
5. Recalculation and recheck against the adopted criteria threshold level.
6. Consideration of additional facilities (e.g. zebra and light-controlled crossings – where heavy traffic flows or speeding exist).

Often it will be unnecessary to continue beyond Part 3 of the procedure, as there will often be a clear indication about whether an SCP Site can be justified. Use the graph provided at page 37 to carry out an initial check about the viability of the SCP Site:

a. Sites that fall within area "A" justify a SCP site without any further investigation.

b. Sites falling within area "B" need further investigation.

c. Sites that fall within area "C" will not usually warrant further investigation unless there are exceptional circumstances attached to the Site.

d. Sites that fall within area "P" need special consideration because traffic flows are so heavy they create major difficulties for an SCP to work safely. Within this area additional facilities (such as pedestrian crossings) may be justified.

2.3 PROCEDURE – PART ONE

Pedestrian and Vehicle Count

2.3.1 Sites having fewer than 15 children (P) crossing the road in the busiest 30-minute period should not be considered for establishing an SCP. It is important to check the policy of your own organisation. Based on specific circumstances, Authorities may choose to set a lower minimum number of children.

2.3.2 A classified count should be taken at the Site to identify the busiest 30-minute period, recording child pedestrians (P) and vehicles (light vehicles, large goods vehicles and PCUs and cycles).

2.3.3 It is recommended the traffic counts be recorded as 'passenger car' equivalent values (PCUs), by using the following multiplication factors:

Passenger Car Units (PCUs) for Recording Purposes	
3 Pedal Cycles	= 1 PCU
2 Motorcycles	= 1 PCU
1 Car	= 1 PCU
1 Light Goods Vehicle (up to 3.5 tonnes gross weight)	= 1 PCU
1 Bus/Coach	= 2 PCUs
1 Medium Goods Vehicle (over 3.5 tonnes gross weight)	= 2 PCUs
1 Large Goods Vehicle (over 7.5 tonnes gross weight/multi axle lorries)	= 3 PCUs
1 Bendi-bus	= 3 PCUs

If an automatic vehicle counter is used that does not provide vehicle classification data, then some observation of the traffic flow and composition will be needed.

2.3.4 The count should include child pedestrians who attend an educational establishment and who cross the road at the time of the heaviest traffic flow (normally during the morning peak). Record the numbers of children (P) who cross the road at (for existing staffed sites) or within 50 metres of the site (for unstaffed or new sites).

2.4 PROCEDURE PART TWO: CALCULATION OF PV^2 RATING

PLEASE NOTE – all values used in the calculation must be taken from the same 30-minute (6x5 minutes) busiest period.

2.4.1 Having collected all the necessary data from the site, the calculation PV^2 must be completed. Below is a checklist of the main points to be considered:

a) Identify the busiest consecutive 30-minute period (note that vehicles form the most significant part of the equation).

b) Calculate the total of child pedestrians (P) and multiply it with the square of the total number of PCU equivalents (V^2) from the same consecutive 30-minute period to provide the product PV^2.

2.5 PROCEDURE – PART THREE

Comparison with Adopted Criteria Threshold Level

2.5.1 If a PV^2 of greater than 4 million is achieved, an SCP location can be justified. The graph shown on page 37 shows whether a site immediately justifies a SCP or if it needs further investigation or measures other than a SCP.

Example (i):
200 children (P) and 250 vehicle equivalents (V) in the same consecutive 30-minute period, multiplied together in the form PV^2 produces point 'X' on the graph. The point is within area 'A', exceeding the required threshold value of 4×10^6 and justifying the establishment of an SCP site. There is no need for further site assessment, or mathematical calculations.

RESULT
Site can be justified.

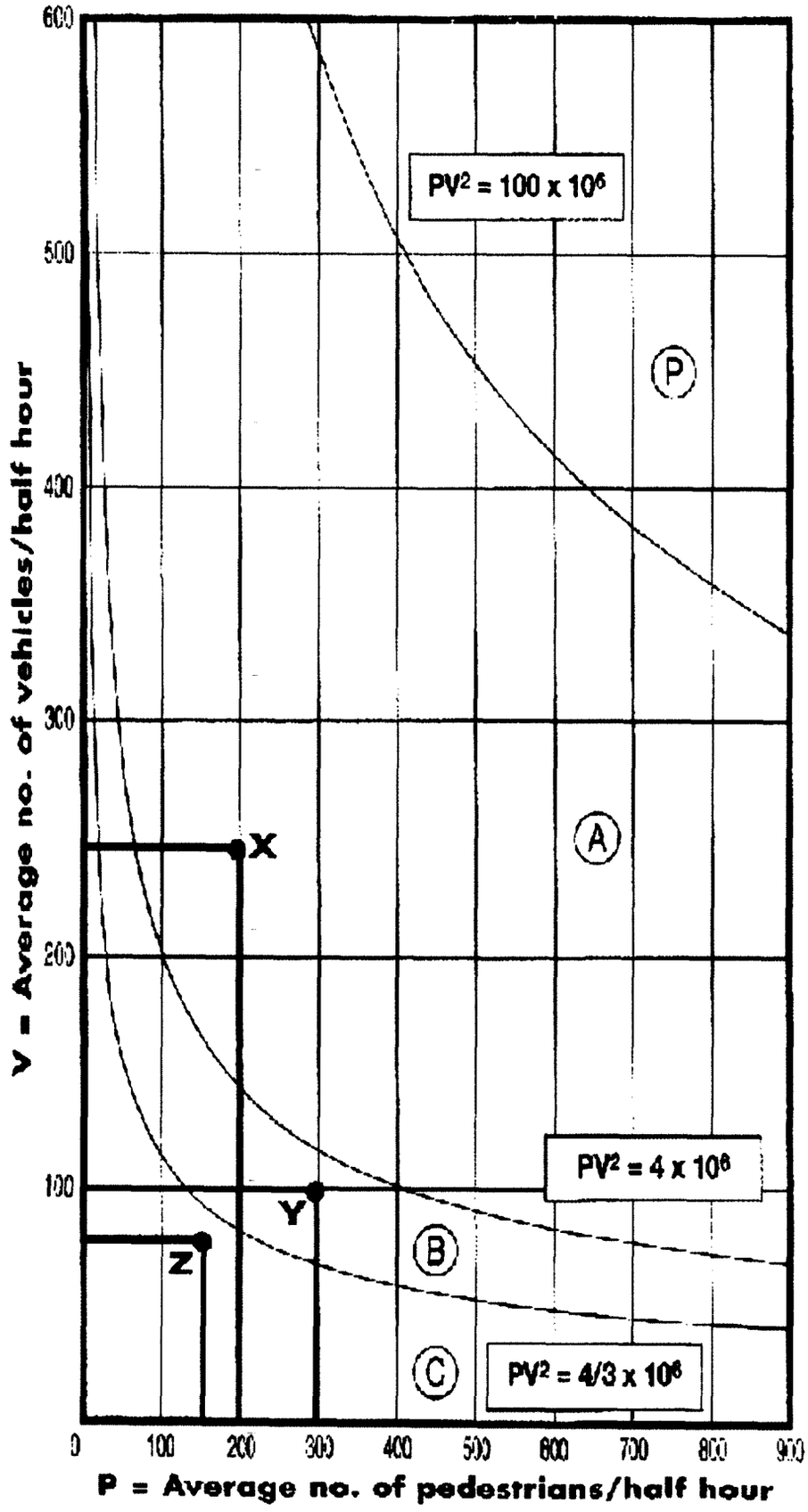
Example (ii):
300 children (P) and 100 vehicle equivalents (V) in the same consecutive 30-minute period, multiplied together in the form PV^2 produces point 'Y' on the graph. This is within area 'B' [between lines (1) and (2)], not achieving the threshold level and not justifying the establishment of an SCP site at this stage. Reference should be made to Part 4 of the criteria in order to re-assess whether the site can be justified.

RESULT
Site NOT immediately justified – further investigation needed using Adjustment factors.

Example (iii):
150 children (P) and 75 vehicle equivalents (V) in the same consecutive 30-minute period, multiplied together in the form PV^2 produces point 'Z' on the graph. This is within area 'C' [below and to the left of line (2)], not reaching the threshold level and almost certainly not justifying the establishment of an SCP site.

RESULT
Site NOT justified.

Should extreme pressure be applied for the provision of an SCP at this site, Part 4 of the criteria may be applied to verify the position.


600
500
400
300
200
100
0
100
200
300
400
500
600
700
800
900
V = Average no. of vehicles/half hour
P = Average no. of pedestrians/half hour
PV² = 100 x 10⁶
PV² = 4 x 10⁶
PV² = 4/3 x 10⁶
P
A
B
C
X
Y
Z

Action Chart – Checking SCP Site Viability (using Graph)

Position of Point	**Action to be taken**
Area 'P'	Crossing facilities justified (It is recommended a light controlled crossing be considered)
Area 'A'	SCP site justified (Recommended establishment of SCP site)
Area 'B'	SCP site not justified at initial assessment (Apply Part 4 of the procedure to verify the position)
Area 'C'	SCP site definitely not justified at initial assessment (Apply Part 4 of the procedure if exceptional circumstances exist)

2.6 PROCEDURE – PART FOUR

Consideration of 'Adjustment factors' and selection of 'Multiplier'.

2.6.1 Where the PV^2 criterion threshold level falls within area 'B' [between lines (1) and (2)] a detailed site investigation should be undertaken using the list of 'Adjustment Factors' (Page 40).

2.6.2 The adjustment factors quantify the 'environmental' considerations to be used in assessing the potential risks at the proposed site. Each item must be assessed objectively and appropriate factors assigned.

2.6.3 Once the number of adjustment factors has been decided, the appropriate multiplier should be obtained from the table of 10% Compound Multipliers (Page 42).

2.7 ADJUSTMENT FACTORS

The following section highlights environmental factors that may be the cause of potential risk at sites where an SCP already exists or is proposed. Some or all of these may be true for the site under consideration.

Accurate site assessment makes it possible to check each of the items on the following list and establish how many adjustment factors should be allocated (factors being assigned according to the level of difficulty). Using the final total of adjustment factors it is possible to determine a compound multiplier (from the table), which is then used to uprate the original PV^2 value to provide a weighted (and more accurate) assessment of the potential risk at the site.

Table of Adjustment Factors

2.7.1 **Carriageway Width (single Carriageway)**	**Factor**
Carriageway width between 7.5 and 10 metres	**+1**
Carriageway width in excess of 10 metres	**+2**
Footpath width less than 2 metres	**+1**
Down gradient steeper than 12.5% (1 in 8)	**+2**
Down gradient less than 12.5% greater than 5% (1 in 20)	**+1**

2.7.2 Speed/Visibility

It is recommended that SCP sites are not established on roads with speed limits greater than 40 mph.

85%ile speed of traffic)[1]	**Visibility (metres)**[2, 3]	**Factor**
Travelling between 30 and 40 mph	Less than 50 m	**+3**
	Between 50 – 75 m	**+2**
	Between 75 – 100 m	**+1**
Travelling between 40 and 50 mph	Less than 60 m	**+3**
	Between 60 – 100 m	**+2**
	Between 100 – 150 m	**+1**

[1] To obtain the 85th percentile (85%ile) speed of traffic, a record of the speeds of at least 100 free running vehicles will be needed on one visit during the period 08.30 (08.15 if the full operation of an SCP is required) to 09.00 – i.e. the site operation times prior to the start of the **busiest** school day.

The formula used is: $\frac{(85\%ile - 30)}{3}$ = FACTOR

e.g. 36 MPH 85%ile gives $\frac{(36 - 30)}{3}$ = +2

A negative factor would not be applied.

[2] Care must be taken when using these factors, as the distances shown are less than vehicle stopping distance in adverse weather conditions.

[3] If parked vehicles obstruct sightlines or mask children, and it is not possible to prohibit parking, then the visibility criteria from the kerb edge should be applied using a 1 metre eye level.

2.7.3	**Street Lighting**	**Factor**
	None	**+3**

2.7.4	**Signs, Street Furniture, Trees, etc**	**Factor**
	If visibility is variously obstructed within 100 metres of the proposed Site and pedestrians are masked.	**+1**

2.7.5	**Road Markings**	**Factor**
	If the Site is complicated by road markings for the purpose other than an SCP, i.e. turning lanes etc., within 50 metres either side.	**+1**

2.7.6	**Junctions**	**Factor**
	If the Site is on a major road and is within 20 metres of a road junction	**+2**
	If the Site is on a minor road and is within 20 metres of a road junction	**+1**

2.7.7 Accidents

Accidents involving pedestrians on weekdays within 50 metres of the proposed crossing point.

One point per pedestrian injured per year based on a three-year average.

2.7.8 Weight of Traffic

Where pedestrian flows are light, the vehicle flows are heavy and the criteria are not satisfied, then at 800 passenger-carrying units (see table on page 35) per hour (two way, or one way on dual carriageway) it is recommended to add a further +1 factor.

2.7.9	**Age Factors**		**Factor**
	Average Age	Primary (up to 11 years)	**+5**
		Secondary (12+ years)	**+1**

2.8 PROCEDURE – PART FIVE

Recalculating the Rating against the Adopted Criteria Threshold Level

2.8.1 Take the 'Multiplier' indicated in the table of '10% Compound Multipliers' and multiply it with the previous threshold rating (PV^2). The result of this calculation is the 'New' PV^2 value. Re-check it again with the adopted threshold level.

Worked Examples – using the 'Multiplier' factor

Example 1	**300 pedestrians**	**100 vehicles**	
V^2	100 x 100	=	10,000
PV^2	300 x 10,000	=	3,000,000

This is less than 4 million and produces point 'Y' on the graph in area 'B'. However, further investigation at the site identified five 'Adjustment Factors' that should be taken into account. By referring to the Table of Compound Multipliers, five factors produce a multiplier of 1.610.

Thus the revised value is 3,000,000 x 1.610 = 4,830,000. This value exceeds the criteria threshold value (4×10^6) and therefore justifies the establishment of an SCP site.

Had only two factors been assigned, the multiplier would have been 1.210 and the revised value 3,000,000 x 1.210 = 3,630,000 (less than 4,000,000).

The provision of an SCP site would not have been justified.

Example 2	**150 pedestrians**	**75 vehicles**	
V^2	75 x 75	=	5,625
PV^2	5625 x 150	=	843,750

This produces a value of 843,750, point Z within area 'C' on the graph, and is very much less than 4 million.

Unless the Site attracts an abnormally large number of Adjustment Factors, it is unlikely that an SCP site could be justified.

2.9 PROCEDURE – PART SIX

Consideration of Additional Facilities

2.9.1 Where significant flows of vehicles and/or children are identified at the potential site, other additional facilities may be justified. Assuming that there are no grade separated facilities already available, a zebra or light-controlled crossing should be considered in accordance with the criteria laid down by the DfT.

2.9.2 It should be remembered that an important part of the Manager's responsibility as 'employer' is to ensure the safety of their employees (SCPs), the people in their charge and the safety of those who may be affected by their acts or omissions. Therefore, sites which are very heavily trafficked, or deemed potentially dangerous by the nature of the road layout or other environmental conditions, may not be safe for the authorisation and siting of an SCP.

2.9.10 TABLE OF 10% COMPOUND MULTIPLIERS

No of Factors	Multipliers to be applied to basic PV^2 figures
1	1.100
2	1.210
3	1.331
4	1.464
5	1.610
6	1.772
7	1.949
8	2.144
9	2.358
10	2.594
11	2.853
12	3.139
13	3.453
14	3.798