

Note / Memo

HaskoningDHV UK Ltd.
Transport & Planning

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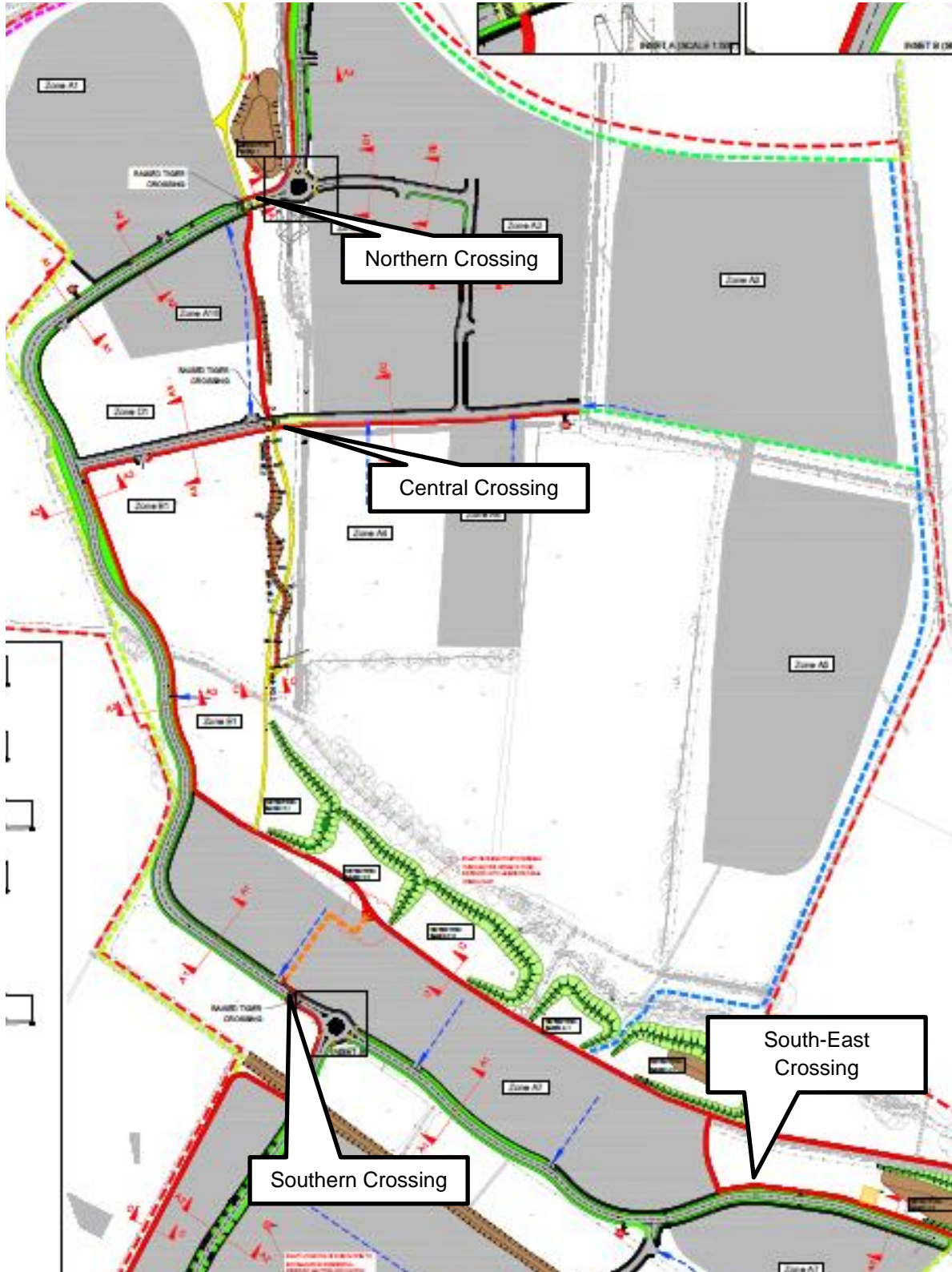
Subject: Pedestrian Crossing Assessment Associated with the Proposed Residential Led Mixed-Use Development at Land near Haverhill, Wilsey Road, Little Wratting, Suffolk (Planning Application Reference DC/19/0834/RM)

1 Introduction

1.1 Overview

- 1.1.1 This Technical Note (TN) has been prepared in association with a reserved matters planning application (planning ref: DC/19/0834/RM) to provide submission of details under outline planning permission (planning ref: DC/15/2151/OUT) for up to 2,500 dwellings on land near Haverhill, Wilsey Road, Little Wratting.
- 1.1.2 This TN responds to consultation comments issued by Suffolk County Council's Highway Development Control Officers to the Planning Case Officer on 29th May 2019. The TN specifically addresses the comment relating to pedestrian crossings of the consultation response, relating to the proposed pedestrian crossing facilities associated with the development proposals. The comment relating to pedestrian crossings states:
- “The spine road design indicates several Zebra or Tiger (cycle Zebra) or uncontrolled crossing points. The proposed traffic flows and potential for higher speeds will not enable this type of crossing to operate safely. Given the traffic flows expected through the site formal push button Puffin or Toucan crossings will be required on key pedestrian and cycle desire lines.”*
- 1.1.3 Three pedestrian crossing points are proposed on the proposed internal highway network. The proposed crossings would facilitate north-south pedestrian and cycle movements and would be provided in the form of Tiger (cycle Zebra) crossings. The locations of the proposed crossings are indicated in **Insert 1.1**.
- 1.1.4 Pedestrian crossing assessments have been undertaken for the three crossing locations in order to determine the most appropriate type of crossing facility. The assessments have been undertaken in accordance with guidance presented in Local Transport Note (LTN) 1/95 ‘*The Assessment of Pedestrian Crossings*’ (Department for Transport, 1995) and takes into consideration various factors such as traffic flows, vehicle speeds, pedestrian demand, carriageway and footway geometry and road safety.
- 1.1.5 This note represents the findings of the pedestrian crossing assessments and preferred crossing arrangements for each location.

Insert 1.1: Proposed Pedestrian Crossing Locations



2 Methodology

2.1 Assessment Procedure

2.1.1 The assessment procedures set out in LRN 1/95 recommend that a 'Site Assessment' and 'Option Assessment' are undertaken, which combine to form the 'Assessment Framework'. All relevant factors included in the framework should be considered when deciding whether to provide a crossing and, if so, the type of facility. The framework should seek to quantify the difficulties experienced by vulnerable road users.

2.2 Site Assessment

2.2.1 The 'Site Assessment' is based on a visit undertaken by an experienced traffic engineer and includes the collection of information, photographs, maps, records of any representations. LTN 1/95 states that *"in the case of roads not yet built, or where future development is likely, the information should be estimated and the basis noted. For existing road the information should be measured"*.

2.3 Options Assessment

2.3.1 A range of options should be considered when considering the provision of pedestrian crossings. These include:

- Do nothing;
- Provide traffic management (including informal crossings and/or refuge island);
- Provide a zebra crossing;
- Provide a signal-controlled crossing.

2.3.2 The choice of pedestrian crossing type will be influenced by factors such as:

- Difficulty in crossing;
- Vehicle delays during peak periods;
- Carriageway capacity;
- Local representations;
- Cost (including maintenance);
- Vehicle speeds.

2.3.3 LTN 1/95 also provides guidance on the quantification of the factors listed above.

2.4 Assessment Framework

2.4.1 The 'Assessment Framework' is an appraisal of the effects of each option under consideration. The final decision as to whether to install a crossing and the choice of option will depend on a combination of factors.

2.5 PV² Criteria

2.5.1 In addition to the guidance provided in LTN 1/95, the 'PV² Criteria' has also been considered. PV² is an industry recognised quantitative method for assessing the need for new pedestrian

crossing facilities. The criteria are widely used by Local Highway Authorities, including Transport for London (TfL).

- 2.5.2 PV^2 considers the pedestrian flow across a 100m length of road, centred on the proposed crossing site (P) and the number of vehicles in both directions (vehicles/hour) (V). A controlled crossing facility is normally justified where the calculated value of PV^2 is equal to or greater than 1×10^8 on an undivided road or 2×10^8 on a carriageway incorporating a staggered crossing.

3 Site 1 – Northern Crossing

3.1 Overview

- 3.1.1 The proposed northern pedestrian crossing is located on the northern section of the main spine road, in close proximity to the Zone A1 parcel of land and the internal roundabout. The crossing would form part of the shared pedestrian and cycle route, proposed to route along a north-south alignment through the development site. The crossing would connect Zone A1 and the northern access to the shared route, providing a route south towards the proposed local centre and school.

3.2 Site Assessment

- 3.2.1 The results of the Site Assessment for the northern pedestrian crossing are presented in **Appendix A** and summarised in **Table 3.1**.

Table 3.1: Site Assessment - Northern Crossing

Characteristic	Data and Comments
Location	The proposed northern pedestrian crossing is located on the northern section of the main spine road, in close proximity to the Zone A1 parcel of land and the internal roundabout.
Highway Facilities	Footways are proposed to both sides of the crossing. Footways are proposed to be 2.0m in width to the north-west and 3.0m to north-east. To the south, footways would be 2.0m in width.
Visibility	Visibility on the approach to the site is very good to the west. To the east the crossing is located within 40m of the internal roundabout, however, vehicle speeds are anticipated to be lower as vehicles approach from the roundabout.
Complexity	No accesses are located within 50m of the crossing. The crossing falls along the desire line for the proposed school, playground and local centre and would serve Zone 1A of the development.
Crossing Traffic	The whole development is proposed and, therefore, there is no existing crossing demand. Following the introduction of the proposed development, it is considered that the highest levels of crossing demand would occur before and after school hours. Forecasts of the demand have been developed from trip generation forecasts presented in the original Transport Assessment for the development. Trips have been split proportionally amongst the zones of the development and assumptions regarding routing have been made. The assessment concludes that up to 70 pedestrians could use the crossing in the AM peak and 22 in the PM peak.
Vehicles	Traffic flows have been derived from the trip generation forecasts presented in the original Transport Assessment for the development. The trip generation has been split proportionally amongst the various zones based on the number of units. Assumptions have been made with regards to the routing of vehicles through the development. The assessment has concluded that a two-way flow of 212 vehicles in the AM peak hour and 140 in the PM peak hour could be expected.
Road Collisions	The crossings and internal roads are yet to be implemented. There is, therefore, no existing personal injury collision history.

3.3 Option Assessment

3.3.1 **Table 3.2** presents the pedestrian crossing options for the northern crossing.

Table 3.2: Northern Crossing - Option Assessment

Factor	Do Nothing	Informal Crossing	Refuge Island	Zebra	Signal Controlled Crossing
Difficulty of Crossing / Average Wait in Seconds	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	1 to 3 seconds for all groups	1 to 3 seconds after the end of vehicle minimum green period
Vehicle Delay in peak periods	None	None	None	1 stop/minute of 8 seconds	1 stop/minute of 15 seconds
Road Capacity	Not reduced	Not reduced	Not reduced	13% reduction	25% reduction
Vehicle Speeds	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	LTN 1/95 states that "Zebra crossings should not be installed on roads with an 85 percentile speed of 35 mph"	LTN 1/95 states that "Caution should be exercised where pedestrian flows are generally light or light for long periods of the day. Drivers who become accustomed to not being stopped at the crossing may begin to ignore its existence, with dangerous consequences."

3.4 PV² Criteria

3.4.1 Based on the forecast pedestrian and vehicle flows presented in **Section 3.2** the following results can be derived:

AM Peak Hour

$P = c.70$

$V = c.210$

$PV^2 = 3,087,000$

PM Peak Hour

$P = c.20$

$V = c.140$

$PV^2 = 329,000$

3.4.2 The result of the PV² calculation is less than 10⁸, therefore, a controlled crossing would not be justified based on this methodology.

3.4.3 The PV² calculation and derivation of pedestrian and traffic flows can be found in **Appendix E**.

3.5 Appraisal

- 3.5.1 It is considered that an informal pedestrian crossing, comprising dropped kerbs and tactile paving would provide an adequate level of provision, based on the forecast pedestrian and traffic flows.
- 3.5.2 A zebra crossing has been proposed to account for the likely high proportion of school children using the proposed crossing in the AM peak hour.

4 Site 2 – Central Crossing

4.1 Overview

4.1.1 The proposed crossing is located on the central section of the spine road, located between Zone B1 and Zone D1. The crossing is located on the desire line for pedestrians accessing the proposed school and local centre from Zones A1 and A2.

4.1.2 The proposed crossing connects the northern portion of the internal shared pedestrian and cycle route with the southern section, facilitating north-south pedestrian and cycle movements.

4.2 Site Assessment

4.2.1 The results of the Site Assessment for the central pedestrian crossing are presented in **Appendix B** and summarised in **Table 4.1**.

Table 4.1: Site Assessment - Central Crossing

Characteristic	Data and Comments
Location	The proposed crossing is located on the central section of the spine road, located between Zone B1 and Zone D1. The crossing is located on the desire line for pedestrians accessing the proposed school and local centre from Zones A1 and A2.
Highway Facilities	Footways are proposed to both sides of the crossing. Footways are proposed to be 3.0m in width to the north. To the south, footways would be 3.0m in width.
Visibility	Visibility in both directions is good for both pedestrians and vehicles. Visibility of greater than 200m is achievable to the east and 150m to the west.
Complexity	The access to the proposed school is located approximately 50m to the west of the proposed crossing. The crossing falls along the desire line for the proposed school, playground and local centre trips.
Crossing Traffic	The whole development is proposed and, therefore, there is no existing crossing demand. Following the introduction of the proposed development, it is considered that the highest levels of crossing demand would occur before and after school hours. Forecasts of the demand have been developed from trip generation forecasts presented in the original Transport Assessment for the development. Trips have been split proportionally amongst the zones of the development and assumptions regarding routing have been made. The assessment concludes that up to 336 pedestrians could use the crossing in the AM peak and 94 in the PM peak.
Vehicles	Traffic flows have been derived from the trip generation forecasts presented in the original Transport Assessment for the development. The trip generation has been split proportionally amongst the various zones based on the number of units. Assumptions have been made with regards to the routing of vehicles through the development. The assessment has concluded that a two-way flow of 82 vehicles in the AM peak hour and 35 in the PM peak hour could be expected.
Road Collisions	The crossings and internal roads are yet to be implemented. There is, therefore, no existing personal injury collision history.

4.3 Option Assessment

4.3.1 **Table 4.2** presents the pedestrian crossing options for the central crossing.

Table 4.2: Central Crossing - Option Assessment

Factor	Do Nothing	Informal Crossing	Refuge Island	Zebra	Signal Controlled Crossing
Difficulty of Crossing / Average Wait in Seconds	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	1 to 3 seconds for all groups	1 to 3 seconds after end of vehicle minimum green period
Vehicle Delay in peak periods	None	None	None	1 stop/minute of 8 seconds	1 stop/minute of 15 seconds
Road Capacity	Not reduced	Not reduced	Not reduced	13% reduction	25% reduction
Vehicle Speeds	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	LTN 1/95 states that "Zebra crossings should not be installed on roads with an 85 percentile speed of 35 mph"	LTN 1/95 states that "Caution should be exercised where pedestrian flows are generally light or light for long periods of the day. Drivers who become accustomed to not being stopped at the crossing may begin to ignore its existence, with dangerous consequences."

4.4 PV² Criteria

4.4.1 Based on the forecast pedestrian and vehicle flows presented in **Section 4.2** the following results can be derived:

AM Peak Hour

$$P = c.340$$

$$V = c.80$$

$$PV^2 = 2,176,000$$

PM Peak Hour

$$P = c.90$$

$$V = c.40$$

$$PV^2 = 144,000$$

4.4.2 The result of the PV² calculation is less than 10⁸, therefore, a controlled crossing would not be justified based on this methodology.

4.4.3 The PV² calculation and derivation of pedestrian and traffic flows can be found in **Appendix E**.

4.5 Appraisal

- 4.5.1 It is considered that an informal pedestrian crossing, comprising dropped kerbs and tactile paving would provide an adequate level of provision, based on the forecast pedestrian and traffic flows.
- 4.5.2 A zebra crossing has been proposed to account for the likely high proportion of school children using the proposed crossing in the AM peak hour.

5 Site 3 – Southern Crossing

5.1 Overview

- 5.1.1 The proposed crossing is located on the main spine road to the south of Zone A7 and to the north of Zone A8. The crossing links the internal shared pedestrian and cycle route with the eastern access point and provides a route north from Zone A8 towards the proposed school and local centre.

5.2 Site Assessment

- 5.2.1 The results of the Site Assessment for the southern pedestrian crossing are presented in **Appendix C** and summarised in **Table 5.1**.

Table 5.1: Site Assessment - Southern Crossing

Characteristic	Data and Comments
Location	The proposed crossing is located on the main spine road to the south of Zone A7 and to the north of Zone A8.
Highway Facilities	Footways are proposed to both sides of the crossing. Footways are proposed to be 3.0m in width to the north. To the south, footways would be 3.0m in width.
Visibility	Visibility is good in both directions for both pedestrians and cyclists. Visibility of greater than 200m is achievable to the west and 100m to the east.
Complexity	The access to the proposed school is located within 50m of the crossing. The crossing falls along the desire line for the proposed school, playground and local centre trips.
Crossing Traffic	The whole development is proposed and, therefore, there is no existing crossing demand. Following the introduction of the proposed development, it is considered that the highest levels of crossing demand would occur before and after school hours. Forecasts of the demand have been developed from trip generation forecasts presented in the original Transport Assessment for the development. Trips have been split proportionally amongst the zones of the development and assumptions regarding routing have been made. The assessment concludes that up to 361 pedestrians could use the crossing in the AM peak and 108 in the PM peak.
Vehicles	Traffic flows have been derived from the trip generation forecasts presented in the original Transport Assessment for the development. The trip generation has been split proportionally amongst the various zones based on the number of units. Assumptions have been made with regards to the routing of vehicles through the development. The assessment has concluded that a two-way flow of 75 vehicles in the AM peak hour and 37 in the PM peak hour could be expected.
Road Collisions	The crossings and internal roads are yet to be implemented. There is, therefore, no existing personal injury collision history.

5.3 Option Assessment

5.3.1 **Table 5.2** presents the pedestrian crossing options for the southern crossing.

Table 5.2: Southern Crossing - Option Assessment

Factor	Do Nothing	Informal Crossing	Refuge Island	Zebra	Signal Controlled Crossing
Difficulty of Crossing / Average Wait in Seconds	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	1 to 3 seconds for all groups	1 to 3 seconds after end of vehicle minimum green period
Vehicle Delay in peak periods	None	None	None	1 stop/minute of 8 seconds	1 stop/minute of 15 seconds
Road Capacity	Not reduced	Not reduced	Not reduced	13% reduction	25% reduction
Vehicle Speeds	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	LTN 1/95 states that "Zebra crossings should not be installed on roads with an 85 percentile speed of 35 mph"	LTN 1/95 states that "Caution should be exercised where pedestrian flows are generally light or light for long periods of the day. Drivers who become accustomed to not being stopped at the crossing may begin to ignore its existence, with dangerous consequences."

5.4 PV² Criteria

5.4.1 Based on the forecast pedestrian and vehicle flows presented in **Section 5.2** the following results can be derived:

AM Peak Hour

$$P = c.370$$

$$V = c.80$$

$$PV^2 = 2,368,000$$

PM Peak Hour

$$P = c.110$$

$$V = c.40$$

$$PV^2 = 176,000$$

5.4.2 The result of the PV² calculation is less than 10⁸, therefore, a controlled crossing would not be justified based on this methodology.

5.4.3 The PV² calculation and derivation of pedestrian and traffic flows can be found in **Appendix E**.

5.5 Appraisal

- 5.5.1 It is considered that an informal pedestrian crossing, comprising dropped kerbs and tactile paving would provide an adequate level of provision, based on the forecast pedestrian and traffic flows.
- 5.5.2 A zebra crossing has been proposed to account for the likely high proportion of school children using the proposed crossing in the AM peak hour.

6 Site 4 – South East Crossing

6.1 Overview

- 6.1.1 The proposed crossing is located on the main spine road between the two sections of Zone A7. The crossing links the internal shared pedestrian and cycle route with the eastern access point and provides a route north from Zone A8 towards the proposed school and local centre.

6.2 Site Assessment

- 6.2.1 The results of the Site Assessment for the south east pedestrian crossing are presented in **Appendix D** and summarised in **Table 6.1**.

Table 6.1: Site Assessment – South East Crossing

Characteristic	Data and Comments
Location	The proposed crossing is located on the main spine road between the two sections of Zone A7
Highway Facilities	Footways are proposed to both sides of the crossing. Footways are proposed to be 3.0m in width to the west. To the east, footways would be 3.0m in width.
Visibility	Visibility is good in both directions for both pedestrians and cyclists. Visibility of greater than 200m is achievable to the west and 35m to the east.
Complexity	The access to the road through Zone A8 is located 50m to the west of the crossing.
Crossing Traffic	The whole development is proposed and, therefore, there is no existing crossing demand. Following the introduction of the proposed development, it is considered that the highest levels of crossing demand would occur before and after school hours. Forecasts of the demand have been developed from trip generation forecasts presented in the original Transport Assessment for the development. Trips have been split proportionally amongst the zones of the development and assumptions regarding routing have been made. The assessment concludes that up to 50 pedestrians could use the crossing in the AM peak and 11 in the PM peak.
Vehicles	Traffic flows have been derived from the trip generation forecasts presented in the original Transport Assessment for the development. The trip generation has been split proportionally amongst the various zones based on the number of units. Assumptions have been made with regards to the routing of vehicles through the development. The assessment has concluded that a two-way flow of 42 vehicles in the AM peak hour and 25 in the PM peak hour could be expected.
Road Collisions	The crossings and internal roads are yet to be implemented. There is, therefore, no existing personal injury collision history.

6.3 Option Assessment

6.3.1 **Table 6.2** presents the pedestrian crossing options for the south east crossing.

Table 6.2: South East Crossing - Option Assessment

Factor	Do Nothing	Informal Crossing	Refuge Island	Zebra	Signal Controlled Crossing
Difficulty of Crossing / Average Wait in Seconds	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	Minimal difficulty, crossing within a second or two	1 to 3 seconds for all groups	1 to 3 seconds after end of vehicle minimum green period
Vehicle Delay in peak periods	None	None	None	1 stop/minute of 8 seconds	1 stop/minute of 15 seconds
Road Capacity	Not reduced	Not reduced	Not reduced	13% reduction	25% reduction
Vehicle Speeds	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	Vehicle speeds are within the Posted Speed Limit	LTN 1/95 states that "Zebra crossings should not be installed on roads with an 85 percentile speed of 35 mph"	LTN 1/95 states that "Caution should be exercised where pedestrian flows are generally light or light for long periods of the day. Drivers who become accustomed to not being stopped at the crossing may begin to ignore its existence, with dangerous consequences."

6.4 PV² Criteria

6.4.1 Based on the forecast pedestrian and vehicle flows presented in **Section 6.2** the following results can be derived:

AM Peak Hour

$$P = c.40$$

$$V = c.30$$

$$PV^2 = 36,000$$

PM Peak Hour

$$P = c.10$$

$$V = c.20$$

$$PV^2 = 4,000$$

6.4.2 The result of the PV² calculation is less than 10⁸, therefore, a controlled crossing would not be justified based on this methodology.

6.4.3 The PV² calculation and derivation of pedestrian and traffic flows can be found in **Appendix E**.

6.5 Appraisal

- 6.5.1 It is considered that an informal pedestrian crossing, comprising dropped kerbs and tactile paving would provide an adequate level of provision, based on the forecast pedestrian and traffic flows.
- 6.5.2 A zebra crossing has been proposed to account for the likely high proportion of school children using the proposed crossing in the AM peak hour.

7 Summary and Conclusions

7.1 Summary

- 7.1.1 This Technical Note (TN) has been prepared in association with a reserved matters planning application (planning ref: DC/19/0834/RM) to provide submission of details under outline planning permission (planning ref: DC/15/2151/OUT) for up to 2,500 dwellings on land near Haverhill, Wilsey Road, Little Wratting.
- 7.1.2 The Note presents the assessments for two proposed crossing facilities located on B4349. The assessments have been undertaken in accordance with guidance presented in Local Transport Note (LTN) 1/95 'The Assessment of Pedestrian Crossings' (Department for Transport, 1995) and takes into consideration various factors such as traffic flows, vehicle speeds, pedestrian demand, carriageway and footway geometry and road safety.
- 7.1.3 The Note also considers the 'PV²' value for each location; an industry recognised quantitative method for assessing the need for new pedestrian crossing facilities.

7.2 Conclusions

- 7.2.1 The assessments have considered various crossing types, including informal, Zebra and signal controlled crossing. The appraisals have demonstrated that informal crossings would provide an appropriate level of provision given the existing and future traffic and pedestrian demand, however, given the high proportion of school children using the crossings in the AM peak, Zebra crossings are proposed at all three crossing locations.
- 7.2.2 In all three locations, the forecast PV² did not exceed the recognised thresholds for requiring a controlled pedestrian crossing. Furthermore, it is considered that there is no overriding need for signal controlled provision in any of the four locations.

Appendix A

**Appendix A
Site Assessment (Site 1 - Northern Crossing)**

SITE ASSESSMENT

SITE CHARACTERISTICS

1.1 Site Location	Northern section of the main spine road in close proximity to the northern access and Zone A1.	
1.2 Carriageway Type		Single Two Way
	Number of Lanes	2 (total)
1.3 Carriageway Width		6.2m
1.4 Footway Width	Northern Footway (proposed)	2.0m
	Southern Footway (proposed)	2.0m
1.5 Refuge Island		No
1.6 Road Lighting Standard	BS5489 classification?	Yes
	Is lighting to above standard?	Yes
	Any re-arrangement necessary?	No
	Better lighting standard needed?	No
	Supplementary lighting needed?	No
1.7 Minimum Visibility	Pedestrian to vehicle	Eastbound 35m Westbound 170m (to roundabout)
	Vehicle to crossing	Eastbound 35m Westbound 200m (to roundabout)
1.8 Waiting/Loading/Stopping Restrictions	At prospective site	No
	Within 50 metres of the site	No
1.9 Public Transport Stopping Points	At prospective site	No
	Within 50 metres of the site	No
	Relationship to crossing	Eastbound n/a Westbound n/a
1.10 Nearby Junctions	Distance to nearest significant traffic junction	To East 35m To West n/a
1.11 Other Pedestrian Crossings	Distance to next crossing	To East 60m To West n/a
	Type of crossing	Priority
1.12 School Crossing	Patrol distance if less than 100 metres	No
1.13 Skid Risk	Does surface meet skid requirements	Yes
1.14 Surroundings (entrances within 100 metres)	Hospital/Sheltered Housing/Workshop for Disabled people	No
	School	No
	Post office	No
	Railway/Bus Station	No
	Pedestrian leisure/Shopping area	No
	Sports stadia/entertainment venue	No
	Junction with cycle route	No
	Equestrian centre or junction with Bridle Path	No
	Others (for example Fire Station)	No

CROSSING TRAFFIC INFORMATION

2.1 Flow and Composition	Pedestrian count	AM - 70 PM - 22
	Prms/pusjchaors	Unknown
	Precent elderly	Unknown
	Unaccompanied young children	Unknown
	severe mobility difficulties	Unknown
	Visually impaired	Unknown
	Crossing cyclists	2.10%
	Equestrians	Unknown
	Others	Unknown
2.2 Time to cross the road	Able pedestrians	6.0 seconds
	Elderly pedestrians	9.0 seconds
		Assumes 1.2m/s for abled and 0.8m/s for elderly
2.3 Difficulty of Crossing	Able pedestrians	Minimal
	Elderly pedestrians	Minor delay
2.4 Latent Crossing Demand	Estimate	Unlikely

VEHICLE TRAFFIC INFORMATION

3.1 Flow and composition	Vehicle count	AM Peak - 212 PM Peak - 140
	Cyclists	Negligible
	Heavy goods vehicles	Negligible
	Public service vehicles	Negligible
3.2 Vehicle Speed	85th Percentile	Unknown (not yet constructed)
	Speed Limit	30 mph

ROAD COLLISIONS

4.1 Mean Personal Injury Collisions (PIC) Frequency	Number per year at site (over 5 years)	n/a
	Number per year at an average local site (over 5 years)	<1

Appendix B

**Appendix B
Site Assessment (Site 2 - Central Crossing)**

SITE ASSESSMENT

SITE CHARACTERISTICS

1.1 Site Location	Northern section of the main spine road in close proximity to the northern access and Zone A1.	
1.2 Carriageway Type		Single Two Way
	Number of Lanes	2 (total)
1.3 Carriageway Width		6.2m
1.4 Footway Width	Northern Footway (proposed)	3.0m
	Southern Footway (proposed)	3.0m
1.5 Refuge Island		No
1.6 Road Lighting Standard	BS5489 classification?	Yes
	Is lighting to above standard?	Yes
	Any re-arrangement necessary?	No
	Better lighting standard needed?	No
	Supplementary lighting needed?	No
1.7 Minimum Visibility	Pedestrian to vehicle	Eastbound >200m Westbound 155m
	Vehicle to crossing	Eastbound >200m Westbound 155m
1.8 Waiting/Loading/Stopping Restrictions	At prospective site	No
	Within 50 metres of the site	No
1.9 Public Transport Stopping Points	At prospective site	No
	Within 50 metres of the site	No
	Relationship to crossing	Eastbound n/a Westbound n/a
1.10 Nearby Junctions	Distance to nearest significant traffic junction	To East n/a To West 155m
1.11 Other Pedestrian Crossings	Distance to next crossing	To East 130m To West 155m
	Type of crossing	Priority
1.12 School Crossing	Patrol distance if less than 100 metres	No
1.13 Skid Risk	Does surface meet skid requirements	Yes
1.14 Surroundings (entrances within 100 metres)	Hospital/Sheltered Housing/Workshop for Disabled people	No
	School	Yes
	Post office	No
	Railway/Bus Station	No
	Pedestrian leisure/Shopping area	No
	Sports stadia/entertainment venue	No
	Junction with cycle route	No
	Equestrian centre or junction with Bridle Path	No
	Others (for example Fire Station)	No

CROSSING TRAFFIC INFORMATION

2.1 Flow and Composition	Pedestrian count	AM Peak - 336 PM Peak - 94
	Prams/pusjchaors	Unknown
	Precent elderly	Unknown
	Unaccompanied young children	Unknown
	severe mobility difficulties	Unknown
	Visually impaired	Unknown
	Crossing cyclists	2.10%
	Equestrians	Unknown
	Others	Unknown
2.2 Time to cross the road	Able pedestrians	6.0 seconds
	Elderly pedestrians	9.0 seconds
		Assumes 1.2m/s for abled and 0.8m/s for elderley
2.3 Difficulty of Crossing	Able pedestrians	Minimal
	Elderly pedestrians	Minor delay
2.4 Latent Crossing Demand	Estimate	Unlikely

VEHICLE TRAFFIC INFORMATION

3.1 Flow and composition	Vehicle count	AM Peak - 82 PM Peak - 35
	Cyclists	Negligible
	Heavy goods vehicles	Negligible
	Public service vehicles	Negligible
3.2 Vehicle Speed	85th Percentile	Unknown (not yet constructed)
	Speed Limit	30 mph

ROAD COLLISIONS

4.1 Mean Personal Injury Collisions (PIC) Frequency	Number per year at site (over 5 years)	n/a
	Number per year at an average local site (over 5 years)	<1

Appendix C

**Appendix C
Site Assessment (Site 3 - Southern Crossing)**

SITE ASSESSMENT

SITE CHARACTERISTICS

1.1 Site Location	Northern section of the main spine road in close proximity to the northern access and Zone A1.	
1.2 Carriageway Type		Single Two Way
	Number of Lanes	2 (total)
1.3 Carriageway Width		6.2m
1.4 Footway Width	Northern Footway (proposed)	3.0m
	Southern Footway (proposed)	3.0m
1.5 Refuge Island		No
1.6 Road Lighting Standard	BS5489 classification?	Yes
	Is lighting to above standard?	Yes
	Any re-arrangement necessary?	No
	Better lighting standard needed?	No
	Supplementary lighting needed?	No
1.7 Minimum Visibility	Pedestrian to vehicle	Eastbound >200m Westbound 100m
	Vehicle to crossing	Eastbound >200m Westbound 100m
1.8 Waiting/Loading/Stopping Restrictions	At prospective site	No
	Within 50 metres of the site	No
1.9 Public Transport Stopping Points	At prospective site	No
	Within 50 metres of the site	No
	Relationship to crossing	Eastbound n/a Westbound n/a
1.10 Nearby Junctions	Distance to nearest significant traffic junction	To East 40m To West n/a
1.11 Other Pedestrian Crossings	Distance to next crossing	To East 56m To West 47m
	Type of crossing	Priority
1.12 School Crossing	Patrol distance if less than 100 metres	No
1.13 Skid Risk	Does surface meet skid requirements	Yes
1.14 Surroundings (entrances within 100 metres)	Hospital/Sheltered Housing/Workshop for Disabled people	No
	School	No
	Post office	No
	Railway/Bus Station	No
	Pedestrian leisure/Shopping area	No
	Sports stadia/entertainment venue	No
	Junction with cycle route	No
	Equestrian centre or junction with Bridle Path	No
	Others (for example Fire Station)	No

CROSSING TRAFFIC INFORMATION

2.1 Flow and Composition	Pedestrian count	AM Peak - 368 PM Peak - 111
	Prams/pusjchaors	Unknown
	Precent elderly	Unknown
	Unaccompanied young children	Unknown
	severe mobility difficulties	Unknown
	Visually impaired	Unknown
	Crossing cyclists	2.10%
	Equestrians	Unknown
	Others	Unknown
2.2 Time to cross the road	Able pedestrians	6.0 seconds
	Elderly pedestrians	9.0 seconds
		Assumes 1.2m/s for abled and 0.8m/s for elderley
2.3 Difficulty of Crossing	Able pedestrians	Minimal
	Elderly pedestrians	Minor delay
2.4 Latent Crossing Demand	Estimate	Unlikely

VEHICLE TRAFFIC INFORMATION

3.1 Flow and composition	Vehicle count	AM Peak - 75 PM Peak - 37
	Cyclists	Negligible
	Heavy goods vehicles	Negligible
	Public service vehicles	Negligible
3.2 Vehicle Speed	85th Percentile	Unknown (not yet constructed)
	Speed Limit	30 mph

ROAD COLLISIONS

4.1 Mean Personal Injury Collisions (PIC) Frequency	Number per year at site (over 5 years)	n/a
	Number per year at an average local site (over 5 years)	<1

Appendix D

**Appendix D
Site Assessment (Site 4 - South East Crossing)**

SITE ASSESSMENT

SITE CHARACTERISTICS

1.1 Site Location	The proposed crossing is located on the main spine road between the two sections of Zone A7	
1.2 Carriageway Type		Single Two Way
	Number of Lanes	2 (total)
1.3 Carriageway Width		6.2m
1.4 Footway Width	Northern Footway (proposed)	2.0m
	Southern Footway (proposed)	2.0m
1.5 Refuge Island		No
1.6 Road Lighting Standard	BS5489 classification?	Yes
	Is lighting to above standard?	Yes
	Any re-arrangement necessary?	No
	Better lighting standard needed?	No
	Supplementary lighting needed?	No
1.7 Minimum Visibility	Pedestrian to vehicle	Eastbound: 63m Westbound: 90m
	Vehicle to crossing	Eastbound: 67m Westbound: >100m
1.8 Waiting/Loading/Stopping Restrictions	At prospective site	No
	Within 50 metres of the site	No
1.9 Public Transport Stopping Points	At prospective site	No
	Within 50 metres of the site	No
	Relationship to crossing	Eastbound: n/a Westbound: n/a
1.10 Nearby Junctions	Distance to nearest significant traffic junction	To East: n/a To West: 52m
1.11 Other Pedestrian Crossings	Distance to next crossing	To East: n/a To West: 47m
	Type of crossing	Priority
1.12 School Crossing	Patrol distance if less than 100 metres	No
1.13 Skid Risk	Does surface meet skid requirements	Yes
1.14 Surroundings (entrances within 100 metres)	Hospital/Sheltered Housing/Workshop for Disabled people	No
	School	No
	Post office	No
	Railway/Bus Station	No
	Pedestrian leisure/Shopping area	No
	Sports stadia/entertainment venue	No
	Junction with cycle route	No
	Equestrian centre or junction with Bridle Path	No
	Others (for example Fire Station)	No

CROSSING TRAFFIC INFORMATION

2.1 Flow and Composition	Pedestrian count	AM Peak - 27 PM Peak - 7
	Prams/puschaors	Unknown
	Precent elderly	Unknown
	Unaccompanied young children	Unknown
	severe mobility difficulties	Unknown
	Visually impaired	Unknown
	Crossing cyclists	2.10%
	Equestrians	Unknown
	Others	Unknown
2.2 Time to cross the road	Able pedestrians	6.0 seconds
	Elderly pedestrians	9.0 seconds
		Assumes 1.2m/s for abled and 0.8m/s for elderly
2.3 Difficulty of Crossing	Able pedestrians	Minimal
	Elderly pedestrians	Minor delay
2.4 Latent Crossing Demand	Estimate	Unlikely

VEHICLE TRAFFIC INFORMATION

3.1 Flow and composition	Vehicle count	AM Peak - 27 PM Peak - 16
	Cyclists	Negligible
	Heavy goods vehicles	Negligible
	Public service vehicles	Negligible
3.2 Vehicle Speed	85th Percentile	Unknown (not yet constructed)
	Speed Limit	30 mph

ROAD COLLISIONS

4.1 Mean Personal Injury Collisions (PIC) Frequency	Number per year at site (over 5 years)	n/a
	Number per year at an average local site (over 5 years)	<1

Appendix E

Crossing	AM Peak		PM Peak	
	WB	EB	WB	EB
Northern	89	122	83	57
Central	52	30	13	22
Southern	41	35	18	18
South East	12	15	10	6

Site 1 Northern Crossing- PV² Calculation

P = the pedestrian flow (pedestrians / hour) across a 100m length of road centred on the proposed crossing site.
 V = the number of vehicles in both directions (vehicles / hour).

TfL Guidance (SQA-0064) - 'Design Standards for Signal Schemes in London'
 The PV² value should be the average over the four busiest hours of the day and a crossing is normally justified where the calculated value of PV² is equal to or greater than 1×10^8 on an undivided road or 2×10^8 on a carriageway incorporating a staggered crossing.

For the purposes of this assessment, only the peak hour has been assessed. However this is considered to provide a more robust assessment.

AM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	30
Southbound	40

Vehicle Demand



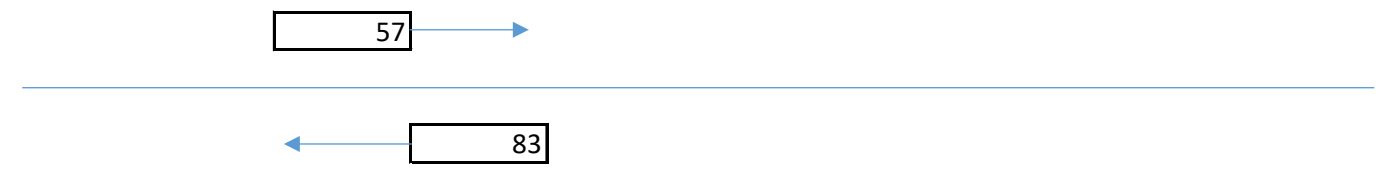
PM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	10
Southbound	12

Vehicle Demand

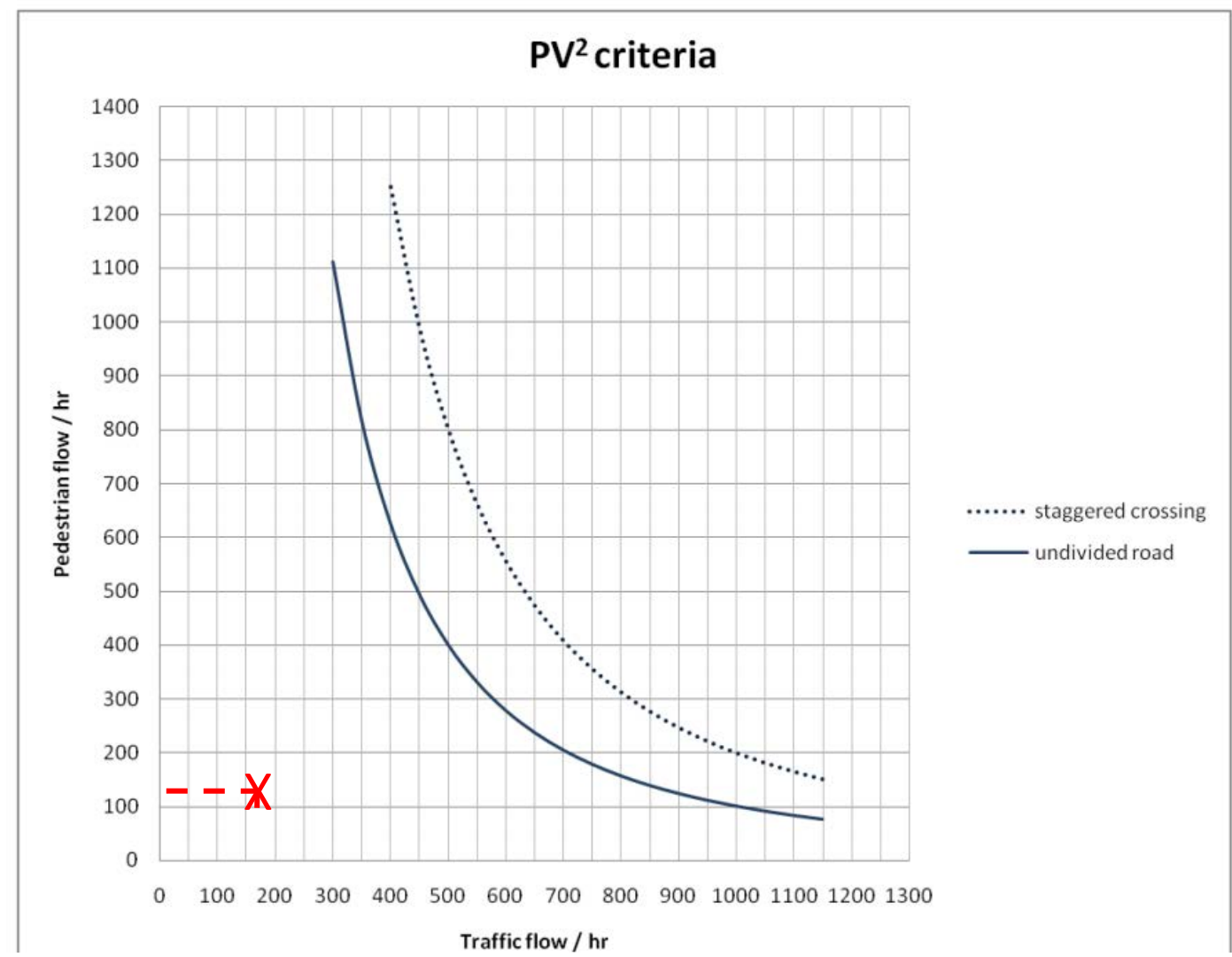
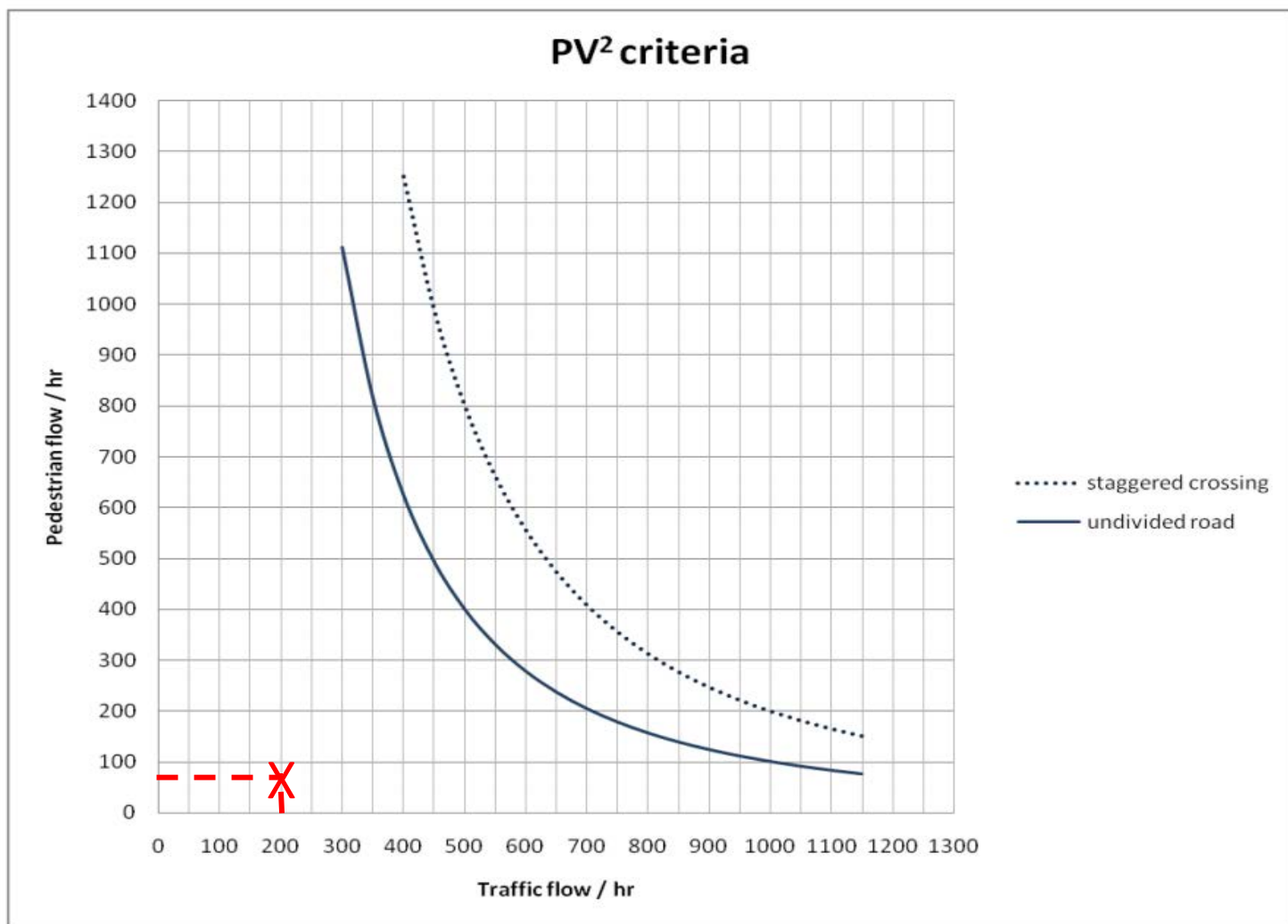


PV² Calculation

		Rounded
P =	70	70
V =	212	210
PV ² =		3,087,000

PV² Calculation

		Rounded
P =	22	20
V =	140	140
PV ² =		392,000



Site 2 Central Crossing - PV² Calculation

P = the pedestrian flow (pedestrians / hour) across a 100m length of road centred on the proposed crossing site.
 V = the number of vehicles in both directions (vehicles / hour).

TfL Guidance (SQA-0064) - 'Design Standards for Signal Schemes in London'
 The PV² value should be the average over the four busiest hours of the day and a crossing is normally justified where the calculated value of PV² is equal to or greater than 1×10^8 on an undivided road or 2×10^8 on a carriageway incorporating a staggered crossing.

For the purposes of this assessment, only the peak hour has been assessed. However this is considered to provide a more robust assessment.

AM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	166
Southbound	170

Vehicle Demand



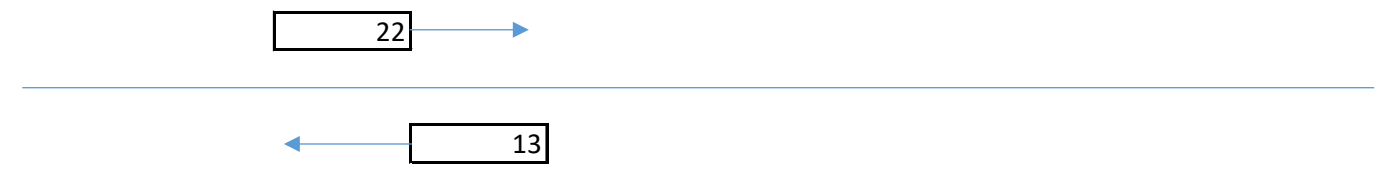
PM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	58
Southbound	36

Vehicle Demand

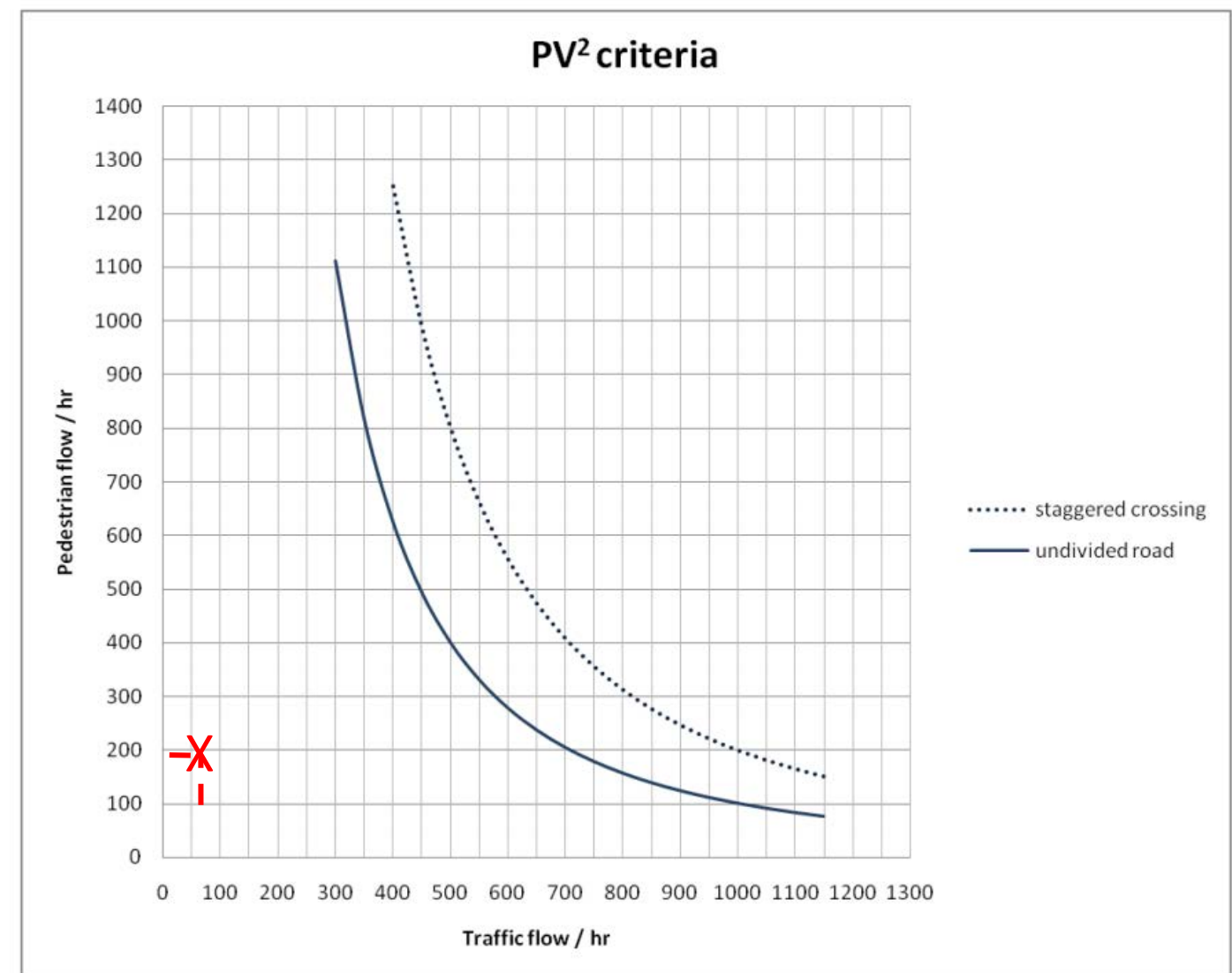
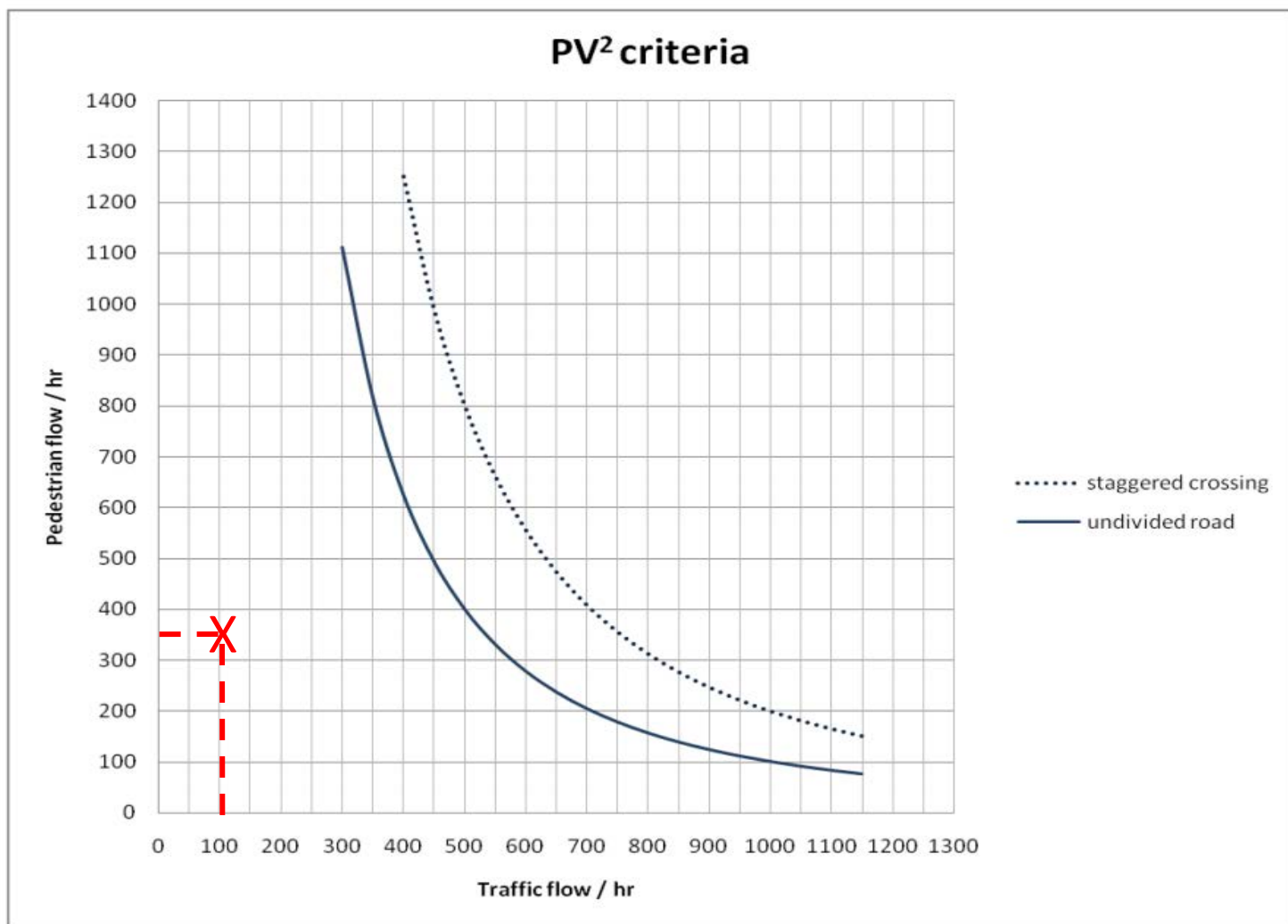


PV² Calculation

		Rounded
P =	336	340
V =	82	80
PV ² =		2,176,000

PV² Calculation

		Rounded
P =	94	90
V =	35	40
PV ² =		144,000



Site 3 Southern Crossing - PV² Calculation

P = the pedestrian flow (pedestrians / hour) across a 100m length of road centred on the proposed crossing site.
 V = the number of vehicles in both directions (vehicles / hour).

TfL Guidance (SQA-0064) - 'Design Standards for Signal Schemes in London'
 The PV² value should be the average over the four busiest hours of the day and a crossing is normally justified where the calculated value of PV² is equal to or greater than 1×10^8 on an undivided road or 2×10^8 on a carriageway incorporating a staggered crossing.

For the purposes of this assessment, only the peak hour has been assessed. However this is considered to provide a more robust assessment.

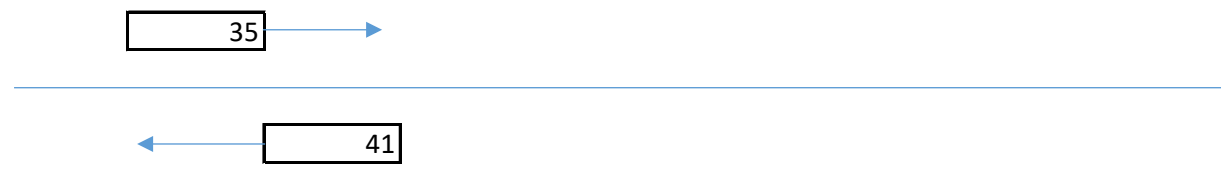
AM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	233
Southbound	135

Vehicle Demand



PM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	68
Southbound	43

Vehicle Demand

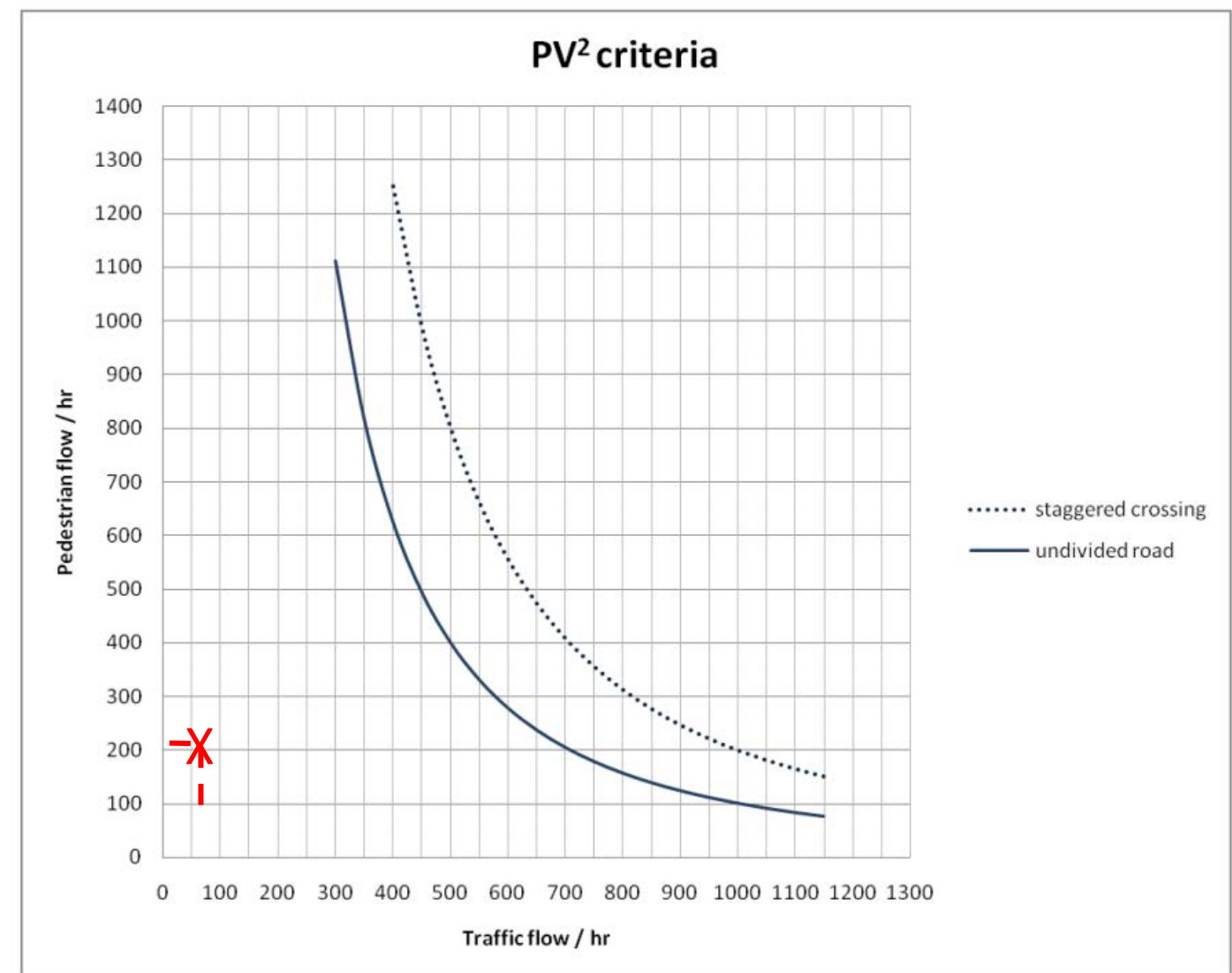
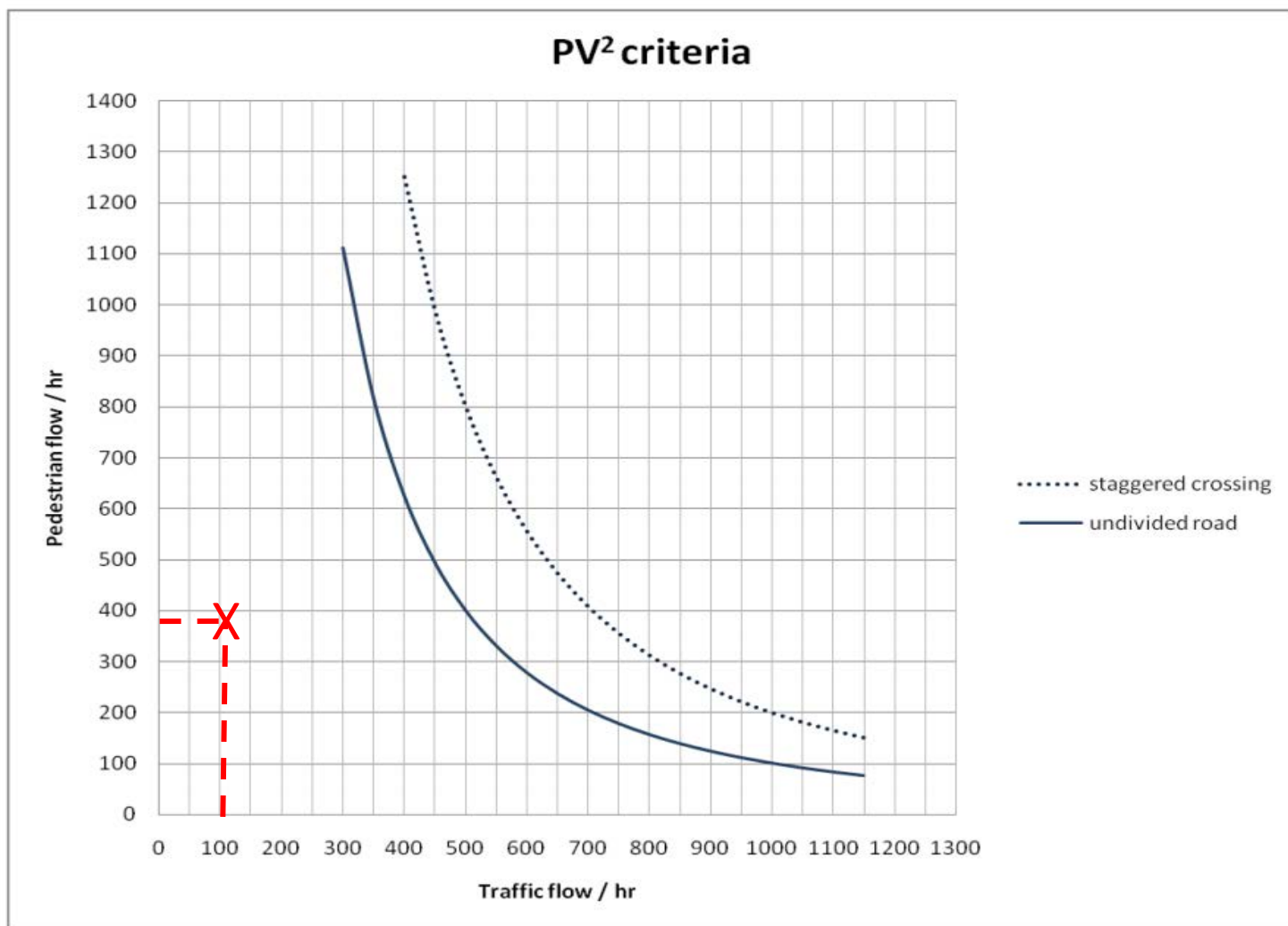


PV² Calculation

		Rounded
P =	368	370
V =	75	80
PV ² =		2,368,000

PV² Calculation

		Rounded
P =	111	110
V =	37	40
PV ² =		176,000



Site 4 South-East Crossing - PV² Calculation

P = the pedestrian flow (pedestrians / hour) across a 100m length of road centred on the proposed crossing site.
 V = the number of vehicles in both directions (vehicles / hour).

TfL Guidance (SQA-0064) - 'Design Standards for Signal Schemes in London'
 The PV² value should be the average over the four busiest hours of the day and a crossing is normally justified where the calculated value of PV² is equal to or greater than 1×10^8 on an undivided road or 2×10^8 on a carriageway incorporating a staggered crossing.

For the purposes of this assessment, only the peak hour has been assessed. However this is considered to provide a more robust assessment.

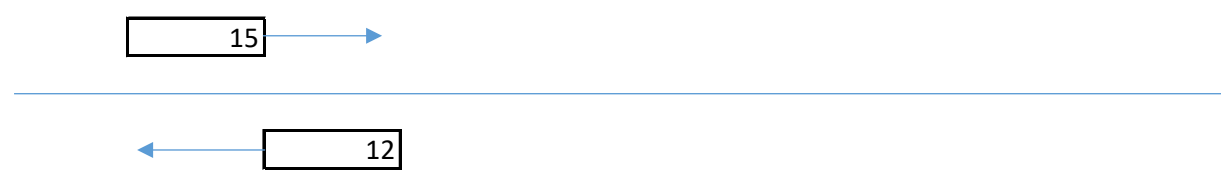
AM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	19
Southbound	16

Vehicle Demand



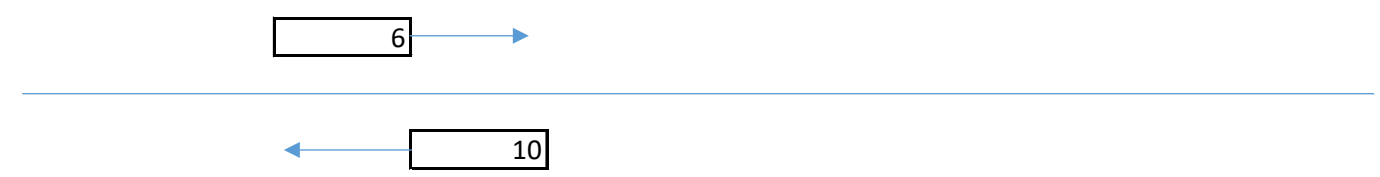
PM Peak Hour

Pedestrian Demand

Forecast Demand

Northbound	5
Southbound	2

Vehicle Demand



PV² Calculation

		Rounded
P =	35	40
V =	26	30
PV ² =		36,000

PV² Calculation

		Rounded
P =	7	10
V =	16	20
PV ² =		4,000

