in partnership with

Nottinghamshire County Council

Via East Midlands Ltd

# HW30415 – Gilt Hill, Kimberley

## Feasibility Report –Crossing Improvements

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# 1 Introduction

The brief is to consider options to improve pedestrian accessibility on Gilt Hill, Kimberley outside Gilthill Primary School west of Digby Street.

This report investigates a range of options to improve pedestrian crossing facilities at this location including consideration of a footway build-out, pedestrian refuge, zebra crossing or puffin crossing.

The study includes the determination of the feasibility and cost of these measures and, if appropriate, makes recommendations. It identifies issues that may arise from the implementation of each of these measures and any difficulties that may affect delivery. The initial view of Via's Safer Highways Team and Traffic Signals Team have been sought and are included in this report.

# 2 Recommendation

A range of options were considered and of these one is recommended as both feasible and effective.

The recommended option is **Option E** – retention of the existing School Crossing Patrol site. The Patrol site has operated safely for a number of years, providing a personalised and responsive service which meets the requirements of the majority of crossing movements at this location.

Option E has no capital costs, it is met by staff revenue budgets.

# 3 Background

Nottinghamshire County Council have received requests from the local County Councillor and members of the public for measures to improve crossing facilities over Gilt Hill, in the vicinity of Gilt Hill Primary School. The school is located on the north-east side of the road and a school crossing patrol operates at school arrival and dispersal times.

The patrol operates at an existing uncontrolled crossing point located approximately 11m north-west of the junction of Digby Street, as shown on Figure 1. Whilst the site was temporarily unstaffed due to illness feasibility work was requested to establish whether an improvement to the crossing facilities could be made.



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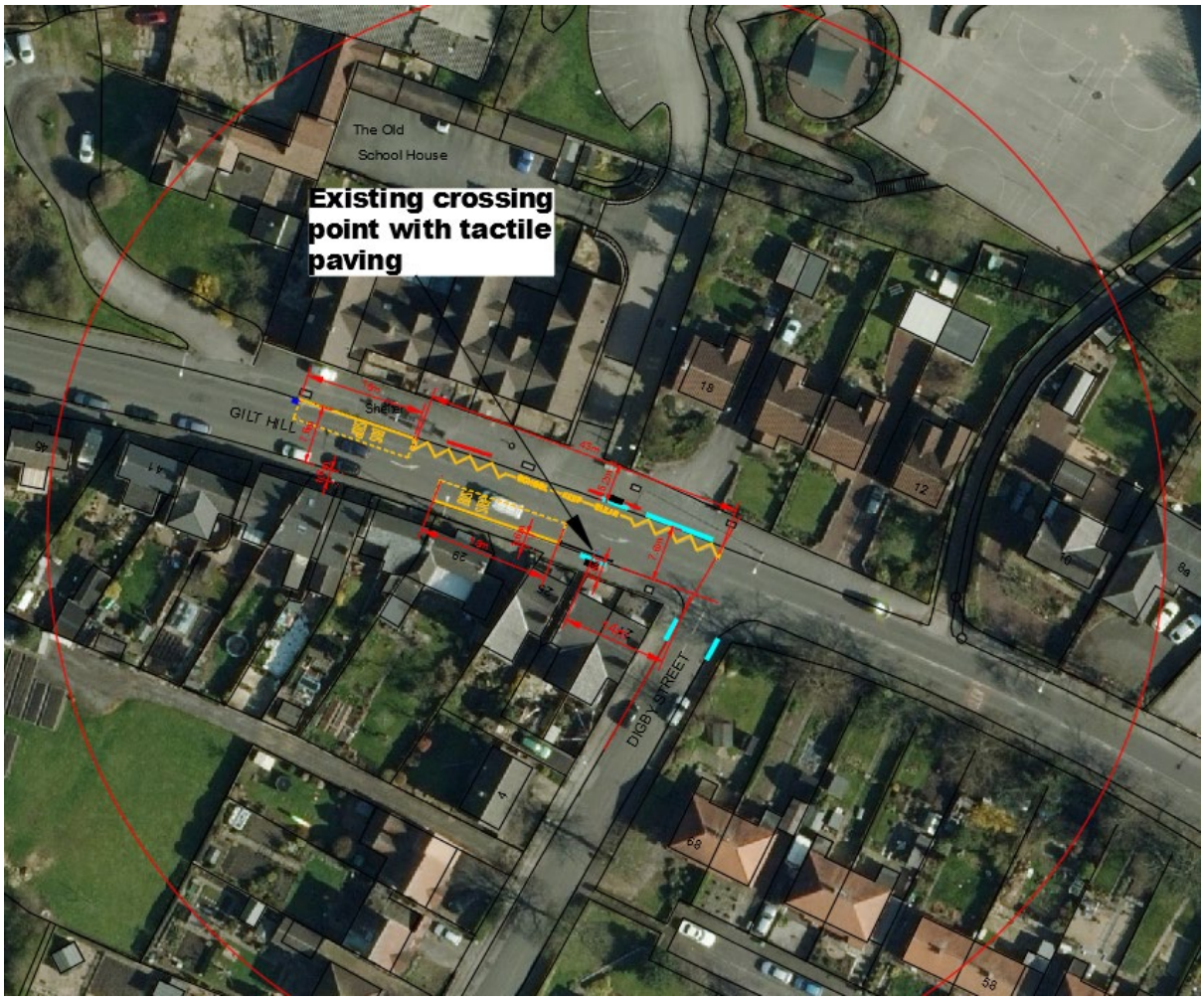
*Figure 1: Existing restrictions and crossing site*




## 4 Existing Traffic Parameters

Gilt Hill is a busy road through Kimberley which connects the A610 from the B6010 at Giltbrook Eastwood towards Nottingham. Outside the school the carriageway width is approximately 7.6m with footway widths of 1.5 to 2.6m on the south-east side and 5.2m on the north-west side. The Annual Average Daily Traffic (AADT) for Gilt Hill is 14,750 of which 245 were HGV's (1.7%). It is subject to a 30mph speed limit and has vehicle mean speed of 27.2 mph.

Gilt Hill is served by a number of scheduled bus services, including the Trent Barton's Amber line, One and the number 27 and Notts Bus 532. These provide a frequent bus service (approx. every 10 – 15 minutes) along Gilt Hill, with bus stops on both sides of the road, adjacent to the proposed location. There is a bus stop shelter and real-time display on the north side of Gilt Hill.

There is an existing uncontrolled crossing point defined by tactile paving and dropped kerbs where a school crossing patrol operates. This crossing point is well located to serve pedestrians coming from Digby Street walking to and from the school. Also, being immediately outside the school access it serves pedestrians walking along Gilt Hill from either direction.

There is a 43m long School Keep Clearway marking outside the school in operation Monday to Friday between 8am and 4.30pm. Bus Stop Clearways are in place on both sides of the road, these are in operation at all times. The school is located on the north side of the road and the south side is predominantly terraced housing with no off-street parking provision and there is considerable demand for parking on this side of the road.



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Gilt Hill, as it extends eastwards from the roundabout with the B6010, both curves slightly and rises towards the brow of the hill, east of the school. This results in poor visibility for pedestrians trying to cross the road, particularly from the southern side. Visibility is also restricted for drivers approaching from both directions, to see pedestrians waiting to cross the road. A single white centreline is in place to the east of the school, which prevents eastbound traffic overtaking parked or waiting vehicles.

There have been no reported injury accidents in the last 3 years in the vicinity of the existing crossing point. Speed, vehicle flow and PV2 measurements were taken in April 2019, these indicate the pedestrian desire line is located at the current crossing location, south-east of the school entrance. The majority of crossing movements occur at school arrival and dispersal times, with a limited number in the inter-peak period.

There are a large number of underground services in the vicinity including WPD electricity, BT and virgin cables, water services, one of which is in the middle of the crossing point. The presence of services has been confirmed through an initial service investigation.

## 5 Design Parameters

Design requirements for zebra and puffin crossing signing and lining are contained in the Traffic Signs Regulations and General Directions (TSRGD) 2016 and Traffic Signs Manuals.

The Nottinghamshire Design Guide sets out the general principles and minimum standards for the layout and dimensions of roads and paved areas in residential and industrial developments. There are other relevant standards and guidance that can be referred to as part of the assessment and detailed design, such as the Design Manual for Roads and Bridges (DMRB) which sets out design standards for the trunk and motorway network. The Design of Pedestrian Crossings Local Transport Note 2/95 (TAL 2/95) has been referenced to ensure that the crossing facility suggested will meet the required standards.

## 6 Assessment

Five options have been considered at the existing location (options A to E); which aligns with the primary desire line for crossing movements and a sixth option 25m west of the current crossing point (option F), there are:

1. Option A – Footway Build Out;
2. Option B – Pedestrian Refuge;
3. Option C – Zebra Crossing;
4. Option D – Puffin Crossing;
5. Option E - Retain existing School Crossing Patrol site; and
6. Option F – Puffing Crossing (25m to the west)

Further alternative locations were considered but were ruled out due to insufficient footway width and constrained visibility for pedestrians crossing the road, these are not included in this report.

## 7 Option A – Footway Build Out

Consideration was given to install a build out on the southern side of Gilt Hill at the location of the existing uncontrolled crossing point. A build out would increase the visibility for pedestrians crossing the road and make it safer for them to cross, however the existing carriageway width is insufficient to accommodate this.



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To achieve the necessary visibility improvement the build out would need to extend 2m into the carriageway, reducing the overall carriageway width to 5.6m. The resultant 2.8m lanes would be well below the required minimum running lane width of 3.5m.

### 7.1 Option A - Safer Highways Team Assessment

The Safer Highways Team advised that pedestrians using the current uncontrolled crossing have a somewhat restricted view of traffic, partly owing to the bend to the east, and the crest to the west, of the site. It was also noted that parked vehicles are a further obstruction to visibility.

It was acknowledged that a build-out on the southern side may improve the view towards the east fractionally, but site observations indicate that this would be a minimal improvement, which would not justify the attendant increase in risk.

In safety terms build-outs sometimes have an attendant increase in risk as they can suffer from repeated vehicle collisions, especially at night. A gradual lead-in to the narrowing, by realigning the kerb-line on the approach, avoids the problem, but obviously narrows the road over a greater length, and hence reduces available parking spaces. This would also considerably increase the scheme cost.

The alternative, and less expensive option, is a short-localised build-out marked by some form of bollard and white lining arrangement, but these can be ineffective in practice. For example, reflective bollards and the like are often damaged by parking vehicles, and the resulting unmarked build-out is very prone to being struck by traffic. White lining, even when in good condition, is less effective at night especially when the road is wet. This means it is not dominant enough to overcome all the other visual cues such as the continuing kerb-line, lines of parked cars, the building line and the footway – this tends to lead to drivers simply looking over the top of the build out, and then colliding with it. This effect has been observed at a number of sites in the past.

## 8 Option B – Pedestrian Refuge

Consideration was given to installing a pedestrian refuge at the location of the existing uncontrolled crossing point. To establish if the proposed pedestrian refuge was suitable for large vehicles to pass, a series of vehicles were tracked through the new layout from Gilt Hill into the driveway / junction that provides vehicular access to Gilthill Primary School and a small number of residential properties. The tracking showed that a refuse freighter, bus and any larger vehicle, (such as a non-articulated lorry or articulated lorry) would be unable to drive in and out of this driveway / junction from Gilt Hill. A plan showing the tracking for a refuse vehicle is attached in Appendix A.

The length and width of a potential refuge was examined to determine if any changes could reduce the adverse effect on access for larger vehicles. The absolute minimum width needed for a refuge to accommodate pedestrians standing in the middle of the road is 1.5m. However, this location is near a school and it is recommended any refuge be a minimum of 2m to accommodate the numbers of pedestrians including school children. This would only leave 5.6m of available carriageway, leaving 2.8m either side of the refuge for passing vehicles.

The Nottinghamshire design guide specifies that the minimum width for a pedestrian-only use refuge is 2m and have a 3.2m clearance to the carriageway edge on either side. It also advises that physical lane widths in the range of 3.1 to 4.0m are avoided in order to avoid a safety hazard involving vehicles overtaking cyclists.

For the purpose of this report, a pedestrian refuge is assumed to require a minimum carriageway width of 10m. As recommended in TAL 2/95, this would be made up of 4m lanes and a 2m island. A 1 in 40 centreline taper and 75m of forward visibility would also be required, as specified in Chapter 5 of the Traffic Signs Manual.



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Therefore, a 2m wide refuge could be achieved in theory by widening the road on the north side by at 2.4m. The extra width would allow a refuge of an appropriate width to be provided. The necessary kerb-line tapers on either side to allow safe passage of vehicles would entail extensive and costly engineering works, particularly as there are significant services (gas, electricity, water and telecom etc) in the area.

As an example, at this location to achieve 1.5m additional carriageway width widening would be required over a length of approximately 126m, this increases to 146m to achieve 2m additional width.

An initial statutory undertaker apparatus survey has been conducted which has identified that utilities are present in the area and indicates the presence of BT cables in the northern footway. These services may need to be relocated as part of works to realign the kerbs and lower the footway to carriageway level. The requirement to divert or lower this equipment, to meet minimum depth requirements, will not be known until detailed design work is undertaken; such investigations will attract further design costs that will be payable to the statutory undertakers. It was considered that the proximity of the refuge in relation to the bus stop clearways was acceptable.

It has not been possible to identify a refuge design which successfully resolves the access constraints on larger vehicles entering or leaving the school site. Additionally, these constraints could not be mitigated by further carriageway widening, nor by moving the refuge further away from the entrance as this is constrained by vehicle accesses, carriageway/footway widths and adjacent junctions.

It is recommended not to pursue this option as the refuge would cause an obstruction for larger vehicles, potentially resulting in road traffic accidents as a result of the access being blocked.

### 8.1 Option B - Safer Highways Team Assessment

The Safer Highways Team advised that as the current road width is 7.6m, the practical minimum width for a refuge is 1.5m, to avoid signs being continually damaged/removed by passing traffic. While a 1.5m refuge is a permissible minimum, this would feel very narrow especially for someone with a child in a pushchair, or if a number of pedestrians were crossing at the same time, for example at the start or end of the school day.

A 1.5m refuge would leave a residual traffic lane in each direction of fractionally more than 3m, among other things this means that drivers would be forced to travel closer to the road edge. The road is busy, and pedestrians waiting to cross Gilt Hill, or standing on the narrow refuge, would feel vulnerable so close to the traffic. They would have little margin for error if they stepped or leaned into the road in error, which may be a pertinent issue for parents with young children.

A refuge would also increase the risk of parked vehicles being struck by traffic and would tend to limit available parking.

A wider refuge of 2m could be achieved in theory by widening the road on the north side. The extra width would allow a more reassuring installation to be provided. The necessary kerb-line tapers on either side to allow safe passage of vehicles would entail extensive and costly engineering works, particularly as there are significant services in the area.

## 9 Option C – Zebra Crossing

This option would be to upgrade the existing uncontrolled crossing point to a new zebra crossing; this is on the pedestrian desire line for the school and it is considered that this site would continue to be used by pedestrians to cross the road.



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Although minimum visibility from the south side can be achieved to the east of the crossing point, visibility to the west is not achievable due to parked cars and the bend in the road and hill. It is not recommended a zebra be installed at this location as approaching vehicles would not be able to see pedestrians waiting to cross the road. This cannot be mitigated by moving the proposed location, as the visibility constraints continue.

The requirements for a controlled area (defined by zig-zag markings) would have also have a negative impact on local residents in an already restricted area where properties have no off-street parking.

A new zebra crossing is also not consistent with other types of controlled crossing along Gilt Hill and the route from the B6010 towards Nottingham.

### 9.1 Option C - Safer Highways Team Assessment

The Safer Highways Team advised a zebra crossing relies on approaching motorists giving way to pedestrians waiting to cross. When there is a continual stream of pedestrians (such as at the beginning or end of the school day) a zebra can be more flexible than a signalled crossing. This is because a Puffin or similar crossing has to provide a defined and relatively lengthy period of time within the signal cycle where traffic is flowing ('Vehicle Precedence Time'), to avoid extensive queues developing. During this period pedestrians are often tempted to cross against a 'red man' signal which places them at risk. A zebra by contrast can sometimes allow a more flexible 'give and take' regime to develop between pedestrians and drivers.

However, this interaction is very dependent on the speed and numbers of vehicles on the road. On busy urban roads a common complaint is that drivers do not see pedestrians, and if they do, they are travelling too fast to stop. In these settings a zebra crossing is often insufficiently prominent and can be the subject of chronic complaints from pedestrians arising from conflicts with vehicles.

Zebra crossings which have injury accident problems are usually suffering from these issues and can be resistant to improvement, except by a costly conversion to a signal-controlled alternative. On Gilt Hill the situation would be compounded by the reduced visibility of the crossing when travelling west due to the bend, and the downhill slope which will increase vehicle stopping distances. Due to the volume and speed of traffic witnessed on Gilt Hill, at a time when the crossing would be most heavily used, a zebra crossing would not be an appropriate form of facility for this site.

## 10 Option D – Puffin Crossing (current crossing location)

This option would be to upgrade the existing uncontrolled crossing point to a new puffin crossing. The current crossing point for the existing SCP is on the pedestrian desire line for the school and it is considered that this site would continue to be used by pedestrians to cross the road.

### 10.1 Option D - Safer Highways Team Assessment

The Safer Highways Team advised that a Puffin crossing offers a much clearer and unambiguous method of control than a zebra crossing and would be better suited to this sort of road. There may be a potential issue when high numbers of pedestrians are crossing in a short space of time, associated with the 'Vehicle Precedence Time', where pedestrians cross against a 'red man' instead of waiting for the 'green man' to appear. However, on balance this would be the most workable choice of facility.

The visibility of the signal heads for westbound drivers may be less than required due to the bend (and the overhanging tree foliage) on this approach. This would lead to conflicts between pedestrians and vehicles, and also shunt type accidents on the approach. As noted above the downhill approach will exacerbate this issue.



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National design guidance indicates that a signal-controlled crossing needs to be sited a minimum distance of 20m from an adjacent uncontrolled side road in order that drivers turning onto the main road have sufficient time to see and react to the signals. This prevents a pedestrian being knocked down by an emerging driver who is concentrating on main road traffic and doesn't see a red light immediately as they join the main road.

The existing crossing point is situated between the school access and Digby Street. The school access also serves a group of residential properties, and effectively operates as a minor road. If a crossing were installed between the two accesses (i.e. in the current crossing point location) the available distance would be at best around 5 to 8m. If the crossing was moved anything like the requisite distance from Digby Street, it would block the school access.

Therefore, while a Puffin Crossing would be the best choice for the class of road, it could not reasonably be sited at the current location.

### 10.2 Option D - Traffic Signals Team Assessment

The Traffic Signals Team advised there is insufficient landing width on the northern side of Gilt Hill to provide a Puffin crossing at the location of the existing uncontrolled crossing point due to the school access and the driveway of Number 18 Gilt Hill. Drivers exiting left from the school access would have insufficient visibility of the stop line and traffic signals before the signal crossing. Drivers exiting right from number 18 would turn out downstream of the crossing stop line which is not acceptable.

Forward visibility on the eastern approach meets the minimum standard of 90m but the visibility on the western approach does not. This minimum approach visibility to the nearside signal is a mandatory requirement on the approach to new traffic signal installations.

These factors make the existing site unsuitable for a signalised crossing installation. To mitigate these issues the crossing location would need to move approximately 25m to the west to achieve the visibility requirements.

## 11 Option E – Retain existing School Crossing Patrol site

This option is included in the assessment to highlight the fact that at the existing uncontrolled crossing point these is provision of a School Crossing Patrol (SCP) and dedicated site (including h-bars, school zigzags and tactile dropped kerbs) that meets the crossing needs of the majority of pedestrians.

There have been no accidents recorded at this location in the last three years, which indicates that the site is operating safely. Whilst a SCP can be retained at the site it is considered that this provides a safe, cost-effective and personalised service which meets the needs of the most vulnerable users crossing at this location.

## 12 Option F – Puffin Crossing (25m West)

The Traffic Signals Team advised that to achieve visibility requirements a new Puffin crossing would need to be located approximately 25m west of the existing SCP site to achieve the visibility requirements. However, at this location the footway on the south of the crossing is only 1.6m wide which is insufficient width to install signal poles. This location is also away from the pedestrian desire line, however due to the difficulties in crossing the road at an uncontrolled location means pedestrians may be willing to travel further away from their desire line.

A minimum footway width of 2m is required to install the necessary signal poles, however in this location, by a school, the Traffic Signals Team consider that footway widths should be 2.5m or more. This is to provide sufficient space for pedestrians to gather whilst waiting for the "green man" to enable them to cross. If insufficient holding space is available there is the potential for vulnerable



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users to move into the live carriageway. This would require a footway widening of approximately 1m tapered over an extended length of carriageway. This would not leave an appropriate running width for the remaining carriageway, which is particularly relevant due to the proportion of HGV's using the route.

This could only be addressed by reducing the northern footway width to maintain appropriate carriageway running widths. The carriageway widening would be required over approximately 126m to achieve around 1.5m additional width. Statutory undertakers' equipment, including BT, is present in the footway and would need to be diverted.

This proposal would require the two bus stops, associated clearways, shelter and real-time pole to be moved to another location. The curve and rise of the road mean there that there are very limited locations that the bus stops could be moved to. Both stops could not be moved eastwards, due to the potential danger if drivers ignored the single white centreline and overtook a stationary bus. Whereas moving them westwards, towards the roundabout would remove much of the remaining on-street parking from the area and potentially create congestion which could queue back to the island, affecting its operation. In addition, insufficient footway widths are available for comparable facilities (shelter, real-time) to be installed. The relocation of the bus stops, away from the new crossing point, would also reduce the inter-peak use of the crossing and therefore reduce the justification for providing a facility at this location.

The zig-zag lines, associated with the crossing, would prohibit loading and unloading outside the houses opposite the school. Due to the topography constraints of the location the zigzags would need to be at least of standard length (8 zigzags) to maintain visibility of the crossing. This would remove all on-street parking on both sides of the road, near the school.

The Puffin crossing would cost between £65,000 and £75,000 and the road re-alignment approximately £120,000. This cost could increase significantly if works are required to relocate the existing statutory undertakers' plant and equipment in the footway. Further feasibility work to determine the extent of the relocation required would attract design fees from the statutory undertakers.

### 12.1 Option F - Safer Highways Team Assessment

The Safer Highways Team advised a better position for a Puffin Crossing would be further west of the existing crossing point, around the location of the existing bus stops. This would provide better separation from adjacent side roads, better visibility of the crossing for approaching drivers, and better view of approaching traffic for pedestrians who elect to cross against a 'red man' signal. Of the options considered this is the most realistic crossing choice.

A potential shortfall would be that it is some distance from the 'desire line', i.e. where pedestrians wish to cross the road most conveniently. A crossing away from the 'desire line' is often ignored by people, who continue crossing at the most convenient point for them, unwittingly putting themselves at risk. However, parents with young children were witnessed having so much difficulty crossing at morning school time that it is likely they would be prepared to walk the extra distance to use a Puffin. Nonetheless the relocated crossing may not be used at other periods of the day, which would make it less effective than if a crossing could be located at the current position.

It should be noted that the existing bus stops would have to be relocated, including the shelter and raised kerbs. Assuming that a safe and convenient location(s) could be identified, this is likely to be extremely unwelcome not only for residents near the new stops, but for bus passengers who may be faced with a long walk to a less convenient stop. Also, parking would have to be prohibited on the



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crossing approaches which would affect houses on the south side of Gilt Hill, some of which have no off-road alternative.

# 13 Assessment of Options

This section provides a brief assessment of the options considered to improve pedestrian accessibility at this location.

## 13.1 Option A – Footway build-out

This option is not considered feasible due to the extent of the build-out required to achieve sufficient visibility, road safety concerns regarding it being struck by vehicles and the minimal benefits accrued to crossing movements for pedestrians.

## 13.2 Option B – Pedestrian refuge

A 2m wide pedestrian refuge meets design standards and considered to provide adequate protection of vulnerable users. However, tracking shows that even narrowing the northern footway to achieve the necessary carriageway running width does not enable larger vehicles to turn into and out of the school access road. As such this option is not considered feasible.

## 13.3 Option C – Zebra crossing

This option is not considered feasible due to the sight lines at this location and the concerns expressed by Safer Highways Team about the suitability of this type of crossing.

## 13.4 Option D – Puffin crossing

This option is not considered feasible due to the sight lines at this location and its proximity of junctions / accesses.

## 13.5 Option E – Retain existing School Crossing Patrol site

This is the recommended option, it recognises that the existing provision of a SCP and dedicated site (including h-bars, school zigzags and tactile dropped kerbs) meets the crossing needs of the majority of pedestrians. Whilst a SCP can be retained at the site it is considered that this is the most appropriate facility for the location and demographic of those crossing.

## 13.6 Option F – Puffin 25m west of existing crossing location

This option is not recommended due to the extent of the widening required on the southern footway in conjunction with the required narrowing of the northern footway; effectively re-aligning the road. As detailed in the body of the report, the crossing movements at this location are focussed primarily on school arrival and dispersal times; with limited use during the remainder of the day. With the relocation of the bus stops it is likely that these residual crossing movements will be further reduced at this location. This option would have a significantly adverse effect on public transport utility for bus users, due to relocating the stops and reducing bus facilities.

The cost of this option and the disruption of the engineering works would be significant. The local community will be adversely affected by this, the reduction in bus facilities and the loss of all the on-street parking on this stretch of Gilt Hill. It is likely that this last factor will attract significant levels of objection; particularly from residents of the properties opposite the school.



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# 14 Appendix A



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