

## Proposed Zebra Crossing Sandpit Lane, Thurston – Feasibility Report





## Document Control

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## Background

Thurston parish council has commissioned Suffolk Highways to assess the suitability of a Zebra Crossing on Sandpit Lane, Thurston. Sandpit Lane is an unclassified road (U4920) which links the north and east of Thurston, to the south of Thurston and further afield junction 46 of the A14.

At the proposed Zebra Crossing location there is an existing raised speed table which also acts as an uncontrolled crossing point. There is a junction with School Road approximately 10m south of the crossing point, a formal northbound bus stop approximately 30m to the north, and an informal southbound bus stop immediately adjacent to the crossing point.

Along this section of Sandpit Lane, there is a footpath on the west side, but no footpath on the east side. The speed limit is 30mph by virtue of street lighting, and the road width at the crossing point is 5.6m.

## Zebra Crossings

Zebra Crossings give pedestrians and cyclists a right of way over vehicles and rely upon motorists identifying pedestrians waiting to cross (rather than being signalled to stop). Zebra Crossings can allow pedestrians to cross on busy roads with a continuous vehicle traffic flow, and can be installed when pedestrian numbers and vehicle flows are moderate.

The provision of formal crossings should be targeted at groups who experience most difficulty. Sometimes, drivers do not stop when a pedestrian is waiting to cross whilst the pedestrian assumes that a driver will stop. Subsequently, Zebra Crossings can be unsuitable for young, vulnerable, or inexperienced pedestrians. The elderly benefit more from Zebra Crossings, because the traffic on a busy road might require them to move quickly to cross. Blind or partially blind people find Zebra Crossings harder to use than signal-controlled crossings.

Any formal crossing must be seen within the wider context of the street in which it sits. A new Zebra Crossing would include street lighting and beacons to the latest specification, and be clearly delineated with Zebra and zig-zag road markings. Installing a new Zebra Crossing depends upon having the necessary resources to initially design and construct the scheme, and then to maintain the crossing over time to the required highways standards.



## Methodology

To assess the need for a Zebra Crossing, the conflict between pedestrians and vehicles needed to be quantified with robust data. To measure the degree of conflict between pedestrians wanting to cross the road, and the two-way traffic flow, Suffolk Highways commissioned a 3-day CCTV survey between Thursday 13th January – Saturday 15th January. A 3-day survey period was chosen so the peak periods could be identified, and the weekday and weekend data could be compared.

The daytime weather conditions were good for the time of year – sunny with a high of 9 degrees Celsius (Thursday), sunny with a high of 7 degrees Celsius (Friday), sunny intervals with a high of 8 degrees Celsius (Saturday). The CCTV survey was taken between 7am–7pm, during term-time. Despite the good weather conditions for the time of year, it can be safely assumed that the pedestrian demand would increase in spring/summer/autumn months. The time of year does need to be considered when making assumptions about the survey data.

A CCTV survey can classify the type of vehicle travelling past the crossing point and differentiate between cars, heavy goods vehicles, buses, motorcycles, and pedal cycles. The survey can also differentiate between the type of pedestrian, and classify them by their age and ability. Once the peak periods were identified, the raw data was then manipulated by Suffolk Highways (by applying multiplying factors), to take into consideration the classification of vehicles and the type of pedestrians. Please refer to the section on the Modified Quantitative Crossing Assessment for more information.

A 7-day vehicle speed assessment was also undertaken by Suffolk Highways - this will ultimately be required as Zebra Crossings can only be installed on roads where the 85th percentile speed is below 35mph.

## Accident Data

If a formal crossing is being considered, then the existing accident records for the proposed location must be investigated to identify any patterns. Accident data was obtained from 'AccsMap' over a 10-year period between 1st Jan 2011 - 30th Nov 2021. There were no reported accidents during this 10-year period.

However, Thurston Parish Council have reported near misses at the existing crossing point. The crossing point is located on a raised speed table which is causing indecision between pedestrians and vehicles, and who has the right of way.



## Traffic Speed Survey

Traffic speeds were recorded on Sandpit Lane during a 7-day period between 27th January - 2nd February 2022. The speeds were recorded in both directions, at roughly 50m before the crossing site. The data collected during the traffic speed survey has been summarised below.

Zebra Crossings should not be installed on roads with an 85th percentile speed of 35mph or above. If average speeds are too high, then other traffic calming measures are needed. The speed data reveals that the average 85th percentile speed for both 7-day and 5-day period were below 35mph, therefore, the existing traffic speeds meet the criteria for proposing a Zebra Crossing.

	<b>Sandpit Lane – South bound Approach</b>	<b>Thedwastre Road – Northbound Approach</b>
<b>Mean Speed</b>	26mph	26mph
<b>85th Percentile Speed</b>	30mph	31mph

## Quantitative Crossing Assessment

The quantitative crossing assessment is a calculation used by highway authorities to assess the need for a particular type of pedestrian crossing facility. The assessment factor measures the degree of conflict between pedestrians and vehicles at the busiest times, and then compares the results to intervention levels dictated by the Department for Transport (DfT).

The calculation factor is calculated as  $PV^2$ , where V is the 2-way total hourly flow of vehicles, and P is the 2-way total hourly flow of pedestrians crossing the road (within 50m on either side of proposed location). Generally, the intervention level for providing a central refuge is if the average  $PV^2$  value is above  $0.4 \times 10^8$ . To justify a Zebra Crossing, the average  $PV^2$  should exceed  $0.6 \times 10^8$ . A signal-controlled crossing would be appropriate if the average  $PV^2$  value exceeded  $0.9 \times 10^8$ .



## Modified Quantitative Crossing Assessment

Pedestrians with good mobility are free to cross a road anywhere, as long as traffic speeds are reasonably low and there are sufficient gaps in the traffic. Many people can cross a carriageway without the need for a specific crossing point, however, as traffic speeds and vehicle flows increase, vulnerable people may find it harder, and are more likely to need a dedicated facility in order to safely cross the carriageway.

Crossings are important for all road users, but are a key part of enabling some groups, particularly mobility and visually impaired people, to navigate independently. The Equality Act 2010 places a duty on public sector authorities to comply with the Public Sector Equality Duty when carrying out their functions. This includes making reasonable adjustments to the existing built environment to ensure infrastructure is accessible to all.

The advice previously stipulated by the DfT has now been superseded - now the crossing assessment data should be modified to make it more robust and informative for a given location. Now pedestrian surveys should also record the type of pedestrian - as these groups are particularly significant when assessing the crossing difficulty at a particular site. These may include:

- Visually impaired people,
- Mobility impaired people,
- Children,
- Older people,
- People with pushchairs.

The advice from the DfT also stated that the types of vehicles during the peak periods should also be quantified. A classified count can give an accurate breakdown of a particular class of vehicles using a particular road, these may include:

- Cars
- Light Goods Vehicles
- Heavy Goods Vehicles
- Buses
- Cyclists
- Motorcyclists

To better reflect the composition of pedestrian and vehicle conflict during the peak periods, Suffolk Highways applied multiplying factors to each type of pedestrian, and each classification of vehicle, please refer to the summary table on page 7.



	Thursday 13 <sup>th</sup> Jan	Friday 14 <sup>th</sup> Jan	Saturday 15 <sup>th</sup> Jan
<b>Peak Traffic Flow per Hour</b>	96	87	58
<b>Modified Peak Traffic Flow per Hour</b>	126	109	67
<b>Peak Pedestrian Flow per Hour</b>	85	86	36
<b>Modified Peak Pedestrian Flow per Hour</b>	97	98	38
<b>Modified PV2</b>	0.015x10 <sup>8</sup>	0.012x10 <sup>8</sup>	0.0017x10 <sup>8</sup>
<b>Zebra Crossing Intervention Level</b>	0.6x10 <sup>8</sup>	0.6x10 <sup>8</sup>	0.6x10 <sup>8</sup>

The modified quantitative crossing assessment factor showed that there was insufficient conflict between the number of vehicles and number of pedestrians to justify a Zebra Crossing (when compared to the intervention levels set out by the DfT).

There could be a latent demand if a Zebra Crossing was installed, we define 'latent demand' as the additional number of pedestrian journeys generated as a consequence of a crossing being provided.





## Community, Connectivity and Desire Line

The proposed Zebra Crossing location will match the existing crossing point, and the desire line for pedestrians accessing the village centre, railway station and New Green Community Centre, from the School Road area.

There is no footpath on the east side of the carriageway down the majority of Sandpit Lane and Thedwastre Road. Therefore, the Zebra Crossing would also be used by pedestrians travelling to and from the north and south of the village. In recent years, a new housing development has been built to the east of Sandpit Lane (Meadow Brown Way), and there are a several potential new housing developments to the north of the village.

Recently, 2no. Zebra Crossings have been constructed outside the primary school on Nowton Road at the top of Sandpit Lane. A Zebra Crossing on Sandpit Lane may help promote walking to school and throughout the wider community.

## Road Geometry and Visibility

Zebra Crossings require good visibility and a lack of other distractions to maximise the chances of motorists seeing pedestrians. Yellow beacons indicate the presence of a Zebra Crossing and must be provided at each end of the crossing. The guiding principle should be to make sure vehicles can see them in time to react. There are no set locations, but they are normally placed on the nearside, closest to approaching traffic. For Sandpit Lane, the yellow beacons may be more suitable on the offside to the approaching traffic – particularly on the northbound approach where there is a bend in the carriageway, please refer to Appendix A.

The visibility of approaching vehicles or waiting pedestrian should not be obscured or restricted by factors such as parked vehicles, trees, or street furniture. There must be no obstacles on the pavement and a reasonably straight road geometry. On Sandpit Lane, the Zebra Crossing beacons may be partially obscured by the mature trees (as well as pedestrian visibility, and illumination of the crossing point). These trees may need to be cut back significantly (if not protected by a Tree Protection Order) and maintained over time - this may attract objections from residents. The Zebra Crossing design may opt for yellow beacons to be situated on the offside for both the northbound and south bound approaches to avoid these mature trees.

There are not many distractions close to this crossing facility, but the concentration of motorists may be affected by manoeuvres at the School Road junction, or manoeuvres associated with the bus stop. The sight lines and how these are affected by parked buses would need to be investigated. This may be an issue if the southbound yellow beacon is situated on the offside approach, and northbound buses are waiting at the



bus stop. Please refer to the section Road Network Implications for the southbound bus stop. Fortunately, parked cars and street furniture are not an issue at this location.

The footpath width will have to be widened on the west side, so pedestrians can safely pass any pedestrians waiting at the crossing point. If the footpath needs to be widened, there could potentially be complications acquiring the adjacent private land. Building out the footway into the carriageway is not possible due to the narrow width of the carriageway.

Fortunately, the proposed Zebra Crossing is located at an existing dropped crossing which is of adequate width, so there is no need to make alterations to the kerb line. The carriageway level is suitable for mobility impaired people as the raised speed table reduces the kerb upstand. There are also existing tactile paving on both side of the crossing for visually impaired pedestrians.

The controlled area of Zebra Crossings is defined by zig-zags markings, these make Zebra Crossings more conspicuous, and keep the approaches clear from parked vehicles. The number of zig-zag markings will need to be reduced at the Sandpit Lane location due to the proximity of the junction to School Road. The regulations allow for the number of zig-zag marks to be reduced to a minimum of two - where the local authority is satisfied that the layout or character of the road makes it impractical to provide eight. However, reducing the number of zig-zag marks also impact on visibility. The approaches to the Zebra Crossing will need to be resurfaced to provide adequate skid resistance. This will make the new crossings more conspicuous (before the entire road is resurfaced), but also add to the cost.

The proposed Zebra Crossing is adjacent to the Sandpit Lane junction with School Road. The associated vehicle manoeuvres may affect the concentration of drivers and their ability to recognise the beacons and react to waiting pedestrians. It is not envisaged that the tracking of large vehicle will be affected by the presence of the Zebra Crossing, but the new stop line will have to be positioned accordingly.

The potential issues detailed above will be scrutinised by an independent stage 2 Road Safety Audit after the Zebra Crossing has been designed.

## Engineering Measures

As the yellow beacons to the Zebra Crossing are illuminated there would need to be an electrical design to this scheme. A desk-top study of the underground services has shown that there are numerous services within the highway. These services may affect the ability to duct electrical equipment and situate foundations during construction. Trial holes may be needed during the design phase to ascertain the exact alignment and depth of the underground services - this may lead to a significant increase in the construction costs. Locating a yellow beacon on the nearside southbound approach may be difficult due to the B.T. underground service in the verge (as well as the



impeded tree), subsequently, the beacon may have to be located on the offside instead. There are no overhead power lines that would make constructing and maintaining the Zebra Crossing a hazard.

It is unlikely that the kerb alignment will be altered as part of the design. However, the surface water drainage in the vicinity would require investigating. There is currently a single kerb offlet adjacent to the crossing on the western kerb line.

A Zebra Crossing would include street lighting and beacons to the latest specification, and be clearly delineated with Zebra and zig-zag road markings (and to begin with) a change in the road surface on each approach. Suitable measures would be put in place to reduce the environmental impact - the regulations allow for a shroud to be fitted to the beacons to reduce the amount of light entering neighbouring properties.

## Road Network Implications

It is not anticipated that traffic movements in the local area would be adversely affected if a Zebra Crossing was constructed. The bus routes and vehicle movements would encounter insignificant delays. Delays would be minimal due to the crossing frequency at this location. Vehicle delays are typically 5 seconds for a single person crossing but may increase when irregular streams of people are crossing. It is not envisaged that any delays will overly affect the junction with School Road.

Importantly, a Zebra Crossing location will prevent passengers from alighting at the informal southbound bus stop. The southbound bus stop will have to be relocated, possibly further north, adjacent to Meadow Brown Way. Currently, the informal bus stop may already be creating a hazard by obscuring the crossing point when buses are alighting passengers. A Zebra Crossing could be safely situated without affecting any off-street accesses, and there would be no significant removal of on-street parking.

Construction a new Zebra Crossing would require a road closure (with a minor diversion) for approximately 2-weeks. This would be undertaken during the school holidays due to the proximity to the primary school. Passenger Transport would be consulted during the design stage to ensure that the delays to bus services would be minimised. The emergency services would be notified as part of the statutory legal noticing and when the road closure is booked.



## Comments from Road Safety and Speed Management Team

The principle of upgrading the existing crossing point to a Zebra appears to be a feasible scheme, subject to any issues raised by the Stage 2 Road Safety Audit being addressed.

## Comments from Asset Maintenance Manager

Consideration of the future maintenance burden associated with new infrastructure is essential, along with the ongoing power requirements associated with the electrical elements of this proposal, however, the Street Lighting Team are best placed to comment on this aspect. Maintenance of the road surface (where a higher specification would be required) would add cost and complexity to future maintenance activities. The costs and resource requirements associated with the future maintenance of the road markings, street furniture, consumption of electricity and the need to maintain vegetation would all be factors when considering the proposal as a whole.

To justify the increased asset and future maintenance burden associated this type of new facility, there must be tangible evidence of a problem and data that supports the requirement for such a proposal. From the data gathered as part of this feasibility assessment it appears that there is no crash history, nor a significant lack of speed limit compliance. Most importantly, the analysis of the volume of pedestrian movements in conflict with the volume of vehicle movements is significantly lower than the DfT threshold to recommend the need for a crossing facility of this sort. I appreciate that the data is merely a snapshot in time and that numbers may vary, but it appears that the timing and duration of the surveys seem appropriate to be representative of the typical conditions at this location. If the score was closer to the threshold one may consider that local and season variation, or latent demand, may justify the need for a crossing, however, given the disparity of the score to the required threshold, I can only conclude that there is not sufficient evidence to support the need for this type of facility given the future asset / maintenance burden this would create at a time when budgets are significantly stretched.

## Comments from Street Lighting Manager

The installation of additional assets obviously will incur ongoing revenue costs. Should a Zebra Crossing be installed in this location, the existing lighting may need to be revised and potentially new units installed to comply with requirements of lighting such a crossing; a contrast in lighting is required to illuminate any users during the hours of darkness.



## Indicative Cost to Construct a Zebra Crossing

The total cost of installing the Zebra Crossing is estimated below (excluding on-going maintenance costs). The estimate includes the professional services fee to design the scheme, and the civil, electrical and road marking work to construct the scheme. An independent Stage 2 Road Safety Audit would be undertaken between the professional services and construction phases.

If the scheme is being funded by an external source, Suffolk Highways would need to provide a fixed fee for both the professional services and construction phases, these fees would include a third party overhead charge and VAT.

	Estimated Design Cost	Estimated Construction Cost	Safety Audit	Legal Advertising Cost	Third Party Overhead Charge	VAT	Total (Inc. VAT)
Zebra Crossing	£8,000	£40,000 - £50,000	£1,500	£500	£9000	£11,800	£70,000 - £80,000

## Conclusion

The survey data showed that the existing crossing is being regularly used by adults and children during the periods immediately before and after school. From the data it looks like the majority of the children were accompanied by an adult during these periods. Zebra Crossings are not entirely suitable for young pedestrians as they can assume motorists have seen them waiting and will stop accordingly. It would be prudent for the local schools to educate their pupils on road safety issues when they are not accompanied by an adult. Highways schemes are subject to independent road safety audits, but the safety audits cannot account for pedestrian/driver error.

Despite the risks associated with Zebra Crossings, there is already a similar situation at the existing crossing point, with the raised speed table causing indecision between pedestrians and vehicles. Fortunately, there have been no reported accidents during the past 10 years, but near-misses have been highlighted as a concern by Thurston Parish Council. If the indecision caused by the raised speed table is deemed a significant safety hazard, the most cost-effective solution would be to relocate the speed table to another location, or to install an alternative traffic calming measure. The



existing informal crossing point is performing well and is on the pedestrian desire line between the School Road housing estate and the communal facilities in the village. The existing crossing point is of adequate width, has a level surface, and tactile paving for visually impaired pedestrians.

Although a new pedestrian crossing facility would be welcomed by the local community, there may be frustrations from residents who object to the part-removal of the mature trees (so adequate sight lines can be achieved). Also, the footpath may have to be widened on the west side, so pedestrians can safely pass pedestrians waiting at the crossing point. If the footpath needs to be widened, there could be complications acquiring the adjacent private land to the west.

The CCTV survey showed that the existing crossing point is being used regularly throughout the day. This is particularly significant when considering the need for a Zebra Crossing - as motorists familiar with the area will be expecting pedestrians at the crossing point. However, the quantitative crossing assessment factor also showed that there was an insufficient conflict between the number of pedestrians and the number of vehicles to justify a Zebra Crossing. This is mainly due to the frequency of vehicles along Sandpit Lane - it appears that traffic flows are not delaying pedestrians a safe passage across the carriageway, and pedestrians would rarely have to wait for a significant period. Therefore, the quantitative crossing assessment has shown that a Zebra Crossing is not required at this location.

The demand for new crossings far exceeds the County Council's ability to provide funding for each request. Therefore, the need for new formal crossing facilities needs to be carefully assessed at each site so the best value can be obtained from the available resources. Suffolk County Council also needs to consider the lifespan and maintenance costs when considering new infrastructure. Unfortunately, the evidence compiled within this report shows that a Zebra Crossing would not be a cost-effective crossing facility at this location.