TECHNICAL NOTE

YORK PEDESTRIAN CROSSING ASSESSMENT REVIEW

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IDENTIFICATION TABLE	
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1. INTRODUCTION

1.1.1   SYSTRA was appointed in November 2023 to review the current assessment criteria used by City of York Council to assess the need for new pedestrian crossings and make recommendations on the assessment process.

1.1.2   The report builds upon recent recommendations made by officers in the active travel team which would help make a stronger case for new crossings by considering suppressed demand, and alignment with other strategies such as the Local Cycling and Walking Infrastructure Plan (LCWIP) and Road Safety Plan.

2. METHODOLOGY

2.1.1   The study included the following stages:

- Review of current policy, national guidance and assessment process
- Review other local authority practice
- Consultation with relevant council teams
- Make recommendations on criteria and process

3. CURRENT APPROACH

3.1   Policy Objectives

3.1.1   The **Council Plan (2023-27)** has seven priorities with commitments made to equalities and human rights; affordability; climate and health. These priorities are:

- a) Health and wellbeing: A health generating city, for children and adults
- b) Education and skills: High quality skills and learning for all
- c) Economy and good employment: A fair, thriving, green economy for all
- d) Transport: Sustainable accessible transport for all
- e) Housing: Increasing the supply of affordable housing
- f) Sustainability: Cutting carbon, enhancing the environment for our future
- g) How the Council operates

3.1.2   Council Plan ambitions which could be served by the provision of improved pedestrian (and cycle) crossings include:

ACTION	RELEVANCE TO CROSSING CRITERIA
Review Blue Badge accessibility by rolling back restrictions to those in place before November 2021.	Proximity of disabled parking bays; weighting towards disabled users, particularly at locations in city centre
Introduce family friendly foot streets and place-making that give young people confidence in their future	Traffic calming and changed traffic priorities may reduce need for formal crossings.

ACTION	RELEVANCE TO CROSSING CRITERIA
Prioritise safe active travel in our Movement plan and in routes to school.	Movement Plan may increase (or reduce) need for crossings along key routes. Weighting towards children and young people near schools Safety should take account of near misses and perceived safety issues as well as casualty data
Develop a Movement plan as a statement of intent to make it easier to move through the city, reducing traffic around primary schools and making significant progress towards reducing carbon by 71% and traffic by 20% for discussion with the new Mayor.	Weighting towards primary schools Weighting towards strategic walking and cycle routes Weighting towards key attractors Weighting towards bus stops and rail stations
Encourage healthy travel options to maintain healthy lifestyles	Safe crossings encourage healthy travel options

3.2 National Guidance

Traffic Signs Manual

3.2.1   This incorporates previous guidance on How to Plan Pedestrian Crossings (LTN 1/95) although it no longer includes the PV^2 formula which was traditionally used to assess need. This formula continues to be used in many local authority areas including York and is described in Section 3.3 and Appendix A. The manual includes useful descriptions of common site assessment requirements, the options assessment process and detailed design guidance.

3.2.2   The principal assessment requirements include:

- Responsibility for site assessments
- Site survey
- Pedestrian survey
- Traffic survey
- Crossing difficulty
- Average crossing time/speed
- Casualty data

3.2.3   Para 13.3.1 - "A pedestrian survey should record both numbers and type. The numbers of people with characteristics that may make it more difficult for them to cross should be recorded, as these groups are particularly significant when assessing the difficulty of crossing at a site. These may include:

a) Visually impaired people,
b) Mobility impaired people,
c) Children,

d) Older people, and

e) People with pushchairs."

Cycle Design Guidance, LTN1/20

3.2.4   Design guidance for cycling is generally better developed than for walking. Nearly all cycle crossings would normally include pedestrian crossing needs.

3.2.5   Table 10-2 below gives a useful guide to crossing selection based on vehicle flow, speed limit and road width. This is geared to design for cycle provision but since cycle crossings will almost always accommodate pedestrians as well, it is relevant.

3.2.6   Latest TfGM guidance uses the vehicle flow cut offs in Table 10-2 for specification of different crossing types on the Bee Active Network (See Section 4.2).

Table 10-2: Crossing design suitability

Speed Limit	Total traffic flow to be crossed (pcu)	Maximum number of lanes to be crossed in one movement	Uncontrolled	Cycle Priority	Parallel	Signal	Grade separated
≥ 60mph	Any	Any					
40 mph and 50 mph	> 10000	Any					
	6000 to 10000	2 or more					
	0-6000	2					
	0-10000	1					
< 30mph	> 8000	> 2					
	> 8000	2					
	4000-8000	2					
	0-4000	2					
	0-4000	1					

Provision suitable for most people

Provision not suitable for all people and will exclude some potential users and/or have safety concerns

Provision suitable for few people and will exclude most potential users and/or have safety concerns

Notes:

1.   If the actual 85th percentile speed is more than 10% above the speed limit the next highest speed limit should be applied

2.   The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow

Active Travel England

3.2.7   New guidance on pedestrian and cyclist crossing appraisal and selection will be published by Active Travel England 'early in 2024'. It will include a 'crossing selector tool' and will build upon guidance in LTN1/20.

3.3   Assessment Criteria used in York

3.3.1   Current Criteria used by the Active Travel Team have been used since 2016 and are summarised in Appendix A.

3.3.2   Key criteria used in the assessment process include:

- Pedestrian Flow (modified with weightings for different age groups and those with obvious disabilities)
- Vehicle Flow (modified to take account of different vehicle types)

- Road Safety (pedestrian casualties over last 3 years within 50m either side of location)
- Crossing delay (for pedestrians attempting to cross within 50m within either side of location)
- Road width
- 85%ile Speed; and
- Proximity to Trip Attractors (key attractors listed with approximate distance from crossing)

3.3.3   Of the criteria used above, the following are usually collected via video survey:

- Pedestrian Flow and Classification
- Vehicle Flow and Classification
- Crossing Delay
- 85%ile vehicle speed

3.3.4   Pedestrian classification generally includes child, adult, elderly, disabled, and push chair. Further automation of pedestrian classification using AI technology is unlikely in the near future as it requires facial recognition which is subject to strict GDPR regulation.

3.3.5   Other considerations taken into account in the final assessment include:

- Funding availability
- Technical or safety constraints

4. REVIEW OF LOCAL AUTHORITY PRACTICE

4.1 General Approaches

4.1.1 An internet search of local authority guidance was completed in 2016 and helped form the Council's current guidance. We have revisited online guidance published by the same authorities. Some local authority guidance was unavailable (pink) and some had been updated (green). We have refreshed the table below, adding information from TfL, TfGM and Oxfordshire. Specific searches for other areas which are particularly proactive or with significant active travel budgets such as Cambridgeshire and Devon were unsuccessful.

Criteria	Cheshire East	West Sussex	Lincolnshire	Warwickshire	Edinburgh	Rotherham	Portsmouth	Derby	Luton	Leicester	TfL	TfGM	Cambridgeshire	Oxfordshire	Frequency
Pedestrian Flow (4 peak hours)	Y				Y	Y		Y	Y	Y	Y		Y	Y	9
Weighted Pedestrian Flow		Y	Y	Y			Y								4
Vehicle Flow (4 peak hours)	Y				Y	Y		Y	Y	Y	Y	Y		Y	9
Weighted Vehicle Flow		Y	Y	Y			Y								4
Casualties in previous 3 years	NEW	Y	Y	Y	Y		Y	Y	NEW	Y	Y				10
85th percentile speed	Y			NEW	Y	Y		Y	Y	NEW	Y			Y	9
Road Width	Y		Y	Y	Y	Y		Y	Y		Y			Y	9
Severance / Suppressed Demand (trip ends)	Y			Y	Y	Y		Y	NEW	Y	Y				8
Separate proportion of children	Y			NEW	Y	Y		Y	Y					Y	7
Separate proportion of elderly/disabled	Y			NEW	Y	Y		Y	Y					Y	7
Separate proportion of people with prams	Y			NEW	Y	Y		Y	Y					Y	7
Crossing delay (time spent waiting to cross/crossing)	Y		Y	Y		Y		NEW	Y	Y					7
Vehicle composition (HGVs/buses)	Y			NEW	Y	Y		Y			Y				6
Speed limit			Y	Y											2
Combined speed limit / road width		Y					Y								2
Public transport access improvement						Y				Y					2
Community support (requests/petitions)						Y									1
Proportion of cyclists crossing	Y														1
SRTS / Strategic cycle or ped route										Y					1

4.1.2 The PV^2 formula continues to be used by most local authorities (indicated by the dominance of criteria in the top four rows in the table above). Other criteria are used to support decision making, but there are no examples of numerical weightings that we could find.

4.1.3 The frequency of criteria used are ranked from the top down. 85%ile speed is regarded as a more robust criteria than speed limit. Authorities choosing to break down classification of pedestrian type had generally done so for the same groups (children, elderly and those with prams).

4.2 Manchester (TfGM)

4.2.1   Transport for Greater Manchester devolve crossing selection decisions to each district. They have stipulated that crossing facilities appropriate to the type of road must be provided at least every 400m when they serve the Bee Active Network.

4.2.2   On roads that form part of the Bee Network – crossing facilities appropriate to the type of road must be provided at least every 400m

4.2.3   Where Beeway crosses main roads crossings should be of a type able to be used by both pedestrians and cyclists (otherwise on a case by case basis), either parallel, zebra or sparrow crossings. Signalised crossings are preferable where motor vehicle flows are greater than 8000 pcu per day.

4.2.4   Toucan crossings should be avoided except where cycle/pedestrian feeder routes to both sides of crossing are shared use paths – only acceptable where all other options have been thoroughly investigated and shown in business case to be undeliverable

4.2.5   Pedestrian Crossings should be controlled when the vehicle flow is over 4000 pcu (usually a zebra crossing) or a puffin crossing if the vehicle flow is over 8000 pcu.

4.2.6   A Crossing Selection Tool accompanies the Design Guide (appendix B) although this is more about process than data requirement.

4.3 London (TfL)

4.3.1   TfL devolve decisions about crossing selection to the London Boroughs. They have issued a series of assessment questions based on **Healthy Streets Principles**:

- Can people cross the road safely at the point they would find most convenient?
- Does the amount and speed of traffic make it difficult for people to cross the road?
- Are the crossings provided suitable for the type of street, the amount of traffic and nearby uses e.g. doctor's surgery or school?
- Are crossings accessible to everyone?
- Do people need to walk to a junction to find a safe and accessible place to cross?
- Can people walking and cycling pedestrians and cyclists cross safely, directly and comfortably at junctions?
- Are people waiting a long time for a green man at pedestrian crossings?
- Is there enough time for everyone to cross without feeling rushed, including mobility impaired people or people crossing with children?
- Is there good visibility so that people crossing can see oncoming traffic and be seen?
- Where pavements get crowded, is there enough space for people to wait and are crossings wide enough for the amount of people using them?
- Could crossings where people have to wait on an island in the middle of the road be made more comfortable to use?
- Have the entrances to side streets been narrowed and raised to pavement level to give clear priority to people walking and make drivers slow down?
- Does the amount and location of car parking and loading bays make it difficult for people to cross the road

4.3.2   A Healthy Streets Scoring Checklist https://tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/healthy-streets#on-this-page-1 includes guidance on:

Ease of crossing side roads for people walking:

- Existing scheme - Classified vehicle turning counts

- Proposed schemes – forecast volumes
- Level of exposure of people walking from turning motorised traffic and whether this exposure has been mitigated
- Crossing width
- Raised entry treatments & Continuous footway in areas where pedestrian flows are much higher than vehicle flows

Crossings to meet pedestrian desire lines:

- Pedestrian movements during peak times and destination mapping to identify desire lines
- Collision analysis to reveal patterns of conflicts

Type and suitability of pedestrian crossings away from junctions:

- Type of street/street width
- Type of crossing
- Volume of vehicular traffic conflicting with crossing movement (<200, 200-1000, >1000)
- Additional features to support people using controlled crossings (scoring depending on amount of features available)
- Traffic calming features such as raised table, raised entry treatment, crossing on a flat-topped road hump mid-link
- PCaTs(pedestrian countdown at traffic signals)
- Correct use of blister tactile paving

5. OFFICER CONSULTATION

5.1 Summary

5.1.1 The following people provided written or verbal responses:

- Andy Vose, Transport Policy; and Greg Morgan, Active Travel
- Helen Vergereau and Ian Stokes, Highway Access and Development
- Jayne Ward, Road Safety
- Michael Banham, Traffic Signals; and Dave Mercer, Highway Engineering
- David Smith, Access and Diversity

5.2 Active Travel

5.2.1 Crossings are currently requested using an online 'crossing request ' form

5.2.2 A completely quantitative scoring process would be clearer, allowing robust decisions to be made. It would enable more transparent decision making, and enable low value suggestions to be dismissed earlier.

5.2.3 The impact of weightings as suggested would inevitably increase the number of 'justified' crossings and therefore the eventual cost burden on the council.

5.2.4 Key changes could include:

- Likely (suppressed) demand from different trip attractors, i.e. schools, new housing, retirement homes; perhaps using a tailored matrix for attractor types
- Evidence of community demand

- Proximity to strategic active travel routes
- Proximity to existing crossings
- Proximity to bus stops, disabled parking bays, taxi ranks enabling better integration
- Weightings towards children and encumbered pedestrians

5.2.5   The cost of data collection needs to be balanced with the available budget for new crossings.

5.3   Highway Access and Development

5.3.1   Key points raised were:

- Doubts expressed about the relevance of road width and speed factors.
- PCU values for different vehicles should be kept as standard, in line with their use in other calculations.
- How is change accounted for, i.e. new bus routes, new developments, changes to traffic and pedestrian flows?
- Are there other options that can facilitate a safe crossing which can be taken first? (i.e. lower speed limit, traffic management measure, school crossing patrol)
- The site visit/survey should consider pedestrian flow (these travelling along the road) and the available footway width. A crossing in a busy location may impact on these.
- Design issues which may need to be considered include proximity of junctions, driveway accesses, use of raised crossings and 'scramble type' crossings which allow movements in various directions.

5.4   Road Safety

5.4.1   There are currently 22 sites which qualify for a School Crossing Patrol (SCP). All are on 30mph or 20mph roads. Only 10 of these are staffed at present owing to recruitment challenges.

5.4.2   As crossings are upgraded to Smart Puffin/Toucan types with cameras, these sites may become ineligible for a SCP and could present cost savings for the council.

5.4.3   Crossing Patrol requests are based on the basic PV^2 formula and national guidance. Data is collected at a site visit by the Road Safety Officer.

5.4.4   There is agreement with existing appraisal process. Future criteria should take account of key routes to schools. A flow chart to assist the decision making process is welcomed.

5.5   Highway Engineering/Traffic Signals

5.5.1   These teams become involved at site visit and design stage. Both welcome an approach which involves a desktop assessment covering appraisal of speed, evidence of need, and likely constraints.

5.5.2   The Go/No Go decision should follow an initial site visit and take account of need, including connectivity with any strategic walking and cycling routes, and likely cost.

5.5.3   The appraisal process should take account of qualified judgement and not just numbers. An example might be 'safety'. Safety grounds may ultimately influence the final decision.

5.5.4   The Engineering Design team has had initial discussion with North Yorkshire Police about availability and future use of 'damage only' and 'near miss' traffic casualty data.

5.6   Access and Diversity

5.6.1   Selection criteria should take account of disability as far as possible. Visual clues for survey analysts include people with a guide dog, white stick, walking frame, wheelchair, escorts walking arm in arm etc. Priority locations should include day centres, specialist schools and employers, retirement homes, etc.

5.6.2   Identifying conditions including neurodiversity, dementia and the extent to which this deters walking journeys is difficult.

5.6.3   The assessment process should allow for anomalies and an invitation to site visits would be welcomed.

6.   RECOMMENDATIONS

6.1   Assessment Criteria

6.1.1   The following table includes recommendations for changes to weightings used in the current assessment formula (See Appendix A).

6.1.2   Comments and recommendations are based on officer views about readily available data and the importance of other factors which can help demonstrate pedestrian safety, mobility or accessibility needs.

6.1.3   Each of the suggested changes can be assessed during desktop analysis or within site surveys.

6.1.4   Evidence of community demand is not easily scored and is best considered in the initial desktop assessment.

6.1.5   The weightings should be tested against data gathered for previously justified or rejected crossings and adjusted accordingly.

Criteria	Description	Current Weighting	Suggested Change	Comments
Pmod	**Moderated Pedestrian Flow**	Children (/,16yrs) x 4, Elderly (>65yrs) x 4, Disabled / Blind x 6, Adult x 1	Add Ped crossing with cycle or e-scooter	Including pedestrian crossing speed may be possible in the future and could improve the accuracy of AI based video analysis
Vmod	**Moderated Vehicle Flow**	HGV x 2.5, LGV/Bus x 2, Car / Minivan x 1, Motorcycle x 0.75, Pedal cycle x 0.5	Include e-scooters and give the same value as pedal cycles	These values reflect "perceived safety" aspects of different vehicles. There is justified variance from PCU values which are "capacity" based.
A	**Road Safety Factor**	1 + N/10 where N is Pedestrian casualties in previous 3 years	Consider including Near Miss data if available	Highways team in contact with North Yorkshire Police
D	**Crossing Delay**	<20 sec = 1, 20-40 sec = 1.2, 41-60 sec = 1.4, 60+ sec = 1.6	<30 sec = 1, 30-60 sec = 1.5, 60+ sec = 2	Living Streets, a UK charity that promotes walking, suggest that if the wait time exceeds 30 seconds, people are more likely to take risks when crossing the road.
W	**Road Width**	Single carriageway: For widths<7.3m use 1, for widths >7.3m use width/7.3, Dual Carriageway: If 1/2 width<7.3m use 1, if 1/2 width>7.3m use 1/2 width/7.3	No change	
S	**85th Percentile Speed**	<20mph = 0.8, 21-30mph = 1, 31-35mph = 1.1, 36-40mph = 1.2, 41-45mph = 1.3, 46-50mph = 1.4	No change	
T	**Proximity to Trip Attractors**	If not near a school, healthcare site, leisure facility, old people's home, or employment site use 1; If near 1 of the above use 1.1; if near 2 of the above use 1.2; if near 3+ of the above use 1.3	**Small/Medium Attractors**: Use 1.5 if two or more of the following are within 50m of crossing location: single bus stop, single disabled parking bay, local shop/takeaway, place of worship, hotels, PROW crossing of roads, small/medium employment site.	NB: Existing demand should be picked up by Pmod value. Future demand from development sites should inform S106 provision. This factor makes allowance for suppressed demand but requires clearer definition.
			Large Attractors: Use 2 if school, local retail centre, supermarket, healthcare facility, cinema/theatre/bingo hall/swimming pool/leisure centre, rail station, bus stop cluster, cluster of disabled parking bays, car park, large employment site, University/college site, park, large student accommodation block.	
New	**Proximity to Strategic Cycle Routes**	New Criteria	If within 50m of a signed or identified cycle route use 2	**Only use this criteria if a Toucan Crossing has been specifically requested**. Strategic pedestrian routes are difficult to define and are not generally signed. Signed off-road cycle routes are also important pedestrian routes. Existing pedestrian routes should be picked up by Pmod
New	**Proximity to Bus Stop Clusters / Rail Station**	New Criteria	If within 50m of a busy bus stop (>4 services per hour) use 1.5. If within 50m of a bus stop cluster or rail station use 2.	For single bus stops see Proximity to Trip Attractors above
New	**Proximity to Disabled Parking Bays**	New Criteria	If within 50m of two or more signed diabled parking spaces use 2	For single disabled parking spaces see Proximity ro Trip Attractors above.

6.2   Implementation Process

6.2.1   The following teams should be included in the Crossing Assessment process shown below. Their input can identify previous studies or survey work, funding options, implications for parallel work programmes, and opportunities to add value. It may also avoid duplication of work.

- Active Travel (at initiation stage)
- Road Safety
- Access and Diversity
- Development Control
- Highway Engineering
- Traffic Control/Traffic Management

6.2.2   Subject to the emerging Transport Strategy and Movement Plan, the views of the Transport Policy (Traffic Modelling) team may be required.

6.2.3   A suggested assessment process is shown below.

Crossing Request

Online form

Petition

Member request

School Crossing Patrol*

All requests logged by AT Team

→

Desktop Assessment

Is there evidence of demand/known safety issue?

Locate trip attractors within 200m

Is there an existing crossing <50m away?

What are likely constraints?

→

Contact Other Teams

Are new developments planned?

Is other funding available?

Has the crossing been investigated before?

Impact on highway network?

→

Site Visit

Measure road width

Observe ped & driver behaviour

What type of crossing is feasible?

Are alternative measures possible?

→

Go/No Go Decision

Is funding available?

Review evidence

Inform other teams

↓

*School Crossing Patrol requests follow a separate evaluation process. Failure to recruit may prompt a formal crossing request

Detailed Design

Road safety audit

←

Member Approval

Agree funding

Inform applicant

Inform other teams

←

Select Crossing Type

Controlled xing

Uncontrolled xing

←

Evaluation

PV^2 x adj factor

Other factors?

Rank or Dismiss proposal

←

Commission Surveys

Vehicle flow/classification

Vehicle speed

Ped crossing flow/classification

Ped delay

7. APPENDIX A

Weightings and formula for calculating the **Modified Flows (P_{mod} and V_{mod})** and **PV^2 Adjustment Factor (AF)**

To calculate the **Modified Pedestrian Flow (P_{mod})** use the following weightings for vulnerable road user groups: Children (<16yrs) x 4, Elderly (>65yrs) x 4, Disabled / Blind x 6, Adult x 1
To calculate the **Modified Vehicle Flow (V_{mod})** use the following weightings: HGV x 2.5, LGV / Bus x 2, Car / Minivan x 1, Motorbike x 0.75, Pedal Cycle x 0.5
Road Safety factor (A) = 1 + N/10 where N is number of pedestrian casualties in previous 3 year period
To calculate the **Crossing Delay Factor (D)** use the following factors: <20 sec = 1, 20-40 sec = 1.2, 41-60 sec = 1.4, 60+ sec = 1.6
To calculate the **Road Width Factor (W)** use the following values: Single carriageway: Width<7.3m use 1, Width>7.3m use Width/7.3,   Dual carriageway: ½Width<7.3m use 1, ½Width>7.3m use ½Width/7.3
To calculate the **Speed Factor (S)** use the following values (use the 85th percentile speeds):   < 20 mph = 0.8, 21-30 mph = 1, 31-35 mph = 1.1, 36-40 mph = 1.2, 41-45 mph = 1.3, 46-50 mph = 1.4
To calculate the **Proximity to Pedestrian Trip Attractors Factor (T)** use the following: If not near a school, healthcare site, leisure facility, old peoples' home or employment site use 1, if near one of the above use 1.1, if near two of the above use 1.2, if near 3+ of the above use 1.3

PV^2 Adjustment Factor (AF) = A x D x W x S x T

Adjusted PV^2 (APV^2) = P_{mod} x (V_{mod})^2 x AF