

CALDERDALE LOCAL PLAN

TECHNICAL NOTE ON THE IMPACT OF POTENTIAL HOUSING ALLOCATIONS ON HIPPERHOLME CROSSROADS

Calderdale Metropolitan Borough Council

2019



TECHNICAL NOTE ON THE IMPACT OF POTENTIAL HOUSING ALLOCATIONS ON HIPPERHOLME CROSSROADS

- 1.1 This Note sets out the basis for the decision to filter a number of potential residential Local Plan sites in the Hipperholme Area.
- 1.2 Whilst referred to as the Hipperholme Crossroads, the proximity of the A649 junction with the A58 Leeds Road immediately to the east of the actual A58/ A644 crossroads means that there is clearly interaction between the junctions, i.e. they do not operate independently. In particular queuing created by vehicles travelling eastbound on the A58 and then waiting to turn right onto the A649 Wakefield Road can have a disproportionately high impact on through traffic.
- 1.3 In modelling terms for the Local Plan, the “Hipperholme Crossroads” junction therefore includes the adjacent A649 Wakefield Road junction with the A58.
- 1.4 The various Technical Notes summarise the traffic modelling approach undertaken to provide an informed basis to assess the Local Plan. WSP consultants undertook the borough wide traffic modelling work to provide this transport evidence base on behalf of the Council. This was done using an updated and validated Calderdale Strategic Traffic Model (STM).
- 1.5 An STM is considered the most appropriate method for an area-wide assessment such as informing the transport implications of potential Local Plan sites. It was able to include sites in Kirklees and Bradford within a buffer zone as well as modelling driver route choice following the various transport interventions in the “Do Something” scenario.
- 1.6 Hipperholme Crossroads is one of the most congested junctions in Calderdale in terms of the existing delay to drivers. Paragraph 6.9.3 of Technical Note 4; (Assessment of Cumulative Impact) explained that the model predicted significant additional delays as a result of growth in other areas of Calderdale (and other districts) even without any developments within the local vicinity. It set out the following increases in delay between 2014 and 2032;
 - almost 1 ½ minutes on Denholme Gate (A644),
 - 1 minute on Wakefield Road (A649),
 - 30 seconds on Brighouse Road (A644),
 - 45 seconds on Halifax Road.

- 1.7 In the same paragraph it also explained that there are currently no formal plans for improvement at the junction. The proximity of buildings close up to the highway means that any improvement that would achieve a meaningful reduction in vehicular delays would require the demolition of properties.
- 1.8 In paragraph 8.2.2 of Technical Note 4 the author recommended a short term intervention to improve the operation of the junction. However, the Council has not been able to identify any minor scheme that would improve capacity. The traffic signals already use a modern controller with the latest software that maximises the throughput of vehicles through the junction using data from sensors on all the junction's approaches. There is no way of increasing the capacity of the junction further within its present highway boundary constraints.
- 1.9 The report also recommended a longer term need for a package of measures along the A58 corridor. Such a scheme is in the initial stages of investigation. The study area is an approximately 10km length of the A58 between Halifax Town centre to the west and the M606/ M62 junction to the east. Preliminary work is being undertaken on potential multi-modal interventions to improve travel by public transport, cycle as well as vehicles journey time.
- 1.10 Work is also being carried out to identify possible funding streams. Given the nature of the likely interventions, the costs are likely to be significant. By comparison the budgets for the A629 Halifax- Huddersfield and A641 Huddersfield-Brighouse-Bradford schemes are £98 and £76 million respectively. Both these schemes were funded by the West Yorkshire Plus Transport Fund (WT+TF).
- 1.11 At present there is therefore too much uncertainty about the likelihood of any mitigating improvements, and the scale of any benefits, to allow the Council to promote any sites within the Hipperholme area.
- 1.12 Technical Note 5, "Hipperholme Sensitivity Test", summarised the findings of additional STM testing of the impact of sites within a cordon around the Hipperholme area.
- 1.13 This additional work was undertaken given the sensitivity of the congested Hipperholme Crossroads to even small increases in traffic. The Council was concerned about the cumulative impact of several sites in the Hipperholme area given their understanding of the operation of the crossroads.

- 1.14 In particular, microsimulation modelling work had recently been undertaken in late 2016 for a planning application for a discount foodstore close to the Crossroads. That work had assumed that only 30% of retail trip would be new to the local network; the remainder comprising trips already passing through the crossroads and diverting into the site.
- 1.15 This microsimulation modelling indicated that even a relatively small increase in trips was likely to have a disproportionately large impact on queuing and delay.
- 1.16 The modelling work, as summarised in Technical Note 5, indicated that the additional land released from Green Belt would have a large and unacceptable impact on congestion at the crossroads junction.
- 1.17 Having considered the absence of any short term potential mitigating measures, the likelihood of a major scheme (such as a bypass of the A58) within the Local Plan period and the location of other potential sites in Calderdale, the decision was made that the traffic impact at the Crossroads outweighed the benefits of these additional housing sites.
- 1.18 On the latter point regarding alternative site locations, considerable weight was attached to the fact there were site located more favourably in highway terms. In particular, alternative sites were in areas where there were programmed schemes that would increase capacity, such as the A641 WY+TF corridor scheme which is focussed on Brighouse. The strategic modelling indicated that other sites, such as those in north Halifax, were not constrained by traffic congestion by the same degree.

Appendix A
Extracts from Manual for Streets



Department for
Transport



Manual for Streets



Table 7.1 Derived SSDs for streets (figures rounded).

| Speed | Kilometres per hour | 16 | 20 | 24 | 25 | 30 | 32 | 40 | 45 | 48 | 50 | 60 |
|--|---------------------|----|----|----|----|----|----|----|----|----|----|----|
| | Miles per hour | 10 | 12 | 15 | 16 | 19 | 20 | 25 | 28 | 30 | 31 | 37 |
| SSD (metres) | | 9 | 12 | 15 | 16 | 20 | 22 | 31 | 36 | 40 | 43 | 56 |
| SSD adjusted for bonnet length. See 7.6.4 | | 11 | 14 | 17 | 18 | 23 | 25 | 33 | 39 | 43 | 45 | 59 |
| Additional features will be needed to achieve low speeds | | | | | | | | | | | | |

7.5.7 The SSD values used in MFS are based on a perception–reaction time of 1.5 seconds and a deceleration rate of 0.45g (4.41 m/s²). Table 7.1 uses these values to show the effect of speed on SSD.

7.5.8 Below around 20 m, shorter SSDs themselves will not achieve low vehicle speeds: speed-reducing features will be needed. For higher speed roads, i.e. with an 85th percentile speed over 60 km/h, it may be appropriate to use longer SSDs, as set out in the *Design Manual for Roads and Bridges*.

7.5.9 Gradients affect stopping distances. The deceleration rate of 0.45g used to calculate the figures in Table 7.1 is for a level road. A 10% gradient will increase (or decrease) the rate by around 0.1g.

7.6 Visibility requirements

7.6.1 Visibility should be checked at junctions and along the street. Visibility is measured horizontally and vertically.

7.6.2 Using plan views of proposed layouts, checks for visibility in the horizontal plane ensure that views are not obscured by vertical obstructions.

7.6.3 Checking visibility in the vertical plane is then carried out to ensure that views in the horizontal plane are not compromised by obstructions such as the crest of a hill, or a bridge at a dip in the road ahead. It also takes into account the variation in driver eye height and the height range of obstructions. Eye height is assumed to range from 1.05 m (for car drivers) to 2 m (for lorry drivers). Drivers need to be able to see obstructions 2 m high down to a point 600 mm above the carriageway. The latter dimension is used to ensure small children can be seen (Fig. 7.17).

7.6.4 The SSD figure relates to the position of the driver. However, the distance between the driver and the front of the vehicle is typically up to 2.4 m, which is a significant proportion of shorter stopping distances. It is therefore recommended that an allowance is made by adding 2.4 m to the SSD.

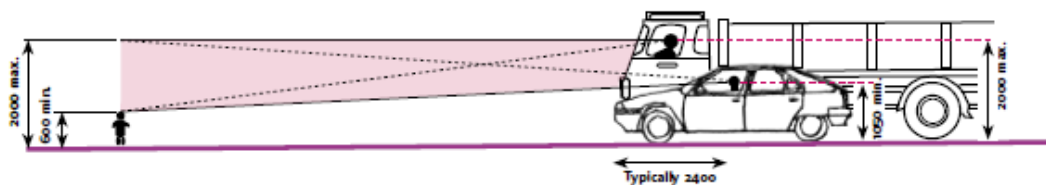


Figure 7.17 Vertical visibility envelope.

7.7 Visibility splays at junctions

7.7.1 The visibility splay at a junction ensures there is adequate inter-visibility between vehicles on the major and minor arms (Fig. 7.18).

7.7.2 The distance back along the minor arm from which visibility is measured is known as the X distance. It is generally measured back from the 'give way' line (or an imaginary 'give way' line if no such markings are provided). This distance is normally measured along the centreline of the minor arm for simplicity, but in some circumstances (for example where there is a wide splitter island on the minor arm) it will be more appropriate to measure it from the actual position of the driver.

7.7.3 The Y distance represents the distance that a driver who is about to exit from the minor arm can see to his left and right along the main alignment. For simplicity it is measured along the nearside kerb line of the main arm, although vehicles will normally be travelling a distance from the kerb line. The measurement is taken from the point where this line intersects the centreline of the minor arm (unless, as above, there is a splitter island in the minor arm).

7.7.4 When the main alignment is curved and the minor arm joins on the outside of a bend, another check is necessary to make sure that an approaching vehicle on the main arm is visible over the whole of the Y distance. This is done by drawing an additional sight line which meets the kerb line at a tangent.

7.7.5 Some circumstances make it unlikely that vehicles approaching from the left on the main arm will cross the centreline of the main arm – opposing flows may be physically

segregated at that point, for example. If so, the visibility splay to the left can be measured to the centreline of the main arm.

X distance

7.7.6 An X distance of 2.4 m should normally be used in most built-up situations, as this represents a reasonable maximum distance between the front of the car and the driver's eye.

7.7.7 A minimum figure of 2 m may be considered in some very lightly-trafficked and slow-speed situations, but using this value will mean that the front of some vehicles will protrude slightly into the running carriageway of the major arm. The ability of drivers and cyclists to see this overhang from a reasonable distance, and to manoeuvre around it without undue difficulty, should be considered.

7.7.8 Using an X distance in excess of 2.4 m is not generally required in built-up areas.

7.7.9 Longer X distances enable drivers to look for gaps as they approach the junction. This increases junction capacity for the minor arm, and so may be justified in some circumstances, but it also increases the possibility that drivers on the minor approach will fail to take account of other road users, particularly pedestrians and cyclists. Longer X distances may also result in more shunt accidents on the minor arm. TRL Report No. 184²⁰ found that accident risk increased with greater minor-road sight distance.

Y distance

7.7.10 The Y distance should be based on values for SSD (Table 7.1).

Appendix B

Extracts from Inclusive Mobility

The distinction between a footway and a footpath is that a footway (usually called the pavement) is the part of a highway adjacent to, or contiguous with, the carriageway on which there is a public right of way on foot. A footpath has no contiguous carriageway. Where reference is made to one, it can generally be regarded as applying to the other for design purposes.

3.1 Widths

A clear width of **2000mm** allows two wheelchairs to pass one another comfortably. This should be regarded as the minimum under normal circumstances. Where this is not possible because of physical constraints **1500mm** could be regarded as the minimum acceptable under most circumstances, giving sufficient space for a wheelchair user and a walker to pass one another. The absolute minimum, where there is an obstacle, should be **1000mm** clear space. The maximum length of restricted width should be **6 metres** (see also Section 8.3). If there are local restrictions or obstacles causing this sort of reduction in width they should be grouped in a logical and regular pattern to assist visually impaired people.

It is also recommended that there should be minimum widths of **3000mm** at bus stops and **3500mm** to **4500mm** by shops though it is recognized that available space will not always be sufficient to achieve these dimensions.

Where a cycle track runs alongside a footway or a footpath best practice is to physically segregate the two as advocated in Local Transport Note (LTN) 2/86 Shared Use by Cyclists and Pedestrians.

If this is not possible, appropriate tactile surfaces should be used to identify the cycle and pedestrian paths (see Section 4.5). The cycle track should be at least **1400mm** wide with the cycle symbol on the ground every 50 yards. The pedestrian part should meet the standards given earlier in this section and should be separated from the cycle track by a raised dividing line **150mm** wide and **12 to 20mm high**, with a **50mm** wide top face.

3.2 Gradients (see Section 8.4 for design of steps and ramps)

There is general agreement among guidelines from many countries that an 8 per cent (1 in 12) slope is the maximum that may be used; anything greater than this will cause difficulties for manual wheelchair users. Most guidelines also agree that 5 per cent (1 in 20) is preferred. (A ramp is generally defined as a pathway with a slope of more than 5 per cent). The effects of different gradients have been described in the Swedish publication *Streets for Everybody* as:

- **1%** (1 in 100) - is never an obstacle.
- **2%** (1 in 50) - can be managed by most people (and also provides good drainage).
- **2.5%** (1 in 40) - can be managed by many people.
- Steeper than **2.5%** - impossible for many manual wheelchair users.

These figures may be regarded as a counsel of perfection as the terrain in many places imposes steeper gradients than 2.5 per cent, but the standard of 5 per cent should be borne in mind when designing new footpaths and pedestrian areas.

Steeper gradients than these can be managed by some wheelchair users, but only over very short distances (1000mm or less), for example on a ramp between a bus entrance and the pavement. Even over these short distances the maximum gradient used should be no more than **10 per cent (1 in 10)**. As a general rule, however, **8 per cent (1 in 12)** should be used as the absolute maximum. Not only is the physical effort of getting up a steeper gradient beyond many wheelchair users, but there is also a risk of the wheelchair toppling over.

Crossfall on footways and footpaths may be necessary to provide good drainage², but if too great, can make it difficult for wheelchair users. Recommendations contained in guidelines vary somewhat but, under normal circumstances, a figure of **2.5 per cent (1 in 40)** should be regarded as the maximum acceptable. Where possible, it is preferable to have a crossfall between **1 and 2 per cent**.

Variable crossfall, such as may be found when travelling along a street with vehicle cross-overs, can be irritating as it affects the steering of wheelchair users and can also cause problems for people with walking difficulties. Local authorities should take these problems into account when considering their policies on front garden parking in residential areas, which may result in the installation of cross-overs.

3.3 Fences and guardrails

If there is a steep slope or drop at the rear of the footway, precautions must be made to prevent wheelchair users running over the edge or blind or partially sighted people walking over it. Guardrails and barriers at the side of or across footways should be at least **1100mm high**; preferably **1200mm** measured from ground level.

In common with other street furniture on or close by footways, guardrails should be clearly colour contrasted from their surroundings: simple galvanized railings are not acceptable. If, for reasons of economy, this type of railing has to be used it should at minimum have colour contrasted markings on it. These requirements also apply to rails around street works.

Guardrails should also be designed to prevent guide dogs from walking under the rails, but there should be sufficient openings between vertical members to ensure that children and wheelchair users can see, and be seen, through the railings. The top rail should have a smooth profile and, if intended to provide support, should be circular with a diameter of between **40 and 50mm**.

There should also be an upstand a minimum of **150mm** in height at the rear of the paved area, which can then act as a tapping rail for long cane users as well as a safeguard for wheelchair users.