West Winch Housing Access Road

Environmental Statement Chapter 16: Traffic and Transport:

Appendix 16.1 Magnitude of Impact

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1 Magnitude of Impact

1.1.1 To assist with assigning a magnitude to traffic and transport impacts, the IEMA Guidelines (**Ref 16.15**) sets out considerations, and in some cases thresholds, in respect to changes in the volume and composition of traffic.

1.1.2 The assessment methodology for defining the magnitude of traffic and transport impacts has been derived from IEMA guidance and is set out below. Where no guidance is available, commonly agreed thresholds for judging the magnitude of traffic and transport impacts and professional judgement, backed-up by data/ quantified information has been applied as suggested in paragraph 3.12 of the IEMA guidance (**Ref 16.15**).

1.1.3 Dependent on the magnitude of impact, the effect on receptors can be beneficial or adverse or neutral if there is no change. An impact may also be classed as temporary or permanent.

1.1.4 The assessment undertaken to assess the magnitude of impact of each assessment category is discussed below.

1.2 Severance

1.2.1 The IEMA Guidelines (**Ref 16.15**) set out a range of indicators for determining the magnitude of impact on pedestrian and cyclist severance. Changes in total traffic flow of 30%, are regarded as producing ‘Low’, 60% as ‘medium’ and 90% as ‘high’ changes. This criterion has not been superseded by the subsequent changes to the IEMA guidance and so has been maintained for this assessment.

1.2.2 These indicators, together with specific local conditions (such as the provision of crossing facilities and adequate width provision), have been used to determine the magnitude of impact on severance.

1.3 Pedestrian and Cyclist Delay

1.3.1 The IEMA guidance (**Ref 16.15**) states that:

> *"Pedestrian delay and severance are closely related effects and can be grouped together. Changes in the volume, composition or speed of traffic may affect the ability of people to crossroads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility, and general physical conditions of the development site".*

1.3.2 As there is no formal or published guidance for the assessment of pedestrian and cyclist delay, the IEMA Guidelines (**Ref 16.15**) recommends assessors use their professional judgement to determine the significance of effects. However, the IEMA guidance suggest the use of the Department for Transport TAG Unit A4-1 Social Impact Appraisal guidance (**Ref 16.19**) which sets out guidance on assessing the hindrance of pedestrian movements and DMRB LA 112 'Population and Human Health' (**Ref 16.16**) which contains sensitivity values for walkers, cyclists and horse riders based on traffic flow thresholds.

1.3.3 Table 3.11 of DMRB LA112 (**Ref 16.16**) sets out the following threshold for total vehicle flow:

- Very Low: Change in delay <4000
- Low: Change in delay >4000 and <=8000
- Medium: Change in delay >8000 and <=16000
- High: Change in delay > 16000

1.3.4 The Department for Transport TAG Unit A4-1 Social Impact Appraisal (2021) guidance (**Ref 16.19**) on assessing severance (Table 5.1) provides a matrix for assessing the impact of projects on severance based on the difference in the level of severance for the without-scheme and with-scheme cases. These were classified according to the following four broad levels and set out in Table 1-1.

- **None** - Little or no hindrance to pedestrian movement.
- **Slight** - All people wishing to make pedestrian movements will be able to do so, but there will probably be some hindrance to movement.
- **Moderate** - Pedestrian journeys will be longer or less attractive; some people are likely to be dissuaded from making some journeys on foot.
- **Severe** - People are likely to be deterred from making pedestrian journeys to an extent sufficient to induce a reorganisation of their activities. In some cases, this could lead to a change in the location of centres of activity or to a permanent loss of access to certain facilities for a particular community. Those who do make journeys on foot will experience considerable hindrance.

Table 1-1 – Assessment of change in severance (Table 5.1 DfT TAG Unit A4-1)

Without-scheme Severance Scoring	**With-scheme Severance Scoring**	**With-scheme Severance Scoring**	**With-scheme Severance Scoring**	**With-scheme Severance Scoring**
None	**None**	**Slight**	**Moderate**	**Large**
None	None	Slight negative	Moderate negative	Large negative
Slight	Slight positive	None	Slight negative	Moderate negative
Moderate	Moderate positive	Slight positive	None	Slight negative
Large	Large positive	Moderate positive	Slight positive	None

1.3.5 To provide consistency in the scoring assessment for all effects, the DfT TAG Unit A4-1 (Ref 16.19) Table 5.1 was modified as shown below.

Table 1-2 – Change in severance (Table 5.1 TAG Unit A4-1 Modified)

Without-scheme Severance Scoring	**With-scheme Severance Scoring**	**With-scheme Severance Scoring**	**With-scheme Severance Scoring**	**With-scheme Severance Scoring**
Very Low	**Very Low**	**Low**	**Medium**	**High**
Very Low	Negligible	Minor adverse	Moderate adverse	Substantial adverse
Low	Minor beneficial	Negligible	Minor adverse	Moderate adverse
Medium	Moderate beneficial	Minor beneficial	Negligible	Minor adverse
High	Substantial beneficial	Moderate beneficial	Minor beneficial	Negligible

1.3.6 The two thresholds based on DfT TAG Unit A4-1 (**Ref 16.19**) Table 5.1 and Table 3.11 of DMRB LA112 (**Ref 16.16**) have been combined to determine the magnitude of impact.

1.4 Pedestrian & Cyclist Amenity

1.4.1 Pedestrian amenity is broadly defined as the relative pleasantness of a journey. The IEMA Guidelines (**Ref 16.15**) suggest a screening threshold for judging the significance of changes in pedestrian and cycling amenity would be where the traffic flow is halved or doubled.

1.4.2 The magnitude of impact upon pedestrian and cyclist amenity is defined by a combination of traffic flow, traffic composition, pavement width and extent of segregation of the carriageway. Though improvements to the existing network includes new segregated NMU routes and improvements to existing active travel infrastructure, the effect of these have not been considered in the assessment. For a robust approach traffic flow and composition has been relied on as the main criteria for this assessment.

1.4.3 The IEMA Guidance suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled. For this assessment the following criteria has been used:

- Very Low: Change in two-way traffic of >0 and <=100%
- Low: Change in two-way traffic of >100% and <=130%
- Medium: Change in two-way traffic of >130% and <=160%
- High: Change in two-way traffic of >160%

1.4.4 Further to this, the IEMA Guidance (**Ref 16.15**) recommends the Pedestrian Comfort (PCL) Guidance for London (2019) by Transport for London (**Ref 20.15**) as a tool to assess the comfort of pedestrians on a footway. The recommended footway width at Appendix B of the PCL has been combined with the traffic flow information to assess the level of pleasantness. The PCL guidance threshold for footway width adapted for use is set out below.

- Very Low >3.3m
- Low 2.2m-3.3m
- Medium 2.0-2.2m
- High 0.0-2.0m

1.4.5 The criteria above have been supported by further analysis drawing on current information provided within the LTN/120 guidance (**Ref 16.4**) threshold, thus:

- Very Low: AADT two-way traffic less than 2500 vehicles per day.
- Low: AADT two-way traffic between >2501 - <=5000 vehicles per day
- Medium: AADT two-way traffic between >5000 and <=10,000
- High: AADT two-way traffic greater than >10,000 vehicles per day

1.4.6 The three criteria above have been combined to generate a final magnitude of impact. Such that:

- Very Low: Change in two-way traffic of >0 and <=100% and AADT two-way traffic less than 2500 vehicles per day and footway width >3.3m.
- Low: Change in two-way traffic of >100% and <=130% and AADT two-way traffic between >2501 and <=5000 vehicles per day and footway width 2.2m to 3.3m.
- Medium: Change in two-way traffic of >130% and <=160% and AADT two-way traffic between >5000 and <=10,000 and footway width 2.0m to 2.2m.
- High: Change in two-way traffic of >160% and AADT two-way traffic greater than >10,000 vehicles per day and footway width 0m to 2m.

1.5 Fear and Intimidation

1.5.1 The new IEMA guidance sets out on paragraph 3.33 that the extent of fear and intimidation is dependent on:

- The total volume of traffic;
- The heavy vehicle composition of traffic;
- The speed at which vehicles are passing; and
- The proximity of traffic to people – and/or the feeling of the inherent lack of protection created by factors such as a narrow pavement median, a narrow path or a constraint (such as a wall or fence) preventing people stepping further away from moving vehicles.

1.5.2 Whilst the above is recognised as an important environmental impact, there are no commonly agreed thresholds for estimating these levels of danger.

1.5.3 In the absence of commonly agreed thresholds for judging the significance of likely fear and intimidation effects, IEMA Guidance suggests new thresholds to the previous Crompton and Gilbert, 1976 study.

1.5.4 Outlined in Table 1-3 to Table 1-5 are the recommended criteria set out in the IEMA guidance (**Ref 16.15**) as an option to assess the magnitude of impact on fear and intimidation.

1.5.5 With the updated criteria, a weighting system has been defined to help assessors provide a first approximation of the likelihood of pedestrian fear and intimidation.

1.5.6 Firstly, the degree of hazard is assessed with reference to the established thresholds, and a score provided for each combination on a highway link under consideration. Table 3.1 of the IEMA guidance provides an example of a scoring system that can be adapted to reflect local conditions. This is replicated in Table 1-3 below.

Table 1-3 – Fear and intimidation degree of hazard

Average traffic flow over 18-hour day – all vehicles/hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average vehicle speed (c)	Degree of hazard score
+1,800	+3,000	=>40	30
1,200-1,800	2,000-3,000	30-40	20
600-1,200	1,000-2,000	20-30	10
<600	<1,000	<20	0

Source: IEMA 'Guideline for the Environmental Assessment for Road Traffic' (2023) Table 3.1

1.5.7 The total score from all three elements is combined to provide a 'level' of fear and intimidation as shown in Table 1-4 below (adapted from Table 3.2 in the IEMA guidance)

Table 1-4 – Levels of fear and intimidation

Level of fear and intimidation	Total hazard score (a) + (b) + (c)
Extreme	71+
Great	41–70

Level of fear and intimidation	Total hazard score (a) + (b) + (c)
Moderate	21–40
Small	0–20

Source: IEMA 'Guideline for the Environmental Assessment for Road Traffic' (2023)

1.5.8 The magnitude of impact is approximated with reference to the changes in the level of fear and intimidation from baseline conditions. This is shown in Table 1-4 below (adapted from Table 3.3 of the IEMA guidance).

Table 1-5 – Fear and intimidation magnitude of impact

Magnitude of impact	Change in step/traffic flows (AADT) from baseline conditions
High	Two step changes in level
Medium	**One step change in level, but with** • >400 vehicle increase in average 18hr AV two-way all vehicle flow; and/or • >500 HV increase in total 18hr HV flow
Low	**One step change in level, but with** • <400 vehicle increase in average 18hr AV two-way all vehicle flow; and/or • <500 HV increase in total 18hr HV flow
Negligible	No change in step changes

Source: IEMA 'Guideline for the Environmental Assessment for Road Traffic' (2023)

1.6 Driver Delay

1.6.1 To determine the traffic and transport impact of the Proposed Scheme on driver delay, junctions on the local and strategic highway network in the study area has been modelled for the Do-Minimum and Do-Something scenarios.

1.6.2 Driver delay is only likely to be an issue requiring consideration of mitigation where junctions are operating at or beyond capacity. Sensitive junctions are

those which have a Ratio of Flow to Capacity (RFC) of 0.85 or greater. These are the junctions operating at or close to theoretical capacity of 1.0 RFC.

1.6.3 In this assessment, Paramics modelling results have been utilised in place of individual junctions assessments. The Paramics model provides an indication of junction sensitivity based on a level of service (LOS) grading A to F, junctions with level of service E and F have been considered for the delay assessment. LOS A represents free-flow conditions, while LOS F represents over capacity.

1.6.4 The magnitude of scale applied to the category 'driver delay' has been based Table 6-3 of the **Transport Assessment - Appendix 14: Paramics Model Technical Note** (Document Reference 4.01.14). The adapted modelled average vehicle delay changes is set out below:

- Very Low: average vehicle delay changes >0s and <= 20s (LOS A,B)
- Low: average vehicle delay changes >20s and <= 30s (LOS C,D)
- Medium: average vehicle delay changes >30s and <= 60s (LOS E)
- High: average vehicle delay changes > 60s (LOS F)

1.7 Accidents and Safety

1.7.1 The 1993 IEMA Guidelines advocated the calculation of road accident rates (collision rates in modern terminology) as an approximation of the potential for road safety impacts stating: 'From knowing the expected increase in vehicle-km on different classes of road, it will be possible to make an initial simple statistical assessment of the likely increase or decrease in the number of accidents resulting from changes in traffic flows and composition.'

1.7.2 The current 2023 IEMA guidance (**Ref 16.15**) advocates that the calculation of collision rates is still considered a relevant approach to scale a road safety assessment.

1.7.3 Based on the above, an estimate has been made based on the changes in traffic flows. The changes in traffic flow have been based on the vehicle flow

thresholds sets out in Table 3.11 of DMRB LA112 (**Ref 16.16**) as sets out below:

- Very Low: Change in two-way traffic flow <4000
- Low: Change in two-way traffic flow >4000 and <=8000
- Medium: Change in two-way traffic flow >8000 and <=16000
- High: Change in two-way traffic flow > 16000

1.8 Hazardous/abnormal Loads

1.8.1 If the number of hazardous/abnormal load movements is expected to be significant, a risk of catastrophe analysis will be required to illustrate the potential for an accident to happen and the likely effect of such an accident.