

Appendix 3 - Methodology

Speed Limit Review Assessment Process – Developed from the Setting Local Speed Limits in Wales Guidance (Welsh Assembly Government Circular No 24/2009)

In order to carry out the assessment a process was followed that included several stages being used to consider each classified road in the County Borough. The following is a description of the stages/process.

Stage 1 – Assign the link into an appropriate **functional tier**. Depending on the type of road under consideration it will either be classed as an upper or lower tier route.

Functional Tiers

Depending on the characteristics of the road, links are either classified as upper or lower tier routes. These tiers have different collision rate thresholds which help identify the appropriate speed limit. Functions are defined as follows:

- **Upper Tier** – those roads with a primarily through function where mobility is important, typically major A and B roads.
- **Lower Tier** – single carriageway roads passing through a community, or having a local access or recreational function where quality of life benefits are important. A community is defined as an area with 20 or more homes/properties which have frontages onto the route being assessed.

Stage 2 – Collect data and information for each link including the link's road length, mean speed of traffic, average annual daily traffic flow and the number of collisions per year.

Stage 3 - Compare the recorded mean speed of vehicles on the road with the road's current speed limit. If the mean speed is higher than the speed limit's intervention level, consider a review of the speed limit or measures to bring the traffic speed within an accepted range for the existing speed limit.

Stage 4 - Calculate the link's **collision rate** and compare the figure against the evaluation rate for the current posted speed limit. If the rate is below the level to justify the speed limit consider the recorded mean speed, function and role of the road recommend the appropriate action after considering the characteristics in stage 5.

Collision Rates

The number of road traffic collisions is a key factor to be considered when setting speed limits. In order to review each link, a collision rate per 100 million vehicle kilometres has been used, which can be calculated by following the formula below:

$$\text{CollisionRate} = \frac{\text{CollisionsPerYear} \times 100,000,000}{365 \times \text{AverageAnnualDailyTrafficFlow} \times \text{RouteLength}}$$

In order to calculate this figure, a collision per year rate is gathered by calculating the number of collisions per year along the link within a three-year period and obtaining a yearly average for use in the calculation. For all links/calculations traffic collisions for a three-year period beginning on the 1st of January 2010 and ending on the 31st of December 2012 were used for consistency.

The Welsh Government circular sets out guidance with regards to acceptable collision rates for various speed limits and functional tiers as follows:

“Upper Tier Roads

- *60mph: high quality strategic roads with few bends, junctions or accesses. When the assessment framework is being used, the accident rate should be below a threshold of 35 injury accidents per 100 million vehicle kilometres.*
- *50mph: lower quality strategic roads, which may have a relatively high number of bends, junctions or accesses. When the assessment framework is being used, the accident rate should be above a threshold of 35 injury accidents per 100 million vehicle kilometres and/or the mean speed already below 50mph.*
- *40mph: where there is a high number of bends, junctions and accesses, substantial development, where there is a strong environmental or landscape reason, or where the road is used by considerable numbers of vulnerable road users.*
- *30mph: should be the norm in villages where appropriate.*

Lower Tier Roads

- *60mph: only the best quality roads with a mixed function (i.e. partial traffic flow and local access) with a few bends, junctions or accesses (in the longer term these roads should be assessed using the upper tier criteria).*
- *50mph: lower quality roads with a mixed function where there are relatively high number of bends, junctions or accesses. When the assessment framework is being used, the accident rate should be below a threshold of 60 injury accidents per 100 million vehicle kilometres.*
- *40mph: roads with a predominantly local, access or recreational function, or where the road forms part of the recommended route for vulnerable users. When the assessment framework is being used, the accident rate should be above 60 injury accidents per 100 million vehicle kilometres.*
- *30mph: should be the norm in villages where appropriate”.*

Stage 5 - Consider whether the characteristics are applied correctly in terms of the speed limit and function of the road and technical requirements; the characteristics including:

- length of the speed limit section;
- the location of the speed limit gateways;
- and whether the link fits in with the consistency of speed limits across the borough;

If any of these characteristics are considered to not match the Welsh Government guidance or function and characteristics the link was consider further.

Stage 6 - If the link has been identified for **further review**. At this stage the appropriate measures are identified. For example road safety measures that address a localised safety problem or address higher than acceptable traffic speeds in an urban environment or consideration is given to the appropriate change to the current posted speed limit.

Each appraisal is based on a minimum road length of 600m.

Further Review

For each site that was highlighted for further consideration recommendations have been made. The recommendations either suggest a change in the road’s speed limit or safety

measures to reduce the traffic speeds. In some cases the gateway of the speed limit has been considered.

However if the recorded mean speed is considerably higher than the speed limit, engineering works might not be appropriate and in these circumstances an increase in the posted speed limit will be considered.

The following provides more information on the processes used to carry out the review the Caerphilly County Borough Speed Limits.

Mean Speeds

In order to review whether a link's mean speed is acceptable, an evaluation based on Caerphilly County Borough Councils adopted 'Speed Management Strategy' has been carried out. This strategy includes policies, practices and procedures and is used to deal with any road traffic speed related complaints.

For each link the vehicle mean speed has been compared against the road's current speed limit. The 'Speed Management Strategy', speed intervention levels have been applied for various speed limits. Any mean speed rate above an intervention level has been highlighted for further review. The intervention levels for each speed limit used are as follows:

Current Speed Limit (mph)	Intervention Levels (mph)
30	32
40	43
50	53*
60	63*
70	73*

Any vehicle mean speed that is significantly lower/higher than the road's current speed limit has been examined further to see whether there's any reason to reduce/increase the road's posted speed limit.

* Intervention levels for speed limits of 50mph and above are based on the levels given for 30mph and 40mph limits within the 'Speed Management Strategy'.

Length of Speed Limit

When reviewing the various links, one issue to take into consideration is the length of the speed limit. According to 'Setting Local Speed Limits in Wales', 'the **minimum length of a speed limit** should be **600 metres**' although 'highway authorities may, however, lower this to 400 metres and, in exceptional circumstances, to 300 metres'.

Short speed limit sections used to slow down vehicles on approach to tight bends are not recommended and will be highlighted and reviewed. This is based on the 'Setting Local Speed Limits in Wales' guidance that quotes 'speed limits should not be used to attempt to solve the problem of isolated hazards, such as a single road junction or reduced forward visibility at a bend'.

Further considerations should also be made to whether the location of speed limit gateways are positioned correctly and are not positioned on bends, located too close or too far away from village (settlement boundaries), or are based in locations of poor visibility. It is also

important to evaluate the speed limits to the characteristics of a route/link to keep consistency across the Borough and Wales as far as this is practicable.

Presentation

For each link the following data and information has been produced:-

- Maps,

The “Speed Assessment Record” includes; a description of the link’s carriageway and the surrounding environment, the link’s length and width of carriageway, current speed limit, mean speed, estimated “Annual Average Daily Traffic Flow” and calculated collision rates.

- A plan has been created showing the location of the classified road and the length of the link, and where the speed and volume data was recorded.
- The original speed and volume data records.
- Photos along the carriageway in both directions along the link.

Each link has a record which includes where applicable a recommended action with the rationale for the recommendation.