

Summary of Noise Measurement Investigation – Todds Green

Measurements and observations were undertaken east of the A1M on 21st August 2023 under the most common atmospheric and wind conditions. Four measurement locations were adopted with measurements rotating between those four sites during the hours 10am-3pm, in accordance with measurement guidance. This avoids the 'rush hour' periods and includes increased holiday traffic compared with non-holiday periods. The approach also enabled direct comparison between each location.

Two locations were north of the Fishers Green bridge at 152m from the A1M on the north side of Kessingland Avenue and 265m from the A1M just south-east of Aldeburgh Close. Two locations were south of the bridge at distances of 190m from the A1M in Berwick Close and 256m from the road in a park just south of Clovelly Way. The latter positions are those where potential reflection hotspots are plausible. The first two are closer to properties where complaints were made of increased noise.

This exercise was done after review of the noise modelling along part of the eastern side of the A1M south of Fisher Green, using an independent expert with no prior involvement in this matter. The modelling indicated a possibility of some perceptible increase in noise due to reflected content in a limited area directly opposite the new noise barrier.

Analysis of the relevant acoustic principles meant that the modelling exercise was impractical with respect to properties north of Fishers Green bridge due to the angle of reflected noise, predicted increases being away from buildings, and the bridge and associated road embankment, which obstruct noise pathways towards the north-east. This area was not modelled due to increased error that is introduced but also because of lower reflection in that direction.

The observations and measurements on 21st August 2023 found no evidence of any hotspots of reflected noise nor any reflected contribution at all. The road traffic noise was predominantly added to from a more distant length of the road to the south. The distant contribution, called downwind refraction, cannot be modelled as the relevant formulas discount it. This extra refracted noise renders any possible reflection content too small to be observed or measured. Reflected noise was not found and at most it can only be a minor element compared to downwind refracted noise that is a major contributor.

The noise model predicted sound energy levels at the point reflected noise would be greatest, with the barrier in place, at 62-65dBA as an energy average. This was on Berwick Close. The measured levels nearest this point ranged from 55-57dB as an average. This is 6-8dBA lower than prediction levels and much quieter. The results obtained are consistent with the observations made during the measurements which were that the most significant contribution was from the length of road further south.

After adjustment for distance differences, the location north of Fishers Green shows levels fractionally higher than those where reflection hotspots were predicted. This contradicts any suggestion that there is added reflected noise of any significance, as that would make levels even higher below Fishers Green bridge and directly opposite the noise barrier. Furthermore, the Kessingland Avenue location north of Fishers Green is screened by the bridge and should experience lower noise levels. It is however, exposed to higher long distance downward refracted noise from the south. Other wind directions would reduce the noise, resulting in a quieter environment.

The two other locations compared, one north and one south of the bridge, were further away from the A1M. North of the bridge, levels were lower than expected when compared to Kessingland Avenue, the other location north of the bridge but closer to the A1M. South of the bridge the levels further from the road were similar to those at Berwick Close, that is nearer the A1M and close to the main predicted reflection hotspots. In contrast it should be about 2dBA lower at this location. This anomaly is explained by the main additional contribution being from more distant downward refracted noise. If there was a notable reflection element it would be lower at this position, being further away than the Berwick Close one.

The two more distant locations, east of Clovelly Road and south of Aldeburgh Close were similar in decibel levels but the latter has a sound path that is less obstructed by buildings and should be higher in level. However, it was found that it is not, further indicating that no reflected effect arises. In contrast significant long distance downwind refraction effects dominate. This is also consistent with the observations at the time.

Not only was an absence of reflective effects found but they are predicted to be much smaller than the actual meteorological effects at any location on the eastern side of the A1M.

None of the measurement evidence or observations support the existence of any identifiable reflected contribution from the noise barrier, even directly opposite it, contrary to expectation. When the additional contribution from downwind refraction of the road noise from parts of the road further south are considered, the resulting noise is predictable.

The conclusion is that noise reflected from the barrier is insignificant, especially as there are far greater modifiers of the sound environment, as found on 21st August. Any mitigation to try to address even a theoretically reflected element is without value.