



ACOUSTIC
CONSULTANTS

**PROPOSED CAR PARK EXTENSION,
STANSTY ROAD, WREXHAM**

NOISE IMPACT ASSESSMENT

architectural

environmental

occupational

industrial

noise control at source

project management

planning

legal services

expert witness

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1.0 SUMMARY

At the request of Urban Developments Ltd an assessment of the noise impact of the proposed extension to the existing Total Fitness car park off Stansty Road, Wrexham has been carried out.

A noise survey of the existing ambient environmental noise levels at the boundary with the nearest noise sensitive residences has been made. These noise levels have been compared with the noise levels due to the proposed car park extension, including the effect of the proposed close boarded fence to the boundary. The noise levels due to the proposed car-park extension are more than 10 dB(A) below the existing ambient noise level, both in terms of overall L_{Aeq} , and in terms of individual L_{Amax} events and hence the impact of the car park noise on the residences is unlikely to be significantly perceptible.

2.0 BRIEF FOR CONSULTANCY

PDA Ltd. was engaged to carry out the following:

A) Noise Survey

We will travel to the site and carry out a manned ambient noise survey to assess the level of existing background noise at the boundary of the site to the nearby noise sensitive residences. The measurement and assessment will include for noise from the adjacent road and rail network, existing car-park use, and other local noise sources.

We would propose to undertake manned measurements between the hours of 19:00 – 22:00 hours representative of the likely quietest background noise levels during the operation of the Gym. We will also perform a count of cars entering and leaving the car-park during this period.

We will carry out all noise surveys in accordance with the provisions of BS7445 “Description and Measurement of Environmental Noise”. The measurements made will include both dBA and octave band noise levels including L_{eq} , L_{max} , and L_{90} parameters. During the survey duration, we will require unrestricted access to the site.

B) Noise Impact Assessment

We will predict the noise levels at the nearby noise sensitive properties due to the extension to the existing car-park. Noise propagation calculations will be undertaken from the car park to the nearby residences in accordance with the noise propagation calculations of ISO 9613 and taking into account the proposed boundary treatment.

The noise due to the car park use will be compared to the pre-existing background noise level measured in Part A. The impact of the noise will be assessed in accordance with the requirements of TAN 11 (Planning Guidance (Wales) - Technical Advice Note (Wales) 11).

We will produce a report detailing all survey procedure, measurements and results suitable for submission to the Local Authority in support of your planning application.

3.0 SITE DESCRIPTION

The site is currently a car park serving the Total Fitness Gym with a triangular strip of grassed land between the eastern edge of the parking area and the boundary with the rear gardens of houses on Mayville Avenue. Part of the northern end of the existing car park has been redeveloped as housing and it is now proposed to develop the grass strip between the existing parking and the boundary with the residences as additional parking for 20 cars.

4.0 ASSESSMENT CRITERIA

In assessing the impact of new noise generating development for planning purposes advice is given in TAN 11.

4.1 TAN 11

TAN 11 states;

Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind

that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions.

Noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development, for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration. In addition to noise from aircraft landing and taking off, noise from aerodromes is likely to result from engine testing as well as ground movements. The impact of noise from sport, recreation and entertainment will depend to a large extent on frequency of use and the design of facilities. Advice on assessing noise and on factors to consider in relation to the major noise sources including roads, railways, airports, industrial and recreational noise and their measurement is given in Annex B.

TAN 11 does not give any specific guidance with relation to car-parks. However, given that the proposed development is an extension to a car park which is already in operation, in this case it is the increase in the existing noise level which has the potential to cause impact rather than the introduction of any new noise character, as the character of the noise from the car park extension is likely to be indistinguishable from the character of the existing car park noise, hence we have assessed the impact of the proposed car park extension in terms of the likely noise increase due to the additional spaces closer to the residences.

4.2 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

Although TAN 11 specifically refers to assessment in accordance with BS8233:1987, this standard has been superseded and is now withdrawn. We have assumed that assessment in accordance with the current BS 8233:2014 standard will be acceptable.

Dwelling houses, flats and rooms in residential use

British Standard 8233:2014, *Guidance on Sound Insulation and noise reduction for buildings*, gives guidance on internal noise levels within dwellings, flats and rooms in residential use when unoccupied. The following criteria are for Living and Dining Rooms for daytime use and Bedrooms for night time.

Table 1 - BS8233 recommended indoor ambient noise levels

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 L _{Aeq,16hour}	—
Dining	Dining room/area	40 L _{Aeq,16hour}	—
Sleeping (daytime resting)	Bedrooms	35 L _{Aeq,16hour}	30 L _{Aeq,8hour}

It should however be stressed that the above criterion relates to steady noise, in this case from road traffic etc., excluding unusual noise events departing from the typical noise character of the area.

In addition, BS 8233 suggests, '*regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{Amax,F}, depending on the character and number of events per night. Sporadic noise events could require separate values*'.

5.0 EXISTING ENVIRONMENTAL NOISE AND CAR PARK SURVEY

5.1 Method

An environmental noise survey was carried out on the evening of Thursday 16th August 2018 between 19:05 and 22:00 hours. The survey time was selected to represent the likely worst case time period in terms of noise from the extended car park affecting the noise sensitive properties as background noise from other sources is likely to be low at this time, but the car park is likely to be at its maximum use in the evening in the hours prior to the Gym closing at 22:00.

Noise levels were measured by Mr Wesley Charlton BSc(Hons) TechIOA of PDA Ltd using a calibrated NTi XL2 Class 1 sound level meter for which calibration certificates are held. The meter was located on a tripod with the microphone height between 1.2 and 1.5m above ground and more than 3.5m away from all other reflecting surfaces close to the boundary of the proposed car park extension with the rear gardens of houses on Mayville Avenue. A windshield was fitted to the microphone and the sound level meter was calibrated both before and after the measurements during which time no significant drift was observed. Measurements were made of broadband, octave band and statistical parameters in 5 minute contiguous measurement intervals.

The weather conditions were dry and suitable for acoustic measurement with wind speeds between 0 and 2 m.s⁻¹ and temperatures between 14°C and 17°C.

In addition to the environmental noise measurements the number of vehicles entering and leaving the existing car park was also noted.

5.2 Measured ambient noise levels

The measured noise levels are summarised in Table 2 below;

Table 2 – Measured noise levels at boundary with nearest residential (5 minute samples)

Time	L _{Aeq} [dB]	L _{A90} [dB]	L _{Amax} [dB]
1905 – 2200	51	43 – 48	78

Full survey measurements are presented in Figure 1 at the end of this report.

Note that the L_{Aeq} given is the energy averaged noise level over the whole measurement period whilst the L_{A90} is the range of L_{A90} measurements for each five minute period. The typical (median) L_{A90} for the whole measurement period was 47 dB.

Subjectively the ambient noise climate was dominated by road traffic noise on the surrounding roads, and noise from vehicles on the existing car-park. During the survey noise was also noted from a number of trains passing on the nearby railway line including several freight trains.

5.3 Vehicle count

At the start of the ambient noise survey the number of vehicles in the existing car park was counted as 83. During the survey the number of vehicles entering or leaving the car park was also recorded and was found to be a total of 71 vehicle movements over the 3 hour measurement period.

6.0 NOISE IMPACT ASSESSMENT

The noise impact of the proposed development may be assessed by comparing the predicted noise from the use of the new section of car-park with the existing noise climate to which the residences are exposed.

The existing car-park site has the capacity for 195 spaces. The proposal is to extend the car park to accommodate 20 spaces (these being direct replacements for the 20 car park spaces lost to the proposed residential development on the northern end of the car park), to give a neutral post-development car park facility for 195 spaces.

We have assumed that all of the spaces in the car park are equally likely to be used. This is probably a conservative assumption as the proposed spaces are at the furthest end of the car park from the gym and are likely to be less utilised than those close to the gym entrance. Based on the 71 vehicle movements recorded during the 3 hour survey, we would expect on average $71 \times 20/195 = 7$ vehicle movements over the three hour period to involve vehicles moving to or from spaces in the car park extension.

6.1 Noise due to car park extension

In order to calculate the noise due to the new car park extension measured noise levels for a van manoeuvring into a space and the driver getting out of the van and slamming the door were taken from the PDA database of noise measurements. In the original measurements the van manoeuvring into position was taken over 34 seconds, and the measurement of the door slam was taken over a 4 second measurement of which the door slam was the dominant noise. The measurements were made at night and no corrections were made for residual noise. The measurements were made at 10m from the source in free field conditions over reflective ground. These measurements have been normalised to a 1 second equivalent L_{Aeq} (i.e. a Single Event Level) which is detailed in Table 3 below;

Table 3 – Parking Noise SEL levels

Event	Equivalent SEL at 10m [dB(A)]
Van manoeuvring into space	72
Van door slam	61

In addition to the above SEL levels, the L_{Amax} due to the van door slam was recorded as 67 dB(A) at 10m.

In order to calculate the noise due to the car park extension the above SEL levels have been adjusted for the number of vehicle movements in the proposed car park extension (7 per 3 hours) assuming one door slam and one manoeuvre per vehicle movement to obtain an equivalent L_{Aeq} for the use of the new car park of 40.0 dB(A) at 10m.

The distance from the centre of the car park to the centre of the garden of the nearest noise sensitive property (12A Mayville Avenue) is approximately 10m hence no correction for distance is required.

Comparison of the calculated noise level due to the new car park extension with the existing ambient noise is given in Table 4 below;

Table 4 – Noise levels due to new car park compared to existing noise levels

Source	L_{Aeq} [dB]	L_{Amax} [dB]
Existing ambient noise	51	78
Proposed car park extension	40	67

We would note that the noise level due to the proposed car park extension is more than 10dB below the existing noise level at the site. An additional noise source 10 dB or more

below the existing level will lead to an increased noise level of less than 0.5 dB. As a rule of thumb a noise increase of 3dB is generally regarded as the minimum perceptible increase under normal listening conditions and hence the perceived noise level will not significantly increase above that currently experienced at the site. In terms of L_{Amax} , the L_{Amax} due to the door slamming is well below the existing L_{Amax} levels recorded at the boundary of the site which is likely to be due to other events such as train passes and hence the L_{Amax} events are unlikely to cause any significant adverse impact on the residences. Note that in terms of the overall energy averaged noise level the effect of the door slams has already been included in the overall L_{Aeq} noise level calculated above.

6.2 Additional boundary mitigation

Although the above assessment indicates that there is unlikely to be any significant impact due to the new car park extension without any boundary treatment, we note that it is proposed to install a close boarded boundary fence to the boundary between the car park and the residences. For a close boarded fence of minimum 10kg/m² surface mass a conservative rule-of-thumb attenuation of 10dB would be expected, where the line of sight between the source and the receiver is completely shielded (i.e. in gardens and ground floor windows). For sources partially obscured by the fence a 5dB attenuation is achieved (i.e. typically upstairs windows).

Reduction of the noise levels calculated in Table 4 above by 5 – 10 dB(A) results in noise levels in terms of both L_{Aeq} and L_{Amax} which are significantly more than 10dB below the current existing levels and hence are of a low additional impact.

It should also be borne in mind that whilst the calculations above have been made for typical distances from the centre of the new parking area to the centre of the gardens, the provision of the barrier fence will serve to give greater reductions than the 10dB rule-of-thumb quoted for the cars parked close to the barrier, thus mitigating against any additional impact where vehicles are parked in the closest spaces to the residential boundary.

7.0 CONCLUSION

At the request of Urban Developments Ltd an assessment of the noise impact of the proposed extension to the existing Total Fitness car park off Stansty Road, Wrexham has been carried out.

A noise survey of the existing ambient environmental noise levels at the boundary with the nearest noise sensitive residences has been made. These noise levels have been compared with the noise levels due to the proposed car park extension, including the effect of the proposed close boarded fence to the boundary. The noise levels due to the proposed car-park extension are more than 10 dB(A) below the existing ambient noise level, both in terms of overall L_{Aeq} , and in terms of individual L_{Amax} events and hence the impact of the car park noise on the residences is unlikely to be significantly perceptible.

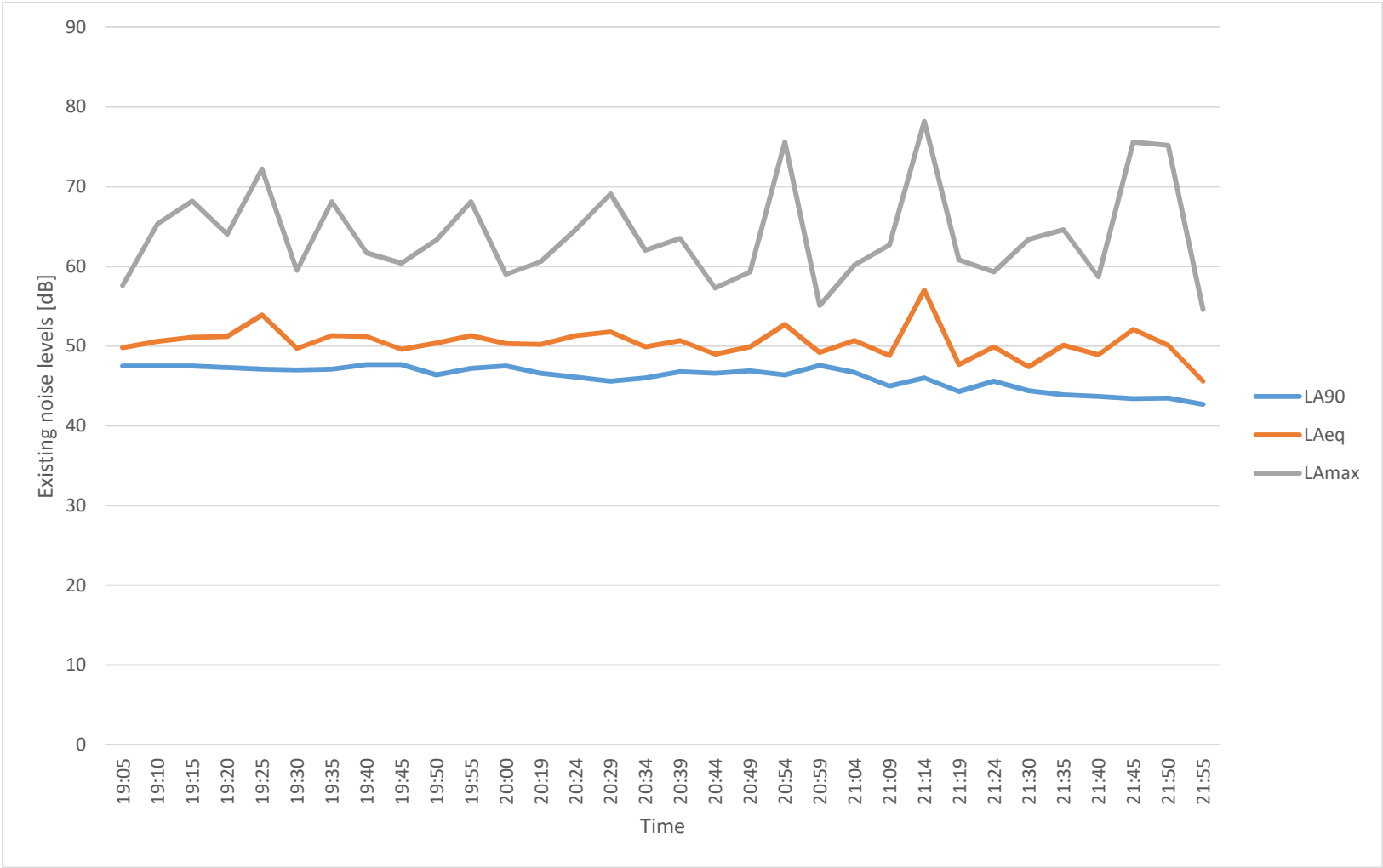


Figure 1 – Survey of existing ambient noise levels at boundary with rear of houses on Mayville Avenue