



Council Policy

Policy Title: Surface Transportation Noise Policy
Policy Number:
Report Number: TT2017-0512
Adopted by/Date:
Effective Date:
Last Amended:
Policy Owner: Transportation Planning

1. POLICY STATEMENT

1.1. All motor vehicles and especially trucks are significant sources of noise. Persistent, excessive noise can become bothersome and The City of Calgary ("The City") is committed to reducing the impact of noise generated by vehicles in existing and future residential areas. As part of the planning process in Calgary, residential areas are examined to determine whether there is an existing or potential problem in outdoor rear leisure areas around the home.

2. PURPOSE

- 2.1. The City's Surface Transportation Noise Policy prescribes the conditions under which noise attenuation is constructed adjacent to residential properties using guidelines established by the Federal Government.
- 2.2. The intent of the *Surface Transportation Noise Policy* is to provide the following:
- 2.2.1. Design noise levels and descriptors;
 - 2.2.2. Design criteria; and
 - 2.2.3. The responsibility for providing noise attenuation.

3. DEFINITIONS

- 3.1. In this Council policy:
- a. "Design Noise Level (DNL)" means an amount of noise that is considered acceptable, and above which would be considered annoying;
 - b. "Developer" means a person or entity that is responsible for the development or construction of a parcel or community; and
 - c. "Noise Attenuation" means intervention to reduce noise in a residential area to a level below the design noise level.
 - d. "Outdoor Leisure Area" means a ground level area such as a yard, patio or common area allocated outside a multi-residential building. For walk-out style

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lots adjacent to designated truck routes, the outdoor leisure area includes a rear deck that is at the same elevation as the main floor.

4. APPLICABILITY

4.1. This Council policy:

- 4.1.1. Applies to existing and future residential areas in Calgary; and
- 4.1.2. Does not apply to developments along roadways identified as urban boulevards or neighbourhood boulevards in the *Calgary Transportation Plan*. Noise attenuation in these areas is achieved through appropriate architectural practices in the construction of the adjacent developments.

5. PROCEDURE

5.1. The Design Noise Level (DNL) in residential areas for outdoor leisure areas is either:

- i. 60 dB (A) L_{eq} (24); or
- ii. 65 dB (A) L_{10} in residential areas adjacent to designated truck routes.

5.2. Measuring Noise Levels:

- 5.2.1. For truck routes, noise levels are measured at a height of 1.5 m above the ground for standard lots (at a distance of 3.0 m from the house or 4.5 m from the property line) or 1.0 m above the center of the main floor deck for walk-out style lots (after 1996.)
- 5.2.2. For non-truck routes, noise levels are measured at a height of 1.5 m above the ground for standard lots (at a distance of 3.0 m from the house or 4.5 m from the property line.)

5.3. Acceptable Noise Level Objectives:

- 5.3.1. In order to achieve acceptable noise levels in residential areas in a consistent and objective manner, it is necessary to utilize a guideline or target noise level. The descriptor dB(A) L_{eq} (24) is defined as the daily unit of noise which condenses a full 24 hours worth of sound energy into a single number "A-Weighted" to correlate closely with human hearing. Generally, it has been found that a single number representing a 24 hour time period is a good measure of annoyance. The descriptor L_{eq} (24) has been used for a number of years and based on empirical research, has proven to be acceptable. The decibel level of 60 dB(A) for 24 hours has also proven to be acceptable from a benefit/cost point of view.

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- 5.3.2. To account for the “peaking” of noise, The City adopted the noise descriptor, 65 dB(A) L_{10} peak hour, along designated truck routes. This descriptor indicates that, during the peak hour, the noise level of 65 dB(A) is exceeded for 10% of the hour. This definition does imply that the noise level of 65 dB(A) is exceeded for six continuous minutes (10% of one hour). Rather, during the course of the peak hour, the noise level of 65 dB(A) will be exceeded for a total of six minutes.
- 5.3.3. In residential areas it is specifically the outdoor leisure area in which target levels are to be achieved. For buildings two stories or higher, where balconies are considered as the outdoor leisure area, protection should be provided on an individual basis through the use of architectural treatments.
- 5.3.4. With the achievement of the exterior DNL of 60 dB (A) L_{eq} (24), it is expected that the interior DNL of 45 dB (A) L_{eq} (24) should result with the use of standard construction materials. This level is acceptable, on an average, for most rooms inside dwellings;
- 5.3.5. In all cases, in order to maximize benefit/cost, noise attenuation should be constructed to achieve a minimum 5 decibel reduction, with a desirable target of 10 decibels. There may be instances where these criteria are not achievable and, therefore, the design noise level cannot be applied in all cases. The achievement of design noise levels must be technically, economically and administratively feasible. Therefore, feasibility is determined when Administration reviews the details of the noise attenuation design and all alternative measures have been evaluated.
- 5.3.6. For both road construction projects and retrofit locations along and adjacent to truck routes where there is existing attenuation, the warrant for attenuation is determined based on the policy in place at the time of development. If attenuation is warranted, the barrier shall be designed in accordance with the policy where economically and technically feasible. A DNL of 65 dB (A) L_{10} is used in residential areas adjacent to designated truck routes.
- 5.3.7. For both road construction projects and retrofit locations along and adjacent to truck routes where there is no existing attenuation, the warrant for attenuation is based on a Design Noise Level of 65 dB (A) L_{10} . If attenuation is warranted, the barrier shall be designed in accordance with the policy where economically and technically feasible.

5.4. Implementation of Design Noise Level Objectives:

- 5.4.1. In the process of implementing design noise level objectives, the roles of all participants involved in the planning, design and construction of

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residential subdivisions and adjacent roadways and associated noise attenuation, must be clearly defined;

- 5.4.2. The general practice is that the provision of noise attenuation is dependent on the timing of the residential development and/or the transportation facility; and
- 5.4.3. The earlier in the planning process that noise is considered, the greater the flexibility that will be available in providing acceptable acoustical environments in residential areas.

5.5. Potential Noise Impacts:

- 5.5.1. A potential noise impact area consists of residential development proposed adjacent to skeletal roads, arterial streets and parkways, light rail transit corridors, and other rail lines; and
- 5.5.2. Residential development adjacent to a transportation corridor/facility may or may not experience traffic noise problems resulting from proximity to the corridor/facility. Based on field measurements and/or computer calculations, facilities are identified as having a potential noise problem and a noise impact analysis is required. In cases where residential development is proposed adjacent to existing or future transportation corridors/facilities, the developer is responsible for providing a noise impact analysis. This requirement and the analysis methodology is reviewed and approved by the Transportation Department.

5.6. Responsibility for implementation:

- 5.6.1. The City's responsibility for achieving desirable noise levels is an ongoing process. As a general principle, the timing for providing noise attenuation is the most critical factor in determining responsibility for funding its implementation. When a developer constructs a residential development adjacent to a roadway which has a potential noise impact, if the expected noise levels exceed the City's Design Noise Level, the developer is responsible for providing noise attenuation at his expense. The choice of attenuation measure is left to the developer, subject to City approval. When the method chosen is the installation of a noise barrier, the City reimburses the cost of a 1.8 metre high chain link fence (which would have been required as a minimum) for the length of the noise barrier required;
- 5.6.2. Future noise levels are to be based on 10 year forecasted traffic volumes for non truck routes and, for truck routes, the higher of 10 or 20 year forecasted traffic volumes. If it is found that a barrier is warranted at the 10 year horizon, the design of the noise barrier is based on the highest traffic volume during the 20 year period (for truck routes).



5.6.3. There are four typical cases in which this responsibility can be categorized.

i. **Residential development or redevelopment adjacent to an existing or imminent (within 10 years) transportation noise source:**

- a. The developer, at his cost, is responsible for providing noise attenuation necessary to achieve sound levels less than or equal to the appropriate DNL as identified in Section 5.1. where technically and economically feasible; and
- b. The method of attenuation should be initiated by the developer, and determined in consultation with the City in order to meet City specifications. Given the developer has maximized opportunities to provide an acceptable acoustical environment, the City will continue to accept the responsibility to further the achievement of the desired noise levels as part of the roadway design.
- c. Example: Where there are existing transportation corridors/facilities, the future noise level is calculated based on the design year traffic volumes (10 years hence), and noise attenuation must be constructed by the developer at the time of development.

ii. **Residential development or redevelopment adjacent to a future (beyond 10 years) transportation noise source:**

- a. The developer, is responsible for designing and constructing the residential area in such a way as to facilitate the necessary attenuation at the time of construction of the roadway. The City would then be responsible for completing the required noise attenuation.
- b. Example: Where there is a future transportation corridor, the future noise level is calculated, based on the design year (beyond 10 years). The developer shall design and construct the residential area in such a way as to accommodate the construction of noise attenuation by The City.

iii. **Upgrading of a roadway adjacent to existing residential developments:**

- a. The City is responsible for providing noise attenuation necessary to achieve the DNL where technically and economically feasible.

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- b. Example: When any upgrading takes place, such as reconstruction or new construction of roadways adjacent to an existing residential development, the City installs noise attenuation, as feasible.

iv. **Present residential development, adjacent to an existing transportation noise source:**

- a. Problem locations are identified, and placed as a candidate on the Noise Barrier Retrofit Program.
- b. Example: In situations where a noise problem has been identified, but where a roadway is not scheduled for upgrading within the foreseeable future, The City installs noise attenuation, as feasible. The process involves a feasibility review of candidate locations, and ranking based on a benefit/cost analysis. Project priority and funding level is determined by City Council.

8. **AMENDMENT(S)**

Date of Council Decision	Report/By-Law	Description

9. **REVIEWS(S)**

Date of Policy Owner's Review	Description