ENVISION FREIGHT
A ROADMAP TO FREIGHT COMPATIBILITY

# Setback Standards

Setback standards are another zoning element for new and infill development that can reduce conflicts between residential and other sensitive land uses and freight facilities and corridors. As a best-practice, setback standards should be drawn from the outer perimeter of the freight right-of-way and NOT from the centerline of the freight right-of-way.

**TABLE 1**
**RECOMMENDED MINIMUM SETBACK STANDARDS FOR A MUNICIPALITY TO CONSIDER IN ZONING AROUND FREIGHT FACILITIES AND CORRIDORS (IN FEET)**

| Type of Freight Corridor * | Type of Land Use | Residential | Mixed Use | School Hospital Residential Day Care Facility ** | Commercial | Industrial |
|---|---|---|---|---|---|---|
| **Primary freight corridor** | | 250 | 200 | 250 | 100 | 15 |
| **Secondary lines (rail) and major arterials (trucking)** | | 150 | 150 | 250 | 50 | 10 |
| **Passing spurs/small branch lines (rail)** | | 100 | 100 | 150 | 50 | 10 |
| **Rail yard** | | 150 | 150 | 150 | 50 | - |
| **Intermodal facility** | | 100 | 100 | 150 | 50 | - |
| **Port facility** | | 150 | 150 | 250 | 50 | - |
| **Air Cargo facility*** ** | | 10,000 | 10,000 | 10,000 | 10,000 | - |

* Setback standards should be amended depending on speed, weight, and type of cargo carried by freight components, as well as width of ROW and the Ldn 65 noise contour. This will also allow for changes to be made to zoning code if freight activities increase or diminish.

**The City and County of Denver's zoning code for Hospital districts does not allow railway right-of-way as a permitted use beside schools/hospitals. Researchers consider this to be too exclusionary for all jurisdictions so we would rather leave this up to individual municipalities/counties to address

*** Cities should check with individual airports to determine where any aviation easements have been created, and any airport influence zones, and also should delineate out the 65 DNL contour and flight path approaches as they consider permitting any projects. This recommendation is based on distance to existing or planned runway approaches at a regional, commercial or air freight airport.

These are minimum, suggested standards that a local jurisdiction should consider in planning for development around freight activities. These standards were developed after reviewing city codes, guidance on noise and vibration, reviewing zoning activities in Canada and Australia around freight rail corridors, CN and CP Railroad guidelines, and the best practice that was created by the Canadian Railway Proximity Website. Municipalities and other jurisdictions may chose to implement more stringent setbacks and zoning structures.

## California Air Resources Board Recommendations on Siting New Sensitive Land Uses.

The California Air Resources Board developed "Air Quality and Land Use Handbook: A Community Health Perspective" in 2004. Numerous situations were reviewed: freeways and high traffic roads, distribution centers, rail yards, ports, refineries, other industries that use hazardous materials.

For freeways and high traffic roads, it was found that the combination of children's health studies and distance related findings suggest that it is important to avoid exposing children to elevated air pollution levels immediately downwind of freeway and high traffic roadways. A substantial benefit can be achieved by a 500-foot separation. For distribution centers, it was found that taking into account the configuration of the distribution center can reduce pollution exposure, and it was recommended locating any new sensitive land uses away from the main entry and exit points to reduce cancer risk and other health impacts. It was recommended to avoid siting new sensitive land uses within 1,000 feet of a distribution center that accommodates more than 100 trucks a day or more than 40 trucks that have transportation refrigeration units. Similarly for rail yards the area of highest impact was found within 1,000 feet of the yard.

**TABLE 2**
**AIR QUALITY RECOMMENDATIONS ON SITING NEW SENSITIVE LAND USES SUCH AS RESIDENCES, SCHOOLS, DAYCARE CENTERS, PLAYGROUNDS, OR MEDICAL FACILITIES**

| Source Category | CARB Advisory Recommendations |
|---|---|
| Rail Yards | ➢ Avoid siting new sensitive land uses within 1000 feet of a major service and maintenance rail yard.<br>➢ Within one mile of a rail yard consider possible siting limitations and mitigation approaches. |
| Distribution Centers, Truck Stops | ➢ Avoid siting new sensitive land uses within 1000 feet of a distribution center (that accommodates more than 100 trucks per day - more than 40 trucks with operating transport refrigeration units [TRUs] per day - or where TRU unit |

| | |
|---|---|
| | operations exceed 300 hours per week).<br>➢ Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points. |

Source: California Air Resources Board, Air Quality and Land Use Handbook http://www.arb.ca.gov/ch/landuse.htm

## Buffer Zones

Another consideration that the planner, developer, and freight facility might consider is the use of buffer zones within setback standards. This would then become an area that has no development upon it, and may often be planted with vegetation. The goal is to provide a buffer area over which noise, vibration, and any environmental effects may be diminished to reduce conflicts.

There are many examples of buffer zones being created around airports, and where airports have purchased property to create better landing approach zones and reduce the number of properties that are close to the airport. Ports have also created buffer zones through the use of yard re-development plans and through the purchase of property. The port of Panama City in Florida, for example, has some modest problems with encroachment on the east side of the port. There is significant residential development, and for a long time the port has had a policy of buying out homes on the eastern side and demolishing houses in order to create a buffer zone. This process has been going on for at least 10 years. The policy started with the intention of using these properties for future port expansion. However, as the port continued to develop it became clear that the highest value for this property was to provide a buffer so that future problems with land-use conflicts would not arise. The houses were purchased one at a time. Some were freestanding structures and some were mobile homes, therefore they were not very expensive to purchase and mostly not in very good condition.

## Canadian Railroad Activities

Canadian National Railroad and Canadian Pacific Railroad have created their own set of rail land use guidelines. Canada also has a Railroad Proximity website that has useful information to be considered when planning and developing around railroads.

CN Rail

CN Rail adopted a set of recommended development guidelines for residential development adjacent to the rail right-of-way. The buffering requirements are dependent on the classification identified by the rail company for the purpose of applying the acceptable protective measures.

The rail lines, yards, and stations are categorized into classes and include: principal main lines, secondary main lines, principal branch lines, secondary branch lines, and spur lines. These classifications were determined based on the frequency, speed, and the average number of locomotives per train. For example, principal main lines have higher speed trains and higher

traffic volumes with heavier trains than on the secondary main lines. Branch lines have slower speed trains and lower traffic volumes, with generally light to moderate weight trains. Spur lines have unscheduled traffic on a demand basis with limited speeds. While not explicitly stated in their guidelines, CN Rail also suggests their guidelines be incorporated into future residential development. CN Rail land use development guidelines are summarized in the attached table (Table 1a).

Table 1a – CN Rail Land Use Guidelines for Residential Uses abutting the Rail Right-of-Way

| | Setback of Dwelling | Noise Assessment and Ground-borne Vibration Assessment | Noise Attenuation Barrier | Berm and Fence | Buyer Awareness | Drainage Pattern/Utilities | Others |
|---|---|---|---|---|---|---|---|
| **CN Rail** | | | | | | | |
| **Railway yards** | 300 m | All residential uses located between 300m and 1000 m (Noise and Ground-borne Vibration) | | | | | |
| **principal main lines** | 30 m | All residential uses located within 300 m (Noise)<br><br>All residential uses located within 75 m (Ground-borne Vibration) | A min. of 5.5 m above top-of-rail | 2.5 m safety berm with Acoustic fence (subject to the noise report) | A clause be inserted in all development agreements, offers to purchase, and agreements of Purchase and Sales or lease of each dwelling unit within 300m of the railway right-of-way, advising the property owners of the potential adverse impacts as a result of the railway operations. | Alterations to the existing drainage pattern affecting railway property requires prior concurrence from CN. | Restrictive Covenants on title advising that any berm, fencing, or vibration isolation features implemented are not to be tampered with or altered, and further that the owner shall have the sole responsibility for maintaining these features. 1.83m min. height chain link fence along the mutual property line. |
| **secondary main lines** | 30 m | | A min. of 4.5 m above top-of-rail | 2.0 m safety berm with Acoustic fence (subject to the noise report) | | | |
| **principal branch lines** | 15 m | | A min. of 4.0 m above top-of-rail | 2.0 m safety berm with Acoustic fence (subject to the noise report) | | | |
| **secondary branch lines** | 15 m | | A min. of 4.0 m above top-of-rail | 2.0 m safety berm with Acoustic fence (subject to the noise report) | | | |
| **spur lines** | 15 m | | n/a | n/a | | | 1.83m min. height chain link fence along the mutual property line. |

<u>CP Rail</u>

CP Rail recognizes the fact that train operations result in the transmission of noise, vibration, and other related industrial nuisances to adjacent properties. The company introduces the "Residential Development Adjacent to the CPR" guidelines for any residential development adjacent to the rail right-of-way. In general, CP Rail opposes all residential development within 75 m of the railway right-of-way, as it is not compatible with railway operations since there is the possibility that the safety, health, and welfare of residents could be adversely affected by railway activities.

Moreover, the guidelines also note that notwithstanding the company's opposition, if a municipality decides to approve a proposed residential subdivision application within 75 m of the railway right-of-way, the CP Rail requests that consideration be given to the recommendations summarized in the following table (Table 1b).

Table 1b - CP Rail Land Use Guidelines for Residential Uses abutting the Rail Right-of-Way

| | Setback of Dwelling | Noise Assessment and Ground-borne Vibration Assessment | Berm and Fence | Buyer Awareness | Drainage Pattern/Utilities | Others |
|---|---|---|---|---|---|---|
| **CP Rail** | | | | | | |
| **Applies to all residential development within 75 m of the CP Rail right-of-way** | 30 m | All residential uses located within 75 m requires both Noise Assessment and Ground-borne Vibration Assessment (if in excess of the acceptable levels, all dwellings within 75 m of the railway right-of way should be protected through adequate measures) | 2.5 m safety berm with Acoustic fence (subject to the noise report) | A clause be inserted in all offers to purchase, agreements of sale and purchase or lease, and in the title deed or lease of each dwelling, informing prospective purchasers or tenants of the existence of the railway's operating right-of-way; the possibility of alterations, including the possibility that the railway may expand its operations, which expansion may affect the living environment of the residents notwithstanding the inclusion of noise and vibration attenuating measures in the design of the subdivision and individual unit; and that the railway will not be responsible for complaints or claims arising from use of its facilities and/or operations | Alterations to the existing drainage pattern affecting railway property requires prior concurrence from CP.<br><br>Any proposed utilities under, over or along railway property to serve the development must be designed in accordance with applicable standards. All plans for utility occupancies of railway property must be approved by the Railway prior to construction and installation. | 1.83m min. height chain link fence along the mutual property line if no solid noise attenuation fence is required by the noise assessment.<br><br>A clause on all agreements of sale and purchase or lease, and in the title for each dwelling affected by any noise and vibration attenuation measures, advising that any berm, fencing, or vibration isolation features implemented are not to be tampered with or altered, and further that the owner shall have the sole responsibility for maintaining these features.<br><br>Any access roads across the railway will be subject to Railway approval, and must be in compliance with the latest Transport Canada regulations concerning same. |