

Calculating and Placing Non-Residential Receptors (NRRs)

Methodology: Single Point

FHWA-HEP-17-058

This Fact Sheet is intended to provide basic information regarding the calculation (Step 1) and placement (Step 2) of Non-Residential Receptors (NRRs) using the Single Point Methodology.

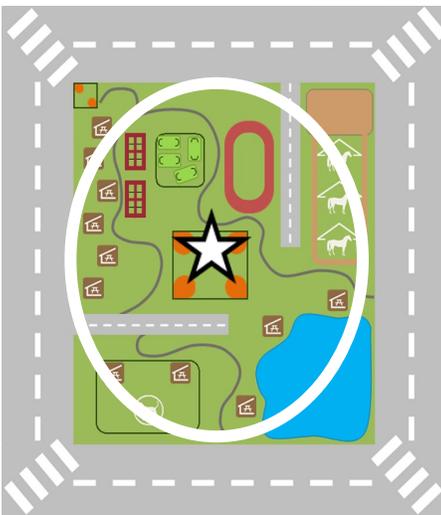
1. How many Receptors will I have?
2. Where would I then place those receptors within a site?
3. What impact do these decisions have on the Feasibility and Reasonableness of Noise Abatement?

LEGEND



One star =
One receptor

Please note: For visual clarity, no receptors were provided for the walking trails.



**NRR Value Option 1,
NRR Point Option 1**
[One receptor represents the
entire facility]
Result: a total of 1 receptor



**NRR Value Option 2,
NRR Point Option 1**
[One receptor represents each
individual activity area]
Result: a total of 33 receptors



**Variation of NRR Value Option 2,
NRR Point Option 1**
[One receptor represents a group
of similar activity areas]
Result: a total of 9 receptors

This methodology can be applied two ways to determine NRR Values:

- 1) The entire facility is assigned an NRR value of one. This method would be useful for a small or single-use property.
- 2) Each specific activity area, or group of areas, in the facility is assigned an NRR value of one.

In this methodology, NRR points can be placed in two ways depending on which NRR Value method was applied:

- 1) At the center of the facility or at the center of each activity area.
- 2) At the point closest to the noise source for the overall facility or the point closest to the noise source at each activity area.

While the point placement options would not affect the number of NRR points, it would affect the noise level and insertion loss at each point. The placement can have a substantial influence when dealing with large properties.

The contents of this fact sheet are meant for informational purposes only and shall not be considered FHWA policy, guidance and/or requirements. This fact sheet is partially based on State noise policies as of October 2011, updates to those policies since then may not be reflected here. Aerial photographs courtesy Google Earth.

CASE STUDY EXAMPLES



U.S. Department of Transportation
Federal Highway Administration

No actual data on the sites was obtained, the examples assume:

That all properties were impacted.

A Value of 1 for each specific activity area in the facility, where such information is available.

The West Parcel consists of two tennis courts, a tot lot, a swimming pool, a basketball court, a hockey arena, two baseball diamonds, and a sports field used for football and soccer.

The East Parcel consists of two baseball diamonds, a sports field, and a tennis court.



West Parcel NRR Value = 9
East Parcel NRR Value = 5
Total facility NRR Value = 14

NRR Points placed at the point of each activity area closest to the noise source, in this case an Interstate.

The outdoor amphitheatre has one central seating area surrounded by two areas of lawn seating. In addition, it has one main stage and some walking trails.



NRR Value = 4

NRR Points placed at the point of each activity area closest to the noise source, in this case an Interstate.

A 4,000 foot portion of a multi-mile trail parallels a major highway and is used for walking, jogging, and bicycle riding.

Along this 4,000 foot portion there are 5 rest areas with benches and water fountains.



NRR Value = 5

NRR Points placed at the center of each rest area along the trail.

A property contains a Church, a school, and a cemetery. The cemetery has an active burial area to the east of the Church. The school does not have a playground. Both the school and the church operate under open-window conditions at certain times of the year. The number of interior rooms (activity areas) is unknown.



Church NRR Value* = 1
Cemetery NRR Value = 1
School NRR Value* = 1
Total Facility NRR Value = 3

NRR Points placed at the face of the building closest to the noise source for the school and church; and at the center of the active burial area for the cemetery.

** Since the number of rooms are unknown, each building is assigned a value of 1.*

A motel has an exterior area containing a pool surrounded by a restaurant facility, a gazebo, and a large sunbathing area.



NRR Value = 4

NRR Points placed at the point of each activity area closest to the noise source, in this case an Interstate.