

Welcome to the Roadway Construction Noise Model (RCNM) 2.0 User Guide

The Roadway Construction Noise Model (RCNM) 2.0 is a computer program used to analyze construction noise to assist identifying impacts resulting from project construction. The RCNM computes the effect of intervening ground (defined by its type, or optionally by its flow resistivity with theory-based acoustics that have been validated against field measurements).

The RCNM uses the same graphic user interface (GUI) as the Federal Highway Administration Traffic Noise Model version 3.0 (FHWA TNM 3.0) but does not incorporate all features of TNM 3.0. Nonfunctional menu items from TNM 3.0 were retained in RCNM 2.0 as placeholders for future incorporation of the function and integration of the two applications.

Detailed instructions on how to operate RCNM Standalone Application is comprised of the following topics:

1. **RCNM Homepage**
2. **RCNM Toolbar**
3. **View Pane**
4. **Edit Pane**
5. **Search Pane**
6. **Properties Pane**
7. **Object Details Pane**
8. **Drawing Functions**

RCNM Homepage

The RCNM User Homepage consists of the toolbar and individual function panes. The homepage is designed to be user-friendly. The mouse and keyboard are used to navigate, draw, and perform construction noise modeling. The homepage contains the following functional areas:

RCNM Toolbar

The toolbar contains Open, Home, Edit/Modify, View, Settings, Calculate, Barrier Analysis, Contours (nonfunctional), Reports, Windows, and Help tabs.

Legend Pane

The Legend Pane shows layers and/or features that have been added to the legend.

View Pane

The View Pane lists the Plan View, 3D View, Section View, and Report View sub-panes.

Edit Pane

The Edit Pane lists the sub-panes for objects that can be edited including barriers, building rows, ground zones, receivers, equipment, terrain lines, and tree zones.

Search Pane

The Search Panes include sub-panes for Search, Bookmarks, Annotation, and Geocode functions.

Properties Pane

The Properties Pane allows the user to view the attributes of an object selected within the View Panes.

Object Details Pane

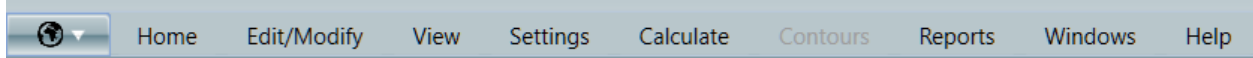
The Object Details Pane, located at the base of the user interface, allows the user to review the individual attribution of each object in the RCNM project being viewed.

Drawing Functions

RCNM provides multiple drawing functions that are used to add objects to a map for noise modeling.

RCNM Toolbar

The RCNM Toolbar is used to perform various functions of the RCNM. You can minimize or maximize the toolbar by right clicking and selecting Minimize the Ribbon.



The toolbar consists of the following tabs:

Open

Home

Edit/Modify

View

Settings

Calculate

Contours

Reports

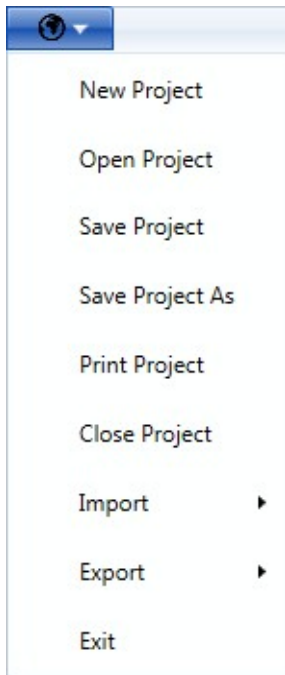
Windows

Help

Click each toolbar function for more information.

Open Tab


The Open Tab is used to create New Projects, Open and Close Projects, Save Projects, Print Projects, Import and Export Projects, and Exit the RCNM software.



Creating a New Project

To create a new project:

1. Click the Open Tab.
2. Click New Project. The New Project window displays.

 Edit Project
 ✕

Basic

Analyst:

Organization:

Contract:

Project Unit: English (Applies to length, distance, and speed.)

Project Projection Settings: ☐ Cartesian ☐ Geographic ☒ Projected

Category: World

System: WebMercator

Report Metric: LAeq

Analysis Period (Hours): 24

Relative Humidity (%): 50

Temperature (°F): 68

Ground Type: Hard Soil

LOS Distance Limit: 500

Name:

Description:

Cancel

Help

Save

3. Enter the Organization for the project.
4. Enter the Contract for the new project.
5. Select a Project Unit of measure that would be used for all unit calculations and labeling within the application. Choose form English or Metric in the drop-down list.
6. Define the Project Projection Settings by selecting one of the Cartesian, Geographic, or Projected radio buttons. Please note that depending on that selection you might need to also select a value from the Category and System pull down lists.
7. Select the report metric. Choose from:
 - LAeq
 - LAsmax
 - L10
 - L50
8. Enter the Analysis Period

Analysis Period is the period of interest for the analysis in hours. The default is a 24-hour analysis period. Users can change this to the any duration. The analysis period interacts with the **Time Active**

value assigned to equipment included in the analysis. For example, if the analysis includes a pump that runs 24 hours a day, the user would set the Analysis Period to 24 and the Time Active for the pump to 24. Any other equipment included in the model would have an assigned Time Active based on the total duration of use during the 24-hour period.

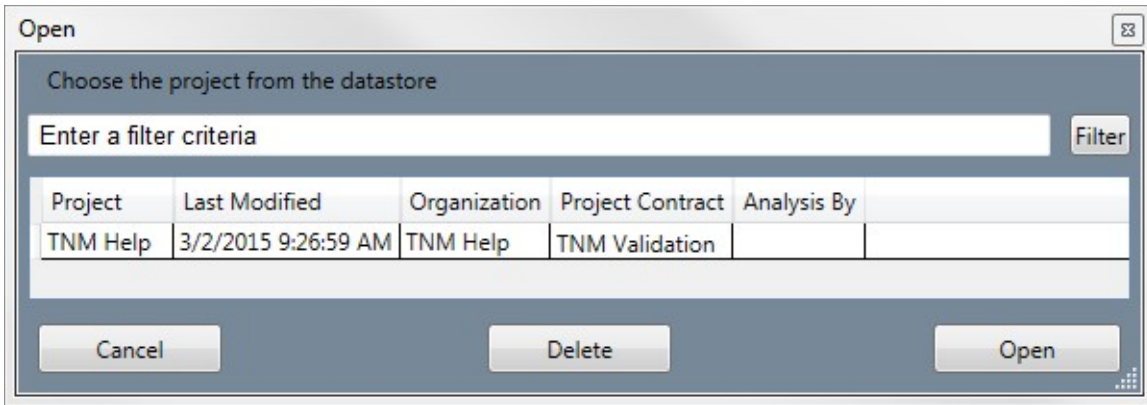
If the user wants to determine the noise level of a piece of equipment while it is in use they should assign the same value to the Analysis Period and the Time Active.

9. Update the Relative Humidity value, if needed.
10. Update the Temperature value, if needed.
11. Select a Ground Type. Choose from Custom, Pavement, Water, HardSoil, LooseSoil, Lawn, FieldGrass, GranularSnow, PowderSnow, or Custom.
12. Update the LOS Distance Limit to define the Line of Sight distance, if needed.
13. Enter a Name for your new project.
14. Enter a Description of the new project.
15. Click Create to create the New Project.
16. Click Cancel at any time to cancel the new project creation.
17. There are three options when setting up a New Project with regards to Project Projection Settings: Cartesian, Geographic, and Projected.
 - **Cartesian** coordinates are based on spatial positions described by a pair of coordinates indicating that position's relationship to a fixed origin on a 2-dimensional plane of infinite distance. This system is most often utilized in Computer Aided Design (CAD) software and may or may not have a direct relationship with known coordinates on the Earth. The recommended Geographic Category and System selections from their respective pull-down menus to utilize in RCNM for new projects in North America are Category = 'Cartesian' and System = 'Cartesian 2D (Meters)'. Cartesian coordinates correspond to the Orthographic system used in RCNM 2.5. When importing a project from RCNM 2.5 to RCNM 3.0 users should verify that the Project is using Cartesian for this value.
 - **Geographic** coordinates base spatial positions on a 3-dimensional spherical model of the earth and are often described in terms of longitude, latitude, and elevation. Latitude and longitude designations are typically described using decimal degrees or in degrees, minutes, and seconds. The recommended Geographic Category and System selections from their respective pull-down menus to utilize in RCNM for new projects in North America are Category = 'World' and System = 'WGS1984' to leverage the WGS84 (EPSG: 4326) decimal degrees, since this is a standard in cartography and navigation/global positioning systems.
 - **Projected** coordinates are based on a model of the surface of the Earth where the Earth's surface is rendered as a flat, 2-dimensional surface. Different projected systems preserve or alter distance, shape/areas, and North directionality, among other factors that should be taken into consideration when selecting a projected system. The recommended Projected settings to utilize in RCNM for new projects in North America are Category = 'World' and System = 'WebMercator' to leverage the WGS84 Web Mercator (EPSG: 3857) meters, since it is the de facto standard for web mapping applications.

Opening a Project

To open an existing project:

1. Click the Open Tab.
2. Click Open Project. The Open Project window displays.



3. If desired, enter a filter criterion to filter the list of existing projects located in the project datastore.
4. Click a project name in the list of the existing projects.
5. Click the Open button to open the project.
6. Click Cancel at any time to cancel opening a project.
7. Click Delete to delete an existing project from the datastore.

Note: This will completely delete the project. Only click delete if you no longer want the project.

Saving a Project

To Save a Project or Save a Project As:

1. Click the Open Tab.
2. Click Save Project. The project is now saved.
3. Click Save Project As.
4. Enter a Project Name and Click Save.

Print a Project

To Print a Project:

1. Click the Open Tab.
2. Click Print Project.

Close Project

To close a project:

1. Click the Open Tab.
2. Click Close Project.

Import a Project

To Import a Project:

1. Click the Open Tab.
2. Click Import.
3. Click Import from RCNM, Import from XML, Import from GDB, or Import from CAD.
4. Select the appropriate RCNM, XML, GDB, or CAD file from the location.

5. Click Open. The imported project is now imported into the project datastore and can be opened.

Export a Project

To export a Project:

1. Click the Open Tab.
2. Click Export.
3. Select Export to RCNM, Export to XML, Export to GDB, or Export to CAD.
4. Select a location to export the project to.
5. Click Save. The project is now exported in the format chosen.

Exit

To Exit the RCNM software:

1. Click the Open Tab.
2. Click Exit. The RCNM software closes.

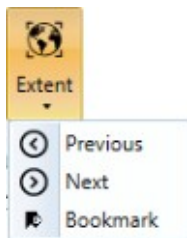
Home Tab



The Home tab lists Navigation, Batch Convert, and Measure functions.



Navigation Function

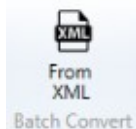
Navigation allows you to view Previous and Next extents and Bookmarks. The Previous and Next buttons cycle recent map locations in the View Panes.



To navigate to the previous and next map location click the Previous button  to go back and click the Next button  to go to the next map location.

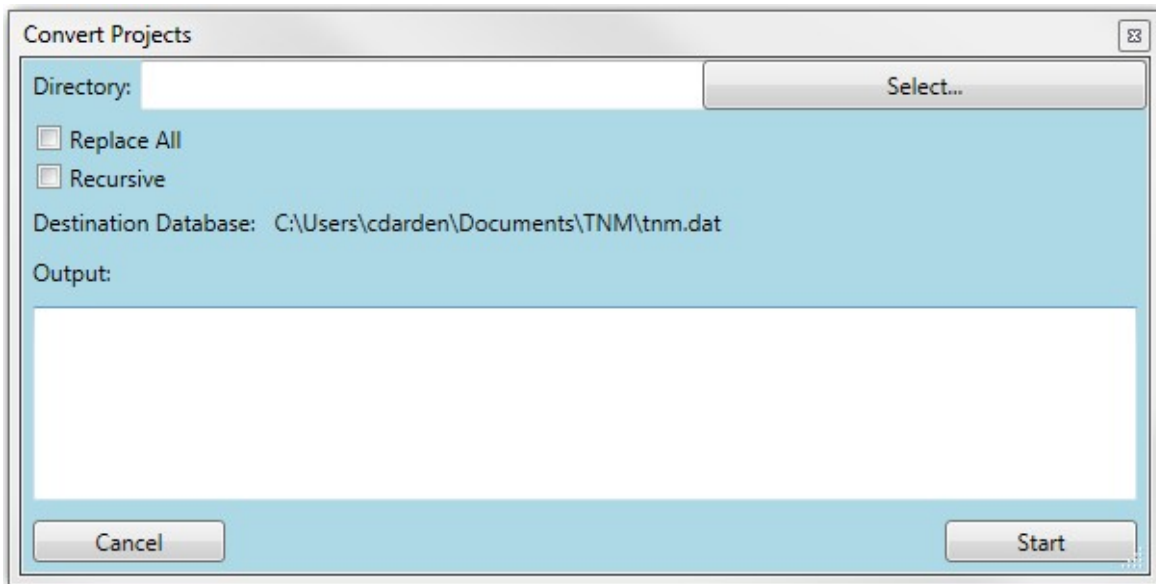
Batch Convert Function

The Batch Convert function allows you to select a directory of older XML projects and load them into the user database.



To Batch Convert XML files:

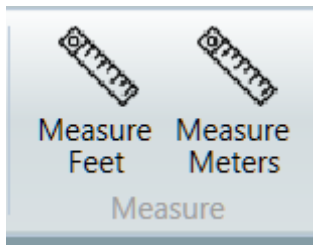
1. Click the From XML button to open the convert projects dialog box.



2. Click Select to choose a directory for your converted project.
3. Check the Replace All check-box to replace all project data files.
4. Check the Recursive check-box to dive recursively into directories. This allows you to choose a parent directory to find all projects inside child directories.
5. Ensure that the correct Destination Database is listed.
6. The Output box displays the status output from the process.
7. Click Start to convert the project.
8. Click Cancel to cancel converting the project.

Measure Function

The Measure tools allows you to trace a line on the plan view and see its length in either feet or meters.



To use the Measure Tool:

1. Click either the Measure Feet or Measure Meters button.
2. Hover your cursor over the point at which you want to begin measuring a distance.
3. Click your left mouse button once to begin the measuring line.
4. Drag your mouse to the location at which you want to end measuring the distance, noting that the current distance is labelled at the beginning, along, and at the end of the graphic measurement line.
5. Single click the left mouse button to end that measure segment and continue with another segment, or,
6. Double click the left mouse button to end that measurement line.
7. View the resulting measurement line graphic, its distance label at its origin point, and the new entry at the bottom of the Legend pane.
8. Toggle the visibility on or off by checking or unchecking the corresponding box in the Legend.
9. Reduce or increase the measurement line graphic's transparency by using the corresponding transparency slider bar.

Edit/Modify Tab

The Edit/Modify tab lists Shared Tools, Receivers, Barriers, Equipment, Tree Zones, Building Rows, Terrain Lines, Ground Zones, and Contour Zones selection and edit functions. When editing a feature, you must first select that feature on the map. A feature can be selected on a map by clicking on that feature with the mouse or by using the Edit/Modify tab to easily access multiple feature selection options.

Shared Tools Function

The Shared Tools function provides Delete, Undo, Redo, Edit, Segments, and Enable Object Add buttons for features that have been selected on the map.

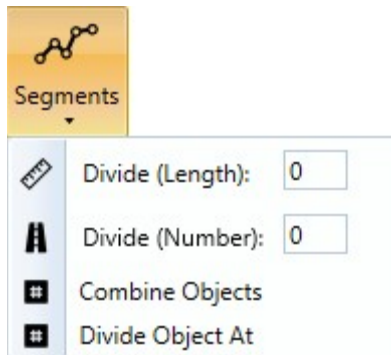


To delete a feature that has been selected click the Delete button.

To undo or redo adding and removing of objects click the Undo or Redo buttons.

To edit a feature that has been selected click the Edit button. See Edit Pane for more specific information on editing a feature.

To edit segments of a feature that has been selected click the Segments button. See Edit Pane for more specific information on editing a feature.

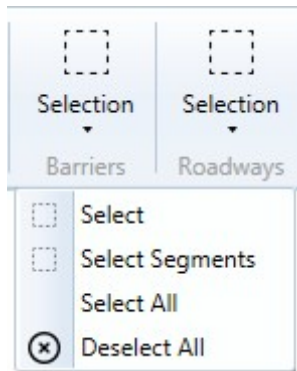


1. In the Segments function window enter a Divide (Length) to divide a feature by length.
2. Enter a Divide (Number) to divide a feature by a number amount (i.e. divide into 4 sections).
3. Click Combine Objects to combine selected objects on the map.
4. Click Divide Object At to select a point to divide combined objects.

The Enable Object Add button acts as the "D" key to enable drawing of objects. It can be toggled on and off.

Barriers and Equipment Select Functions

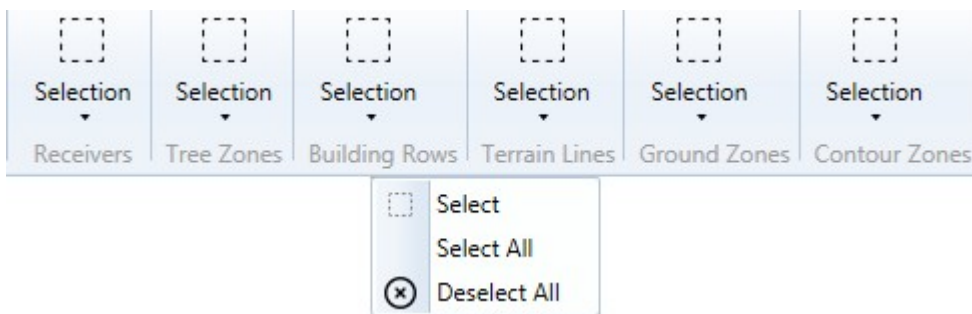
1. To edit barriers or receivers that have been added to the map, you must first select the feature. To edit equipment or barriers select the object and click the Selection button for that feature. You may also double-click the barrier or equipment object to select it or use a single click to select a segment.
2. Click Select, Select Segments, Select All, or Deselect All to edit the chosen feature on the map.



In the Edit pane, the selected feature's attributes are displayed and can be edited. See Edit Pane for more specific information on editing a feature.

Receivers, Tree Zones, Building Rows, Terrain lines, Ground Zones, and Contour Lines Select Functions

1. To edit receivers, tree zones, building rows, terrain lines, ground zones, or contour lines you must first select the feature. To select a feature on the map, click the Selection button for that object. You may also single click the object to select it.
2. Click Select, Select All, or Deselect All to edit the chosen feature on the map.



The selected feature's attributes are displayed and can be edited in the Edit pane. See Edit Pane for more specific information on editing a feature.

View Tab

The View tab lists Sync 3D Geometry, Sync 3D View, Exaggerate Heights, Zoom Extent, Start Selection Function, Show/Hide Point Labels and Show/Hide Object Labels functions.



Sync 3D Geometry Function

To sync the 3D geometry:

1. Click the Sync 3D Geometry button.
2. The Plan View and 3D View will refresh and display identical data in their respective formats.

Sync 3D View Function

To sync the 3D view:

1. With both the Plan view and 3D View windows open click the Synch 3D View button.
2. The 3D View and Plan View will refresh and display the same features.

Exaggerate Heights Function

To exaggerate the height of any object when viewing it in the 3D View, click the Exaggerate Heights button. Objects that have height will be exaggerated on the 3D View Map.

Zoom Extent

Selecting the Zoom Extent button will zoom the map to visually include all objects.

Start Section Function

The Start Section Function allows you to select a section of the map to view details of the items on the map.

1. Click the Start Section button.
2. Click and drag a line across the map to select the features that line crosses.
3. The Section View will now display the features that are included in the section.

Show/Hide Point Labels Function

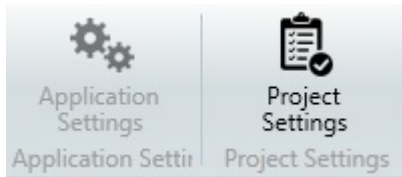
The Show/Hide Point Labels show or hide the point labels on the map.

Show/Hide Object Labels Function

The Show/Hide Object Labels show or hide the object labels on the map.

Settings Tab

The Settings Tab contains the Application Settings and Project Settings functions.



Application Settings Function

Application specific settings are applied prior to opening or creating a project. Applying these settings allows you to tailor the application to your own preferences to be used every time you create a new project.

To adjust the Application Settings, click the Application Settings button. The Application Settings dialog box appears.

The image shows a screenshot of the 'Application Settings' dialog box. The title bar says 'Application Settings'. On the left is a sidebar with two tabs: 'Project Defaults' (selected) and 'Interface'. The main area contains several settings: 'Analyst:' with a text input field; 'Organization:' with a text input field; 'Contract:' with a text input field; 'Unit Of Measure:' with a dropdown menu showing 'English'; 'Report Metric:' with a dropdown menu showing 'LAeq'; 'Analysis Period (Hours):' with a text input field showing '24'; 'Relative Humidity (%)' with a text input field showing '50'; 'Temperature (°F):' with a text input field showing '68'; and 'Ground Type:' with a dropdown menu showing 'Hard Soil'. At the bottom are 'Cancel' and 'Save Settings' buttons.

1. In the Application Settings dialog box click Project Defaults in the left column. Settings chosen here will be applied to all new projects.
2. Enter an Organization Name.
3. Enter a Contract.
4. Select a Unit of Measure from the drop-down list. Choose English or Metric.
5. Select a Report Metric measurement from the drop-down. Choose from:
 - LAeq

- LAeq
 - LAsmax
 - L10
 - L50
6. Enter Analysis Period
 7. Enter Relative Humidity.
 8. Enter Temperature.
 9. Select a Ground Type form the drop-down. Choose Custom, Pavement, Water, HardSoil, LooseSoil, Lawn, FieldGrass, GranularSnow, PowderSnow, or Custom.
 10. Click Save Settings to save the settings.
 11. Click Cancel to abandon the changes.

Project Settings Function

Project Settings can be changed for any project that has been created. Any Application Settings that have been made will be applied to Project Settings.

To adjust the Project Settings, click the Project Settings button. The Edit Project dialog box appears.

Edit Project

Basic

Analyst:

Organization:

Contract:

Project Unit: (Applies to length, distance, and speed.)

Project Projection Settings: ☐ Cartesian ☐ Geographic ☒ Projected

Category:

System:

Report Metric:

Analysis Period (Hours):

Relative Humidity (%):

Temperature (°F):

Ground Type:

LOS Distance Limit:

Name:

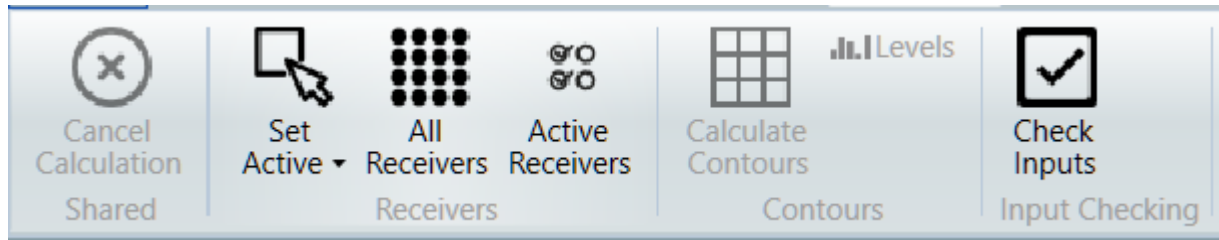
Description:

1. Enter or change the Organization Name.

2. Enter or change the Contract.
3. Select or change the Project Unit of measure. Choose English or Metric.
4. Select or change the Project Projection Settings through adjustments to the three radio buttons and their corresponding pull-down menu Category and System values.
5. Select or change the Traffic measurement from the drop-down. Choose from:
 - LAeq
 - LAsmax
 - L10
 - L50
6. Enter the Analysis Period
7. Select or change the Relative Humidity.
8. Select or change the Temperature.
9. Select or change the Ground Type from the drop-down. Choose Custom, Pavement, Water, HardSoil, LooseSoil, Lawn, FieldGrass, GranularSnow, PowderSnow, or Custom.
10. Select or change the LOS DistanceLimit.
11. Enter a name for the Project.
12. Enter a Description for the project.
13. Click Save Settings to save the settings.
14. Click Cancel to abandon the changes.

Calculate Tab

The Calculate tab lists the Shared, Receivers, Contours, and Input Validation calculation functions. After setting up a project and applying all the needed features to the map, you can calculate the noise level of traffic via noise receivers that have been strategically placed in the area of interest. These calculations are used to assist in the design of noise barriers.



Shared Function

The Shared Function contains the Cancel Calculation button. The Cancel Calculation button is enabled when a calculation is running and disabled when a calculation is not running. Click the Cancel Calculation to cancel a running calculation.

Receivers Function

The Receivers Function contains the Set Active, All Receivers, and Active Receivers buttons.

- 1.
2. The Set Active options allow you to toggle the activation of receivers to be used for the calculate functions.
3. To calculate all active and inactive receivers click the All Receivers button.
4. To calculate only the active receivers, click the Active Receivers button.

Input Validation Function

The Input Checking Function contains the Check Inputs button. Click the button to validate the project data that has been input.

Reports Tab

The Reports Tab lists the Input Reports and Result Reports functions. Each Report function contains links to reports that are visible in the Report View window.

Roadways	Receivers	Terrain Lines	On-Structure Barriers	Sound Levels - No Barrier Objects	Vehicle Type - No Barrier Objects
Barriers	Building Rows	Receiver Adjustment Factors	Ground Zones	Sound Levels - Input Heights	Sound Levels Diagnosis By Barrier Segment
Tree Zones	Contour Zones	Equipment		Barrier Descriptions	Barrier-Segment Descriptions
Input Reports				Result Reports	

Input Reports Function

The Input Reports Function contains links to Input Reports. Click any report link to view the report in the Report View window. The following Input Reports are listed:

- Roadways
- Barriers
- Tree Zones
- Receivers
- Reflecting Barriers
- Building Rows
- Terrain Lines
- Receiver Adjustment Factors
- Equipment
- On-Structure Barriers
- Ground Zones

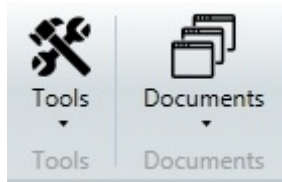
Result reports

The Result Reports Function contains links to Result Reports. Click any report link to view the report in the Report View window. The following Result Reports are listed:

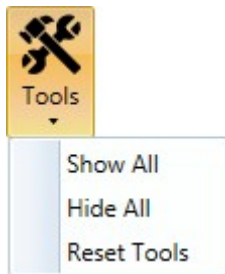
- Sound Levels - No Barrier Objects
- Sound Levels - Input Heights
- Barrier Descriptions
- Vehicle Type - No Barrier Objects
- Sound Levels Diagnosis By Barrier Segment
- Barrier - Segment Descriptions

Windows Tab

The Windows Tab lists the Tools and Documents Functions. The Tools and Documents Function are used to make tools and documents visible in the user interface.



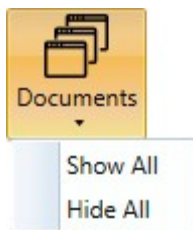
Tools Function



To adjust which tools are visible:

1. Click the Tools button.
2. Select Show All to show all tools windows and functions on the screen.
3. Select Hide All to remove all tools windows and functions on the screen.
4. Select Reset Tools to reset the tools windows and functions to the default user interface view setting.

Documents Function

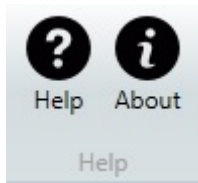


To adjust which documents are visible:

1. Click the Documents button.
2. Select Show All to show all documents in the View pane.
3. Select Hide All to hide all documents in the View Pane.

Help Tab


The Help Tab contains a link to the online Help for RCNM. Click the Help button to access the online Help.



Legend Pane

The Legend Pane displays the layers and/or features that have been added to a project map. When you apply a feature to the map, such as a equipment, it will be listed in the Legend Pane. Once a feature is listed in the Legend Pane, you can choose whether to have that feature viewable on the map and you can increase or decrease its transparency.

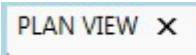

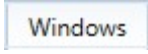
To enable/disable legend features on the map:

1. Click the check-box next the feature in the Legend Pane.
2. To view the feature, ensure the check-box is checked.
3. To adjust the transparency of the legend item on the map use the slider bar  by sliding it left to increase transparency and right to decrease transparency.
4. To remove the feature from the map, un-check the check-box.

View Pane

The View Pane displays the map and associated map data using different visualization methods. The View Pane is comprised of the following four sub-panes used to represent project data in various visualization forms: Plan View, 3D View, Section View, and Report View.

To select a View Sub-pane:

1. Click the sub-pane  or click the down arrow  in the right corner of the sub-pane.
2. Click the X to close the view sub-pane.
3. To open a closed view pane, click the Windows tab  and click the Documents button.



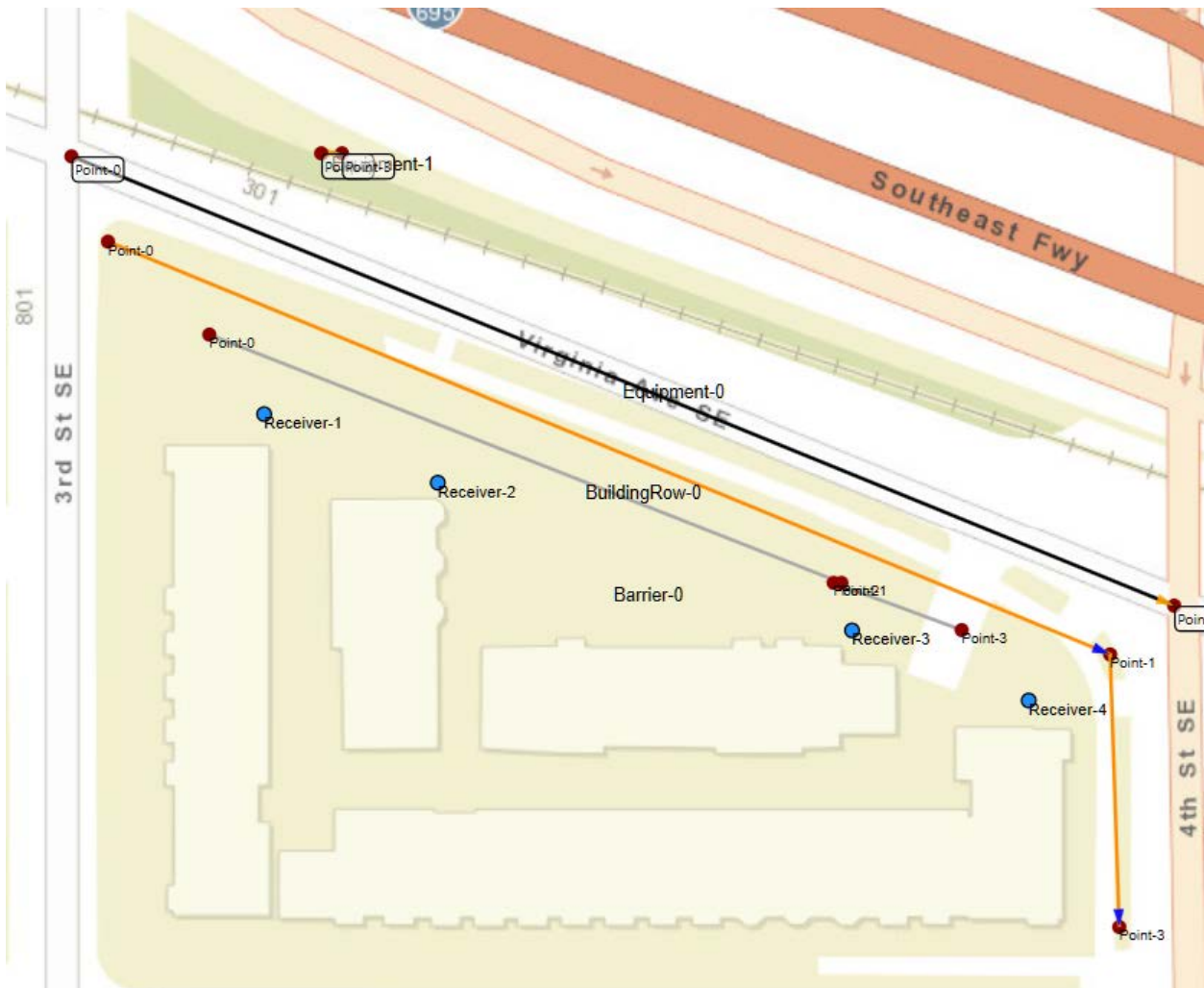
4. Click Show All. All View Panes will appear.

Plan View

The Plan View sub-pane displays the map in a top-down 2D format in which the user designs projects. The majority of project design is done in the Plan View.

To view the map in Plan view:

1. Click the Plan View sub-pane. The map will be displayed.
2. Click and hold the left mouse button and drag the mouse to pan the map left or right.
3. Roll the mouse wheel to zoom in and out of the section view.
4. Click right mouse button to bring up a drop-down list of the following functions:
 - Clear Selection
 - Bookmark Selection
 - Select All Receivers, barriers, Equipment, Terrain lines, Tree Zones, Contour Zones, Ground Zones, or Building Rows

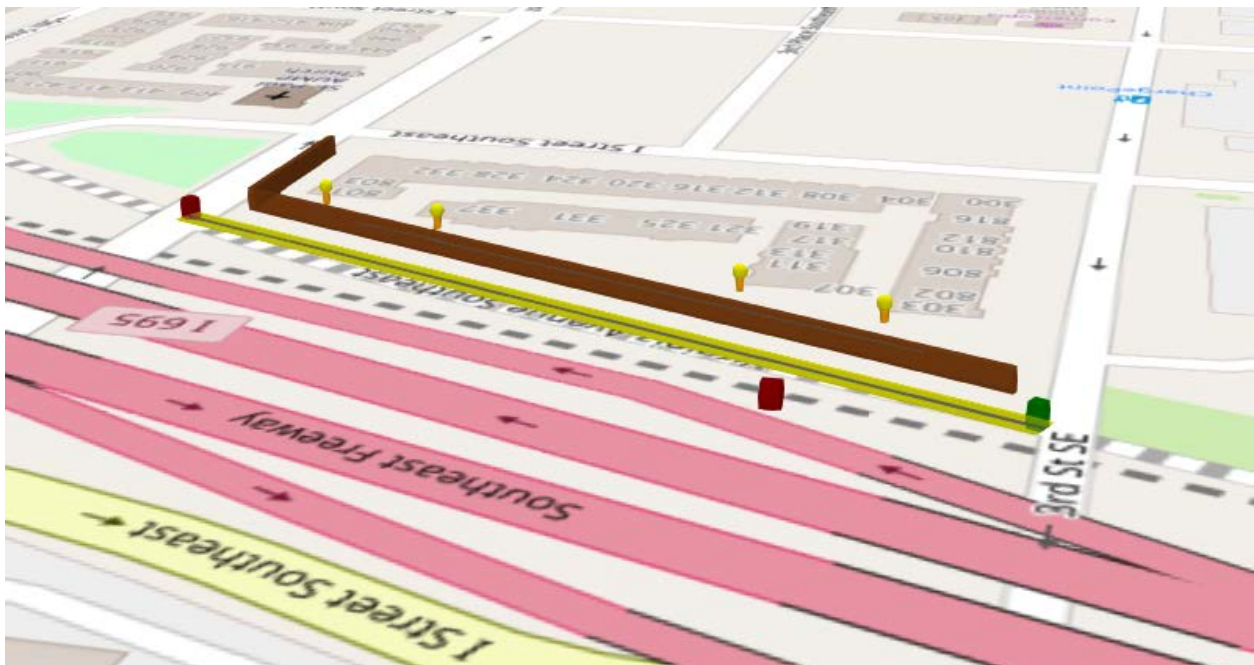


3D View

The 3D View sub-pane displays the map in a three-dimensional format. The 3D view is a three-dimensional representation of the 2D view. Viewing the map in 3D allows you to see contours and heights of terrain.

To view the map in 3D view:

1. Click the 3D View sub-pane. The map will be displayed in a three-dimensional format.
2. Click and hold the right mouse button and drag the mouse to pan the map left or right.
3. Click and hold the middle mouse wheel and drag the mouse to rotate the map on an axis.
4. Click and Hold the left mouse button and drag the mouse to zoom in and zoom the map.

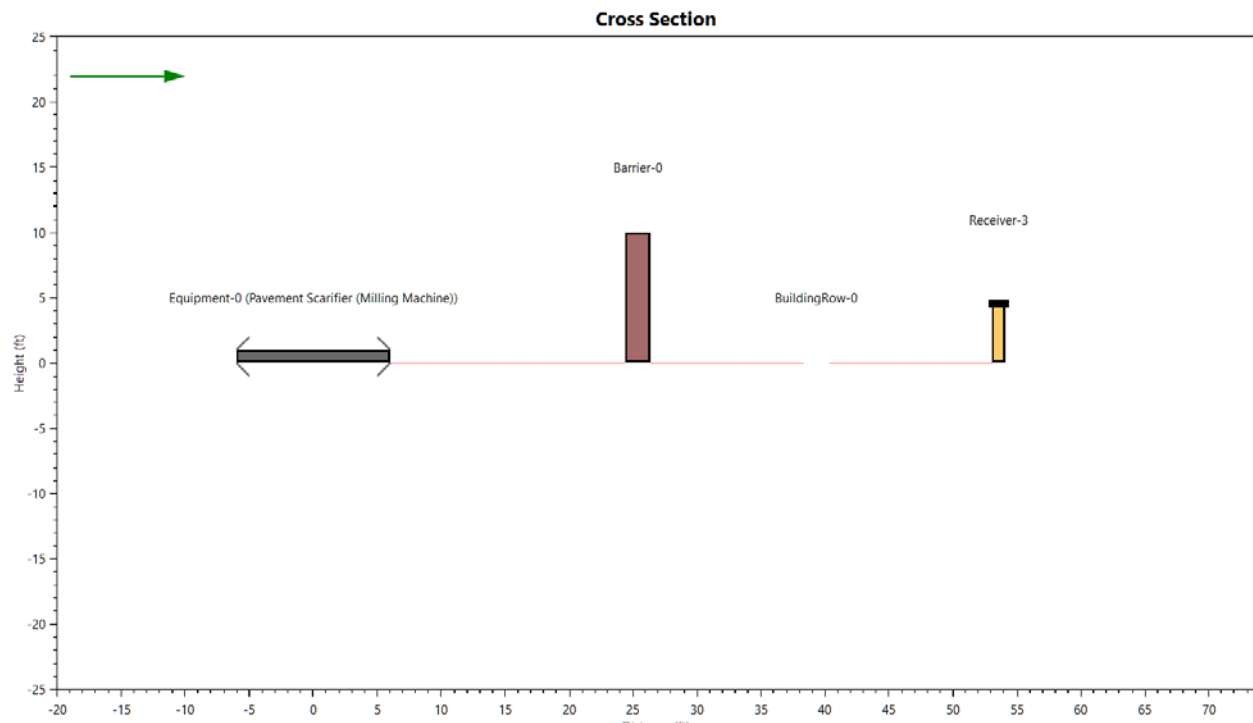


Section View

The Section View sub-pane displays a cross section of the map where sector lines have been drawn using the Start Selection Function. The Section View is used to show distances and elevation changes.

To view the map in Section view:

1. Click the Section View sub-pane. The Section view will display a chart of the sectors that have been drawn.
2. Click the left mouse button on a sector line to get distance/height measurements.
3. Roll the mouse wheel to zoom in and out of the section view.
4. Click and hold the middle mouse wheel and drag the mouse creating a polygon section view of the sector line.
5. Click and Hold the right mouse button and drag the mouse to adjust the distance/height of the sector lines.



Report View

The Report View sub-pane displays reports for the open project.

To view the Report view:

1. Click the Report View sub-pane. A list of reports will be displayed.
2. Use the toolbar buttons on the Report view to scroll pages, print reports, save, etc.

REPORT:			Equipment		
TNM VERSION:	2.0	REPORT DATE:	28 December 2018		
CALCULATED WITH:	2.0	CALCULATION DATE:	12/28/2018 1:01:41 PM		
CASE:	NCHRP Example 1	ORGANIZATION:			
PATH:		ANALYSIS BY:	aalexander		
CALCULATION SEQUENCE NUMBER:		TNM SERIAL NUMBER:			
		PROJECT/CONTRACT:	NCHRP Example 1		

Roadway Name			Equipment Name			Operation			Coordinates (ground)		
Roadway Name			Name			Operation			X	Y	Z
									[ft]	[ft]	[ft]
Equipment-0			Pavement Scarifier (Milling Machine)			Breaking asphalt			-8571825.00	4704524.00	0.00
Equipment-1			Pump			Idling / Pumping / Pumping Water / Pumping water			-8571789.00	4704524.00	0.00

Equipment	Page 1 of 1	28 December 2018
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Edit Pane

The Edit Pane contains the editing functions for RCNM. To edit a feature, click the Edit tab in the Tools Window. The following editing functions are listed:

-  Receivers
-  Barriers
-  Tree Zones
-  Equipment
-  Terrain Lines
-  Ground Zones
-  Building Rows


Click each function for more information.

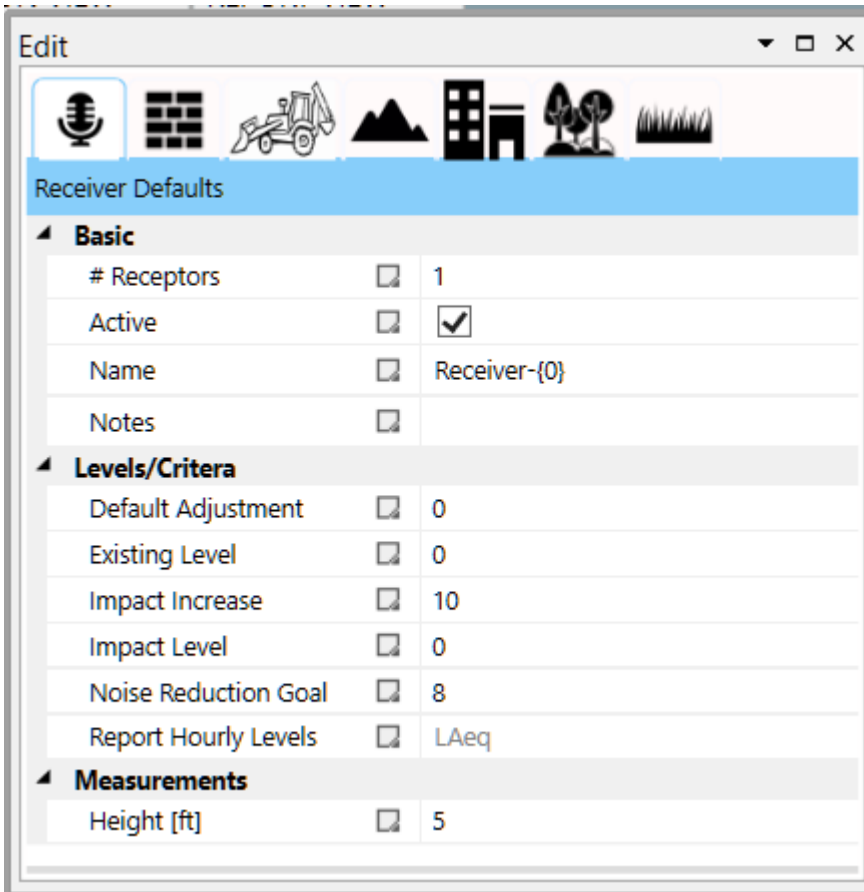
Editing Receivers

The Edit Receivers Pane provides functions to edit receiver defaults for all receivers that **have not** yet been added to the map. Default changes will not apply to receivers that have already been added to the map.

Edit Receivers Pane

To edit receiver defaults:




1. Click the Receiver icon . The Edit Receiver Pane displays listing the receivers that have been added to the map.








Receiver Defaults		
Basic		
# Receptors	<input type="checkbox"/>	1
Active	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Name	<input type="checkbox"/>	Receiver-{0}
Notes	<input type="checkbox"/>	
Levels/Criteria		
Default Adjustment	<input type="checkbox"/>	0
Existing Level	<input type="checkbox"/>	0
Impact Increase	<input type="checkbox"/>	10
Impact Level	<input type="checkbox"/>	0
Noise Reduction Goal	<input type="checkbox"/>	8
Report Hourly Levels	<input type="checkbox"/>	LAeq
Measurements		
Height [ft]	<input type="checkbox"/>	5

2. Click on a receiver to edit it.

To edit the Basic features of a receiver:

1. Enter or use the up/down arrows  in the fill box to change the # of Receptors.
2. Check or Un-check the Inactive check-box.
3. Enter or use the up/down arrows  in the fill box to change the Name of the selected receiver.
4. Enter or use the up/down arrows  in the fill box to change any Notes.

To edit the Levels/Criteria features of a receiver:

1. Enter or use the up/down arrows  in the fill box to change the DefaultAdjustment.
2. Enter or use the up/down arrows  in the fill box to change the Existing Level.
3. Enter or use the up/down arrows  in the fill box to change the Impact Level.
4. Enter or use the up/down arrows  in the fill box to change the ImpactIncrease.
5. Enter or use the up/down arrows  in the fill box to change the Noise Reduction Goal.


To edit the Measurements features of a receiver:

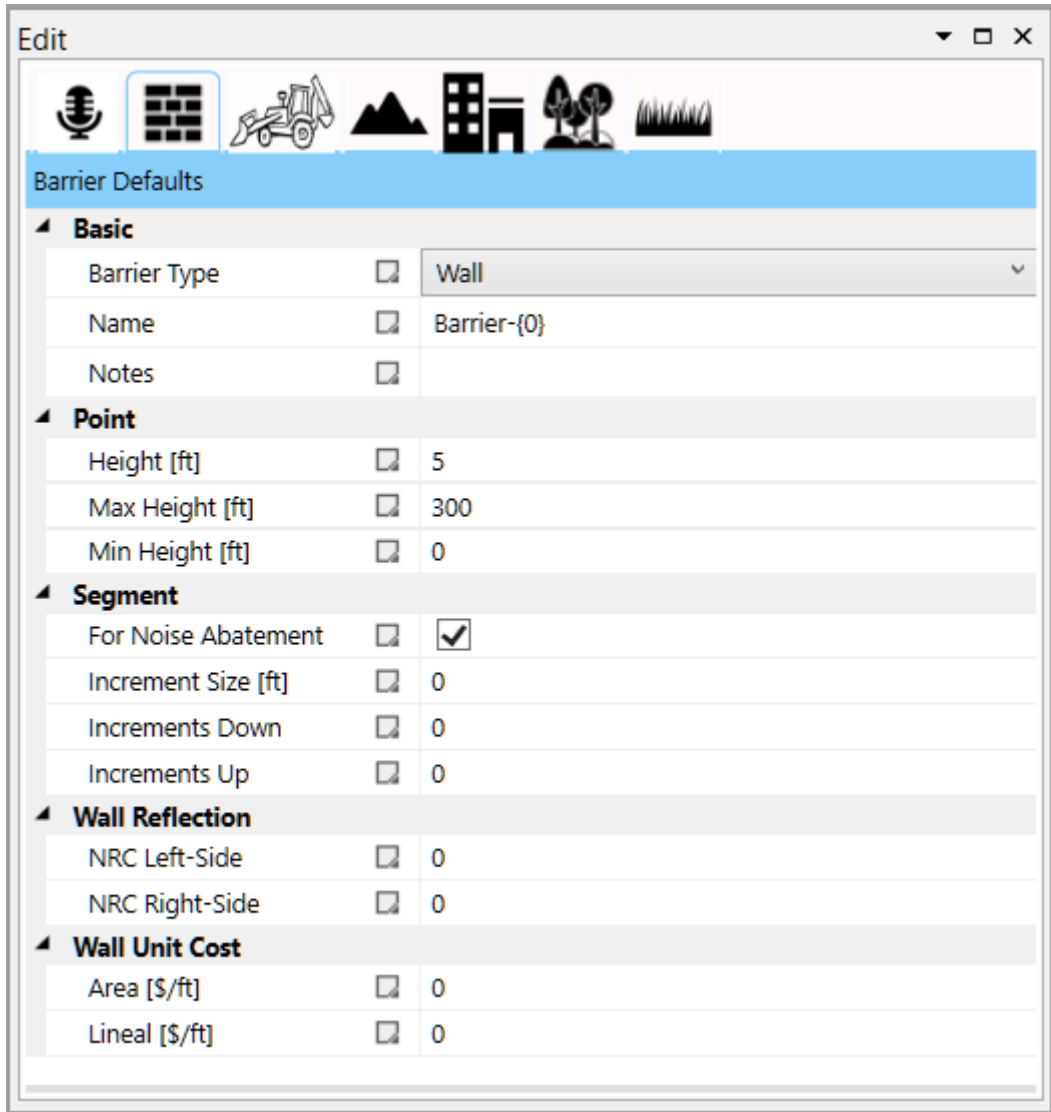
1. Enter or change the height of the selected receiver.

Editing Barrier Defaults

The Edit Barriers Pane provides functions to edit barrier defaults for all barriers that **have not** yet been added to the map. Default changes will not apply to barriers that have already been added to the map.


Edit Barriers Pane

To edit barrier defaults, click the Barrier icon . The Edit Barrier Pane displays listing the barrier defaults.






Barrier Defaults		
Basic		
Barrier Type	<input type="checkbox"/>	Wall
Name	<input type="checkbox"/>	Barrier-{0}
Notes	<input type="checkbox"/>	
Point		
Height [ft]	<input type="checkbox"/>	5
Max Height [ft]	<input type="checkbox"/>	300
Min Height [ft]	<input type="checkbox"/>	0
Segment		
For Noise Abatement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Increment Size [ft]	<input type="checkbox"/>	0
Increments Down	<input type="checkbox"/>	0
Increments Up	<input type="checkbox"/>	0
Wall Reflection		
NRC Left-Side	<input type="checkbox"/>	0
NRC Right-Side	<input type="checkbox"/>	0
Wall Unit Cost		
Area [\$ /ft]	<input type="checkbox"/>	0
Lineal [\$ /ft]	<input type="checkbox"/>	0




To edit the Basic features of a barrier:

1. Enter or use the up/down arrows  in the fill box to select the Barrier Type.
2. Enter or change the Name of the barrier.
3. Enter or change any Notes about the barrier.



To edit the Point features of a barrier:

1. Enter or use the up/down arrows  in the fill box to select the Height in feet (ft).
2. Enter or use the up/down arrows  in the fill box to select the Max Height (ft).
3. Enter or use the up/down arrows  in the fill box to select the Min Height (ft).



To edit the Segment features of a barrier:

1. Check or un-check the check-box to apply the For Noise Abatement feature.
2. Enter or use the up/down arrows  in the fill box to increase or decrease the Increment Size (ft).
3. Enter or use the up/down arrows  in the fill box to increase or decrease the Increments Down.
4. Enter or use the up/down arrows  in the fill box to increase or decrease the Increments Up.

To edit the Wall Reflection features of a barrier:

1. Enter or use the up/down arrows  in the fill box to increase or decrease the NRC left.
2. Enter or use the up/down arrows  in the fill box to increase or decrease the NRC right.

To edit the Wall Unit Cost of a barrier:

1. Enter or use the up/down arrows  in the fill box to increase or decrease the Area dollar amount per foot (\$/ft).
2. Enter or use the up/down arrows  in the fill box to increase or decrease the Lineal (\$/ft).


NOTE: several barrier features, such as perturbation increments, and the number of up and down increments can be edited but have no effect on the analysis since the Barrier Design function is not active in RCNM 2.0.

Editing Equipment Defaults

The Edit Equipment pane provides functions to edit equipment defaults for all equipment that **have not** yet been added to the map. Default changes will not apply to equipment that has already been added to the map.

Edit Equipment Pane



To edit equipment defaults, click the Equipment icon . The Edit Equipment Pane displays listing the equipment defaults.



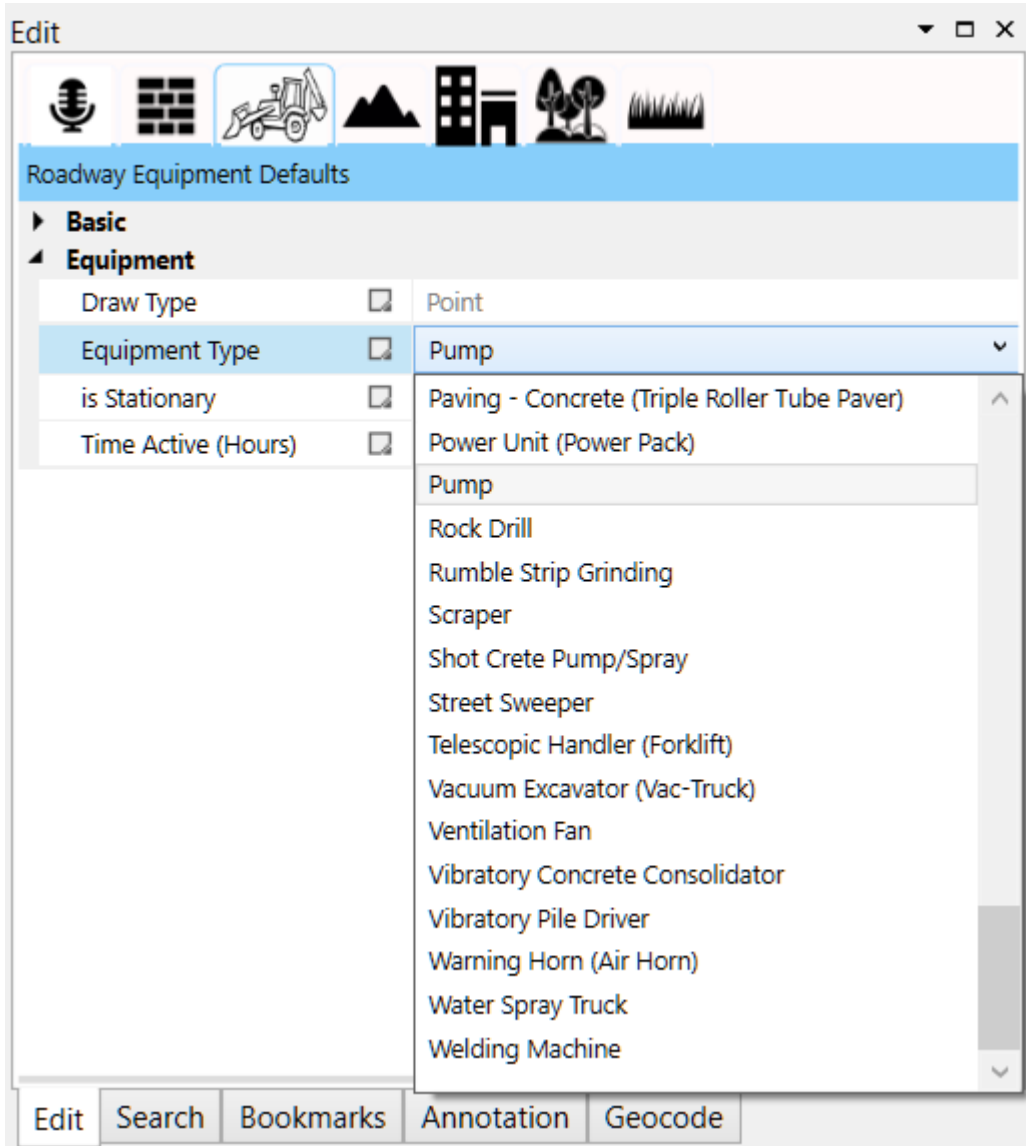
The screenshot shows the 'Edit' window with the 'Equipment' tab selected. The 'Roadway Equipment Defaults' section is expanded, showing the following settings:


Property	Value
Draw Type	<input type="checkbox"/> Point
Equipment Type	<input type="checkbox"/> Pump
is Stationary	<input type="checkbox"/> True
Time Active (Hours)	<input type="checkbox"/> 2

At the bottom of the window, there are five tabs: Edit, Search, Bookmarks, Annotation, and Geocode.

To edit the Basic features of equipment:

1. Choose the type of equipment to add to the model by clicking on the box adjacent to Equipment Type and clicking on the type of equipment to analyze. RCNM categorizes equipment into point sources and line sources. Adding point source equipment, such as a pump, results in RCNM drawing a 10' long roadway to represent the equipment. The user can rotate the equipment or lengthen the segment as desired using the edit functions. Adding a line source piece of equipment, such as a street sweeper, requires that the user click on the beginning and end points of the area of activity.



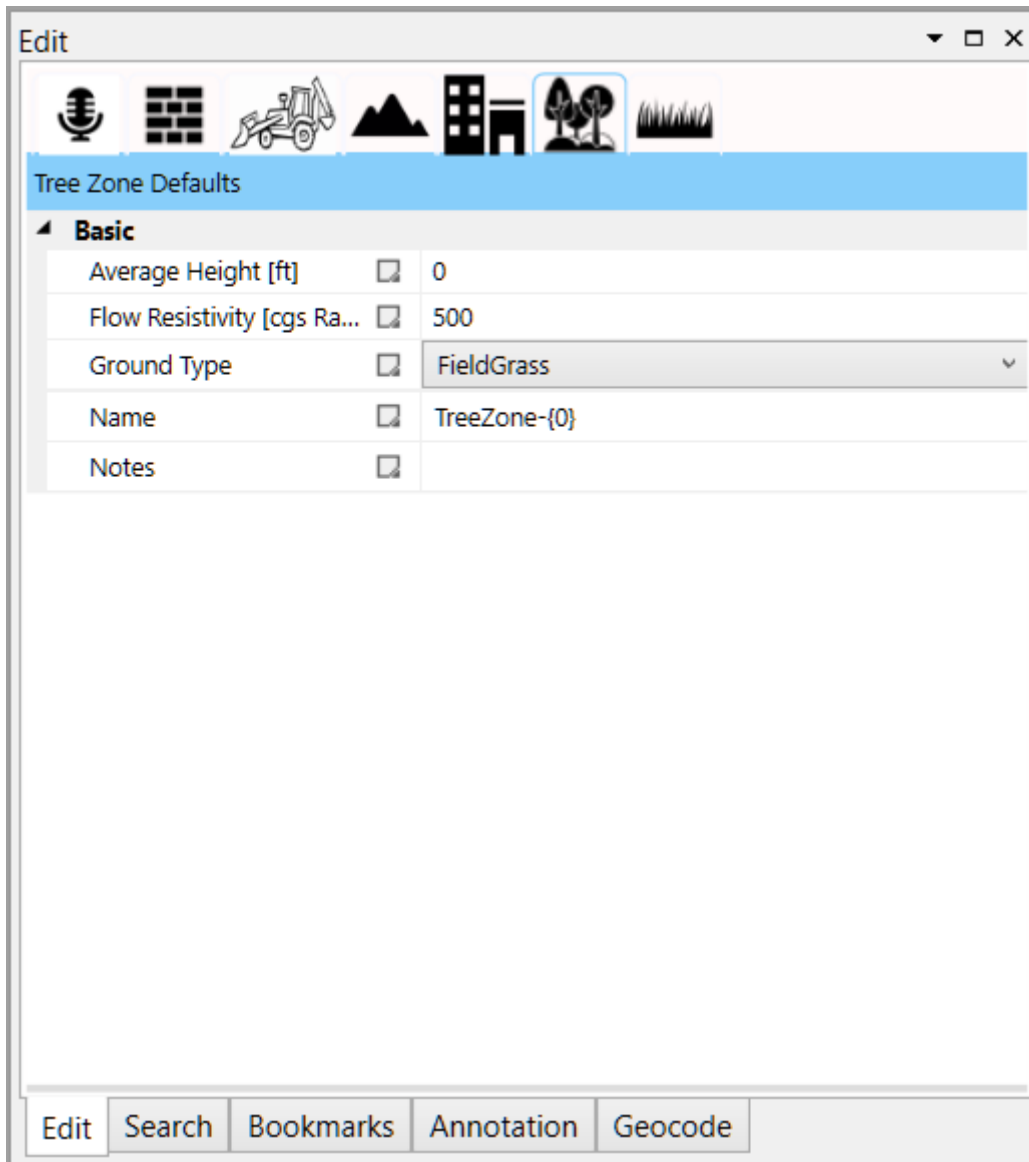
2. Enter or use the up/down arrows  in the fill box to select the Time Active.
3. Enter or change the Name of the equipment.

Editing Tree Zone Defaults

The Edit Tree Zones pane provides functions to edit tree zone defaults for all tree zones that **have not** yet been added to the map. Default changes will not apply to tree zones that have already been added to the map.

Edit Tree Zones Pane

To edit tree zone defaults, click the Tree Zone icon . The Edit Tree Zones Pane displays listing the tree zone defaults.






The screenshot shows a software window titled "Edit" with a standard macOS-style title bar (minimize, maximize, close buttons). Inside the window, there is a horizontal toolbar with several icons: a microphone, a brick wall, a bulldozer, a mountain, a city skyline, a tree zone icon (which is highlighted with a blue border), and a grass field. Below the toolbar is a blue header bar labeled "Tree Zone Defaults". Underneath this header is a section titled "Basic" with a small expand/collapse arrow to its left. This section contains a table of default settings:

Average Height [ft]	<input type="checkbox"/>	0
Flow Resistivity [cgs Ra...	<input type="checkbox"/>	500
Ground Type	<input type="checkbox"/>	FieldGrass
Name	<input type="checkbox"/>	TreeZone-{0}
Notes	<input type="checkbox"/>	

Below the table is a large, empty white rectangular area. At the bottom of the window is a horizontal bar containing five buttons: "Edit", "Search", "Bookmarks", "Annotation", and "Geocode".

To edit the Basic features of tree zones:


1. Enter or use the up/down arrows  in the fill box to select the Average Height in feet (ft).

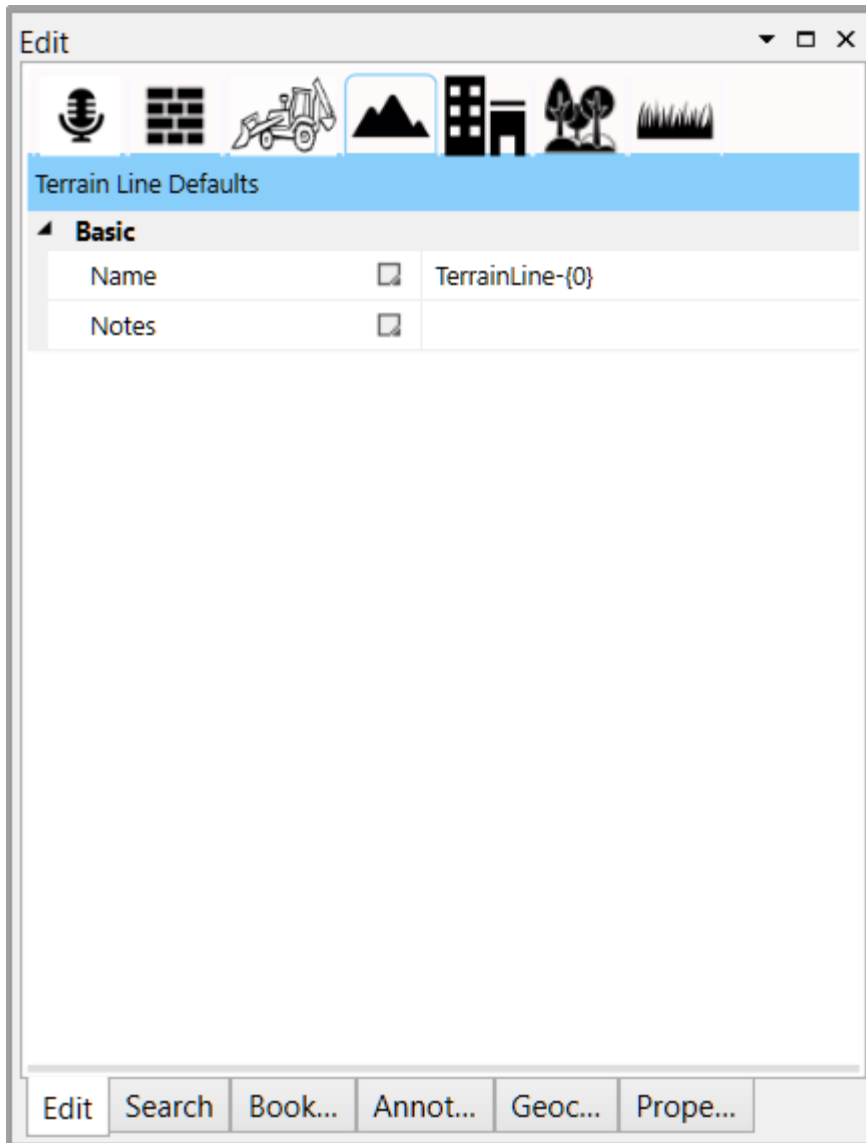
2. Enter or use the up/down arrows  in the fill box to select the Flow Resistivity.
3. Use the drop-down list to select or change the Ground Type. Choose from:
 - Pavement
 - Water
 - HardSoil
 - LooseSoil
 - fieldGrass
 - GranularSnow
 - PowderSnow
 - Custom
4. Enter or use the up/down arrows  in the fill box to select the Average Height in feet (ft).
5. Enter or change the Name of the tree zone.
6. Enter or change any Notes for the tree zone.

Editing Terrain Line Defaults

The Edit Terrain Lines pane provides functions to edit terrain line defaults for all terrain lines that **have not** yet been added to the map. Default changes will not apply to terrain lines that have already been added to the map.

Edit Terrain Lines Pane

To edit terrain line defaults, click the Terrain Line icon . The Edit Terrain Lines Pane displays listing the terrain lines defaults.



The screenshot shows a software window titled "Edit" with standard window controls (minimize, maximize, close). Below the title bar is a toolbar with several icons: a microphone, a grid, a bulldozer, a mountain range (selected), a building, trees, and a grass field. Below the toolbar is a section titled "Terrain Line Defaults" with a blue header. Under this header is a sub-section titled "Basic" with a small triangle icon. Below "Basic" is a table with two rows: "Name" and "Notes". The "Name" row has a checkbox and the text "TerrainLine-{0}". The "Notes" row has a checkbox and is empty. At the bottom of the window is a row of buttons: "Edit", "Search", "Book...", "Annot...", "Geoc...", and "Prope...".

Basic	
Name	<input type="checkbox"/> TerrainLine-{0}
Notes	<input type="checkbox"/>


To edit the Basic features of terrain lines:

1. Enter or change the Name of the terrain line.
2. Enter or change any Notes for the terrain line.

Editing Ground Zone Defaults

The Edit Ground Zones pane provides functions to edit ground zones defaults for all ground zones that **have not** yet been added to the map. Default changes will not apply to ground zones that have already been added to the map.

Edit Ground Zones Pane

To edit Ground Zone defaults, click the Ground Zone icon . The Edit Ground Zones Pane displays listing the ground zone defaults.

Ground Zone Defaults		
Basic		
Name	<input type="checkbox"/>	GroundZone-[0]
Notes	<input type="checkbox"/>	
Ground Info		
Flow Resistivity	<input type="checkbox"/>	0
Ground Type	<input type="checkbox"/>	Custom

To edit the Basic features of ground zones:

1. Enter or change the Name of the ground zone.
2. Enter or change any Notes for the ground zone.


To edit the Ground Info of ground zones

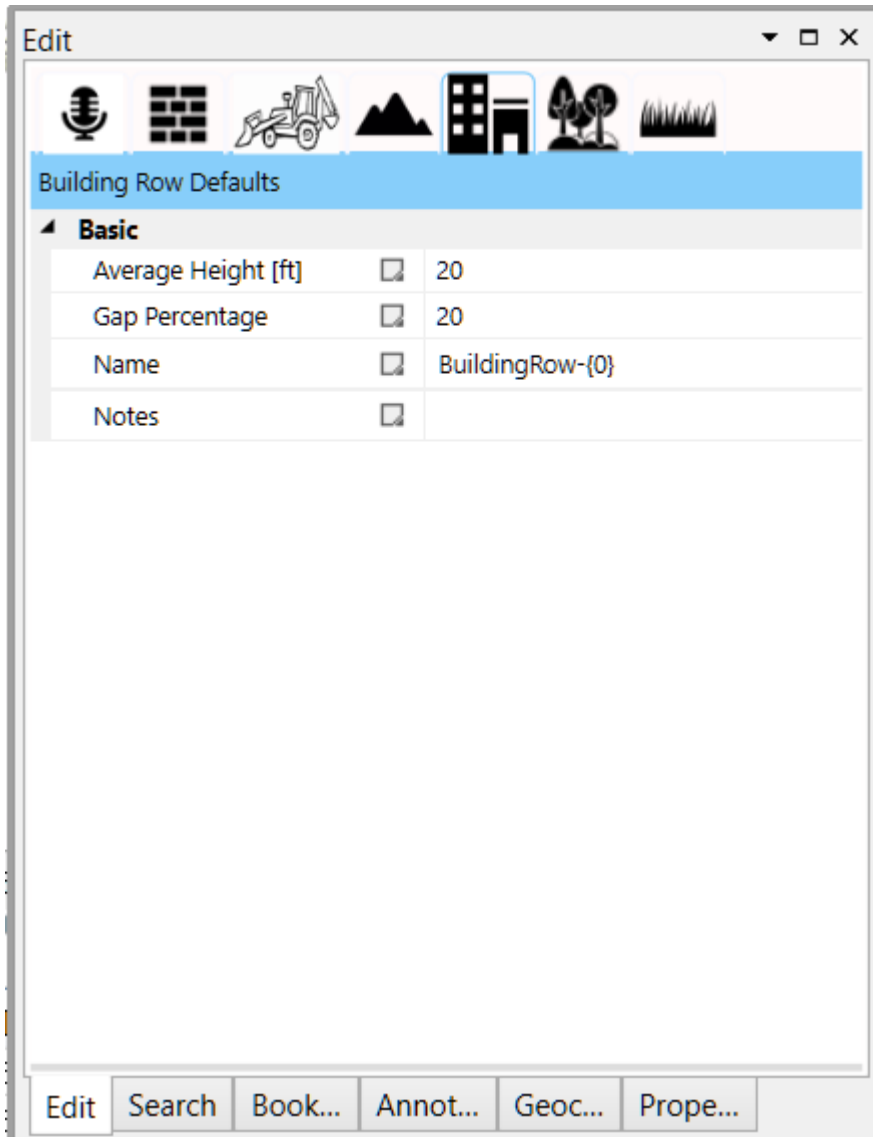
1. Enter or change the value for Flow Resistivity.
2. Select a Ground Type from the pull down-list provided.

Editing Building Row Defaults

The Edit Building Row pane provides functions to edit building row defaults for all building rows that **have not** yet been added to the map. Default changes will not apply to building rows that have already been added to the map.

Edit Building Row Pane

To edit Building Row defaults, click the Building Row icon . The Edit Building Row Pane displays listing the building row defaults.





The screenshot shows a software window titled "Edit" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there is a horizontal toolbar with several icons: a microphone, a grid, a construction vehicle, a mountain, a building (which is highlighted with a blue border), trees, and grass. Below the toolbar is a blue header bar labeled "Building Row Defaults". Underneath this header is a section titled "Basic" with a small expand/collapse arrow to its left. This section contains a table with four rows, each with a checkbox, a label, and a value or field.

Basic		
<input type="checkbox"/>	Average Height [ft]	20
<input type="checkbox"/>	Gap Percentage	20
<input type="checkbox"/>	Name	BuildingRow-{0}
<input type="checkbox"/>	Notes	

At the bottom of the window is a row of buttons: "Edit", "Search", "Book...", "Annot...", "Geoc...", and "Prope...".

To edit the Basic features of building rows:

1. Enter or use the up/down arrows  in the fill box to increase or decrease the Average Height.
2. Enter or use the up/down arrows  in the fill box to increase or decrease the Gap Percentage.

3. Enter or change the Name of the building row.
4. Enter or change any Notes for the building row.

Search Pane

The Search Pane is comprised of four sub-panes including Search, Bookmarks, Annotation, and Geocode functions. Click each sub-pane for more information.

[Search](#)

[Bookmarks](#)

[Annotation](#)

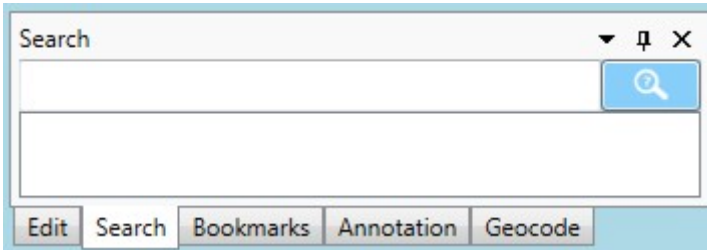
[Geocode Functions](#)


Search Sub-pane

The default active sub-pane is Search, which is used to search for items that have been added to the map.

To search for an item:

1. Click the Search sub-pane in the Tools window. The Search interface appears.



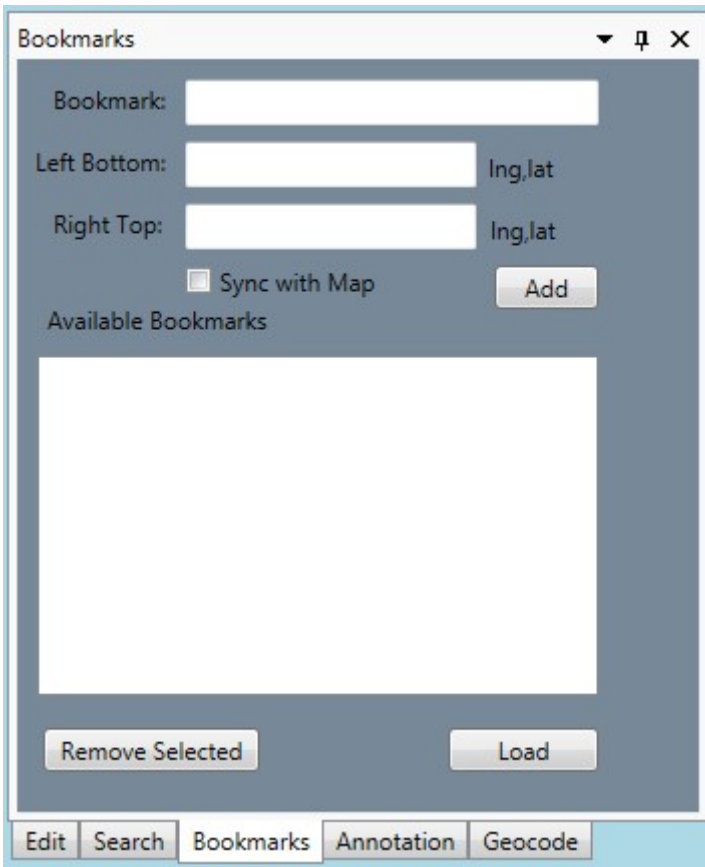
2. Type the name of the item you want to search for.
3. Click the hourglass icon  or hit Enter on the keyboard to begin the search. Results matching your search criteria will display.
4. Click a result to view it on the map.

Bookmarks Sub-pane

The Bookmarks sub-pane is used to create and view bookmarks applied to a project.

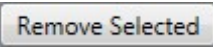

To add a bookmark.

1. Click the Bookmarks sub-pane in the Tools window. The Bookmarks interface appears.

The screenshot shows the 'Bookmarks' sub-pane of a software interface. It has a title bar with a dropdown arrow, a pin icon, and a close button. The main area contains a 'Bookmark:' text label followed by an empty text input field. Below this are two rows: 'Left Bottom:' with an input field and 'Ing,lat' label, and 'Right Top:' with an input field and 'Ing,lat' label. There is a checkbox labeled 'Sync with Map' and an 'Add' button. A large empty rectangular area is labeled 'Available Bookmarks'. At the bottom of the pane are 'Remove Selected' and 'Load' buttons. Below the pane is a tab bar with 'Edit', 'Search', 'Bookmarks' (selected), 'Annotation', and 'Geocode' tabs.

2. Enter a name for your bookmark.
3. Enter the Left Bottom: longitude, latitude of the bookmark location.
4. Enter the Right Top: longitude, latitude of the bookmark location.
5. Check the check-box to sync the location with the map. The bookmark is listed in the Available Bookmarks section.

To Remove and/or Load a bookmark:

1. Click the Remove Selected button  to remove a selected bookmark.
2. Click the Load button  to load a selected bookmark to the map. The map displays the bookmark location.
3. If you are in the Bookmarks sub-pane and Check Sync With map the bookmark screen will update with the current map extent to allow you to save bookmarked extents easily from the map by clicking on the map at a location, you wish to bookmark.

To View bookmarks in the Available Bookmarks pane:

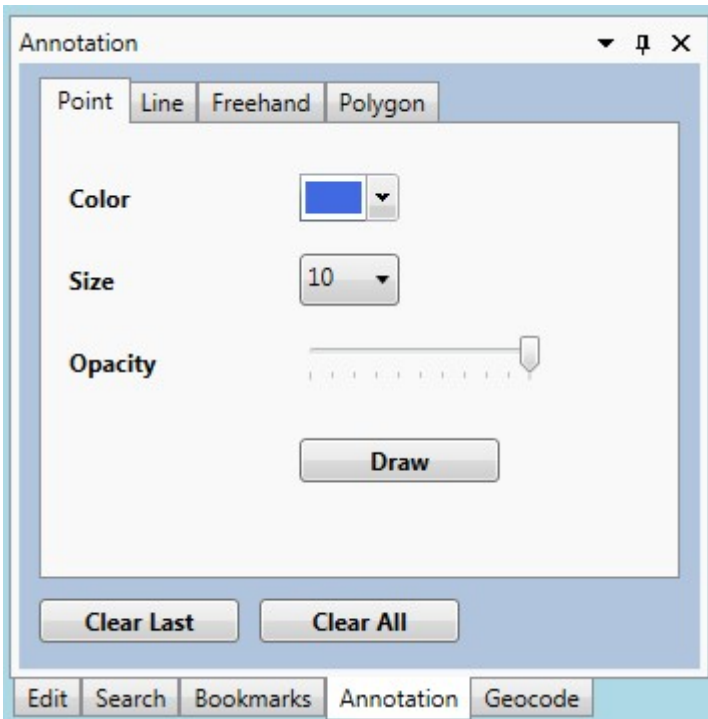
1. Right click on a bookmark. Zoom To, Rename, or Remove functions are listed.
2. Click Zoom To, to zoom to the bookmark on the map.
3. Click Rename to rename the bookmark.
4. Click Remove to remove the bookmark.

Annotation Sub-pane

The Annotation Sub-pane is used to create annotations on the map within a project.

To add an annotation:

1. Click the Annotation sub-pane in the Tools window. The Annotation interface appears.



2. You can choose from a point, line, freehand, or polygon annotation to add to the map.

To add a Point annotation:

1. Select the Point tab.
2. Select a Color.
3. Select a Size.
4. Use the slider bar to increase or decrease the Opacity of the annotation.
5. Click the Draw button.
6. Click a location on the map to enter the point annotation.

To add a Line annotation:

1. Select the Line tab.
2. Select a Color.
3. Select a Size.
4. Use the slider bar to increase or decrease the Opacity of the annotation.
5. Click the Draw button.
6. Left click the mouse at a starting spot to begin drawing a line.
7. Click multiple mid-points to continue drawing the line.

8. Double-click to end the line.

To add a Freehand annotation:

1. Select the Freehand tab.
2. Select a Color.
3. Select a Size.
4. Use the slider bar to increase or decrease the Opacity of the annotation.
5. Click the Draw button.
6. Click and hold the left mouse button and move the pointer around to draw a freehand annotation.
7. Release the left mouse button to end the freehand annotation.

To add a Polygon annotation:

1. Select the Polygon tab.
2. Select a Color.
3. Select a Border Thickness.
4. Select a Border Color.
5. Use the slider bar to increase or decrease the Opacity of the annotation.
6. Click the Draw button.
7. Click a location on the map to enter the polygon annotation.

To Clear Last and Clear All annotations:

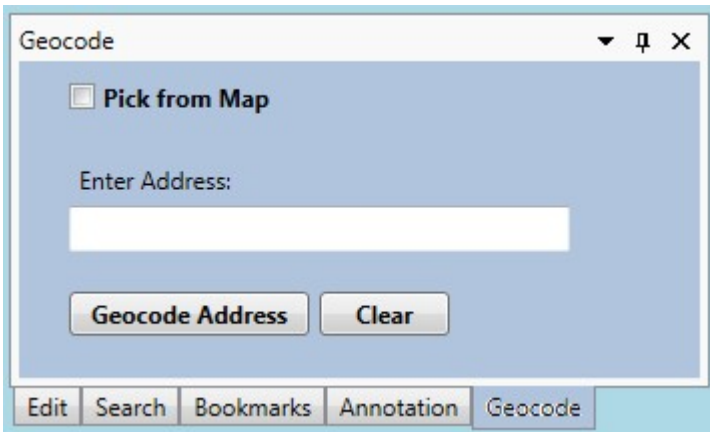
1. Click the Clear Last button to clear the last annotation that was added to the map.
2. Click the Clear All button to clear all annotations that have been added to the map.

Geocode Sub-pane

The Geocode Sub-pane is used to obtain Geocode addresses from a location on the map.

To obtain a Geocode address:

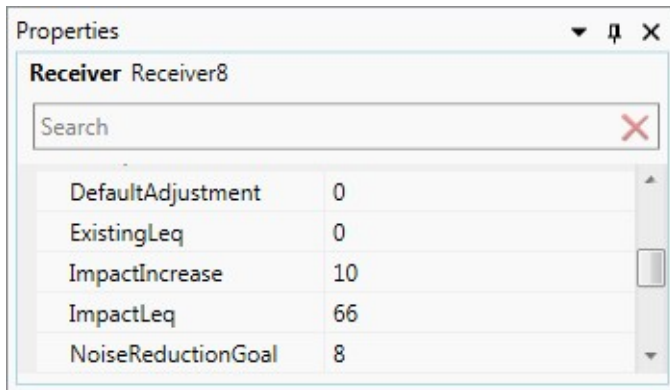
1. Click the Geocode sub-pane in the Tools window. The Geocode interface appears.



2. Check the Pick from Map check-box to obtain a geocode address from a selected point on the map.
3. Click a point on the map. The Geocode Address displays.
4. Enter an address to obtain the Geocode Address from a known address.
5. Click the Geocode Address button. The Geocode Address displays.

Properties Pane

The Properties Pane lists the attributes currently established for each object (feature) that has been added to the project map. The Properties Pane becomes active once the user selects a specific RCNM object. As the user selects different object types, or different objects of the same type, the attributes of each selected object is presented in this Properties Pane.



Object Details Pane

The Object Details Pane list the details for each feature that has been added to the project map. This is like the presentation function of the Properties Pane.

Receivers	Barriers	Equipment	Terrain Lines	Building Rows	Tree Zones	Ground Zones	Contour Zones	Output
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The Detail panes consist of the following sub-panes:

- Receivers
- Barriers
- Terrain Lines
- Tree Zones
- Contour Zones
- Ground Zones
- Building Rows
- User Defined Vehicles
- Output
- Project Information
- Calculation Results

Click each sub-pane for more information.

RCNM Data Entry Efficiency Tips

RCNM provides multiple techniques and tools that assist users in entering the attribute values for objects to reduce the time necessary to set up complex models. Here are a few tips:

- When editing equipment object segment attributes in the lower data grid, RCNM allows users to click the Copy Down button for repetitive Traffic attribute copying and pasting full rows of values.
- RCNM allows the user to select one or more rows from the lower data grid for an object, use Ctrl-C to copy the data, and then in an active MS Excel spreadsheet use Ctrl-P to paste the data into the spreadsheet including the column headings.
- RCNM allows the user when editing Receivers to establish rows of properly structured values in MS Excel, use Ctrl-C to copy the rows of data in MS Excel, and then in the RCNM Receiver data grid the user selects a current row in the Receivers tab, uses Ctrl-P to paste the new row into the table. Please note that due to the need to preserve proper geometries of more complex line and polygon objects, this paste function is limited to only Receivers, whose geometry is a single point, and not the other line and polygon objects.

Receivers Detail Sub-pane

The Receivers Detail sub-pane contains the details for each receiver that has been added to the project map. You can view and edit the Receivers, Level/Criteria, Adjustments 1, Adjustments 2, and Notes of each receiver.

To view and edit the receivers that have been added to the project map:

1. Click the Receivers Detail sub-pane.
2. Click Receivers in the left column to view the list of receivers.
3. Click Level/Criteria in the left column to view and edit the level/criteria of the receivers.
4. Click Adjustments 1 in the left column to view and edit the Adjustments 1 section of the receivers.
 - In the Adjustments 1 section you can Show the receiver in the Plan View, Pair a receiver with a selected equipment segment or edit textual pairing.
5. Click Adjustments 2 in the left column to view and edit the Adjustments 2 section of the receivers.
 - In the Adjustments 2 section you can view the equipment, adjust the dB, and remove existing adjustments.
6. Click Notes in the left column to view and edit notes for the receivers.

Barriers Detail Sub-pane

The Barriers Detail sub-pane contains the details for each barrier that has been added to the project map. You can view and edit the General settings, Points, Segments, Structure, and Reflections of each barrier.

To view and edit the barriers that have been added to the project map:

1. Click the Barriers Detail sub-pane.
2. Click General in the left column to view and edit the general settings of each barrier.
3. Click Points in the left column to view and edit the points of each barrier.
4. Click Segments in the left column to view and edit each point of a barrier.
5. Click Structure in the left column to view and edit the structure of each barrier.
6. Click Reflections in the left column to view and edit the reflections of each barrier.

Equipment Detail Sub-pane

The Equipment Detail sub-pane contains the details for each equipment that has been added to the project map. You can view and edit the Equipment, Points, Segments, and Notes.

To view and edit the equipment that have been added to the project map:

1. Click the Equipment Detail sub-pane.
2. Click Equipment in the left column to view and edit the list of equipment.
3. Click Points in the left column to view and edit the points of each equipment.
4. Click Traffic in the left column to view and edit traffic of each equipment.
5. Click Notes in the left column to view and edit the notes of each equipment.

Terrain Lines Detail Sub-pane

The Terrain Lines Detail sub-pane contains the details for each terrain line that has been added to the project map. You can view and edit the Terrain Lines, General settings, and Notes.

To view and edit the terrain lines that have been added to the project map:

1. Click the Terrain Lines Detail sub-pane.
2. Click Terrain Lines in the left column to view and edit the list of terrain lines.
3. Click Notes in the left column to view and edit the notes of each terrain line.

Tree Zones Detail Sub-pane

The Tree Zones Detail sub-pane contains the details for each tree zone that has been added to the project map. You can view and edit the Tree Zones, Points, and Notes.

To view and edit the tree zones that have been added to the project map:

1. Click the Tree Zones Detail sub-pane.
2. Click Tree Zones in the left column to view and edit the list of tree zones.
3. Click Points in the left column to view and edit the points of each tree zone.
4. Click Notes in the left column to view and edit the notes of each tree zone.

Contour Zones Detail Sub-pane

The Contour Zones Detail sub-pane contains the details for each contour zone that has been added to the project map. You can view and edit the Contour Zones and Points.

To view and edit the contour zones that have been added to the project map:

1. Click the Contour Zones Detail sub-pane.
2. Click Contour Zones in the left column to view and edit the list of contour zones.
3. Click Points in the left column to view and edit the points of each contour zone.

Ground Zones Detail Sub-pane

The Ground Zones Detail sub-pane contains the details for each ground zone that has been added to the project map. You can view and edit the Ground Zones, General settings, and Notes.

To view and edit the ground zones that have been added to the project map:

1. Click the Ground Zones Detail sub-pane.
2. Click Ground Zones in the left column to view and edit the list of ground zones.
3. Click General in the left column to view and edit the general settings of each ground zone.
4. Click Notes in the left column to view and edit the notes of each ground zone.

Building Rows Detail Sub-pane

The Building Rows Detail sub-pane contains the details for each building row that has been added to the project map. You can view and edit the Building Rows, Points, and Notes.

To view and edit the Building Rows that have been added to the project map:

1. Click the Building Rows Detail sub-pane.
2. Click Building Rows in the left column to view and edit the list of building rows.
3. Click Points in the left column to view and edit the points of each building row.
4. Click Notes in the left column to view and edit the notes of each building row.

User Defined Vehicles Detail Sub-pane

The User Defined Vehicles Detail sub-pane contains the details for each user defined vehicle that has been added to the project map. You can view and edit the user defined vehicles.

To view and edit the User Defined Vehicles that have been added to the project map:

1. Click the User Defined Vehicles Detail sub-pane.
2. Click UDVs in the left column to view and edit the list of user defined vehicles.

Output Detail Sub-pane

The Output Detail sub-pane is an application log that provides an idea of what is happening at a given moment. The Output Detail sub-pane lists the details for the outputs that were created for the open project.

Project Information Detail Sub-pane

The Project Information Detail sub-pane lists the project details for the open project.

Calculation Results Detail Sub-pane

The Calculation Results Detail sub-pane lists the calculation results of the noise model operations for the open project after the noise contours have been generated.

Drawing on the Map

To calculate construction noise levels affecting a specific area several items must be drawn on the map. Items that can be drawn on the map are as follows:


- Receivers
- Barriers
- Tree Zones
- Equipment
- Terrain Lines
- Ground Zones
- Building Rows

RCNM uses these items to analyze noise emission levels and provides a way to manipulate the items drawn to cause an effect on the traffic noise levels. Without these specific items added to the map, RCNM could not model noise levels to assist in the design and development of traffic noise barriers. Click each item above to learn how to draw the feature on the map.

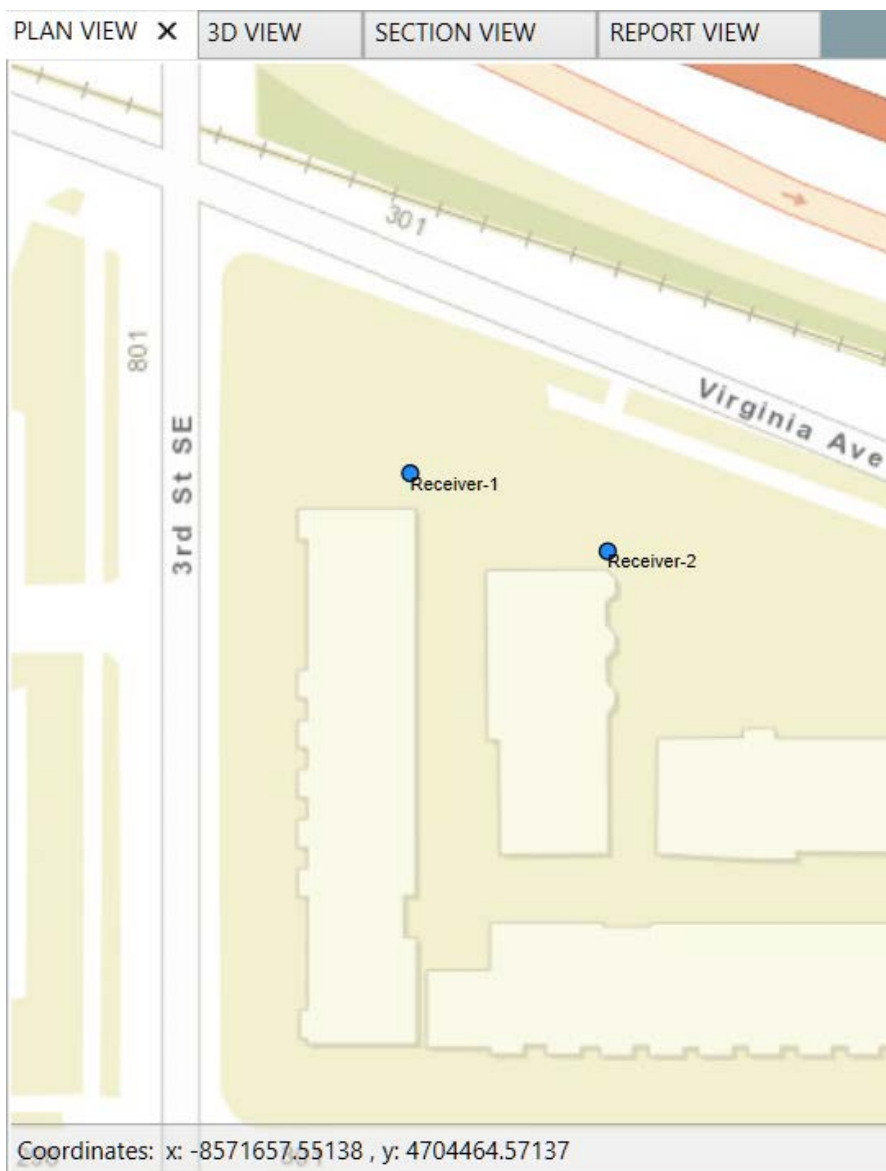
Adding Receivers to the Map

Receivers must be added to the map to calculate noise levels. You can add as many receivers to the map as you want to ensure you capture sound frequencies from all the appropriate locations required to provide a detailed and accurate calculation.

To add a Receiver

1. Click the Receiver icon . The Receiver Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to place a Receiver. A blue circle appears at that point indicating that a Receiver has been applied.

Note: To delete the Receiver, right click on the Receiver point and select Delete.




Now that a Receiver has been added you can edit the details of the Receiver in the Receivers Detail Pane.

Adding Barriers to the Map

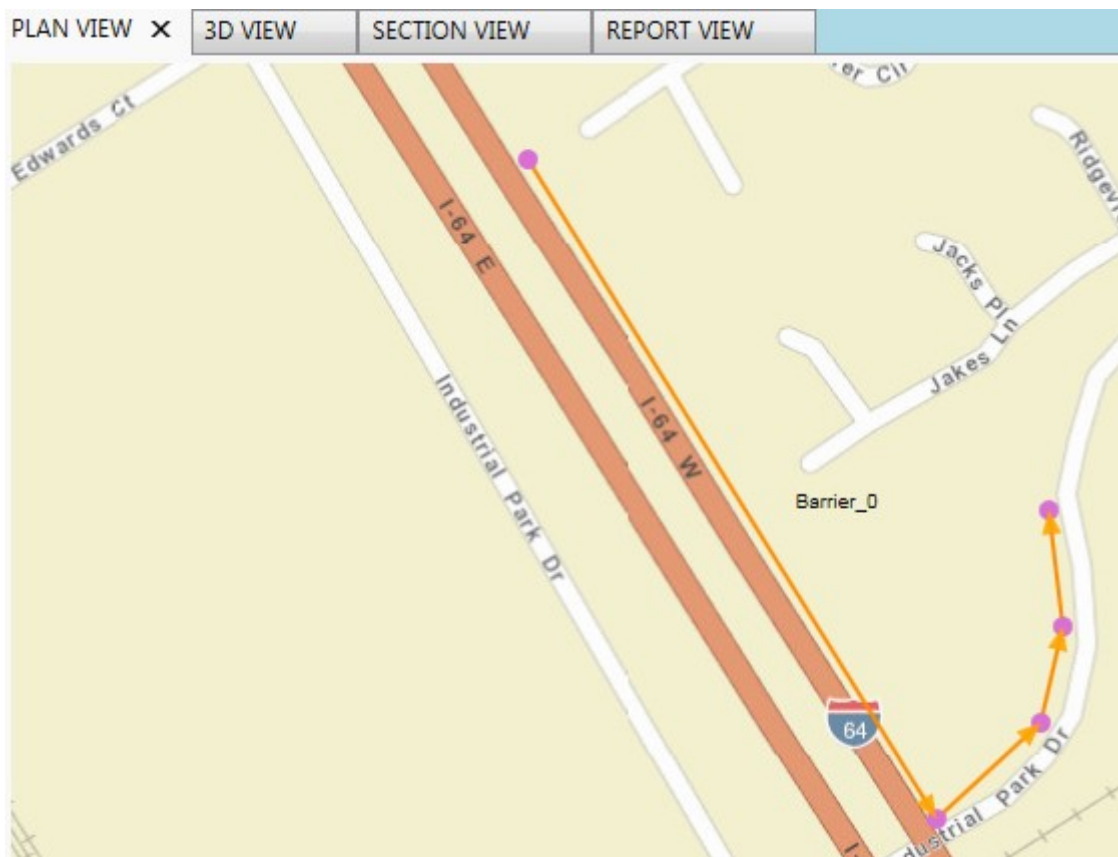
Barriers can be added to the map to help block noise abatements at specific locations or represent large structures such as buildings. Barrier height can be adjusted to produce the desired level of noise abatement.

To add a Barrier



1. Click the Barrier icon . The Barrier Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to begin the Barrier.
3. Continue to hold the "D" key and click a secondary point on the map. A line will appear as you continue to draw the Barrier.
4. Click as many mid-points as you want to draw the Barrier.
5. Double click the end location for the Barrier. An amber directional line and pink circles appear on the map showing the starting point, mid-points, and end indicating the barrier has been applied.

Note: To delete the Barrier, right click on the Barrier and select Delete.




Now that a Barrier has been added you can edit the details of the Barrier in the Barriers Detail Pane.

Adding Tree Zones to the Map

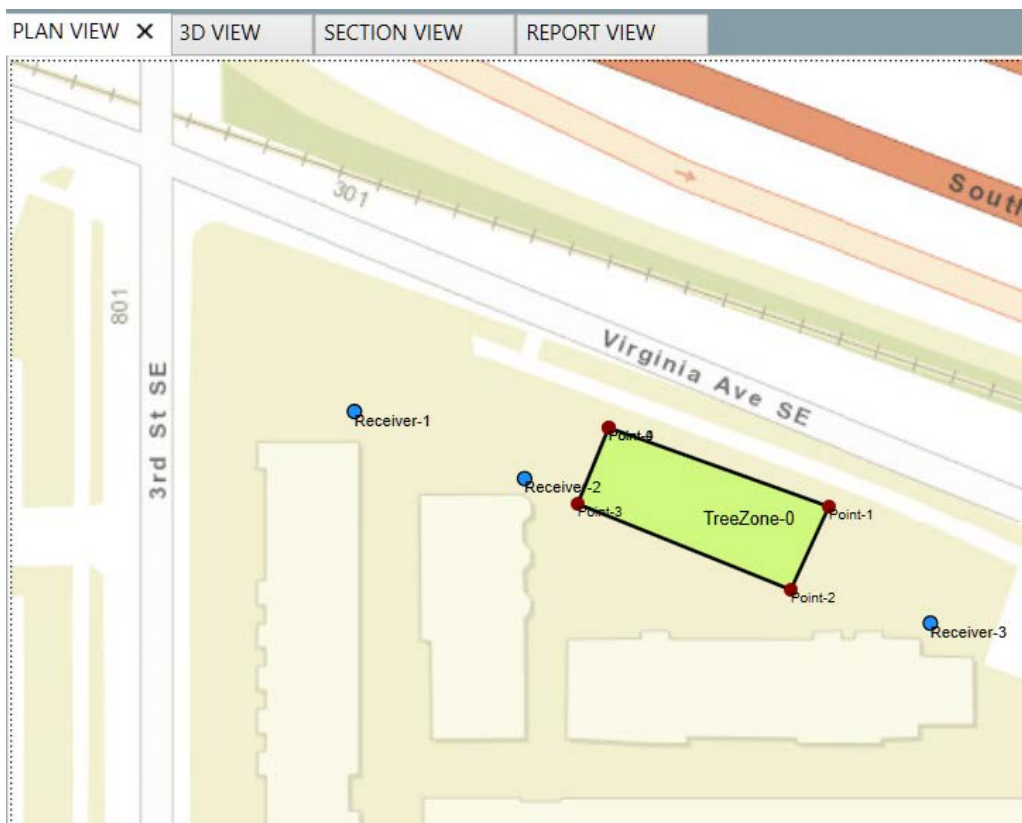
When calculating traffic noise, Tree Zones can be added to the map to help block noise levels at specific locations. Tree Zones are made up of heavy wooded areas and thick undergrowth located between the equipment and the receiver.

To add a Tree Zone



1. Click the Tree Zones icon . The Tree Zones Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to begin the Tree Zone.
3. Continue to hold the "D" key and click a secondary point on the map. A polygon will appear while you continue to draw the Tree Zone.
4. Click as many mid-points as you want to draw the Tree Zone polygon.
5. Double click the end location for the Tree Zone. A yellow polygon with red circles appears on the map showing the Tree Zone and the mid-points indicating the Tree Zone has been applied.

Note: To delete the Tree Zone, right click on the Tree Zone polygon and select Delete.




Now that a Tree Zone has been added you can edit the details of the Tree Zone in the Tree Zones Detail Pane.

Adding a Equipment to the Map

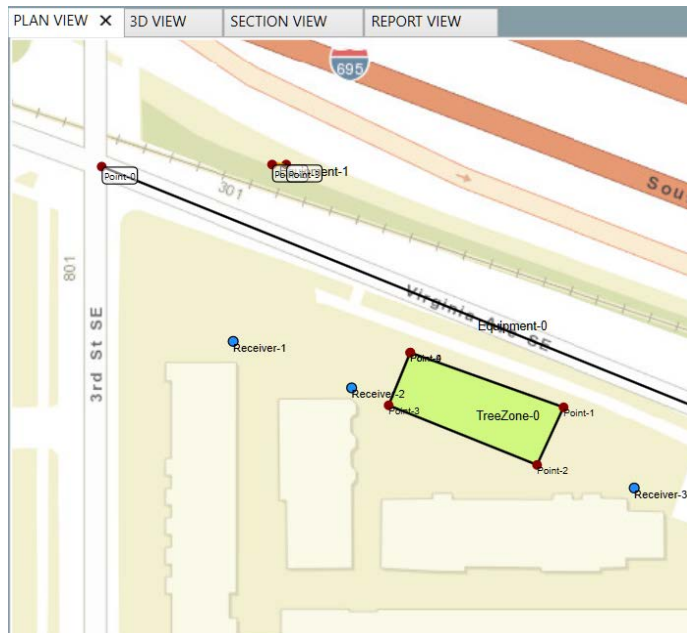
Traffic Noise Levels originate from traffic on equipment. As equipment cycles, the noise emitted increases or decreases based on the use of the equipment. Assign the Time Active in hours to each piece of equipment to represent the total duration the equipment is active during the Analysis Period designated in the project setup.

To add Equipment



1. Click the Equipment icon . The Equipment Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to begin the Equipment.
3. If the Equipment is a point source, such as a generator, the model will draw a 10' segment that the user can rotate as desired to represent the facing of the Equipment.
4. If the Equipment is a line source, such as a paving machine, continue to hold the "D" key and click a secondary point on the map. A line will appear as you continue to draw the path of the Equipment.
5. Click as many mid-points as you want to draw the Equipment.
6. Double click the end location for the equipment. A black directional line and red circles appear on the map showing the starting point, mid-points, and end indicating the Equipment has been applied.

Note: To delete the Equipment, right click on the Equipment and select Delete.




Now that Equipment has been added you can edit the details of the Equipment in the Equipment Detail Pane.

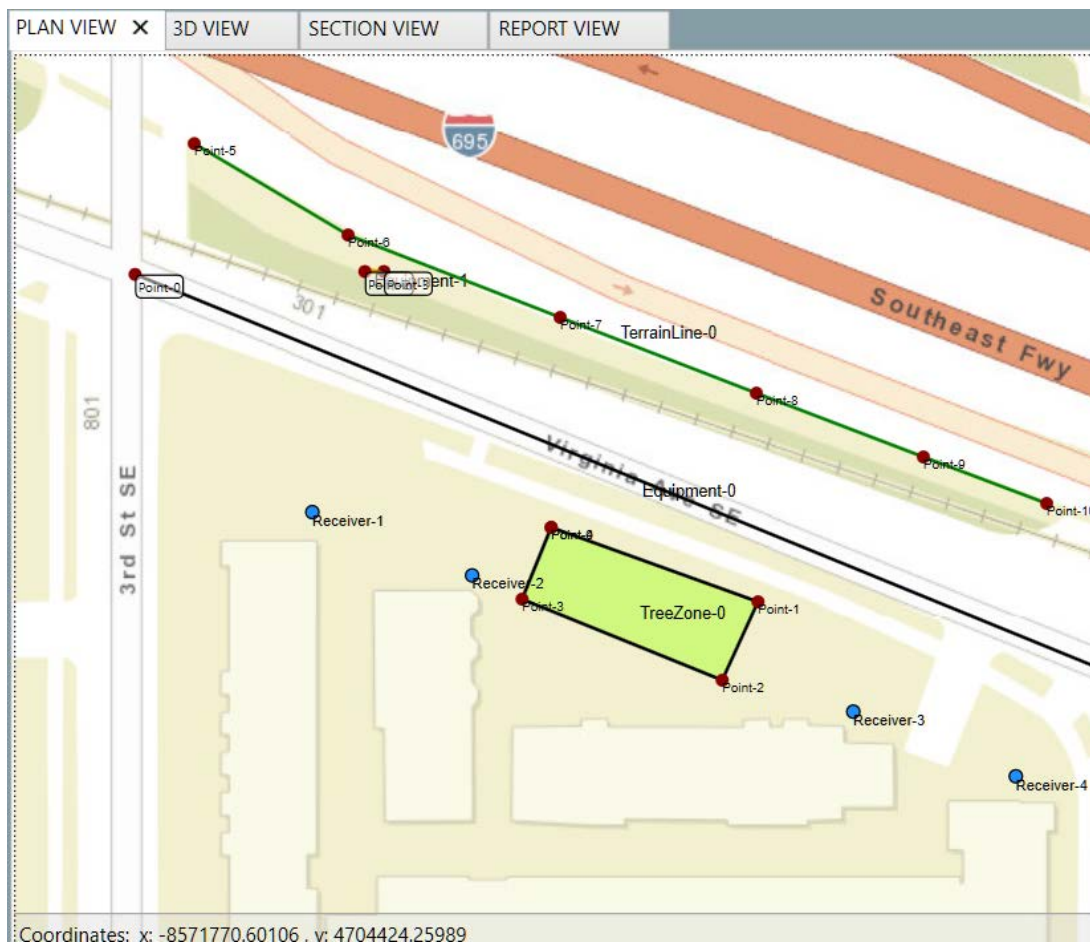
Adding Terrain Lines to the Map

Terrain Lines show the location of surrounding terrain and the horizontal and vertical attributes of the terrain. Terrain lines are used to show where specific areas may be of a certain height or length that they provide barriers or cause an increase in traffic noise levels.

To add a Terrain Line

1. Click the Terrain Line icon . The Terrain Line Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to begin the Terrain Line.
3. Continue to hold the "D" key and click a secondary point on the map. A line will appear as you continue to draw the Terrain Line shape.
4. Click as many mid-points as you want to draw the Terrain Line shape.
5. Double click the end location for the Terrain Line. A polygon with green lines and red circles appear on the map indicating the Terrain Line polygon has been applied.

Note: To delete the Terrain Line, right click on the Terrain Line and select Delete.




Now that a Terrain Line has been added you can edit the details of the Terrain Line in the Terrain Lines Detail Pane.

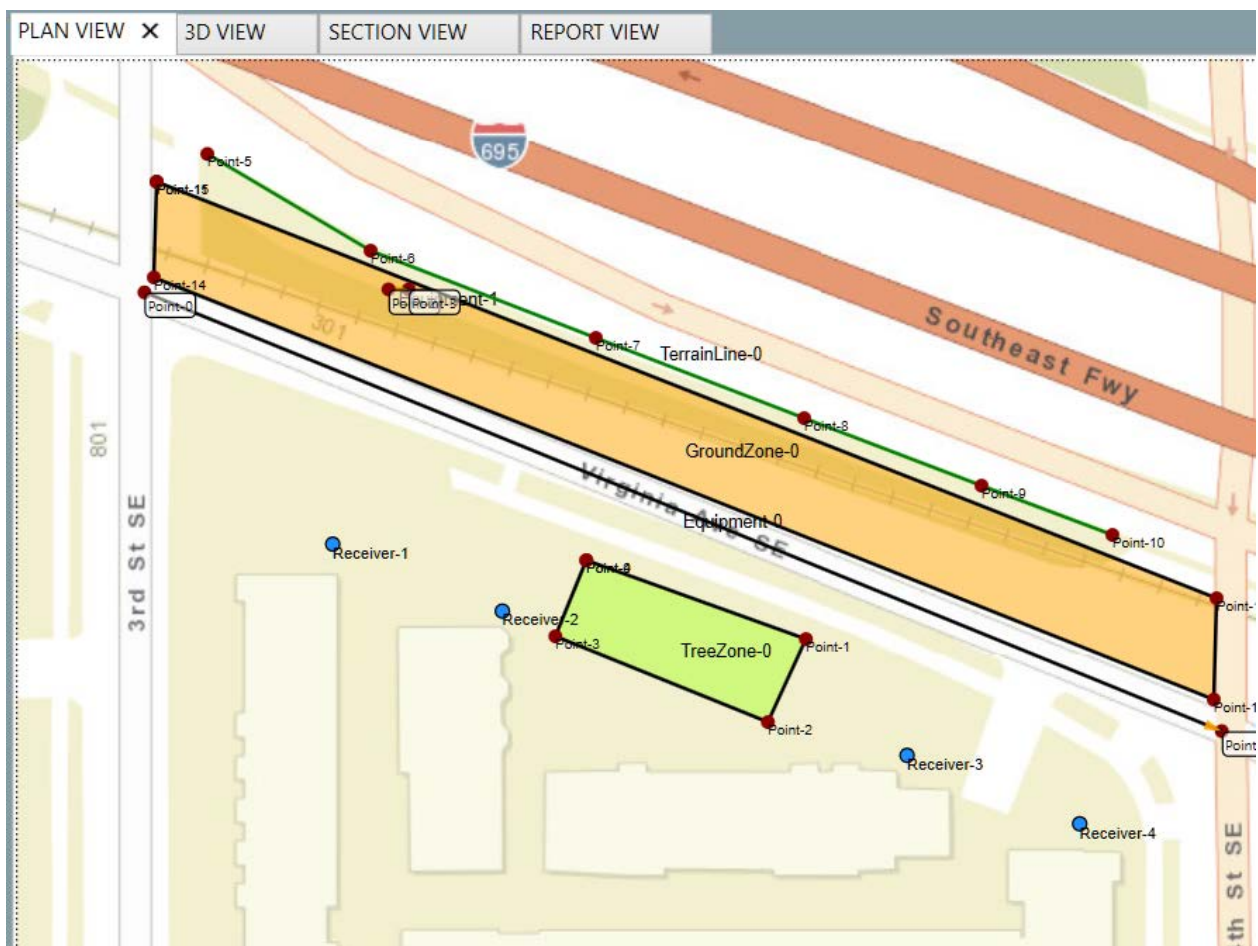
Adding Ground Zones to the Map

Ground Zones are used to define the type of ground. The ground type of an area has varying acoustical attenuation characteristics that are used when calculating traffic noise levels. For example, a grass covered area provides more sound dampening than a paved area.

To add Ground Zones

1. Click the Ground Zone icon . The Ground Zone Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to begin the Ground Zone.
3. Continue to hold the "D" key and click a secondary point on the map. A polygon will appear as you continue to draw the Ground Zone shape.
4. Click as many mid-points as you want to draw the Ground Zone polygon.
5. Double click the end location for the Ground Zone. A yellow filled polygon with black lines and red circles appear on the map indicating the Ground Zone polygon has been applied.

Note: To delete the Ground Zone, right click on the Ground Zone and select Delete.




Now that a Ground Zone has been added you can edit the details of the Ground Zone in the Ground Zones Detail Pane.

Adding Building Rows to the Map

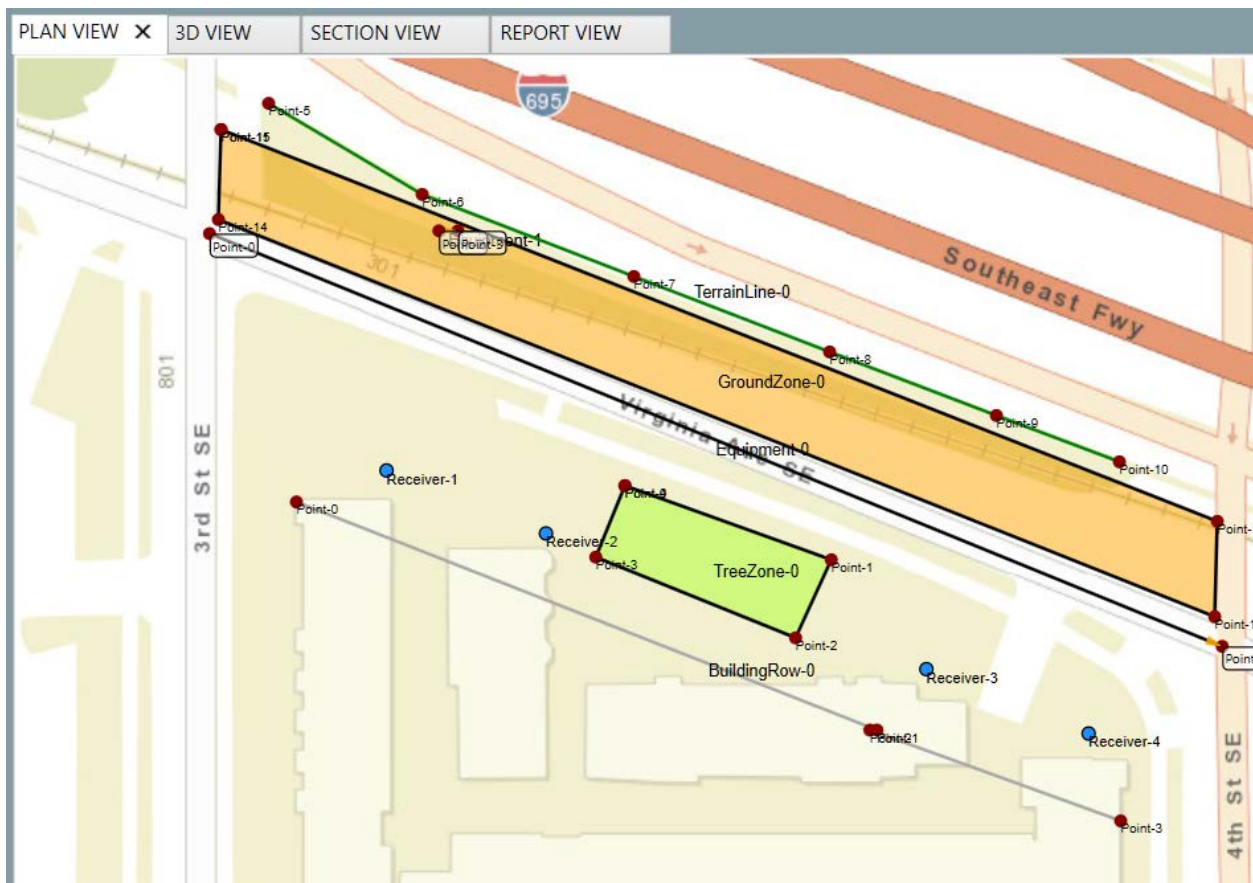
Building Rows consist of rows of buildings between equipment and receivers that act like barriers to reduce sound levels. Building Rows that have gaps allow noise levels to travel through these gaps. Building Rows provide sound dampening but at a decreased level due to these gaps.

To add Building Rows



1. Click the Building Rows icon . The Building Rows Defaults window appears.
2. Hold down the "D" key on the keyboard and click a point on the map where you want to begin drawing the Building Row.
3. Continue to hold the "D" key and click a secondary point on the map. A line will appear as you continue to draw the Building Row shape.
4. Click as many mid-points as needed to create the shape of the Building Row.
5. Double click the end location for the Building Row. Gray lines with red circles in the shape of the building drawn will appear on the map indicating the building row has been applied.

Note: To delete the Building Row, right click on the Building Row and select Delete.



Now that a Building Row has been added you can edit the details of the Building Row in the Building Rows Detail Pane.