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Federal Highway Administration

FILE FORMAT REFERENCE MANUAL

TRAFFIC NOISE MODEL 3.2

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FEDERAL HIGHWAY ADMINISTRATION
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A new file format to save project data was introduced in version 3.0 of the Federal Highway Administration's Traffic Noise Model (FHWA's TNM 3.0). This file format is based on the Extensible markup language (XML) and includes a series of tags to represent objects and their parameters. The original purpose of this file format was to provide a means of exporting and importing project data from TNM 2.5 without including calculated results. In TNM 3.1, the file format was extended to include calculated results and was used to replace the database structure in TNM 3.0. In TNM 3.2, the file format was extended to include construction equipment input data and calculated results. Starting with TNM 3.1, this file format is the primary tool for saving and loading TNM project data.

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INTRODUCTION

A new file format to save project data was introduced in version 3.0 of the Federal Highway Administration's Traffic Noise Model (FHWA's TNM 3.0). This file format is based on the Extensible Markup Language (XML) and includes a series of tags to represent objects and their parameters. The original purpose of this file format was to provide a means of exporting and importing project data from TNM 2.5 without including calculated results. In TNM 3.1, the file format was extended to include calculated results and was used to replace the database structure in TNM 3.0. In TNM 3.2, the file format was extended to include construction equipment input data and calculated results. Starting with TNM 3.1, this file format is the primary tool for saving and loading TNM project data.

This reference guide provides information on each tag in the TNM XML Format (.TXF) file.[1] The following information is provided for each tag:

- Description
- Mandatory[2] or optional
- Type of value (e.g. integer, decimal, string, Boolean, etc.)
- Valid range if applicable (e.g. greater than 0, 1-24, etc.)[3]

Tags have a hierarchy defined by a parent / child relationship. For example, in the tag sequence, <roadways>.<roadway object>, the <roadways> is the parent tag and the <roadway object> is the child tag. The <roadways> tag can hold multiple <roadway object> tags. There is only one <project> tag in a .TXF file and it encapsulates all other tags. It is the parent tag of 12 main tags that encapsulate many other tags used to define the TNM project data. The 12 main tags are:

1. UDV
2. roadways
3. EquipmentCollection
4. receivers
5. groundZones
6. treeZones
7. contourZones
8. terrainLines
9. buildingRows
10. barriers
11. barrierDesigns
12. defaults

[1] Note that there is no difference between "XML" and "TXF" file formats in the context of TNM. "TXF" is the file extension that TNM 3.1 and subsequent versions of TNM assign to models built natively in TNM 3.1 and beyond. This file extension was created to differentiate TNM models from any other non-TNM-related XML files you may have on your computer.
[2] When a tag is listed as mandatory, it is considered mandatory provided that its parent tag exists. In this case, TNM will expect to find this tag. In some cases, TNM can generate this tag when it is not present, but it is not recommended to leave these tags out of a file.
[3] In some cases, there are a large number of valid, but defined entry types, such as for the <coordinateSystem> tag. In these cases, this document provides some examples. Additional examples can be found by creating a project in TNM 3.2 and examining the TXF file.

The <project> tag and each of the 12 main tags are described in separate sections of this reference guide. A minimal example of a .TXF is provided with this guide in the file named "SAMPLE_GEOMETRY_TEMPLATE.TXF".

1.1 SCOPE

This reference document is intended to provide the advanced analyst with an understanding of the TNM file format to help with workflow automation. This reference document describes the tags that are used by TNM to determine the project geometry prior to calculation and to save receiver results. Most tags that are not covered can be understood by using this reference and examining existing TNM files that include the tags; however serialized results (i.e., results stored in a non-human-readable format) are not intended to be read, edited, or generated by any manner other than TNM. See 1.5.3.1.1 for more details. Note, the FHWA's AUTOMATED CONSISTENCY TEST SUITE TOOL uses the tags described in this reference document and not the serialized results.

XML Header

The <xml> tag is required for all XML files. This tag serves as the header line to instruct software like TNM how to read the following file contents. Note that for TNM, the <xml> tag contains information within the tag label, which is highlighted in grey below.

```
<?xml version="1.0" encoding="utf-8"?>
```

PROJECT

The <project> tag contains all other tags. Note that the <project> tag contains information within the tag label, which is highlighted in grey below.

<project xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

The <project> tag includes the following tags with #### inserted to represent tag data.

<calculatedBy>####</calculatedBy>
<savedBy>####</savedBy>
<lastModifiedOn>####</lastModifiedOn>
<AcousticsModel>####</AcousticsModel>
<organization>####</organization>
<SerializationVersion>####</SerializationVersion>
<runTitle>####</runTitle>
<StatePlaneAdjustment>####</StatePlaneAdjustment>
<projectContract>####</projectContract>
<analysisBy>####</analysisBy>
<analysisPeriod>####</analysisPeriod>
<CalculatedMetric>####</CalculatedMetric>
<description>####</description>
<unitOfMeasure>####</unitOfMeasure>
<coordinateSystemType>####</coordinateSystemType>
<coordinateSystemCategory>####</coordinateSystemCategory>
<coordinateSystem>####</coordinateSystem>
<trafficEntryType>####</trafficEntryType>
<relHumid>####</relHumid>
<temperature>####</temperature>
<groundType>####</groundType>
<subSourceHeightDistLimit>####</subSourceHeightDistLimit>
<UDV>####</UDV>
<roadways>####</roadways>
<EquipmentCollection>####</EquipmentCollection>
<receivers>####</receivers>
<groundZones>####</groundZones>
<treeZones>####</treeZones>
<contourZones>####</contourZones>
<terrainLines>####</terrainLines>
<buildingRows>####</buildingRows>
<barriers>####</barriers>
<barrierDesigns>####</barrierDesigns>
<defaults>####</defaults>

<project>.<calculatedBy>

- Description: Indicates the version of TNM used to calculate results
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<savedBy>

- Description: Indicates the version of TNM used to save the project data
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<lastModified>

- Description: Indicates the date and time in which the file was most recently saved
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: string with date and time information, e.g. 2020-07-31T08:40:06.1148298-04:00

<project>.<AcousticsModel>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Serial
- Valid range/list if applicable: Should not be manually created

<project>.<organization>

- Description: Indicates the entity performing the analysis
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<SerializationVersion>

- Description: The serialization version
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Should not be changed outside of TNM

<project>.<runTitle>

- Description: Indicates the project name
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<StatePlaneAdjustment>

- Description: Contains map projection information
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See STATE PLANE ADJUSTMENT

<project>.<projectContract>

- Description: Indicates the contract under which the analysis is being conducted
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<analysisBy>

- Description: Indicates the name of the analyst
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<analysisPeriod>

- Description: Indicates the duration over which construction noise LA_{eq} calculations are computed
- Mandatory or optional: Mandatory for calculation of construction noise levels, Optional for partial project file or roadway noise analysis
- Type of value: Integer
- Valid range/list if applicable: 1 to 24

<project>.<CalculatedMetric>

- Description: Indicates the construction noise report metric
- Mandatory or optional: Mandatory for calculation of construction noise levels, Optional for partial project file or roadway noise analysis
- Type of value: String
- Valid range/list if applicable: “LAeq”, “LAsmax”

<project>.<description>

- Description: Short project description
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<unitOfMeasure>

- Description: Indicates whether the project input data are in English or Metric units
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Undefined, English, Metric

<project>.<coordinateSystemType>

- Description: Indicates coordinate system type
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Cartesian, Geographic, Projected

<project>.<coordinateSystemCategory>

- Description: Indicates coordinate system category, which helps to organize specific coordinate systems
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Examples include Cartesian and StatePlaneNad1983Feet. Others can be found utilizing the TNM 3.2 Category dropdown menu in the Project Settings dialog box.

<project>.<coordinateSystem>

- Description: Indicates the specific coordinate system
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Examples include Cartesian 2D (Feet) and NAD1983StatePlaneAlabamaEastFIPS0101Feet. Others can be found utilizing the TNM 3.2 System dropdown menu in the Project Settings dialog box.

<project>.<trafficEntryType>

- Description: Indicates the roadway noise level report metric, which informs the roadway traffic input format
- Mandatory or optional: Mandatory for roadway noise analysis
- Type of value: String
- Valid range/list if applicable: “LEqualHourly”, “LEqualPercent”, “LDayNight”, “CNEL”

<project>.<relHumid>

- Description: Indicates the percent relative humidity used to compute atmospheric absorption
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0 to 100

<project>.<temperature>

- Description: Indicates the temperature used to compute atmospheric absorption
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: -76 to 140 deg F, -60 to 60 deg C

<project>.<groundType>

- Description: Indicates the default ground in the project area corresponding to a known EFR used to compute ground effects
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Pavement”, “Water”, “HardSoil”, “LooseSoil”, “Lawn”, “FieldGrass”, “GranularSnow”, “PowderSnow”

<project>.<subSourceHeightDistLimit>

- Description: Indicates the distance limit for the line-of-sight check
- Mandatory or optional: Optional, Mandatory for barrier analysis
- Type of value: Decimal
- Valid range/list if applicable: greater than 0

<project>.<UDV>

- Description: Contains all user-defined vehicle tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See UDV

<project>.<roadways>

- Description: Contains all roadway tags
- Mandatory or optional: Mandatory for calculation of roadway noise levels, Optional for partial project file
- Type of value: Tag list
- Valid range/list if applicable: See ROADWAYS

<project>.<EquipmentCollection>

- Description: Contains all equipment tags
- Mandatory or optional: Mandatory for calculation of construction noise levels, Optional for partial project file or roadway noise analysis
- Type of value: Tag list
- Valid range/list if applicable: See EQUIPMENT

<project>.<receivers>

- Description: Contains all receiver tags
- Mandatory or optional: Mandatory for calculation of roadway or construction noise levels, Optional for partial project file
- Type of value: Tag list
- Valid range/list if applicable: See RECEIVERS

<project>.<groundZones>

- Description: Contains all ground zone tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See GROUND ZONES

<project>.<treeZones>

- Description: Contains all tree zone tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See TREE ZONES

<project>.<contourZones>

- Description: Contains all contour zone tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See CONTOUR ZONES

<project>.<terrainLines>

- Description: Contains all terrain line tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See TERRAIN LINES

<project>.<buildingRows>

- Description: Contains all building row tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See BUILDING ROWS

<project>.<barriers>

- Description: Contains all barrier tags
- Mandatory or optional: Optional, Mandatory for barrier analysis
- Type of value: Tag list
- Valid range/list if applicable: See BARRIERS

<project>.<barrierDesigns>

- Description: Contains all barrier design tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See BARRIER DESIGNS

<project>.<defaults>

- Description: Contains all defaults tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See DEFAULTS

STATE PLANE ADJUSTMENT

The <project>.<StatePlaneAdjustment> tag contains a list of tags that are used to describe if and how an adjustment should be applied to default state plane base maps. The <project>.<StatePlaneAdjustment> tag includes the tags shown below with #### inserted to represent tag data.

```
<IsEnabled>####</IsEnabled>
<MaintainAspectRatio>####</MaintainAspectRatio>
<StatePlaneAdjustmentType>####</StatePlaneAdjustmentType>
<X>####</X>
<Y>####</Y>
```

<project>.<StatePlaneAdjustment>.<IsEnabled>

- Description: Determines whether a state plane adjustment should be applied
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<StatePlaneAdjustment>.<MaintainAspectRatio>

- Description: Indicates whether the x- and y- scales or offsets should be the same
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<StatePlaneAdjustment>.<StatePlaneAdjustmentType>

- Description: Indicates the type of state plane adjustment to be used
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Scale”, “Offset”

<project>.<StatePlaneAdjustment>.<X>

- Description: Describes the scale or offset to be applied to the X coordinate values
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<StatePlaneAdjustment>.<Y>

- Description: Describes the scale or offset to be applied to the Y coordinate values
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

UDV

The <project>.<UDV> tag contains a list of <vehicle> tags that are used to identify user-defined vehicles.

<vehicle>####</vehicle>

<project>.<UDV>.<vehicle>

- Description: Contains all tags for each user-defined vehicle
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.2 for a description of tags under <vehicle>

1.2 DESCRIPTION OF TAGS UNDER <VEHICLE>

Each <project>.<UDV>.<vehicle> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<vehType>####</vehType>
<similarType>####</similarType>
<minLevel>####</minLevel>
<referenceLevel>####</referenceLevel>
<logSlope>####</logSlope>

<project>.<UDV>.<vehicle>.<name>

- Description: Indicates the name of the user-defined vehicle
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<UDV>.<vehicle>.<vehType>

- Description: Indicates the type of vehicle
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Other1”, “Other2”, “Other3”, “Other4”, “Other5”

<project>.<UDV>.<vehicle>.<similarType>

- Description: Indicates the default TNM vehicle type upon which the user-defined vehicle spectra is based
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Other#”[4], “Automobiles”, “MediumTrucks”, “HeavyTrucks”, “Bus”, “Motorcycle”

[4] where # is 1, 2, 3, 4 or 5. Used when no UDV exists in the <vehicle> tag.

<project>.<UDV>.<vehicle>.<minLevel>

- Description: Indicates the minimum noise level for the UDV
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<UDV>.<vehicle>.<referenceLevel>

- Description: Indicates the reference noise level for the UDV
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<UDV>.<vehicle>.<logSlope>

- Description: Used to determine regression slope for the UDV
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

ROADWAYS

The <project>.<roadways> tag contains a list of <roadway> tags that are used to define the geometry, traffic, and relationship to barriers and receivers for each roadway object.

<roadway>####</roadway>

<project>.<roadways>.<roadway>

- Description: Contains all information related to a specific roadway object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.3 for a description of tags under <roadway>

1.3 DESCRIPTION OF TAGS UNDER <ROADWAY>

Each <project>.<roadways>.<roadway> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<points>####</points>

<project>.<roadways>.<roadway>.<name>

- Description: Indicates the name of the roadway object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<points>

- Description: Contains list of all points for a specific roadway
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.3.1 for a description of tags under <points>

1.3.1 DESCRIPTION OF TAGS UNDER <POINTS>

Each <project>.<roadways>.<roadway>.<points> tag includes a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of two <point> tags are required to define a roadway linear object.

<point>####</point>

<project>.<roadways>.<roadway>.<points>.<point>

- Description: Indicates the name of the roadway object point
- Mandatory or optional: Mandatory (two or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.3.1.1 for a description of tags under <point>

1.3.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<roadways>.<roadway>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<pointNumber>####</pointNumber>
<theX####</theX>
<15theY>####</15theY>
<theZ>####</theZ>
<roadwayWidth>####</roadwayWidth>
<onStructure>####</onStructure>
<roadType>####</roadType>
<roadCategory>####</roadCategory>
<speedConstraint>####</speedConstraint>
<controlDevice>####</controlDevice>
<percentAffected>####</percentAffected>
<myTraffic>####</myTraffic>

<project>.<roadways>.<roadway>.<points>.<point>.<name>

- Description: Indicates the name of the roadway object point
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for the roadway point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<roadways>.<roadway>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific roadway point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<points>.<point>.<t16heY>

- Description: Indicates the Y-coordinate for a specific roadway point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific roadway point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<roadways>.<roadway>.<points>.<point>.<roadwayWidth>

- Description: Indicates the dimension of the pavement ground zone extending symmetrically from the roadway segment centerline
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<roadways>.<roadway>.<points>.<point>.<onStructure>

- Description: Indicates if roadway is on structure
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<roadways>.<roadway>.<points>.<point>.<roadType>

- Description: Indicates the type of pavement for the roadway segment
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Average”, “DenseGradedAsphalt”, “OpenGradedAsphalt”, “PortlandCementConcrete”

<project>.<roadways>.<roadway>.<points>.<point>.<roadwayCategory>

- Description: Indicates the purpose for the roadway segment (label only; has no impact on the acoustic results)
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Mainline”, “Ramp”, “Shoulder”

<project>.<roadways>.<roadway>.<points>.<point>.<speedConstraint>

- Description: Indicates the slower traffic speed limit on the roadway segment due to a traffic control device
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0; must be less than cruise speeds for all vehicle types on roadway segment (See 1.3.1.1.1.1.1)

<project>.<roadways>.<roadway>.<points>.<point>.<controlDevice>

- Description: Indicates if a flow control device is present on the roadway segment and if so, what kind
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “None”, “StopSign”, “TrafficLight”, “TollBarrier”, “Onramp”

<project>.<roadways>.<roadway>.<points>.<point>.<percentAffected>

- Description: Indicates the percent of vehicles affected by the flow control device on the roadway segment (applies to all vehicle types evenly)
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0 to 100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>

- Description: Contains all traffic data for the roadway segment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.3.1.1.1 for a description of tags under <myTraffic>

1.3.1.1.1 Description of tags under <myTraffic>

Each <project>.<roadways>.<roadway>.<points>.<point>.<myTraffic> tag includes the tags shown below with #### inserted to represent tag data.

<LEQ_P_ADT>####</LEQ_P_ADT>
<LDN_ADT>####</LDN_ADT>
<CNEL_ADT>####</CNEL_ADT>
<DayPercentVolume>####</DayPercentVolume>
<EvePercentVolume>####</EvePercentVolume>

<NightPercentVolume>####</NightPercentVolume>
<vehicleFlowSet>####</vehicleFlowSet>
<TrafficEntryType>####</TrafficEntryType>

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<LEQ_P_ADT>

- Description: Indicates total hourly traffic volume for the LAEQ1h: Percent Volumes, Speeds traffic input format
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<LDN_ADT>

- Description: Indicates total daily traffic volume for the LDN: Day, Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<CNEL_ADT>

- Description: Indicates total daily traffic volume for the Lden: Day, Evening, and Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<DayPercentVolume>

- Description: Indicates percent of total daily traffic during daytime hours when LDN_ADT or CNEL_ADT are used
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<EvePercentVolume>

- Description: Indicates percent of total daily traffic during evening hours when CNEL_ADT is used
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<NightPercentVolume>

- Description: Indicates percent of total daily traffic during nighttime hours when LDN_ADT or CNEL_ADT are used
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>

- Description: Contains the individual vehicle type volumes and speeds for the roadway segment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.3.1.1.1.1 for a description of tags under <vehicleFlowSet>

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<TrafficEntryType>

- Description: Indicates the traffic input format chosen in the Project Settings dialog box
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “LequalHourly”, “LequalPercent”, “LdayNight”, “CNEL”

1.3.1.1.1.1 Description of tags under <vehicleFlowSet>

Each <project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet> tag includes a list of ten <vehicleFlow> child tags as shown below with #### inserted to represent tag data. Each <vehicleFlow> tag represents one of the default or user-defined vehicle types: Automobile, Medium Truck, … Other5.

```
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
```

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>

- Description: Contains the traffic data for a specific vehicle type on the roadway segment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.3.1.1.1.1.1 for a description of tags under <vehicleFlow>

1.3.1.1.1.1.1 Description of tags under <vehicleFlow>

Each <project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow> tag includes the tags shown below with #### inserted to represent tag data.

```
<vehicleType>####</vehicleType>
<leqVHourlyVolume>####</leqVHourlyVolume>
<leqVAverageSpeed>####</leqVAverageSpeed>
<leqPPercent>####</leqPPercent>
<leqPAverageSpeed>####</leqPAverageSpeed>
<ldnPercentDay>####</ldnPercentDay>
<ldnPercentNight>####</ldnPercentNight>
```

<ldnAverageSpeed>####</ldnAverageSpeed>
<cnelPercentDay>####</cnelPercentDay>
<cnelPercentEve>####</cnelPercentEve>
<cnelPercentNight>####</cnelPercentNight>
<cnelAverageSpeed>####</cnelAverageSpeed>

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<vehicleType>

- Description: Indicates the type of vehicle
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Automobiles”, “MediumTrucks”, “HeavyTrucks”, “Bus”, “Motorcycle”, “Other1”, “Other2”, “Other3”, “Other4”, “Other5”

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqVHourlyVolume>

- Description: Indicates hourly volume for the vehicle type on this roadway segment for the LAeq1h: Volumes, Speed traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqVAverageSpeed>

- Description: Indicates speed for the vehicle type on this roadway segment for the LAeq1h: Volumes, Speed traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-99 mph, 0-159 kph

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqPPercent>

- Description: Indicates the percent of the total hourly traffic volume for the vehicle type on this roadway segment for the LAeq1h: Percent Volumes, Speed traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqPAverageSpeed>

- Description: Indicates speed for the vehicle type on this roadway segment for the LAeq1h: Percent Volumes, Speed traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal value between 0 and 99

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<ldnPercentDay>

- Description: Indicates the percent of traffic during daytime hours encompassed by this vehicle type on this roadway segment for the Ldn: Day Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<ldnPercentNight>

- Description: Indicates the percent of traffic during nighttime hours encompassed by this vehicle type on this roadway segment for the Ldn: Day Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<ldnAverageSpeed>

- Description: Indicates speed for this vehicle type on this roadway segment for the Ldn: Day Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelPercentDay>

- Description: Indicates the percent of traffic during daytime hours encompassed by this vehicle type on this roadway segment for the Lden: Day Evening Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelPercentEve>

- Description: Indicates the percent of traffic during evening hours encompassed by this vehicle type on this roadway segment for the Lden: Day Evening Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelPercentNight>

- Description: Indicates the percent of traffic during nighttime hours encompassed by this vehicle type on this roadway segment for the Lden: Day Evening Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelAverageSpeed>

- Description: Indicates speed for this vehicle type on this roadway segment for the Lden: Day Evening Night traffic input format
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-100

EQUIPMENT

The <project>.<EquipmentCollection> tag contains a list of <equipmentCollection> tags that are used to define the geometry and operation for each construction equipment object.

<equipmentCollection>####</equipmentCollection>

<project>.<EquipmentCollection>.<equipmentCollection>

- Description: Contains all information related to a specific equipment object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.4 for a description of tags under <equipmentCollection>

1.4 DESCRIPTION OF TAGS UNDER <EQUIPMENTCOLLECTION>

Each <project>.<EquipmentCollection>.<equipmentCollection> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<sourceHeight>####</sourceHeight>
<isStationary>####</isStationary>
<comments>####</comments>
<equipmentType>####</equipmentType>
<points>####</points>
<timeActive>####</timeActive>

<project>.<EquipmentCollection>.<equipmentCollection>.<name>

- Description: Indicates the name of the equipment object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<sourceHeight>

- Description: Indicates the vertical distance from the local ground to the measured equipment noise source (e.g., engine exhaust, drive train, impact location, motor, etc.) from which the construction noise propagates
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<EquipmentCollection>.<equipmentCollection>.<isStationary>

- Description: Indicates whether the equipment noise generating activity takes place at a single location in space or while moving throughout space; defines whether equipment will be treated as approximate point or line source
- Mandatory or optional: Mandatory
- Type of value: Boolean

- Valid range/list if applicable: true, false

<project>.<EquipmentCollection>.<equipmentCollection>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<equipmentType>

- Description: Equipment object identifier shown in the Equipment Type dropdown menu in the Edit Pane Equipment Defaults window
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>

- Description: Contains list of all points for a specific equipment object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.4.1 for a description of tags under <points>

<project>.<EquipmentCollection>.<equipmentCollection>.<timeActive>

- Description: Indicates the duration of the noise generating activity for the equipment object
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

1.4.1 DESCRIPTION OF TAGS UNDER <POINTS>

Each <project>.<EquipmentCollection>.<equipmentCollection>.<points> tag includes a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of two <point> tags are required to define a non-stationary equipment object. Exactly two <point> tags are required to define a stationary equipment object.

<point>####</point>

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>

- Description: Indicates the name of the equipment object point
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.4.1.1 for a description of tags under <point>

1.4.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<pointNumber>####</pointNumber>
<theX####</theX>
<25theY>####</25theY>
<theZ>####</theZ>
<roadwayWidth>####</roadwayWidth>
<onStructure>####</onStructure>
<operation>####</operation>
<speedConstraint>####</speedConstraint>
<controlDevice>####</controlDevice>
<percentAffected>####</percentAffected>
<myTraffic>####</myTraffic>

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<name>

- Description: Indicates the name of the equipment point object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for the equipment point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific equipment point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<25theY>

- Description: Indicates the Y-coordinate for a specific equipment point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific equipment point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<roadwayWidth>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<onStructure>

- Description: Indicates if equipment is on structure
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<operation>

- Description: Explanation of equipment noise generating activity to contextualize stationary or non-stationary designation in <isStationary>
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<speedConstraint>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<controlDevice>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: “None”, “StopSign”, “TrafficLight”, “TollBarrier”, “Onramp”

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<percentAffected>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: 0 to 100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See 1.4.1.1.1 for a description of tags under <myTraffic>

1.4.1.1.1 Description of tags under <myTraffic>

Each <project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic> tag includes the tags shown below with #### inserted to represent tag data.

```
<LEQ_P_ADT>####</LEQ_P_ADT>
<LDN_ADT>####</LDN_ADT>
<CNEL_ADT>####</CNEL_ADT>
<DayPercentVolume>####</DayPercentVolume>
<EvePercentVolume>####</EvePercentVolume>
<NightPercentVolume>####</NightPercentVolume>
<vehicleFlowSet>####</vehicleFlowSet>
<TrafficEntryType>####</TrafficEntryType>
```

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<LEQ_P_ADT>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<EquipmentCollection>.<equipmentCollection>.<point>.<myTraffic>.<LDN_ADT>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<CNEL_ADT>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<DayPercentVolume>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<EvePercentVolume>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<NightPercentVolume>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See 1.4.1.1.1.1 for a description of tags under <vehicleFlowSet>

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<TrafficEntryType>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: “LequalHourly”, “LequalPercent”, “LdayNight”, “CNEL”

1.4.1.1.1.1 Description of tags under <vehicleFlowSet>

Each <project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet> tag includes a list of ten <vehicleFlow> child tags as shown below with #### inserted to represent tag data. Each <vehicleFlow> tag represents one of the default or user-defined vehicle types: Automobile, Medium Truck, … Other5.

```
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
<vehicleFlow>####</vehicleFlow>
```

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>

- Description: Deprecated
- Mandatory or optional: Optional

- Type of value: Tag list
- Valid range/list if applicable: See 1.4.1.1.1.1.1 for a description of tags under <vehicleFlow>

1.4.1.1.1.1.1 DESCRIPTION OF TAGS UNDER <VEHICLEFLOW>

Each <project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow> tag includes the tags shown below with #### inserted to represent tag data.

```
<vehicleType>####</vehicleType>
<leqVHourlyVolume>####</leqVHourlyVolume>
<leqVAverageSpeed>####</leqVAverageSpeed>
<leqPPercent>####</leqPPercent>
<leqPAverageSpeed>####</leqPAverageSpeed>
<ldnPercentDay>####</ldnPercentDay>
<ldnPercentNight>####</ldnPercentNight>
<ldnAverageSpeed>####</ldnAverageSpeed>
<cnelPercentDay>####</cnelPercentDay>
<cnelPercentEve>####</cnelPercentEve>
<cnelPercentNight>####</cnelPercentNight>
<cnelAverageSpeed>####</cnelAverageSpeed>
```

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<vehicleType>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: “Automobiles”, “MediumTrucks”, “HeavyTrucks”, “Bus”, “Motorcycle”, “Other1”, “Other2”, “Other3”, “Other4”, “Other5”.

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqVHourlyVolume>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqVAverageSpeed>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-99 mph, 0-159 kph

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqPPercent>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<leqPAverageSpeed>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal value between 0 and 99

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<ldnPercentDay>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<ldnPercentNight>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<ldnAverageSpeed>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelPercentDay>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelPercentEve>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelPercentNight>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

<project>.<EquipmentCollection>.<equipmentCollection>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow>.<cnelAverageSpeed>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-100

RECEIVERS

The <project>.<receivers> tag contains a list of <receiver> tags that are used to define the geometry, noise level impact analysis attributes, and barrier attenuation benefit analysis attributes, as well as store noise level results for each receiver object.

<receiver>####</receiver>

<project>.<receivers>.<receiver>

- Description: Contains all information related to a specific receiver object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5 for a description of tags under <receiver>

1.5 DESCRIPTION OF TAGS UNDER <RECEIVER>

Each <project>.<receivers>.<receiver> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<sequenceNumber>####</sequenceNumber>
<heightAboveTerrain>####</heightAboveTerrain>
<dwellingUnits>####</dwellingUnits>
<defaultAdjustment>####</defaultAdjustment>
<noiseReductionGoal>####</noiseReductionGoal>
<existingLEQ>####</existingLEQ>
<impactLEQ>####</impactLEQ>
<impactIncrease>####</impactIncrease>
<inactive>####</inactive>
<roadAdjustmentSet>####</roadAdjustment>
<points>####</points>
<ReceiverResults>####</ReceiverResults>
<receiverResultsForEquipment>####</receiverResultsForEquipment>

<project>.<receivers>.<receiver>.<name>

- Description: Indicates the name of the receiver object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<receivers>.<receiver>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String

- Valid range/list if applicable: N/A

<project>.<receivers>.<receiver>.<sequenceNumber>

- Description: Indicates the ID number for the receiver
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than 0; should be unique

<project>.<receivers>.<receiver>.<heightAboveTerrain>

- Description: Indicates the vertical distance from the local ground to the receiver
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<receivers>.<receiver>.<dwellingUnits>

- Description: The number of receptors associated with the receiver
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0-32767

<project>.<receivers>.<receiver>.<defaultAdjustment>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0

<project>.<receivers>.<receiver>.<noiseReductionGoal>

- Description: The desired abatement barrier attenuation at the receiver location
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<receivers>.<receiver>.<existingLEQ>

- Description: Indicates existing 1-hour A-weighted equivalent noise level at the receiver location
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0; other values treated as no entry

<project>.<receivers>.<receiver>.<impactLEQ>

- Description: Indicates 1-hour A-weighted equivalent noise level at which receiver location is considered to be impacted
- Mandatory or optional: Mandatory

- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<receivers>.<receiver>.<impactIncrease>

- Description: Indicates the noise level difference above the existing 1-hour A-weighted equivalent noise level due to the roadway project at which the receiver location is considered to be impacted
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0; other values treated as no entry

<project>.<receivers>.<receiver>.<inactive>

- Description: Indicates whether the receiver is included in the list of "active" receivers
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<roadAdjustmentSet>

- Description: Contains the roadway noise level adjustment factor information for the receiver
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.1 for a description of tags under <roadAdjustmentSet>

<project>.<receivers>.<receiver>.<points>

- Description: Indicates the location of the receiver
- Mandatory or optional: Mandatory (must be exactly one)
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.2 for a description of tags under <points>

<project>.<receivers>.<receiver>.<ReceiverResults>

- Description: Contains the calculated roadway noise level results for the receiver
- Mandatory or optional: Mandatory
  - If no results calculated, use <ReceiverResults xsi:nil="true" />
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3 for a description of tags under <ReceiverResults>

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>

- Description: Contains the calculated construction equipment noise level results for the receiver
- Mandatory or optional: Mandatory
  - If no results calculated, use <receiverResultsForEquipment xsi:nil="true" />
- Type of value: Tag list
- Valid range/list if applicable: See **ERROR! REFERENCE SOURCE NOT FOUND.** For a description of tags under <receiverResultsForEquipment>

1.5.1 Description of tags under <roadAdjustmentSet>

Each <project>.<receivers>.<receiver>.<roadAdjustmentSet> tag includes the tags shown below with #### inserted to represent tag data.

<roadAdjustment>####</roadAdjustment>

<project>.<receivers>.<receiver>.<roadAdjustmentSet>.<roadAdjustment>

- Description: Contains the noise level, roadway object, and roadway segment start point for a given adjustment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.1.1 for a description of tags under <roadAdjustment>

1.5.1.1 Description of tags under <roadAdjustment>

Each <project>.<receivers>.<receiver>.<roadAdjustmentSet>.<roadAdjustment> tag includes the tags shown below with #### inserted to represent tag data.

<factor>####</factor>
<theRoad>####</theRoad>
<thePoint>####</thePoint>

<project>.<receivers>.<receiver>.<roadAdjustmentSet>.<roadAdjustment>.<factor>

- Description: The noise level adjustment to be applied to the noise emissions from the specified roadway and segment start point to be propagated to the receiver
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0.00-99.99

<project>.<receivers>.<receiver>.<roadAdjustmentSet>.<roadAdjustment>.<theRoad>

- Description: The name of the roadway object whose noise emissions are being adjusted
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String matching extant roadway name

<project>.<receivers>.<receiver>.<roadAdjustmentSet>.<roadAdjustment>.<thePoint>

- Description: The roadway segment start point number whose noise emissions are being adjusted
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Integer matching extant roadway point for this roadway

1.5.2 Description of tags under <points>

Each <project>.<receivers>.<receiver> tag includes only one <points> tag, which includes only one <point> tag. This <point> tag includes the tags shown below with #### inserted to represent tag data.

<pointNumber>####</pointNumber>
<OrderingNumber>####</OrderingNumber>
<theX>####</theX>
<36theY>####</36theY>
<theZ>####</theZ>

<project>.<receivers>.<receiver>.<points>.<point>.<pointNumber>

- Description: The sequential number of the receiver object
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer

<project>.<receivers>.<receiver>.<points>.<point>.<OrderingNumber>

- Description: The ordering number of the receiver object
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Must be 0

<project>.<receivers>.<receiver>.<points>.<point>.<theX>

- Description: The X-coordinate of the receiver object
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<receivers>.<receiver>.<points>.<point>.<36theY>

- Description: The Y-coordinate of the receiver object
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<receivers>.<receiver>.<points>.<point>.<theZ>

- Description: The Z-coordinate (i.e., elevation) of the receiver object
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

1.5.3 Description of tags under <ReceiverResults>

Each <project>.<receivers>.<receiver>.<ReceiverResults> tag includes one tag as shown below with #### inserted to represent tag data.

<ReceiverResult>####</ReceiverResult>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>

- Description: Contains all calculation results for a specific receiver object

- Mandatory or optional: Optional if <ReceiverResults xsi:nil="true" />, otherwise Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1 for a description of tags under <ReceiverResult>

1.5.3.1 Description of tags under <ReceiverResult>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult> tag includes the tags shown below with #### inserted to represent tag data. Except for the tag <Results>, all tags pertain to the results for the current traffic input format.

<Name>####</Name>
<Relative>####</Relative>
<ImpactType>####</ImpactType>
<Impacted>####</Impacted>
<Benefited>####</Benefited>
<Calculated>####</Calculated>
<WithBarrierLevel>####</WithBarrierLevel>
<NoBarrierLevel>####</NoBarrierLevel>
<NoiseReductionCalc>####</NoiseReductionCalc>
<NoiseReductionDifference>####</NoiseReductionDifference>
<MeetNoiseReductionGoal>####</MeetNoiseReductionGoal>
<NoBarrierIncrease>####</NoBarrierIncrease>
<NoBarrierLeqCalc>####</NoBarrierLeqCalc>
<SavedTriangles>####</SavedTriangles>
<Results>####</Results>
<ParallelIncrease>####</ParallelIncrease>

<project>.<receivers>.<receiver>.<ReceiverResult>.<Name>

- Description: The name of the calculated receiver
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<receivers>.<receiver>.<ReceiverResult>.<Relative>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<ReceiverResult>.<ImpactType>

- Description: Indicates type of impact at the receiver location, if any
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: None, Substantial Increase, Sound Level, Both (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<Impacted>

- Description: Indicates whether the receiver location is impacted by the roadway noise levels
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<Benefited>

- Description: Indicates whether the noise reduction goal was met for roadway noise analysis
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<Calculated>

- Description: Indicates whether valid roadway noise level results were computed at the receiver location
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<WithBarrierLevel>

- Description: Indicates the calculated roadway noise level result at the receiver location including attenuation from abatement barriers
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<NoBarrierLevel>

- Description: Indicates the calculated roadway noise level result at the receiver location with all abatement barriers at zero height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<NoiseReductionCalc>

- Description: Indicates the calculated roadway noise level attenuation at the receiver location due to abatement barriers
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<NoiseReductionDifference>

- Description: Indicates the calculated difference between the roadway <NoiseReductionCalc> and the <noiseReductionGoal> for the receiver

- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<MeetNoiseReductionGoal>

- Description: Indicates whether the noise reduction goal was met for roadway noise analysis
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<NoBarrierIncrease>

- Description: Indicates the calculated difference between the roadway <NoBarrierLevel> and the <existingLEQ> for the receiver
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<NoBarrierLeqCalc>

- Description: Indicates the calculated roadway noise level result at the receiver location with all abatement barriers at zero height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResult>.<SavedTriangles>

- Description: Contains a list of tags storing elemental triangle results
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.1 for a description of tags under <SavedTriangles>

<project>.<receivers>.<receiver>.<ReceiverResult>.<Results>

- Description: Contains a list of tags for aggregated results
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.2 for a description of tags under <Results>

<project>.<receivers>.<receiver>.<ReceiverResult>.<ParallelIncrease>

- Description: Indicates the calculated noise level adjustment to be applied to the noise emissions from the roadway(s) included in the Calculate Section line for the receiver due to parallel barrier performance degradation
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

1.5.3.1.1 Description of tags under <SavedTriangles>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles> tag includes a list of <Items> tags as shown below with #### inserted to represent tag data. There is one <Items> tag for each elemental triangle. <SavedTriangles> are used to persist detailed data that are not intended to be manipulated outside of FHWA's TNM. For this reason, only basic details of the tags in the <SavedTriangles> is included in this documentation.

<Items>####</Items>
<Items>####</Items>
…

<Items>####</Items>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>

- Description: Contains elemental triangle results for active receivers used in the Barrier Analysis module
- Mandatory or optional: Optional; mandatory for barrier analysis only – serialized strings should only be created with FHWA's TNM
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.1.1 for a description of tags under <Items>

1.5.3.1.1.1 Description of tags under <Items>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items> tag includes the tags shown below with #### inserted to represent tag data.

<Phi_Savg_NoBarrByte>####</Phi_Savg_NoBarrByte>
<Phi_SavgByte>####</Phi_SavgByte>
<phi_geom>####</phi_geom>
<AdjustmentFactorEnergy>####</AdjustmentFactorEnergy>
<deltaL_energy>####</deltaL_energy>
<TrafficEntryType>####</TrafficEntryType>
<NumTimePeriods>####</NumTimePeriods>
<E_traff_h_ffBytes>####</E_traff_h_ffBytes>
<BarrierSegmentStartPointIds>####</BarrierSegmentStartPointIds>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<Phi_Savg_NoBarrByte>

- Description: Matrix of roadway noise level attenuation calculated for all abatement barriers at zero height
- Mandatory or optional: Mandatory
- Type of value: Serialized String
- Valid range/list if applicable: Should not be manually created or edited

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<Phi_SavgByte>

- Description: Matrix of roadway noise level attenuation calculated for all possible abatement barrier segment height combinations for use in Barrier Analysis module
- Mandatory or optional: Mandatory
- Type of value: Serialized String
- Valid range/list if applicable: Should not be manually created or edited

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<phi_geom>

- Description: Indicates calculated roadway noise level attenuation due to divergence
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<AdjustmentFactorEnergy>

- Description: Indicates the roadway noise energy adjustment to be applied to the noise emissions from the specified elemental triangle to be propagated to the receiver
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<deltaL_energy>

- Description: Indicates energy change
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<TrafficEntryType>

- Description: Indicates the traffic input format for these results
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “LequalHourly”, “LequalPercent”, “LdayNight”, “CNEL”

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<NumTimePeriods>

- Description: Indicates the number of time periods for computation
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 1 (when roadway report metric = LA_{eq}), 2 (when roadway report metric = L_{DN}) or 3 (when roadway report metric = L_{DEN})

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<E_traff_h_ffBytes>

- Description: Matrix of calculated free-field roadway noise energy by vehicle source height
- Mandatory or optional: Mandatory
- Type of value: Serialized String
- Valid range/list if applicable: Should not be manually created or edited

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles>.<Items>.<BarrierSegmentStartPointIds>

- Description: ID representing the starting point of the Barrier Segment that is related to the elemental triangle
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: must be unique

1.5.3.1.2 Description of tags under <Results>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results> tag includes four tags as shown below with #### inserted to represent tag data. There is one tag for each of traffic entry types: LequalHourly, LequalPercent, LdayNight, CNEL.

<Items>####</Items>
<Items>####</Items>
<Items>####</Items>
<Items>####</Items>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>

- Description: Contains a list of tags for aggregate results
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.2.1 for a description of tags under <Items>

1.5.3.1.2.1 Description of tags under <Items>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items> tag includes the tags shown below with #### inserted to represent tag data.

<Name>####</Name>
<Value>####</Value>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Name>

- Description: Indicates the traffic input format for these results
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “LequalHourly”, “LequalPercent”, “LdayNight”, “CNEL”

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>

- Description: Contains a list of tags for aggregate results
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.2.1.1 for a description of tags under <Value>

1.5.3.1.2.1.1 DESCRIPTION OF TAGS UNDER <VALUE>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value> tag includes the tags shown below with #### inserted to represent tag data. Current behavior in FHWA's TNM is to set <Value> for all <Items> other than for the current traffic entry type to the default values, which are "–INF" for decimals and "false" for Booleans.

<TrafficEntryType>####</TrafficEntryType>
<Calculated>####</Calculated>
<WithBarrierLevel>####</WithBarrierLevel>
<NoBarrierLevel>####</NoBarrierLevel>
<ChangeCalc>####</ChangeCalc>
<NoiseReductionCalc>####</NoiseReductionCalc>
<NoiseReductionDifference>####</NoiseReductionDifference>
<MeetNoiseReductionGoal>####</MeetNoiseReductionGoal>
<ByBarrierSegment>####</ByBarrierSegment>
<ByRoadwaySegment>####</ByRoadwaySegment>
<ByVehicleType>####</ByVehicleType>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<TrafficEntryType>

- Description: Indicates the traffic input format for these results
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: "LequalHourly", "LequalPercent", "LdayNight", "CNEL"

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<Calculated>

- Description: Indicates whether receiver results for the traffic input format have been computed
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<WithBarrierLevel>

- Description: Indicates the calculated roadway noise level result for this traffic input format including attenuation from abatement barriers
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<NoBarrierLevel>

- Description: Indicates the calculated roadway noise level result for this traffic input format with all abatement barriers at zero height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ChangeCalc>

- Description: Indicates the calculated difference between the roadway <WithBarrierLevel> for this traffic input format and the <existingLEQ>
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<NoiseReductionCalc>

- Description: Indicates the calculated roadway noise level attenuation for this traffic input format due to abatement barriers
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<NoiseReductionDifference>

- Description: Indicates the calculated difference between the roadway <NoiseReductionCalc> for this traffic input format and the <noiseReductionGoal>
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<MeetNoiseReductionGoal>

- Description: Indicates whether the noise reduction goal was met for this traffic input format
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByBarrierSegment>

- Description: Contains a list of tags for results by barrier segment
- Mandatory or optional: Mandatory

- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.2.1.1.1 for a description of tags under <ByBarrierSegment>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByRoadwaySegment>

- Description: Contains a list of tags for results by roadway segment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.2.1.1.2 for a description of tags under <ByRoadwaySegment>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByVehicleType>

- Description: Contains a list of tags for results by vehicle type
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.3.1.2.1.1.3 for a description of tags under <ByVehicleType>

1.5.3.1.2.1.1.1 Description of tags under <ByBarrierSegment>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByBarrierSegment> tag contains an <Items> tag for each barrier point. These <Items> tags each contain the tags shown below with #### inserted to represent tag data. Note, the XML format for these data are currently insufficient to provide unique identifiers to each barrier point in the project.

<Name>####</Name>
<Value>####</Value>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByBarrierSegment>.<Items>.<Name>

- Description: Indicates the name of the barrier segment starting point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than 0, corresponding to a barrier segment point (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByBarrierSegment>.<Items>.<Value>

- Description: Indicates the calculated roadway noise level associated with the barrier segment point for the Input Heights barrier design
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

1.5.3.1.2.1.1.2 Description of tags under <ByRoadwaySegment>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByRoadwaySegment> tag contains an <Items> tag for each barrier point. These <Items> tags each contain the tags shown below with #### inserted to represent tag data. Note, the XML format for these data are currently insufficient to provide unique identifiers to each roadway point in the project.

<Name>####</Name>
<Value>####</Value>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByRoadwaySegment>.<Items>.<Name>

- Description: Indicates the name of the roadway segment starting point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than 0, corresponding to a roadway segment point (should not be manually created or edited)

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByRoadwaySegment>.<Items>.<Value>

- Description: Indicates the calculated roadway noise level associated with the roadway segment point for the Input Heights barrier design
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

1.5.3.1.2.1.1.3 Description of tags under <ByVehicleType>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByVehicleType> tag contains an <Items> tag for each of the ten vehicle types (Automobile, Medium Truck, …Other5). These <Items> tags each contain the tags shown below with #### inserted to represent tag data.

<Name>####</Name>
<Value>####</Value>

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByVehicleType>.<Items>.<Name>

- Description: Indicates the name of the vehicle type
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Automobiles”, “MediumTrucks”, “HeavyTrucks”, “Bus”, “Motorcycle”, “Other1”, “Other2”, “Other3”, “Other4”, “Other5”

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByVehicleTyp e>.<Items>.<Value>

- Description: Indicates the calculated roadway noise level associated with the vehicle type for the Input Heights barrier design
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

1.5.4 DESCRIPTION OF TAGS UNDER <RECEIVERRESULTSFOREQUIPMENT>

Each <project>.<receivers>.<receiver>.<receiverResultsForEquipment> tag includes one tag as shown below with #### inserted to represent tag data.

<receiverResultsForEquipment>####</receiverResultsForEquipment>

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>

- Description: Contains all calculations for a specific receiver object
- Mandatory or optional: Optional if <receiverResultsForEquipment xsi:nil=”true” />, otherwise Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.4.1 for a description of tags under <receiverResultsForEquipment>

1.5.4.1 DESCRIPTION OF TAGS UNDER <RECEIVERRESULTSFOREQUIPMENT>

Each <project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment> tag includes the tags shown below with #### inserted to represent tag data.

<Name>####</Name>
<Relative>####</Relative>
<Impacted>####</Impacted>
<Benefitted>####</Benefitted>
<Calculated>####</Calculated>
<WithBarrierLevel>####</WithBarrierLevel>
<NoBarrierLevel>####</NoBarrierLevel>
<NoiseReductionCalc>####</NoiseReductionCalc>
<NoiseReductionDifference>####</NoiseReductionDifference>
<MeetNoiseReductionGoal>####</MeetNoiseReductionGoal>
<NoBarrierIncrease>####</NoBarrierIncrease>
<NoBarrierLeqCalc>####</NoBarrierLeqCalc>
<Results>####</Results>
<ParallelIncrease>####</ParallelIncrease>

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Name>

- Description: The name of the calculated receiver
- Mandatory or optional: Mandatory
- Type of value: String

- Valid range/list if applicable: N/A

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Relative>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Impacted>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Benefitted>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Calculated>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<WithBarrierLevel>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<NoBarrierLevel>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<NoiseReductionCalc>

- Description: Deprecated

- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<NoiseReductionDifference>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<MeetNoiseReductionGoal>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<NoBarrierIncrease>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<NoBarrierLeqCalc>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>

- Description: Contains a list of tags for aggregated results
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.5.4.1.1 for a description of tags under <Results>

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<ParallelIncrease>

- Description: Indicates the calculated noise level adjustment to be applied to the noise emissions from the equipment object(s) included in the Calculate Section line for the receiver due to parallel barrier performance degradation

- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

1.5.4.1.1 Description of tags under <Results>

Each <project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results> tag includes the tags shown below with #### inserted to represent tag data.

```
<Calculated>####</Calculated>
<WithBarrierLevel>####</WithBarrierLevel>
<NoBarrierLevel>####</NoBarrierLevel>
<ChangeCalc>####</ChangeCalc>
<NoiseReductionCalc>####</NoiseReductionCalc>
<NoiseReductionDifference>####</NoiseReductionDifference>
<MeetNoiseReductionGoal>####</MeetNoiseReductionGoal>
```

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<Calculated>

- Description: Indicates whether valid construction noise level results were computed at the receiver location
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<WithBarrierLevel>

- Description: Indicates the calculated construction noise level result at the receiver location including attenuation from abatement barriers
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<NoBarrierLevel>

- Description: Indicates the calculated construction noise level result at the receiver location with all abatement barriers at zero height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<ChangeCalc>

- Description: Indicates the calculated difference between the construction equipment <WithBarrierLevel> and the <existingLEQ>
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<NoiseReductionCalc>

- Description: Indicates the calculated construction noise level attenuation at the receiver location due to abatement barriers
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<NoiseReductionDifference>

- Description: Indicates the calculated difference between the construction equipment <NoiseReductionCalc> and the <noiseReductionGoal> for the receiver
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A (should not be manually created or edited)

<project>.<receivers>.<receiver>.<receiverResultsForEquipment>.<receiverResultsForEquipment>.<Results>.<MeetNoiseReductionGoal>

- Description: Indicates whether the noise reduction goal was met for construction noise analysis
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false (should not be manually created or edited)

GROUND ZONES

The <project>.<groundZones> tag contains a list of <groundZone> tags that are used to define the geometry and EFR for each ground zone object.

<groundZone>####</groundZone>

<project>.<groundZones>.<groundZone>

- Description: Contains all information related to a specific ground zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.6 for a description of tags under <groundZone>

1.6 DESCRIPTION OF TAGS UNDER <GROUNDZONE>

Each <project>.<groundZones>.<groundZone> tag includes the following tags with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<groundType>####</groundType>
<flowResistivity>####</flowResistivity>
<points>####</points>

<project>.<groundZones>.<groundZone>.<name>

- Description: Indicates the name of the ground zone object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<groundZones>.<groundZone>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<groundZones>.<groundZone>.<groundType>

- Description: Indicates the ground cover material within the ground zone associated with a known Effective Flow Resistivity value
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Pavement”, “Water”, “HardSoil”, “LooseSoil”, “Lawn”, “FieldGrass”, “GranularSnow”, “PowderSnow”, “Custom”

<project>.<groundZones>.<groundZone>.<flowResistivity>

- Description: Indicates the impedance pattern associated with the ground cover material within the ground zone; used to compute ground absorption/reflections for each 1/3 octave-band
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0-100,000

<project>.<groundZones>.<groundZone>.<points>

- Description: Contains list of all points for a specific ground zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.6.1 for a description of tags under <points>

1.6.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<groundZones>.<groundZone>.<points> tag contains a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of three <point> tags are required to define a ground zone polygon object.

<point>####</point>

<project>.<groundZones>.<groundZone>.<points>.<point>

- Description: Indicates the name of the ground zone object point
- Mandatory or optional: Mandatory (three or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.6.1.1 for a description of tags under <point>

1.6.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<groundZones>.<groundZone>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<pointNumber>####</pointNumber>
<OrderingNumber>####</OrderingNumber>
<theX>####</theX>
<53theY>####</53theY>
<theZ>####</theZ>
<comments>####</comments>

<project>.<groundZones>.<groundZone>.<points>.<point>.<name>

- Description: Indicates the name of the ground zone object point
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<groundZones>.<groundZone>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for this ground zone point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<groundZones>.<groundZone>.<points>.<point>.<OrderingNumber>

- Description: Indicates the point ordering
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer corresponding to the order in which the points were created

<project>.<groundZones>.<groundZone>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific ground zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<groundZones>.<groundZone>.<points>.<point>.<54theY>

- Description: Indicates the Y-coordinate for a specific ground zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<groundZones>.<groundZone>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific ground zone point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Must be zero

<project>.<groundZones>.<groundZone>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

TREE ZONES

The <project>.<treeZones> tag contains a list of <treeZone> tags that are used to define the geometry and EFR for each tree zone object.

<treeZone>####</treeZone>

<project>.<treeZones>.<treeZone>

- Description: Contains all information related to a specific tree zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.7 for a description of tags under <treeZone>

1.7 DESCRIPTION OF TAGS UNDER <TREEZONE>

Each <project>.<treeZones>.<treeZone> tag includes the following tags with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<groundType>####</groundType>
<flowResistivity>####</flowResistivity>
<averageHeight>####</averageHeight>
<points>####</points>

<project>.<treeZones>.<treeZone>.<name>

- Description: Indicates the name of the tree zone object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<treeZones>.<treeZone>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<treeZones>.<treeZone>.<groundType>

- Description: Indicates the ground cover material within the tree zone associated with a known Effective Flow Resistivity value
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Pavement”, “Water”, “HardSoil”, “LooseSoil”, “Lawn”, “FieldGrass”, “GranularSnow”, “PowderSnow”, “Custom”

<project>.<treeZones>.<treeZone>.<flowResistivity>

- Description: Indicates the impedance pattern associated with the ground cover material within the tree zone; used to compute ground absorption/reflections for each 1/3 octave-band
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0-100,000

<project>.<treeZones>.<treeZone>.<averageHeight>

- Description: Indicates the vertical distance from the local ground to the top of the tree canopy below which the tree zone attenuation is applied
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<treeZones>.<treeZone>.<points>

- Description: Contains list of all points for a specific tree zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.7.1 for a description of tags under <points>

1.7.1 Description of tags under <points>

The <project>.<treeZones>.<treeZone>.<points> tag contains a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of three <point> tags are required to define a tree zone polygon object.

<point>####</point>

<project>.<treeZones>.<treeZone>.<points>.<point>

- Description: Indicates the name of the tree zone object point
- Mandatory or optional: Mandatory (three or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.7.1.1 for a description of tags under <point>

1.7.1.1 Description of tags under <point>

Each <project>.<treeZones>.<treeZone>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<pointNumber>####</pointNumber>
<OrderingNumber>####</OrderingNumber>
<theX>####</theX>
<56theY>####</56theY>
<theZ>#### </theZ>
<comments>#### </comments>

<project>.<treeZones>.<treeZone>.<points>.<point>.<name>

- Description: Indicates the name of the tree zone object point
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<treeZones>.<treeZone>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for this tree zone point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<treeZones>.<treeZone>.<points>.<point>.<OrderingNumber>

- Description: Indicates the point ordering
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer corresponding to the order in which the points were created

<project>.<treeZones>.<treeZone>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific tree zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<treeZones>.<treeZone>.<points>.<point>.<57theY>

- Description: Indicates the Y-coordinate for a specific tree zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<treeZones>.<treeZone>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific tree zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<treeZones>.<treeZone>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

CONTOUR ZONES

The <project>.<contourZones> tag contains a list of <contourZone> tags that are used to define the geometry and receiver configuration for each contour zone object.

<contourZone>####</contourZone>

<project>.<contourZones>.<contourZone>

- Description: Contains all information related to a specific contour zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.8 for a description of tags under <contourZone>

1.8 DESCRIPTION OF TAGS UNDER <CONTOURZONE>

Each <project>.<contourZones>.<contourZone> tag includes the following tags with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<spacing>####</spacing>
<precision>####</precision>
<receiverHeight>####</receiverHeight>
<points>####</points>

<project>.<contourZones>.<contourZone>.<name>

- Description: Indicates the name of the contour zone object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<contourZones>.<contourZone>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<contourZones>.<contourZone>.<spacing>

- Description: Indicates the minimum grid spacing
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<contourZones>.<contourZone>.<precision>

- Description: Indicates the contour tolerance
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<contourZones>.<contourZone>.<receiverHeight>

- Description: Indicates the vertical distance from the local ground to the array of receivers within the contour zone
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<contourZones>.<contourZone>.<points>

- Description: Contains list of all points for a specific contour zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.8.1 for a description of tags under <points>

1.8.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<contourZones>.<contourZone>.<points> tag contains a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of three <point> tags are required to define a contour zone polygon object.

<point>####</point>

<project>.<contourZones>.<contourZone>.<points>.<point>

- Description: Indicates the name of the contour zone object point
- Mandatory or optional: Mandatory (three or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.8.1.1 for a description of tags under <point>

1.8.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<contourZones>.<contourZone>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<pointNumber>####</pointNumber>
<OrderingNumber>####</OrderingNumber>
<theX>####</theX>
<59theY>####</59theY>
<theZ>####</theZ>
<comments>####</comments>

<project>.<contourZones>.<contourZone>.<points>.<point>.<name>

- Description: Indicates the name of the contour zone object point
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<contourZones>.<contourZone>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for this contour zone point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<contourZones>.<contourZone>.<points>.<point>.<OrderingNumber>

- Description: Indicates the point ordering
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer corresponding to the order in which the points were created

<project>.<contourZones>.<contourZone>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific contour zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<contourZones>.<contourZone>.<points>.<point>.<60theY>

- Description: Indicates the Y-coordinate for a specific contour zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<contourZones>.<contourZone>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific contour zone point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Must be

<project>.<contourZones>.<contourZone>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

TERRAIN LINES

The <project>.<terrainLines> tag contains a list of <terrainLine> tags that are used to define the geometry for each terrain line object.

<terrainLine>####</terrainLine>

<project>.<terrainLines>.<terrainLine>

- Description: Contains all information related to a specific terrain line object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.9 for a description of tags under <terrainLine>

1.9 DESCRIPTION OF TAGS UNDER <TERRAINLINE>

Each <project>.<terrainLines>.<terrainLine> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<points>####</points>

<project>.<terrainLines>.<terrainLine>.<name>

- Description: Indicates the name of the terrain line object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<terrainLines>.<terrainLine>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<terrainLines>.<terrainLine>.<points>

- Description: Contains list of all points for a specific terrain line
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.9.1 for a description of tags under <points>

1.9.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<terrainLines>.<terrainLine>.<points> tag includes a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of two <point> tags are required to define a terrain line linear object.

<point>####</point>

<project>.<terrainLines>.<terrainLine>.<points>.<point>

- Description: Indicates the name of the terrain line object point
- Mandatory or optional: Mandatory (two or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.9.1.1 for a description of tags under <point>

1.9.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<terrainLines>.<terrainLine>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<pointNumber>####</pointNumber>
<OrderingNumber>####</OrderingNumber>
<theX>####</theX>
<theY>####</theY>
<theZ>####</theZ>
<comments>####</comments>

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<name>

- Description: Indicates the name of a point of the terrain line object point
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for the terrain line point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<OrderingNumber>

- Description: Indicates the point ordering
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer corresponding to the order in which the points were created

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific terrain line point
- Mandatory or optional: Mandatory
- Type of value: Decimal

- Valid range/list if applicable: N/A

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<theY>

- Description: Indicates the Y-coordinate for a specific terrain line point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific terrain line point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<terrainLines>.<terrainLine>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

BUILDING ROWS

The <project>.<buildingRows> tag contains a list of <buildingRow> tags that are used to define the geometry for each building row object.

<buildingRow>####</buildingRow>

<project>.<buildingRows>.<buildingRow>

- Description: Contains all information related to a specific building row object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.10 for a description of tags under <buildingRow>

1.10 DESCRIPTION OF TAGS UNDER <BUILDINGROW>

Each <project>.<buildingRows>.<buildingRow> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments>####</comments>
<averageHeight>####</averageHeight>
<gapPercentage>####</gapPercentage>
<points>####</points>

<project>.<buildingRows>.<buildingRow>.<name>

- Description: The name of the building row object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<buildingRows>.<buildingRow>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<buildingRows>.<buildingRow>.<averageHeight>

- Description: Indicates the vertical distance from the local ground to the top of the buildings below which the building row attenuation is applied
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<buildingRows>.<buildingRow>.<gapPercentage>

- Description: Indicates the spacing between buildings through which sound can pass freely; represented by a portion of the noise energy not attenuated by the building row object
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 20-80

<project>.<buildingRows>.<buildingRow>.<points>

- Description: Contains list of all points for a specific building row
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.10.1 for a description of tags under <points>

1.10.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<buildingRows>.<buildingRow>.<points> tag contains a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of two <point> tags are required to define a building row linear object.

<point>####</point>

<project>.<buildingRows>.<buildingRow>.<points>.<point>

- Description: Indicates the name of the building row object point
- Mandatory or optional: Mandatory (two or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.10.1.1 for a description of tags under <point>

1.10.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<buildingRows>.<buildingRow>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<pointNumber>####</pointNumber>
<OrderingNumber>####</OrderingNumber>
<theX>####</theX>
<theY>####</theY>
<theZ>####</theZ>
<comments>####</comments>

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<name>

- Description: Indicates the name of a point of the building row object point
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for this building row point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<OrderingNumber>

- Description: Indicates the point ordering
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer corresponding to the order in which the points were created

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific building row point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<theY>

- Description: Indicates the Y-coordinate for a specific building row point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific building row point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<buildingRows>.<buildingRow>.<points>.<point>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

BARRIERS

The <project>.<barriers> tag contains a list of <barrier> tags that are used to define the type, geometry, reflectivity, and cost for each barrier object.

<barrier>####</barrier>

<project>.<barriers>.<barrier>

- Description: Contains all information related to a specific barrier object
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.11 for a description of tags under <barrier>

1.11 DESCRIPTION OF TAGS UNDER <BARRIER>

Each <project>.<barriers>.<barrier> tag includes the tags shown below with #### inserted to represent tag data.

<FeatureId>####</FeatureId>
<FeatureType>####</FeatureType>
<name>####</name>
<comments/>####</comments>
<barrierType>####</barrierType>
<segPertResolution>####</segPertResolution>
<segUpIncrements>####</segUpIncrements>
<segDownIncrements>####</segDownIncrements>
<segTopWidth>####</segTopWidth>
<segSideSlopeRun>####</segSideSlopeRun>
<segSideSlopeRise>####</segSideSlopeRise>
<segNRCLSide>####</segNRCLSide>
<segNRCRSide>####</segNRCRSide>
<segNRCPBA>####</segNRCPBA>
<costPerUnitArea>####</costPerUnitArea>
<costPerUnitVolume>####</costPerUnitVolume>
<addedCostPerUnitLength>####</addedCostPerUnitLength>
<maxHeight>####</maxHeight>
<minHeight>####</minHeight>
<baseHeight>####</baseHeight>
<points>####</points>

<project>.<barriers>.<barrier>.<FeatureId>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: 0

<project>.<barriers>.<barrier>.<FeatureType>

- Description: Indicates whether the barrier object represents a wall or berm
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “SKEWLINE”, “BERM”

<project>.<barriers>.<barrier>.<name>

- Description: Indicates the name of the barrier object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<comments>

- Description: Contains object-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<barrierType>

- Description: Indicates whether the barrier object represents a wall or berm
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: “Wall”, “Berm”

<project>.<barriers>.<barrier>.<segPertResolution>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<segUpIncrements>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<segDownIncrements>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<segTopWidth>

- Description: Indicates the berm top width when <barrierType> == “Berm”
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Must be 0

<project>.<barriers>.<barrier>.<segSideSlopeRun>

- Description: Indicates the berm slope horizontal component when <barrierType> == “Berm”
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<barriers>.<barrier>.<segSideSlopeRise>

- Description: Indicates the berm slope vertical component when <barrierType> == “Berm”
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<barriers>.<barrier>.<segNRCLSide>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-1

<project>.<barriers>.<barrier>.<segNRCRSide>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-1

<project>.<barriers>.<barrier>.<segNRCPBA>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: 0-1

<project>.<barriers>.<barrier>.<costPerUnitArea>

- Description: Indicates the cost per unit area when <barrierType> == “Wall”
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<costPerUnitVolume>

- Description: Indicates the cost per unit volume when <barrierType> == “Berm”
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<addedCostPerUnitLength>

- Description: Indicates the additional cost for wall or berm length
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<maxHeight>

- Description: Indicates the maximum allowable barrier segment height for input checks considering perturbation heights
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<minHeight>

- Description: Indicates the minimum allowable barrier segment height for input checks considering perturbation heights
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<baseHeight>

- Description: Deprecated
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<points>

- Description: Contains list of all points for a specific barrier
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.11.1 for a description of tags under <points>

1.11.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<barriers>.<barrier>.<points> tag contains a list of <point> tags as shown below with #### inserted to represent tag data. A minimum of two <point> tags are required to define a barrier linear object.

<point>####</point>

<project>.<barriers>.<barrier>.<points>.<point>

- Description: Indicates the name of the barrier object point
- Mandatory or optional: Mandatory (two or more required)
- Type of value: Tag list
- Valid range/list if applicable: See 1.11.1.1 for a description of tags under <point>

1.11.1.1 DESCRIPTION OF TAGS UNDER <POINT>

Each <project>.<barriers>.<barrier>.<points>.<point> tag includes the tags shown below with #### inserted to represent tag data.

<name>####</name>
<comments/>####</comments>
<pointNumber>####</pointNumber>
<theX>####</theX>
<theY>####</theY>
<theZ>####</theZ>
<pertResolution>####</pertResolution>
<upIncrements>####</upIncrements>
<downIncrements>####</downIncrements>
<height>####</height>
<nrcLSide>####</nrcLSide>
<nrcRSide>####</nrcRSide>
<nrcPBA>####</nrcPBA>
<shieldedRoadSegmentSet>####</shieldedRoadSegmentSet>
<reflectedRoadSegmentSet>####</reflectedRoadSegmentSet>
<ForNoiseMitigation>####</ForNoiseMitigation>

<project>.<barriers>.<barrier>.<points>.<point>.<name>

- Description: Indicates the name of a point of the barrier object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<comments>

- Description: Point-level comments
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<points>.<point>.<pointNumber>

- Description: Indicates the ID number for the barrier point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, greater than or equal to 0

<project>.<barriers>.<barrier>.<points>.<point>.<theX>

- Description: Indicates the X-coordinate for a specific barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<points>.<point>.<theY>

- Description: Indicates the Y-coordinate for a specific barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<points>.<point>.<theZ>

- Description: Indicates the Z-coordinate (i.e., elevation) for a specific barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: N/A

<project>.<barriers>.<barrier>.<points>.<point>.<pertResolution>

- Description: Indicates the barrier segment height change for each perturbation increment
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<points>.<point>.<upIncrements>

- Description: Indicates the number of barrier segment perturbations above the input height
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<points>.<point>.<downIncrements>

- Description: Indicates the number of barrier segment perturbations below the input height
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<points>.<point>.<height>

- Description: Indicates the barrier segment input height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Greater than or equal to 0

<project>.<barriers>.<barrier>.<points>.<point>.<nrcLSide>

- Description: Indicates the noise reduction coefficient of the barrier segment left-side (relative to the barrier centerline directional arrow)
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-1

<project>.<barriers>.<barrier>.<points>.<point>.<nrcRSide>

- Description: Indicates the noise reduction coefficient of the barrier segment right-side (relative to the barrier centerline directional arrow)
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-1

<project>.<barriers>.<barrier>.<points>.<point>.<nrcPBA>

- Description: Indicates the noise reduction coefficient of the barrier segment for parallel barrier analysis
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0-1

<project>.<barriers>.<barrier>.<points>.<point>.<shieldedRoadSegmentSet>

- Description: Contains the roadway segment IDs whose noise emissions are shielded by this on-structure barrier segment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.11.1.1.1 for a description of tags under <shieldedRoadSegmentSet>

<project>.<barriers>.<barrier>.<points>.<point>.<reflectedRoadSegmentSet>

- Description: Contains the roadway segment IDs whose noise emissions are reflected by this barrier segment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.11.1.1.2 for a description of tags under <reflectedRoadSegmentSet>

<project>.<barriers>.<barrier>.<ForNoiseMitigation>

- Description: Indicates whether the barrier is intended for noise abatement and to be included in the Barrier Analysis module
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

1.11.1.1.1 Description of tags under <shieldedRoadSegmentSet>

The <project>.<barriers>.<barrier>.<points>.<point>.<shieldedRoadSegmentSet> tag contains a list of <roadSegmentID> tags that are used to indicate road segments that are paired with this barrier. The tags contained within the <point> tag are shown below with #### inserted to represent tag data.

<roadSegmentID>#### </roadSegmentID>

<project>.<barriers>.<barrier>.<points>.<point>.<shieldedRoadSegmentSet>.<roadSegmentID>

- Description: Indicates the roadway segment IDs whose noise emissions are shielded by this on-structure barrier segment
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer associated with a shielded roadway segment

1.11.1.1.2 Description of tags under <reflectedRoadSegmentSet>

The <project>.<barriers>.<barrier>.<points>.<point>.<reflectedRoadSegmentSet> tag contains a list of <roadSegmentID> tags that are used to indicate road segments that are paired with this barrier. The tags contained within the <point> tag are shown below with #### inserted to represent tag data.

<roadSegmentID>#### </roadSegmentID>

<project>.<barriers>.<barrier>.<points>.<point>.<reflectedRoadSegmentSet>.<roadSegmentID>

- Description: Indicates the roadway segment IDs whose noise emissions are reflected by this barrier segment
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer associated with a roadway segment

BARRIER DESIGNS

The <project>.<barrierDesigns> tag contains a list of <barrierDesign> tags that are used to define all aspects of barrier designs.

<barrierDesign>####</barrierDesign>

<project>.<barrierDesigns>.<barrierDesign>

- Description: Contains all information related to a specific barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12 for a description of tags under <barrierDesign>

1.12 DESCRIPTION OF TAGS UNDER <BARRIERDESIGN>

Each <project>.<barrierDesigns>.<barrierDesign> tag includes the following tags with #### inserted to represent tag data.

<name>####</name>
<receiverList>####</receiverList>
<roadwayList>####</roadwayList>
<barrierList>####</barrierList>

<project>.<barrierDesigns>.<barrierDesign>.<name>

- Description: Indicates the name of the barrier design
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<barrierDesigns>.<barrierDesign>.<receiverList>

- Description: Contains the receiver objects included in the barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12.1 for a description of tags under <receiverList>

<project>.<barrierDesigns>.<barrierDesign>.<roadwayList>

- Description: Contains the roadway objects included in the barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12.2 for a description of tags under <roadwayList>

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>

- Description: Contains the barrier objects included in the barrier design and their perturbation increments

- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12.3 for a description of tags under <barrierList>

1.12.1 DESCRIPTION OF TAGS UNDER <RECEIVERLIST>

The <project>.<barrierDesigns>.<barrierDesign>.<receiverList> tag contains a list of <receiver> tags that are used to identify each receiver in the barrier design. The tags contained within the <receiverList> tag are shown below with #### inserted to represent tag data.

<receiver>####</receiver>

<project>.<barrierDesigns>.<barrierDesign>.<receiverList>.<receiver>

- Description: Indicates the name of a receiver object included in the barrier design
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

1.12.2 DESCRIPTION OF TAGS UNDER <ROADWAYLIST>

The <project>.<barrierDesigns>.<barrierDesign>.<roadwayList> tag contains a list of <roadway> tags that are used to identify each roadway in the barrier design. The tags contained within the <roadwayList> tag are shown below with #### inserted to represent tag data.

<roadway>####</roadway>

<project>.<barrierDesigns>.<barrierDesign>.<roadwayList>.<roadway>

- Description: Indicates the name of a roadway object included in the barrier design
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

1.12.3 DESCRIPTION OF TAGS UNDER <BARRIERLIST>

The <project>.<barrierDesigns>.<barrierDesign>.<barrierList> tag contains a list of <barrier> tags that are used to identify each barrier in the barrier design. The tags contained within the <barrierList> tag are shown below with #### inserted to represent tag data.

<barrier>####</barrier>

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>

- Description: Contains information about the barriers included in a barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12.3.1 for a description of tags under <barrier>

1.12.3.1 DESCRIPTION OF TAGS UNDER <BARRIER>

Each <project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier> tag includes the following tags with #### inserted to represent tag data.

<barrierName>####</barrierName>
<segments####</segments>

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<barrierName>

- Description: Indicates the name of the barrier
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: N/A

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<segments>

- Description: Tag that contains a list of tags that contain the information about each barrier segment's perturbations in a barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12.3.1.1 for a description of tags under <segments>

1.12.3.1.1 Description of tags under <segments>

The <project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<segments> tag contains a list of tags that are used to identify the perturbation of each barrier segment in the barrier design. The tags contained within the <point> tag are shown below with #### inserted to represent tag data.

####

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<segments>.

- Description: Contains perturbations for each barrier segment in a barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See 1.12.3.1.1.1 for a description of tags under

1.12.3.1.1.1 DESCRIPTION OF TAGS UNDER

Each <project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<segments>. tag includes the following tags with #### inserted to represent tag data.

<startPointNumber>####</startPointNumber>
<currentIncrement>####</currentIncrement>

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<segments>..<startPointNumber>

- Description: Indicates the starting point of the specific barrier segment to be perturbed
- Mandatory or optional: Mandatory

- Type of value: Integer
- Valid range/list if applicable: Non-negative integer associated with the start of a barrier segment on the selected barrier

<project>.<barrierDesigns>.<barrierDesign>.<barrierList>.<barrier>.<segments>..<currentIncrement>

- Description: Indicates the perturbation number for the specific barrier segment
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer associated with a possible perturbation for the barrier segment on the selected barrier where 0 represents no perturbation (i.e., the input height), positive integers represent the number of perturbations up, and negative integers represent the number of perturbations down

DEFAULTS

The <project>.<defaults> tag contains a list of tags that are used to define all available default values for TNM input objects shown in the Edit Pane of the GUI. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data.

<receiverDefaults>####</receiverDefaults>
<barrierDefaults>####</barrierDefaults>
<roadwayDefaults>####</roadwayDefaults>
<terrainLineDefaults>####</terrainLineDefaults>
<buildingRowDefaults>####</buildingRowDefaults>
<groundZoneDefaults>####</groundZoneDefaults>
<treeZoneDefaults>####</treeZoneDefaults>
<contourZoneDefaults>####</contourZoneDefaults>

1.13 DESCRIPTION OF TAGS UNDER <RECEIVERDEFAULTS>

The <project>.<defaults>.<receiverDefaults> tag contains a list of tags that are used to define all available default values for receiver objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see RECEIVERS

<name>####</name>
<heightAboveTerrain>####</heightAboveTerrain>
<dwellingUnits>####</dwellingUnits>
<defaultAdjustment>####</defaultAdjustment>
<noiseReductionGoal>####</noiseReductionGoal>
<existingLEQ>####</existingLEQ>
<impactLEQ>####</impactLEQ>
<impactIncrease>####</impactIncrease>
<inactive>####</inactive>

1.14 DESCRIPTION OF TAGS UNDER <BARRIERDEFAULTS>

The <project>.<defaults>.<barrierDefaults> tag contains a list of tags that are used to define all available default values for barrier objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see BARRIERS.

<name>####</name>
<barrierType>####</barrierType>
<segPertResolution>####</segPertResolution>
<segUpIncrements>####</segUpIncrements>
<segDownIncrements>####</segDownIncrements>
<segTopWidth>####</segTopWidth>
<segSideSlopeRun>####</segSideSlopeRun>
<segSideSlopeRise>####</segSideSlopeRise>
<segNRCLSide>####</segNRCLSide>
<segNRCRSide>####</segNRCRSide>
<segNRCPBA>####</segNRCPBA>

<costPerUnitArea>####</costPerUnitArea>
<costPerUnitVolume>####</costPerUnitVolume>
<addedCostPerUnitLength>####</addedCostPerUnitLength>
<maxHeight>####</maxHeight>
<minHeight>####</minHeight>
<baseHeight>####</baseHeight>
<segmentForNoiseAbatement>####</segmentForNoiseAbatement>

1.15 DESCRIPTION OF TAGS UNDER <ROADWAYDEFAULTS>

The <project>.<defaults>.<roadwayDefaults> tag contains a list of tags that are used to define all available default values for roadway objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data.

<name>####</name>
<roadwayWidth>####</roadwayWidth>
<onStructure>####</onStructure>
<roadType>####</roadType>
<roadCategory>####</roadCategory>
<multiLaneEnabled>####</multiLaneEnabled>
<insideShoulder>####</insideShoulder>
<insideShoulderWidth>####</insideShoulderWidth>
<numberOfLanes>####</numberOfLanes>
<outsideShoulder>####</outsideShoulder>
<outsideShoulderWidth>####</outsideShoulderWidth>

Roadway default tags not covered elsewhere in this document are described below. These tags pertain to the Multi-Lane Tool settings, which are only relevant when manually digitizing more than one roadway object at once in the TNM GUI. For more information about all other tags, please see ROADWAYS.

<project>.<defaults>.<roadwayDefaults>.<multiLaneEnabled>

- Description: Indicates whether the Multi-Lane Tool is toggled on in order to digitize more than one roadway object at once
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<defaults>.<roadwayDefaults>.<insideShoulder>

- Description: Indicates whether a roadway object should be created to represent the inside shoulder when digitizing a roadway while <multiLaneEnabled> == true
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<defaults>.<roadwayDefaults>.<insideShoulderWidth>

- Description: Indicates the dimension of the pavement ground zone extending symmetrically from the centerline of the roadway segment representing the inside shoulder when digitizing a roadway while <multiLaneEnabled> == true
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

<project>.<defaults>.<roadwayDefaults>.<numberOfLanes>

- Description: Indicates the number of roadway objects to be created to represent the mainline lanes when digitizing a roadway while <multiLaneEnabled> == true
- Mandatory or optional: Optional
- Type of value: Integer
- Valid range/list if applicable: Greater than 1

<project>.<defaults>.<roadwayDefaults>.<outsideShoulder>

- Description: Indicates whether a roadway object should be created to represent the outside shoulder when digitizing a roadway while <multiLaneEnabled> == true
- Mandatory or optional: Optional
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<defaults>.<roadwayDefaults>.<outsideShoulderWidth>

- Description: Indicates the dimension of the pavement ground zone extending symmetrically from the centerline of the roadway segment representing the outside shoulder when digitizing a roadway while <multiLaneEnabled> == true
- Mandatory or optional: Optional
- Type of value: Decimal
- Valid range/list if applicable: Greater than 0

1.16 Description of tags under <terrainLineDefaults>

The <project>.<defaults>.<terrainLineDefaults> tag contains a list of tags that are used to define all available default values for terrain line objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see Terrain Lines.

<name>####</name>

1.17 Description of tags under <buildingRowDefaults>

The <project>.<defaults>.<buildingRowDefaults> tag contains a list of tags that are used to define all available default values for building row objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see Building Rows.

<name>####</name>

<averageHeight>####</averageHeight>
<gapPercentage>####</gapPercentage>

1.18 Description of tags under <groundZoneDefaults>

The <project>.<defaults>.<groundZoneDefaults> tag contains a list of tags that are used to define all available default values for ground zone objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see Ground Zones.

<name>####</name>
<groundType>####</groundType>
<flowResistivity>####</flowResistivity>

1.19 Description of tags under <treeZoneDefaults>

The <project>.<defaults>.<treeZoneDefaults> tag contains a list of tags that are used to define all available default values for tree zone objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see Tree Zones.

<name>####</name>
<groundType>####</groundType>
<flowResistivity>####</flowResistivity>
<averageHeight>####</averageHeight>

1.20 Description of tags under <contourZoneDefaults>

The <project>.<defaults>.<contourZoneDefaults> tag contains a list of tags that are used to define all available default values for contour zone objects. The <defaults> tag includes a list of tags shown below with #### inserted to represent tag data. For more information about each tag, please see Contour Zones.

<name>####</name>
<spacing>####</spacing>
<precision>####</precision>
<receiverHeight>####</receiverHeight>