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FILE FORMAT REFERENCE MANUAL

TRAFFIC NOISE MODEL 3.1

FHWA-HEP-21-040
FEDERAL HIGHWAY ADMINISTRATION
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Washington, D.C.

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I. INTRODUCTION

A new file format to save site model information was introduced in version 3.0 of the Federal Highway Administration's Traffic Noise Model (TNM 3.0). This file format is based on the XML markup language and includes a series of tags to represent objects and their parameters in the site model. The original purpose of this file format was to provide a means of exporting and importing site models 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 site model database structure in TNM 3.0. Starting with TNM 3.1, this file format is the primary tool for saving and loading TNM site models.

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

- Description
- Mandatory¹ or optional
- Type of value (e.g. integer, decimal, string, Boolean, etc.)
- Valid range if applicable (e.g. any positive number, any number, etc.)²

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

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

The <project> tag and each of the eleven 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 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.

² 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 study in TNM 3.1 and examining the TXF file.

I.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 what the site model is prior to calculation and to save receiver level 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 are not intended to be read, edited, or generated by any manner other than TNM. Note, the FHWA's [AUTOMATED CONSISTENCY TEST SUITE TOOL](#) uses the tags described in this reference document and not the serialized results.

2. 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 for tag data.

```
<calculatedBy>#####</calculatedBy>
<savedBy>#####</savedBy>
<lastModifiedOn>#####</lastModifiedOn>
<AcousticsModel>#####</AcousticsModel>
<runTitle>#####</runTitle>
<organization>#####</organization>
<SerializationVersion>#####</SerializationVersion>
<StatePlaneAdjustment>#####</StatePlaneAdjustment>
<projectContract>#####</projectContract>
<analysisBy>#####</analysisBy>
<description>#####</description>
<unitOfMeasure>#####</unitOfMeasure>
<coordinateSystemType>#####</coordinateSystemType>
<coordinateSystemCategory>#####</coordinateSystemCategory>
<coordinateSystem>#####</coordinateSystem>
<trafficEntryType>#####</trafficEntryType>
<relHumid>#####</relHumid>
<temperature>#####</temperature>
<groundType>#####</groundType>
<StatePlaneAdjustment>#####</StatePlaneAdjustment>
<UDV>#####</UDV>
<roadways>#####</roadways>
<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: String

<project>.<savedBy>

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

<project>.<lastModified>

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

<project>.<AcousticsModel>

- Description: Contains serialized results that are generated after calculation
- Mandatory or optional: Optional; should only be created by TNM
- Type of value: Serial
- Valid range/list if applicable: Should not be manually created

<project>.<runTitle>

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

<project>.<organization>

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

<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>.<StatePlaneAdjustment>

- Description: Contains 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: Mandatory
- Type of value: String
- Valid range/list if applicable: String

<project>.<analysisBy>

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

<project>.<description>

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

<project>.<unitOfMeasure>

- Description: Indicates whether the data are in English or Metric
- 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: Manual
- 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 3.1 Category drop-down menu in the Project Settings.

<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 3.1 System down down menu in the Project Settings.

<project>.<trafficEntryType>

- Description: Indicates the volume metric for traffic entry
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: LEqualHourly, LEqualPercent, LDayNight, CNEL

<project>.<relHumid>

- Description: Indicates the percent relative humidity
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer between 0 and 100

<project>.<temperature>

- Description: Indicates the temperature to use for 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 used in the study
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Pavement, Water, HardSoil, LooseSoil, Lawn, FieldGrass, Granular Snow, PowderSnow, Custom

<project>.<subSourceHeightDistLimit>

- Description: Indicates the LOS distance limit
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

<project>.<UDV>

- Description: This tag holds all user defined vehicle tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [UDV](#)

<project>.<roadways>

- Description: This tag holds all roadway tags

- Mandatory or optional: Mandatory for functional run, Optional for partial study
- Type of value: Tag list
- Valid range/list if applicable: See [ROADWAYS](#)

<project>.<receivers>

- Description: This tag holds all receivers' tags
- Mandatory or optional: Mandatory for functional run, Optional for partial study
- Type of value: Tag list
- Valid range/list if applicable: See [RECEIVERS](#)

<project>.<groundZones>

- Description: This tag holds all groundZone tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [GROUND ZONES](#)

<project>.<treeZones>

- Description: This tag holds all treeZone tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [TREE ZONES](#)

<project>.<contourZones>

- Description: This tag holds all contourZone tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [CONTOUR ZONES](#)

<project>.<terrainLines>

- Description: This tag holds all terrainLine tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [TERRAIN LINES](#)

<project>.<buildingRows>

- Description: This tag holds all buildingRow tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [BUILDING ROWS](#)

<project>.<barriers>

- Description: This tag holds all barrier tags

- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [BARRIERS](#)

<project>.<barrierDesigns>

- Description: This tag holds all barrierDesign tags
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [BARRIER DESIGNS](#)

3. 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 for 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 or 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 or 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" or "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

4. 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: Indicates the name of the user-defined vehicle
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [4.1](#) for a description of tags under <vehicle>

4.1 DESCRIPTION OF TAGS UNDER <VEHICLE>

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

<name>####</name>

<vehType>####</vehType>

<similarType>####</similarType>

<minLevel>####</minLevel>

<referenceLevel>####</referenceLevel>

<logSlope>####</logSlope>

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

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

<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 or Other5

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

- Description: This tag contains a dropdown of vehicle types
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Other#³, Automobiles, MediumTrucks, HeavyTrucks, Bus, Motorcycle

³ where # is 1, 2, 3, 4 or 5. Used when the UDV is disabled.

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

- Description: Indicates the reference level for the UDV
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Decimal value reflecting UDV being defined

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

- Description: Indicates the minimum level for the UDV
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Decimal value reflecting UDV being defined

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

- Description: Used to determine slope for the UDV
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Decimal value reflecting UDV being defined

5. 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.

<roadway>####</roadway>

<project>.<roadways>.<roadway>

- Description: Contains all information related to a specific roadway object
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [5.1](#) for a description of tags under <roadway>

5.1 DESCRIPTION OF TAGS UNDER <ROADWAY>

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

<name>####</name>

<comments>####</comments>

<points>####</points>

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

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

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

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

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

- Description: Contains road-level comments
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [5.1.1](#) for a description of tags under <points>

5.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

Each <project>.<roadways>.<roadway>.<points> tag includes a list of <point> tags as shown below with #### inserted for tag data.

<point>####</point>

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

- Description: Indicates the name of the roadway point object
- Mandatory or optional: Mandatory (2 or more required)
- Type of value: Tag list
- Valid range/list if applicable: See [5.1.1.1](#) for a description of tags under <point>

5.1.1.1 DESCRIPTION OF TAGS UNDER <POINT>

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

<name>####</name>

<comments>####</comments>

<pointNumber>####</pointNumber>

<theX>####</theX>

<theY>####</theY>

<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 point object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

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

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

- Description: Indicates the number of the roadway point object
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique, non-negative integer

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

- Description: Indicates the X-value of a single roadway point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the Y-value of a single roadway point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the Z-value of a single roadway point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: The width of the roadway
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<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 object
- 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 roadway category of the roadway object
- 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 speed constraint if a flow control device is present
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal. Should be less than all cruise speeds on roadway (See [5.1.1.1.1.1.1](#))

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

- Description: Indicates if a flow control device is present 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 control device
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer between 0 – 100

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

- Description: Tag that contains the traffic data for this roadway point
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [5.1.1.1.1](#) for a description of tags under <myTraffic>

5.1.1.1.1 Description of tags under <myTraffic>

Each <project>.<roadways>.<roadway>.<points>.<point>.<myTraffic> tag includes the tags shown below with ##### inserted for 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 volume associated with user inputs for the LAEQ1h: Percent Volumes, Speeds setting in project setting
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer

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

- Description: Indicates total vehicles per 24 hours associated with user inputs for the LDN: Day, Night setting in project setting
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer

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

- Description: Indicates total vehicles per 24 hours associated with user inputs for the Lden: Day, Evening, and Night setting in project setting
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer

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

- Description: Indicates daytime portion as a percent of total traffic when LDN_ADT or CNEL_ADT are used
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates evening portion as a percent of total traffic when CNEL_ADT is used.
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates nighttime portion as a percent of total traffic when LDN_ADT or CNEL_ADT are used
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Tag that contains the individual vehicle traffic data for this roadway point
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [5.1.1.1.1.1](#) for a description of tags under <vehicleFlowSet >

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

- Description: Indicates the type of traffic chosen in project settings

- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: LEqualHourly, LDayNight, CNEL

5.1.1.1.1.1 DESCRIPTION OF TAGS UNDER <VEHICLEFLOWSET>

Each <project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet> tag includes a list of ten <vehicleFlow> tags as shown below with ##### inserted for tag data. Each <vehicleFlow> tag is for one of the ten vehicles, 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 at a point
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [5.1.1.1.1.1.1](#) for a description of tags under <vehicleFlow>

5.1.1.1.1.1.1 DESCRIPTION OF TAGS UNDER <VEHICLEFLOW>

Each <project>.<roadways>.<roadway>.<points>.<point>.<myTraffic>.<vehicleFlowSet>.<vehicleFlow> tag includes the tags shown below with ##### inserted for 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: Automobile, MediumTrucks, HeavyTrucks, Bus, Motorcycle, Other1, Other2, Other3, Other4, Other5.

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

- Description: Indicates hourly volume of for the vehicle type at this <point> when LAeq1h: Volumes, Speed is selected in the project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates speed for the vehicle type at this <point> when LAeq1h: Volumes, Speed is selected in the project settings
- 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>.<leqPP
ercent>

- Description: Indicates vehicle percent of total hourly traffic when LAeq1h: Percent Volumes, Speed is selected in the project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates speed for the vehicle type at this <point> when LAeq1h: Percent Volumes, Speed is selected in the project settings
- 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>.<ldnPe
rcentDay>

- Description: Indicates the daytime traffic percent for this vehicle type at this <point> when Ldn: Day Night is selected in project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal

- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates the nighttime traffic percent for this vehicle type at this <point> when Ldn: Day Night is selected in project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates speed for the vehicle type at this <point> when Ldn: Day Night is selected in the project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates the daytime traffic percent for this vehicle type at this <point> Lden: Day Evening Night is selected in project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates the evening traffic percent for this vehicle type at this <point> Lden: Day Evening Night is selected in project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates the nighttime traffic percent for this vehicle type at this <point> Lden: Day Evening Night is selected in project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

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

- Description: Indicates speed for the vehicle type at this <point> when Lden: Day Evening Night is selected in the project settings
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 100

6. RECEIVERS

The <project>.<receivers> tag contains a list of <receiver> tags that are used to define each receiver.

<receiver>####</receiver>

<project>.<receivers>.<receiver>

- Description: Contains all information related to a specific receiver object
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [6.1](#) for a description of tags under <receiver>

6.1 DESCRIPTION OF TAGS UNDER <RECEIVER>

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

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

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

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

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

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

- Description: Receiver sequence number
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer; two receivers cannot have the same sequenceNumber

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

- Description: Height above terrain
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal greater than 0

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

- Description: The number of receptors associated with receiver
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer up to 32767

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

- Description: The default adjustment factor
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Set to 0

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

- Description: The noise reduction goal
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates existing LAeq,1h
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal greater than 0, (0 and negative numbers are treated as no entry)

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

- Description: Indicates absolute criterion
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates relative criterion
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates if the receiver is inactive
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

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

- Description: Contains the roadway adjustments for a receiver
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [6.1.1](#) for a description of tags under <roadAdjustmentSet>

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

- Description: Indicates the location of the receiver
- Mandatory or optional: Mandatory (1 point)
- Type of value: Tag list
- Valid range/list if applicable: See [6.1.2](#) for a description of tags under <points>

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

- Description: Contains the calculated 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 [6.1.3](#) for a description of tags under <ReceiverResults>

6.1.1 DESCRIPTION OF TAGS UNDER <ROADADJUSTMENTSET>

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

<roadAdjustment>#####</roadAdjustment>

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

- Description: Contains the factor, roadway and point for a given adjustment
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [6.1.1.1](#) for a description of tags under <roadAdjustment>

6.1.1.1 DESCRIPTION OF TAGS UNDER <ROADADJUSTMENT>

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

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

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

- Description: The adjustment factor to be applied to the receiver results for the specified road and point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0.00 and 100.00

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

- Description: The name of the roadway object 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 point number associated with the adjustment
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Integer matching extant roadway point for this roadway

6.1.2 DESCRIPTION OF TAGS UNDER <POINTS>

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

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

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

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

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

- Description: The ordering number
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 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: Any decimal

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

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

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

- Description: The Z coordinate of the receiver object
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

6.1.3 DESCRIPTION OF TAGS UNDER <RECEIVERRESULTS>

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

<ReceiverResult>#####</ReceiverResult>

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

- Description: Contains all calculations related to 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 [6.1.3.1](#) for a description of tags under <ReceiverResult>

6.1.3.1 DESCRIPTION OF TAGS UNDER <RECEIVERRESULT>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult> tag includes the tags shown below with ##### inserted for tag data. Except for the tag <Results>, all tags pertain to the results for the currently selected traffic entry type.

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

<Relative>#####</Relative>

```

<ImpactType>####</ImpactType>
<Impacted>####</Impacted>
<Benefitted>####</Benefitted>
<Calculated>####</Calculated>
<AnyCalculated>####</AnyCalculated>
<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: String

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

- Description: Not currently used
- Mandatory or optional: Mandatory; required for program stability
- Type of value: Boolean
- Valid range/list if applicable: true, false

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

- Description: Indicates type of impact, if any
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: None, Substantial Increase, Sound Level, Both

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

- Description: Indicates whether the receiver has been impacted
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<ReceiverResult>.<Benefitted>

- Description: Indicates whether the noise reduction goal is met
- Mandatory or optional: Mandatory
- Type of value: Boolean

- Valid range/list if applicable: true, false

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

- Description: Indicates whether results for the receiver have been calculated
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<project>.<receivers>.<receiver>.<ReceiverResult>.<AnyCalculated>

- Description: Indicates whether results for any receiver have been calculated
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

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

- Description: Indicates the sound level with the barrier(s) intended for noise mitigation
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the sound level with no barrier(s) intended for noise mitigation
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the noise level changed due to barrier(s) intended for noise mitigation
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates how much reduction over the noise reduction goal the barrier(s) intended for noise mitigation achieved
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates whether the noise reduction goal was met
- Mandatory or optional: Mandatory

- Type of value: Boolean
- Valid range/list if applicable: true, false

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

- Description: Indicates increase above existing level for the no barrier case
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

<project>.<receivers>.<receiver>.<ReceiverResult>.<NoBarrierLEQCalc>

- Description: Indicates the noise level with no barrier(s) intended for noise mitigation. Note, this tag is used for all metrics, e.g. Ldn and Lden as well
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Contains a list of tags elemental triangle results
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [6.1.3.2](#) 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 [6.1.3.3](#) for a description of tags under <Results>

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

- Description: Indicates the adjustment to be used for parallel barrier increases
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

6.1.3.2 DESCRIPTION OF TAGS UNDER <SAVEDTRIANGLES>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<SavedTriangles> tag includes a list of <Items> tags as shown below with ##### inserted for tag data. There is one <Item> 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 a list of tags for elemental triangle results for use with the Barrier Design Analysis
- Mandatory or optional: Optional; mandatory for Barrier Design Analysis only - serialized Strings should only be created with FHWA's TNM
- Type of value: Tag list
- Valid range/list if applicable: See [6.1.3.3](#) for a description of tags under <Results>

6.1.3.2.1 Description of tags under <Items>

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

<Phi_SAvg_NoBarrByte>####</Phi_SAvg_NoBarrByte>
 <Phi_SAvgByte>####</Phi_SAvgByte>
 <phi_geom>####</phi_geom>
 <AdjustmentFactorEnergy>####</AdjustmentFactorEnergy>

<delta_energy>####</delta_energy>
 <TrafficEntryType>####</TrafficEntryType>
 <NumTimePeriods>####</NumTimePeriods>
 <E_traff_h_ffBytes>####</E_traff_h_ffBytes>
 <BarrierSegmentStartPointIds>####</BarrierSegmentStartPointIds>

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

- Description: Indicates average phi matrix for the no barrier case
- Mandatory or optional: Mandatory
- Type of value: Serialized String
- Valid range/list if applicable: Should not be manually created or edited

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

- Description: Indicates average phi matrix for barrier case
- Mandatory or optional: Mandatory
- Type of value: Serialized String
- Valid range/list if applicable: Should not be manually created or edited

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

- Description: Indicates phi for the geometry
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates user specified adjustment
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates energy change
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the traffic entry type for these results
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: LEqualHourly, LEqualPercent, LDayNight, CNEL

<project>.<receivers>.<receiver>.<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, 2 or 3

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

- Description: Indicates free-field traffic energy
- Mandatory or optional: Mandatory
- Type of value: Serialized String
- Valid range/list if applicable: Should not be manually created or edited

<project>.<receivers>.<receiver>.<ReceiverResult>.<SavedTriangles>.<Items>.<BarrierSegmentStartPoin
tIds>

- Description: Unique ID across the project representing the start of the Barrier Segment that is related to the ElementTriangle
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Unique ID across the project

6.1.3.3 DESCRIPTION OF TAGS UNDER <RESULTS>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results> tag includes four tag as shown below with ##### inserted for 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 [6.1.3.3.1](#) for a description of tags under <Items>

6.1.3.3.1 Description of tags under <Items>

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

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

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

- Description: Indicates type of traffic for the results
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: LEqualHourly, LEqualPercent, LDayNight, CNEL

<project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<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 [6.1.3.3.1.1](#) for a description of tags under <Value>

6.1.3.3.1.1 DESCRIPTION OF TAGS UNDER <VALUE>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value> tag includes the tags shown below with #### inserted for 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 type of traffic for this set of 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 results for the receiver for this traffic entry type have been calculated
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

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

- Description: Indicates the sound level with the barrier(s) intended for noise mitigation for this traffic entry type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the sound level with no barrier(s) intended for noise mitigation for this traffic entry type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the noise level change relative to the existing level
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the noise level changed due to barrier(s) intended for noise mitigation for this traffic entry type

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

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

- Description: Indicates how much reduction over the noise reduction goal the barrier(s) intended for noise mitigation achieved for this traffic entry type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates whether the noise reduction goal was met for this traffic entry type.
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

<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 [6.1.3.3.1.1.1](#) 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 [6.1.3.3.1.1.2](#) 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 [6.1.3.3.1.1.3](#) for a description of tags under <ByVehicleType>

6.1.3.3.1.1 DESCRIPTION OF TAGS UNDER <BYBARRIERSEGMENT>

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

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

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

- Description: Indicates the name of the barrier segment point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer corresponding to a barrier segment point

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

- Description: Indicates the noise level associated with the barrier segment point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

6.1.3.3.1.2 DESCRIPTION OF TAGS UNDER <BYROADWAYSEGMENT>

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

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

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

- Description: Indicates the name of the roadway segment point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer corresponding to a roadway segment point

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

- Description: Indicates the noise level associated with the roadway segment point
- Mandatory or optional: Mandatory

- Type of value: Decimal
- Valid range/list if applicable: Any decimal

6.1.3.3.1.3 DESCRIPTION OF TAGS UNDER <BYVEHICLETYPE>

Each <project>.<receivers>.<receiver>.<ReceiverResults>.<ReceiverResult>.<Results>.<Items>.<Value>.<ByVehicleType> tag includes and <Items> tag for each of the ten vehicle types (Automobile – Other5). These <Item> tags include the tags shown below with ##### inserted for tag data.

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

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

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

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

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

- Description: Indicates the noise level associated with the vehicle type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

7. GROUND ZONES

The <project>.<groundZones> tag contains a list of <groundZone> tags that are used to define all aspects of ground zones. There is one <groundZone> tag for each ground zone. The <groundZones> tag includes a list of <groundZone> tags shown below with ##### inserted for tag data.

```
<groundZone>#####</groundZone>
```

```
<project>.<groundZones>.<groundZone>
```

- Description: Tag that contains the data for a specific ground zone
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [7.1](#) for a description of tags under <groundZone>

7.1 DESCRIPTION OF TAGS UNDER <GROUNDZONE>

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

```
<name>#####</name>
```

```
<comments>#####</comments>
```

```
<groundType>#####</groundType>
```

```
<flowResistivity>#####</flowResistivity>
```

```
<points>#####</points>
```

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

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

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

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

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

- Description: Indicates type of ground within ground zone
- 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 flow resistivity within the ground zone
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0 to 20,000

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

- Description: Tag that contains the geometry data for a specific ground zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [7.1.1](#) for a description of tags under <points>

7.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<groundZones>.<groundZone>.<points> tag contains a list of <point> tags that are used to define the geometry of the ground zone. A minimum of 3 <point> tags are required. The tags contained within the <point> tag are shown below with ##### inserted for tag data.

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

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

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

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

- Description: Contains point level comments for the specified ground zone object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the point number for this ground zone
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer

<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 the points in the ground zone are created

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

- Description: Indicates the x-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the y-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the z-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: 0

8. TREE ZONES

The <project>.<treeZones> tag contains a list of <treeZone> tags that are used to define all aspects of tree zones. There is one <treeZone> tag for each tree zone. The <treeZones> tag includes a list of <treeZone> tags shown below with ##### inserted for tag data.

```
<treeZone>#####</treeZone>
```

```
<project>.<treeZones>.<treeZone>
```

- Description: Tag that contains the data for a specific tree zone
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [8.1](#) for a description of tags under <treeZone>

8.1 DESCRIPTION OF TAGS UNDER <TREEZONE>

Each <project>.<treeZones>.<treeZone> tag includes the following tags with ##### inserted for 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
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

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

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

- Description: Indicates type of ground within tree zone
- 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 flow resistivity within the tree zone
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0 to 20,000

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

- Description: Indicates the average height of the trees in the tree zone
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Tag that contains the geometry data for a specific tree zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [8.1.1](#) for a description of tags under <points>

8.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<treeZones>.<treeZone>.<points> tag contains a list of <point> tags that are used to define the geometry of the tree zone. A minimum of 3 <point> tags are required. The tags contained within the <point> tag are shown below with ##### inserted for tag data.

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

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

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

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

- Description: Contains point level comments for the specified tree zone object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the point number for this tree zone

- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer

<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 the points in the tree zone are created

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

- Description: Indicates the x-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the y-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the z-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

9. CONTOUR ZONES

The <project>.<contourZones> tag contains a list of <contourZone> tags that are used to define all aspects of contour zones. There is one <contourZone> tag for each contour zone. The <contourZones> tag includes a list of <contourZone> tags shown below with ##### inserted for tag data.

```
<contourZone>#####</contourZone>
```

```
<project>.<contourZones>.<contourZone>
```

- Description: Tag that contains the data for a specific contour zone
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [9.1](#) for a description of tags under <contourZone>

9.1 DESCRIPTION OF TAGS UNDER <CONTOURZONE>

Each <project>.<contourZones>.<contourZone> tag includes the following tags with ##### inserted for 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
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

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

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

- Description: Indicates the minimum grid spacing
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the contour tolerance
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the grid height of the contour
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Tag that contains the geometry data for a specific contour zone
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [9.1.1](#) for a description of tags under <points>

9.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<contourZones>.<contourZone>.<points> tag contains a list of <point> tags that are used to define the geometry of the contour zone. A minimum of 3 <point> tags are required. The tags contained within the <point> tag are shown below with ##### inserted for tag data.

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

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

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

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

- Description: Contains point level comments for the specified contour zone object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the point number for this contour zone
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer

<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 the points in the contour zone are created

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

- Description: Indicates the x-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the y-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the z-coordinate of the point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

10. TERRAIN LINES

The `<project>.<terrainLines>` tag contains a list of `<terrainLine>` tags that are used to define all aspects of ground zones. There is one `<terrainLine>` tag for each terrain line. The `<terrainLines>` tag includes a list of `<terrainLine>` tags shown below with ##### inserted for tag data.

`<terrainLine>#####</terrainLine>`

`<project>.<terrainLines>.<terrainLine>`

- Description: Tag that contains the data for a specific terrain line
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [10.1](#) for a description of tags under `<terrainLine>`

10.1 DESCRIPTION OF TAGS UNDER `<TERRAINLINE>`

Each `<project>.<terrainLines>.<terrainLine>` tag includes the following tags with ##### inserted for 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: String

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

- Description: Contains comments for the specified terrain line object
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Tag that contains the geometry data for a specific terrain line
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [10.1.1](#) for a description of tags under `<points>`

10.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<terrainLines>.<terrainLine>.<points> tag contains a list of <point> tags that are used to define the geometry of a terrain line. A minimum of 2 <point> tags are required. The tags contained within the <point> tag are shown below with ##### inserted for 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
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the sequential point number of the terrain line object
- Mandatory or optional: Mandatory. Minimum of two points
- Type of value: Integer
- Valid range/list if applicable: Non-negative integer

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

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

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

- Description: Indicates the x-coordinate of a terrain line point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the y-coordinate of a terrain line point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the z-coordinate of a terrain line point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Contains point level comments for the specified terrain line object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

II. BUILDING ROWS

The <project>.<buildingRows> tag contains a list of <buildingRow> tags that are used to define all aspects of building rows. There is one <buildingRow> tag for each building row. The <buildingRows> tag includes a list of <buildingRow> tags shown below with ##### inserted for tag data.

<buildingRow>#####</buildingRow>

<project>.<buildingRows>.<buildingRow>

- Description: Tag that contains the data for a specific building row
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [11.1](#) for a description of tags under <buildingRow>

II.1 DESCRIPTION OF TAGS UNDER <BUILDINGROW>

Each <project>.<buildingRows>.<buildingRow> tag includes the following tags with ##### inserted for 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: String

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

- Description: Contains comments for the specified terrain line object
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the average height of the building row object
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the gap percentage of the building row object

- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer between 20 and 80

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

- Description: Tag that contains the geometry data for a specific building row
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [11.1.1](#) for a description of tags under <points>

11.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<buildingRows>.<buildingRow>.<points> tag contains a list of <point> tags that are used to define the geometry of a building row. A minimum of 2 <point> tags are required. The tags contained within the <point> tag are shown below with ##### inserted for 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
- Mandatory or optional: Mandatory; at least two to define a building row
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the sequential point number of the building row object
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer

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

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

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

- Description: Indicates the x-coordinate of a building row point

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

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

- Description: Indicates the y-coordinate of a building row point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the z-coordinate of a building row point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Contains point level comments for the specified building row object
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: String

12. BARRIERS

The <project>.<barriers> tag contains a list of <barrier> tags that are used to define all aspects of barrier inputs. There is one <barrier> tag for each barrier. The <barriers> tag includes a list of <barrier> tags shown below with ##### inserted for tag data.

```
<barrier>#####</barrier>
```

```
<project>.<barriers>.<barrier>
```

- Description: Tag that contains the data for a specific barrier
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [12.1](#) for a description of tags under <barrier>

12.1 DESCRIPTION OF TAGS UNDER <BARRIER>

Each <project>.<barriers>.<barrier> tag includes the following tags with ##### inserted for 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: The feature ID
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: 0 (BERM), 1 (WALL)

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

- Description: The type of barrier feature
- 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: String

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

- Description: Indicates the type of barrier
- Mandatory or optional: Mandatory
- Type of value: String
- Valid range/list if applicable: Berm, Wall

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

- Description: Indicates the increment amount for each up and down increment
- Mandatory or optional: Mandatory; deprecated
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates the number of up increments for this barrier segment
- Mandatory or optional: Mandatory; deprecated
- Type of value: Integer
- Valid range/list if applicable: Any integer

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

- Description: Indicates the number of down increments for this barrier segment
- Mandatory or optional: Mandatory; deprecated
- Type of value: Integer
- Valid range/list if applicable: Any integer

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

- Description: Indicates the top width when Berm is selected as the barrier type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates the slope run when Berm is selected as the barrier type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the slope rise when Berm is selected as the barrier type
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the NRC (left side)
- Mandatory or optional: Mandatory; deprecated
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 1

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

- Description: Indicates the NRC (right side)
- Mandatory or optional: Mandatory; deprecated
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 1

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

- Description: Indicates the NRC (PBA)
- Mandatory or optional: Mandatory; deprecated
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 1

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

- Description: Indicates the cost per unit area when Wall is selected as the barrier type [\$/ft²]
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates the cost per unit volume when Berm is selected as the barrier type [\$/ft³]
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates the additional lineal unit cost [\$/ft]
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates the maximum barrier height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the minimum barrier height
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any positive decimal

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

- Description: Indicates the base height of the barrier
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Tag that contains the geometry data for a specific barrier
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [12.1.1](#) for a description of tags under <points>

12.1.1 DESCRIPTION OF TAGS UNDER <POINTS>

The <project>.<barriers>.<barrier>.<points> tag contains a list of <point> tags that are used to define the geometry of a barrier. A minimum of 2 <point> tags are required. The tags contained within the <point> tag are shown below with ##### inserted for 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: Any String

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

- Description: Contains comments for the specified barrier object
- Mandatory or optional: Optional
- Type of value: String
- Valid range/list if applicable: String

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

- Description: Indicates the sequential point number of the barrier object
- Mandatory or optional: Mandatory; minimum of two to define a barrier
- Type of value: Integer
- Valid range/list if applicable: Any non-negative integer

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

- Description: The x-coordinate of a barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: The y-coordinate of a barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: The z-coordinate of a barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the increment amount for each up and down increment
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any non-negative decimal

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

- Description: Indicates the number of up increments for this barrier point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer

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

- Description: Indicates the number of down increments for this barrier point
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer

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

- Description: Indicates the height of the barrier point
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal

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

- Description: Indicates the NRC (left side) for that point of the barrier
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 1

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

- Description: Indicates the NRC (right side) for that point of the barrier
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 1

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

- Description: Indicates the NRC (PBA) for that point of the barrier
- Mandatory or optional: Mandatory
- Type of value: Decimal
- Valid range/list if applicable: Any decimal between 0 and 1

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

- Description: Tag that contains the geometry data for a specific barrier's on-structure shielding
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [12.1.1.1](#) for a description of tags under <shieldedRoadSegmentSet>

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

- Description: Tag that contains the geometry data for a specific barrier's "single barrier reflections"
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [12.1.1.2](#) for a description of tags under <reflectedRoadSegmentSet>

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

- Description: Indicates whether the barrier is for noise mitigation
- Mandatory or optional: Mandatory
- Type of value: Boolean
- Valid range/list if applicable: true, false

12.1.1.1 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 for tag data.

<roadSegmentID>##### </roadSegmentID>

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

- Description: Indicates the road segment to be paired with the barrier for on-structure shielding
- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer associated with a shielded roadway segment

12.1.1.2 DESCRIPTION OF TAGS UNDER <REFLECTEDROADSEGMENTSET>

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 for tag data.

<roadSegmentID>##### </roadSegmentID>

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

- Description: Indicates the road segment to be paired with the barrier for barrier's "single barrier reflections"

- Mandatory or optional: Mandatory
- Type of value: Integer
- Valid range/list if applicable: Any integer associated with a roadway segment to have reflections applied

13. BARRIER DESIGNS

The <project>.<barrierDesigns> tag contains a list of <barrierDesign> tags that are used to define all aspects of ground zones. There is one <barrierDesign> tag for each barrier design. The <barrierDesigns> tag includes a list of <barrierDesign> tags shown below with ##### inserted for tag data.

```
<barrierDesign>#####</barrierDesign>
```

```
<project>.<barrierDesigns>.<barrierDesign>
```

- Description: Tag that contains the data for a specific ground zone
- Mandatory or optional: Optional
- Type of value: Tag list
- Valid range/list if applicable: See [13.1](#) for a description of tags under <barrierDesign>

13.1 DESCRIPTION OF TAGS UNDER <BARRIERDESIGN>

Each <project>.<barrierDesigns>.<barrierDesign> tag includes the following tags with ##### inserted for 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: String

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

- Description: Tag that contains the receivers included in a barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [13.1.1](#) for a description of tags under <receiverList>

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

- Description: Tag that contains the roadways included in a barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [13.1.2](#) for a description of tags under <roadwayList>

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

- Description: Tag that contains the barriers included in a barrier design.
- Mandatory or optional: Mandatory.
- Type of value: Tag list.
- Valid range/list if applicable: See [13.1.3](#) for a description of tags under <barrierList>

13.1.1 DESCRIPTION OF TAGS UNDER <RECEIVERLIST>

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

<receiver>#####</receiver>

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

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

13.1.2 DESCRIPTION OF TAGS UNDER <ROADWAYLIST>

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

<roadway>#####</roadway>

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

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

13.1.3 DESCRIPTION OF TAGS UNDER <BARRIERLIST>

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

<barrier>#####</barrier>

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

- Description: Tag that contains the information about the barriers included in a barrier design
- Mandatory or optional: Mandatory
- Type of value: Tag list
- Valid range/list if applicable: See [13.1.3.1](#) for a description of tags under <barrier>

13.1.3.1 DESCRIPTION OF TAGS UNDER <BARRIER>

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

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

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

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

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

- Description: Tag that contains a list of <segment> 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 [13.1.3.1.1](#) for a description of tags under <segments>

13.1.3.1.1 Description of tags under <segments>

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

<segment>#####</segment>

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

- Description: Tag that contains 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 [13.1.3.1.1.1](#) for a description of tags under <segment>

13.1.3.1.1.1 DESCRIPTION OF TAGS UNDER <SEGMENT>

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

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

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

- Description: Indicates the start point number 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>.<segment>.<currentIncrement>

- Description: Indicates the perturbation increment of the specific barrier segment to be perturbed
- 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

14. DEFAULTS

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

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

14.1 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 for 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>
```

14.2 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 for 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>

```

14.3 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 for tag data. For more information about each tag please see [ROADWAYS](#).

```

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

```

14.4 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 for tag data. For more information about each tag please see [TERRAIN LINES](#).

```

<name>####</name>

```

14.5 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 for tag data. For more information about each tag please see [BUILDING ROWS](#).

```

<name>####</name>
<averageHeight>####</averageHeight>
<gapPercentage>####</gapPercentage>

```

14.6 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 for tag data. For more information about each tag please see [GROUND ZONES](#).

```

<name>####</name>
<groundType>####</groundType>
<flowResistivity>####</flowResistivity>

```

14.7 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 for tag data. For more information about each tag please see [TREE ZONES](#).

```

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

```

14.8 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 for tag data. For more information about each tag please see [CONTOUR ZONES](#).

```

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

```