Note

Project	Develop and implement harmonised noise assessment methods		
Concerns	Source Modules Rail – Programming guide		
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1. Introduction

This report provides the programming guide for the implementation of the source model for railway noise as described in Chapter IV of the JRC Reference Report "Stylianos Kephalopoulos, Marco Paviotti, Fabienne Anfosso-Lédée (2012), Common Noise Assessment Methods in Europe (CNOSSOS-EU), EUR 25379 EN".

The source model calculates the source power of a single railway noise source, for a given type of source (point, line or area) and direction. The source model will only describe the calculation of the source power for a given period and direction.

Chapter 2 gives the file format for the look-up tables. These files contain all the static data needed for the calculation of the source power. Examples of static data are:

- Emitted sound power
- Correction on the sound emitted in each direction, relative to the source's direction.

Chapter 3 gives the file format for the input XML file and chapter 4 the file format for the output XML file.

Chapter 5 describes how the command line utility is used. Chapter 6 gives an overview of the source model DLL interface.

Annexes:

A. example of the file CNOSSOS_Rail_Track.xml
B. example of the file CNOSSOS_Rail_Vehicles.xml
C. example of the file CNOSSOS_Rail_Input.xml
D. example of the file CNOSSOS_Rail_Output.xml
E. example of the file CNOSSOS_Rail_Output.csv

2. Look-up tables

All data for the look-up tables is located in two XML files:

- CNOSSOS_Rail_Track.xml
  contains the track-based look-up tables needed for the calculation of the emission of railway noise.
- CNOSSOS_Rail_Vehicles.xml
  contains the vehicle-related look-up tables needed for the calculation of the emission of railway noise.

The format used is self-explanatory and the delivered files contain clarifying comments.

All XML files (including those for the user input) need to comply with the following:

- Decimal separator a point ('.')
- Date format yyyy-MM-dd
- Spectral information is given as
  - 8 values for octave information (63 Hz .. 8 kHz)
  - 24 values for 1/3 octave information (50 Hz .. 10 kHz)
  - values are separated by 1 or more spaces.
- Wave length information is given as
  - 32 values (100 cm .. 0.08 cm)
  - Wavelengths:

100.000	80.000	63.000	50.000	40.000	31.500	25.000	20.000
16.000	12.500	10.000	8.000	6.300	5.000	4.000	3.150
2.500	2.000	1.600	1.250	1.000	0.800	0.630	0.500
0.400	0.315	0.250	0.200	0.160	0.125	0.100	0.080

  - values are separated by 1 or more spaces.

The following sections describe the contents of each file. The table is formatted as follows.

- The first column lists the element or attribute name, preceded by its parent element's name:
  - Names in **bold** represent an XML element which can contain other elements.
  - Names in *italics* represent an XML attribute.
  - Names neither bold or italic represent an XML element containing a simple value.
- The second column lists the data type:
  - Data type "decimal" means a floating-point number.
  - Data type "list of decimals" is used for spectral information. The values are separated by one or more whitespace characters (space, tab, or line-break).
- The third column lists the allowed number of occurrences:
  - "1" means the item is required, and must occur exactly once.
  - "1..n" means the item is required, and may occur more than once.
  - "0..1" means the item is optional, but if present may not occur more than once.
  - "0..n" means the item is optional, but if present may occur more than once.
- The fourth column provides a description of the item.

2.1 CNOSSOS_Rail_Track.xml

Name	Data Type	Count	Description
TrackParameters		1	
. *TrackParameters› version*	string	1	Version of this file format.
. Date	date	1	Catalogue date (informative)
. TrackParameters›**TrackTransfer**		1	
.. TrackTransfer›**Track**		1..n	
... *Track› ID*	integer	1	
... *Track› Default*	boolean	0..1	(informative)
... *Track› Reference*	string	0..1	(informative)
... *Track› Description*	string	0..1	(informative)
... *Track› SleeperCode*	string	0..1	(informative)
... *Track› RailpadCode*	string	0..1	(informative)
... *Track› Values*	list of decimals	1	Values are given per 1/3 octave band (50 Hz .. 10 kHz)
. TrackParameters›**StructureTransfer**		1	
.. StructureTransfer›**Structure**		1..n	
... *Structure› ID*	integer	1	
... *Structure› Default*	boolean	0..1	(informative)
... *Structure› Reference*	string	0..1	(informative)
... *Structure› Description*	string	0..1	(informative)
... *Structure› Values*	list of decimals	1	Values are given per 1/3 octave band (50 Hz .. 10 kHz)
. TrackParameters›**RailRoughness**		1	
.. RailRoughness›**Rail**		1..n	
... *Rail› ID*	integer	1	
... *Rail› Default*	boolean	0..1	(informative)
... *Rail› Reference*	string	0..1	(informative)
... *Rail› Description*	string	0..1	(informative)
... *Rail› RoughnessCode*	string	0..1	(informative)
... *Rail› Values*	list of decimals	1	Values are given per wavelength (100 cm .. 0.08 cm)
. TrackParameters›**ImpactNoise**		1	
.. ImpactNoise›**Impact**		1..n	
... *Impact› ID*	integer	1	
... *Impact› Default*	boolean	0..1	(informative)
... *Impact› Reference*	string	0..1	(informative)
... *Impact› Description*	string	0..1	(informative)
... *Impact› JointDensity*	integer	1	Number of joints per 100 metres
... *Impact› JointDensityDescription*	string	0..1	(informative)
... *Impact› RoughnessCode*	string	0..1	(informative)
... *Impact› Values*	list of decimals	1	Values are given per wavelength (100 cm .. 0.08 cm)
. TrackParameters›**BridgeConstant**		1	
.. BridgeConstant›**Bridge**		1..n	
... *Bridge› ID*	integer	1	
... *Bridge› Default*	boolean	0..1	(informative)
... *Bridge› Reference*	string	0..1	(informative)
... *Bridge› Description*	string	0..1	(informative)
... *Bridge› Value*	integer	1	ΔLbridge [dB]

2.2 CNOSSOS_Rail_Vehicles.xml

	Data Type	Count	Description
RailParameters		1	
. RailParameters› version	string	1	Version of this file format.
. Date	date	1	Catalogue date (informative)
. r0	decimal	1	Reference value for roughness in µm
. h1	decimal	1	First source height in m
. h2	decimal	1	Second source height in m
. RailParameters›**VehicleDefinition**		1	This section contains the definitions of the supported train vehicles. If a vehicle is not defined in this section, it is not calculated.
.. VehicleDefinition›**Vehicle**		1..n	
... Vehicle› ID	string	1	unique identification of the vehicle
... Vehicle› Code	string	0..1	Vehicle Code short description (informative)
... Vehicle› Description	string	0..1	Vehicle Type long description (informative)
... Vehicle› P_mech	integer	0..1	Power in kW (informative)
... Vehicle› V_max	integer	0..1	Max speed in km/h (informative)
... Vehicle› Weight	decimal	0..1	in metric tonnes
... Vehicle› Length	decimal	0..1	in metres
... Vehicle› Axles	integer	1	number of axles
... Vehicle› WheelDiameter	integer (or empty)	0..1	in mm (informative)
... Vehicle› WheelDiameterCode	value from list: *(empty)* large*(>800mm)* medium *(500 to 800mm)* small*(<500mm)*	0..1	(informative)
... Vehicle› WheelMeasure	value from list: wheelDampers other screens none	0..1	Wheel measures (informative)
... Vehicle› BrakeCode	value from list: castIronBlock compositeBlock disk	0..1	Brake type (informative)
... Vehicle› Load	integer (or empty)	0..1	load in kN (informative)
... Vehicle› RefTransfer	string	1	Reference to "VehicleTransfer"
... Vehicle› RefContact	string	1	Reference to "ContactFilter"
... Vehicle› RefRoughness	string	1	Reference to "WheelRoughness"
... Vehicle› RefTraction	string	1	Reference to "TractionNoise"
... Vehicle› RefAerodynamic	string	1	Reference to "AerodynamicNoise"
. RailParameters›**VehicleTransfer**		1	
.. VehicleTransfer›**Transfer**		1..n	
... Transfer› ID	string	1	unique identification
... Transfer› Default	boolean	0..1	(informative)

... Transfer› Reference	string	0..1	(informative); examples: IMAGINE, European Commission. Member State, Local User, CNOSSOS
... Transfer› Description	string	0..1	(informative)
... Transfer› WheelDiameter	integer (or empty)	0..1	in mm (informative)
... Transfer› WheelDiameterCode	value from list: *(empty)* large*(>800mm)* medium *(500 to 800mm)* small*(<500mm)*	0..1	(informative)
... Transfer› Values	list of decimals	1	Values are given per 1/3 octave band (50 Hz .. 10 kHz)
. RailParameters›**WheelRoughness**		1	
.. WheelRoughness›**Roughness**		1..n	
... Roughness› ID	string	1	unique identification
... Roughness› Default	boolean	0..1	(informative)
... Roughness› Reference	string	0..1	(informative); examples: IMAGINE, European Commission. Member State, Local User, CNOSSOS
... Roughness› Description	string	0..1	(informative)
... Roughness› Values	list of decimals	1	Values are given per wave length (100cm .. 0.04cm)
. RailParameters›**ContactFilter**		1	
.. ContactFilter›**Contact**		1..n	
... Contact› ID	string	1	unique identification
... Contact› Default	boolean	0..1	(informative)
... Contact› Reference	string	0..1	(informative); examples: IMAGINE, European Commission. Member State, Local User, CNOSSOS
... Contact› Description	string	0..1	(informative)
... Contact› Load	integer (or empty)	0..1	Load in kN (informative)
... Contact› WheelDiameter	integer (or empty)	0..1	in mm (informative)
... Contact› WheelDiameterCode	value from list: *(empty)* large*(>800mm)* medium *(500 to 800mm)* small*(<500mm)*	0..1	(informative)
... Contact› Values	list of decimals	1	Values are given per 1/3 octave band (50 Hz .. 10 kHz)
. RailParameters›**TractionNoise**		1	
.. TractionNoise›**Traction**		1..n	
... Traction› ID	string	1	unique identification
... Traction› Default	boolean	0..1	(informative)
... Traction› Reference	string	0..1	(informative); examples: IMAGINE, European Commission. Member State, Local User, CNOSSOS
... Traction› Description	string	0..1	(informative)
... Traction›**Source**		1..n	

…. Source› Type	value from list: A *(source at 0.5 m)* B *(source at 4.0 m)*	1	source (height) to which these values apply
…. Source› Constant	list of decimals	1	Values are given per 1/3 octave band (50 Hz .. 10 kHz). NOTE 1: values should be Sound Power Level per vehicle for use directly in Equ IV-8 NOTE 2: values were converted from SPL to SWL using method in IMAGINE.
…. Source› Accelerating	list of decimals	1	
…. Source› Decelerating	list of decimals	1	
…. Source› Idling	list of decimals	1	
. RailParameters›**AerodynamicNoise**		1	
.. AerodynamicNoise›**Aerodynamic**		1..n	
… Aerodynamic› ID	string	1	unique identification
… Aerodynamic› Default	boolean	0..1	(informative)
… Aerodynamic› Reference	string	0..1	(informative); examples: IMAGINE, European Commission. Member State, Local User, CNOSSOS
… Aerodynamic› Description	string	0..1	(informative)
… Aerodynamic›**Source**		1..n	
…. Source› Type	value from list: A *(source at 0.5 m)* B *(source at 4.0 m)*	1	source (height) to which these values apply
…. Source› V0	decimal	1	Speed at which aerodynamic noise is dominant [km/h]
…. Source› Values	list of decimals	1	Lw0(v0) = source power for rolling noise at speed v0. Values are given per 1/3 octave band (50 Hz .. 10 kHz)
…. Source› Alpha	decimal	1	Coefficient for aerodynamic noise

3. User data

All user input is located in a single XML file: CNOSSOS_Rail_Input.xml. (The file name itself is variable).
The format used is self-explanatory, and the delivered files contain comments for clarification.

The following table describes the contents of the file. The table is formatted as specified in chapter 2.

Name	Data Type	Count	Description
CNOSSOS_Rail_Input		1	
. *CNOSSOS_Rail_Input› version*	string	1	Version of this file format.
. Test	boolean	1	whether or not to create a tab-separated file with the intermediate results
. Tref	decimal	1	The reference time in hours
. Source	value from list: A *(source at 0.5 m)* B *(source at 4.0 m)*	1	The source to calculate
. Idling	boolean	1	whether to calculate idling (true) or moving (false) vehicles
. CNOSSOS_Rail_Input›**Track**		1	The track-specific parameters to be used
.. *Track› SectionLength*	decimal	1	the length of the track section [m]
.. *Track› VerticalAngle*	integer	1	the vertical angle [°]
.. *Track› HorizontalAngle*	integer	1	the horizontal angle [°]
.. *Track› TrackTransferID*	integer	1	references /TrackParameters/TrackTransfer/Track with the given ID, in CNOSSOS_Rail_Track.xml
.. *Track› StructureTransferID*	integer	1	references /TrackParameters/StructureTransfer/Structure with the given ID, in CNOSSOS_Rail_Track.xml
.. *Track› RailRoughnessID*	integer	1	references /TrackParameters/RailRoughness/Rail with the given ID, in CNOSSOS_Rail_Track.xml
.. *Track› ImpactNoiseID*	integer	1	references /TrackParameters/ImpactNoise/Impact with the given ID, in CNOSSOS_Rail_Track.xml
.. *Track› CurveRadius*	decimal	1	the radius R of the curve [m]
.. *Track› BridgeConstantID*	integer	1	references /TrackParameters/BridgeConstant/Bridge with the given ID, in CNOSSOS_Rail_Track.xml
. CNOSSOS_Rail_Input›**Vehicles**		1	The types of vehicle circulating on the specified track section.
.. Vehicles›**Vehicle**		1..n	
... *Vehicle› Ref*	integer	1	references /RailParameters/VehicleDefinition/Vehicle with the given ID, in CNOSSOS_Rail_Vehicles.xml. Also used for VehicleTransfer, WheelRoughness, ContactFilter, TractionNoise and AerodynamicNoise in that same file.
... *Vehicle› Description*	string	1	
... *Vehicle› RunningCondition*	value from list: constant	1	the running condition of railway vehicles. Note that when Idling (see above) is set to 'true', only idling vehicles will be taken into

	accelerating decelerating idling		account. Vice versa, when Idling is set to 'false', only moving vehicles will be taken into account.
... Vehicle› Q	integer	0..1	the number of vehicles on the track section; **not** used when RunningCondition = "idling"
... Vehicle› v	integer	0..1	the speed of the vehicles [km/h]; **not** used when RunningCondition = "idling"
... Vehicle› IdlingTime	integer	0..1	the idling time of the vehicle [hours]; **only** used when RunningCondition = "idling"

4. Calculated source power

All calculated source power is output to the given XML file name (e.g. CNOSSOS_Industry_Output.xml).
The format used is self-explanatory and the delivered files contain clarifying comments.

The following table describes the contents of the file. The table is formatted as specified in chapter 2.

Name	Data Type	Count	Description
CNOSSOS_SourcePower		1	
. CNOSSOS_SourcePower› version	string	1	
. CNOSSOS_SourcePower›**source**		1..n	
.. h	decimal	1	Source height in m
.. Lw	list of decimals	1	Sound power definitions
... Lw› frequencyWeighting	value from list: LIN dBA	1	
... Lw› measurementType	value from list: Unknown FreeField HemiSpherical	1	
... Lw› sourceType	value from list: PointSource LineSource AreaSource	1	

If the value "Test" in the input file is set to "true" all intermediate results will be written to a file named after the output file, except with the extension '.csv'; e.g. CNOSSOS_Road_Output.csv.

5. Command line utility "CNOSSOS_DLL_CONSOLE.exe"

The command line utility can be used to calculate the source power using a XML file as input. The use is as follows:

```
CNOSSOS_DLL_CONSOLE.exe <-road | -rail | -industry> infile outfile
```

- **<-road | -rail | -industry>** describes which source model will be used.
- **infile** contains the location and name of the XML input file. Its format is described in chapter 3. If no location is specified, the location is assumed to be the current folder.
- **outfile** contains the location and name of the XML output file (and – if specified – the corresponding CSV file). Its format is described in chapter 4. If no location is specified, the location is assumed to be the current folder.

The source module DLLs (CNOSSOS_RAILNOISE_DLL.dll, CNOSSOS_ROADNOISE_DLL.dll and CNOSSOS_INDUSTRIAL_NOISE_DLL.dll) and the corresponding look-up tables (CNOSSOS_Rail_Track. CNOSSOS_Road_Params.xml, CNOSSOS_Road_Surfaces.xml and CNOSSOS_Industry_Catalogue.xml) need to be located in the same folder as the command line utility "CNOSSOS_DLL_CONSOLE.exe".

6. Interface of "CNOSSOS_RAILNOISE_DLL.dll"

This section defines all of the supported functions included in the CNOSSOS_RAILNOISE_DLL. These are currently only the required functions to support XML input and output:

- InitDLL
- CalcFromFile
- ReleaseDLL.

6.1 InitDLL

Initializes the rail noise model DLL, creates the required data structures and imports the look-up tables.

Usage:

```
int InitDLL();
```

Parameters:

-

Return values:

0 in case of succes

-1 in case of failure

6.2 CalcFromFile

Reads the rail data from a user specified input file. Calculates the corresponding rail section source power and writes the results to a user specified output file.

Usage:

```
int CalcFromFile(const string infile, string outfile);
```

Parameters:

`infile`	the file which contains the rail data
`outfile`	the file to which the calculated source power will be written

Return values:

0 in case of success

-1 in case of failure

6.3 ReleaseDLL

Release the active DLL and frees all active objects

Usage:

```
void ReleaseDLL();
```

Parameters:

-

Return values:

-

6.4 GetVersionDLL

Release the active DLL and frees all active objects

Usage:

```
char* GetVersionDLL();
```

Parameters:

-

Return values:

String encoded version of the shared library

Annex A -- example of the file CNOSSOS_Rail_Track.xml

```
<?xml version="1.0" ?>
<TrackParameters version="V1.0">
    <!--
        CNOSSOS_Rail_Track.XML contains all look-up tables needed for the
        calculation of the emission of rail noise which are related to the
        track.

        Format:
        - Decimal separator a point ('.')
        - Spectral information is given as
            - 8 values for octave information (63 Hz .. 8 kHz)
            - 24 values for 1/3 octave information (50 Hz .. 10 kHz)
            - values are separated by 1 or more spaces.
        - Information concerning wavelengths
            - is given as 32 values (100 cm .. 0.08 cm)
            - Wavelengths:
                100.000   80.000   63.000   50.000   40.000   31.500   25.000
                 20.000   16.000   12.500   10.000    8.000    6.300    5.000
                  4.000    3.150    2.500    2.000    1.600    1.250    1.000
                  0.800    0.630    0.500    0.400    0.315    0.250    0.200
                  0.160    0.125    0.100    0.080
        - Values are separated by 1 or more spaces.
    -->
    <Date>2014-04-27</Date> <!-- Catalogue date (informative) -->
    <TrackTransfer>
        <!--
            - ID = unique identification of the track transfer function
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - SleeperCode = (informative), options
                          Concrete bi-block
                          Concrete mono-block
                          Steel
                          Wood
                          Steel zigzag
            - RailpadCode = (informative), options
```

```
                    Stiff
                    Medium
                    Soft
    - Values are given per 1/3 octave band  (50 Hz .. 10 kHz)
    - NOTE 1: Values should be Sound Power Level per axle for use directly in Equ IV-7
    - NOTE 2: Values were converted from SPL to SWL using method in IMAGINE
-->
<Track ID="0"
       Default="true"
       Reference=""
       Description="empty track transfer function"
       SleeperCode=""
       RailpadCode=""
       Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
/>
<Track ID="1"
       Default="true"
       Reference="IMAGINE"
       Description="min"
       SleeperCode=""
       RailpadCode=""
       Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
/>
<Track ID="2"
       Default="true"
       Reference="IMAGINE"
       Description="max"
       SleeperCode=""
       RailpadCode=""
       Values="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
/>
<Track ID="3"
       Default="true"
       Reference="IMAGINE"
       Description="Mono-block sleeper on soft rail pad"
       SleeperCode="Concrete mono-block"
       RailpadCode="Soft"
       Values="53.3 59.3 67.2 75.9 79.2 81.8 84.2 88.6 91.0 94.5 97.0 99.2 104.0 107.1 108.3 108.5 109.7 110.0 110.0 110.0 110.3 110.0 110.1 110.6"
/>
<Track ID="4"
       Default="true"
       Reference="IMAGINE"
       Description="Mono-block sleeper on medium stiffness rail pad"
       SleeperCode="Concrete mono-block"
       RailpadCode="Medium"
```

```
            Values="50.9 57.8 66.5 76.8 80.9 83.3 85.8 90.0 91.6 93.9 95.6 97.4 101.7 104.4 106.0 106.8 108.3 108.9 109.1 109.4 109.9 109.9 110.3 111.0"
        />
        <Track ID="5"
            Default="true"
            Reference="IMAGINE"
            Description="Mono-block on hard rail pad"
            SleeperCode="Concrete mono-block"
            RailpadCode="Hard"
            Values="50.1 57.2 66.3 77.2 81.6 84.0 86.5 90.7 92.1 94.3 95.8 97.0 100.3 102.5 104.2 105.4 107.1 107.9 108.2 108.7 109.4 109.7 110.4 111.4"
        />
        <Track ID="6"
            Default="true"
            Reference="IMAGINE"
            Description="Bi-block sleeper on soft rail pad"
            SleeperCode="Concrete bi-block"
            RailpadCode="Soft"
            Values="50.9 56.6 64.3 72.3 75.4 78.5 81.8 86.6 89.1 91.9 94.5 97.5 104.0 107.9 108.9 108.8 109.8 110.2 110.1 110.1 110.3 109.9 110.0 110.4"
        />
        <Track ID="7"
            Default="true"
            Reference="IMAGINE"
            Description="Bi-block sleeper on medium stiffness rail pad"
            SleeperCode="Concrete bi-block"
            RailpadCode="Medium"
            Values="50.0 56.1 64.1 72.5 75.8 79.1 83.6 88.7 89.6 89.7 90.6 93.8 100.6 104.7 106.3 107.1 108.8 109.3 109.4 109.7 110.0 109.8 110.0 110.5"
        />
        <Track ID="8"
            Default="true"
            Reference="IMAGINE"
            Description="Bi-block sleeper on hard rail pad"
            SleeperCode="Concrete bi-block"
            RailpadCode="Hard"
            Values="49.8 55.9 64.0 72.5 75.9 79.4 84.4 89.7 90.2 90.2 90.8 93.1 97.9 101.1 103.4 105.4 107.7 108.5 108.7 109.1 109.6 109.6 109.9 110.6"
        />
        <Track ID="9"
            Default="true"
            Reference="IMAGINE"
            Description="Wooden sleepers"
            SleeperCode="Wood"
            RailpadCode=""
            Values="44.0 51.0 59.9 70.8 75.1 76.9 77.2 80.9 85.3 92.5 97.0 98.7 102.8 105.4 106.5 106.4 107.5 108.1 108.4 108.7 109.1 109.1 109.5 110.2"
        />
    </TrackTransfer>

    <StructureTransfer>
```

```
        <!--
            - ID = unique identification of the superstructure transfer function
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - Values are given per 1/3 octave band  (50 Hz .. 10 kHz)
            - NOTE: Values should be Sound Power Level per axle for use directly in Equ IV-9
        -->
        <Structure ID="0"
                   Default="true"
                   Reference=""
                   Description="empty superstructure transfer function"
                   Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Structure ID="1"
                   Default="true"
                   Reference="IMAGINE"
                   Description="min"
                   Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Structure ID="2"
                   Default="true"
                   Reference="IMAGINE"
                   Description="max"
                   Values="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
        />
        <Structure ID="3"
                   Default="true"
                   Reference="CNOSSOS"
                   Description="CNOSSOS-EU Default"
                   Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
    </StructureTransfer>

    <RailRoughness>
        <!--
            - ID = unique identification of the rail roughness
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
```

```
                        European Commission
                        Member State
                        Local User
                        CNOSSOS
        - Description = (informative)
        - RoughnessCode = (informative), options
                        Not maintained and bad condition
                        Well maintained and very smooth
                        Normally maintained smooth
                        Not well maintained
        - Values are given per wave length  (100 cm .. 0.08 cm)
    -->
    <Rail ID="0"
          Default="true"
          Reference=""
          Description="empty rail roughness"
          RoughnessCode=""
          Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
    />
    <Rail ID="1"
          Default="true"
          Reference="IMAGINE"
          Description="min"
          RoughnessCode="Well maintained and very smooth"
          Values="-15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15"
    />
    <Rail ID="2"
          Default="true"
          Reference="IMAGINE"
          Description="max"
          RoughnessCode="Not maintained and bad condition"
          Values="22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22"
    />
    <Rail ID="3"
          Default="true"
          Reference="IMAGINE"
          Description="EN ISO 3095 2013"
          RoughnessCode="Well maintained and very smooth"
          Values="17.1 17.1 17.1 17.1 17.1 15 13 11 9 7 4.9 2.9 0.9 -1.1 -3.2 -5 -5.6 -6.2 -6.8 -7.4 -8 -8.6 -9.2 -9.8 -10.4 -11 -11.6 -12.2 -12.8 -13.4 -14 -14"
    />
    <Rail ID="4"
          Default="true"
          Reference="IMAGINE"
          Description="Average network"
          RoughnessCode="Normally maintained smooth"
```

```
            Values="11 11 11 11 11 10 9 8 7 6 5 4 3 2 1 0 -1 -2 -3 -4 -5 -6 -7 -8 -9 -10 -11 -12 -13 -14 -15 -15"
        />
    </RailRoughness>

    <ImpactNoise>
        <!--
            - ID = unique identification of the record
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - RoughnessCode = (informative), options
                          Not maintained and bad condition
                          Well maintained and very smooth
                          Normally maintained smooth
                          Not well maintained
            - JointDensity = Joint density is given per 100 meters, options
                          2
                          3
                          0
                          1
            - JointDensityDescription = (informative), options
                          2 switches/joints/crossings/100m
                          >2 switches/joints/crossings/100m
                          none
                          single switch/joint/crossing/100m
            - Values are given per wave length  (100 cm .. 0.08 cm)
        -->
        <Impact ID="0"
                Default="true"
                Reference=""
                Description="empty impact noise"
                RoughnessCode=""
                JointDensity=""
                JointDensityDescription=""
                Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Impact ID="1"
                Default="true"
                Reference="IMAGINE"
                Description="min"
```

```
            RoughnessCode="Normally maintained smooth"
            JointDensity="0"
            JointDensityDescription="none"
            Values="-40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40 -40"
        />
        <Impact ID="2"
            Default="true"
            Reference="IMAGINE"
            Description="max"
            RoughnessCode="Normally maintained smooth"
            JointDensity="3"
            JointDensityDescription="more than 2 switches/joints/crossings/100m"
            Values="30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30 30"
        />
        <Impact ID="3"
            Default="true"
            Reference="IMAGINE"
            Description="Single switch/joint/crossing/100m"
            RoughnessCode="Normally maintained smooth"
            JointDensity="1"
            JointDensityDescription="single switch/joint/crossing/100m"
            Values="22.4 22.4 22.4 23.8 24.7 24.7 23.4 21.7 20.2 20.4 20.8 20.9 19.8 18 16 13 10 6 1 -4 -11 -16.5 -18.5 -21 -22.5 -24.7 -26.6 -28.6 -30.6 -32.6 -34 -34"
        />
    </ImpactNoise>

    <BridgeConstant>
        <!--
            - ID = unique identification of the record
            - Default = true or false (informative)
            - Reference = (informative), examples:
                            IMAGINE
                            European Commission
                            Member State
                            Local User
                            CNOSSOS
            - Description = (informative)
            - Value = Overall value for the bridge correction
        -->
        <Bridge ID="0"
            Default="true"
            Reference=""
            Description="empty bridge constant"
            Value="0"
        />
        <Bridge ID="1"
```

```
                Default="true"
                Reference="IMAGINE"
                Description="min"
                Value="0"
        />
        <Bridge ID="2"
                Default="true"
                Reference="IMAGINE"
                Description="max"
                Value="9"
        />
        <Bridge ID="3"
                Default="true"
                Reference="CNOSSOS"
                Description="Predominantly concrete or masonry bridges with any trackform"
                Value="1"
        />
        <Bridge ID="4"
                Default="true"
                Reference="CNOSSOS"
                Description="Predominantly steel bridges with ballasted track"
                Value="4"
        />
    </BridgeConstant>
</TrackParameters>
```

Annex B -- example of the file CNOSSOS_Rail_Vehicles.xml

```
<?xml version="1.0" ?>
<RailParameters version="V1.0">
    <!--
        CNOSSOS_Rail_Vehicles.XML contains all look-up tables needed for the
        calculation of the emission of rail noise.

        Format:
        - Decimal separator a point ('.')
        - Spectral information is given as
            - 8 values for octave information (63 Hz .. 8 kHz)
            - 24 values for 1/3 octave information (50 Hz .. 10 kHz)
            - values are separated by 1 or more spaces.
        - Information concerning wavelengths
            - is given as 32 values (100 cm .. 0.08 cm)
            - Wavelengths:
                100.000   80.000   63.000   50.000   40.000   31.500   25.000
                 20.000   16.000   12.500   10.000    8.000    6.300    5.000
                  4.000    3.150    2.500    2.000    1.600    1.250    1.000
                  0.800    0.630    0.500    0.400    0.315    0.250    0.200
                  0.160    0.125    0.100    0.080
        - Values are separated by 1 or more spaces.
    -->
    <Date>2014-04-27</Date> <!-- Catalogue date (informative)         -->
    <r0>1</r0>              <!-- Reference value for roughness in Âµm -->
    <h1>0.5</h1>            <!-- Height of source A in m (bogie)      -->
    <h2>4.0</h2>            <!-- Height of source B in m (pantograph) -->

    <VehicleDefinition>
        <!--
            This section contains the definitions of the supported train vehicles.
            If a vehicle is not defined in this section, it is not calculated.

            - ID = unique identification of the vehicle
            - Code = Vehicle Code short description (informative)
            - Description = Vehicle Type long description (informative)
            - P_mech = Power in kW (informative)
            - V_max = Max speed in kmh (informative)
            - Weight = Weight in tonnes (informative)
            - Length = Length in m
            - Axles = no of axles
            - WheelDiameter = in mm (informative)
            - WheelDiameterCode = diameter in mm (large, medium, small) (informative)
            - WheelMeasure = Wheel measures (none, wheelDampers, screens, other) (informative)
            - BrakeCode = Brake type (castIronBlock, compositeBlock, disk) (informative)
```

```
        - Load = load in kN (informative)
        - RefTransfer = Reference to table "VehicleTransfer"
        - RefContact = Reference to table "ContactFilter"
        - RefRoughness = Reference to table "WheelRoughness"
        - RefTraction = Reference to table "TractionNoise"
        - RefAerodynamic = Reference to table "AeroDynamicNoise"
    -->
    <Vehicle ID= "0"
             Code=""
             Description="Empty vehicle definition"
             P_mech="0"
             V_max="0"
             Weight="0"
             Length="0"
             Axles="0"
             WheelDiameter="0"
             WheelDiameterCode="large"
             WheelMeasure="none"
             BrakeCode="CastIronBlock"
             Load=""
             RefTransfer="0"
             RefContact="0"
             RefRoughness="0"
             RefTraction="0"
             RefAerodynamic="0"
    />
    <Vehicle ID= "1"
             Code="1"
             Description="Example vehicle 1"
             P_mech="830"
             V_max="120"
             Weight="68"
             Length="14.89"
             Axles="4"
             WheelDiameter="360"
             WheelDiameterCode="small"
             WheelMeasure="none"
             BrakeCode="CastIronBlock"
             Load="17"
             RefTransfer="1"
             RefContact="1"
             RefRoughness="1"
             RefTraction="1"
             RefAerodynamic="3"
    />
```

```
        <Vehicle ID= "2"
                 Code="2"
                 Description="Example vehicle 2"
                 P_mech="640"
                 V_max="140"
                 Weight="93.8"
                 Length="52.34"
                 Axles="4"
                 WheelDiameter="920"
                 WheelDiameterCode="large"
                 WheelMeasure="none"
                 BrakeCode="CastIronBlock"
                 Load="23"
                 RefTransfer="2"
                 RefContact="2"
                 RefRoughness="2"
                 RefTraction="2"
                 RefAerodynamic="3"
        />
        <Vehicle ID= "3"
                 Code="SNCF BB66400"
                 Description="Diesel loc"
                 P_mech="830"
                 V_max="120"
                 Weight="70"
                 Length="14.97"
                 Axles="4"
                 WheelDiameter="1100"
                 WheelDiameterCode="large"
                 WheelMeasure="none"
                 BrakeCode="CastIronBlock"
                 Load="18"
                 RefTransfer="6"
                 RefContact="6"
                 RefRoughness="3"
                 RefTraction="3"
                 RefAerodynamic="3"
        />
        <Vehicle ID= "4"
                 Code="SNCF CC72000"
                 Description="Diesel loc"
                 P_mech="2250"
                 V_max="160"
                 Weight="114"
                 Length="20"
```

```
            Axles="4"
            WheelDiameter="1140"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load="29"
            RefTransfer="6"
            RefContact="6"
            RefRoughness="3"
            RefTraction="4"
            RefAerodynamic="3"
      />
      <Vehicle ID= "5"
            Code="RENFE Dloco"
            Description="Diesel loc"
            P_mech="1155"
            V_max="125"
            Weight="80"
            Length="19.5"
            Axles="4"
            WheelDiameter="1000"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load="20"
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="5"
            RefAerodynamic="3"
      />
      <Vehicle ID= "6"
            Code="NS6400 Dloco"
            Description="Diesel loc"
            P_mech="1180"
            V_max="125"
            Weight="82"
            Length="14.4"
            Axles="4"
            WheelDiameter="1000"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load="21"
            RefTransfer="3"
```

```
            RefContact="6"
            RefRoughness="3"
            RefTraction="6"
            RefAerodynamic="3"
        />
        <Vehicle ID= "7"
            Code="TKOJ JT42CWR/Class66"
            Description="Diesel loc"
            P_mech="2200"
            V_max="121"
            Weight="126"
            Length="20.1"
            Axles="6"
            WheelDiameter="1120"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CompositeBlock-k-block"
            Load="21"
            RefTransfer="6"
            RefContact="6"
            RefRoughness="4"
            RefTraction="7"
            RefAerodynamic="3"
        />
        <Vehicle ID= "8"
            Code="NS DM 90 DMU"
            Description="DMU"
            P_mech="640"
            V_max="140"
            Weight="94"
            Length="52.3"
            Axles="4"
            WheelDiameter="920"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="Disc-Non-Tread"
            Load="24"
            RefTransfer="3"
            RefContact="6"
            RefRoughness="5"
            RefTraction="8"
            RefAerodynamic="3"
        />
        <Vehicle ID= "9"
            Code="NS 1700 Eloco"
```

```
            Description="ELoco"
            P_mech="4560"
            V_max="140"
            Weight="86"
            Length="17.6"
            Axles="4"
            WheelDiameter="1260"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load="22"
            RefTransfer="6"
            RefContact="6"
            RefRoughness="3"
            RefTraction="9"
            RefAerodynamic="3"
        />
        <Vehicle ID= "10
            Code="NS mat 64 EMU"
            Description="EMU"
            P_mech="508"
            V_max="140"
            Weight="82"
            Length="52.1"
            Axles="4"
            WheelDiameter="920"
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load="21"
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="10"
            RefAerodynamic="3"
        />
        <Vehicle ID= "11
            Code="RMR Cat 1"
            Description="Block braked passenger"
            P_mech=""
            V_max=""
            Weight=""
            Length="26"
            Axles="4"
            WheelDiameter=""
```

```
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="10"
            RefAerodynamic="3"
      />
      <Vehicle ID= "12
            Code="RMR Cat 2 (a)"
            Description="ICM-III, ICR trailer, SNCF passenger, TEE"
            P_mech=""
            V_max=""
            Weight=""
            Length="26"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="10"
            RefAerodynamic="3"
      />
      <Vehicle ID= "13
            Code="RMR Cat 2 (b)"
            Description="ICR 1700, DDM-1 1800 loco, Belgian locos"
            P_mech=""
            V_max=""
            Weight=""
            Length="18"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="6"
            RefContact="6"
            RefRoughness="3"
```

```
            RefTraction="9"
            RefAerodynamic="3"
        />
        <Vehicle ID= "14
            Code= "RMR Cat 3"
            Description="Disc braked passenger trains"
            P_mech=""
            V_max=""
            Weight=""
            Length="26"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="Disc-Non-Tread"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="5"
            RefTraction="10"
            RefAerodynamic="3"
        />
        <Vehicle ID= "15
            Code= "RMR Cat 4"
            Description="Block braked freight trains variable l and no. axles"
            P_mech=""
            V_max=""
            Weight=""
            Length="n"
            Axles="n"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="0"
            RefAerodynamic="3"
        />
        <Vehicle ID= "16
            Code= "RMR Cat 5 (a)"
            Description="DE1, DE2, DE3"
            P_mech=""
```

```
            V_max=""
            Weight=""
            Length="25"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="8"
            RefAerodynamic="3"
        />
        <Vehicle ID= "17
            Code= "RMR Cat 5 (b)"
            Description="2200, 2300 locos"
            P_mech=""
            V_max=""
            Weight=""
            Length="14"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="3"
            RefAerodynamic="3"
        />
        <Vehicle ID= "18
            Code= "RMR Cat 5 (c)"
            Description="2400, 2500 locos"
            P_mech=""
            V_max=""
            Weight=""
            Length="13"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
```

```
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="3"
            RefAerodynamic="3"
        />
        <Vehicle ID= "19
            Code= "RMR Cat 6"
            Description="Diesel trains with disc brakes"
            P_mech=""
            V_max=""
            Weight=""
            Length="26"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="Disc-Non-Tread"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="5"
            RefTraction="8"
            RefAerodynamic="3"
        />
        <Vehicle ID= "20
            Code= "RMR Cat 7"
            Description="Disc braked urban subway and rapid tram trains"
            P_mech=""
            V_max=""
            Weight=""
            Length="15"
            Axles="3"
            WheelDiameter=""
            WheelDiameterCode="medium"
            WheelMeasure="none"
            BrakeCode="Disc-Non-Tread"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="5"
            RefTraction="10"
            RefAerodynamic="3"
```

```
        />
        <Vehicle ID= "21
                 Code= "RMR Cat 8 (a)"
                 Description="ICM IV, IRM"
                 P_mech=""
                 V_max=""
                 Weight=""
                 Length="26"
                 Axles="4"
                 WheelDiameter=""
                 WheelDiameterCode="large"
                 WheelMeasure="none"
                 BrakeCode="Disc-Non-Tread"
                 Load=""
                 RefTransfer="3"
                 RefContact="6"
                 RefRoughness="5"
                 RefTraction="10"
                 RefAerodynamic="3"
        />
        <Vehicle ID= "22
                 Code= "RMR Cat 8 (b)"
                 Description="DDM 2/3"
                 P_mech=""
                 V_max=""
                 Weight=""
                 Length="26"
                 Axles="4"
                 WheelDiameter=""
                 WheelDiameterCode="large"
                 WheelMeasure="none"
                 BrakeCode="CastIronBlock"
                 Load=""
                 RefTransfer="3"
                 RefContact="6"
                 RefRoughness="3"
                 RefTraction="10"
                 RefAerodynamic="3"
        />
        <Vehicle ID= "23
                 Code= "RMR Cat 9 (a)"
                 Description="TGV PBA type, power car"
                 P_mech=""
                 V_max=""
                 Weight=""
```

```
            Length="20"
            Axles="4"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="CastIronBlock"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="3"
            RefTraction="9"
            RefAerodynamic="3"
    />
    <Vehicle ID= "24
            Code= "RMR Cat 9 (b)"
            Description="TGV PBA type, trailer car adjacent to power car"
            P_mech=""
            V_max=""
            Weight=""
            Length="20"
            Axles="3"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="Disc-Non-Tread"
            Load=""
            RefTransfer="3"
            RefContact="6"
            RefRoughness="5"
            RefTraction="0"
            RefAerodynamic="3"
    />
    <Vehicle ID= "25
            Code= "RMR Cat 9 (c)"
            Description="TGV PBA types, other trailer cars"
            P_mech=""
            V_max=""
            Weight=""
            Length="20"
            Axles="2"
            WheelDiameter=""
            WheelDiameterCode="large"
            WheelMeasure="none"
            BrakeCode="Disc-Non-Tread"
            Load=""
```

```
                RefTransfer="3"
                RefContact="6"
                RefRoughness="5"
                RefTraction="0"
                RefAerodynamic="3"
        />
        <Vehicle ID= "26
                Code= "RMR Cat 10"
                Description="ICE-3 type assuming no wheel dampers"
                P_mech=""
                V_max=""
                Weight=""
                Length="25"
                Axles="4"
                WheelDiameter=""
                WheelDiameterCode="large"
                WheelMeasure="none"
                BrakeCode="Disc-Non-Tread"
                Load=""
                RefTransfer="3"
                RefContact="6"
                RefRoughness="5"
                RefTraction="10"
                RefAerodynamic="3"
        />
    </VehicleDefinition>

    <VehicleTransfer>
        <!--
            - ID = unique identification of the vehicle transfer function
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - WheelDiameter = diameter in mm(informative)
            - WheelDiameterCode = wheel diameter code (informative), options:
                          large
                          medium
                          small
            - Values are given per 1/3 octave band  (50 Hz .. 10 kHz)
        -->
```

```
        <Transfer ID="0"
                  Default="true"
                  Reference=""
                  Description="empty vehicle transfer function"
                  WheelDiameter=""
                  WheelDiameterCode=""
                  Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Transfer ID="1"
                  Default="true"
                  Reference="IMAGINE"
                  Description="min"
                  WheelDiameter=""
                  WheelDiameterCode=""
                  Values="60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60 60"
        />
        <Transfer ID="2"
                  Default="true"
                  Reference="IMAGINE"
                  Description="max"
                  WheelDiameter=""
                  WheelDiameterCode=""
                  Values="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
        />
        <Transfer ID="3"
                  Default="true"
                  Reference="IMAGINE"
                  Description="Wheel with diameter 920 mm, no measure"
                  WheelDiameter="920"
                  WheelDiameterCode="large"
                  Values="75.4 77.3 81.1 84.1 83.3 84.3 86.0 90.1 89.8 89.0 88.8 90.4 92.4 94.9 100.4 104.6 109.6 114.9 115.0 115.0 115.5 115.6 116.0 116.7"
        />
        <Transfer ID="4"
                  Default="true"
                  Reference="IMAGINE"
                  Description="Wheel with diameter 840 mm, no measure"
                  WheelDiameter="840"
                  WheelDiameterCode="large"
                  Values="75.4 77.3 81.1 84.1 82.8 83.3 84.1 86.9 87.9 89.9 90.9 91.5 91.5 93.0 98.7 101.6 107.6 111.9 114.5 114.5 115.0 115.1 115.5 116.2"
        />
        <Transfer ID="5"
                  Default="true"
                  Reference="IMAGINE"
                  Description="Wheel with diameter 680 mm, no measure"
                  WheelDiameter="680"
```

```
                WheelDiameterCode="medium"
                Values="75.4 77.3 81.1 84.1 82.8 83.3 83.9 86.3 88.0 92.2 93.9 92.5 90.9 90.4 93.2 93.5 99.6 104.9 108.0 111.0 111.5 111.6 112.0 112.7"
        />
        <Transfer ID="6"
                Default="true"
                Reference="IMAGINE"
                Description="Wheel with diameter 1200 mm, no measure"
                WheelDiameter="1200"
                WheelDiameterCode="large"
                Values="75.4 77.3 81.1 84.1 82.8 83.3 84.5 90.4 90.4 89.9 90.1 91.3 91.5 93.6 100.5 104.6 115.6 115.9 116.0 116.0 116.5 116.6 117.0 117.7"
        />
    </VehicleTransfer>

    <ContactFilter>
        <!--
            - ID = unique identification of the contact filter
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - Load = Load in kN (informative)
            - WheelDiameter = diameter in mm(informative)
            - WheelDiameterCode = wheel diameter code (informative), options:
                          large
                          medium
                          small
            - Values are given per 1/3 octave band  (50 Hz .. 10 kHz)
        -->
        <Contact ID="0"
                 Default="true"
                 Reference=""
                 Description="empty contact filter"
                 Load=""
                 WheelDiameter=""
                 WheelDiameterCode=""
                 Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Contact ID="1"
                 Default="true"
                 Reference="IMAGINE"
                 Description="min"
```

```
            Load=""
            WheelDiameter=""
            WheelDiameterCode=""
            Values="-30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30 -30"
        />
        <Contact ID="2"
            Default="true"
            Reference="IMAGINE"
            Description="max"
            Load=""
            WheelDiameter=""
            WheelDiameterCode=""
            Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Contact ID="3"
            Default="true"
            Reference="IMAGINE"
            Description="Axle load 50kN - wheel diameter 360mm"
            Load="50"
            WheelDiameter="360"
            WheelDiameterCode="small"
            Values="0 0 0 0 0 0 0 0 0 0 0 0 0 -0.2 -0.5 -1.2 -2 -3 -4.3 -6 -8.4 -12 -11.5 -12.5 -13.9 -14.7 -15.6 -16.6 -17.6 -18.6 -19.6 -20.6"
        />
        <Contact ID="4"
            Default="true"
            Reference="IMAGINE"
            Description="Axle load 50kN - wheel diameter 680mm"
            Load="50"
            WheelDiameter="680"
            WheelDiameterCode="medium"
            Values="0 0 0 0 0 0 0 0 0 0 0 0 -0.2 -0.4 -0.7 -1.5 -2.8 -4.5 -7 -10.3 -12 -12.5 -13.5 -16 -16 -16.5 -17 -18 -19 -20.2 -21.2 -22.2"
        />
        <Contact ID="5"
            Default="true"
            Reference="IMAGINE"
            Description="Axle load 50kN - wheel diameter 920mm"
            Load="50"
            WheelDiameter="920"
            WheelDiameterCode="large"
            Values="0 0 0 0 0 0 0 0 0 0 0 0 -0.2 -0.5 -0.9 -1.6 -2.5 -3.8 -5.8 -8.5 -12 -12.6 -13.5 -14.5 -16 -16.5 -17.7 -18.6 -19.6 -20.6 -21.6 -22.6"
        />
        <Contact ID="6"
            Default="true"
            Reference="IMAGINE"
            Description="Axle load 25kN - wheel diameter 920mm"
```

```
                Load="25"
                WheelDiameter="920"
                WheelDiameterCode="large"
                Values="0 0 0 0 0 0 0 0 0 0 -0.2 -0.5 -0.9 -1.6 -2.5 -3.8 -5.8 -8.5 -11.4 -12 -13.5 -14.5 -16 -16.5 -17.7 -18.6 -19.6 -20.6 -21.6 -22.6 -23.6"
        />
        <Contact ID="7"
                Default="true"
                Reference="IMAGINE"
                Description="Axle load 100kN - wheel diameter 920mm"
                Load="100"
                WheelDiameter="920"
                WheelDiameterCode="large"
                Values="0 0 0 0 0 0 0 0 0 0 -0.2 -0.6 -1.3 -2.2 -3.7 -5.8 -9 -11.5 -12.5 -12 -14 -15 -17 -18.4 -19.5 -20.5 -21.5 -22.4 -23.5 -24.5 -25.4"
        />
    </ContactFilter>

    <WheelRoughness>
        <!--
            - ID = unique identification of the wheel roughness
            - Default = true or false (informative)
            - Reference = (informative), examples:
                            IMAGINE
                            European Commission
                            Member State
                            Local User
                            CNOSSOS
            - Description = (informative)
            - Values are given per wave length (100cm .. 0.08cm)
        -->
        <Roughness ID="0"
                   Default="TRUE"
                   Reference=""
                   Description="empty wheel roughness"
                   Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Roughness ID="1"
                   Default="TRUE"
                   Reference="IMAGINE"
                   Description="min"
                   Values="-15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15"
        />
        <Roughness ID="2"
                   Default="TRUE"
                   Reference="IMAGINE"
                   Description="max"
```

```
                Values="25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25"
        />
        <Roughness ID="3"
                Default="TRUE"
                Reference="IMAGINE"
                Description="standard freight cast iron tread"
                Values="2.17 2.17 2.17 2.17 2.17 2.17 2.17 2.17 2.37 0.61 2.61 5.76 8.78 11.11 10.96 9.79 7.49 5.15 3.02 1.29 0.17 -0.7 -1.17 -1.02 0.27 0.24 1.32 3.1 3.1 3.1 3.1 3.1"
        />
        <Roughness ID="4"
                Default="TRUE"
                Reference="IMAGINE"
                Description="freight with k-block composite"
                Values="-3.95 -3.95 -3.95 -3.95 -3.95 -3.95 -3.95 -3.95 -3.95 -3.95 -3.95 -4.34 -4.62 -4.9 -5.22 -6.31 -6.8 -7.24 -7.27 -7.27 -7.14 -6.94 -6.68 -5.99 -3.75 -2.38 -2.59 -2.46 -2.46 -2.46 -2.46 -2.46"
        />
        <Roughness ID="5"
                Default="TRUE"
                Reference="IMAGINE"
                Description="passenger disc brake"
                Values="-5.93 -5.93 -5.93 -5.93 -5.93 -5.93 2.32 2.82 2.56 1.22 2.06 0.92 -0.25 -1.57 -2.85 -4.94 -7. -8.58 -9.32 -9.51 -10.12 -10.25 -10.33 -10.81 -10.91 -9.52 -9.52 -9.52 -9.52 -9.52 -9.52 -9.52"
        />
    </WheelRoughness>

    <TractionNoise>
        <!--
            - ID = unique identification of the traction noise
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - Type = A: values for source located at bogie height (0.5m)
                     B: values for source located at pantograph height (4.0m)
            - Constant = Traction noise for constant speed
            - Accelerating = Traction noise for accelerating vehicles
            - Decelerating = Traction noise for decelerating vehicles
            - Idling = Traction noise for idling vehicles
            - Values are given per 1/3 octave band  (50 Hz .. 10 kHz)
            - NOTE 1: Values should be Sound Power Level per vehicle for use directly in Equ IV-8
            - NOTE 2: Values were converted from SPL to SWL using method in IMAGINE
        -->
        <Traction ID="0"
                  Default="true"
```

```
            Reference=""
            Description="empty traction">
        <Source Type="A"
            Constant="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Accelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Decelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Idling="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Source Type="B"
            Constant="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Accelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Decelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Idling="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
    </Traction>
    <Traction ID="1"
            Default="true"
            Reference="IMAGINE"
            Description="min">
        <Source Type="A"
            Constant="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Accelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Decelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Idling="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
        <Source Type="B"
            Constant="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Accelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Decelerating="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
            Idling="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
        />
    </Traction>
    <Traction ID="2"
            Default="true"
            Reference="IMAGINE"
            Description="max">
        <Source Type="A"
            Constant="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
            Accelerating="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
            Decelerating="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
            Idling="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
        />
        <Source Type="B"
            Constant="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
            Accelerating="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
```

```
            Decelerating="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
            Idling="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
        />
    </Traction>
    <Traction ID="3"
            Default="true"
            Reference="IMAGINE"
            Description="Diesel locomotive (c. 800kW)">
        <Source Type="A"
            Constant="98.86 94.76 92.56 94.56 92.76 92.76 92.96 94.76 94.56 95.66 95.56 98.56 95.16 95.06 95.06 94.06 94.06 99.36 92.46 89.46 86.96 84.06 81.46 79.16"
            Accelerating="96.86 102.76 100.56 97.56 95.76 95.76 95.96 97.76 97.56 98.66 98.56 102.56 98.16 98.06 98.06 97.06 97.06 97.36 105.46 97.46 94.96 92.06 89.46 87.16"
            Decelerating="87.86 83.76 86.56 88.56 86.76 86.76 86.96 88.76 88.56 89.66 89.56 93.56 89.16 89.06 89.06 88.06 88.06 86.36 83.46 80.46 77.96 75.06 72.46 70.16"
            Idling="87.86 83.76 86.56 88.56 86.76 86.76 86.96 88.76 88.56 89.66 89.56 93.56 89.16 89.06 89.06 88.06 88.06 86.36 83.46 80.46 77.96 75.06 72.46 70.16"
        />
        <Source Type="B"
            Constant="103.16 99.96 95.46 93.96 93.26 93.56 92.86 92.66 92.36 92.76 92.76 96.76 92.66 92.96 92.86 93.06 93.16 98.26 91.46 88.66 85.96 83.36 80.86 78.66"
            Accelerating="101.16 107.96 103.46 96.96 96.26 96.56 95.86 95.66 95.36 95.76 95.76 100.76 95.66 95.96 95.86 96.06 96.16 96.26 104.46 96.66 93.96 91.36 88.86 86.66"
            Decelerating="92.16 88.96 89.46 87.96 87.26 87.56 86.86 86.66 86.36 86.76 86.76 91.76 86.66 86.96 86.86 87.06 87.16 85.26 82.46 79.66 76.96 74.36 71.86 69.66"
            Idling="92.16 88.96 89.46 87.96 87.26 87.56 86.86 86.66 86.36 86.76 86.76 91.76 86.66 86.96 86.86 87.06 87.16 85.26 82.46 79.66 76.96 74.36 71.86 69.66"
        />
    </Traction>
    <Traction ID="4"
            Default="true"
            Reference="IMAGINE"
            Description="Diesel locomotive (c. 2200kW)">
        <Source Type="A"
            Constant="99.41 107.31 103.11 102.11 99.31 99.31 99.51 101.31 101.11 102.21 102.11 101.11 101.71 101.61 99.31 96.01 93.71 101.91 89.51 87.11 90.51 31.41 81.21 79.61"
            Accelerating="99.41 102.31 113.11 107.11 103.31 102.31 102.51 104.31 104.11 105.21 105.11 104.11 104.71 104.61 102.31 99.01 96.71 94.71 105.01 90.11 88.31 93.61 84.21 82.61"
            Decelerating="89.41 90.31 103.11 95.11 93.31 93.31 93.51 95.31 95.11 96.21 96.11 95.11 95.71 95.61 93.31 96.61 87.71 85.71 87.01 81.11 79.31 77.11 75.21 73.61"
            Idling="89.41 90.31 103.11 95.11 93.31 93.31 93.51 95.31 95.11 96.21 96.11 95.11 95.71 95.61 93.31 96.61 87.71 85.71 87.01 81.11 79.31 77.11 75.21 73.61"
        />
        <Source Type="B"
            Constant="103.71 112.51 106.01 101.51 99.81 100.11 99.41 99.21 98.91 99.31 99.31 99.31 99.21 99.51 97.11 95.01 92.81 100.81 88.51 86.31 89.51 30.71 80.61 79.11"
            Accelerating="103.71 107.51 116.01 106.51 103.81 103.11 102.41 102.21 101.91 102.31 102.31 102.31 102.21 102.51 100.11 98.01 95.81 93.61 104.01 89.31 87.31 92.91 83.61 82.11"
            Decelerating="93.71 95.51 106.01 94.51 93.81 94.11 93.41 93.21 92.91 93.31 93.31 93.31 93.21 93.51 91.11 95.61 86.81 84.61 86.01 80.31 78.31 76.41 74.61 73.11"
            Idling="93.71 95.51 106.01 94.51 93.81 94.11 93.41 93.21 92.91 93.31 93.31 93.31 93.21 93.51 91.11 95.61 86.81 84.61 86.01 80.31 78.31 76.41 74.61 73.11"
        />
    </Traction>
    <Traction ID="5"
            Default="true"
            Reference="IMAGINE"
            Description="Diesel loc/RENFE Dloco/1155kW">
        <Source Type="A"
            Constant="99.3 103.2 109.0 114.0 109.2 106.2 103.4 105.2 105.0 106.1 106.0 105.0 105.6 104.5 102.9 99.4 96.8 94.6 92.1 89.6 87.5 85.1 82.9 81.1"
            Accelerating="99.3 103.2 109.0 114.0 115.2 112.2 109.4 108.2 108.0 109.1 109.0 108.0 108.6 108.5 107.5 104.9 102.4 100.1 97.7 95.1 93.1 90.6 88.5 86.6"
```

```
                Decelerating="99.3 103.2 103.0 102.0 97.2 97.2 97.4 99.2 99.0 100.1 100.0 98.0 97.0 94.4 91.8 88.3 85.7 83.5 81.0 78.5 76.4 74.0 71.9 70.1"
                Idling="99.3 103.2 103.0 102.0 97.2 97.2 97.4 99.2 99.0 100.1 100.0 98.0 97.0 94.4 91.8 88.3 85.7 83.5 81.0 78.5 76.4 74.0 71.9 70.1"
        />
        <Source Type="B"
                Constant="103.6 108.4 111.9 113.4 109.7 107.0 103.3 103.1 102.8 103.2 103.2 103.2 103.1 102.4 100.7 98.4 95.9 93.5 91.1 88.8 86.5 84.4 82.3 80.6"
                Accelerating="103.6 108.4 111.9 113.4 115.7 113.0 109.3 106.1 105.8 106.2 106.2 106.2 106.1 106.4 105.3 103.9 101.5 99.0 96.7 94.3 92.1 89.9 87.9 86.1"
                Decelerating="103.6 108.4 105.9 101.4 97.7 98.0 97.3 97.1 96.8 97.2 97.2 96.2 94.5 92.3 89.6 87.3 84.8 82.4 80.0 77.7 75.4 73.3 71.3 69.6"
                Idling="103.6 108.4 105.9 101.4 97.7 98.0 97.3 97.1 96.8 97.2 97.2 96.2 94.5 92.3 89.6 87.3 84.8 82.4 80.0 77.7 75.4 73.3 71.3 69.6"
        />
    </Traction>
    <Traction ID="6"
              Default="true"
              Reference="IMAGINE"
              Description="Diesel loc/NS6400 Dloco/1180kW">
        <Source Type="A"
                Constant="101.0 89.9 92.7 104.7 94.9 87.9 83.1 84.9 84.7 85.8 85.7 84.7 85.3 85.2 85.2 84.2 84.2 84.5 81.6 78.6 76.1 73.2 70.6 68.3"
                Accelerating="99.0 104.9 95.7 97.7 105.9 97.9 91.1 87.9 87.7 88.8 88.7 87.7 88.3 88.2 88.2 87.2 87.2 87.5 87.6 84.6 82.1 79.2 76.6 74.3"
                Decelerating="83.0 93.9 88.7 83.7 76.9 76.9 77.1 78.9 78.7 79.8 79.7 78.7 79.3 79.2 79.2 78.2 75.2 72.5 69.6 66.6 64.1 61.2 58.6 56.3"
                Idling="83.0 93.9 88.7 83.7 76.9 76.9 77.1 78.9 78.7 79.8 79.7 78.7 79.3 79.2 79.2 78.2 75.2 72.5 69.6 66.6 64.1 61.2 58.6 56.3"
        />
        <Source Type="B"
                Constant="105.3 95.1 95.6 104.1 95.4 88.7 83.0 82.8 82.5 82.9 82.9 82.9 82.8 83.1 83.0 83.2 83.3 83.4 80.6 77.8 75.1 72.5 70.0 67.8"
                Accelerating="103.3 110.1 98.6 97.1 106.4 98.7 91.0 85.8 85.5 85.9 85.9 85.9 85.8 86.1 86.0 86.2 86.3 86.4 86.6 83.8 81.1 78.5 76.0 73.8"
                Decelerating="87.3 99.1 91.6 83.1 77.4 77.7 77.0 76.8 76.5 76.9 76.9 76.9 76.8 77.1 77.0 77.2 74.3 71.4 68.6 65.8 63.1 60.5 58.0 55.8"
                Idling="87.3 99.1 91.6 83.1 77.4 77.7 77.0 76.8 76.5 76.9 76.9 76.9 76.8 77.1 77.0 77.2 74.3 71.4 68.6 65.8 63.1 60.5 58.0 55.8"
        />
    </Traction>
    <Traction ID="7"
              Default="true"
              Reference="IMAGINE"
              Description="Diesel loc/TKOJ JT42CWR/Class66/2200kW">
        <Source Type="A"
                Constant="95.4 104.3 102.1 99.1 93.3 96.3 96.5 98.3 98.1 99.2 99.1 98.1 98.7 96.6 94.6 91.6 89.6 87.9 86.0 84.0 82.5 80.6 79.0 77.7"
                Accelerating="91.4 99.3 110.1 107.1 100.3 96.3 99.5 101.3 101.1 102.2 102.1 101.1 101.7 101.6 99.6 96.6 94.6 92.9 91.0 89.0 87.5 85.6 84.0 82.7"
                Decelerating="92.4 88.3 87.1 92.1 90.3 90.3 90.5 92.3 92.1 93.2 93.1 90.1 88.7 86.6 84.6 81.6 79.6 77.9 76.0 74.0 72.5 70.6 69.0 67.7"
                Idling="92.4 88.3 87.1 92.1 90.3 90.3 90.5 92.3 92.1 93.2 93.1 90.1 88.7 86.6 84.6 81.6 79.6 77.9 76.0 74.0 72.5 70.6 69.0 67.7"
        />
        <Source Type="B"
                Constant="99.7 109.5 105.0 98.5 93.8 97.1 96.4 96.2 95.9 96.3 96.3 96.3 96.2 94.5 92.4 90.6 88.7 86.8 85.0 83.2 81.5 79.9 78.4 77.2"
                Accelerating="95.7 104.5 113.0 106.5 100.8 97.1 99.4 99.2 98.9 99.3 99.3 99.3 99.2 99.5 97.4 95.6 93.7 91.8 90.0 88.2 86.5 84.9 83.4 82.2"
                Decelerating="96.7 93.5 90.0 91.5 90.8 91.1 90.4 90.2 89.9 90.3 90.3 88.3 86.2 84.5 82.4 80.6 78.7 76.8 75.0 73.2 71.5 69.9 68.4 67.2"
                Idling="96.7 93.5 90.0 91.5 90.8 91.1 90.4 90.2 89.9 90.3 90.3 88.3 86.2 84.5 82.4 80.6 78.7 76.8 75.0 73.2 71.5 69.9 68.4 67.2"
        />
    </Traction>
    <Traction ID="8"
```

```
            Default="true"
            Reference="IMAGINE"
            Description="Diesel multiple unit">
        <Source Type="A"
            Constant="82.58 82.48 89.28 90.28 93.48 99.48 98.68 95.48 90.28 91.38 91.28 90.28 90.88 91.78 92.78 92.78 90.78 88.08 85.18 83.18 81.68 78.78 76.18 73.88"
            Accelerating="80.58 86.48 88.28 94.28 91.48 96.48 102.68 103.48 98.28 94.38 94.28 93.28 93.88 93.78 94.78 94.78 95.78 94.08 91.18 88.18 86.68 84.78 82.18 79.88"
            Decelerating="78.58 79.48 88.28 84.28 82.48 82.48 88.68 84.48 84.28 85.38 85.28 84.28 90.88 84.78 84.78 83.78 83.78 84.08 82.18 79.18 75.68 71.78 68.18 64.88"
            Idling="78.58 79.48 88.28 84.28 82.48 82.48 88.68 84.48 84.28 85.38 85.28 84.28 90.88 84.78 84.78 83.78 83.78 84.08 82.18 79.18 75.68 71.78 68.18 64.88"
        />
        <Source Type="B"
            Constant="86.88 87.68 92.18 89.68 93.98 100.28 98.58 93.38 88.08 88.48 88.48 88.48 88.38 89.68 90.58 91.78 89.88 86.98 84.18 82.38 80.68 78.08 75.58 73.38"
            Accelerating="84.88 91.68 91.18 93.68 91.98 97.28 102.58 101.38 96.08 91.48 91.48 91.48 91.38 91.68 92.58 93.78 94.88 92.98 90.18 87.38 85.68 84.08 81.58 79.38"
            Decelerating="82.88 84.68 91.18 83.68 82.98 83.28 88.58 82.38 82.08 82.48 82.48 82.48 88.38 82.68 82.58 82.78 82.88 82.98 81.18 78.38 74.68 71.08 67.58 64.38"
            Idling="82.88 84.68 91.18 83.68 82.98 83.28 88.58 82.38 82.08 82.48 82.48 82.48 88.38 82.68 82.58 82.78 82.88 82.98 81.18 78.38 74.68 71.08 67.58 64.38"
        />
    </Traction>
    <Traction ID="9"
            Default="true"
            Reference="IMAGINE"
            Description="Electric locomotive">
        <Source Type="A"
            Constant="87.86 90.76 91.56 94.56 94.76 96.76 103.96 100.76 99.56 101.66 98.56 95.56 95.16 96.06 92.06 89.06 87.06 85.36 83.46 81.46 79.96 78.06 76.46 75.16"
            Accelerating="87.86 94.76 91.56 94.56 94.76 96.76 107.96 100.76 99.56 105.66 98.56 95.56 95.16 100.06 92.06 89.06 87.06 85.36 83.46 81.46 79.96 78.06 76.46 75.16"
            Decelerating="78.86 84.76 82.56 85.56 85.76 87.76 97.96 91.76 90.56 95.66 89.56 86.56 86.16 90.06 83.06 80.06 78.06 76.36 74.46 72.46 70.96 69.06 67.46 66.16"
            Idling="78.86 84.76 82.56 85.56 85.76 87.76 97.96 91.76 90.56 95.66 89.56 86.56 86.16 90.06 83.06 80.06 78.06 76.36 74.46 72.46 70.96 69.06 67.46 66.16"
        />
        <Source Type="B"
            Constant="92.16 95.96 94.46 93.96 95.26 97.56 103.86 98.66 97.36 98.76 95.76 93.76 92.66 93.96 89.86 88.06 86.16 84.26 82.46 80.66 78.96 77.36 75.86 74.66"
            Accelerating="92.16 99.96 94.46 93.96 95.26 97.56 107.86 98.66 97.36 102.76 95.76 93.76 92.66 97.96 89.86 88.06 86.16 84.26 82.46 80.66 78.96 77.36 75.86 74.66"
            Decelerating="83.16 89.96 85.46 84.96 86.26 88.56 97.86 89.66 88.36 92.76 86.76 84.76 83.66 87.96 80.86 79.06 77.16 75.26 73.46 71.66 69.96 68.36 66.86 65.66"
            Idling="83.16 89.96 85.46 84.96 86.26 88.56 97.86 89.66 88.36 92.76 86.76 84.76 83.66 87.96 80.86 79.06 77.16 75.26 73.46 71.66 69.96 68.36 66.86 65.66"
        />
    </Traction>
    <Traction ID="10"
            Default="true"
            Reference="IMAGINE"
            Description="Electric multiple unit ">
        <Source Type="A"
            Constant="80.55 81.45 80.55 82.25 80.05 79.75 79.65 96.45 80.55 81.35 97.25 79.55 79.85 86.75 81.75 82.75 80.75 78.05 75.15 72.15 69.65 66.75 64.15 61.85"
            Accelerating="80.55 81.45 80.55 82.25 94.45 79.75 79.65 96.45 80.55 81.35 80.85 79.55 79.85 86.75 81.75 82.75 80.75 78.05 75.15 72.15 69.65 66.75 64.15 61.85"
            Decelerating="80.55 81.45 80.55 82.25 80.05 79.75 79.65 81.05 80.55 81.35 80.85 79.55 79.85 86.75 81.75 82.75 80.75 78.05 75.15 72.15 69.65 66.75 64.15 61.85"
            Idling="80.55 81.45 80.55 82.25 80.05 79.75 79.65 81.05 80.55 81.35 80.85 79.55 79.85 86.75 81.75 82.75 80.75 78.05 75.15 72.15 69.65 66.75 64.15 61.85"
        />
        <Source Type="B"
            Constant="84.85 86.65 83.45 81.65 80.55 80.55 79.55 94.35 78.35 78.45 94.45 77.75 77.35 84.65 79.55 81.75 79.85 76.95 74.15 71.35 68.65 66.05 63.55 61.35"
```

```
                    Accelerating="84.85 86.65 83.45 81.65 94.95 80.55 79.55 94.35 78.35 78.45 78.05 77.75 77.35 84.65 79.55 81.75 79.85 76.95 74.15 71.35 68.65 66.05 63.55 61.35"
                    Decelerating="84.85 86.65 83.45 81.65 80.55 80.55 79.55 78.95 78.35 78.45 78.05 77.75 77.35 84.65 79.55 81.75 79.85 76.95 74.15 71.35 68.65 66.05 63.55 61.35"
                    Idling="84.85 86.65 83.45 81.65 80.55 80.55 79.55 78.95 78.35 78.45 78.05 77.75 77.35 84.65 79.55 81.75 79.85 76.95 74.15 71.35 68.65 66.05 63.55 61.35"
            />
        </Traction>
    </TractionNoise>

    <AerodynamicNoise>
        <!--
            - ID = unique identification of the aerodynamic noise
            - Default = true or false (informative)
            - Reference = (informative), examples:
                          IMAGINE
                          European Commission
                          Member State
                          Local User
                          CNOSSOS
            - Description = (informative)
            - Type = A: values for source located at bogie height (0.5m)
                     B: values for source located at pantograph height (4.0m)
            - V0 = Speed at which the given values are determined
            - Alpha =
            - Values are given per 1/3 octave band  (50 Hz .. 10 kHz)
        -->
        <Aerodynamic ID="0"
                     Default="true"
                     Reference=""
                     Description="empty aerodynamic noise">
            <Source Type="A"
                    V0="0"
                    Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
                    Alpha="0"
            />
            <Source Type="B"
                    V0="0"
                    Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
                    Alpha="0"
            />
        </Aerodynamic>
        <Aerodynamic ID="1"
                     Default="true"
                     Reference="IMAGINE"
                     Description="min">
            <Source Type="A"
                    V0="0"
```

```
                Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
                Alpha="0"
            />
            <Source Type="B"
                V0="0"
                Values="0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0"
                Alpha="0"
            />
        </Aerodynamic>
        <Aerodynamic ID="2"
                Default="true"
                Reference="IMAGINE"
                Description="max">
            <Source Type="A"
                V0="400"
                Values="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
                Alpha="100"
            />
            <Source Type="B"
                V0="400"
                Values="140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140 140"
                Alpha="100"
            />
        </Aerodynamic>
        <Aerodynamic ID="3"
                Default="true"
                Reference="IMAGINE"
                Description="Aerodynamic noise given at 300 km/h">
            <Source Type="A"
                V0="300"
                Values="112.6 113.2 115.7 117.4 115.3 115.0 114.9 116.4 115.9 116.3 116.2 115.2 115.8 115.7 115.7 114.7 114.7 115.0 114.5 113.1 112.1 110.6 109.6 108.8"
                Alpha="50"
            />
            <Source Type="B"
                V0="300"
                Values="36.7 38.5 39.0 37.5 36.8 37.1 36.4 36.2 35.9 36.3 36.3 36.3 36.2 36.5 36.4 105.2 110.3 110.4 105.6 37.2 37.5 37.9 38.4 39.2"
                Alpha="50"
            />
        </Aerodynamic>
    </AerodynamicNoise>
</RailParameters>
```

Annex C -- example of the file CNOSSOS_Rail_Input.xml

```
<?xml version="1.0"?>
<CNOSSOS_Rail_Input version="X1.0">

    <Test>true</Test>       <!-- whether or not to create a tab-separated file with the intermediate
                                 results    -->

    <Tref>12</Tref>         <!--    The reference time [hours]  -->
    <Source>A</Source>      <!--    the source to calculate; A (0.5m) or B (4.0m)   -->
    <Idling>false</Idling>  <!--    whether to calculate idling (true) or moving (false) vehicles   -->

    <!--
        The track-specific parameters to be used:
        SectionLength       the length of the track section [m]
        VerticalAngle       the vertical angle [°]
        HorizontalAngle     the horizontal angle [°]
        TrackTransferID     references /TrackParameters/TrackTransfer/Track with the given ID, in CNOSSOS_Rail_Track.xml
        StructureTransferID references /TrackParameters/StructureTransfer/Structure with the given ID, in CNOSSOS_Rail_Track.xml
        RailRoughnessID     references /TrackParameters/RailRoughness/Rail with the given ID, in CNOSSOS_Rail_Track.xml
        ImpactNoiseID       references /TrackParameters/ImpactNoise/Impact with the given ID, in CNOSSOS_Rail_Track.xml
        CurveRadius         the radius R of the curve [m]
        BridgeConstantID    references /TrackParameters/BridgeConstant/Bridge with the given ID, in CNOSSOS_Rail_Track.xml
    -->
    <Track  SectionLength="50"
            VerticalAngle="0"
            HorizontalAngle="90"
            TrackTransferID="1"
            StructureTransferID="1"
            RailRoughnessID="1"
            ImpactNoiseID="1"
            CurveRadius="250"
            BridgeConstantID="1"
            />

    <Vehicles>
        <!--
            The types of vehicle circulating on the specific track section.

            For each vehicle type, specify the following parameters:
            Ref                 references /RailParameters/VehicleDefinition/Vehicle with the given
                                 ID, in CNOSSOS_Rail_Vehicles.xml
                                This also references the following parameters as required:
                                /RailParameters/VehicleTransfer/Vehicle
                                /RailParameters/WheelRoughness/Vehicle
```

```
                              /RailParameters/ContactFilter/Vehicle
                              /RailParameters/TractionNoise/Vehicle
                              /RailParameters/AerodynamicNoise/Vehicle
            Description       a description for the user
            RunningCondition  the running condition of the railway vehicle.
                              Possible values: constant, accelerating, decelerating, idling
                              Note that when Idling (see above) is set to 'true', only idling
                               vehicles will be taken into account. Vice versa, when Idling is
                               set to 'false', only moving vehicles will be taken into account.
            Q                 the number of vehicles on the track section
            v                 the speed of the vehicles [km/h]
            IdlingTime        the idling time of the vehicle [hours]; only used when
                               RunningCondition = "idling"
        -->
        <Vehicle Ref="1"
                 Description=""
                 RunningCondition="accelerating"
                 Q="1"
                 v="250"
                 IdlingTime="1"
                />
        <Vehicle Ref="2"
                 Description=""
                 Q="1"
                 v="200"
                 IdlingTime="1"
                 RunningCondition="constant"
                />
        <Vehicle Ref="2"
                 Description=""
                 Q="10"
                 v="250"
                 IdlingTime="4"
                 RunningCondition="idling"
                />
    </Vehicles>

</CNOSSOS_Rail_Input>
```

Annex D -- example of the file CNOSSOS_Rail_Output.xml

```
<?xml version="1.0" ?>
<CNOSSOS_SourcePower version="X1.0">
    <source>
        <h>0.5</h>
        <Lw sourceType="LineSource"
            measurementType="FreeField"
            frequencyWeighting="LIN">
            39.0046 39.8615 41.2514 45.0035 45.4897 55.9174 57.8646 53.5764
        </Lw>
    </source>
</CNOSSOS_SourcePower>
```

Annex E -- example of the file CNOSSOS_Industry_Output.csv

```
Sep=
Tref:     12
Source:   A
Idling:   no        LineSource

Track data:
Vertical angle      0
Horizontal angle    90
Section length      50
Curve radius        250

[Hz]                          63        125       250       500       1.000     2.000     4.000     8.000
Lw          A         PointSource         58,9042   61,8512   65,7076   65,4438   72,6234   85,3693   84,4143   80,6348
Lw          A         LineSource          39,0046   39,8615   41,2514   45,0035   45,4897   55,9174   57,8646   53,5764
Lw          B         PointSource         40,9969   38,0003   40,9969   38,0003   40,9969   38,0003   33,5354   22,1508
Lw          B         LineSource          25,9882   26,7536   26,6018   26,0299   25,9381   29,5134   25,5254   25,4468

[Hz]                          50        63        80        100       125       160       200       250       315       400       500       630       800       1.000     1.250     1.600     2.000     2.500
          3.150     4.000     5.000     6.300     8.000     10.000
LwEqTdir  A         PointSource         53,0314   54,022    55,0996   56,0086   57,0039   58,0002   59,5264   61,5099   61,4902   59,6736   59,5951   62,2114   63,4649   65,772    70,898    75,4413
          79,5954   83,3882   81,5817   79,2981   76,7499   76,3725   75,8434   75,31
LwEqTdir  A         LineSource          34,0407   34,1882   34,4608   34,8194   35,0489   35,384    35,6538   36,3217   37,3047   39,2016   40,7404   40,5951   39,0928   39,3189   42,7264   45,697
          50,1372   53,9841   53,7332   53,7637   51,3825   48,9993   49,0752   48,2998
LwEqTdir  B         PointSource         33,2291   33,2291   39,2291   33,2291   33,2291   33,2291   39,2291   33,2291   33,2291   33,2291   33,2291   33,2291   39,2291   33,2291   33,2291   33,2291
          33,2291   33,2291   31,2291   28,2291   24,2291   20,2291   16,2291   12,2291
LwEqTdir  B         LineSource          21,4742   21,0012   21,1623   21,1079   21,5424   23,0501   22,6853   21,5424   21,1079   21,1079   21,1079   21,5453   21,1079   21,1623   21,2298   21,3133
          25,8262   25,7543   20,8077   20,7448   20,7095   20,6856   20,6736   20,6676

 ---------- VEHICLE Ref = 1
Running condition:  accelerating        LineSource
Q:        1
v:        250

LwEqLine  A                   33,7701   33,86     34,0633   34,361    34,4772   34,6298   34,7551   35,0404   36,3359   38,8178   40,48     40,0895   38,0925   37,5597   39,7693   40,3439   45,4147
          49,372    51,0812   52,4074   50,0859   46,7108   47,1616   46,2462
Lw0dir    A                   87,7495   87,8394   88,0427   88,3404   88,4566   88,6092   88,7345   89,0198   90,3153   92,7972   94,4594   94,0689   92,0719   91,5391   93,7487   94,3233   99,3941
          103,351   105,061   106,387   104,065   100,69    101,141   100,226
Lw0dir    A         rolling   82,2989   83,2989   84,2989   85,2989   85,7989   86,2989   86,6989   87,2989   89,1989   92,2956   94,1237   93,6939   91,4726   90,8552   93,3505   93,9765   99,2891
          103,31    105,036   106,374   104,05    100,667   101,126   100,212
Lw0       A         rolling   82,2989   83,2989   84,2989   85,2989   85,7989   86,2989   86,6989   87,2989   89,1989   92,2956   94,1237   93,6939   91,4726   90,8552   93,3505   93,9765   99,2891
          103,31    105,036   106,374   104,05    100,667   101,126   100,212
Lw0dir    A         traction  66,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     66,99     61,99     61,99     61,99     61,99     61,99     59,99
          56,99     53,99     50,99     47,99     44,99     41,99
Lw0       A         traction  66,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     61,99     66,99     61,99     61,99     61,99     61,99     61,99     59,99
          56,99     53,99     50,99     47,99     44,99     41,99
Lw0dir    A         aerodynamic         86,2409   85,9409   85,6409   85,3409   85,0409   84,7409   84,4409   84,1409   83,8409   83,1409   83,1409   83,1409   83,1409   83,1409   83,1409   83,1409
          83,1409   83,1409   82,5409   81,1409   79,6409   78,0409   76,6409   75,1409
```

Lw0	A	aerodynamic		86,2409	85,9409	85,6409	85,3409	85,0409	84,7409	84,4409	84,1409	83,8409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	
	83,1409	83,1409	82,5409	81,1409	79,6409	78,0409	76,6409	75,1409												
deltaLw0dirVert	A			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
LwEqLine	B		21,3499	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	21,3499	20,8912	20,8912	20,8912	20,8912	25,7355	
	25,7083	20,7355	20,6988	20,6802	20,6709	20,6662	20,6639													
Lw0dir	B		75,3293	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	75,3293	74,8706	74,8706	74,8706	74,8706	79,7149	
	79,6877	74,7149	74,6782	74,6596	74,6503	74,6456	74,6433													
Lw0dir	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
Lw0	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
Lw0dir	B	traction	66,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	66,99	61,99	61,99	61,99	61,99	61,99	59,99
	56,99	53,99	50,99	47,99	44,99	41,99														
Lw0	B	traction	66,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	66,99	61,99	61,99	61,99	61,99	61,99	59,99
	56,99	53,99	50,99	47,99	44,99	41,99														
Lw0dir	B	aerodynamic		74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	
	79,6409	79,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409												
Lw0	B	aerodynamic		74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	
	79,6409	79,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409												
deltaLw0dirVert	B			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
deltaLw0dirHorz				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
LwTr			8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29565	8,3237	8,29392	8,27263	8,05518	7,7505	7,07654	6,28912	
	5,30964	4,03614	2,37373	0,0495889	-3,33345	-2,87442	-3,78792													
LwVeh			74,2989	75,2989	76,2989	77,2989	77,7989	78,2989	78,6989	79,2989	81,1989	84,2956	86,1237	85,6939	83,4726	82,8552	85,3505	85,9765	91,2891	
	95,3096	97,0361	98,3737	96,0496	92,6666	93,1256	92,2121													
LwVehSup			8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29565	8,3237	8,29392	8,27263	8,05518	7,7505	7,07654	6,28912	
	5,30964	4,03614	2,37373	0,0495889	-3,33345	-2,87442	-3,78792													
deltaLsqueal				8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	8	8	8	8	8	8	8													
deltaLbridge				0																
LRtot			2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27505	2,3031	2,27332	2,25203	2,03458	1,7299	1,05594	0,268516	-
0,710961	-1,98446	-3,64687	-5,97101	-9,35405	-8,89502	-9,80852														
LHTr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
LHVeh			66	67	68	69	69,5	70	70,4	71	72,9	76	77,8	77,4	75,2	74,8	77,6	78,9	85	90
	93	96	96	96	96	96														
LHVehSup			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
LrRough			2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,24925	2,27747	2,24752	2,22609	2,00731	1,70064	1,02175	0,227498	-
0,762419	-2,05359	-3,74862	-6,14624	-9,74544	-9,24553	-10,2453														
LrImpact			-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
	-20	-20	-20	-20	-20	-20														

---------- VEHICLE Ref = 2

Running condition:	constant	LineSource																	
Q:	1																		
v:	200																		
LwEqLine	A		21,8502	22,8085	23,8792	24,827	25,9606	27,4093	28,3704	30,3954	30,3142	28,4746	28,3892	31,0047	32,2256	34,5441	39,6623	44,2002	48,3517	
52,1413	50,3325	48,049	45,5004	45,1228	44,594	44,0606													
Lw0dir	A		74,8605	75,8188	76,8895	77,8373	78,9709	80,4196	81,3807	83,4057	83,3245	81,4849	81,3995	84,015	85,2359	87,5544	92,6726	97,2105	101,362	
105,152	103,343	101,059	98,5107	98,1331	97,6043	97,0709													
Lw0dir	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	80,9644	83,3263	83,299	81,446	81,3598	83,9933	85,2195	87,5423	92,6679	97,2085	101,362	
105,152	103,343	101,059	98,5106	98,133	97,6042	97,0709													
Lw0	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	80,9644	83,3263	83,299	81,446	81,3598	83,9933	85,2195	87,5423	92,6679	97,2085	101,362	
105,152	103,343	101,059	98,5106	98,133	97,6042	97,0709													
Lw0dir	A	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99
55,99	53,99	51,99	48,99	45,99	42,99														
Lw0	A	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99
55,99	53,99	51,99	48,99	45,99	42,99														
Lw0dir	A	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
Lw0	A	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
deltaLw0dirVert	A		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
LwEqLine	B		5,97971	4,97971	8,9797	7,9797	12,9797	18,9797	17,9797	12,9797	7,9797	7,9797	7,9797	7,9797	7,9797	8,9797	9,9797	10,9797	8,9797	
5,97971	2,97971	0,979717	-1,02027	-4,02025	-7,02019	-10,0201													
Lw0dir	B		58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99
55,99	53,99	51,99	48,9901	45,9901	42,9902														
Lw0dir	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
Lw0	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
Lw0dir	B	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99
55,99	53,99	51,99	48,99	45,99	42,99														
Lw0	B	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99
55,99	53,99	51,99	48,99	45,99	42,99														
Lw0dir	B	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
Lw0	B	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
deltaLw0dirVert	B		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
deltaLw0dirHorz			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0													
LwTr			0,746598	0,746598	0,746598	0,746598	0,746598	0,746598	0,464401	0,526257	0,599015	0,64601	0,659781	0,693314	0,519505	0,242329	-0,132125	-0,791536	-1,63845	-2,8485
-4,6573	-6,94076	-9,48937	-9,867	-10,3958	-10,9291														
LwVeh			66,7466	67,7466	68,7466	69,7466	70,7466	71,7466	72,9644	75,3263	75,299	73,446	73,3598	75,9933	77,2195	79,5423	84,6679	89,2085	93,3615	
97,1515	95,3427	93,0592	90,5106	90,133	89,6042	89,0709													

LwVehSup			0,746598	0,746598	0,746598	0,746598	0,746598	0,746598	0,464401	0,526257	0,599015	0,64601	0,659781	0,693314	0,519505	0,242329	-0,132125	-0,791536	-1,63845	-
2,8485	-4,6573	-6,94076	-9,48937	-9,867	-10,3958	-10,9291														
deltaLsqueal				8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	8	8	8	8	8	8	8													
deltaLbridge				0																
LRtot			-5,274	-5,274	-5,274	-5,274	-5,274	-5,274	-5,5562	-5,49434	-5,42158	-5,37459	-5,36082	-5,32729	-5,50109	-5,77827	-6,15272	-6,81214	-7,65905	-
8,8691	-10,6779	-12,9614	-15,51	-15,8876	-16,4164	-16,9497														
LHTr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
LHVeh			66	67	68	69	70	71	72,5	74,8	74,7	72,8	72,7	75,3	76,7	79,3	84,8	90	95	100
	100	100	100	100	100	100														
LHVehSup			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
LrRough			-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,71517	-5,65103	-5,57562	-5,52694	-5,51268	-5,47796	-5,65803	-5,94575	-6,33561	-7,02575	-7,92007	-
9,21743	-11,2178	-13,9183	-17,4186	-18,0196	-18,9203	-19,9204														
LrImpact			-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
	-20	-20	-20	-20	-20	-20														
---------- VEHICLE Ref = 2																				
Running condition:		idling	PointSource																	
Tidling:	4																			
Section length:		50																		
LwEqLine	A		53,0314	54,022	55,0996	56,0086	57,0039	58,0002	59,5264	61,5099	61,4902	59,6736	59,5951	62,2114	63,4649	65,772	70,898	75,4413	79,5954	
	83,3882	81,5817	79,2981	76,7499	76,3725	75,8434	75,31													
Lw0dir	A		74,7923	75,7829	76,8605	77,7696	78,7648	79,7611	81,2873	83,2709	83,2511	81,4345	81,356	83,9723	85,2258	87,5329	92,6589	97,2022	101,356	
	105,149	103,343	101,059	98,5108	98,1334	97,6043	97,071													
Lw0dir	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	81,2466	83,2644	83,2446	81,4246	81,346	83,9668	85,2094	87,5305	92,6582	97,202	101,356	
	105,149	103,343	101,059	98,5108	98,1334	97,6043	97,071													
Lw0	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	81,2466	83,2644	83,2446	81,4246	81,346	83,9668	85,2094	87,5305	92,6582	97,202	101,356	
	105,149	103,343	101,059	98,5108	98,1334	97,6043	97,071													
Lw0dir	A	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99
	52,99	49,99	45,99	41,99	37,99	33,99														
Lw0	A	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99
	52,99	49,99	45,99	41,99	37,99	33,99														
Lw0dir	A	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
Lw0	A	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
deltaLw0dirVert		A		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
LwEqLine	B		33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	33,2291	
	33,2291	31,2291	28,2291	24,2291	20,2291	16,2291	12,2291													
Lw0dir	B		54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99
	52,99	49,99	45,99	41,99	37,99	33,99														
Lw0dir	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
Lw0	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														

Lw0dir	B	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99
	52,99	49,99	45,99	41,99	37,99	33,99														
Lw0	B	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99
	52,99	49,99	45,99	41,99	37,99	33,99														
Lw0dir	B	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
Lw0	B	aerodynamic		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
deltaLw0dirVert	B			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
deltaLw0dirHorz				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0													
LwTr			0,746598	0,746598	0,746598	0,746598	0,746598	0,746598	0,746598	0,464401	0,544615	0,624636	0,64601	0,666821	0,509372	0,230515	-0,14185	-0,798039	-1,6438	-
2,85094	-4,65738	-6,94101	-9,48918	-9,86658	-10,3957	-10,929														
LwVeh			66,7466	67,7466	68,7466	69,7466	70,7466	71,7466	73,2466	75,2644	75,2446	73,4246	73,346	75,9668	77,2094	79,5305	84,6582	89,202	93,3562	
	97,1491	95,3426	93,059	90,5108	90,1334	89,6043	89,071													
LwVehSup			0,746598	0,746598	0,746598	0,746598	0,746598	0,746598	0,746598	0,464401	0,544615	0,624636	0,64601	0,666821	0,509372	0,230515	-0,14185	-0,798039	-1,6438	-
2,85094	-4,65738	-6,94101	-9,48918	-9,86658	-10,3957	-10,929														
deltaLsqueal				8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	8	8	8	8	8	8	8													
deltaLbridge				0																
LRtot			-5,274	-5,274	-5,274	-5,274	-5,274	-5,274	-5,274	-5,5562	-5,47599	-5,39596	-5,37459	-5,35378	-5,51123	-5,79009	-6,16245	-6,81864	-7,6644	-
8,87154	-10,678	-12,9616	-15,5098	-15,8872	-16,4163	-16,9496														
LHTr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
LHVeh			66	67	68	69	70	71	72,5	74,8	74,7	72,8	72,7	75,3	76,7	79,3	84,8	90	95	100
	100	100	100	100	100	100														
LHVehSup			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0														
LrRough			-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,71517	-5,632	-5,54908	-5,52694	-5,50539	-5,66854	-5,95803	-6,34575	-7,03258	-7,92575	-
9,22007	-11,2179	-13,9186	-17,4183	-18,0189	-18,9202	-19,9203														
LrImpact			-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
	-20	-20	-20	-20	-20	-20														

Or, as imported into a spreadsheet:

Tref: 12

Source: A

Idling: no LineSource

Track data:

Vertical angle 0

Horizontal angle	90	
Section length	50	
Curve radius	250	

[Hz]			63	125	250	500	1.000	2.000	4.000	8.000
Lw	A	PointSource	58,9042	61,8512	65,7076	65,4438	72,6234	85,3693	84,4143	80,6348
Lw	A	LineSource	39,0046	39,8615	41,2514	45,0035	45,4897	55,9174	57,8646	53,5764
Lw	B	PointSource	40,9969	38,0003	40,9969	38,0003	40,9969	38,0003	33,5354	22,1508
Lw	B	LineSource	25,9882	26,7536	26,6018	26,0299	25,9381	29,5134	25,5254	25,4468

[Hz]			50	63	80	100	125	160	200	250	315	400	500	630	800	1.000	1.250	1.600	2.000	2.500	3.150	4.000	5.000	6.300	8.000	10.000
LwEqTdir	A	PointSource	53,0314	54,022	55,0996	56,0086	57,0039	58,0002	59,5264	61,5099	61,4902	59,6736	59,5951	62,2114	63,4649	65,772	70,898	75,4413	79,5954	83,3882	81,5817	79,2981	76,7499	76,3725	75,8434	75,31
LwEqTdir	A	LineSource	34,0407	34,1882	34,4608	34,8194	35,0489	35,384	35,6538	36,3217	37,3047	39,2016	40,7404	40,5951	39,0928	39,3189	42,7264	45,697	50,1372	53,9841	53,7332	53,7637	51,3825	48,9993	49,0752	48,2998
LwEqTdir	B	PointSource	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	33,2291	33,2291	31,2291	28,2291	24,2291	20,2291	16,2291	12,2291
LwEqTdir	B	LineSource	21,4742	21,0012	21,1623	21,1079	21,5424	23,0501	22,6853	21,5424	21,1079	21,1079	21,1079	21,5453	21,1079	21,1623	21,2298	21,3133	25,8262	25,7543	20,8077	20,7448	20,7095	20,6856	20,6736	20,6676

VEHICLE Running condition:	Ref = 1 accelerating	LineSource
Q:	1	
v:	250	

LwEqLine	A		33,7701	33,86	34,0633	34,361	34,4772	34,6298	34,7551	35,0404	36,3359	38,8178	40,48	40,0895	38,0925	37,5597	39,7693	40,3439	45,4147	49,372	51,0812	52,4074	50,0859	46,7108	47,1616	46,2462
Lw0dir	A		87,7495	87,8394	88,0427	88,3404	88,4566	88,6092	88,7345	89,0198	90,3153	92,7972	94,4594	94,0689	92,0719	91,5391	93,7487	94,3233	99,3941	103,351	105,061	106,387	104,065	100,691	101,141	100,226
Lw0dir	A	rolling	82,2989	83,2989	84,2989	85,2989	85,7989	86,2989	86,6989	87,2989	89,1989	92,2956	94,1237	93,6939	91,4726	90,8552	93,3505	93,9765	99,2891	103,31	105,036	106,374	104,05	100,667	101,126	100,212
Lw0	A	rolling	82,2989	83,2989	84,2989	85,2989	85,7989	86,2989	86,6989	87,2989	89,1989	92,2956	94,1237	93,6939	91,4726	90,8552	93,3505	93,9765	99,2891	103,31	105,036	106,374	104,05	100,667	101,126	100,212
Lw0dir	A	traction	66,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	66,99	61,99	61,99	61,99	61,99	61,99	59,99	56,99	53,99	50,99	47,99	44,99	41,99
Lw0	A	traction	66,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	66,99	61,99	61,99	61,99	61,99	61,99	59,99	56,99	53,99	50,99	47,99	44,99	41,99
Lw0dir	A	aerodynamic	86,2409	85,9409	85,6409	85,3409	85,0409	84,7409	84,4409	84,1409	83,8409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	82,5409	81,1409	79,6409	78,0409	76,6409	75,1409

Lw0	A	aerodynamic	86,2409	85,9409	85,6409	85,3409	85,0409	84,7409	84,4409	84,1409	83,8409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	83,1409	82,5409	81,1409	79,6409	78,0409	76,6409	75,1409
deltaLw0dirVert	A		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LwEqLine	B		21,3499	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	20,8912	21,3499	20,8912	20,8912	20,8912	20,8912	25,7355	25,7083	20,7355	20,6988	20,6802	20,6709	20,6662	20,6639
Lw0dir	B		75,3293	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	74,8706	75,3293	74,8706	74,8706	74,8706	74,8706	79,7149	79,6877	74,7149	74,6782	74,6596	74,6503	74,6456	74,6433
Lw0dir	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0dir	B	traction	66,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	66,99	61,99	61,99	61,99	61,99	61,99	59,99	56,99	53,99	50,99	47,99	44,99	41,99
Lw0	B	traction	66,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	61,99	66,99	61,99	61,99	61,99	61,99	61,99	59,99	56,99	53,99	50,99	47,99	44,99	41,99
Lw0dir	B	aerodynamic	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	79,6409	79,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409
Lw0	B	aerodynamic	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409	79,6409	79,6409	74,6409	74,6409	74,6409	74,6409	74,6409	74,6409
deltaLw0dirVert	B		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirHorz			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LwTr			8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29565	8,3237	8,29392	8,27263	8,05518	7,7505	7,07654	6,28912	5,30964	-4,0361	-2,37373	-0,049589	-3,3334	-2,8744	-3,7879
LwVeh			74,2989	75,2989	76,2989	77,2989	77,7989	78,2989	78,6989	79,2989	81,1989	84,2956	86,1237	85,6939	83,4726	82,8552	85,3505	85,9765	91,2891	95,3096	97,0361	98,3737	96,0496	92,6666	93,1256	92,2121
LwVehSup			8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29891	8,29565	8,3237	8,29392	8,27263	8,05518	7,7505	7,07654	6,28912	5,30964	-4,0361	-2,37373	-0,049589	-3,3334	-2,8744	-3,7879
deltaLsqueal			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
deltaLbridge			0																							
LRtot			2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27831	2,27505	2,3031	2,27332	2,25203	2,03458	1,7299	1,05594	-0,26851	-0,71096	-1,9844	-3,64687	-5,97101	-9,3540	-8,8950	-9,8085
LHTr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHVeh			66	67	68	69	69,5	70	70,4	71	72,9	76	77,8	77,4	75,2	74,8	77,6	78,9	85	90	93	96	96	96	96	96
LHVehSup			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LrRough			2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,25254	2,24925	2,27747	2,24752	2,22609	2,00731	1,70064	1,02175	-0,22749	-0,76241	-2,0535	-3,74862	-6,14624	-9,7454	-9,2455	-10,245
LrImpact			-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20

VEHICLE Ref = 2
Running condition: constant LineSource

Q: 1

v: 200

LwEqLine	A		21,8502	22,8085	23,8792	24,827	25,9606	27,4093	28,3704	30,3954	30,3142	28,4746	28,3892	31,0047	32,2256	34,5441	39,6623	44,2002	48,3517	52,1413	50,3325	48,049	45,5004	45,1228	44,594	44,0606
Lw0dir	A		74,8605	75,8188	76,8895	77,8373	78,9709	80,4196	81,3807	83,4057	83,3245	81,4849	81,3995	84,015	85,2359	87,5544	92,6726	97,2105	101,362	105,152	103,343	101,059	98,5107	98,1331	97,6043	97,0709
Lw0dir	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	80,9644	83,3263	83,299	81,446	81,3598	83,9933	85,2195	87,5423	92,6679	97,2085	101,362	105,152	103,343	101,059	98,5106	98,133	97,6042	97,0709
Lw0	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	80,9644	83,3263	83,299	81,446	81,3598	83,9933	85,2195	87,5423	92,6679	97,2085	101,362	105,152	103,343	101,059	98,5106	98,133	97,6042	97,0709
Lw0dir	A	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99	55,99	53,99	51,99	48,99	45,99	42,99
Lw0	A	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99	55,99	53,99	51,99	48,99	45,99	42,99
Lw0dir	A	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	A	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirVert	A		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LwEqLine	B		5,97971	4,97971	8,9797	7,9797	12,9797	18,9797	17,9797	12,9797	7,9797	7,9797	7,9797	7,9797	7,9797	8,9797	9,9797	10,9797	8,9797	5,97971	2,97971	0,97971	-1,02027	-4,0205	-7,0209	-10,021
Lw0dir	B		58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99	55,99	53,99	51,99	48,991	45,991	42,992
Lw0dir	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0dir	B	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99	55,99	53,99	51,99	48,99	45,99	42,99
Lw0	B	traction	58,99	57,99	61,99	60,99	65,99	71,99	70,99	65,99	60,99	60,99	60,99	60,99	60,99	61,99	62,99	63,99	61,99	58,99	55,99	53,99	51,99	48,99	45,99	42,99
Lw0dir	B	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	B	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirVert	B		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirHorz			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LwTr			0,74659	0,74659	0,74659	0,74659	0,74659	0,74659	0,46440	0,52625	0,59901	0,64601	0,65978	0,69331	0,51950	0,24232	-0,13212	-0,79153	-1,63845	-2,8485	-4,6573	-6,94076	-9,48937	-9,867	-10,3958	-10,9291
LwVeh			66,7466	67,7466	68,7466	69,7466	70,7466	71,7466	72,9644	75,3263	75,299	73,446	73,3598	75,9933	77,2195	79,5423	84,6679	89,2085	93,3615	97,1515	95,3427	93,0592	90,5106	90,133	89,6042	89,0709
LwVehSup			0,74659	0,74659	0,74659	0,74659	0,74659	0,74659	0,46440	0,52625	0,59901	0,64601	0,65978	0,69331	0,51950	0,24232	-0,13212	-0,79153	-1,63845	-2,8485	-4,6573	-6,94076	-9,48937	-9,867	-10,3958	-10,9291
deltaLsqueal			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
deltaLbridge			0																							
LRtot			-5,274	-5,274	-5,274	-5,274	-5,274	-5,274	-5,5562	5,49434	5,42158	5,37459	5,36082	5,32729	5,50109	5,77827	6,15272	6,81214	7,65905	-8,8691	-10,6779	12,9614	-15,51	15,8876	16,4164	16,9497
LHTr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHVeh			66	67	68	69	70	71	72,5	74,8	74,7	72,8	72,7	75,3	76,7	79,3	84,8	90	95	100	100	100	100	100	100	100
LHVehSup			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LrRough			-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	5,71517	5,65103	5,57562	5,52694	5,51268	5,47796	5,65803	5,94575	6,33561	7,02575	7,92007	9,21743	-11,2178	13,9183	-17,4186	18,0196	18,9203	19,9204
LrImpact			-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20

VEHICLE Ref = 2
Running condition: idling PointSource

Tidling: 4

Section length: 50

LwEqLine	A		53,0314	54,022	55,0996	56,0086	57,0039	58,0002	59,5264	61,5099	61,4902	59,6736	59,5951	62,2114	63,4649	65,772	70,898	75,4413	79,5954	83,3882	81,5817	79,2981	76,7499	76,3725	75,8434	75,31
Lw0dir	A		74,7923	75,7829	76,8605	77,7696	78,7648	79,7611	81,2873	83,2709	83,2511	81,4345	81,356	83,9723	85,2258	87,5329	92,6589	97,2022	101,356	105,149	103,343	101,059	98,5108	98,1334	97,6043	97,071
Lw0dir	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	81,2466	83,2644	83,2446	81,4246	81,346	83,9668	85,2094	87,5305	92,6582	97,202	101,356	105,149	103,343	101,059	98,5108	98,1334	97,6043	97,071
Lw0	A	rolling	74,7466	75,7466	76,7466	77,7466	78,7466	79,7466	81,2466	83,2644	83,2446	81,4246	81,346	83,9668	85,2094	87,5305	92,6582	97,202	101,356	105,149	103,343	101,059	98,5108	98,1334	97,6043	97,071
Lw0dir	A	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	52,99	49,99	45,99	41,99	37,99	33,99
Lw0	A	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	52,99	49,99	45,99	41,99	37,99	33,99
Lw0dir	A	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	A	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirVert	A		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LwEqLine	B		33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	33,2291	33,2291	39,2291	33,2291	33,2291	33,2291	33,2291	33,2291	31,2291	28,2291	24,2291	20,2291	16,2291	12,2291
Lw0dir	B		54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	52,99	49,99	45,99	41,99	37,99	33,99
Lw0dir	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	B	rolling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0dir	B	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	52,99	49,99	45,99	41,99	37,99	33,99
Lw0	B	traction	54,99	54,99	60,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	60,99	54,99	54,99	54,99	54,99	54,99	52,99	49,99	45,99	41,99	37,99	33,99
Lw0dir	B	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lw0	B	aerodynamic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirVert	B		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
deltaLw0dirHorz			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LwTr			0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,46440 1	0,54461 5	0,62463 6	0,64601	0,66682 1	0,50937 2	0,23051 5	-0,14185	-0,79803 9	-1,6438	-2,85094	-4,6573 8	-6,94101	-9,48918	-9,8665 8	-10,395 7	-10,929
LwVeh			66,7466	67,7466	68,7466	69,7466	70,7466	71,7466	73,2466	75,2644	75,2446	73,4246	73,346	75,9668	77,2094	79,5305	84,6582	89,202	93,3562	97,1491	95,342 6	93,059	90,5108	90,133 4	89,604 3	89,071
LwVehSup			0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,74659 8	0,46440 1	0,54461 5	0,62463 6	0,64601	0,66682 1	0,50937 2	0,23051 5	-0,14185	-0,79803 9	-1,6438	-2,85094	-4,6573 8	-6,94101	-9,48918	-9,8665 8	-10,395 7	-10,929
deltaLsqueal			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
deltaLbridge			0																							
LRtot			-5,274	-5,274	-5,274	-5,274	-5,274	-5,274	-5,274	-5,5562	-5,47599	-5,39596	-5,37459	-5,35378	-5,51123	-5,79009	-6,16245	-6,81864	-7,6644	-8,87154	-10,678	-12,9616	-15,5098	-15,887 2	-16,416 3	-16,949 6
LHTr			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LHVeh			66	67	68	69	70	71	72,5	74,8	74,7	72,8	72,7	75,3	76,7	79,3	84,8	90	95	100	100	100	100	100	100	100
LHVehSup			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LrRough			-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,4228	-5,71517	-5,632	-5,54908	-5,52694	-5,50539	-5,66854	-5,95803	-6,34575	-7,03258	-7,92575	-9,22007	-11,217 9	-13,9186	-17,4183	-18,018 9	-18,920 2	-19,920 3
LrImpact			-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20