

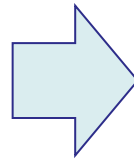
Comment for Cross-matrix

17. December 2021

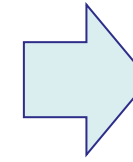
TFVS#6

JASIC

Typical scenarios for road traffic noise



Coverage of regulations



- Where is an insufficient area to regulate if applicable?
- Which scenario does R51 limits cover?

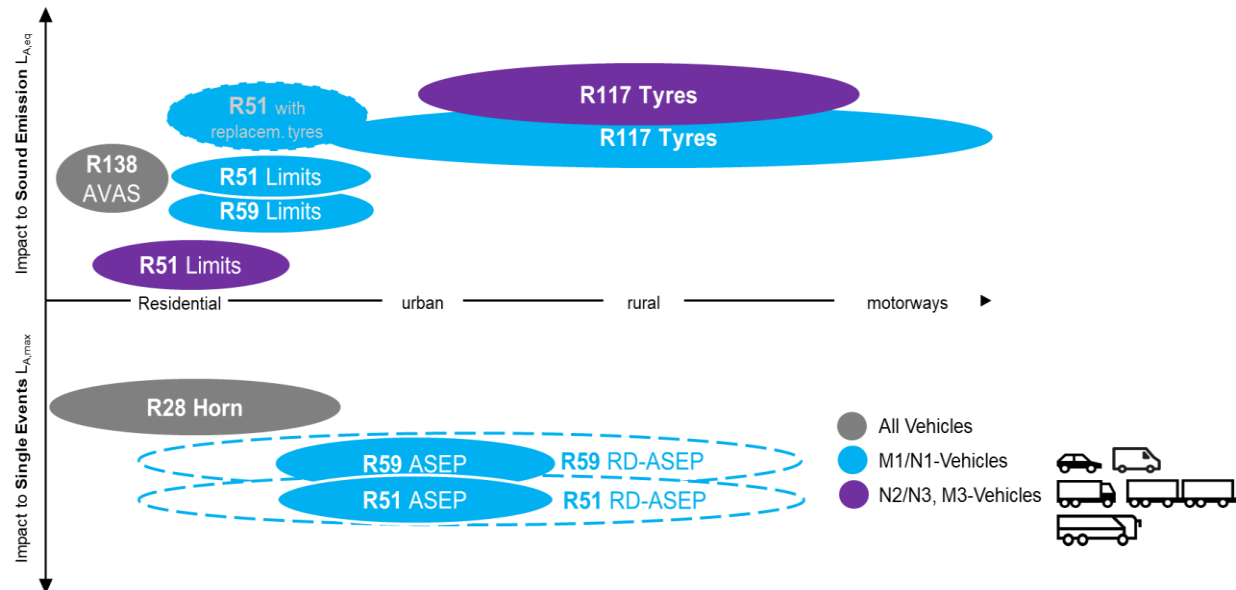
TFVS-05-06 Parameters

1. Categorizing
2. Additional parameters

Comments today

TFSL-02-10 Rev.2

Proposal for a Sound Emission Regulation Cross Matrix



Categorization of parameters according to TFVS-05-06 helps to consider the scenario for road traffic noise .

A

Location

Street category



HP; 総栄建設株式会社

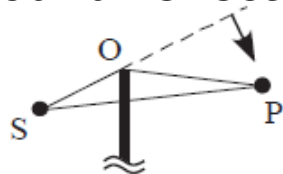


HP; 2021 富山の遊び場!

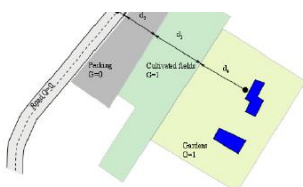
B

Sound propagation

Diffraction
Grand surface
Sound reflection



(a) For S invisible from P
 $\delta = L - R$



$$d = d_1 + d_2 + d_3 + d_4$$

$$G_{\text{path}} = \frac{(0 \cdot d_1 + 0 \cdot d_2 + 1 \cdot d_3 + 1 \cdot d_4)}{d} = \frac{(d_3 + d_4)}{d}$$

Figure VI.17. Determination of the ground coefficient G_{path} over a propagation path

C

Traffic flow

Traffic volume
Vehicle speed
Mixture of vehicle categories



Hodogaya bypass in Yokohama, Japan - Wikipedia

D

Sound sources



Road traffic noise

A. Location

Parameter number in TFVS-05-06

No.	Parameters																
1	Street category	<table border="1" data-bbox="797 285 1651 742"> <tr> <td colspan="3" data-bbox="797 285 1651 364">Environmental Standard for noise in Japan</td> </tr> <tr> <td data-bbox="797 364 1154 435">Type of area</td> <td data-bbox="1154 364 1403 435">Daytime</td> <td data-bbox="1403 364 1651 435">Nighttime</td> </tr> <tr> <td data-bbox="797 435 1154 549">Specially required quietness</td> <td data-bbox="1154 435 1403 549">50 dB or less</td> <td data-bbox="1403 435 1651 549">40 dB or less</td> </tr> <tr> <td data-bbox="797 549 1154 628">Residence</td> <td data-bbox="1154 549 1403 628">55 dB or less</td> <td data-bbox="1403 549 1651 628">45 dB or less</td> </tr> <tr> <td data-bbox="797 628 1154 742">Commerce/industry with residence</td> <td data-bbox="1154 628 1403 742">60 dB or less</td> <td data-bbox="1403 628 1651 742">50 dB or less</td> </tr> </table> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="1694 299 2089 671" style="text-align: center;">  <p>Residence HP: 総栄建設株式会社</p> </div> <div data-bbox="2127 299 2517 671" style="text-align: center;">  <p>Arterial road HP: 中野区</p> </div> </div>	Environmental Standard for noise in Japan			Type of area	Daytime	Nighttime	Specially required quietness	50 dB or less	40 dB or less	Residence	55 dB or less	45 dB or less	Commerce/industry with residence	60 dB or less	50 dB or less
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Residence	55 dB or less	45 dB or less															
Commerce/industry with residence	60 dB or less	50 dB or less															
3	Lane	One lane or more than one lane per one direction															
<div style="border: 1px solid blue; border-radius: 10px; padding: 5px; display: inline-block; margin-bottom: 10px;">Should be added</div> <div style="color: red; font-size: 2em; margin-top: 10px;">○</div>	Specific feature for road	<div style="display: flex; justify-content: space-around;"> <div data-bbox="802 849 1363 1285" style="text-align: center;">  <p>Google map Roundabout, signalized intersection</p> </div> <div data-bbox="1375 849 1936 1285" style="text-align: center;">  <p>Google map Elevated road</p> </div> <div data-bbox="2000 849 2471 1285" style="text-align: center;">  <p>Fig. 4.4 Arrangement of a vehicle and equivalent sources. 2020 The Acoustical Society of Japan Road tunnel</p> </div> </div>															
15	Observer Distance	(height as well as horizontal distance)															

C. Traffic flow

No.	Parameters	
2	Daily Traffic Volume (DTV)	Traffic volume
13	Hourly Traffic Volume Distribution (HTV)	
4	Maximum Vehicle Speed LDV / HDV / MC	Vehicle speed
14	Speed Attenuation and increase	
8	Split HDV (p%HDV)	Mixture of vehicle categories
9	Split MC (p%MC)	
10	Vehicle category share ($\xi\%$)	
11	Level of Service (LoS)	Free flow > >traffic jam
12	Level of Interruption (LoI)	Traffic signal system etc.



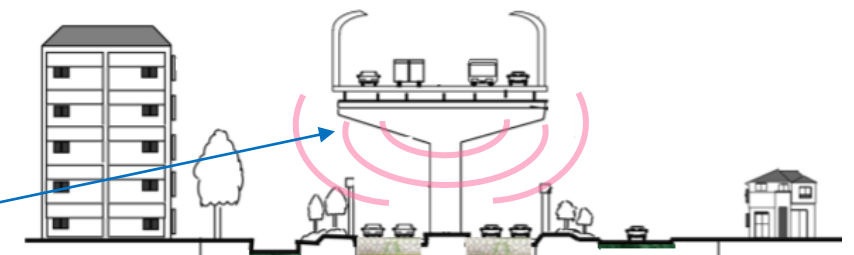
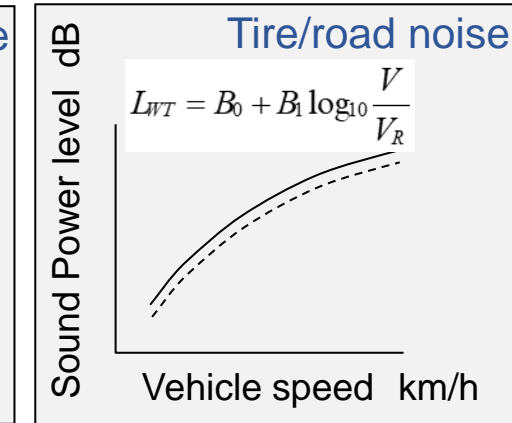
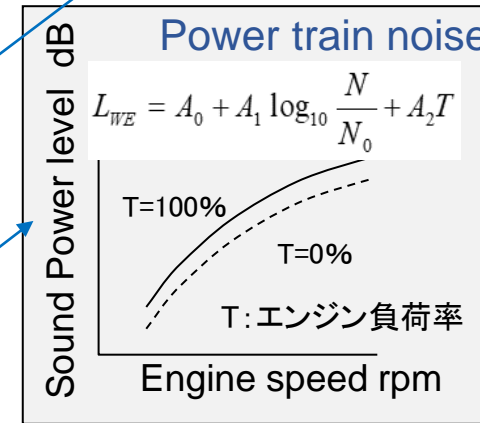
Hodogaya bypass in Yokohama, Japan - Wikipedia

D. Sound Sources

No.	Parameters
D-1	Vehicle categories and kinds
5	Light Duty Vehicles (LDV)
6	Heavy Duty Vehicles (HDV)
7	Motorized Two-Wheelers (MC)
<input type="radio"/>	Electric vehicle
<input type="radio"/>	Modified vehicle
<input type="radio"/>	Regulation level (Former or new regulation etc.)
D-2	Power level of individual vehicle
<input type="radio"/>	Sound power level; Tire rolling noise-function of vehicle speed Powertrain noise-function of engine speed & load
	Various corrections (gradient, directivity etc.)
D-3	Others
16	Road Surface
	Noise from elevated road



Sound source model



Should be added

Road Traffic Noise Prediction Model

Input data

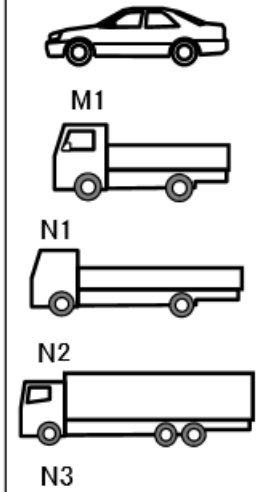
Traffic condition

- Number of lanes
- Dimension of road
- Vehicle speed(90% tile)
- Cycle of traffic signal

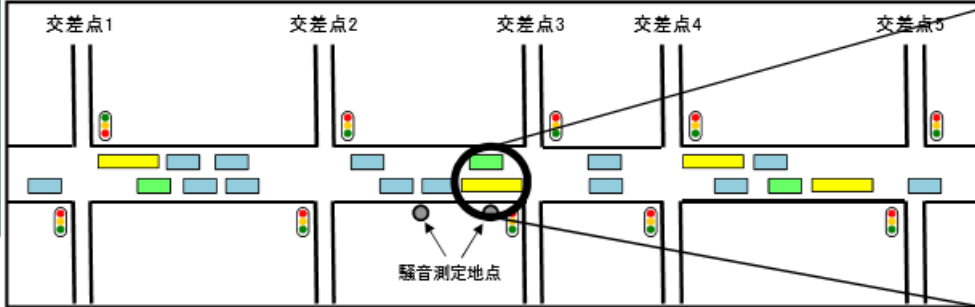
Traffic volume

- Each categories

Vehicle category



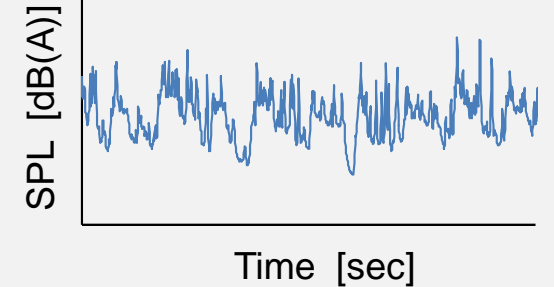
A Simulation of traffic flow



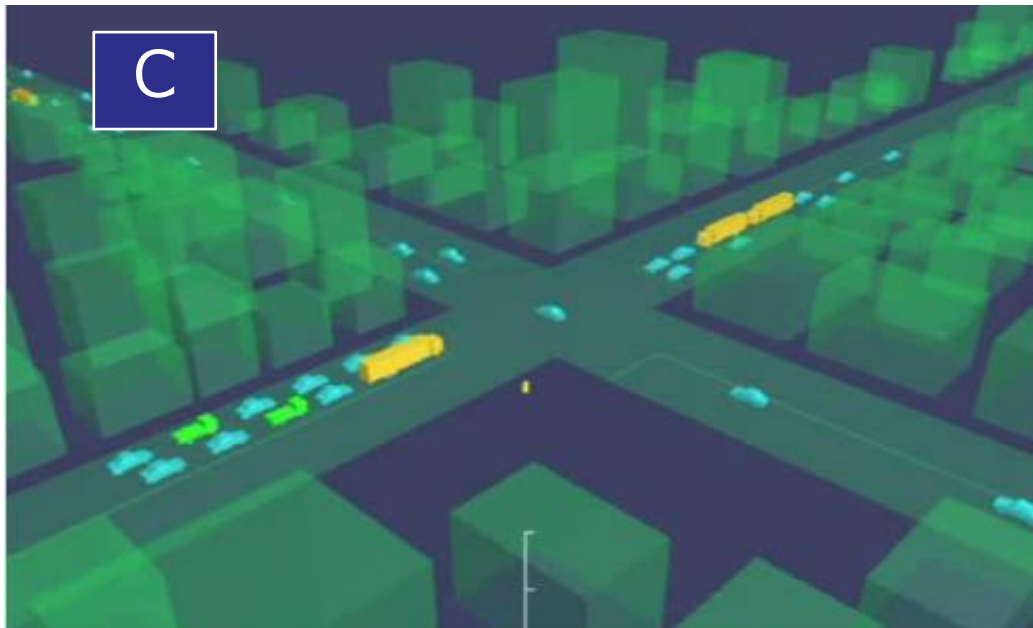
Vehicle conditions for each vehicles

- Vehicle speed
- Engine speed
- Acceleration
- Location

Output



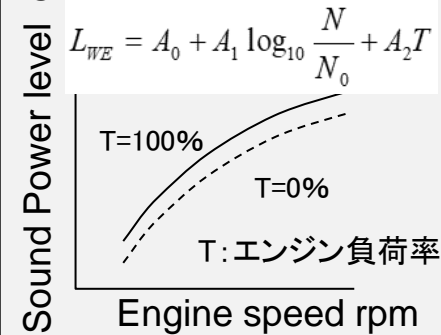
C



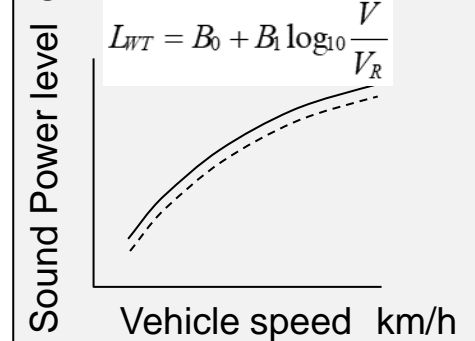
D

Sound source model

Power train noise



Tire/road noise



The impact of road traffic noise with reduction of vehicle noise limit is assessed by using the JARI prediction model based on micro traffic flow in Japan.

- Categorization of parameters can help to consider the scenario for road traffic noise.
 - A: Location
 - B: Sound propagation
 - C: Traffic flow
 - D: Sound source

- The parameters below are recommended to add on the list.
 - Specific feature for road (A)
 - Kinds of vehicle-electric vehicle (D)
 - Kinds of vehicle-modified vehicle (D)
 - Kinds of vehicle- regulation level (D)
 - Sound power level (D)

- There are several tools for prediction of road traffic noise such as CNOSSOS-EU, ASJ-RTN, and JARI prediction model. Understanding each tool may be useful for a discussion about improvement of road traffic noise.