TF-VS CROSSMATRIX

STATUS REPORT

April 04, 2022

TF Vehicles‘ Sound – Cross matrix – Subgroup

Aim	• Identify where the problems/complaints due to the noise are coming from to be able to build a kind of simulation tool/traffic scenario to make some ‘prediction’ to continue to improve noise in real life

Creation of Subgroup	• Volunteers:
	  • CPs: China, France, Japan, NL
	  • NGO:OICA, ETRTO
	  • Guest: HS Consultant

Our guideline	- Keep in mind the intention of this work: improve noise level especially in urban area - Proposals must not be limited to noise sources - Situations with the biggest impact on noise to be considered - Not to be limited to the TA process – other measures (as Police) possible - Define (3-5) common scenarios to be able to compare them/harmonize - **Input & output of the group needs to be better described**

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For reminder, documents already available

- TFVS-01-05 Rev.1 (Germany) General ideas about the work of the TF
- TFVS-02-07 (OICA) Diagram type of road vs. impact on noise per regulations
- TFVS-04-14 (Secretary) General Summary
- TFVS-05-06 (Subgroup) Explanation of parameters
- TFVS-06-03 (Japan) Comments on crossmatrix parameters
- TFVS-06-05 (OICA) Draft table for traffic scenario
- TFVS-07-05 (Subgroup) Table Traffic scenario classification
- TFVS-07-08 (Subgroup) Explanations traffic scenario specifications
- TFVS-07-13 (NL) Traffic scenario classification in the NL

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WP.1	• Identification & explanation of parameters which could be taken into account
WP.2	• Identification & Definition of the scenarios
WP.3	• From the defined scenarios, calculation from existing models for roadmapping
WP.4	• Comparison and analysis of calculations
WP.5	• Conclusions • Next steps

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WP.1

- **Identification & explanation of parameters which could be taken into account**
  - Location / Road surface, level of maintenance, age, …
  - Traffic flow / scenario
  - (Sound propagation)
  - Sound sources

- Street category
- Daily traffic volume (DTV)
- Lanes / Specific features
- Maximum vehicle speed LCV/HDV/MC
- Split HDV, split MC
- Vehicle category share
- Level of service (LoS)
- Level of Interrruption (LoI)
- Hour traffic volume distribution (HTV)
- Speed attenuation and increase
- Observer distance
- Road surface

SELECTION TO BE DONE

- TFVS-05-06
- TFVS-07-08
- TFVS-05-03

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WP.2

- **Identification & Definition of the scenarios**

- TFVS-02-07
- TFVS-06-05
- TFVS-07-05
- TFVS-07-13

COMMON SCENARIOS

3 to 5 to be able
to compare the different models

Based on parameters to be chosen as:
- Different type of city areas (not motorways)
- Different speeds
- Road surface / test track
- …

Questions to be solved:
- Single events (through L_{EQ}) or driver behaviors or manipulation to be considered?

+ OPTIONAL SCENARIO?

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WP.3

- From the defined scenarios, calculation from existing models for roadmapping

Identification of the roadmappping models worldwide

Identification of CPs volunteer to make calculation

Prediction models: (EU) CNOSSOS, ASJ-RTN, JARI

WP.4

- Comparison and analysis of calculations

WP.5

- Conclusions
- Next steps

Comments & suggestions?

Parameter	Symbol	Value min	Value max
Daily Traffic Volume	DTV	1 000	100 000
Lanes	n_lanes	2	10
Exposed People	n/km	40	500
Observer Position	MIC_pos	7,5 m	50 m

		LDV		HDV	
		Value min	Value max	Value min	Value max
Reference Speed	v	30 km/h	125 km/h	20 km/h	85 km/h
Fluidity	%load	0%	70%	50%	100%
Split LDV/HDV	%HDV	0%	80%	100%	20%

Vehicle Major C	Overall Share	Veh Category	%Share per Sub
LDV	(100%-p%HDV)	M1	
		N1	
		M2 M<3.5 to	
HDV	p% HDV	M2 M>3.5 to	
		M3	
		N2	
		N3	

Fluidity	Congestion	Stoptime (%cycle)
10%	90%	45%
20%	80%	40%
30%	70%	35%
40%	60%	30%
50%	50%	25%
60%	40%	20%
70%	30%	15%
80%	20%	10%
90%	10%	5%
100%	0%	0%

Scenario	DTV veh/day	Lanes (both directions)	Flow Speed LDV [km/h]	Flow Speed HDV [km/h]	Fluidity (determines road load)	Spatial Factor (see remarks)	p% HDV M > 3.5 to	Exposed People people/km	Observer Pos [m]	Length Stream [m]	Available Space [m]	Road Utilization [%]	Cycle Split Acceleration	Deceleration	Stand	Cruise
Residential Area 25 km/h	1 500	2	25	20	90%	2,0	0,5%	50	7,5	52 658	1 200 000	4%	5%	5%	5%	85%
Main Street 30 km/h	15 000	2	30	25	80%	3,0	1,0%	500	7,5	904 725	1 440 000	63%	10%	10%	10%	70%
Main Street 50 km/h	25 000	2	50	35	50%	4,0	1,0%	300	7,5	3 005 500	2 400 000	125%	25%	25%	25%	25%
City Arterial 50 km/h	40 000	4	50	35	40%	2,0	2,0%	100	20	2 408 800	4 800 000	50%	30%	30%	30%	10%
City Arterial 70 km/h	80 000	6	70	65	40%	2,5	5,0%	50	20	8 105 000	10 080 000	80%	30%	30%	30%	10%
City Motorway 100 km/h	110 000	6	100	80	50%	2,5	10,0%	30	50	15 207 500	14 400 000	106%	25%	25%	25%	25%
Motorway 120 km/h	45 000	4	120	85	50%	2,0	15,0%	5	50	5 789 250	11 520 000	50%	25%	25%	25%	25%
Motorway 120 km/h	180 000	8	120	85	85%	2,0	15,0%	5	50	23 157 000	23 040 000	101%	8%	8%	10%	75%

Explanation: the left part with the yellow field are data entry field to define a reference condition.

Each scenario is defined by the following parameters:

DTV ➔ Traffic volume on a street segment in vehicle per day

Number of lanes for both direction ➔ 2 lanes means one lane per driving direction)

Flow speed LDV and HDV ➔ is likely different on all streets

Fluidity ➔ defines how interrupted the traffic is. Interruption could come from too many vehicles, too many vehicles force standstill or lower speed

Spatial factor ➔ parameter which enables extra space/time for crossings, traffic lights, space for lane

Share of HDV ➔ percentage of HDV from the DTV (means LDV is calculated by 100%-p%HDV)

For estimation of noise on affected people, two additional parameter are suggested

Exposed people ➔ people that are assigned to that street (likely less that to population living along the street ➔ see CNOSSOS)

Observer position ➔ How far from the street do we assume people (Microphone location)

The right part contains calculation formula, so do not touch these cells.

Length stream ➔ lining up all vehicles in a chain and determine the length of that chain (a LDV is estimated 5 m long a HDV 18 m long, each vehicle is supposed to have double speed distance)

Available Space ➔ Determines how much road length is available for the speed within 24 hours multiplied with the number of lanes

Road Utility ➔ ratio between needed space (length stream) and available space ➔ 0% mean free flow, no traffic, 100% mean road fully occupied but might be fluent, >100% road capacity exceeded system with go to congestion

The Cycle split provides percentage per diving condition and can be used in simulation models

What is missing is a load definition for the acceleration condition, which I have made, but not yet included.