Measurements & Tests
Simulation
Lit. Study
Position

Category(ies) of vehicle : M, N & L

(JAPAN) RESULTS OF THE SIMULATION STUDIES ON REDUCING AUTOMOBILE NOISE FROM JAPAN

VEHICLE CATEGORY
TYRE ROAD NOISE
PREDICTION MODEL
TRAFFIC FLOW/ CONDITION
CROSSMATRIX
VEHICLE FLEET
SOUND LIMITS

MAIN MESSAGES FROM THE PRESENTATION(S)

- Position of Japan
  - Japan believe that it must be important to take the technical review in each country and assess the effectiveness of new regulation such as beyond phase 3 for vehicle noise reduction, before making global agreement on it.
  - Japan would like to propose to highlight importance of such process by using models and parameters we have discussed at TF-VS, in its technical report which is going to submit to GRBP.
- Current status in Japan
  - As a result of deliberations by the Expert Committee on Motor Vehicle Noise on the introduction of Phase 3, which has taken into consideration the results of the study presented here, it was agreed to introduce Phase 3 because of the noise reduction effect expected from the introduction of Phase 3 limit values.
- Next steps & goals:
  - [Next steps] Public comments will be made on the draft version of the fourth report of the Future Policy for Motor Vehicle Noise Reduction, and based on the results, the report will be formally reported to the Atmospheric Noise and Vibration Subcommittee for deliberation by the Central Environmental Council.
  - [Goals] To achieve 100% in the EQSs (Environmental Quality Standards) for Road Traffic Noise
  - [Goals] To reduce the number of complaints related to vehicle noise

SUMMARY

- In terms of the UN Regulation No. 51-03, before introducing phase 3, its effect should be verified
- Conducted the study to assess the effectiveness of the phase 3 introduction at the points exceeding EQSs, by using JARI (Japanese Automobile Research Institute) prediction model
- Targets
  - To achieve 100% in the EQSs for Road Traffic Noise
  - To reduce the number of complaints related to vehicle noise
- Method and condition for predictive calculations
  - The original road traffic noise prediction model developed by JARI was applied for the prediction.
  - Changes in road traffic noise were calculated in case that phase 3 was applied to all vehicles to those conformed to phase 2.
  - Assumed dense asphalt pavement (maximum chipping size of 13 mm) of average condition
  - Based on distributions of measured L_{urban} of vehicles conformed to phase 1 and phase 2 provided by JAMA (Japan Automobile Manufacturers Association).

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- *For the* field surveys, 3 types of sites according to the traffic conditions have been defined. For each site (near intersection & in cruising section), hourly traffic volume, speed and L_{Aeq} have been measured per time zones.

- Results
  - In case of the reduction rate for each noise source for LDV was set to 75% (power train unit noise):25% (tyre noise), the L_{Aeq} reduction of applying phase 3 was 0.4 to 0.6 dB near intersections and 0.3 to 0.5 dB in the cruising sections.
  - In case of the reduction rate for each noise source for LDV was set to 50% (power train unit noise):50% (tyre noise), the L_{Aeq} reduction of applying phase 3 was 0.4 to 0.8 dB near intersections and 0.3 to 0.7 dB in the cruising sections.

ADDITIONAL POINTS FROM DISCUSSIONS IN THE UN TF-VS

- The JARI (Japanese Automobile Research Institute) model can also consider the evolution of the road surfaces due to its wear (road service) even if not included for the time being.
- The distribution between ICE & xEV/electrified Vehicles has not been considered in this study but Japan plans also to analyze this aspect which will become important in the future.

REFERENCES

- TFSL-03-06 (JAPAN): Technical review of R51-03 phase 3 in Japan
- TFVS-08-04 Rev1 (JAPAN): Results of the simulation studies on reducing automobile noise from Japan