

(FRANCE/BRUITPARIF) ROAD NOISE IN THE ENVIRONMENT – MEASUREMENTS IN REAL LIFE

**SINGLE EVENTS
TYRE ROAD NOISE
ROAD SURFACE ,ITSELF'
SOCIAL IMPACTS**

MAIN MESSAGES FROM THE PRESENTATION(S)

Context:

- The environmental noise pollution is a major concern for Paris region with a social cost of noise due to road noise estimated to 16 billion €/year(*)

Main issues in road noise:

- People mostly complain about high noise peaks
- High noise peaks represent most of the noise generated by traffic in the city as well as on touristic roads
- As long as the vehicle fleet will be consisted of noisy vehicles and/or as long as uncivil behaviors will not be considered, improvements on passenger cars by manufacturers or the increase of Electric Vehicles (EV) will lead to light benefits on the overall noise situation
- Design efforts should be focused on reducing rolling noise
- Some development actions such as road requalification or/and implementation of anti-noise road surfaces have greater and more immediate positive impacts than the effects of renewing the car fleet or tightening regulations

Recommendations:

- Fighting against incivilities through awareness-raising actions, prevention campaigns and the reinforcement of the sanction system
- Act on rolling noise through better maintenance of roads, installation of noise-reducing road surfaces and reduction traffic speeds
- Generate more relaxed driving conditions by adding low speed areas, avoiding speed bumps, optimizing traffic signals
- Focus design efforts on the noisiest vehicles by encouraging the ecological transition of heavy vehicles, through a strengthening of regulations

SUMMARY

The environmental noise pollution is a major concern for Paris region with a social cost of noise due to road noise estimated to 16 billion €/year(*). 76 % of Paris region inhabitants are exposed to noise with 9 million people exposed to noise levels exceeding World Health Organization (WHO) recommendations and 1.5 million to French regulation limits. Also, 108 000 Disability-Adjusted Life Years (DALY) (*) are estimated every year due to noise health impacts.

Based on population surveys, the authors estimate that 54 %(*) of Ile de France residents are annoyed by noise when they are at home. This annoyance increases with the urban density (62 %(*) in Paris versus 42 %(*) in rural areas) and mostly about high noise peaks. 2 main sources are identified in the study: the noise coming from neighbors and from two-wheelers [1].

Focusing the study on transport noises, the authors argue that high noise peaks represent most of the noise generated by traffic in the city as well as on touristic roads. This conclusion is based on 3 specific test campaigns in Paris streets and on a touristic road. Using the acoustic-camera sensor named Medusa, the number of peak appearances and the noise sources per day have been identified. It has been observed that for the street located in the 3rd arrondissement of Paris, the contribution of noise peaks in ambient noise reaches 58 % and composed essentially of sirens (24 %), horn (15 %), trucks (8%) and two-wheelers (8 %). In the street located in the 15th arrondissement of Paris, the results of measurement show that the noise peaks with a $L_{Amax} \geq 80$ dB(A) represent 1.5 % of the number of peaks measured per day but are responsible for 37 % in sound energy of road noise. Finally concerning the test campaign on a touristic road, the number of high noise peaks represents 13 % of events in average, responsible of 54 % of roadway noise on average.

After having identified the noise source types responsible of annoyance, the authors highlight that there are not significant improvements of the transport noise since 2013 with only a slight decrease of 0.2 dB(A) per year monitored on 3 locations in Paris region. It has been concluded that, as long as the vehicle fleet will be consisted of noisy vehicles and/or as long as uncivil behaviors will not be considered, improvements on passenger cars by manufacturers or the increase of Electric Vehicles (EV) will lead to light benefits on the overall noise situation. Indeed, the authors explained that the rolling noise of light vehicles is higher than the engine noise, even at slow speeds like 30 km/h, due to improvements on engine acoustic emissions. Therefore, the authors recommend that design efforts should be focused on reducing rolling noise and to keep in mind that the AVAS system of EV could be a risk to re-increase the engine noise in city centers.

The third part of the Bruitparif study is dedicated to the impact of infrastructure. According to the authors, some development actions such as road requalification or/and implementation of anti-noise road surfaces have greater and more immediate positive impacts than the effects of renewing the car fleet or tightening regulations. Indeed, the authors present some road improvements evaluated by Bruitparif. A reduction around 4 dB(A) have been measured thanks to a rearrangement of a national road. A resurfacing in Porte de Vincennes has been done in 2012 with an immediate reduction of 6.4 dB(A). The authors also show that the ageing of the road surface induces a 0.6 dB(A) increase per year. Other resurfacing roads on motorways are mentioned in the study showing a noise improvement of between 5.8 and 8.2 dB(A) one year after the replacement.

In conclusion, the authors make some recommendations to reduce road noise.

- First, they suggest fighting against incivilities through awareness-raising actions, prevention campaigns and the reinforcement of the sanction system.
- Secondly, they mention to act on rolling noise through better maintenance of roads, installation of noise-reducing road surfaces and reduction traffic speeds. The authors argue that rearrangement of traffic could be generate more relaxed driving conditions by adding low speed areas, avoiding speed bumps, optimizing traffic signals and so one.
- And finally, Bruitparif incites manufacturers to focus their design efforts on the noisiest vehicles by encouraging the ecological transition of heavy vehicles, through a strengthening of regulations.

ADDITIONAL POINTS FROM DISCUSSIONS IN THE TF-VS

- The intention to reduce the speed limitation inside Paris at 30km/h is confirmed by the speakers.
- Noise peak events and driving behavior are predominant in noise complaints.
- The general approach is supported by several TF experts: where is the problem, what is the cause and then find the good solution.

REFERENCES

[TFSL-03-05](#) (FRANCE/BRUITPARIF): Road noise in the environment – Measurements in real life

[1]: CREDOC (Centre de Recherche pour l'Etude et l'Observation des Conditions de vie - *Research Center for the Study and Observation of Living Conditions*) study for Bruitparif, 2016

(*) Please note that data have been updated in 2021 after the presentation done during the 03rd session of the UN TF-VS → *nb.: an updated presentation will be done in the future to the TF-VS.*

- BRUITPARIF, Le coût social du bruit en Île-de-France, 2021 (The social cost of noise in the Ile-de-France region – Bruitparif report 2021)
- CREDOC (Centre de Recherche pour l'Etude et l'Observation des Conditions de vie - *Research Center for the Study and Observation of Living Conditions*) study for Bruitparif, 2021

In 2021, the social cost of noise for Paris region was estimated to **42,6** billion €/year, of which **18,1** billion is due to road noise

158 000 Disability-Adjusted Life Years (DALY) are estimated every year due to noise health impacts.

Based on population surveys, the authors estimate that **56 %** of Ile de France residents are annoyed by noise when they are at home This annoyance increases with the urban density (**67 %** in Paris versus **48 %** in rural areas) and mostly about high noise peaks.