



BRUITPARIF

TRAFFIC NOISE BY ENVIRONMENT ACOUSTIC EXPERT

David BERNFELD & Carlos RIBEIRO

BRUITPARIF

18-19
OCTOBER
2023

International Congress & Exhibition

**AUTOMOTIVE
NVH COMFORT
LE MANS 2023**



PALAIS DES CONGRÈS - LE MANS



BRUITPARIF: WHO WE ARE AND WHAT WE DO

- An independent non-profit organisation created in 2004 by the Regional Council
- Governance with 98 members within 4 colleges:
 - State representatives
 - Local authorities
 - Transport and economic activities
 - Associations
- 1 scientific committee
- Multiple partnerships → member of the Noise Working Group of SIA
- A multidisciplinary team of about 18 engineers and technicians

1. NOISE ASSESSMENT



Data collection

An acoustic measurement network and a technical team for interventions

2. IMPROVING KNOWLEDGE

3. SUPPORTING PUBLIC POLICIES



Processing and analysis

Staff analyze the data, produce studies and noise maps

4. INFORMING THE GENERAL PUBLIC

Dissemination of information

Bruitparif raises public awareness and supports local stakeholders



THE ASSESSMENT SYSTEM

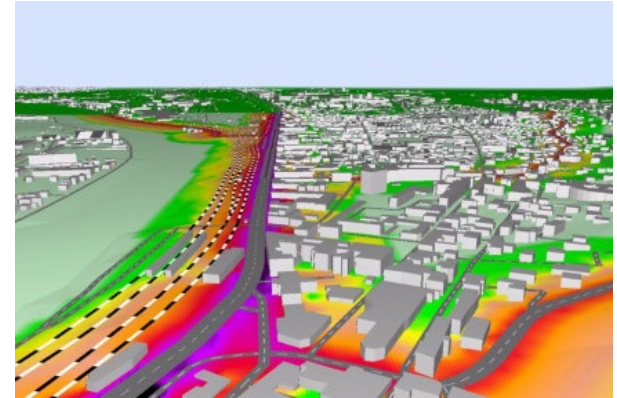
3 complementary tools:



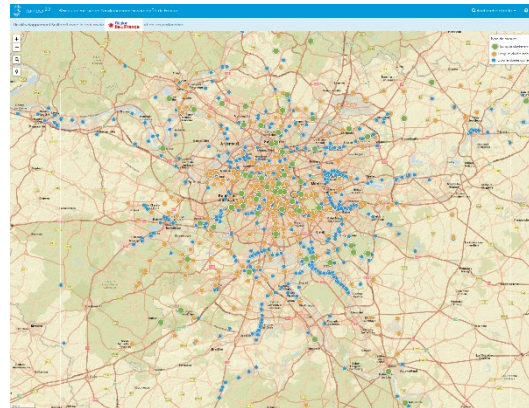
Population survey results
Complaints



Short (>800) or long term
(~180) measurements



Modelling and mapping



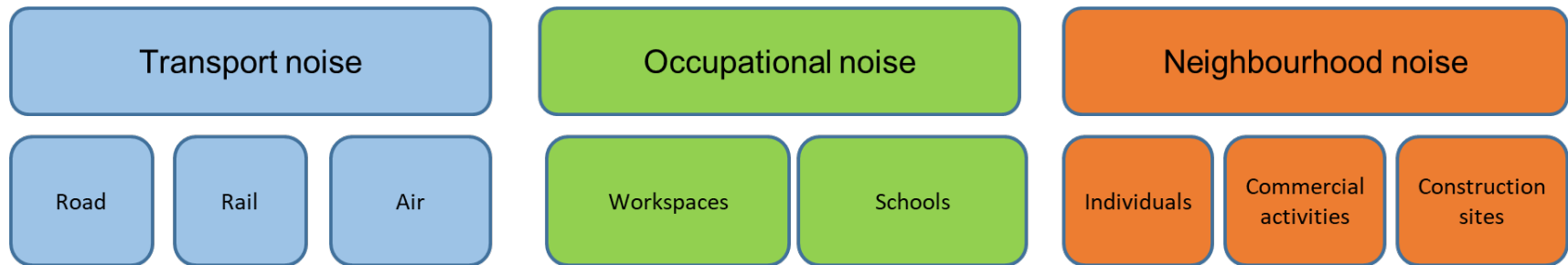


THE SOCIAL COST OF NOISE IN FRANCE

THE SOCIAL COST OF NOISE IN FRANCE

- Study carried out in 2021 by a consortium of two consultancies (I-Care &Consult and Energies Demain) on behalf of ADEME with the collaboration of experts from the Noise National Council (e.g Bruitparif)
- **Methodology:**

3 types of noise sources:



Two types of costs linked to negative externalities of noise:

→ Non-market costs (non-tangible, not directly measured in euros):

Economic valuation of the loss of well-being and healthy life due to noise impacts on health

→ Market costs (tangible expenditures made by society in monetary form):

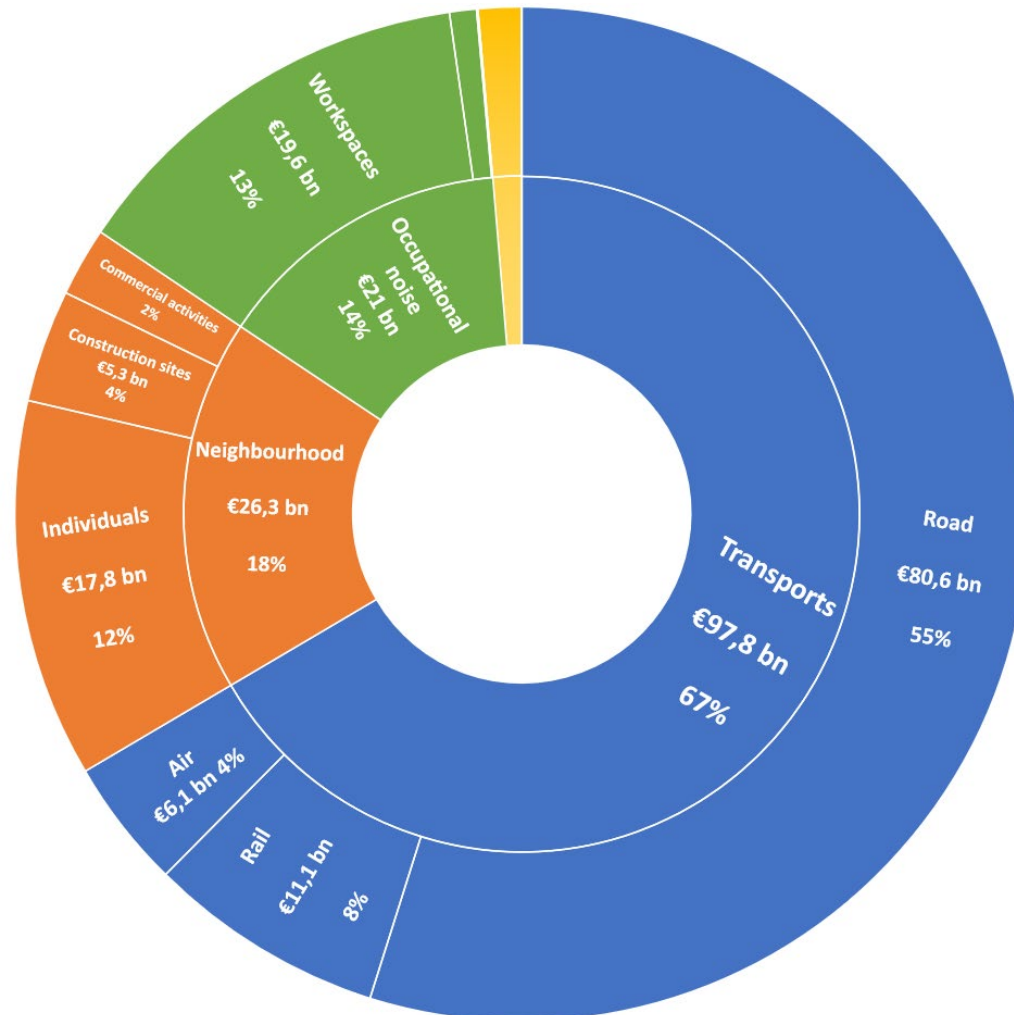
Productivity losses, property depreciation, health expenses

THE SOCIAL COST OF NOISE IN FRANCE

A total of €147.1 bn each year

2/3 of the costs are transport related (€97,8 bn)

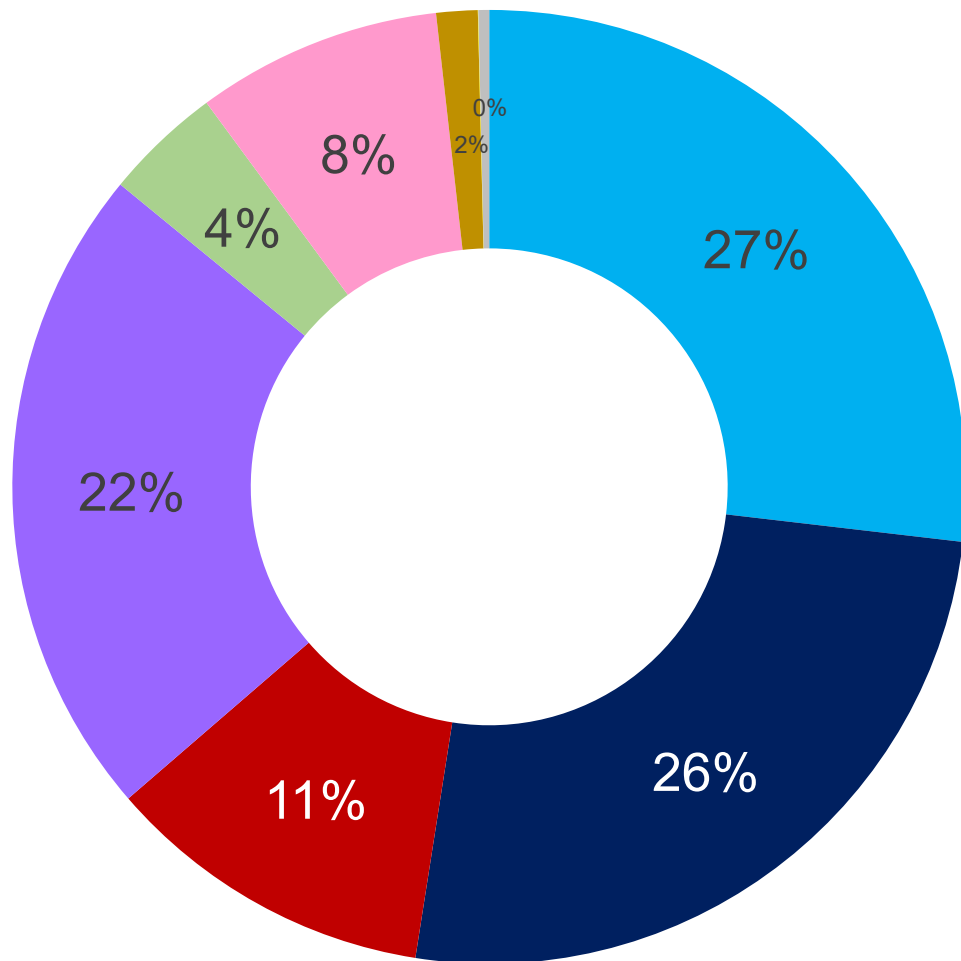
Road traffic noise represents 55% of the costs (€80,6 bn)





EFFECTS OF TRAFFIC NOISE THAT COST THE MORE

A total of €80,6 bn each year

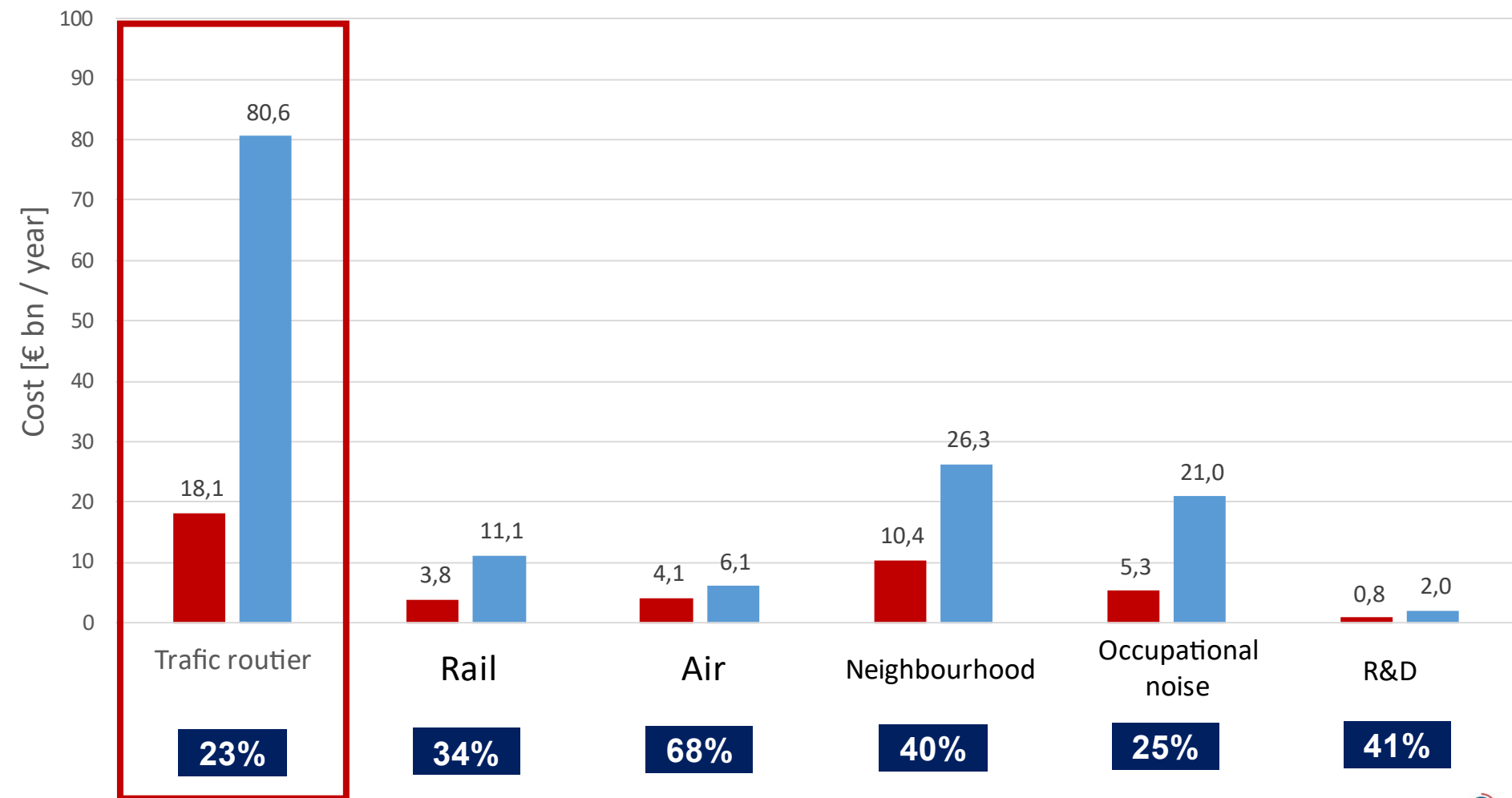


- Annoyance : €21,6 bn / year
- Sleep disturbance : €20,7 bn / year
- Cardiovascular disease : €9 bn / year
- Obesity : €18 bn / year
- Productivity loss : €3,2 bn / year
- Anxiety and depression : €6,7 bn / year
- Property depreciation : €1,1 bn / year
- Diabete : €0,3 bn / year

ILE-DE-FRANCE REGION REPRESENTS 23% OF THE NATIONAL COST OF TRAFFIC NOISE



■ Île-de-France ■ France entière



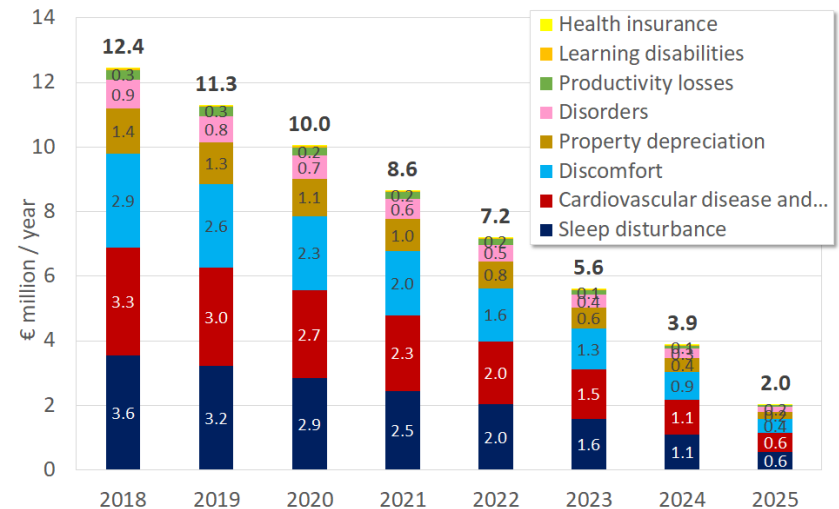
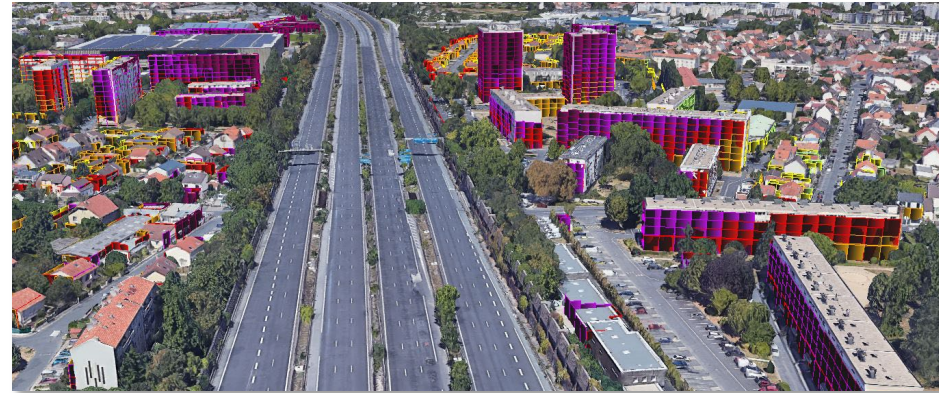
Contribution of the Île-de-France region to the national cost of noise

COST-BENEFIT ANALYSIS OF USING LOW NOISE PAVEMENTS IN URBAN AREAS

2 examples in Île-de-France Region

Example 1: A6 MOTORWAY (90 km/h)

- **Social noise costs avoided** due to the presence of the new pavement on the A6 motorway at L'Haÿ-les-Roses, according to its progressive loss of acoustic effectiveness over time.
- Estimated costs avoided
 - 2018 : €12.4 million (reducing the social cost of noise by 59%)
 - 2018-2026 : **€61 million**
- Amount invested : **€3.5 million**
- Ratio of 17 between the benefits and the amount invested



COST-BENEFIT ANALYSIS OF USING LOW NOISE PAVEMENTS IN URBAN AREAS

2 examples in Île-de-France Region

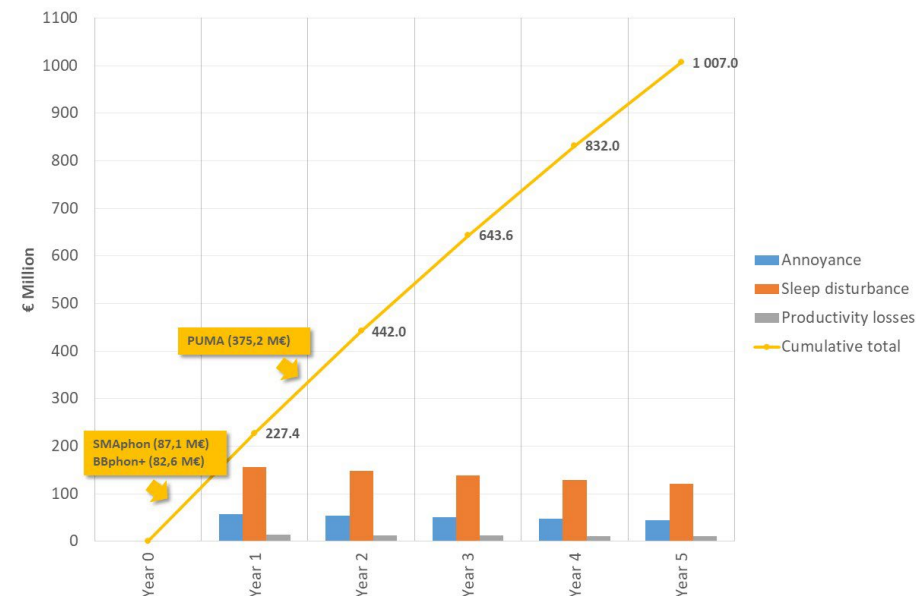
Example 2: City center of Paris (30-50 km/h)

LIFE Cool & Low Noise Asphalt

- If the entire Parisian road network is treated, after 5 years, the replacement of existing pavements with innovative solutions will generate savings of around **€1 billion**.
- The average cost of laying SMAphon and BBphon+ mixes on the entire Parisian network is estimated at around **€90 million**. The cost of PUMA asphalt is approximately €375 million.



Replacement of existing pavements with innovative solutions (1600 km)

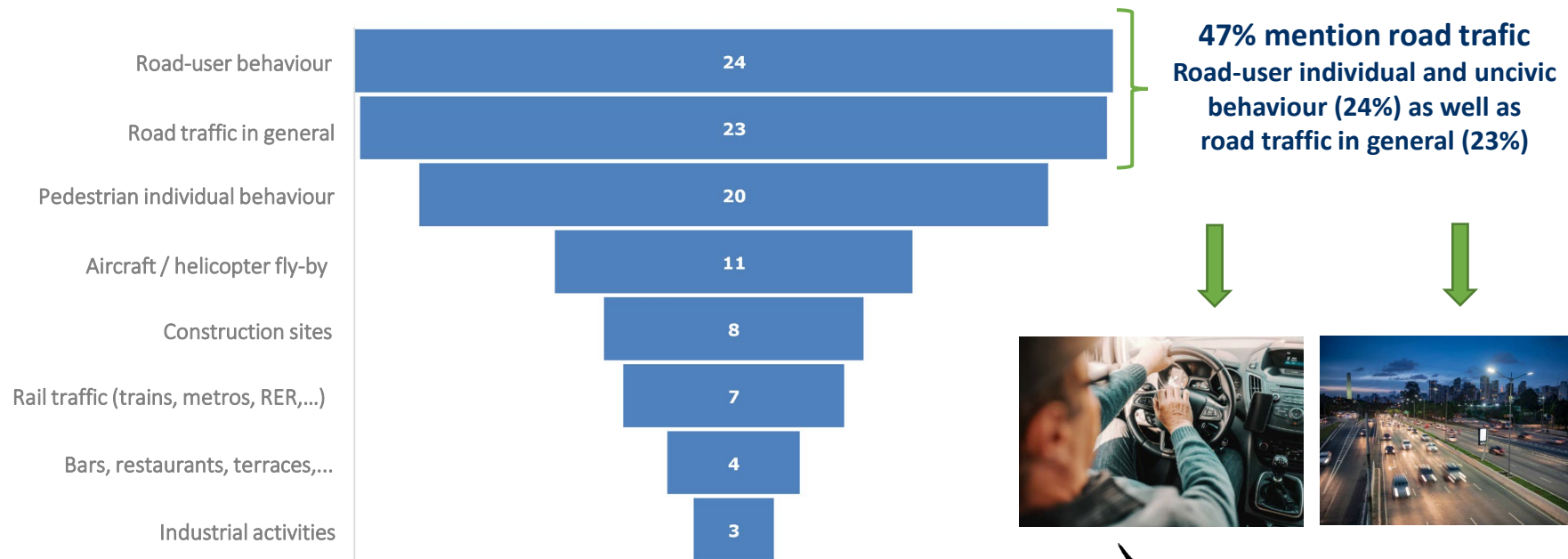




ROAD TRAFFIC NOISE DATA FOR THE ÎLE-DE-FRANCE REGION

For nearly half of Ile-de-France residents, the main source of noise annoyance in their neighborhood is road traffic.

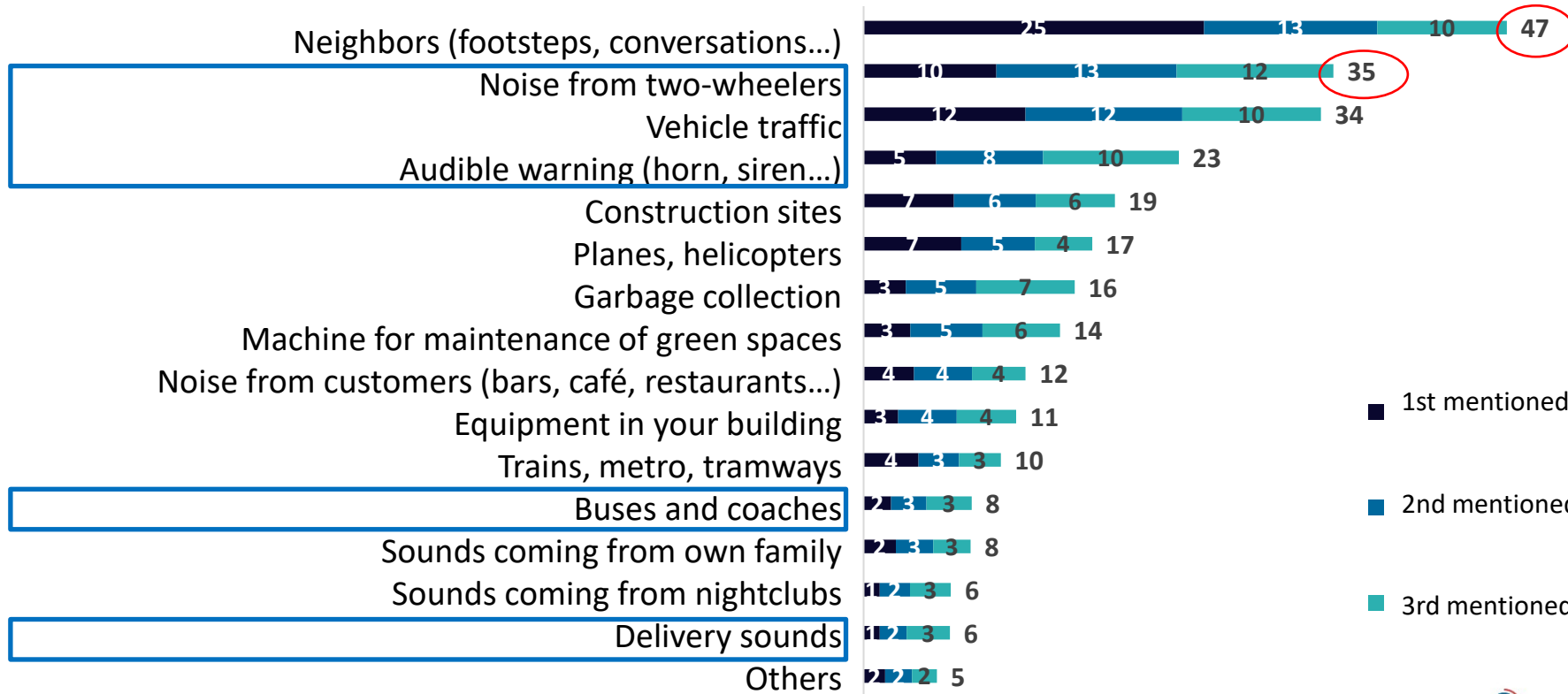
According to you, what is the main source of noise annoyance in your neighborhood?



Source : CREDOC Study for Bruitparif, 2021

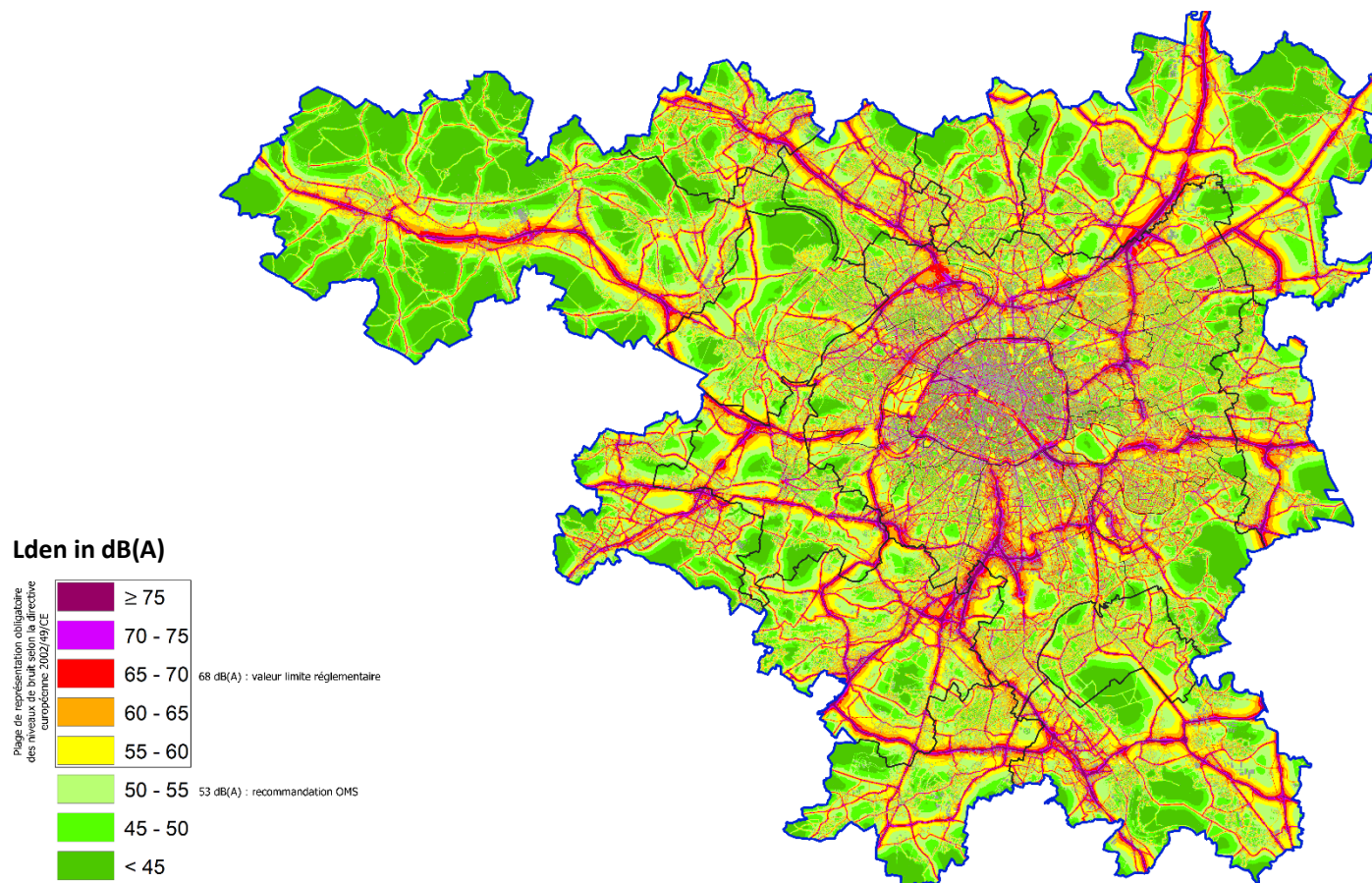
THE MAIN SOURCES OF NOISE POLLUTION AT HOME

- For 30% of Ile-de-France residents, 1st reason = Road traffic noise
- For 25% of Ile-de-France residents, 1st reason = noise from neighbors
- In total, noise from neighbors (47%) and two-wheelers (35%) are the most mentioned



Source : CREDOC Study for Bruitparif, 2021

ROAD TRAFFIC NOISE MAP IN THE DENSE POPULATED AREA OF THE ILE-DE-FRANCE REGION ACCORDING TO END (4RD STAGE / CNOSSOS METHOD)



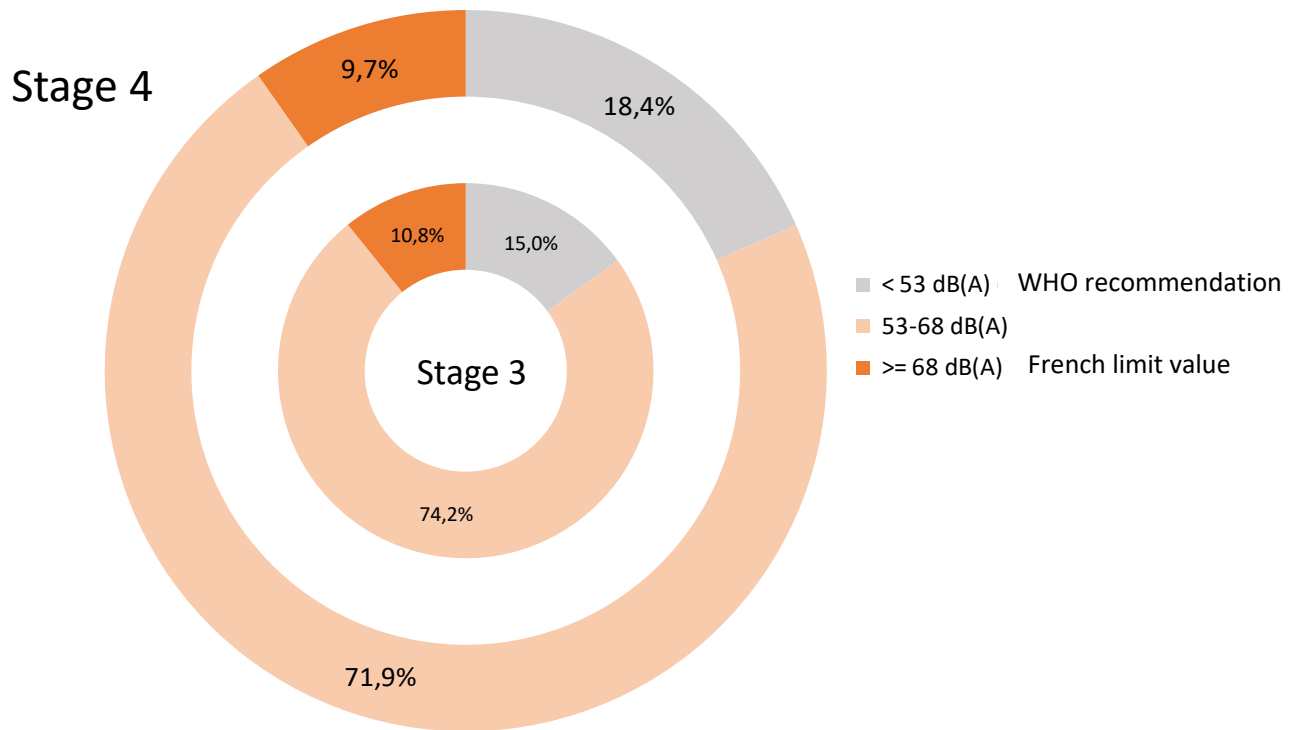
9,7 % of the population > VL Lden 68 dB(A) and 3,8 % > VL Ln 62 dB(A)

81,6 % and 75,5 % above WHO recommendations (53 dB(A) Lden and 45 dB(A) Ln)

66 000 DALY (disability-adjusted life years) every year due to road noise health impacts

6,3 healthy life-months lost during a lifetime per individual in average

A SLIGHT REDUCTION IN EXPOSURE TO ROAD NOISE BETWEEN STAGES 3 AND 4 OF THE END



Reduction in the number of highly exposed people (10,8 % → 9,7 %)

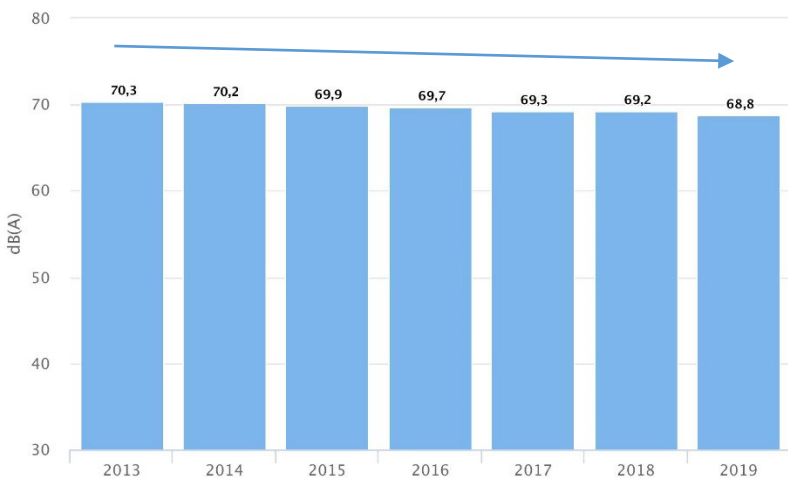
Significant increase in the number of people with low levels of exposure (15 % → 18,4 %)

These improvements may be linked both to the change in method used and to the downward trend in road traffic and changes in the composition of the rolling fleet

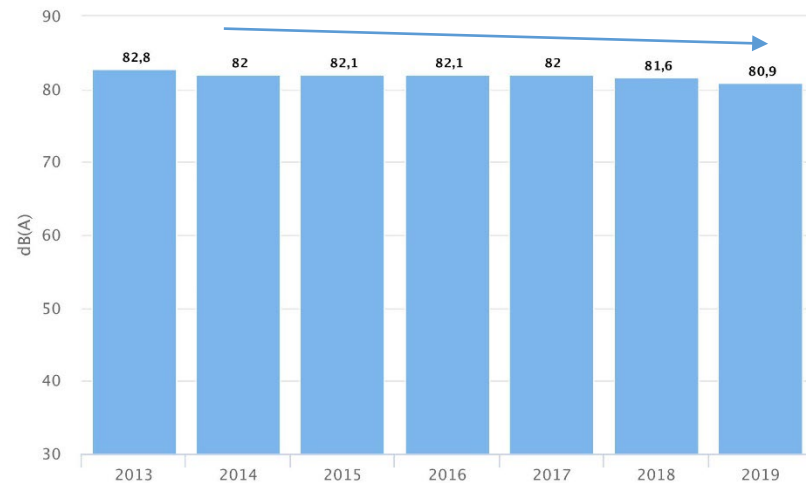
WHAT CHANGES OBSERVED FOR ROAD NOISE IN ENVIRONMENT?

A slight decrease observed through the Bruitparif measurement network around -0,2 dB(A) per year

National road in Pantin



Paris ring road (Pte d'Auteuil)



City center - Place St Michel



THE NOISE PEAKS' ISSUE

Results for rue Frémicourt, Paris 15

High noise peaks with L_{Amax} ≥ 80 dB(A) (non-respect of homologation standards)

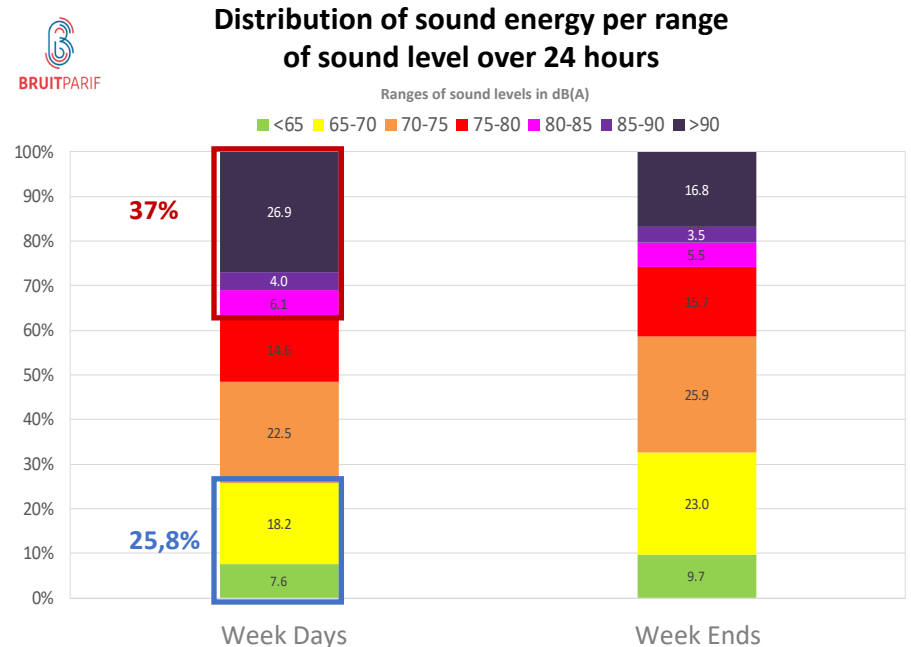
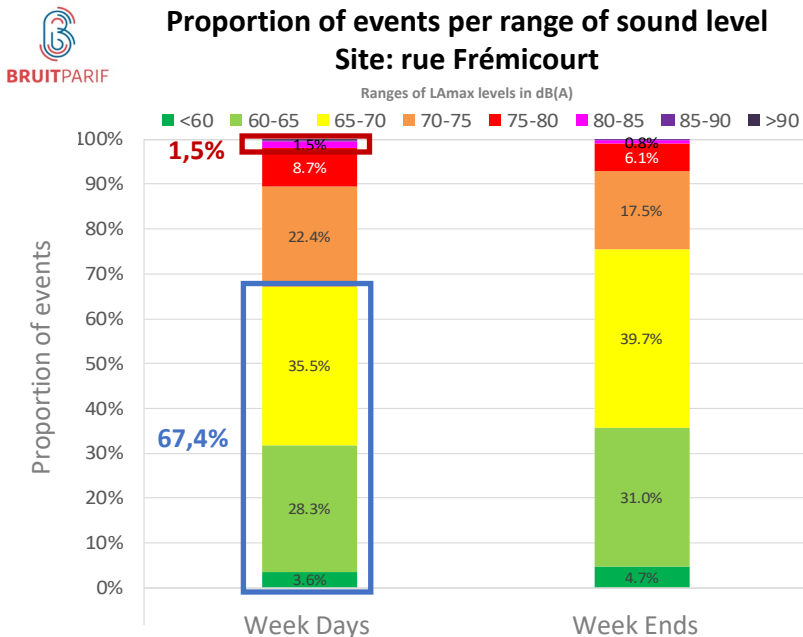
Represent less than 2% of the number of peaks due to vehicles

But are responsible for 37% (week days) of road noise

Low noise peaks with L_{Amax} < 70 dB(A) (respect of ECE R21 regulation for Passengers cars)

Represent 2/3 of the number of peaks due to vehicles

But are responsible for only 1/4 of road noise



ROAD NOISE: MAIN ISSUES

1. People mostly complain about high noise peaks.
2. High noise peaks represent most of the noise generated by traffic in the city as well as on touristic roads.
3. Due to acoustic masking, as long as very noisy vehicles remain present in the car fleet (heavy vehicles, buses, some motorcycles...) and/or as long as uncivil behaviours aren't addressed, improvements on passenger cars by the manufacturers or the increase in electric car numbers will lead to very little benefits on the overall noise situation.
4. For private vehicles, rolling noise is greater than engine noise, even at fairly slow speeds like 30 km/h. This is due to improvements on engine acoustic emissions. Therefore efforts should rather be geared towards reducing rolling noise.
5. The impact of development actions (road requalification, anti-noise road surfaces...) is much greater and more immediate than the effects of renewing the car fleet or tightening the norms.

PRIORITIES FOR ACTION TO REDUCE ROAD NOISE

1. **Fight against uncivil behaviours (uncertified exhausts, engine overdrive, abuse of horn and audible warning devices...)**

Means: raising awareness, prevention campaigns + strenghten sanction system (noise radar, increase road control)

2. **Act on rolling noise**

Means: good maintenance of roads + install anti-noise road surfaces + lower traffic speed

3. **Create conditions for relaxed driving (smooth and calm, no sudden changes or nervousness)**

Means: 30 or 20 km/h areas being carefull not to create congestion, less and more optimized signal lights (green waves, smart network...), avoid speed bumps

4. **Focus first on the noisiest vehicles**

Means: Encourage transition to natural gaz/electric/hydrogen of heavy vehicles + tighten norms for heavy vehicles (M3, N3) and light utility vehicles (M2,N2) (efficiency/cost ratio greater than for passenger cars)



BRUITPARIF

THANK YOU!

www.bruitparif.fr

Axe Pleyel 4 – PB104
32 boulevard Ornano
93 200 Saint-Denis
FRANCE

T. +33(0)1 83 65 40 40
carlos.ribeiro@bruitparif.fr

18-19
OCTOBER
2023

International Congress & Exhibition

**AUTOMOTIVE
NVH COMFORT
LE MANS 2023**



PALAIS DES CONGRÈS - LE MANS

