

Policy brief: Drifting, Tyres and Pollution in Bucharest

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Summary

Central recommendation: Bucharest City Hall should stop authorising drift competitions and “burnout/donuts” demonstrations in public spaces in densely populated areas and move them to dedicated circuits. This measure is consistent with the Low Emission Zone (LEZ) announced for the whole of Bucharest and with the EU’s air quality obligations.

The problem. In early October 2026, one day after the city’s LEZ was announced, the National Drift Championship Final was held in Constitution Square (Piața Constituției) [1]. Drifting speeds up tyre wear by orders of magnitude and turns part of the rubber into fine smoke, released at the breathing height of the audience [1, 12].

The evidence. Three lines of evidence converge:

- **A growing source, unregulated until recently.** Non-exhaust emissions (tyres, brakes, road surface) have become the main source of particles from road transport [1, 14]. Fuller notes that these particles are “far from harmless” and that, at the time of writing, there were no policies to control them [2].
- **Biologically plausible toxicity.** In a study on rats, tyre dust induced cardiac oxidative stress, associated with water-soluble zinc and copper [3, 4]. Transition metals are considered a likely target for reductions with health benefits [3].
- **A binding legal context.** Romania was found in breach by the CJEU for systematically exceeding PM₁₀ limit values in Bucharest [8], and Directive (EU) 2024/2881 lowers the limits from 2030 [7].

Limitations. There are no public air quality measurements from the event [1]. The toxicological studies cited use high doses and intratracheal instillation, not realistic inhalation. These uncertainties justify precaution and monitoring, not inaction.

1. Context: a “Bucharest oxymoron”

Bucharest is sending two contradictory public policy signals at the same time. Bucharest City Hall announced a low emission zone, phased in across the whole city, with a gradual ban on vehicles below the Euro 6 standard. The next day, the National Drift Championship Final took place in Constitution Square, in front of the Palace of the Parliament [1].

The physical mechanism. In normal driving, a car loses about 0.1 g of rubber per km across all four wheels, mostly as coarse particles that settle on the road [1]. When drifting, the rear wheels spin faster than the car moves forward and slide sideways. The tyre surface reaches several hundred degrees and the rubber breaks down thermally (pyrolysis). JRC track measurements show that ultrafine particle emissions rise sharply with tyre slip and temperature [12].

What the emissions contain. Heating releases aromatic oils containing polycyclic aromatic hydrocarbons (PAHs, some of them carcinogenic), zinc oxide, sulphur compounds, carbon black and additives such as 6PPD. 6PPD reacts with ozone to form 6PPD-quinone, a toxic substance [1].

Why the location matters. Four factors make exposure worse in Constitution Square [1]:

1. **Concentrated exposure:** thousands of spectators, including children, a few metres from the source, where the smoke is densest. There is no safe exposure threshold for ultrafine particles and PAHs.
2. **Poor dispersion:** the square is framed by tall buildings and opens onto the “urban canyon” of Unirii Boulevard.
3. **Weather:** in October, temperature inversions are frequent and keep pollutants close to the ground.
4. **Secondary contamination:** the layer of rubber left on the asphalt is washed by rain into the sewers and reaches the Dâmbovița river, carrying zinc, 6PPD-quinone and microplastics.

The constitutional dimension. The square bears the name of the fundamental law which, in Article 35, guarantees the right to a healthy and ecologically balanced environment [13].

2. Non-exhaust emissions: a source that has overtaken the tailpipe

As exhaust emissions have fallen, wear from tyres, brakes and the road surface has become the main source of particles from road transport [1, 14]. Emissions Analytics tests, linked to work by Transport & Environment and Imperial College, point to a mass of tyre particles around 2,000 times greater than that from the exhaust of a modern car with a filter [1]. The OECD projects these emissions to grow by more than 50% by 2030, driven by traffic and vehicle weight [1, 14].

Gary Fuller's perspective. In *The Invisible Killer*, Fuller (King's College London) summarises the position of the toxicologists in his group, including Frank Kelly and Ian Mudway: particles from tyre, road and brake wear “are far from harmless” [2]. The mechanism described is oxidative: chemical reactions triggered in the lungs can overwhelm the body's natural defences, leading to lung inflammation [2]. From the same passage, we take three ideas relevant to Bucharest:

1. **The regulatory gap.** Fuller observed that “there are no policies to control these wear particles” [2]. Euro 7 is only now beginning to close this gap (section 4).
2. **Traffic speed and volume as levers.** Stopping from 30 mph (about 48 km/h) emits roughly twice as many brake particles as stopping from 20 mph (about 32 km/h). Lower speed limits and less traffic could help [2].
3. **Electrification alone does not solve the problem.** The extra weight of batteries increases wear emissions compared with similar combustion-engine vehicles, and the underlying solution is to reduce dependence on road transport: cities built around walking, cycling and public transport [2].

The same diagnosis appears in the ICCT, T&E and OECD analyses cited by 2Celsius: light electric vehicles emit about 11–13% less PM_{2.5}, but heavy, long-range ones can emit 3–8% more wear particles [1, 14].

A note. What this means for drifting. If, in everyday driving, sudden acceleration, braking and cornering increase wear, drifting is the extreme form of this behaviour. An event that produces it deliberately, for hours, in the city centre contradicts the logic of all the levers above [1, 2].

3. Toxicological evidence: transition metals in tyre dust

The toxicological literature points to soluble transition metals (zinc, copper) as active components of tyre particles. In their review, Cassee, Héroux, Gerlofs-Nijland and Kelly (2013) discuss the role of fractions, chemical constituents and emission sources “beyond mass” [3]. Frank Kelly, a co-author, is one of the toxicologists cited by Fuller [2].

The experimental study (Gottipolu et al., 2008). The researchers instilled a single intratracheal dose of dust from two types of tyre into rats [4]:

Exposed group	Description
Control	Saline
Tyre dust 1	Recycled, ground styrene-butadiene rubber
Tyre dust 2	Scrap tyres
Soluble metals	Zinc, copper, or both

Effects were assessed at 24 hours and after four weeks. At very high doses (5 mg/kg), the exposures induced cardiac oxidative stress, associated with water-soluble zinc and copper [3, 4]. Separately, soluble zinc and copper caused substantial lung inflammation and reduced the activity of cardiac mitochondrial enzymes [4].

The review authors’ conclusion. Transition metals are unlikely to explain all the effects observed in epidemiological studies at current ambient levels. Even so, they remain a group of components for which reduction measures “will most likely lead to improving the health status of the population” [3]. For a broad synthesis, the authors refer to the US EPA Integrated Science Assessment for particulate matter [5].

Limits of applying this to drifting. A rigorous reading must note three differences:

1. **Dose and route of exposure.** 5 mg/kg by intratracheal instillation far exceeds human exposure through inhalation, even for spectators in the front row.
2. **The nature of the aerosol.** Ground dust differs from drift pyrolysis smoke, which is dominated by ultrafine particles and volatile and semi-volatile organic compounds (PAHs). The toxicity of pyrolysis smoke may be different, not necessarily lower.
3. **Duration.** Exposure at an event is acute and episodic, but it adds to an already high background burden in Bucharest.

These limits do not cancel out the policy conclusion: zinc is a characteristic constituent of tyres, and reducing sources of transition metals is, according to the literature, an intervention with a likely health benefit [3].

4. Legal and institutional framework

Between 2028 and 2033, the European framework moves from no regulation of tyre wear to binding limits, and Bucharest enters this transition with a history of breaching air quality standards.

Instrument	What it provides	Deadline	Relevance for Bucharest
Constitution of Romania, Art. 35 [13]	Right to a healthy and ecologically balanced environment; the state's duty to guarantee it	In force	Basis for limiting activities that degrade air quality in public spaces
CJEU, C-638/18, Commission v Romania [8]	Finds systematic exceedance of PM ₁₀ limit values in the Bucharest zone (daily 2007–2016, annual 2007–2014) and insufficient measures	Judgment of 30 April 2020	Any additional source of particles runs counter to the obligation to shorten the exceedance period
Directive (EU) 2024/2881 on ambient air quality [7]	Stricter annual limit values: PM _{2.5} 10 µg/m ³ , PM ₁₀ 20 µg/m ³	2030	Bucharest must substantially reduce its background particle levels
Regulation (EU) 2024/1257 (Euro 7) [6]	First standard to limit tyre abrasion and brake particles	C1 tyres: July 2028; C2: April 2030; C3: April 2032 [1]	Legal recognition of tyre wear as regulated pollution
UNECE WP.29, abrasion limits [11]	Global limits for car and light van tyres; estimated reduction in total abrasion of more than 10%	Mandatory from 30 June 2028; stricter limits in 2033	Removes from the market about 30% of the highest-wear tyres [1]
Regulation (EU) 2020/740, tyre labelling [9]	Allows abrasion to be added to the label once a test method exists	Revision pending	Informs public procurement by City Hall and STB (the city's public transport operator)
EU Zero Pollution Action Plan, COM(2021) 400 [10]	Target to cut microplastics released into the environment by 30%	2030	Tyre particles are a major source of microplastics

The institutional reading. Bucharest City Hall has direct powers over authorising events in public spaces and over the Integrated Air Quality Plan. The event in Constitution Square probably did not breach any explicit rule. It does, however, contradict the objectives the municipality itself committed to through the LEZ, and which the state must meet following the CJEU judgment.

5. Policy options and recommendations

We recommend a three-tier approach: stopping deliberate and avoidable sources (drifting in the city centre), reducing non-exhaust emissions from everyday traffic, and closing the data gap. This position is not aimed at drifting as a sport, but at where it takes place [1].

#	Measure	Instrument	Responsible	Timing
1	Stop authorising drift, burnout and “donuts” events in public spaces in densely populated areas; move them to dedicated circuits, with the audience kept at a distance from the track	CGMB (General Council of Bucharest) decision on authorising events in public spaces	Bucharest City Hall, CGMB	Now (2027 season)
2	Introduce an air quality criterion in the approval of all motorised events in the LEZ	LEZ regulation; Integrated Air Quality Plan	Bucharest City Hall, APM Bucharest (Environmental Protection Agency)	6–12 months
3	Mandatory monitoring of PM _{2.5} , PM ₁₀ and ultrafine particle number at any motorised event approved by exception; public data	Permit condition; RNMCA (National Air Quality Monitoring Network)	APM Bucharest, organisers	Now
4	Clean the road surface after events and protect storm drains, to reduce the transfer of zinc and 6PPD-quinone into the Dâmbovița	Street cleaning specifications	Bucharest City Hall, Apa Nova	Now
5	Reduce traffic speed and volume: 30 km/h in residential and central areas, priority for public transport, walking and cycling [2]	Sustainable Urban Mobility Plan	Bucharest City Hall, district city halls	1–3 years
6	Low-abrasion and weight criteria in tyre and vehicle procurement for STB and the municipal fleet, as soon as the EU label includes them [9, 11]	Green public procurement	STB, Bucharest City Hall	2028
7	Include non-exhaust emissions in the emissions inventory and the Integrated Air Quality Plan	Local emissions inventory	APM Bucharest, ANPM (National Environmental Protection Agency)	1–2 years
8	National support for revising Regulation 2020/740 and phasing out the highest-abrasion tyres	Position in the Council of the EU	Ministry of Environment	2026–2028

The cost argument. The experience of the tyre reefs off Fort Lauderdale shows that “invisible” pollution does not disappear; it is passed on to future generations, with high clean-up costs [1]. In this case, prevention at source is almost free: a simple change of venue.

Open research questions. There are no measurements of ultrafine particle and PAH concentrations at urban drift events. A measurement campaign at a future event, in partnership with a university, would provide the first local data.

References

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