

1.A.3.b vi-vii - Road Transport: Automobile Tyre and Brake Wear and Road Abrasion

This overview chapter provides information on emissions from automobile tyre and brake wear & road abrasion are reported reported in NFR sub-categories 1.A.3.b vi and 1.A.3.b vii. These sub-categories are important sources for a) particle emissions and b) emissions of heavy metals, POPs etc. included in these particles.

NFR-Code	Name of Category
1.A.3.b vi	Automobile Tyre and Brake Wear
1.A.3.b vii	Automobile Road Abrasion

Methodology

Activity data

Specific mileage data for all different types of road vehicles are generated within TREMOD (Knörr et al., 2020a) ¹⁾. The following table provides an overview of annual mileages.

Table 1: Mileage data for road vehicles 1990-2019, in 10^{10} kilometers

	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Passenger Cars	492.280	535.524	565.345	580.076	581.645	585.236	582.194	592.591	596.532	606.233	607.519	612.573	623.683	630.995	638.156	643.711	643.198	645.829
Light Duty Vehicles	14.259	23.294	31.541	35.938	36.679	37.830	38.290	38.755	39.226	39.703	40.185	40.673	43.112	45.330	47.457	49.698	51.918	53.659
Heavy Duty Vehicles	40.827	54.279	62.659	60.974	63.492	65.618	65.395	60.917	62.979	64.519	63.810	64.318	64.822	65.823	66.697	67.346	68.059	68.968
<i>thereof: Lorries & Trucks</i>	36.657	50.362	58.621	56.877	59.374	61.483	61.244	56.751	58.799	60.324	59.572	60.064	60.553	61.408	62.138	62.833	63.539	64.396
<i>thereof: Buses</i>	4.170	3.916	4.038	4.098	4.119	4.135	4.150	4.166	4.180	4.195	4.238	4.254	4.269	4.415	4.560	4.512	4.520	4.572
Two-wheelers	15.734	12.303	15.161	15.621	15.647	15.804	15.616	15.807	15.298	14.866	14.463	14.196	14.200	14.508	14.519	14.523	14.625	14.842
<i>thereof: Lorries & Trucks</i>	5.917	3.830	4.047	4.191	4.278	4.548	4.686	5.192	4.990	4.855	4.742	4.755	4.684	4.870	4.831	4.749	4.849	4.922
<i>thereof: Buses</i>	9.817	8.473	11.113	11.429	11.370	11.256	10.931	10.615	10.308	10.011	9.721	9.441	9.516	9.638	9.687	9.773	9.776	9.920
TOTAL MILEAGE	522.272	571.120	612.046	631.634	633.971	638.870	636.100	647.153	651.056	660.801	662.167	667.443	680.994	690.832	700.132	707.932	709.742	714.330

source: TREMOD 6.02 ²⁾

Discussion of emission trends

Please see sub-category chapters [1.A.3.b vi - Automobile Tyre and Brake Wear](#) and [1.A.3.b vii - Automobile Road Abrasion](#).

Recalculations

Recalculations were carried out due to a fundamental revision of the TREMOD software.

Table 2: Revised mileage data , in 10^6 kilometers[illegible]

absolute change													
relative change													
HDVs: Trucks													
Submission 2021													
Submission 2020													
absolute change													
relative change													
HDVs: Buses													
Submission 2021													
Submission 2020													
absolute change													
relative change													
Motorcycles & Mopeds													
Submission 2021													
Submission 2020													
absolute change													
relative change													
REVISED TOTAL MILEAGE													
Submission 2021													
Submission 2020													
absolute change													
relative change													

For changes in the **emission factors** applied, please refer to the sub-ordinate chapters on **tyre and brake wear** and **road abrasion**.



For more information on recalculated emission estimates for Base Year and 2018, please see the pollutant specific recalculation tables following chapter [8.1 - Recalculations](#).

Planned improvements

Besides the **routine revision of the TREMOD model**, no specific improvements are planned.

³⁾ ⁴⁾

¹⁾, ²⁾, ³⁾ Knörr et al. (2020a): Knörr, W., Heidt, C., Gores, S., & Bergk, F.: ifeu Institute for Energy and Environmental Research (Institut für Energie- und Umweltforschung Heidelberg gGmbH, ifeu): Fortschreibung des Daten- und Rechenmodells: Energieverbrauch und Schadstoffemissionen des motorisierten Verkehrs in Deutschland 1960-2035, sowie TREMOD, im Auftrag des Umweltbundesamtes, Heidelberg & Berlin, 2020.

⁴⁾ EMEP/EEA, 2019: EMEP/EEA air pollutant emission inventory guidebook – 2019