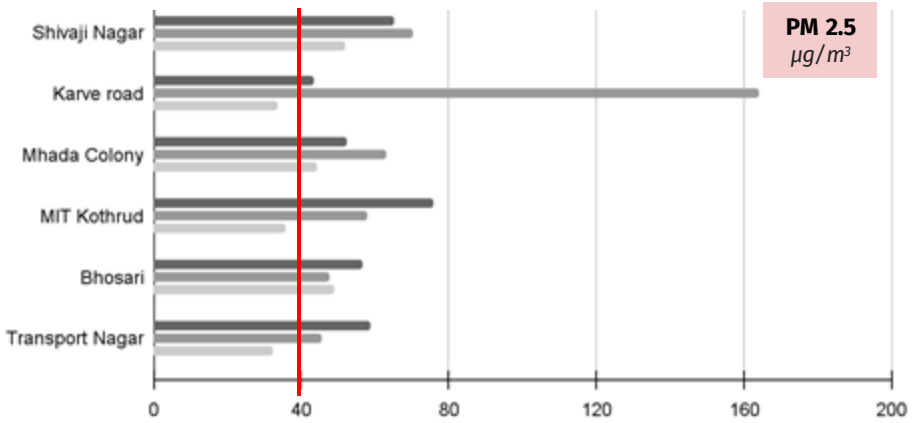
From Exhaust Fumes to Fresh Air

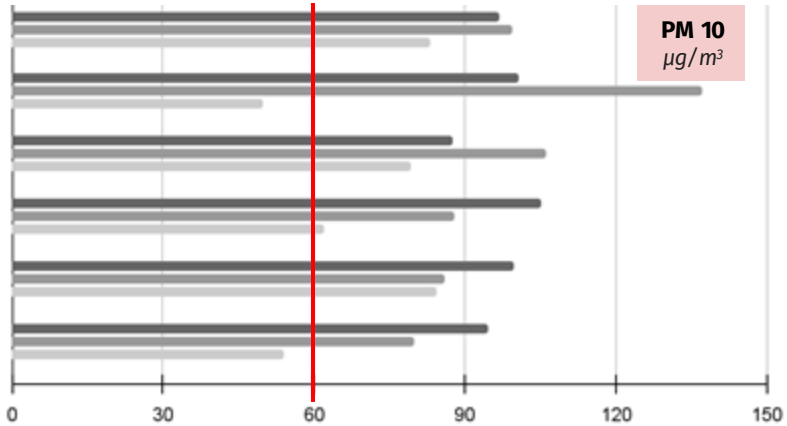
Reimagining City Mobility for Improved Public Health through Low Emission Mobility Zones

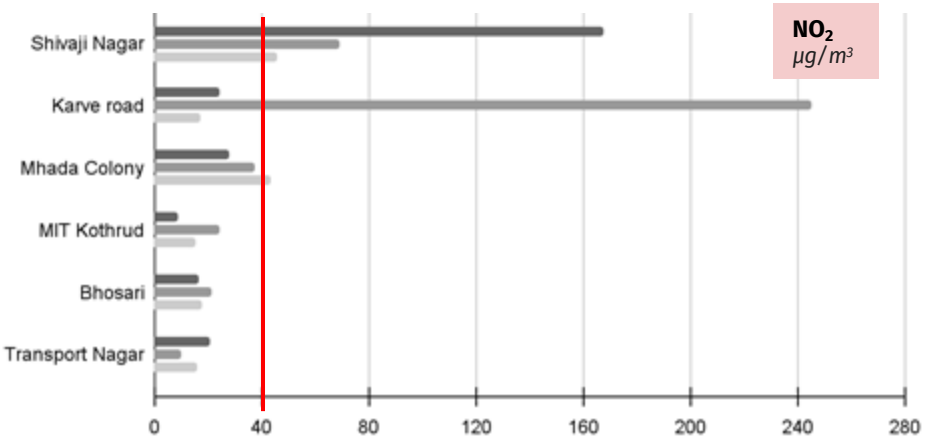
ITDP INDIA icct

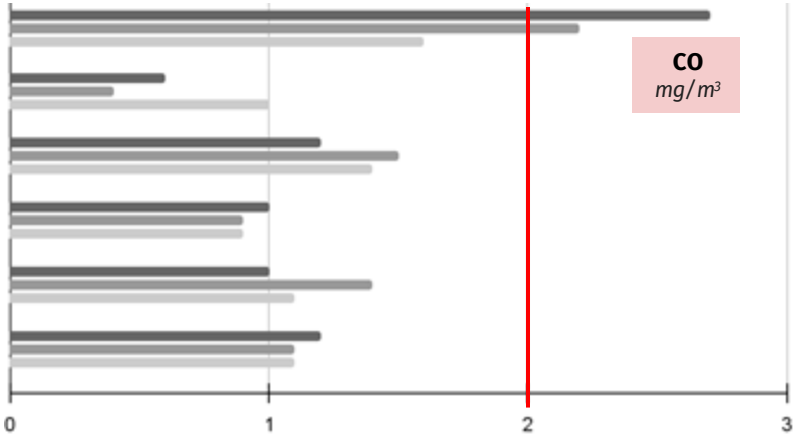
Air quality in Pune & Pimpri-Chinchwad

$PM_{2.5}$ & PM_{10} concentrations is above the prescribed limits









2023
2022
2021

Annual Average Concentration permissible limits by NAAQS

Data Source: Recordings from IITM & MPCB CAAQMS

PM 2.5 concentration is high across Pune & Pimpri-Chinchwad

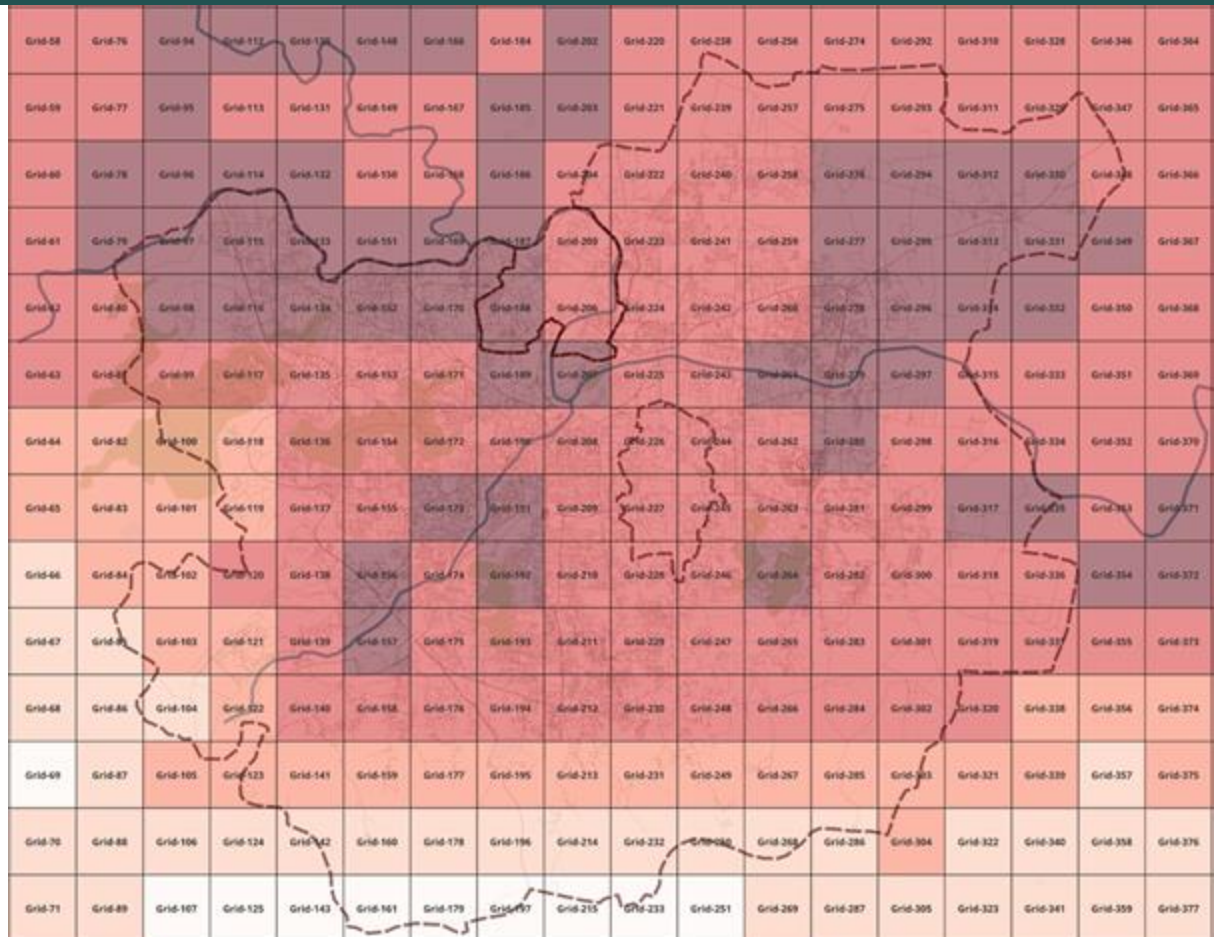
PMC region breaches the Annual Average PM 2.5 prescribed limit of 40 µg/m³ by NAAQS

PM 2.5 annual average concentration (in micrograms per cubic air volume µg/m³) of 6 years (2015 - 2021):

- 54-55
- 52-53
- 50-51
- 48-49
- 46-47

PMC Boundary

Source: Washington University open source data on global air pollution between 2015 - 2021



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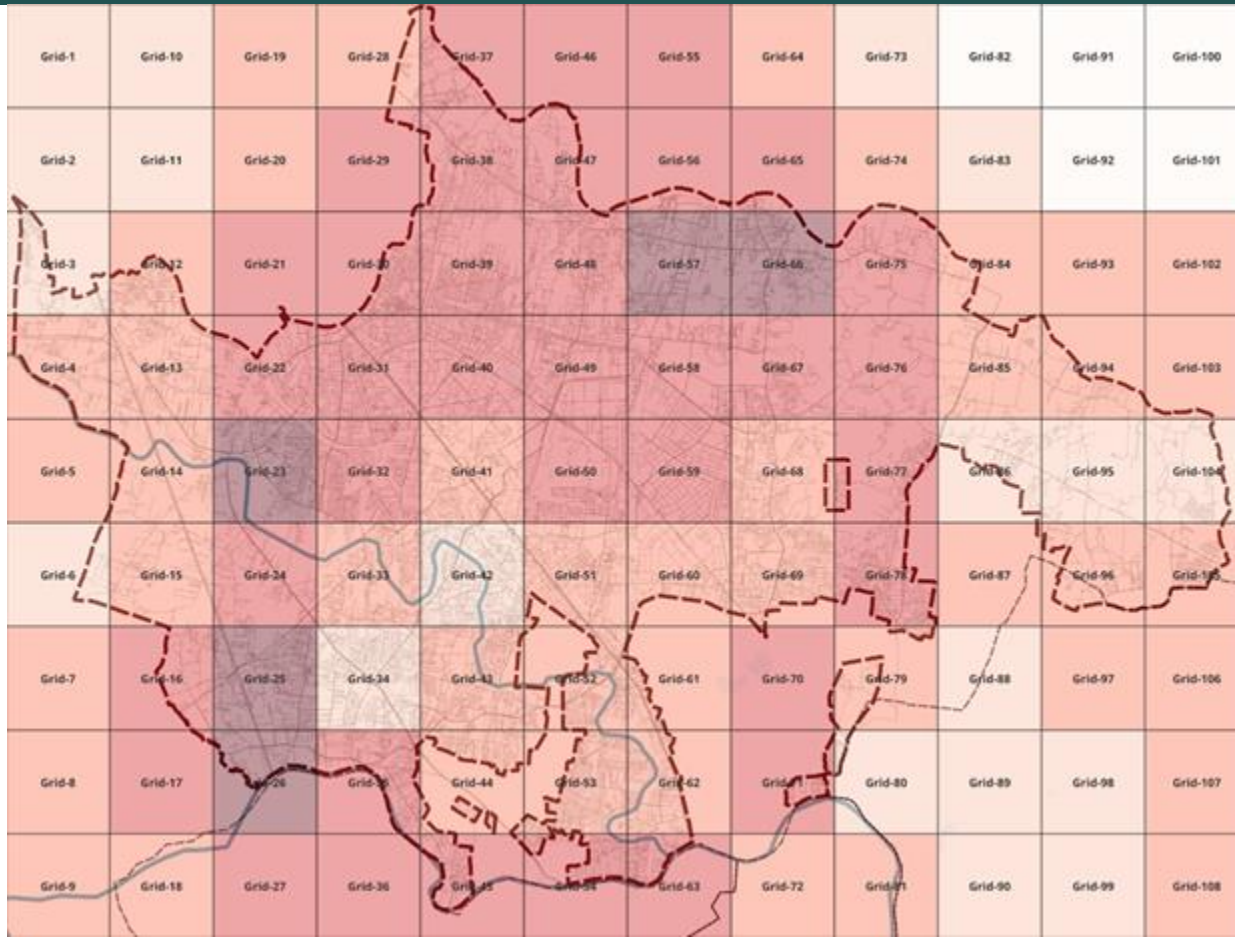
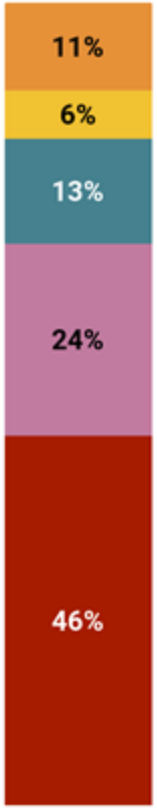


Transport is a major contributor to PM 2.5 emissions and other pollutants in Pune Metropolitan Region

As per the emission inventory report for Pune Metropolitan region by SAFAR-India, 2020, about 46% PM 2.5 emission load came from transport.

91% increase in the PM 2.5 emissions from transport between 2012 and 2019

Also transport contributed highest to oxides of nitrogen (NOx), black carbon (BC), carbon monoxide (CO), volatile organic compounds (VOC).



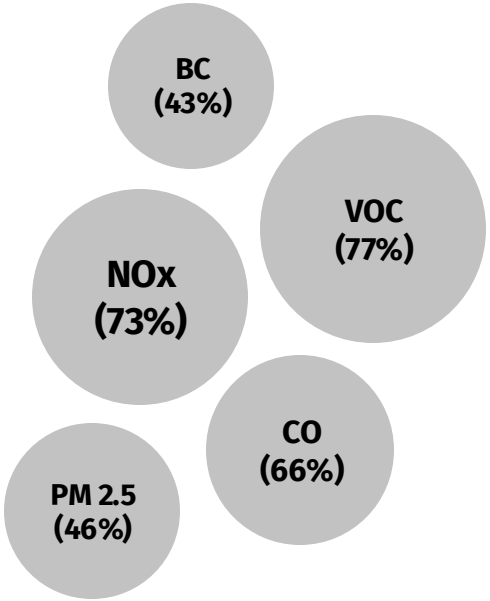
Others
(includes crematorium, open burning)

On-road dust

Residential
(burning of fuel for cooking by slum dwellers, street vendors)

Industries

Road transport



Data source: Emission Inventory Report for PMR by SAFAR-India, 2020

Graph showing sector-wise proportion of PM 2.5 emissions in Pune Metropolitan region (2019-2020)

Transport survey and emissions

4000+ & 3900+ vehicles were surveyed in PMC and PCMC

Light motor vehicles (Personal cars)

2-wheelers

3-wheelers (both passenger & goods)

Light passenger vehicles (Taxi, coach, mini/midi bus)

Heavy passenger vehicles (Standard bus)

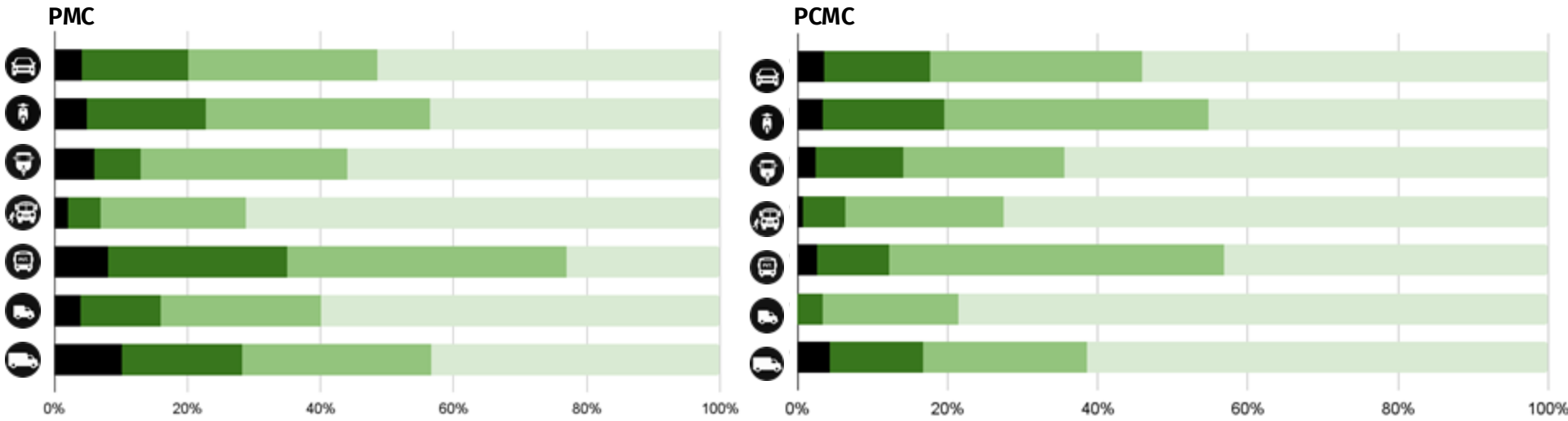
Light goods vehicles

Heavy goods vehicles

Surveys were conducted at 15 petrol pumps and 6 parking spots in PMC and PCMC

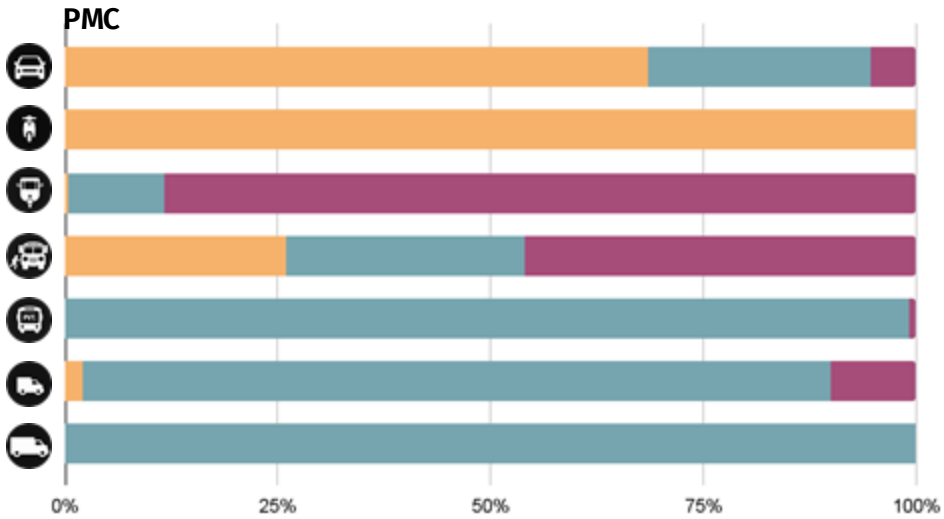
**Public buses were not surveyed, as information was directly obtained from PMPML & MSRTC*

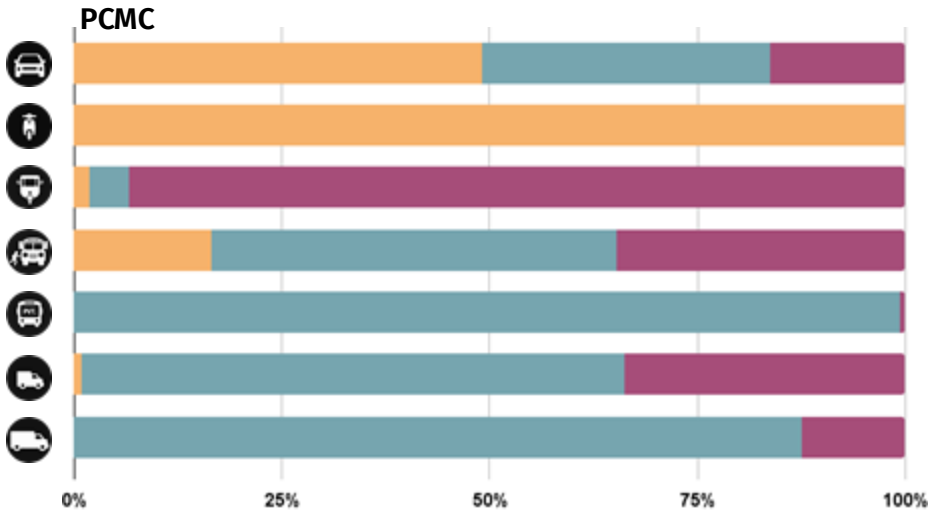
About 20% of cars, 2W & heavy good vehicles running are older than 10 years



*Data source: Primary survey conducted by ITDP & ICCT in 2023

Petrol is highly used amongst personal vehicles; diesel is highly used amongst passenger and goods vehicles



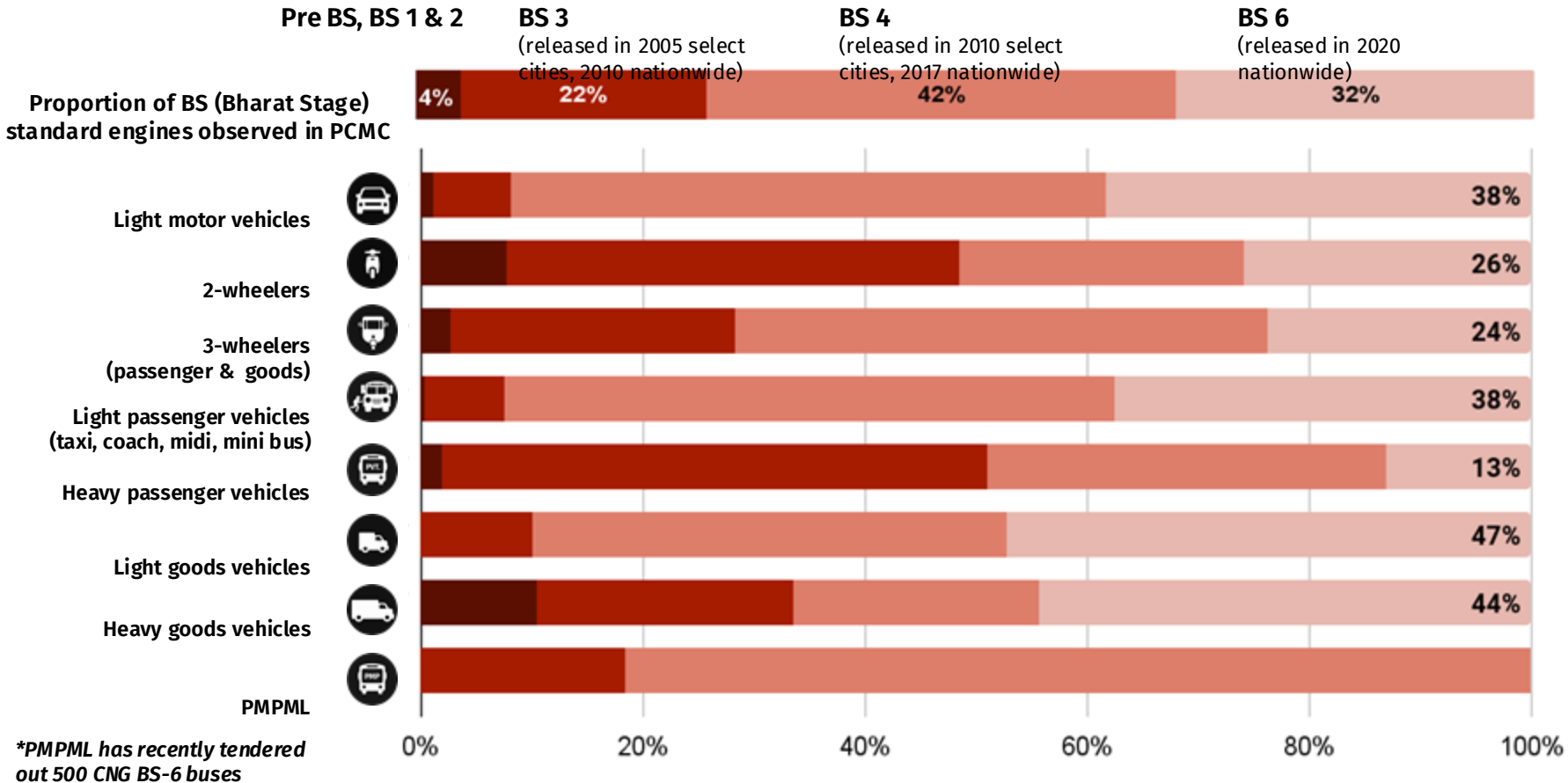


Fuel type
Petrol
Diesel
CNG

Electric vehicles were not surveyed, only ICE (Internal Combustion Engine) vehicles were surveyed

*Data source: Primary survey conducted by ITDP & ICCT in 2023

Close to 70% of ICE Vehicles running in PCMC are pre-BS-6



*PMPML has recently tendered out 500 CNG BS-6 buses

*Data source: Primary survey conducted by ITDP & ICCT in 2023

Goods vehicles, 2-W, LMVs contribute more than 85% of total pollution and greenhouse gas from tailpipe emissions in PCMC

Goods vehicles contribute more than 60% of total PM & NO_2 emissions

2-W contributes about 30% of total CO emissions

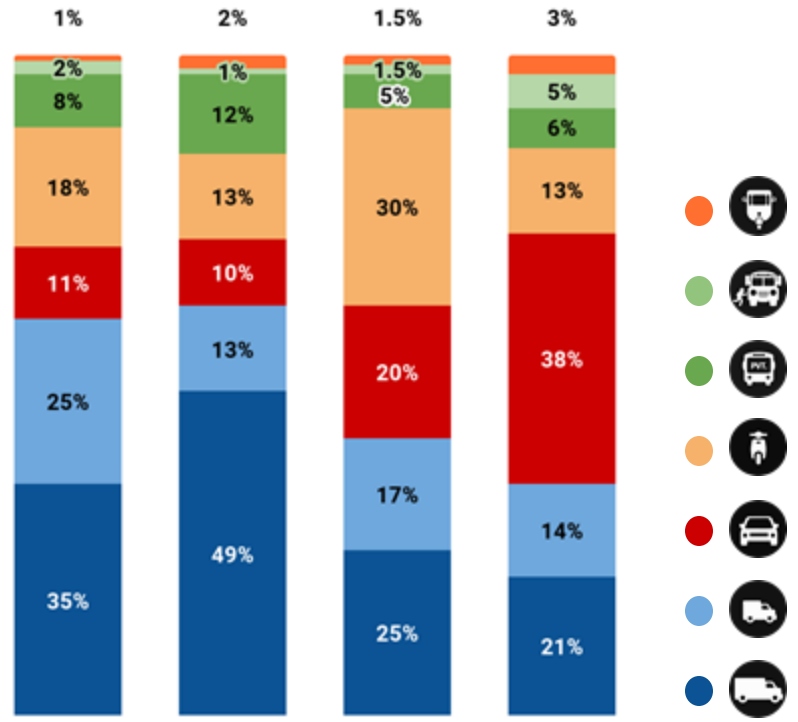
LMVs contribute close to 40% of total majorly to CO_2 emissions

Diesel emits high PM & NO_2

Petrol emits high CO & CO_2

CNG emits 10% less CO_2 than petrol vehicles and almost equal to diesel

- Source: UN Climate Technology Center & Network



PM - Particulate Matter (includes PM 2.5 & 10)
NO_2 - Nitrogen di-oxide
CO - Carbon monoxide
CO_2- Carbon di-oxide (GHG)
KT - Kilo Tonnes

***PMPML bus emissions are combined together with HPVs**

Calculated Vehicular Tailpipe yearly emission load in PCMC boundary in 2023

*Data source: Data modelling & Primary survey conducted by ITDP & ICCT in 2023

2W, Goods vehicles, LMVs together contribute more than 90% to pollution and green-house gas in PMC

Goods vehicles contribute more than 40% of total PM & NO_2 emissions

2W contributes about 40% of total PM emissions, 50% of total CO emissions & 25% of total CO_2 emissions

LMVs contribute close to 44% of total CO_2 emissions

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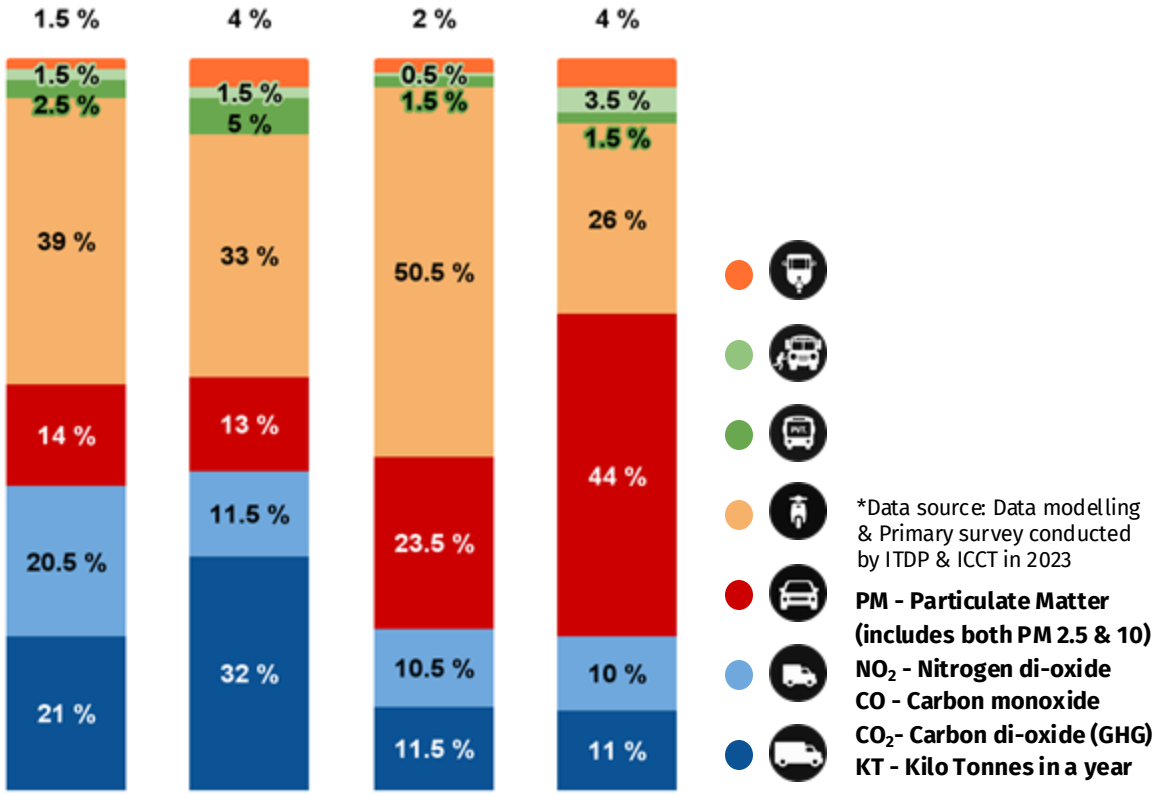

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Image source: Prasanna Desai Architects, Pune