



Anyone moving to Jakarta quickly learns a key phrase in Bahasa: “Kena macet.” It means “(I) get stuck in a traffic jam.”

Jakarta has the worst “macets”—traffic jams—in the world, at least according to an index developed by the oil company Castrol, which measured how often drivers stop and start. According to that analysis, drivers in Jakarta are stopping and starting their cars 33,240 times per year on the road. That is more than twice as often as New York, the worst US city on the list. Traffic is so bad that Indonesia’s previous President, Susilo Bambang Yudhoyono, proposed moving the capital out of Jakarta.

The traffic problems stem largely from the rapid growth of the city. Central Jakarta has a population of more than 10 million in an area of just over 25 square miles. This figure understates the challenge, however the challenge, however. Central Jakarta, also called the Special Capital Region of Jakarta, is just part of a sprawling megacity known as Jabodetabek—taken from the initial letters of the administrative units of Jakarta, Bogor, Depok, Tangerang and Bekasi—that covers some 2,300 square miles and is home to 28 million people.

Over the past century, the population of Jakarta and its surrounding area has increased nearly 200-fold. By 2010, the megacity housed 12 percent of Indonesia’s total population on less than 0.3 percent of the country’s total area.

Jakarta’s infrastructure has struggled to keep pace with the growth, particularly regarding transportation. Jakarta, for example, is the largest city in the world without a metro system. Other major cities in Southeast Asia with smaller populations than Jakarta have had metro systems for years, including Manila (1984), Singapore (1987), Kuala Lumpur (1995), and Bangkok (2004).

All of Jakarta’s cars, trucks, and buses, along with cooking fires, kerosene, and heavy industries, combined to burden the city with some of the most severe air pollution problems in the world in the 1960s and 1970s. In response, the government began phasing out the use of leaded gasoline in 2001 and eliminated the use of lead in 2006, began car emissions checks in 2007, and pushed power plants to switch from diesel to compressed natural gas in 2010. Those steps helped clear the air: Today there are more days when the skies are clear enough to see the lush mountains of the province of West Java, 30 miles south of the city center.

The blue skies do not, however, tell the whole story. While cars have gotten cleaner, they still emit fine particles, and Indonesia’s booming economy over the past decade means that millions more people can afford cars: nearly 500,000 new cars in 2014 alone, along with 1.4 million new motorcycles. All those new vehicles are effectively swamping the benefits of the pollution control laws. So while skies appear clearer, air quality, as measured by PM_{2.5} levels, has actually gone down.

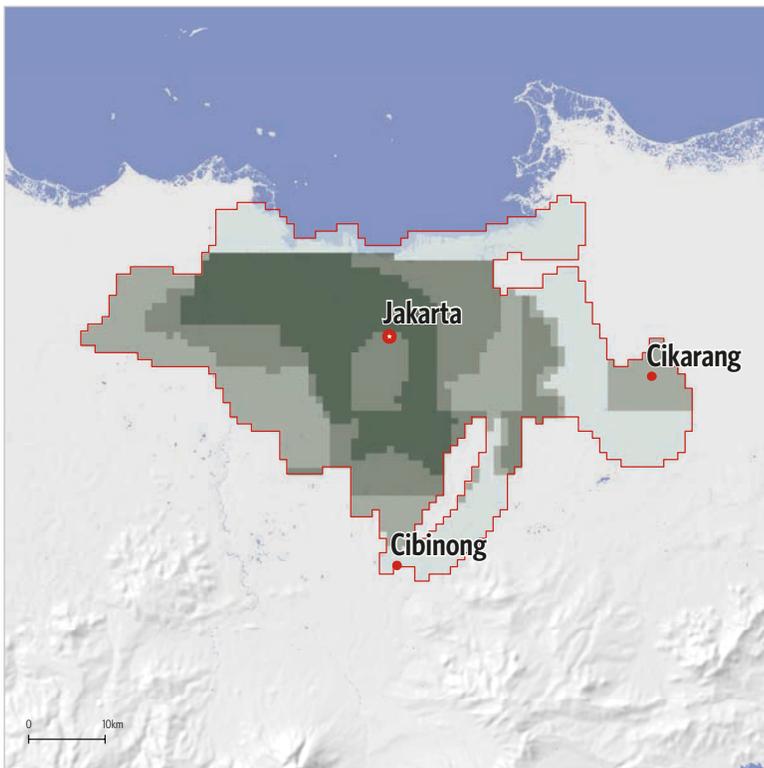
Another, far more visible problem also looms for Jakarta. Indonesia is the world’s largest producer of palm oil, and fires are frequently intentionally lit to clear land for new palm plantations. The illegal burning of forests and agricultural land, combined with a prolonged dry season and the impact of El Niño, has led to more than 100,000 fires across Indonesia since early 2015, some of which are peat fires that may burn for months or even years. The smoke has blanketed much of Southeast Asia in an acrid haze, with one estimate that daily CO₂ emissions from the fires have surpassed the average daily emissions of the entire U.S. economy.

The city of Palangkaraya, on the island Kalimantan, across the Java Sea from Jakarta, recorded PM₁₀ levels of 1,357 micrograms/m³—far above the healthy level. A spokesman for Indonesia’s Meteorology, Climatology and Geophysics Agency called the fires as “a crime against humanity.”

There are some hopeful signs that the government is tackling the fires and the broader pollution problem. The government is seeking to restore degraded peat land and to prosecute corporations that cleared land illegally. The government is also mandating that the auto sector improve emission standards on new vehicles to meet European levels starting in 2017. Monitoring has also improved: The Meteorology, Climatology and Geophysics Council now collects data from eight monitoring stations across Jakarta to measure air quality minute by minute.

Improved mass transit and increased efforts to create more green space in the city could be part of longer-term plans to improve air quality in Jakarta. As a high-density city, Jakarta has a high ROI relative to other cities. The center neighborhoods have the highest density and hence the highest ROI. For an annual additional investment of \$1.7 million in street tree planting, more than 700,000 people could get at least a $1 \mu\text{g}/\text{m}^3$.

Results from the Jakarta study



Map 18. Neighborhood-level ROI for Jakarta (PM reduction).

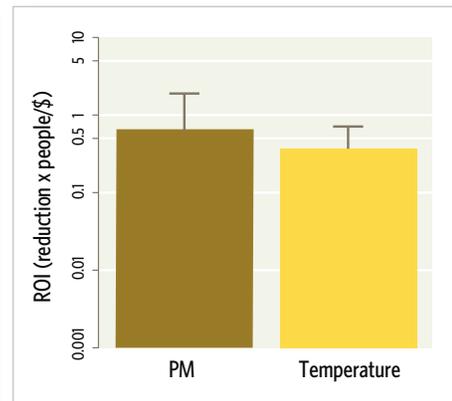


Figure 23. ROI for tree planting for Jakarta.



Investment	Annual Cost (\$)	> $1 \mu\text{g}/\text{m}^2 \text{PM}_{2.5}$	1.5 deg C
10% of sites	1,660,000	761,000	772,000
20% of sites	3,220,000	1,280,000	1,350,000
Full Investment	16,200,000	3,680,000	3,680,000

Table 11. Temperature and PM reduction benefits under three investment scenarios for Jakarta.