Annual TomTom Traffic Index

Major Traffic Trends Shaping Cities Globally in 2023

- London's city center was the slowest to drive through in 2023, with an average speed of 16 km/h.
- Dublin is the most congested city at peak times in 2023, with daily commuters having lost 158 hours (about 6 and a half days) to traffic*.
- In 2023, average speed decreased in 228 of the 387 cities analyzed, compared to 2022.
- **Get the full ranking and interactive report at tomtom.com/Traffic-Index**

Amsterdam, Netherlands, 10 January 2024 - TomTom (TOM2), the geolocation technology specialist, today releases the 13th edition of its TomTom Traffic Index, an annual report that provides data and information on traffic trends in 387 cities in 55 countries throughout 2023.

The TomTom Traffic Index is based on data from over 600 million in-car navigation systems and smartphones. For each city (both the city center and the wider metropolitan area), TomTom calculates the average travel time per kilometer from the time it took to cover the millions of kilometers driven across the entire network in the year 2023.

The trend over 2023 confirms the general decline in average speeds in most cities: of the 387 cities analyzed in the traffic index, 82 saw their average speed remain unchanged, and 77 had a higher average speed (and therefore shorter journey times) than the previous year. In the remaining 228 cities, average speeds decreased. In London and Dublin, the two cities with the lowest average speed, travel times for a 10-kilometer journey increased by +1 minute compared to 2022.

The increase in both the cost of petrol and fuel consumption, due to longer journey times, has a clear impact on the budget of motorists who have to use their car every day to get to work. In more than 60% of 351 cities where TomTom aggregates fuel prices, the average budget in fuel increased by 15% or more between 2021 and 2023. This increase in consumption naturally has a direct impact on average CO2 emissions per vehicle.

A global challenge: Traffic congestion continues in cities worldwide

"With more than half of the world's population living in urban areas, traffic congestion and its economic, ecological and health consequences have become a problem that needs to be urgently addressed", said Ralf-Peter Schäfer, Vice President of Traffic at TomTom. "Planning the future of urban areas is essential to ongoing traffic management. Large urban areas are harnessing Big Data to plan infrastructure and development that will alleviate traffic congestion. Analysis of historical traffic data can help growing cities map more efficient road systems and plan better zoning using location intelligence. Effective

* on average, for a 10-kilometer trip driven twice a day (morning and evening) at rush hour

implementation of planning measures such as the implementation of LEZs to reduce air pollution will benefit from data from connected cars."

The TomTom Traffic Index has become over time a comprehensive tool for urban planners, policymakers, and drivers, as it helps to understand and manage traffic congestion, and provides insights into the impact of congestion on a city's transportation infrastructure and economy. Real-time traffic data can feed the algorithms used by municipalities to manage traffic jams by optimizing road logistics and routes. According to a McKinsey study, this can reduce commuting times in cities by 15-20%. Data can be used to prevent traffic jams through intelligent traffic light synchronization, variable speed limits and real-time alerts showing drivers the fastest routes.

****

TomTom Traffic Index – 2023 Rankings

ALL-YEAR AVERAGES THROUGH 2023 (24/7)

Average travel times: in which city do people drive the slowest?

Travel time is the result of multiple factors, which can be grouped into static factors such as road network configuration, road sizes and capacities, or speed limits - plus dynamic factors like traffic congestion, roadworks, bad weather, etc., providing changes in traffic flow.

The TomTom Traffic Index shows travel times in different cities and ranks them the slowest speed in each city.

Ranking: the five slowest cities to drive in
Average travel time for a 10-kilometer trip in 2023, in minutes/seconds.

City center (5km radius)	2023	vs 2022
London	37 min. 20"	+1 min. 00"
Dublin	29 min. 30"	+1 min. 00"
Toronto	29 min. 00"	+0 min. 50"
Milan	28 min. 50"	+0 min. 20"
Lima	28 min. 30"	+1 min. 20"

Metro. Area (wider area)	2023	vs 2022
Manila	25 min. 30"	+0 min. 50"
Lima	24 min. 20"	+0 min. 30"
Bengaluru	23 min. 50"	-0 min. 40"
Sapporo	23 min. 30"	-0 min. 50"
Bogota	23 min. 30"	-1 min. 10"

For the second year in a row, London was the slowest city to drive in 2023. The capital of England has the lowest base speed due to the static factors, such as the absence of any fast road, and speed limits changed to 20mph on most roads over the past years - so, even in optimal traffic conditions, the average speed in London is slower than any other city in the world.

* on average, for a 10-kilometer trip driven twice a day (morning and evening) at rush hour

Average time lost due to congestion in 2023

This ranking only reflects the impact of dynamic factors that increase base speed under free-flow conditions.

Ranking: The five most congested cities
Average time lost due to traffic for a 10-kilometer trip in 2023, in minutes/seconds.

City center (5km radius)	2023	vs 2022
London	12 min.31"	+0 min. 33"
Mexico-city	12 min.05"	+1 min. 03"
Lima	12 min.04"	+1 min. 05"
Bengaluru	11 min.54"	-0 min. 49"
Dublin	11 min.44"	+0 min. 31"

Metro. Area (wider area)	2023	vs 2022
Manila	9 min. 22''	+0 min. 41"
Bogota	9 min. 17''	-0 min. 46"
Bengaluru	9 min. 08''	-0 min. 34"
Lima	8 min. 31''	+0 min. 22"
Mumbai	7 min. 54''	-0 min. 12"

London's road infrastructure is not the only reason why travel times are slower than in any other city in the world: London is also the city in which motorists have lost the most time due to traffic congestion. A 10-kilometer journey in 2023 is 12 minutes and 31 seconds longer on average than the optimum journey time (i.e. with no traffic at all).

At the level of wide metropoles, Manila is the one in which motorists see their journey times lengthened the most compared to the optimal travel time (+9 min. 22 sec in average, for a 10 km trip).

THE IMPACT OF DRIVING AT RUSH HOURS

Impact of peak-hour congestion on commuter travel times

Ranking: The five cities where rush-hour traffic is the most time-wasting
Average time lost in 2023 for a 10-kilometer daily round trip driven at morning & evening peak hours (total 20 km/day), in hours.

City center (5km radius around center)	Av. travel time per day	Av. time lost due to traffic		
		per day	All year	vs. 2022
Dublin	1 hr. 17 min.	41 min. 28"	**158 hrs.**	+12 hrs. 58 min.
Lima	1 hr. 13 min.	40 min. 59"	**157 hrs.**	+26 hrs. 13 min.
Mexico-city	1 hr. 08 min.	39 min. 50"	**152 hrs.**	+20 hrs. 12 min.
Bucharest	1 hr. 14 min.	39 min. 10"	**150 hrs.**	+6 hrs. 42 min.
London	1 hr. 28 min.	38 min. 41"	**148 hrs.**	+9 hrs. 17 min.

Metropolitan area	Av. travel time /day	Av. time lost due to traffic		
		per day	All year	vs. 2022
Bogota	1 hr. 02 min.	29 min. 10"	**117 hrs.**	-14 hrs. 49 min.
Manila	58 min.	29 min. 00"	**117 hrs.**	+12 hrs. 51 min.
Lima	1 hr. 02 min.	28 min. 10"	**116 hrs.**	+15 hrs. 37 min.
Bucharest	59 min.	27 min. 10"	**112 hrs.**	+3 hrs. 14 min.
Bengaluru	57 min.	26 min. 20"	**109 hrs.**	+0 hrs. 48 min.

* on average, for a 10-kilometer trip driven twice a day (morning and evening) at rush hour

Dublin is the city where commuters lose the most time in rush-hour traffic jams. A motorist spends an average of 1h16 in his or her car to make a typical 10-kilometre journey twice a day during the morning and evening rush hours - but more than 41 minutes of this daily round trip is due to traffic jams. Those who make this journey every day lose 158 hours in traffic jams. The situation is particularly bad in 2023, with almost 13 hours more than in 2022.

Impact of congestion on fuel price

Ranking: Cities with highest cost of driving at rush hours
Average annual fuel cost spent for a 10-kilometer daily round trip driven at morning & evening peak hours (total 20 km/day), in minutes/seconds.

City center (5km radius)				Petrol car		Diesel car	
				Annual fuel cost	***Due to traffic***	**Annual fuel cost**	***Due to traffic***
Hong-Kong				994 €	*180 €*	746 €	*120 €*
Paris				934 €	*288 €*	800 €	*229 €*
London				886 €	*226 €*	783 €	*190 €*
Zurich	804 €	*156 €*	768 €	*134 €*			
Athens	803 €	*220 €*	615 €	*153 €*			

In Hong Kong, where the petrol price is particularly high, a 10-kilometer round trip driven every day with a typical petrol-powered car cost a commuter almost €1,000 in 2023; but in Paris, traffic has had a very significant impact on a daily commuter's budget, with traffic jams "costing" them €288 in 2023, i.e. a 45% increase in the fuel budget if these trips had been made under optimal conditions (€646 = €934-€288).

Impact of congestion on CO2 emissions

Ranking: Cities with the highest CO2 emissions per car at rush hour
Average annual CO_2 emissions based on a 10-kilometer daily round trip driven at morning & evening peak hours (total 20 km/day), in kg of CO_2.

City center (5km radius)	Petrol car		Diesel car	
	Annual CO^2 emitted	***Due to traffic***	**Annual CO^2 emitted**	***Due to traffic***
London	1155 kg	*295 kg*	1086 kg	*264 kg*
Paris	1115 kg	*344 kg*	1076 kg	*308 kg*
Manila	1053 kg	*295 kg*	999 kg	*260 kg*
Bucharest	1046 kg	*308 kg*	990 kg	*264 kg*
Ankara	1036 kg	*204 kg*	1061 kg	*162 kg*

END

* on average, for a 10-kilometer trip driven twice a day (morning and evening) at rush hour

Notes to Editors

About the TomTom Traffic Index
Urban mobility is a key contributor to issues such as climate change, health and economic development and the TomTom Traffic Index has become the barometer of mobility patterns around the world. TomTom's traffic data, which is powered by 600 million connected devices, is an authoritative indicator of how people move, economic activity levels, global trade and much more. For years, TomTom's Traffic Index has been used by analysts, corporations and the media to explain a world in flux.

Which data does TomTom use for the Traffic Index?
We source our traffic flow data from over 600 million devices, such as in-dash car navigation (7 out of 10 connected in-dash navigation systems in passenger cars currently sold in Europe are powered with TomTom Traffic), smartphones, personal navigation devices and telematics systems. Each day, TomTom collects from these sources over 61 billion anonymous GPS data points around the world, covering a total distance of 3.5 billion kilometers driven. This real-time data is archived and accessible as historical data right away. 58 billion driving hours have been accumulated in TomTom's historical traffic data.

2023 TomTom Traffic Index methodology

- **Travel times and Time lost**

For each city (both the city center and the wider metropolitan area), TomTom calculates the average travel time per kilometer from the time it took to cover the millions of kilometers driven across the entire network in the year 2023. This makes it possible to estimate the average time taken to cover a typical 10-kilometer journey in 2023, so that cities can be compared with each other, and year-on-year trends can be assessed. The TomTom Traffic Index determines the optimum travel time (no traffic) and indicates how much these travel times increase on average at different times of day and on different days of the week due to traffic conditions.

- **Costs of driving**

TomTom defines the cost of driving as the amount of time, fuel and CO_2 used per km or per mile. The cost of driving is the difference between the figures in optimal traffic conditions and the actual average figures, considering the extra amount of average time spent on the road. TomTom collects real-time fuel prices for thousands of stations around the world. To assess fuel costs, TomTom data is based on country-averaged daily pricing over 2022.

- **Emissions Methodology**

Emission from traffic is directly proportional to a vehicle's energy consumption. To raise those consumption models, TomTom used the PHEM (Passenger car and Heavy-duty Emission Model) simulation tool developed by the Graz University of Technology (TU Graz). PHEM calculates the energy required to perform any observed driving maneuvers (speeds, accelerations) from TomTom data for different road profiles, and estimates the resulting emissions, based on the vehicle efficiency, vehicle and energy type (petrol, diesel or electric), as well as speeds.

The TomTom Traffic Index report is available online
At tomtom.com/Traffic-Index, anyone can discover where their city ranked in 2022, how travel times changed year on year, and how much their driving habits cost.

About TomTom:

Billions of data points. Millions of sources. Hundreds of communities.

We are the mapmaker bringing it all together to build the world's smartest map. We provide location data and technology to drivers, carmakers, businesses, and developers. Our application-ready maps, routing, real-time traffic, APIs, and SDKs enable the dreamers and doers to shape the future of mobility.

Headquartered in Amsterdam with 3,800 employees around the globe, TomTom has been helping people find their way in the world for over 30 years.

www.tomtom.com

For further information:

Media Relations

tomtom.pr@tomtom.com

Investor Relations
ir@tomtom.com

* on average, for a 10-kilometer trip driven twice a day (morning and evening) at rush hour