








CIVITAS indicators

Average load factor of motorised vehicles used for B2C deliveries
(TRA_FR_EFC)

DOMAIN

 Transport	 Environment	 Energy	 Society	 Economy
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TOPIC

Freight

IMPACT

Urban freight transport efficiency

Increasing the average load of freight vehicles

TRA_FR

Category

Key indicator	Supplementary indicator	State indicator
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CONTEXT AND RELEVANCE

Urban freight delivery must accommodate a variety of independent customers, each with unique requirements for quantity, delivery frequency, and timing. This variability often results in freight vehicles operating only partially loaded or making lengthy trips within urban areas to serve delivery locations distant from each other. The inefficiency in vehicle utilization increases the number of freight trips, adding to traffic congestion, road occupation, and emissions. Maximizing vehicle capacity utilization can help reduce the number of freight trips, mitigating their negative effects.

This indicator provides a measure of the average load factor of light and medium motorised vehicles used to deliver goods to final consumers in the experiment area. **It is a relevant indicator when the policy action is aimed at increasing the efficiency in using motorised road freight vehicles to transport urban goods. A successful action is reflected in a HIGHER value of the indicator.**

DESCRIPTION

The indicator is a measure of the **average load factor** of light motorised vehicles (< 3.5 tonnes) used to deliver goods to final consumers within the experiment area. The indicator is based on deliveries made by light vehicles, concerning essentially the distribution of products purchased on-line (e-commerce). Transport of household appliances and furniture made by larger vehicles is not considered.

The indicator is expressed in **percentage**, therefore is **dimensionless**.

METHOD OF CALCULATION AND INPUTS

The indicator should be computed exogenously, by applying the method described and then coded in the supporting tool.

Method 1

Load factors estimated on data collected from a sample of delivery tours

Significance: **0.50**



The following information is needed to compute the indicator:

- a) **The average load factors of light vehicles used to deliver goods to final consumers (households, commercial firms) in the experiment area.** Light vehicles are those with load < 3.5 tonnes.
The average load factor should be quantified by interviewing a sample of freight vehicles drivers. Drivers should be contacted at warehouses and logistics facilities before the start of their delivery tours. The interview should be very simple to minimise the risk of refusal and not responses. Basically, only two elements should be asked. The first one is just for define eligibility: whether the tour they are starting includes only final consumers or retailers as well. The eligible cases are those where the tour includes only final consumers. To eligible drivers, it should be asked the load rate of the vehicle at the beginning of the tour. The rate should be demand in terms of percentage (e.g. 90%, 75%, 35%). At least 25 responses should be collected, ideally in at least three different interview points.

The experiment would result in a modification of the average load factors.

METHOD OF CALCULATION

The indicator should be computed **exogenously** according to the following steps:

- **Organisation of the on-field interviews.**
- **Data collection through the interviews.**
- **Estimation of the average load factors (indicator).** The average factors is the average of the load percentages collected (see equation below).

EQUATIONS

The average load factor (indicator value) should be computed according to the following equation:

$$B2CLoadFact = \frac{\sum_v LoadRt_v}{V}$$

Where:

$LoadRt_v$ = Load rate (percentage of loading) for sampled vehicle v

V = total number of sampled vehicles

ALTERNATIVE INDICATORS

The indicator is a measure of the average load factor of **light** motorised vehicles used to deliver goods to **final consumers**. **TRA_FR_EFB** refers instead to the average load factor of **light** (< 3.5 tonnes) and **medium** (3.5 – 7 tonnes) trucks used to deliver goods to **shops** within the experiment area.