CIVITAS indicators

Congestion – Version 4 (TRA_FC_CG4)

DOMAIN

Transport	Environment	Energy	Society	Economy

TOPIC

Functionality of the transport system	

IMPACT

Congestion _Reducing congestion in the urban area_	TRA_FC

Category

Key indicator	Supplementary indicator	State indicator

CONTEXT AND RELEVANCE

This indicator provides a measure of the level of congestion in the experiment area. **It is a relevant indicator when the policy action is aimed at reducing the traffic jam and the consequent increase of travel time. A successful action is reflected in a <u>LOWER</u> value of the indicator after the experiment compared to the BAU case.**

DESCRIPTION

This indicator is based on the number of motorised vehicles observed on a sample of road section. Its unit of measurement is **vehicle per lane per hour**.

METHOD OF CALCULATION AND INPUTS

The indicator should be calculated **exogenously** on the required inputs and then coded in the supporting tool**.**

There are two alternative methods of calculation available for this indicator. The two methods distinguish for size of the traffic counts campaign used to collect the information.

METHOD 1	METHOD 2
Number of vehicles observed only in peak time for a sample day	**Number of vehicles observed in the whole day in different days**
It is based on a limited set of data	It is based on a wider set of data
Complexity ▮▮▮▯	Complexity ▮▮▮▮
Significance ▮▮▯▯	Significance ▮▮▮▮

Method 1	
Calculation based on traffic counts in peak time for one day	Significance: **0.50**

INPUTS

The input needed to compute this indicator is:

   a) A set of traffic counts on a sample of road sections in the experiment area.

The experiment would be reflected in the modification of the observed number of motorised vehicles **in same road sections**. The modification would be the result of one or more interventions directly or indirectly affecting the number of motorised vehicles used in the experiment area.

METHOD OF CALCULATION

The indicator should be computed according to the following steps:

- **Definition of the set of road sections** where counting vehicles. The selection of sections should be made according to the following rules:
    - Sections should include the major roads in the experiment area.
    - If the experiment includes interventions on some specific roads, counts should be made in at least some of these roads as well as in at least some roads that could be used as alternative by motorists.
    - If part of the experiment consists of including some roads in a pedestrian area where motorised vehicles are forbidden, these roads should NOT be included in the sample.
    - If part of the experiment consists of restricting access to some roads (e.g. low emissions zone) these roads can be included in the sample, but a sufficient number of roads outside the restricted area should also be included.

  If in the experiment area there is already a traffic counting system in place, the data from the system can be used, but the requirements above should be respected anyway.

- **Measurement of the number of motorised vehicles on each section**. The measurement should be made in at least 2 peak time hours of a working day. Ideally, the measurement should provide classified counts, distinguishing at least light vehicles and heavy vehicles. Non-classified counts are, however, sufficient.

- **Quantification of the indicator**. The indicator is the average number of measured vehicles per lane and per hour computed using all sections.

EQUATIONS

The equation that should be applied to quantify the indicator is:

$$CongInd = \frac{\sum_s \sum_h \frac{Veh_s^h}{lanes_s}}{S * H}$$

Where:

Veh_s^h = Number of motorised vehicles counted in road section s in hour h

$lanes_s$ = Number of lanes of road section s

S = Total number of road sections

H = Number of hours monitored

Method 2

Calculation based on traffic counts in the whole day for more days	Significance: **1.00**	

INPUTS

See Method 1.

METHOD OF CALCULATION

See Method 1.

The difference with respect to Method 1 is in the second step, as there are additional requirements regarding the period of the counts. The measurement should be made continuously from 6 to 22 in at least 3 working days.

EQUATIONS

The equation that should be applied to quantify the indicator is:

$$CongInd = \frac{\sum_s \sum_d \sum_h \frac{^dVeh_s^h}{lanes_s}}{S * D * H}$$

Where:

$^dVeh_s^h$ = Number of motorised vehicles counted in road section s in hour h of day d

$lanes_s$ = Number of lanes of road section s

S = Total number of road sections

H = Number of hours monitored

D = Number of days monitored

ALTERNATIVE INDICATORS

<mark>To be drafted.</mark> In the discussion of pros and cons compared to other congestion indicators, it can be mentioned that:

In many cases, devices used to count vehicles can also measure speeds; therefore TRA_FC_CG5 is probably also computable

in cities where traffic counts are already made on a regular basis, the effort for computing this indicator is very limited as the most complex part is already in place.

If classified counts are made, distinguishing light and heavy vehicles, collected data allows to compute the freight indicator TRA_FR_MA1.