CIVITAS
Sustainable and smart mobility for all
2030

# CIVITAS indicators

## Public transport supply index – Version 2 (TRA_PT_PTA2)

### DOMAIN

| | | | | |
|---|---|---|---|---|
| **Transport** | Environment | Energy | Society | Economy |

| | | |
|---|---|---|
| **TOPIC** | **Public transport** | |
| **IMPACT** | **Public transport availability**<br>*Improving the availability of public transport* | **TRA_PT** |

### Category

| | | |
|---|---|---|
| **Key indicator** | Supplementary indicator | State indicator |

## CONTEXT AND RELEVANCE

Public transport is generally more environmental-friendly than motorised private transport because it facilitates the efficient use of resources by transporting a larger number of passengers in a single vehicle, thereby reducing overall energy consumption and emissions per person compared to individual private vehicles. It is therefore desirable that public transport is widely used. A requirement for the use of public transport is its availability: if supply is limited (stops/stations are difficult to reach, there are few services, etc.) public transport cannot be an attractive or even feasible option for personal urban trips.

This indicator provides a measure of the availability of public transport. **It is a relevant indicator when the policy action is aimed at improving the availability of public transport. A successful action is reflected in a HIGHER value of the indicator.**

## DESCRIPTION

This indicator is a **dimensionless index** where four elements are combined:

- **The length of public transport routes** in the experiment area
- **The share of inhabitants living within 300 m from a stop and/or 500 m from a station** in the experiment area**.**
- **The average number of daily departures of public transport routes** in the experiment area
- **The number of inhabitants** in the experiment area

The length of routes, the share of inhabitants living close to stops/stations and the average frequency of departures are proxy measures of public transport supply. The number of inhabitants is used to consider that the length of routes is correlated with the size of an area.

## METHOD OF CALCULATION AND INPUTS

The indicator is calculated by means of a mathematical equation, **within the supporting tool, building on a set of required inputs**.

| Method | |
|---|---|
| **Calculation of the index based on proxy measures of Public Transport supply** | Significance: **1.00**  |
| METHOD OF CALCULATION<br>The indicator is computed according to the following steps:<br>• **Quantification of total length of public transport routes** involved in the experiment.<br>• **Quantification of the share of inhabitants living within 300 m from a stop and/or 500 m from a station**.<br>• **Quantification of the average number of departures of public transport routes** involved in the experiment.<br>• **Estimation of the index (within the supporting tool)**. | |
| INPUTS | |

**The following information should be coded in the supporting tool** to compute the indicator:

a) $PTLnght$. **Total length of public transport routes in the experiment area.** (If the experiment area is the whole city, it is the length of all public transport routes). Length of each route should be obtained from the transport operator or measured on map and then summed over all relevant routes.

b) $AccInh$. **Share of inhabitants living within 300 m from a stop and/or 500 m from a station in the experiment area.** (If the experiment area is the whole city, it is the share of the total city population). It should be measured using GIS layers of population and stops location. Example of this type of measurement can be found in this document: https://ec.europa.eu/regional_policy/en/information/publications/working-papers/2015/measuring-access-to-public-transport-in-european-cities.

c) $AvDayDepr$. **Average number of departures between 6 and 22 for public transport routes in the experiment area.** It should be computed building on routes timetables considering the number of departures in both directions:

$$AvDayDepr = \frac{\sum_r {}^{r}DayDepr}{R}$$

Where:

${}^{r}DayDepr$ = number of departures (in both directions) between 6 and 22 for route *r*.

$R$ = number of routes involved in the experiment.

d) $Inhab$. **Number of inhabitants in the experiment area.** (If the experiment area is the whole city, it is the total number of inhabitants in the city). It should be taken from the demographic statistics of the municipality.

The experiment would be reflected in the indicator by changing any input that is affected by the measure(s) implemented. For instance, if the frequency of some services is increased, the average number of services AvDayServ would be increased.

## EQUATIONS

The equation **used within the supporting tool** to manage the calculation, building on the provision of the inputs, is the following:

Estimation of the availability index (indicator value):

$$\boldsymbol{PTSuppIndex = \frac{PTLnght^{\beta 1}}{Inhab} * AccInh^{\beta 2} * AvDayServ^{\beta 3}}$$

The elements $\beta 1, \beta 2, \beta 3$ are weights pre-defined in the tool

## ALTERNATIVE INDICATORS

An alternative indicator for measuring the same impact is **TRA_PT_PTA1**. This alternative indicator uses a less elaborated measures of transport supply. Therefore, it is less complex to implement but less significant.