CIVITAS
Sustainable and smart mobility for all
2030

CIVITAS indicators

Car dependency index – Version 2 (TRA_CC_CD2)

DOMAIN

Transport	Environment	Energy	Society	Economy

TOPIC	**Car Centrality**	
IMPACT	**Car dependency** *Reducing the dependency on private car*	**TRA_CC**

Category

Key indicator	Supplementary indicator	State indicator

CONTEXT AND RELEVANCE

To be drafted

This indicator provides a measure of the dependency of personal mobility on private cars. **It is a relevant indicator when the policy action is aimed at increasing the availability and/or the effectiveness of mobility solutions alternative to private cars. A successful action is reflected in a LOWER value of the indicator.**

DESCRIPTION

This indicator is a **dimensionless** index obtained as combination of other indicators, namely:

- **Public Transport availability**
- **Public Transport connectivity**
- **Public Transport reliability**
- **Public Transport affordability**
- **Public Transport speed**
- **Shared mobility availability**

The rationale is that improving one or more of these dimensions of the urban transport system means providing citizens with better alternatives to private car.

This indicator measures the **modification of car dependency provided by the experiment** rather than the dependency in absolute term. It is therefore **a meaningful indicator when comparing the after-experiment case to the BAU case** (or to the before-experiment case) while **it is NOT meaningful indicator to measure the dependency level in one specific condition or when comparing different experiment sites**.

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 other indicators	Significance: **0.50** 
METHOD OF CALCULATION	

The indicator is computed **within the supporting tool** according to the following steps:

- **Calculation of other indicators for the before-experiment case**. For the method of calculation of the required indicators (see inputs below), make reference to the dedicated indicator templates.

- **Calculation of other indicators for the BAU case**. For the method of calculation of the required indicators (see inputs below), make reference to the dedicated indicator templates.

- **Calculation of other indicators for the before-experiment case**. For the method of calculation of the required indicators (see inputs below), make reference to the dedicated indicator templates.

- **Calculation of the change of indicators** in the after-experiment case relative to the before-experiment case and relative to the BAU case.

- **Estimation of the index**.

INPUTS

The following information should exist in the supporting tool to compute the indicator. Note that when it is chosen to compute the indicators mentioned below, their values are found directly within the supporting tool. Therefore, **there is no need to code them manually**. If some of the indicators mentioned below are not available, this indicator cannot be computed.

a) **TRA_PT_PTAn.** Value of the **Indicator of public transport availability** in the before-experiment case, in the BAU case and in the after-experiment case**.** Within the TRA_PT domain there are two alternatives for this indicator.
b) **TRA_PT_PTCn**. Value of the **Indicator of public transport connectivity** in the before-experiment case, in the BAU case and in the after-experiment case**.** Within the TRA_PT domain there are seven alternatives for this indicator.
c) **TRA_PT_RL**. Value of the **Indicator of public transport reliability** in the before-experiment case, in the BAU case and in the after-experiment case**.** Within the TRA_PT domain there is one alternative for this indicator.
d) **SOC_EQ_AFn**. Value of the **Indicator of public transport affordability** in the before-experiment case, in the BAU case and in the after-experiment case**.** Within the SOC_EQ domain there are two alternatives for this indicator.
e) **TRA_PT_PTS.** Value of the **Indicator of public transport speed** in the before-experiment case, in the BAU case and in the after-experiment case**.** Within the TRA_PT domain there is one alternative for this indicator.
f) **TRA_SH_AVn.** Value of the **Indicator of shared mobility availability** in the before-experiment case, in the BAU case and in the after-experiment case**.** Within the TRA_SH domain there are three alternatives for this indicator

The experiment would be reflected in the modification of one or more of these indicators as result of one or more interventions affecting the features of the urban transport system measured by each indicator.

EQUATIONS

The equations used **within the supporting tool** to manage the calculation, building on the needed inputs, are the following:

Calculation of the relative change of the indicator in the after-experiment case relative to the before-experiment case, for those indicators *I* reflecting a successful action by means of a LOWER value (**TRA_PT_RL** and **SOC_EQ_AFn).**

$$_{\square}^{I}AEBEChng = \frac{I[BE]}{I[AE]}$$

Where:

$I[BE]$ = Value of the indicator *I* in the before-experiment case

$I[AE]$ = Value of the indicator *I* in the after-experiment case

For instance:

$$_{\square}^{<TRA\_PT\_RL>}AEBEChng = \frac{TRA\_PT\_RL[BE]}{TRA\_PT\_RL[AE]}$$

Calculation of the relative change of the indicator in the after-experiment case relative to the before-experiment case, for those indicators *I* reflecting a successful action by means of a HIGHER value (**TRA_PT_PTAn, TRA_PT_PTCn, TRA_PT_PTS, TRA_SH_AVn**):

$$_{\square}^{I}AEBEChng = \frac{I[AE]}{I[BE]}$$

Calculation of the relative change of the indicator in the after-experiment case relative to the BAU case, for those indicators *I* reflecting a successful action by means of a LOWER value:

$$_{\square}^{I}AEBAUChng = \frac{I[BAU]}{I[AE]}$$

Calculation of the relative change of the indicator in the after-experiment case relative to the BAU case, for those indicators *I* reflecting a successful action by means of a HIGHER value:

$$_{\square}^{I}AEBAUChng = \frac{I[AE]}{I[BAU]}$$

Estimation of the car dependency index (indicator value) with respect to the BAU and with respect to the before-experiment case:

$$\boldsymbol{CarDepIndex} = \sum_{\boldsymbol{I}} \left({}_{\square}^{\boldsymbol{I}}\boldsymbol{AEBAUChng} * {}_{\square}^{\boldsymbol{I}}\boldsymbol{CarDepWhgt} \right)$$

$$\boldsymbol{CarDepIndex} = \sum_{\boldsymbol{I}} \left({}_{\square}^{\boldsymbol{I}}\boldsymbol{AEBEChng} * {}_{\square}^{\boldsymbol{I}}\boldsymbol{CarDepWhgt} \right)$$

Where:

$_{\square}^{I}CarDepWhgt$ = Weighting factor associated to the indicator *I*.

The weighting factors are **predefined within the supporting tool** as follows:

$^{<TRA\_PT\_PTAn>}_{\square}AEBAUChng$ = 0.25

$^{<TRA\_PT\_PTCn>}_{\square}AEBAUChng$ = 0.20

$^{<TRA\_PT\_RL>}_{\square}AEBAUChng$ = 0.15

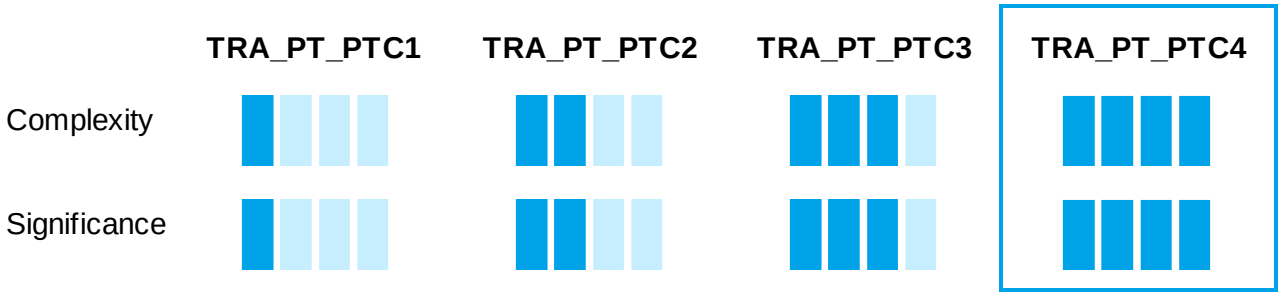
$^{<SOC\_EQ\_AFn>}_{\square}AEBAUChng$ = 0.25

$^{<TRA\_PT\_PTS>}_{\square}AEBAUChng$ = 0.10

$^{<TRA\_SH\_AVn>}_{\square}AEBAUChng$ = 0.05

ALTERNATIVE INDICATORS

To be drafted.



If the experiment area is the whole city, there are three alternative indicators to measure PT connectivity: **TRA_PT_PTC5, TRA_PT_PTC6, TRA_PT_PTC7.** These three indicators are of growing complexity and significance**.**