CIVITAS indicators

Car dependency index (TRA_CC_CD2)

DOMAIN

Transport	Environment	Energy	Society	Economy

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

Category

Key indicator	Supplementary indicator	State indicator

CONTEXT AND RELEVANCE

Car dependency refers to the extent to which individuals must rely on private cars for their daily transportation needs due to the lack of viable alternative modes. High car dependency and, therefore, high numbers of car trips, lead to several urban challenges, including air and noise pollution and sedentarism. It also impacts urban planning as roads and parking take up valuable space that could otherwise be used for public amenities, green spaces, or pedestrian-friendly infrastructure. Car dependency can be tackled through the provision of quality public transport and sharing mobility options, which introduces alternative modes to the private car for trips in urban areas.

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 <u>LOWER</u> value of the indicator.**

DESCRIPTION

This indicator is the **share of trips taking place in the experiment area for which no suitable alternative to driving exists**.

This indicator is a share; as such, it is **dimensionless**.

METHOD OF CALCULATION AND INPUTS

This indicator relies on a **survey** asking a sample of individuals for the share of trips in the experiment area for which no suitable alternative to driving exists. Organising a sample survey requires some resources and implies some complexities, but the survey can be used to collect more information than the one needed for this indicator. See the dedicated "Guidelines for surveys" for methodological indications.

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

Method		
Calculation of the index based on responses to a sample survey	Significance: **1.00**	▮▮▮▮
INPUTS		
The following information is needed to compute the indicator: • **Responses from a sample of individuals to a question regarding the share of their trips in the experiment area for which no suitable alternative to driving exists.** A suggested formulation of this question is provided in the Guidelines for surveys which are part of the MUSE Evaluation Framework.		
METHOD OF CALCULATION		

Assuming that the formulation of the question suggested in the Guidelines for surveys is used, the indicator should be computed **exogenously** according to the following steps:

- **Association of a percentage to each response option proposed in the survey.**
  The suggested formulation of the question includes six different options of response, the associated percentage levels to these options would be as follows:

  Question: What is the share of your urban trips for which you feel that you do not have any realistic alternative to private car?

  Available responses:
  a) *None, for all my urban trips I have a realistic alternative to private car*
  b) *Less than one out of four*
  c) *Between one out of four and a half*
  d) *Between a half and three out of four*
  e) *More than three out of four*
  f) *All, I do not have a realistic alternative to private car for any of my urban trips*

  Numeric levels associated:
  a) *None, for all my urban trips I have a realistic alternative to private car → 0%*
  b) *Less than one out of four → 20%*
  c) *Between one out of four and a half → 40%*
  a) *Between a half and three out of four → 60%*
  b) *More than three out of four → 80%*
  a) *All, I do not have a realistic alternative to private car for any of my urban trips → 100%*

- **Calculation of the average share of urban trips for which respondents report no suitable alternative to driving exists** (see equation below).

EQUATIONS

The equation computing the index (last step of the method of calculation) is the following:

$$CarDepIndex = \frac{\sum_{i=1}^{R} dep_i}{R}$$

Where:

dep_i = Survey respondent i's reported share of urban trips for which no alternative to driving exists

R = Number of respondents in the sample

ALTERNATIVE INDICATORS

This indicator measures the extent to which personal mobility depends on private cars. It is calculated using sample survey data, that is, asking respondents for the share of trips they make in the pilot area for which no viable alternative to driving exists.

Alternative indicator **TRA_CC_CD1** measures car dependency using a combination of other indicators included in this Framework that relate to public transport availability, connectivity,

reliability, affordability, speed, and the availability of shared mobility services. If these underlying indicators are already part of the assessment, this indicator can be easily obtained through the supporting tool with no additional effort. It is important to note that this indicator captures only some dimensions of car dependency, which are not necessarily exhaustive of what contributes to this phenomenon: the indicator indirectly assesses car dependency by evaluating the supply of public transport and shared mobility options. Therefore, its significance is limited in comparison to TRA_CC_CD2.

Furthermore, it should be considered that the choice between these two alternative indicators may depend on data availability: TRA_CC_CD1 uses transport supply underlying indicators, while TRA_CC_CD2 requires conducting a sample survey. Conducting a survey may demand a substantial effort, but if a sample survey in the pilot area is already envisaged to collect information needed for other indicators, adding one question regarding car dependency would be basically effortless. Lastly, TRA_CC_CD1 only allows to assess the change between the after-experiment case and the BAU or before case, as it is not a meaningful indicator to measure car dependency in absolute terms. On the contrary, TRA_CC_CD2 can be used in absolute term, too: this indicator is a share, thus ranging between 0 and 100%, with 0% meaning that for any trip in the experiment area there exist an alternative to driving, i.e., no car dependency at all. As such, it allows comparisons across pilots.

For a focus on people's perception of transport alternatives, **TRA_CC_PCD** measures perceived car dependency in the experiment area. Perceived car dependency reflects social norms and personal habits rather than the actual provision of non-car alternatives.