CIVITAS
Sustainable and smart mobility for all
2030

CIVITAS indicators

Multimodal trips managed through trip planning applications (TRA_MM_FI6)

DOMAIN

Transport	Environment	Energy	Society	Economy

TOPIC	**Multimodality**	
IMPACT	**Functional integration of transport modes** *Increasing the share of multimodal trips managed through trip planning applications*	**TRA_MM**

Category

Key indicator	**Supplementary indicator**	State indicator

CONTEXT AND RELEVANCE

Functional integration of transport modes refers to the coordination of different transportation systems to into a cohesive network where various modes complement one another. This involves unifying ticketing, trip planning and booking platforms to enable seamless travel across all urban mobility modes. By functionally integrating transport modes, cities can significantly enhance the convenience and efficiency of their mobility systems. Coordination between services makes multi-modal journeys more intuitive and time-efficient for users, ultimately improving the accessibility and appeal of public and shared mobility modes.

A functionally integrated system supports as shift to sustainable mobility options, reducing car dependency and promoting environmental and social benefits such as lower emissions, safer streets, and more efficient land use.

This indicator provides a measure of the functional integration of transport modes. **This is a relevant indicator when the policy action is aimed at improving the functional integration between different modes of transport. A successful action is reflected in a HIGHER value of the indicator.**

DESCRIPTION

This indicator measures the share of trips involving at least two transport services that are managed using trip planning applications, relative to the total number of trips involving at least two transport services. Trip planning applications can be used, for example, to purchase unified tickets valid across multiple modes or book shared vehicles at multimodal hubs, such as train stations.

The indicator is **dimensionless**.

METHOD OF CALCULATION AND INPUTS

The required data to calculate this indicator is collected by means of a **sample survey**. The survey must ask a sample of individuals to report on their multimodal trips in the experiment city and on whether they used a trip planning application to arrange them.

Organising a sample survey requires some resources and implies some complexities, but multiple question may be asked at the same time, allowing to compute several indicators as needed. See the dedicated “Sample surveys guidelines” 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: **0.50** 
INPUTS **The following information is needed** to compute the indicator:	

- Responses from a sample of individuals to a question regarding **the share of trips involving at least two transport services that the respondent managed using trip planning applications** over a given period
- Responses from a sample of individuals to a question regarding **the total number of multimodal trips the respondent made** during the same given period**.**

A suggested formulation of this question is provided in the Guidelines for Surveys, part of the MUSE Evaluation Framework. It is recommended **to first ask how many multimodal trips the respondent has taken** over a given period; **then**, to ask **what proportion of those trips were managed using trip planning applications.**

METHOD OF CALCULATION

If the formulation of the questions suggested in the Guidelines for surveys is used, the indicator can be computed according to the following steps:

- **Question 1 on the number of multimodal trips taken by the respondent: association of a numeric value to each response option.**
  The suggested formulation of the question includes five response options, consisting of numeric ranges. The associated value to each option would be as follows:

  Question: In the last three months, have you made any urban trip involving two or more different transport services (e.g. public transport plus shared scooter)?

  Available responses:

  a) No, I haven't made any of such trips
  b) Yes, 1-2 trips
  c) Yes, 3-5 trips
  d) Yes, 5-10 trips
  e) Yes, more than 10 trips

  Numeric values associated:

  a) No, I haven't made any of such trips → 0
  b) Yes, 1-2 trips → 1.5
  c) Yes, 3-5 trips → 4
  d) Yes, 5-10 trips → 7.5
  e) Yes, more than 10 trips → 20

  The available responses to this question may be adjusted based on the prevalence of multimodal trips in the pilot area. In this example, it is assumed that over a three-month period, only some respondents will have taken more than 10 trips involving multiple transport services, while most will have rarely or never done so. The response categories can be adjusted based on local mobility patterns to ensure they effectively capture the full range of behaviours in the pilot area.

- **Question 2 on the share of multimodal trips managed via trip planning applications: association of a percentage to each response option.**
  The suggested formulation of the question includes five different options of response, the associated percentage levels to these options would be as follows:

  Question: Have you used a multimodal planning application to manage these trips (i.e. to purchase a unified ticket, to book a shared means in a specific parking)?

Available responses:
a) Yes, for all trips
b) Yes, for most of trips
c) Yes, for about half of trips
d) Yes, for a minority of trips
e) *No*

Percentage levels associated:
a) Yes, for all trips → 100%
b) Yes, for most of trips → 75%
c) Yes, for about half of trips → 50%
d) Yes, for a minority of trips → 25%
e) No → 0%

- **Calculation of the average share of trips involving two transport services that users managed through trip planning applications** (see equation below).

EQUATIONS

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

$$\boldsymbol{MMIndex} = \frac{\sum_{i=1}^{R}(\boldsymbol{mmshare_i} * \boldsymbol{mmtrips_i})}{\sum_{i=1}^{R} \boldsymbol{mmtrips_i}}$$

Where:

$mmshare_i$ = Survey respondent i's reported share of multimodal trips managed using a trip planning application

mm$trips_i$ = Survey respondent i's reported number of multimodal trips

R = Number of respondents

ALTERNATIVE INDICATORS

This indicator measures the share of trips involving two or more transport services that are managed through trip planning applications. In this Evaluation Framework, there are 5 alternative indicators to assess functional integration of transport modes: TRA_MM_FI1, TRA_MM_FI2, and TRA_MM_FI3 relate to multimodal trip planning applications, while TRA_MM_FI4 and TRA_MM_FI5 evaluate fare integration.

TRA_MM_FI1 considers the share of modes covered by trip planning applications. **TRA_MM_FI2** measures the number of users downloading trip planning applications active in the experiment city. Lastly, **TRA_MM_FI3** measures the share of transport operators whose services are covered by multimodal trip planning applications. Compared to TRA_MM_FI6, these alternative indicators on trip planning applications are simpler to calculate, as they rely on straightforward computations and data that can be easily obtained through observation or by requesting information from application developers. However, their significance is limited as **they measure app downloads and modal/operator coverage rather than actual usage.** In contrast, TRA_MM_FI6 has higher significance since it assesses the extent to which multimodal trip planning applications are used. However, its calculation requires conducting a sample survey, making data collection more costly and time-consuming.

Concerning fare integration, **TRA_MM_FI4** counts the number of different transport modes accessible using a single travel pass, while **TRA_MM_FI5** consists of the share of transport operators whose services are accessible using a single pass. Both metrics are relatively simple to calculate, but TRA_MM_FI5 holds greater significance, as it expresses fare integration as a share of transport operators rather than a simple count of modes.