streamSAVE+ Dialogue Meeting #07

Streamlining Energy Savings Calculations

Energy savings from public traffic management

MINUTES OF THE MEETING

Date: Thursday 20 November 2025 **Duration:** 11.00 to 12.00 CET
Online

Short summary:

Traffic management is one of the main umbrella approaches contributing to a more efficient mobility. Traffic management is the organisation, arrangement, guidance and control of both stationary and moving traffic including all the types of users (such as pedestrians, cyclists and all types of vehicles). It may include various types of measures, such as measures on speed limits, various types of information measures, dynamic lane use control, on-demand transit, improving transfer connections (e.g. between trains and buses), active parking management, pedestrian and cycling infrastructures, etc.

This seventh dialogue meeting presented the new streamSAVE+ methodology to calculate energy savings from public traffic management, and discussed collection and availability of mobility data.

The streamSAVE+ methodology represents a first step toward a harmonized framework for estimating energy savings according to Article 8 of the Energy Efficiency Directive from traffic management measures. It combines a structured calculation approach including the following elements:

- Number of affected vehicles;
- Specific final energy consumption per vehicle type;
- Annual distance travelled;
- Energy-saving factor associated with the measure.

A detailed analysis of the literature has been carried out to estimate indicative values for these parameters as well as about investment, operating and maintenance, and replacement costs. This provides policymakers with guidance to assess cost-effectiveness and identify potential areas for improving urban mobility and energy efficiency.

Understanding mobility is essential to design effective transport policies. Key points include:

- National Travel Surveys collect detailed information on trips, purposes, travel distances, transport modes, and demographics. Limitations include sparse spatial resolution and limited coverage of long-distance trips.
- Big data sources (from mobile phones, GPS devices, and transport operators) provide large, continuously updated datasets. Advantages include high sample coverage and reduced reporting bias, while limitations include difficulty identifying trip purpose and mode, data accessibility, and representativeness.

Co-funded by the European Union

While travel surveys help us understand behavior changes over time, big data can complement surveys by providing near real-time observations, although both have limitations in representing local or urban-specific patterns.

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11:25 – 11:30	Q&A
11:30 – 11:45	Describing personal mobility: travel surveys and other data | **Davide Fiorello** (TRT – Transporti E Territorio)
11:45 – 12:00	Q&A followed by an open discussion

Quick updates about streamSAVE+

Presentation by Jiří Karásek (SEVEn)

(see also presentation file available on the streamSAVE+ website)

Jiří provided updates on the calculation platform development (Link to the calculation platform). Eleven of the fifteen Priority Actions (PAs) covered by streamSAVE and streamSAVE+ are available for use by the public after registration. The streamSAVE+ team is working intensively to integrate and test the remaining PAs so that the platform can be fully functional soon.

Jiří also reminded that the report detailing the development of the calculation methodologies for the new PAs, as well as all materials from the Dialogue meetings, are publicly available on the project website: https://streamsaveplus.eu/article/11-results

The new streamSAVE Plus methodology to calculate energy savings from public traffic management

Presentation by Christos Tourkolias (CRES)

(see also presentation file available on the streamSAVE+ website)

Christos first reminded the background and motivation for developing a bottom-up methodology for traffic management measures. This methodology was initiated in response to a request from policymakers following a survey, aiming to create a practical tool to estimate energy savings.

The first step involved a thorough bibliographic review to **define traffic management**. Based on the literature, traffic management was defined as the organization, arrangement, guidance, and control of both stationary and moving traffic, covering all types of users. The primary objective is to provide safe, orderly, and efficient movement of persons and goods. Additionally, the review highlighted that energy efficiency and environmental improvement should also be considered alongside mobility objectives.

Key challenges identified from the preparation of the methodology include:

- Data collection issues.
- Difficulties to define the baseline: this can be addressed by providing indicative values and guidance to use actual energy consumption data, when available.
- Lack of standardised calculation methodologies: this can be addressed by providing a simplified methodology that can be easily adapted to different national and local contexts.

A key source used to identify the main types of traffic management measures is (US Department of Transportation – Federal Highway Administration, 2022). Christos presented an overview of **typical measures** that can be grouped in **four main categories**:

- **Active traffic management**: dynamically managing recurrent and non-recurrent congestion.
- **Active demand management**: reducing or redistributing travel demand to alternative modes or routes.
- **Active parking management**: influencing demand for parking capacity.

- **Traffic calming measures**: reducing vehicle speeds and improving safety. For each category, multiple interventions exist, each with different energy and mobility impacts

Traffic management measures impact energy consumption both directly and indirectly. **Direct impacts** include smoother traffic flow, reduced stop-and-go driving, and shorter travel distances, which lower fuel consumption. **Indirect impacts** arise when users are encouraged to switch to public transport or other sustainable modes, further reducing energy use. These impacts were organized into four categories to provide a systematic framework for evaluation.

Christos then explained the general formula to calculate final energy savings and discussed the main methodological challenges in developing the bottom-up equation. The main concern is standardization and a **lack of consistent data** across EU Member States regarding:

- Implemented traffic management measures;
- Affected vehicle types and numbers;
- Travel distances and local traffic patterns.

The methodology is presented as an initial, simplified approach that can be refined as better data and additional case studies become available. At the moment the indicative values have been derived from the JRC-IDEES database.

The methodology calculates final energy savings according to Article 8 of the Energy Efficiency Directive. The calculation multiplies the following elements:

- Number of affected vehicles;
- Specific final energy consumption per vehicle type;
- Annual distance travelled;
- Energy-saving factor associated with the measure.

Literature shows a **very broad range of energy saving factors**, from 2 to 70%. Therefore, the calculation should be as specific as possible (considering the specific type of measure, vehicles, etc.). Indicative values of savings **lifetime** range generally between 5–10 years, reflecting the durability of infrastructure and technologies.

One output of the work on the methodology is the start of an **inventory of national data sources**.

Christos suggests further prioritizing efforts on data collection, focusing mainly on data about distance travelled and number of vehicles affected. This allows the methodology to provide a broader energy efficiency assessment across the transport sector.

About the calculation of the primary energy savings, the main issue is the primary energy conversion factor for electricity (cf. electric vehicles or hybrid vehicles). This was also discussed for the streamSAVE methodology for electric vehicles (see chapter 5 of the D2.2 report of streamSAVE).

The analysis of costs considers investment costs, operating and maintenance costs, and replacement costs.

- **Investment costs**: capital expenditures for infrastructure, equipment, and installation.
- **Operating and maintenance costs**: annual expenses for staff, minor repairs, and training.
- **Replacement costs**: periodic replacement of infrastructure and equipment to ensure continued operation and consistent impacts.

The literature review on cost data showed **difficulties in finding specific values** per type of measure or vehicles. Moreover, the main data sources identified are from the US.

At the end of his presentation, Christos emphasized that **pre- and post-implementation studies** are necessary to collect baseline traffic and parking data, determine modal split, assess traffic distribution, and quantify actual energy savings after implementation. This approach enables policymakers to better compare cost-effectiveness across different measures.

Q&A

— *Is it possible to use standardised methods or should the assessment be as specific as possible?*

Christos clarified that while the methodology provides a structured framework, the effectiveness of measures depends heavily on local conditions (e.g. different composition of the affected vehicles, different congestion manners, etc). Therefore, it is not possible to use a too standardised method or EU indicative values for deemed savings. Nevertheless, the developed method is useful to have a standard methodology providing a common ground and guidance to do specific calculations.

— *Are you considering co-benefits, as for example impact in air quality?*

Not in the streamSAVE+ methodology, but this would be relevant indeed.

— *About the energy savings factor, range from 2 to 70%, average of 17%: how did you assess this average ratio of 17%?*

This is based on the estimate of the median value derived from 63 European studies. Christos confirmed that all references and values are documented in the developed guidelines, allowing users to adapt calculations to specific contexts while maintaining methodological transparency.

Describing personal mobility: travel surveys and other data

Presentation by Davide Fiorello (TRT – Transporti E Territorio)

(see also presentation file available on the streamSAVE+ website)

Davide confirmed that data is a major challenge for transport policies and measures. He also reminded that increasing our knowledge of personal mobility is essential to improve transport policies. In practice, mobility cannot be observed as such, as it is related to **multidimensional factors** consisting of number of trips travelled in a certain period of time, the length of the trips and the distribution of trips, distance or the purpose of the trip etc. Travel surveys thus can help explain mobility by gathering information on various factors (such as the number of trips, distances travelled, and travel patterns).

Travel surveys are done in many of the EU countries at national level. Part of the transport data in Eurostat and the JRC-IDEES database likely comes from these travel surveys. The common guidelines for the travel surveys were tested in the EU study New Mobility Pattern. Within this project an online travel questionnaire was conducted compiling common questions in all EU countries.

Davide then discussed what travel surveys can and cannot provide. Importantly, national travel surveys **lack spatial data**, such as trip origins and destinations, as well as information on long-distance travels and explanations of observed travel patterns (for example, modal shift). Whereas this data / information is required to assess the effects of transport policies.

Big data has developed as an alternative data source, that can be relevant to complement data on mobility, particularly from mobile phones, GPS devices, etc. Big data can provide large number of trips, no self-reporting bias (e.g. actual distance travelled), data on origin-destination and they are continuously updated. But there are also limitations, and notably that big data are not built from a statistical sample (so **not statistically representative**). They do not provide information about the trip purposes, and incomplete information about transport modes (e.g. for data from mobile phones). Another significant issue is that the **owners of these data** represent a kind of oligopoly (e.g., phone companies), and thus getting these data can be difficult and expensive.

Overall, travel surveys and big data give **valuable information about personal mobility** as well as policy insights. Davide demonstrated this with an example involving major groups of households with distinct characteristics. A travel survey, for example, can demonstrate that the shift over time is due to changes in population structure rather than changing mobility habits. These distinctions are critical to note when tracking changes over time: **looking at general average values may be misleading** when seeking to identify the causes of these changes. Travel surveys can help make these differences in studies analysing trends.

Davide concluded by emphasising the importance of travel surveys in supporting policy measures, designing policies, and forecasting measure characteristics. In terms of policy analysis, surveys are useful for determining what happened after the policy has been implemented. However, the influence is not immediately apparent.

Q&A

– *You spoke about national travel surveys. Are there also surveys done for urban mobility plans that would provide complementary data (cf. more spatial details, origin-destination data)?*

National travel surveys are undoubtedly more frequent. Most municipalities find it prohibitively expensive to conduct urban surveys. Some large municipalities have done it to support transport planning. However, even large municipalities do not do this on a regular basis.

An alternative might be when the national statistical office can pass specific contracts with municipalities to include additional questions and/or grow the number of persons surveyed from a specific area, as an extension of the national travel survey (this was done sometimes in France for example).

– *Frequency has decreased?*

As far as I know, the surveys do not have a specified timeframe. It can be done in one year and revised. However, there is no set number of years from one survey to another.

— *Is it possible to collect data on origin and destination?*

That is extremely difficult. I believe that even municipal-level surveys are insufficient to determine the origin and destination of travel. That would necessitate a broad survey with a concentrated effort made locally rather than at the national level. There could be a national level data for airport-to-airport travel or railroads, which are deemed sensitive data to collect. However, not for cars.

Open discussion

- *The newer energy audits include transport. Do you see them as a suitable data sources at aggregated level?*

It could be an additional source of information, but it does not replace the need for specific data collection. Christos noted that while these audits can support estimates of vehicle-specific energy consumption, they may not fully represent all vehicles affected by particular measures. Nonetheless, all data sources can help refine and improve the methodology, providing additional insight for policymakers.

Further readings

Armoogum, J., Borgato, S., Fiorello, D., Garcia, C., Gopal, Y., Maffii, S., ... & Schlemmer, L. (2022). Study on new mobility patterns in European cities: Task A, EU wide passenger mobility survey. Final report to the European Commission.

Rózsai, M., Jaxa-Rozen, M., Salvucci, R., Sikora, P., Tattini, J. and Neuwahl, F. (2024). JRC-IDEES-2021: the Integrated Database of the European Energy System – Data update and technical documentation. Report JRC137809 of the Joint Research Centre.

Tattini, J., Jaxa-Rozen, M., Salvucci, R., Rozsai, M., Sikora, P., Gea-Bermúdez, J., & Neuwahl, F. (2025). The transport sector in the Integrated Database of the European Energy System–Methodological update and potential for transport policy analysis. *Energy*, 318, 134400.

US Department of Transportation – Federal Highway Administration (2022). Active Transportation and Demand Management.

Useful webpages:

EC, DG MOVE: https://transport.ec.europa.eu/transport-themes/sustainable-transport/sustainable-transport-studies_en

Multimodal Traffic Management Cluster: https://www.polisnetwork.eu/news/multimodal-traffic-management-cluster-roadmap/

POLIS working group on traffic management: https://www.polisnetwork.eu/topic/traffic-management-2/

StreamSAVE+: https://streamsaveplus.eu/storage/app/media/uploaded-files/d22-extended-guidance-for-standardized-savings-methodologies-indicative-values.pdf

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