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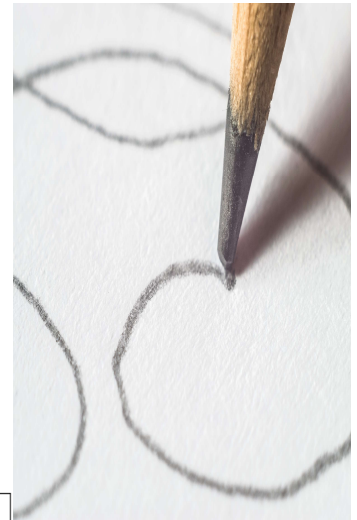
CAPACITY BUILDING FOR SUSTAINABLE URBAN MOBILITY PLANS

INDICATORS, TARGETS AND MONITORING

Stockholm, 5-6 May 2026

Learning objectives

- Understand relevance of setting up indicators, targets and monitoring scheme linked to SUMP vision and objectives
- Grasp fundamental requirements, limitations and recommendations for establishing indicator lists, setting targets and putting monitoring arrangements in place
- Frame these activities in context of a SUMP
- Understand the challenges ahead



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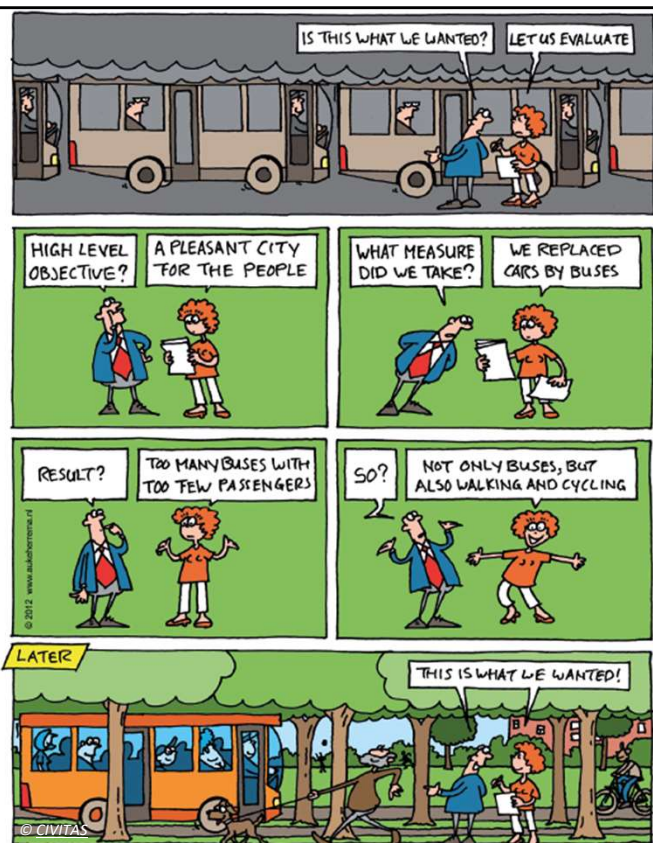
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To illustrate the importance of setting goals: add a news item inspired by the Portuguese PART - Public Transport Fare Reduction Support Program (or use this as a fictitious example) aimed at reducing vehicle usage. Preliminary evaluation shows that it has indeed contributed to an increase in the number of users (due to affordability) but at the expense of other modes, including active modes. The number of vehicles entering the city continues to increase (source: (<https://www.publico.pt/2022/09/21/azul/noticia/especialistas-avisam-passes-baratos-nao-estao-tirar-carros-ruas-2021365>)).

Another example: the new monthly rail pass. According to the news, **only** about 6 thousand monthly passes have been sold in the first 4 months of implementation. However, when we use the adverb "only," we are assuming that expectations are higher, even if the news shows that responsible public authorities have not set a target from the onset. In this case, it is difficult to judge whether the measure is positive or negative because there is no contextual information that could serve as an objective reference for decision-makers (<https://www.jn.pt/3721905860/passe-ferroviario-nacional-para-regionais-chegou-a-seis-mil-passageiros/>).

Why do M&E matter?

- Take stock of the progress of SUMP's and the impact of policy measures.
- Carried out *before, during and after* the implementation of SUMP-related measures.
 - **monitoring** (of measures) -> conducted on a regular cycle,
 - **evaluation** -> conducted when major milestones are achieved and repeated over longer time intervals.
- Regular information to decision makers, potential funding bodies and local stakeholders shows
 - that a SUMP has delivered, or will deliver, benefits to the community in relation to its objectives
 - provides value for money, is worth continuing or requires modifications to be successful.



- The cartoon vividly illustrates the crucial role of evaluation in learning from experiences and refining the action plan.
- M&E is crucial for assessing the effectiveness of our SUMP action plan. It serves as management tools for both the whole SUMP and for individual measures/packages.
- Continuous monitoring with routine collection of core data and information should be carried out for the whole SUMP. Evaluation generally happens at the end of planning cycles, but in practice monitoring and evaluation activities will often be carried out in parallel with implementation, e.g. to review intermediate outcomes.

In terms of benefits:

- Systematic monitoring and evaluation enhance planning efficiency and implementation of measures, optimises resources use and provides empirical evidence for future planning and appraisal of transport measures.
- Enables timely problem identification, potential successes, and adjustments.
- Transparent reporting contributes to public debate and decision-making.

In short, the objective of M&E in the context of the SUMP is to gather the best possible evidence base so as to:

- Measure the performance
- Learn and fine-tune
- Dialogue with stakeholders and citizens
- In the case of TEN-T nodes, it will be mandatory from 2027 for SUMI indicators to be collected and reported to European Commission

M&E in the context of the SUMP lifecycle

- Stepwise, M&E is relevant across the SUMP lifecycle:

- Step 03** - data sources are identified and a baseline set.
- Step 06** - setting strategic indicators and targets.
- Step 07** - M&E plan for each indicator, including measure indicators.
- Step 11** - monitoring progress - critical analysis of the effects (evaluation, possible future revisions).

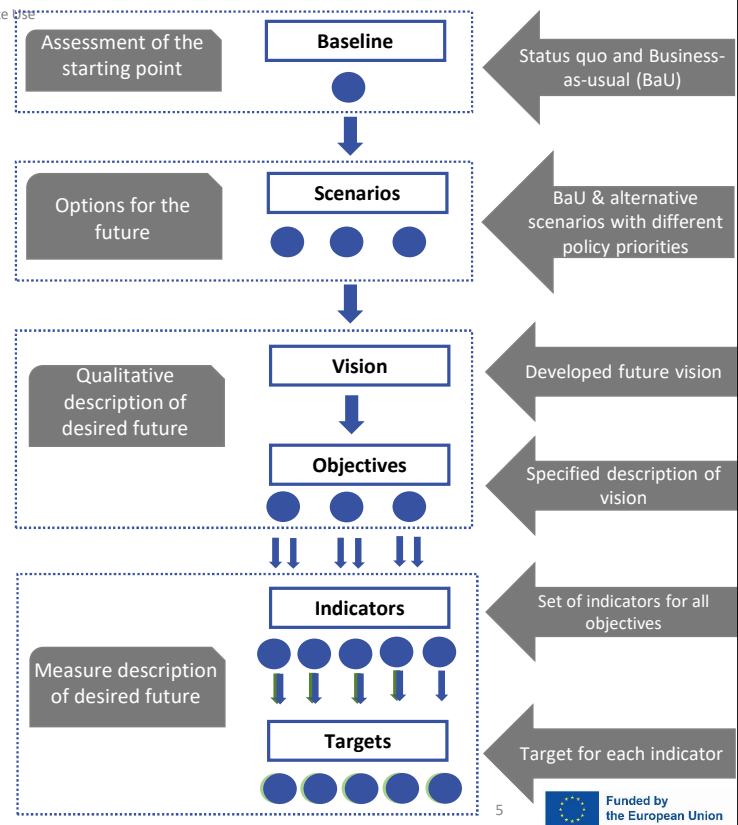


Key steps in monitoring and evaluation are:

- Understanding the current mobility situation (baseline)
- Drawing scenarios and a corresponding vision for the city
- Definition of strategic and specific objectives
- Definition of performance indicators
- Determining targets against which to assess the measures/package of measures/SUMP
- Appraisal of the after conditions against the BAU

M&E in preparation and analysis

- First M&E activity in a SUMP cycle: initial assessment of the current mobility situation.
- This will shape the **baseline** and inform the development of contrasting future scenarios.
 - The baseline describes how conditions in the urban region would develop without the SUMP (BaU).
- Indicators can also be a factual basis for the subsequent development of a vision, objectives and targets.



- Start of the planning process - data collected to identify problems and establish a baseline (your baseline should include the status, trends and problem areas of all transport modes used in your city, including freight transport and the level of integration of modes (multimodality); all main sustainable mobility aspects relevant to your city (e.g. air pollution, traffic noise, road safety, liveability of public spaces, equitable accessibility to services, employment and education).
- Identification of information and data sources needed.
- Data audit should allow to combine data available in different parts of your organisation, in other organisations, and (if needed, cooperation with data owners should be set up) by collecting new data with external data owners -> achieve a set of information on urban mobility and related areas that enables a status analysis and a baseline scenario (i.e.
- Target-oriented and focused data collection and analysis -> includes all transport modes and important mobility-related aims and trends for the entire functional urban area.
- Once the mobility situation is characterised and the baseline scenario is fixed, then alternative scenarios depicting potential futures can be drawn and discussed with stakeholders & citizens.
- measure scenarios are often also developed and appraised after the vision and objectives are set as ways to reach the strategic objectives. In fact the objectives should ideally be the basis for comparative appraisal of various scenarios. The process is often iterative, with targets also informed by appraisal of the scenarios potential.

- The GHG reduction indicator is (should be) calculated as a difference between the SUMP (future) scenario and the current scenario (or a certain reference year), so not comparing with the future BaU

M&E in strategy development

- A suitable set of indicators and targets needs to be selected.
 - Clear relationship to SUMP strategic objectives
 - Feasible, ambitious, mutually consistent, efficient, realistic.
 - Highlighting system evolution without requiring excessive amounts of data collection or processing.
- **Indicator** - clearly-defined data set used to monitor the status of a relevant variable
 - Often, measuring progress towards a particular goal or target.
- Setting **indicators** and **associated targets** provides a way of measuring the extent to which objectives are achieved.



Some Examples:

- (Target) Increase the share of cycling, walking and public transport to 60% of all trips by 2030
- (Indicator) Fatalities by all transport accidents in the urban area on a yearly basis
- (Indicator) GHG emissions by all urban area passenger transport modes (in tonnes of CO₂ eq/capita per year)

- As part of the strategy development phase, a suitable set of strategic indicators and targets needs to be selected.
- Indicators can be distinguished into:
 - Strategic indicators** measuring overall performance of a SUMP (basis for its evaluation).
 - Measure indicators** (more detailed) for monitoring the performance of individual measures.
- A systematic approach to this process developed under the SUMI project. Other strategic indicators complementary or supportive may be needed.
- Targets represent a concrete form of commitment in a SUMP - **want to achieve** and **by when**. Setting these has two main purposes:
 - Provide transparency and clear guidance for transforming transport and mobility in the city.
 - Allows cities to understand the extent to which objectives are to be achieved. Well-defined core indicators and targets are easily understood by decision makers and the public, motivating better results.
- Targets might be defined for each of the strategic core indicators, to allow for the monitoring of progress towards the achievement of objectives.

How to select strategic indicators?

- Selection and definition of **strategic indicators** for some objectives is the basis for the process of **setting targets** and **monitoring progress**. It is important to first identify indicators that:
 - Are well aligned with policy objectives.
 - Can be obtained (data collection & processing) for reasonable effort and cost
 - Can be easily interpreted and communicated



Practical recommendations

- Before developing new indicators, check with key stakeholders and other organisations, as they might already have adopted some.
 - Less additional work, easier acceptance
- Working with fewer indicators may prove more effective, especially for 'newcomer cities' that have limited resources, data or experience when developing a SUMP.
- Consider indicators from related areas other than transport (economy, environment, health and social).
- Making data available online increases responsibility and transparency

- Targets are the expression of an aimed-for value of a strategic indicator. More specifically, they define what should be achieved, in comparison to the current situation, by a specific year.
- Although setting targets is of paramount importance (for instance, for satisfying legal requirements or providing a framework for local stakeholders to aspire to, giving them inspiration for fundamental changes), they also need to be feasible to achieve and be measurable (pragmatic target)
- Targets will in practice be set partly on the basis of aspiration (e.g. Vision Zero for road safety) and partly on the basis of predictions of what measure packages can achieve, derived from modelling and/or based on experience of implementing similar measure packages elsewhere.
- Note though – not all objectives will necessarily have targets
- A caveat to stress that progress is also assessed by looking to the 'process' and not only to the impact, reflecting on how the different stakeholders worked to achieve a certain objective? What went well? What didn't? How could the SUMP steering team do better in the future? This is often referred to as process evaluation, which differs from the most common impact evaluation approach

Selecting indicators

- Selecting indicators for measuring SUMP objectives is not straightforward - many options for measuring an impact
- Standard international data sets are available and in some countries national sets are mandatory
- E.g. see the CH4ALLENGE M&E guidelines and template and the „Urban Mobility Indicators for walking and public transport“ for sets of standard indicators
- CIVITAS evaluation framework is also an option:
 - Set of indicators falling on 4 impact categories (society, energy, environment, economy)
 - Indicative criteria to follow, including:
 - Relevance, Completeness
 - Availability, Measurability
 - Reliability, Familiarity
 - Non-redundancy, Independence

Table 3: List of Indicators from the M&E template

Note: The template provides further guidance on how to select indicators from this list, depending on local circumstances such as the type of project, transport strategies, type of area etc. Outcome indicators are further classified into core indicators that should be covered in a SUMP and optional additional indicators. For core indicators, targets or intended direction of development should be determined. The full M&E template is available for download at www.sump-challenges.eu.

INDICATOR	DEFINITION
Outcome Indicators	
Objective: Efficiency	
	Core Indicators
Average time lost per passenger / ton km	Average difference between time required to travel in free flow and actual conditions for motorised traffic and average pedestrian / cyclist delay at traffic signals / crossings per km
Public transport punctuality	Share of public transport services arriving at stops within set punctuality limits
	Potential Additional Indicators
Transport intensity	Passenger / Ton km / GDP
User benefits	Monetised gains from improvements to transport system
Objective: Liveable Streets	
	Core Indicators
Perceived attractiveness of street environment	Share of people who consider streets safe and easy to walk
Share of liveable streets	Share of streets considered pleasant + safe environment for walking and social interaction
	Potential Additional Indicators
Community satisfaction	Average satisfaction with local community
Security	Crime rates (in street / PT environment)
Walkability of local neighbourhoods	Walkability scores
Objective: Environment	
	Core Indicators
Carbon emissions	CO ₂ emissions of traffic in city

Key take-away point is that it is complex to develop a set of indicators; it may be easier to follow an existing set, such as CIVITAS or CH4ALLENGE or future SUMIs; or it may be that a set is prescribed by a higher level of government, as in France.

According to CIVITAS SATELLITE, for the selection of indicators, the main criteria to follow should include:

- **Relevance:** each indicator should represent an assessment criterion, i.e. have a significant importance for the evaluation process;
- **Completeness:** the set of indicators should consider all aspects of the system/concept under evaluation;
- **Availability:** readily available for entry into the monitoring system;
- **Measurability:** the identified indicators should be capable of being measured objectively or subjectively;
- **Reliability:** clarity of definition and ease of aggregation;
- **Familiarity:** the indicators should be easy to understand;
- **Non-redundancy:** indicators should not measure the same aspect of an assessment criterion;
- **Independence:** small changes in the measurements of an indicator should not impact preferences assigned to other indicators of the evaluation model.
- Cities may also wish to be able to benchmark their performance against indicators with other cities. The challenge here is the approach/methodology for collecting data for the specific indicator so that it is comparable to others (benchmarking etc.). SUMIs

provide an opportunity to provide benchmarking data going forward.

A reference to the new French law on Mobility Plans (https://www.legifrance.gouv.fr/circulaire/id/45080?tab_selection=circ&searchField=ALL&query=*&page=1&init=true&dateSignature), where the French government establishes the development and monitoring of the implementation of mobility plans by defining a set of national indicators. The indicators aim to monitor: the development of the use of alternative mobility modes and services (teleworking, webconferencing, etc.); strengthening the use of alternative modes and services to the acquisition and use of cars (bicycles, shuttle services, car sharing); developments relating to the vehicle fleet (energetic transformation of vehicle fleets, carpooling and generalised car-sharing of service vehicles); optimisation of home-work travel (carpooling solutions for these trips).

Taking into account the difficulty in sometimes having data available (especially in small and medium size cities), it is still possible to perform a good SUMP with lower data collection, namely by using simple targets (and select only a few), mix the use of output indicators (easier to get data) and outcome indicators and use alternative data gathering as smaller surveys (not complete household surveys), traffic counts around the city (cordon counts). The use of trends is sometimes enough to monitor if a specific measure is having the predicted outcome.

Linking objectives with targets

- Imagine that you have the objective of improving the accessibility for disabled people

Output: 100% of PT services to be fully accessible to disabled people by 2030

Action: set target related to existing budget and strategy of the PT Operator. Measure existing situation (e.g. number of low-floor buses, number of vending machines accessible by people on wheelchairs, etc).

Outcome: Increase percentage of disabled people who perceive accessibility to be improving by 5% a year

Action: Use small (100 persons) survey or citizens panel to measure perceived accessibility levels every year.

Process evaluation

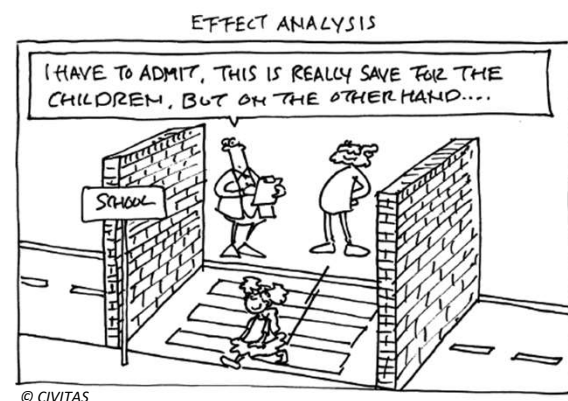
Action: Understand what were the actions taken by the city and PT Operator, which stakeholders were consulted, what were their expectations, etc. Extract takeaways and consider them for revising the strategy.

Practical example of how transport practitioners can link objectives with targets within their evaluation activities.

Outputs are the activities that help achieve outcomes. Outcomes are the results of those activities for individuals, families, groups, or communities.

M&E in measure planning | the road safety use case

- Strategic indicators and targets - defined at the strategy phase (notably on Step 6)
- Indicators at measure level are developed and the M&E activities are defined in more detail - Phase 2
- Key concerns at this stage are:
 - clear definition for each indicator,
 - reporting format,
 - an outline of how data is measured, and the indicator calculated.
- This information is typically condensed in measure **fiches***.



Measure indicator	Definition	Baseline	Target	Measuring area	Data collection method	Measuring frequency	Responsibility
People injured in traffic close to schools	Number of people (per 100,000 inhabitants) injured in traffic accidents with 300m radius of schools per annum	25 (2018)	Decrease by 20% until 2025	300m radius of all targeted schools	Police accident report	Continually (indicator value calculated from police database annually)	Police

*Fictitious example for a measure that aims to create traffic calming zones in front of schools

Strategic outcome indicators on general progress towards sustainable mobility have already been selected in phase 2. Here, more specific indicators on the objectives of individual measure packages are defined (e.g. emissions from buses, trucks and cars, number of accidents, or number of cycle trips in a certain area of the city).

M&E activities are detailed in an M&E plan -> become an integral part of measure implementation. Transport practitioners should develop M&E arrangements for all selected indicators, both strategic and measure indicators. For each of them:

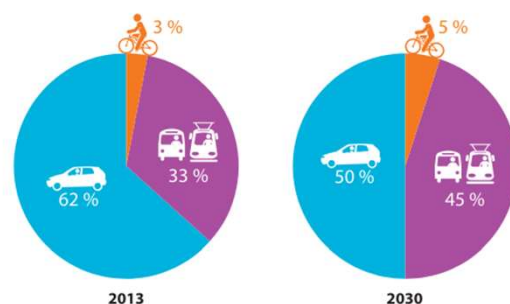
- Identify the outcomes - what impacts are expected from a measure? Define impact expectations for each measure using suitable outcome indicators. Compare target values against baseline values.
- Identify the outputs - what policy, infrastructure or service is directly implemented in a measure? Define a suitable output indicator for each measure to be able to monitor the extent to which it has been carried out, e.g. km of new bus lanes or number of new buses in operation
- Identify the inputs - determine required data, responsible parties and frequency of collection. Evaluate existing data sources and gaps

The outcome of a measure can always be influenced by various effects - impacts are often indirect, with several steps between an activity and its eventual impact. For instance, a decrease in the number of traffic accidents is not necessarily caused solely by the implemented traffic measure. It could be influenced by factors such as increased education on road safety for pupils, changes in their transport choices (e.g., walking or biking), or the opening of new commercial activities in the school surroundings. Therefore, the evaluation may need to focus on the impacts of complementary

indicators, such as vehicle speeds in the school's vicinity, the safety of children, and their choice of transport mode. To identify all meaningful relationships between your objectives and possible effects, a cause-and-effect chain reflection is helpful for identifying the most relevant and precise indicators.

How are targets set?

- Targets might be set for many reasons:
 - Negotiation and consultation with local stakeholders
 - Aligned with wider city and regional development goals
 - Aligned with EU policies (e.g. climate neutral cities by 2050 and more ambitious targets pursued by cities participating in the City Mission Programme)
 - Influenced by the assessment – determination of primary mobility challenges and appraisal of potential impacts of the Plan
- Should define intermediate targets in order to assess whether implementation and initial results on track.



Objective for commuting to Malmö –
Malmö SUMP, 2016

In order to guarantee that SUMP targets are realistic in the context of the chosen set of measures that make up the Plan, these should be defined in a collaborative process, with the involvement of stakeholders and aligned with other goals (EU targets or wider national or regional ones).

The Malmö targets here were based on a combination of aspiration, what changes in mode share had been delivered in the recent past, and what modelling predicted would be possible given a very large predicted increase in population of the city over a short time. Targets can also be influenced by plan assessment (what the appraisal of the different measure packages assesses can be achieved by those measure packages), not just baseline assessment.

It is important to establish intermediate targets in order to evaluate if the output targets defined for the SUMP measures are being translated into the outcome targets predicted, to enable a review of Plan strategy/actions and changes to this, if it looks like target is unlikely to be met....

The difficulties of measuring indicators – a practical example

- CO2 emissions is an indicator that is estimated based on the consumption of fossil fuel. As a result, it cannot be measured directly.
- Imagine that a city does not have a traffic model. Transport practitioners can still find robust proxies:
 - Perform traffic cordon counts and assume an average travel distance for each vehicle trip counted, multiplied by average emissions factors
 - Assess trends of fuel sold for a specific territory and during a dedicated time-frame
 - Annual mileage (from national statistics) for vehicles registered in that city, multiplied by average emissions factors



Also, the cities should look at those indicators already available (for example, to comply with EU directives): **GHG emissions (national inventory report)**, **road safety (data from national authorities)**, **local pollutant and noise emissions** (data usually available in the municipalities) are examples of indicators usually available in (at least) larger cities. More information about the environmental impacts (and indicators) can be found in module 11 and 12.

If cities do not have detailed data on numbers and lengths of vehicle trips made in their area, they must use simpler methods to derive an estimate of vehicle-related GHG emissions.

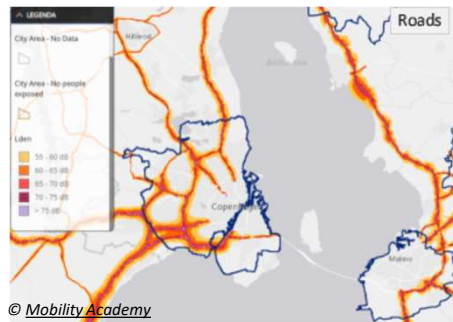
This topic is discussed in much more detail in Module 10.

Example of an indicator | Noise hindrance

- Noise pollution has specific legislation (Environmental Noise Directive END, 2002/49/EC) and requirements - map noise levels in large cities and develop plans to tackle the problem.
- The indicator measures people exposed to noise levels above 55 dB and is designed based on the noise maps and noise exposure data available from the “Noise Observation and Information Service for Europe” of the EEA*.
- In case of missing information from the EEA website, available noise mapping data at urban level could be used.



The case of Copenhagen



- Noise hindrance is an example of an indicator that calculates transport externalities. Source: <https://www.mobility-academy.eu/enrol/index.php?id=109>. Noise pollution is linked to a range of health problems and there is specific legislation for EU Member States to tackle the problem.
 - Notably, Environmental Noise Directive (END) 2002/49/EC, which applies to urban areas with more than 100,000 inhabitants (smaller agglomerations are not directly mandated under the END unless they contain significant noise-emitting infrastructures, such as airports with more than 50,000 movements per year), which are required to i) map noise levels using strategic noise maps and ii) prepare action plans to address noise pollution and reduce harmful exposure levels.
- This indicator is related to noise hindrance of population generated by transport modes in urban areas (roads, railways and airports).
- In the example provided, a GIS-based calculation of how many inhabitants are directly affected by high noise levels for each travel mode has been carried out by the local government of the city of Copenhagen, serving as a model for integrating noise management into sustainable urban mobility planning.
 - Please note that this presentation requires data on distribution of population at street number level – or similar – in the urban area as well as traffic data.

Monitor progress, evaluate and adapt

- With ongoing actions,
 - the selected monitoring tools must be applied regularly
 - Progress against indicators assessed annually/biennially
 - progress towards targets must be assessed
- At this stage, communication and engagement are critical
 - publicly communicate the progress of the implemented actions,
 - outlining their contribution to the agreed vision and objectives.
- At a higher level, **evaluate the planning process**, the SUMP and its implementation
 - understand what led to successes and failures
 - gather lessons for the preparation of the next SUMP generation.



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Whilst impact evaluation involves the identification of verifiable indicators, their measurement and a critical assessment of the differences (with/without intervention), **process evaluation** involves reflecting on the processes of planning and implementation, including the roles of communication and participation in order to understand more clearly why measures succeed or fail.

- Through regular monitoring and reflection, problems can be identified early and adaptations can be made.
- For example, and considering the previous example on road safety around schools, if traffic calming measures are not leading to a reduction on the number of people injured in the school surrounding, alternative measures should be implemented. Example of alternative measures: the complete closure of school streets in the peak hours; the policing of school surrounding during entry and exit times with a strong enforcement;
- Increase ownership of measures by involving citizens as much as possible in the monitoring and implementation process. That way, citizens can realise the connection between the foreseen plans, their earlier input (if applicable) and the real changes in their city or neighborhood. This requires honest, ongoing and respectful communication from the city administration to the public - but also vice versa
- SUMP process is a cycle because it presents a continuous development. The end of the process is also the beginning.
- Evaluate the planning process, the SUMP and its implementation with an eye to understanding what led to successes and failures.
- Might be important to conduct process evaluation. Process evaluation searches for explanations on the delays, changes, failures but also success of the measure. If process evaluation is conducted during the measures development phase as well as later it can provide useful information for improvement. One way to perform process evaluation is through “Learning Histories workshops”, assembling different

stakeholders and presenting them stories structured along a timeline, visualising the strategies, noticeable results, what happened why and in which way.

- Use good practices employed in CIVITAS projects. Importantly, process and impact evaluation are to be seen as two complementary parts of the monitoring and evaluation process.

Horizontal aspects | Data collection

- Data can be collected by a variety of means. For example, counting pedestrians in a square or an intersection can be done by surveyors, with counting machines, or by video cameras with automatic counting software.
- Choice of method depends on the resources available, the size of the problem / sample the reliability required and the budget available. Important it is regular.



When accessing the current baseline, guarantee that the comparison is accurate. For instance, 2020 should in most cases not be used as a reference year due to the impact of COVID-19. Consideration of traffic variability along weekdays and weekends, special events and inclement weather that may change usual patterns.



Capacity Building for Sustainable Urban Mobility Plans – Indicators, targets and monitoring

Data sources for the evaluation	
Primary data (you collect yourself)	Secondary data (you re-analyse data that is already collected by others)
Collected through: <ul style="list-style-type: none"> Individual interview Questionnaire Focus group Observation techniques 	Such as: <ul style="list-style-type: none"> Accident statistics Periodic traffic counts Statistics on purchased vehicles



- Recognise that there are several types of data - distinguished between primary and secondary data.
- Secondary data is important because it can save considerable time and expenses and can be applied to support triangulation of data sources and to verify primary data analysis collected directly as part of the SUMP. Must ensure that secondary data is relevant and reliable: as secondary data is not tailored specifically for the needs of your measure, it is important to avoid the trap of using irrelevant secondary data just because it is available. Secondary data analysis is often not enough to monitor the effects of a measure/package of measures for all selected indicators.
- Attention needs also to be devoted to comparisons - considering that data will be used for comparison between cities and across periods within the same city, it is important to look to sample composition (is data collected from similar types of people?). Or is data biased by the day where it was collected (e.g. organisation of major events that change traffic flows or passenger volumes).

Horizontal aspects | Data collection

- Surveys are typically a sound and reliable option for data collection. However, they are lengthy and costly.
- Different **technologies** are becoming cheaper and more available.
 - video-analytics is very useful for specific types of information (route information, travel times, modal choice, etc.).
- Some issues with the use of these technologies:
 - Privacy issues,
 - Social and demographic biases,
 - Data noise and biases from measurement technique
- Hence, traditional surveys remain valuable instruments.
 - Try to carry out such surveys regularly nonetheless e.g. every 6-10 years in Germany



Use of smart phones for data collection can be valuable:

- Automatic location
- Swift completion of questionnaires
- Regular data flow from respondents to analysts (e.g. trip diaries)
- But this method may exclude potentially interesting respondents such as elderly, or persons with disabilities and it is also difficult to assess trip purpose based on these data.

- New technologies might be more or less cost-efficient than well-established methodologies such as surveys. Technologies surely can enhance data reliability, reduce data collection time, etc.
- Increasingly, apps are used for public space analysis -> easier for cities to collect data in the field and to later organise and share the data on a public database.
- However, surveys remain valuable instruments that allow analysts to obtain more depth of analysis into the transport data. As well-known and accepted data sources, they allow for a degree of continuity in data collection, and as a result comparability over years of information.
- Household travel surveys are still the only way to get more representative quantitative information on different demand segments and motivations of mobility behaviour choices which are important for finding effective solutions. Mobility surveys should be budgeted for and done on a regular basis (every few years) with a sufficient but excessive sample size, which is the main cost driver. How to make a case for such expense in administrations which do not do this traditionally?
- More detail on the considerations and training on the use and fundamental role of traffic models to calculate indicators (both current and planned scenarios) is provided in Module 9.

Good practice examples of data collection



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*MITMA is Spanish national transport authority

MITMA, Mobility study in Spain with Big Data

- By agreement between MITMA* and one telecom operator in Spain, provided daily characterisation of mobility at all geographical scales, supporting monitoring of the COVID-19 pandemic's evolution and assessing the effectiveness of adopted mobility restriction measures.
 - Data was based on mobile phone positioning. It is still being updated, representing a resource centre for SUMP's across the country.



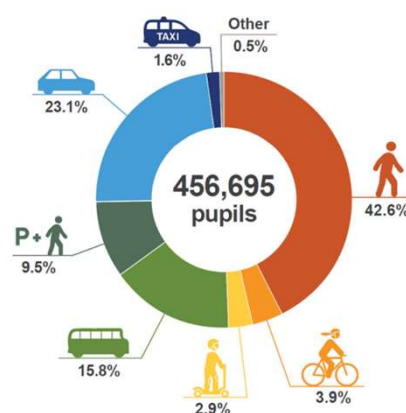
Bremen: Online citizen participation to assess the mobility situation

- Complementing traditional methods of data collection, the city of Bremen used crowdsourcing-based methods to identify mobility problems and opportunities.
 - Citizens invited to become a key data source, addressing questions – 'where are things running badly/smoothly?' – through an online platform, where users reported on their location, and used color-code entries according to transport mode.

- Big data is a great opportunity, however, it can be problematic due to a lack of transparency by phone operators regarding how they process the data....
- First example: top-down agreement carried out by the national government and made available to all local stakeholders;
- Second: initiative from the local government of Bremen that required active involvement of citizens
- Data collected in Spain has been aggregated in compliance with Spanish and European Personal Data Protection laws.
- In Bremen, and according to the 2019 edition of the SUMP guidelines, the portal received more than 4,000 contributions and 9,000 comments.
- Crowdsourcing - very good for identifying micro issues but can be hijacked by interest groups on the big issues....so there is an issue of representativeness of crowdsourcing which can be compensated by more controlled surveys?

Modal share data collection

- A few metropolitan areas have the governance structures and means to regularly collect extensive data, such as the urban mobility observatory of Barcelona
- However, this level of data availability is not common.
- Large metropolitan areas (e.g. Lisbon): surveys conducted every ~10-years and occasionally with smaller surveys performed by each municipality.
- For a city of around 500,000 inhabitants, a mobility survey can cost around €50,000 to €75,000
- Important to regularly collect proxies – e.g. “Hands Up Survey”, that is now replicated in several cities.



Hands Up Survey, Scotland 2023 – one single question made in classes: ‘How do you normally travel to school?’

It is important to consider the cost of data collection options vs. frequency – the use of cheaper alternatives may represent a more frequent data acquisition that enables to capture changes over time (Hands up Survey is a good example).

Alternatives to expensive data collection like surveys can be considered:

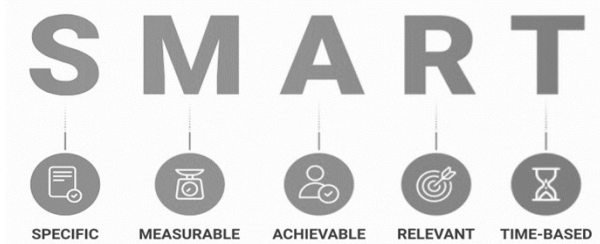
- The Hands Up Survey is a good example of a low-cost survey (the costs is mainly on the implementation process) – the survey is conducted by teachers in each class by raising one single question “How do you normal travel to school”. Although this survey doesn’t provide a lot of information about school travel, the modal shift is collected each year (since it is easy and low cost) and it is possible to have a trend in school mobility patterns. In Scotland, where this survey started in 2008, this data collection method has been embedded in the ‘Official Statistics Provider’ since 2012. Lisbon also performs a similar survey since 2018, called “Mãos ao Ar”, and the results are presented to the community every year along with other school mobility measures (ex: municipal bike trains, school streets) – it is possible to evaluate the result of implementing bike trains to school in the the percentage of kids cycling to school. The annual presentation of the results is a good way of using data to “tell a story” – i.e. depicting trends in the modal share of students and the impact that city school mobility measures have in the increased sustainable mode percentage in those schools where the measures were implemented. Importantly, the “Mãos ao Ar” results are also used as baseline for new school mobility measures for the city of Lisbon.
- Another alternative to household surveys is the use of mobile phone data, eventually combined with traffic counts to validate the data - although this data is normally paid,

the cost is lower than the one of a household survey.

- Key point is that some cities may be able to piggyback on to regular regional household travel surveys, but most will not and will need cheaper ways to gather mode share data.

Interactive exercise

- SMART targets and associated indicators (KPIs) provide a solid framework for assessing measures and SUMP progress towards its goals:



TASKS (15 minutes):

- Formulate at least two associated SMART indicators based on your group's strategic objective:
 - one for a strategic objective (from the list of G1 to G6),
 - one more specific related to the main measure (written in the brackets next to each strategic objective)
- Decide on associated targets
- Write down how would you measure/calculate them

- GROUPS:** Group indicated works on the strategic SUMP objectives it has been allocated:

- **G1:** Road safety improvement for vulnerable groups (includes 30 km/h speed limit zones)
- **G2:** Increasing cycling in the town (includes separated cycling lanes and bike parking)
- **G3:** Improving liveability in the city centre (includes the replacement of on-street parking with outdoor recreational space)
- **G4:** Improving public transport ridership on a specific commuting corridor (mainly a new metro line replacing a bus service)
- **G5:** Reducing the volume of CO₂ emissions from transport in the town (measures include electrification of city owned vehicle fleet)
- **G6:** Reducing the volume of car traffic in the city centre (measures include a residential parking zone and a new by-pass)

Interactive exercise – Instruction

■ TASKS (6 groups, 15 minutes):

1. Formulate at least two associated SMART indicators based on your group's strategic objective:
 - one for the strategic objective you have been allocated,
 - one more specific related to the main measure (written in the brackets next to each strategic objective)
2. Decide on associated targets
3. Write down how would you measure/calculate them

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RESULTS:

Group (G1-G6):		
	Strategic Indicator	Main Measure Indicator
Indicator?		
How to measure/calculate the indicator?		
Target(s)?		

Main factors of M&E deployment

- The level of experience with SUMP M&E varies strongly across EU cities.
- **Challenges** affecting M&E include:
 - Poor culture of accountability
 - Limited financial and staff resources.
 - Lack of culture of data collection and evidence-based decision making
 - Technical knowledge gaps in indicator definition and data handling.
 - Underutilization of GIS and transport modeling tools.
 - Inefficient M&E practices.
- **Drivers** found in cities where M&E activities are well established:
 - Planning authority awareness of M&E's policy role.
 - Communication of successes.
 - Existence of databases collected for other purposes.



Capacity Building for Sustainable Urban Mobility Plans – Indicators, targets and monitoring



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- Public sphere is often reluctant to address impacts – SMART targets + monitoring. A lack of data and a poor culture of conduction monitoring and evaluation activities was identified in several EU projects, such as Ch4llenge and SUMPS-UP
- These projects have noticed that in cities where M&E activities are well established, this is usually driven by awareness in the planning authority of the importance for policy making and also for communication of successes (i.e. demonstrating impact of public policies), plus the existence of databases collected for other purposes.
- Barriers are mostly lack of staff and money resources, but also lack of institutional cooperation and willingness to share data - for many relevant indicators data availability and use is restricted – data is either not available at all, its use is restricted, or there is a fee for doing so. In other cases, data is available, but owned by many different actors which makes it difficult to gather it. The diagnose indicates that the systematic evaluation of transport planning is not undertaken and remains a low priority in European cities. In addition, most cities indicated that they have learning needs in evaluation, indicator development, and data gathering.
- To tackle some of the identified challenges, the Commission is proposing harmonised approach for selecting key strategic indicators (**SUMI**).
- Is it however possible to overcome the challenges by defining alternatives to expensive data collection (some of them presented in previous slides)
- The cost of the M&E of a SUMP can vary substantially, depending on several factors: pre-existence of data for some indicators, automatic data collection systems, internal staff with knowledge in the area of urban mobility and capacity to perform the SUMP monitoring. Also, these costs can be very different from country to country (specially

since they are dependent on the national average salary). Nevertheless, it is important to consider the cost of carrying out 3 moments of intensive and field data collection campaigns (initial stage, intermediate and final phase - during 10 years), with an estimated cost of between 50 and 100 thousand euros/each. Additionally, the cost of human resources must be considered, with an estimate between 1 men.month and 0.5 men.month for the 10-year period. All in all, we anticipate as plausible that the overall M&E costs can lie somewhere between a range of 500,000€ - 1,000,000€ for the whole planning and implementation period, where half the costs should be related with human resources, ¼ to field research campaigns for large data collection activities and ¼ to other related costs (including for instance licenses for software, etc)

Summing-up

- In SUMP, M&E activities carried out before, during, and after implementation of measures. Plan M&E early
- **Indicators**
 - Used to evaluate impact of the plan on individual objectives against the baseline (BAU)
 - Coherent set to monitor outcomes across all plan objectives and associate these with SUMP measures (outputs)
 - Use standardised sets where possible, create new if needed
- **Targets - quantified ambition for indicators**
 - Keep it simple, especially for first generation SUMP
 - Ensure link between what measures can achieve, and targets
- **Use/buy existing data where possible (co-operate with stakeholders), surveys if essential/affordable**

What M&E is

A learning process

A method to assess progress + trigger readjustments

Risk management

A communication tool

- There is widespread agreement that Indicators are important instruments to assess how systems are evolving and, in particular, how effective our interventions on those systems are in making them evolve in the intended direction.
 - This is in support of the principle of accountability
- M&E is a learning process - it fosters a culture of learning within an organisation or project team. This knowledge informs future decision-making and feedback as input for improving overall project performance.
- M&E tracks progress by regularly monitoring key indicators - the steering team can gauge the project's advancement and identify areas that require attention.
- Monitoring and evaluation is also a **retroactive mechanism** that allows transport practitioners to revisit the SUMP objectives and plans
- It is a risk management tool since through ongoing monitoring, potential risks and challenges can be identified early in the project lifecycle – allows the implementation of risk mitigation strategies promptly, reducing the likelihood of negative impacts on project success.
- M&R - powerful communication tool, serving for accountability. Provides evidence of results and alignment with intended outcomes. Ensures transparency in public spending. Facilitates **stakeholders public** feedback systematically
- KPI are not prescriptive - it does not automatically determine whether or not the SUMP measures should be discarded. This is why complementary process evaluation activities should be carried out to understand the broader context involving the planning and implementation of the SUMP and its measures.

- M&E is also not expensive - costs should be regarded as investments (and not just as costs) to optimise the use of resources. The benefits in terms of informed decision-making, resource optimisation, and continuous improvement typically outweigh the M&E costs in the long run. Moreover, low-cost solutions for continuous data collection and processing are available, as presented in the previous slides.
- M&E is not only an expert thing. It involves a range of skills and knowledge, but the involvement of the public is important (example of Bremen). It is also useful to bring diverse perspectives into play when conducting process evaluation activities

Mandatory TEN-T requirements

- Article 41 of the new TEN-T Regulation 2024/1679 calls on the 431 urban nodes until 31 December 2027 to:
 - **develop a SUMP**, including integration of modes, shift towards sustainable mobility, promotion of low emission mobility including logistics, reduce air and noise pollution
 - **collect and submit to the European Commission urban mobility data per urban node**

- Urban mobility indicators are complementary to SUMP indicators, which together establish a robust monitoring framework for the city/urban node

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14688-Collection-of-urban-mobility-data-per-urban-node_en

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- TEN-T is the EU Trans-European Transport Network
- With the revision of the TEN-T Guidelines, the SUMP has for the first time a mandatory character for all the new 432 urban nodes.
- Future EU SUMIs will help urban areas to benchmark and thus identify the strengths and weaknesses of their mobility system in a standardised way and to focus on areas for improvement.

TEN-T Regulation – DRAFT Urban mobility indicators (1)

■ Urban Node Indicators (General):

- Total number of persons (*sex / age group*) with residence in the geographical area;
- Size (km²) of the geographical area; and
- Total number of access nodes in the geographical area.

■ Sustainability Indicators:

- Annual CO₂-equivalent emissions from road transport in the geographical area (*tCO₂e p/a*);
- Number of trips/month by residents: walking, cycling, individual motorised transport & public transport; and
- Number of registered passenger cars by energy type/fuel emission category.



<https://whc.unesco.org/en/list/852/>



<https://www.freepik.com/free-photos-vectors/riga-central-station>

TEN-T Regulation – DRAFT Urban mobility indicators (2)

■ Safety Indicators:

- Number of road traffic accidents in geographical area per year (*main 2 road users involved*);
- Number of people seriously injured in road traffic accidents in geographical area per year (*sex/DoB/veh. type involved etc.*); and
- Number of people fatally injured in road traffic accidents in geographical area per year (*sex/DoB, veh. type involved*).

■ Accessibility Indicators:

- Number of access nodes in geographical area with four or more scheduled departures during peak hours per route per hour;
- Number of rail stations in geographical area;
- Number of rail stations in geographical area reported as accessible by ERSAD¹ entity; and
- Number of secure bike parking facilities in rail stations or vicinity in geographical area.

1 – European Railway Station Accessibility Database (ERSAD) – register of EU Agency for Railways

Wrap-up

- We have essentially covered four blocks
 - Relevance of the monitoring and evaluation processes and overview of key concepts
 - Framing these processes in the context of the SUMP lifecycle
 - Practical suggestions for defining indicators, targets, monitoring arrangements, data collection
 - TEN-T requirements including urban mobility indicators

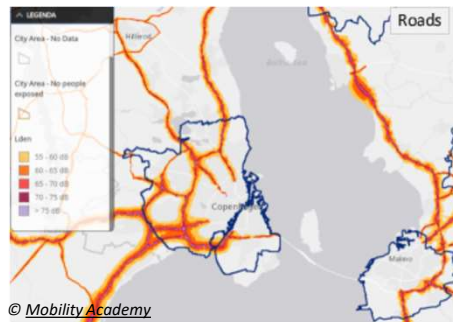
ADDITIONAL SLIDES

Example of an indicator | Noise hindrance

- Noise pollution has specific legislation (Environmental Noise Directive END, 2002/49/EC) and requirements - map noise levels in large cities and develop plans to tackle the problem.
- The indicator measures people exposed to noise levels above 55 dB and is designed based on the noise maps and noise exposure data available from the “Noise Observation and Information Service for Europe” of the EEA*.
- In case of missing information from the EEA website, available noise mapping data at urban level could be used.



The case of Copenhagen

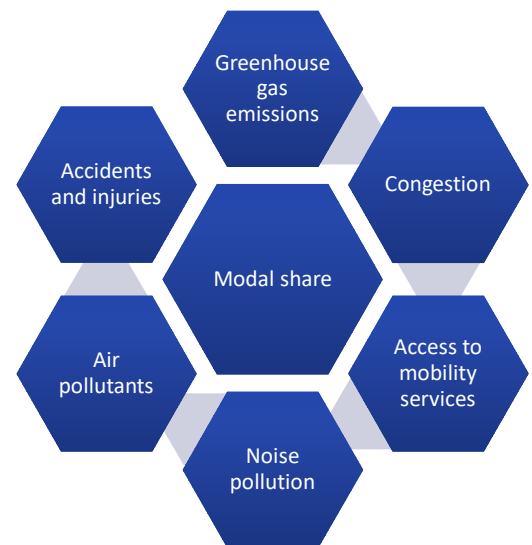


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- Noise hindrance is an example of an indicator that calculates transport externalities. Source: <https://www.mobility-academy.eu/enrol/index.php?id=109>. Noise pollution is linked to a range of health problems and there is specific legislation for EU Member States to tackle the problem.
- This indicator is related to noise hindrance of population generated by transport modes in urban areas (roads, railways and airports).
- A GIS-based calculation of how many inhabitants are directly affected by high noise levels for each travel mode has been carried out by the local government.
- Please note that this presentation required data on distribution of population at street number level – or similar – in the urban area as well as traffic data.

Harmonised approach to KPIs

- EC has developed a harmonised set of indicators.
- SUMI is the standard for ensuring high-quality of SUMP reporting.
 - Identifies strengths and weaknesses of cities' mobility system.
 - Guarantees assessment of how far the plan is delivering on the expected outcomes.
 - Tracks urban area progress over time using different indicators.
 - Compares and benchmarks urban areas within across countries.



While details on monitoring mechanisms are still being developed by the EU legislators, work has been made on developing a harmonised set of indicators.

- Once the new TEN-T Regulation is adopted, an **implementing act** will be published outlining the specifics related with the core indicators set.
- The list of 432 TEN-T urban nodes can be found in Annex II of the proposed Regulation (https://transport.ec.europa.eu/news-events/news/sustainable-and-resilient-transport-network-bringing-europe-closer-together-2024-06-13_en)
- SUMI has reviewed and adapted an indicator set originally developed by the World Business Council for Sustainable Development (WBCSD)
- It was also inspired in the 'EU Transport Statistics – Eurostat guidelines on Passenger Mobility Statistics'
- SUMI indicators allow performing EU-level standardised evaluation of city's mobility system
- The SUMI indicators allow for a comparison with other EC cities of similar size (benchmarking tool)

Important implication of the new TEN-T requirements

- Annex V of the regulation defines basic SUMP planning guidelines for urban nodes, in particular :
 - SUMPs will now need to cater not only to the city or a specific municipality but also to the surrounding commuting zone forming the Functional Urban Area.



Bullet 1

The cities for which SUMI indicators will be made mandatory will need to either:

- Retro-update existing M&E arrangements so as to meet the new requirements; or
- Transition to SUMI at the next natural update of the SUMP

Bullet 2

Arguably, setting up monitoring and evaluation campaigns for an entire FUA is more demanding than doing so for a city centre or a municipality, as the target areas differ significantly. Sample-based approaches may be recommended, provided they are consistent and comparable over time.

In these cases, alternative to expensive data collection (surveys) can be considered. As mentioned previously, an alternative to household surveys can be mobile phone data or some cordon counts complemented with estimates of vehicle occupancy rates. Even if these alternative may not be the most adequate to set absolute values for the indicators, they allow for estimating the trends, the changes over time, aligned with SUMP measures.






Bullet 3

Such cities are defined as having a population of 100,000 inhabitants or more, or, where no such urban node exists in a NUTS 2 region, it shall be the main node of that NUTS 2 region. For these cities, particularly those with limited access to resources for putting in place M&E mechanisms, with lack of experience in conducting such processes, and where no previous research has been carried out, it might be important to consider setting objectives and targets more linked with outcomes than concrete impacts that are

more difficult to measure. Note that outputs are the direct product of the measure, often a tangible achievement (e.g. km of new cycle lane), while outcomes are related to the correlation between the action taken (e.g. the new cycle lane) and the impact it produces (e.g. a 5 percentage point modal shift towards cycling). Also, for these cases, the alternative data collection (mentioned in bullet 2) are important to keep in mind as a way to balance cost and frequency of collecting data.

SUMI | general sources of data

- For each core indicator, spreadsheets will be prepared and made available.
- To the extent possible, data needed is already collected by different EU level agencies and bodies. Some examples:

- 
 ➤ Urban Data Platform Plus developed by the JRC* and DG REGIO.
- 
 ➤ Noise pollution exposure gathered by EEA under the EU Directive 2002/49/EC.
- 
 ➤ Vehicle registration data available from national statistical offices, Eurostat, ACEA, or the European Alternative Fuels Observatory.
- 
 ➤ Road safety statistics published by national statistical offices or maintained by the EC's CARE database.
- 
 ➤ National open data portals may also offer relevant information. Check the European Union Open Data Portal.

- All mandatory KPIs will be streamlined and made available in a way that allows for relatively straightforward completion.
- All spreadsheets will be available to download containing multiple tabs, including a user guide, an example-filled tab and an area for city authorities to input the parameters for calculating the indicator.
- Given that city representatives may not be fully aware of existing sources, the key takeaway from this slide is that, whenever possible, data required for filling in the indicator spreadsheets can be sourced from various locations and different public sources.
- Different EU level agencies and bodies already compile large amount of information - > starting point for the calculation of the parameters needed for the SUMI indicators.
- Data from secondary sources may also be available at a different geographic or administrative level. They might be used in well justified cases and with caution.

Remember:

- A first important element for data harmonisation is to have common definitions.
- SUMI's indicator calculation spreadsheets will provide all the relevant data definitions in the respective "user guides" sheet (e.g. explaining the data format) and will guide cities in the reporting phase.
- Cities will likely be able to download the spreadsheets and follow guidelines to compute the different parameters and calculate their own indicator scores.

Conclusion

- Adopt a “sensible” approach to M&E
- *Perfect* indicator requires significant effort to collect and process - reconsider its use.
- Avoid overly complex indicators - they can easily be tampered with.
- Prevent any single indicator from overly defining success or rewards and ensure there is a coherent set of outcome and output indicators
- Standardised indicators (revised SUMIs or other ?) may need to be supplemented by indicators suited to local context.
- May therefore need extra indicators added if necessary



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A proportionate approach is needed since:

- The performance of transport systems is affected by the urban structure, economic relations, geographical location, and historical conditions. Utilize a methodically sound, feasible, and harmonized indicator set for analyzing progress toward EU goals. This approach is provided by SUMI.
- If the perfect indicator is not readily available, consider using a different indicator, with a bit more “noise” but available in a more timely manner. Avoid complex indicators that can easily be tampered with. In the case of complex endeavours, like SUMPs always are, such tampering may be used to obtain political or financial advantage for the sector showing better performance.
- Avoid that one particular indicator achieves dominant importance for defining success of allocate rewards. This leads to ignoring the other indicators and may even be subject to manipulation.

At the end of the day, transport practitioners need to act as **knowledge brokers**. This is a concept (<https://op.europa.eu/en/publication-detail/-/publication/5fff5736-ffce-4de1-b691-6c3134345391>) that depicts the transformational ambition of the M&E activities and which involves using the knowledge in ways that influence change and helps the city to navigate the climate and green transitions