GUIDELINES FOR REPORTING COSTS AND REVENUES

The economic dimension plays an important role in the Evaluation Framework. Under this dimension the evaluation addresses the financial effort required for the policy measures and, as much as possible, their efficiency. Therefore, a specific section of the Supporting tool is devoted to reporting implementation costs as well as expenditures and revenues for fares, tolls, etc. These elements are used within the tool as input to compute economic indicators.

These guidelines integrate the content of the factsheets related to the economic indicators. In the factsheets some definitions and methodological indications are provided, but there are some general aspects related to the definition of the inputs requiring specific attention.

One important qualification is that the assessment of the economic dimension in the Evaluation Framework is NOT a Cost-Benefit analysis, nor an alternative theoretically based procedure. It is a deliberately simple and practical method building on a limited number of elements to quantify some indicators. A consequence of its simplicity is that some aspects are treated roughly or are even disregarded (e.g. there is not any reference to interest rates to discount costs occurring in future periods of time). This qualification does not mean that the assessment of economic dimensions is intrinsically meaningless or wrong, but that its content should not be judged according to the criteria used in Cost Benefit Analysis or other established methods.

1. Definition of the analytical elements

The quantification of economic indicators is made entirely in the Supporting Tool, building on reported costs and revenues. These two elements are required in form of some input variables that evaluators should provide. In the following a definition of each element is given, in order to clarify what should be collected and coded in the Tool.

1.1 Relevant subjects

Most of the elements required should be reported with reference to three relevant subjects:

Local administration. It is the institution representing the local government in the experiment area. The local government has power and responsibility for setting regulations, elaborating mobility plan, and so on. It has public financial resources for investments and for supporting private initiatives. In most of the cases, it will be the municipality. As explained below, local public transport operators, logistics operators, energy operators are considered under the subject “private companies”. This applies even if in one city one of these operators are entirely or partially owned by the local administration.

Households. Private citizens located in the experiment area. As most of the policy measures impact on the whole mobility in the experiment area, city users (e.g., commuters reaching the experiment city daily or regularly) are included as well as residents. However, for some items it could be practically impossible to collect information for city users (e.g. investments in new vehicles can be quantified building on the number of registrations. Registrations in the city can be identified, but the vehicles registered outside the city and used by city users are unknown). At the same time, for other items it could be practically impossible to distinguish between residents and city users (e.g. parking fees revenues can hardly be separated). Therefore, it is acknowledged that there can be some inconsistency in the definition of “households”. This inconsistency is considered acceptable to reduce the data collection effort or even making feasible data collection.

Private companies. Transport, logistics, energy operators providing (selling) services in the experiment area. These companies manage and pay for the infrastructures, the equipment and the workforce required to produce the services. They can also invest private money to build new infrastructures (e.g. logistics platform, bus terminals). One major example of private company is public transport operators. In many cities, public transport operators are private entities even if in several cases the municipalities or broader governmental bodies may have a participation in the company. When transport operators are participated by local authorities, their activity could be considered part of the subject "Local administration". However, in order to treat them homogenously in all cities and since, in most of the cases, they behave as autonomous subjects, it is conventionally defined to include public transport operators (or public bike sharing operators, public entities managing parking areas and so on) within the subject "private companies".

1.2 Cost categories

Infrastructure/construction costs. These are the costs for physically building an infrastructure. Infrastructures includes urban railways and stations, dedicated bike lanes, logistic bays, Park&Ride stations, physical separations between roads and pedestrian areas, garages and so on. Since the assessment framework refers to solutions implemented as part of an experiment, infrastructure/construction costs concern new infrastructures, not existing before the experiment, or structurally improved/converted ones. Depreciation or maintenance costs of existing infrastructures are not considered. Only the construction costs of infrastructures envisaged as part of the Pilot should be considered. Costs of any infrastructure or part of infrastructure already planned, independently from the Pilot, should be excluded. For instance, if there was already a plan to build a bike lane in the Pilot area and the Pilot consists of adding a second bike lane, only the construction costs of this second bike lane should be considered.

Other investment costs. These are fixed costs deriving from investments in facilities like vehicles, machineries and other facilities (including, e.g. cameras or plate detection systems for road charging). As for infrastructure costs, only costs related to additional equipment is considered, while amortisation of existing facilities is not included. As for infrastructure costs, only costs related to additional investments beyond those already planned, independent of the Pilot, should be considered. This condition applies to households' investments in vehicles too. For instance, a Pilot could include incentives for the renewal of the car fleet. A certain number of electric cars are registered in the observed period. Some of these cars would have been registered anyway. Only the investment cost of additional electric cars as effect of the incentives are relevant for the assessment.

Operating costs. These are running costs for ensuring that new infrastructures and facilities (including the management of parking areas or of road charging systems) are operational and for producing services (e.g. production costs of a public transport service or of a shared vehicle service or of urban freight delivery). Service production costs include labour costs, energy costs, other consumable inputs and so on. The detail of each cost item is not required, the required information is the overall operating cost to produce the service in the observed period. For households, operating costs are variable costs of vehicles, basically fuel and maintenance. Again, only costs for services, infrastructures and other facilities generated by the Pilot should be considered. For example, only the production cost of additional transport services that would have not been supplied without the Pilot.

Subsidies. As part of the Pilot, subsidies can be granted to support some behaviours (e.g., replace a conventional vehicle with a zero-emission vehicle) or to integrate revenues for services whose fares do not cover the whole production costs. From the perspective of the subjects earmarking subsidies (the local administration or another administration), they are a cost. As for the other cost items mentioned above, only the resources used for subsidies not already existing or planned prior of the Pilot should be considered. For instance, if there is an existing national scheme granting a contribution for the purchase of

a zero-emission vehicles, the resources earmarked for this scheme are not relevant as they do not depend on the Pilot.

1.3 Expenditures and revenues

Expenditures and revenues are two alternative views of the payments (expenditures) or yields (revenues) generated by fares, charges, fees, etc. For instance, the purchase of public transport tickets is an expenditure for households and a revenue for the public transport operator. Even if in many cases expenditures and revenues cancel out, when considering the Pilot area as a whole, they are requested for the assessment in order to analyse the distribution of the costs among the different subjects.

Expenditures and revenues are requested for five separate items. Table 1-1 summarises what is expected for each item and for each subject.

Table 1-1: Expenditures and revenues

Category		Local Administration	Private companies	Households
Public transport	*Expenditure*	Nothing Subsidies to the services are NOT included here as they are considered under cost		Expenditure of individuals for purchasing public transport passes
	Revenues	Nothing (even when public transport is fully public, it is conventionally considered under private companies)	Revenues from tickets as well as from other sources (e.g. advertising)	Nothing
Sharing services	*Expenditure*	Nothing Subsidies to the services are NOT included here as they are considered under cost	Rent paid by companies providing sharing services to the local administration (e.g. to cover exemption from road charging). Operating costs of the services provided are NOT included here as they are considered under costs	Expenditure of individuals for purchasing sharing services
	Revenues	Rent paid by companies providing sharing services to the local administration (e.g. to cover exemption from road charging)	Revenues from subscriptions and fees as well as from other sources (e.g. advertising)	Nothing

Parking fees	*Expenditure*	Nothing	In principle, nothing. Operating costs of companies managing parking areas are considered under costs (see 1.2)	Payment of parking fees of vehicles of individuals
	Revenues	Revenues from parking fees in public streets and areas directly managed by the local administration	Revenues from parking fees in areas managed by private operators or dedicated public entities	Nothing
Road pricing	*Expenditure*	Nothing Operating costs of charging systems are NOT included here as they are considered under costs	Nothing (Public transport is usually exempted from road charging and any compensation paid by companies providing sharing services is accounted under "sharing services")	Expenditure of individuals for entering charged areas
	Revenues	Revenues from road charges	Nothing	Nothing
Other	*Expenditure*	Nothing	Expenditure of private companies for other charges.	Expenditure of individuals for other charges.
	Revenues	Revenues from any other charge managed by the local administration	Nothing	Nothing

2. Quantification methods

The values of expenditures and revenues defined above are inputs for the calculation of the economic indicators in the tool. In this section, methods for the quantification of each element are presented.

2.1 Reference period

One preliminary aspect to be considered is the reference period for the calculation. Different pilots can last for different periods of time. Notably, investments in infrastructures or equipment imply an expenditure concentrated in a usually limited time while operating costs or revenues are flows occurring along a longer period. **In order to use comparable values, the expenditure and revenues used in the Assessment Framework are conventionally based on the period of one year**. Practically this means that:

For investment cost, the yearly depreciation cost is considered. The recommended amortisation periods are:

- 25 years for constructions (stations, lanes, warehouses, etc.)
- 25 years for metro/urban rail/tram rolling stock
- 15 years for public transport road vehicles
- 10 years for cars[1], motorcycles and bicycles
- 5 years for other equipment (e.g. cameras, traffic lights, etc.)

Different amortisation periods than those recommended above can be applied if there are reasons.

For operating costs, revenues, etc. the period of one year should be considered. In case the pilot lasts less than one year or more than one year, the values collected should be scaled. For instance, if revenues for a period of 15 months are collected, the input for the calculation of the indicator should be scaled by applying the ratio 12/15.

2.2 Quantification

Most of the costs and revenues should be readily available from the documentation of the Pilot. Indications on methods for the quantifications of the different items are provided below.

Infrastructure/construction costs. These costs should be available in the documentation of the Pilot. In many cases, the expenditure for building infrastructures is directly or indirectly managed by the Local Administration, which should therefore have a full knowledge.

Investment costs. This element includes both public and private investments. While public ones should be more readily observed, private ones can be more difficult to quantify. For specific equipment associated to infrastructures (e.g., racks for parking bikes) or used for enforcing a regulation measure (e.g., plate detectors to manage low emissions zones), the cost is usually clearly identified as part of the project expenditure.

The trickiest part of investment costs is that for vehicles, especially private vehicles. The complexity arises from the condition that only the expenditure for vehicles that would not have been purchased without the implemented measures is accounted for. As already mentioned above, out of the electric cars registered in the observed period, a certain number would have been registered anyway. If the Pilot includes incentives for the renewal of the car fleet, it is expected that there will be an additional number of electric cars registered. The expenditure for these additional cars is the relevant one for the assessment.

Two different strategies can be applied to estimate the relevant investment in private vehicles.

One strategy is readily available if a direct survey is organised for the quantification of some indicators. As part of the survey, the number of purchased vehicles can be collected and specific questions can be added to investigate whether the same vehicle would have been purchased anyway or the measures of the Pilot have affected the decision. From the answers the additional investment cost can be estimated.

If a direct survey is not envisaged, the relevant investment costs can be estimated if data on the registration of new vehicles is available for the Pilot area as well as for another area in a period before the Pilot started (e.g., monthly registrations for at least 6 months or yearly registrations for at least 5 years before the Pilot started). The other area could be the control site, but it could also be another one, provided that it is not affected by the measures of the Pilot or by similar local measures. If this data is available, the number of vehicles that would have been registered in the Pilot area in the BAU case (i.e.

[1] The amortisation period for shared vehicles should be lower than 10 years but, at the same time, a significant residual value should be applied. For sake of simplicity, since the amortisation period is just used to derive a yearly value for the evaluation indicators, the residual value is not applied and the difference between private and shared vehicles is not considered.

without the measures implemented) can be estimated. The estimation is managed within the supporting tool (see box below for the calculation details).

The inputs required (to be coded in the tool) are:

$Pop^P(T)$ = Population in the Pilot area *P* in period *T*
$Pop^Z(T)$ = Population in the control site *Z* in period *T*
$RegCar_f^P(t)$ = Number of registered cars of fuel type *f* in the Pilot area *P* in period *t*
$RegCar_f^Z(t)$ = Number of registered cars of fuel type *f* in the control site *Z* in period *t*

Both last two elements should be a vector of numbers for different periods *t* in the past. The last value of the vectors (period *T*) is meant as the period of the Pilot (i.e., the one for which the estimation of investment costs is required).

Building on these four elements, the calculations are as follows.

a) Calculation of registration rates:

$$RegRate^P(t) = \frac{\sum_f RegCar_f^P(t)}{Pop^P(T)}$$

$$RegRate^Z(t) = \frac{\sum_f RegCar_f^Z(t)}{Pop^Z(T)}$$

(The same population of the Pilot period *T* can be used because population hardly changes significantly in some months or few years. If population for each period *t* is available, even better).

b) Calculation of the average ratio between the registration rate in the Pilot area *P* and the registration rate in the control site *Z*:

$$RegRateRatio(t) = \frac{RegRate^P(t)}{RegRate^Z(t)}$$

$$AvRegRateRatio = \frac{\sum_t^{T-1} RegRateRatio(t)}{T-1}$$

(the average ratio is the average of ratios of all periods before the Pilot period *T*)

c) Assuming that the content of the Pilot is aimed at accelerating the registration of zero-emission vehicles, an average ratio of the share of zero-emission registered car is also computed:

$$ZEShareRatio(t) = \frac{RegCar_{ZE}^P(t) \Big/ \sum_f RegCar_f^P(t))}{RegCar_{ZE}^Z(t) \Big/ \sum_f RegCar_f^Z(t)}$$

$$AvZEShareRatio = \frac{\sum_t^{T-1} ZEShareRatio(t)}{T-1}$$

(again, the average ratio is the average of ratios of all periods before the Pilot period *T*)

d) The ratios computed above say how, on average, the Pilot area *P* behaves compared to the control site *Z* when no measures are implemented. Therefore, the total number of purchased cars and number of zero-emission cars in the BAU case (i.e. without the implementation of Pilot) can be estimated:

$$BAURegCar^P(T) = Pop^P(T) * RegRate^Z(T) * AvRegRateRatio$$

$$BAURegCar_{ZE}^P(T) = BAURegCar^P(T) * \frac{RegCar_{ZE}^Z(T)}{\sum_f RegCar_f^Z(T)} * AvZEShareRatio$$

The relevant investment costs for private vehicles are the difference between the costs observed in the Pilot and the theoretical costs in the BAU case estimated.

Operating costs. The operating costs for providing public transport services should be an information available from public transport operators. In case they cannot provide the total costs, they should be at least able to provide a unitary operating cost per vehicle-km. This unitary cost, applied to the additional vehicles-km supplied as part of the Pilot, can be used to quantify total operating costs. It should be underlined that the relevant costs are only those for the service supplied as effect of Pilot. Costs of services already provided or of services that would have been provided anyway should not be considered.

For shared modes, the source of the information should be again the companies managing these services. They should be able to quantify the overall operating cost (if the shared modes where not available before the Pilot) or the additional operating cost (if the shared modes were already available before the Pilot)

For private vehicles, the relevant operating costs are the difference between the observed operating costs and those that would have been observed without the Pilot (BAU case). Given the estimation of vehicles in the BAU case, the related operating costs can be quantified by applying a vehicle operating cost per km.

Subsidies. If subsidies are part of the Pilot, they should be known already in the planning phase. Otherwise, the Local Administration should be able to provide this element.

Expenditure and revenues. Expenditures are revenues are symmetrical. What is an expenditure for households is a revenue for an operator or for the Local Administration. Practically, it is much easier collecting data on revenues, since the operators and the Local Administration (e.g. for parking or road charging) should know the revenues. Therefore, it is advisable to collect the revenues for the different sources mentioned in **Table *1*-*1***. Then, the same values can be coded as corresponding expenditures for households.