

Public Private Partnerships and Sustainable Transport

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Abstract

Sustainability is a concept which, for many years, depicts efforts of the humankind to preserve current resources for future generations. Today, lots of effort is concentrated on the research on defining sustainability in different aspects where sustainable transport is one of topics. In this field, most of research efforts are focused on identifying measures or indicators at the policy design level which will reflect impact of transport systems on economic, social and environmental aspects. Further research efforts could be emphasized on the principle of translating national or global level strategies into the project level specifics. Complexity of transportation systems, number of involved parties and number of indicators of interest make the process of finding the appropriate models, balanced criteria and manageable amount of information for the specific project not an easy task. Observing this problem with the additional dimension of public-private partnership characteristics in terms of risk sharing, performance requirement, debt and equity issues and estimation of the project financial feasibility, the task is becoming more interesting and demanding.

Keywords: sustainable transport, key performance indicators

Introduction

Sustainability is a concept which, for many years, depicts efforts of the humankind to preserve current resources for future generations. It is considered that this concept was first introduced in 1987 by the Bruntland Commission where sustainable development was defined as "...parts of progress which meet the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs." (1). Even though, as recognized by this commission, sustainable development was mainly related to the problem of the environmental protection, it was highlighted that future development based on the principle of sustainability should address also social and economic aspects of the future growth.

Today, lots of effort is concentrated on the research related to the defining sustainability in different aspects of everyday life. Transport, as an inevitable and important part of modern society, is an area in which lots of time and funds are spent in order to address all related issues and define the concept of sustainable transportation. Many agencies and researchers use as the starting point the definition introduced by the Center for Sustainable

Transportation¹, which was slightly modified and adopted by the European Union's Ministers of Transportation in 2001: "A sustainable transportation system is one that:

- Allows the basic access and development needs of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promises equity within and between successive generations.
- Is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development.
- Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and, uses non-renewable resources at or below the rates of development of renewable substitutes while minimizing the impact on land and the generation of noise." (2)

Background

Although the document which defines European transport policies, the White Paper from 2001, only briefly discusses importance of sustainable development, it did not address sustainability as the main objective of policies in transportation in the period from 2001 till 2010 (3). It is expected that the next revision, which will be adopted and published soon, will have key guidelines toward better and more precise definition and implementation of sustainable principles in the transportation. Last document published by European Commission addressing European strategies in transportation provides an overview of current issues in the EU and also identifies potential policy options which should be evaluated and included in the next revision of the White paper (4). As the main goal of the European Transportation Policy, establishment of the sustainable transport system that meets economic, social and environmental needs of the society is highlighted.

Nevertheless, even though the idea of sustainable transport system is clear, making it real is the other side of the story. Most of research efforts are focused on identifying measures or indicators at the policy design level which will reflect impact of transport systems on economic, social and environmental aspects and many research projects have been conducted addressing this issue. For example, Sustainable Mobility, Policy Measures and Assessment (SUMMA) project, which was conducted from 2003 till 2004 under FP5 program, provided a consistent framework to support policymakers in analyzing trade-offs among economic, environmental and social aspects of sustainable transport (2).

Addressing one of objectives ("...define a set of indicators for monitoring the environmental, economic and social dimensions of sustainable transport and mobility"), list of outcome indicators was identified in this project (Table 1). Outcome of interest is defined as the impact of the transportation system that policy makers are interested in (2). Since these indicators are not measurable,

¹ For more information see <http://www.centreforsustainabletransportation.org/>

each of them is represented by indicators that could be measured and monitored. For each dimension of the sustainable system: economic (EC), environmental (EN) and social (SO), over 60 indicators in total were developed.

Table 1. Final list of outcome indicators from SUMMA project

Outcome of Interest	Indicator name
EC1 ACCESSIBILITY	EC11 Intermodal Terminal facilities EC12 Accessibility of origins/ destinations EC13 Access to basic services (SO11) EC14 Access to public transport (SO12)
EC2 TRANSPORT OPERATION COSTS	EC21 Supplier operating costs EC22 Transport- related expenditures of households (soc 21) EC23 Transport prices
EC3 PRODUCTIVITY / EFFICIENCY	EC31 Freight haulage-related costs on product costs EC32 Utilisation rates EC33 Energy consumption efficiency of transport sector EC34 Energy efficiency
EC4 COSTS TO ECONOMY	EC41 Infrastructure costs EC42 Public subsidies EC43 External transport costs EC44 Final energy consumption (EN11)
EC5 BENEFITS TO ECONOMY	EC51 Gross value added EC52 Public revenues from taxes and traffic system charging EC53 Benefits of transport
EN1 RESOURCE USE	EN11 Energy consumption EN12 Consumption of solid raw materials EN13 Land take
EN2 DIRECT ECOLOGICAL INTRUSION	EN21 Fragmentation of land EN22 Damage of underwater habitats EN23 Losses of nature areas EN24 Proximity of transport infrastructure to designated nature areas EN25 Light emissions EN26 Collisions with wildlife EN27 Introduction of non-native species
EN3 EMISSIONS TO AIR	EN31 Transport emissions of greenhouse gases EN32 Greenhouse gas emissions from manufacture and maintenance EN33 Transport emissions of air pollutants EN34 Air pollutant emissions from manufacture and maintenance
EN4 EMISSION TO SOILAND WATER	EN41 Hardening of surfaces EN42 Polluting transport accidents EN43 Runoff pollution from transport infrastructure
Outcome of Interest	Indicator name
	EN44 Wastewater from manufacture and maintenance of transport infrastructure EN45 Discharges of oil at sea EN46 Discharges of wastewater and waste at sea
EN5 NOISE	EN51 Exposure to transport noise
EN6 WASTE	EN61 Generation of non-recycled waste
SO1 ACCESSIBILITY AND AFFORDABILITY (users)	SO11 Access to basic services SO12 Access to public transport SO13 Car independence SO14 Affordability SO15 Trip length
SO2 SAFETY AND SECURITY (users, drivers, the affected)	SO21 Accident related fatalities and serious injuries SO22 Vehicle thefts & other crimes SO23 Security on public transport
SO3 FITNESS AND HEALTH (users)	SO31 Walking and cycling as transport means for short distance trips
SO4 LIVEABILITY AND AMENITY (inhabitants, society, the affected)	SO41 Walkability, pedestrian friendliness SO42 Traffic calming SO43 Children's journey to school SO44 Open space availability and accessibility
SO5 EQUITY (users and the affected)	SO51 Horizontal equity (fairness) SO52 Vertical equity (income) SO53 Vertical equity (mobility needs and ability)
SO6 SOCIAL COHESION (inhabitants, society and the affected)	SO61 Public opinion profile on transport and transport policy issues SO62 Violation of traffic rules SO63 Long distance commuting
SO7 WORKING CONDITIONS IN TRANSPORT SECTOR (employees, drivers, operatives)	SO71 Occupational accidents SO72 Precarious employment conditions SO73 Work absence due to accidents and illness

Ugwu *et.al.* (5) identify the research gap and need for methods and techniques for sustainable appraisal at various project specific levels (design, construction, operation and decommissioning) and propose an analytical decision model and a methodology for evaluation of application of sustainable principles in infrastructure projects. Within the used research framework in this paper, survey was conducted in order to identify and rank key performance indicators divided into the five main categories: environment, health and safety, economy, societal, resource utilization and project administration. Various stakeholders (clients, consultants and contractors) were asked to rank different KPIs (in total 55) according to their preferences. As expected, different stakeholders identified different KPIs as priorities. For example, consultants ranked waste management for toxic liquid (category: environment) at the first place, while contractors consider design flexibility for noise mitigation (category: environment) and life-cycle cost (category: economy) as priorities.

Currently, for example, there are two research projects under ERA-NET ROAD II² program: Environmental Indicators for the Total Road Infrastructure Assets (EVITA) and Strategic Benchmarking and Key Performance Indicators (SBAKPI). The main objective of the project EVITA is the development and integration of new and existing environmental KPIs in the asset management process taking into account the expectations of different stakeholders (users, operators, neighbors, etc.), while SBAKPI is focused on the strategic level environmental and social KPIs and on benchmarking framework.

Problem definition

Most of the effort is placed in the area of defining and promoting sustainable transport as the system. The application of main principles of sustainability in transportation sector in the reality is in its starting phase. Since the sustainable transport is a topic with firm future, further research efforts could be emphasized on the principle of translating national or global level strategies into the project level specifics. In other words, effort should be made to identify what can be achieved in reality on the project level towards the final objective - sustainable transport.

If we observe the problem of “making it real” in the context of transportation system complexity, number of involved parties (policy makers, stakeholders, users) and number of indicators of interest, it can be assumed that the process of finding the appropriate models, balanced criteria and manageable amount of information for the specific project is not an easy task. If we add to this complexity dimension of public-private partnership characteristics in terms of risk sharing, performance requirement, debt and equity issues and estimation of the project financial feasibility, the task is becoming more interesting and demanding.

Let's observe, for the purpose of the problem definition, PPP as an agreement between a public and a private sector for design, build, finance and operate

² For more information see <http://www.eranetroad.org/>

(DBFO) of the specific (road) project for next 25-30 years. Let's assume that the public sector has chosen the policy which will address all three dimensions of sustainability: economic, environmental and social. The question which arises here is what can be specified in the agreement for the specific project which will reflect public sector policies towards sustainable transport systems? Which part is manageable at the national level, or, in other words, which part is carried by the public sector, and which part can be achieved at the project specific level, that is which part is carried by the private sector? What indicators should be measured and monitored through all phases of DBFO and what is their monetary value?

Proposed research approach

The problem could be analyzed through following three tasks:

1. Identification of project specific indicators. In other words, to identify indicators which are related to the project and can be measured, monitored and evaluated at the project level.
2. Definition of selected indicators in monetary terms. As found in the literature, some of indicators can be represented in monetary terms. Representation of all selected indicators in monetary value is of particular interest for PPPs since their inclusion in the agreement might require some sort of compensation or some other kind of provision.
3. Evaluation of the impact on financial feasibility of the project, if any. To identify financial impact of the integration of selected project indicators into the PPP agreement and to estimate degree of the impact, for example, percentage of the change in the estimated revenue with the respect to the evaluated revenue for the project without selected indicators.

Also, several issues might be interesting to take into account while analyzing this problem: for example, available technology and equipment, or availability of skilled personnel. Correlation between selected indicators and project technical characteristics (for example: area under the pavement, forecasted traffic, maintenance plans and energy use etc.) might be interesting in terms of defining the sign of the correlation, that is, if it is positive or negative. For example, if the policy is to promote alternative means of transportation in order to reduce traffic and gas emissions, which might be considered to be in negative correlation in monetary terms with the estimated number of vehicles which is one of crucial parameters for assessment of the project financial feasibility.

Conclusions

Although concept of sustainable development is not new, its definition and implementation in various areas like transportation might be considered as something that became spotlight in recent years. Sustainable transportation as a system is a topic in which lots of research effort is emphasized. Definition of key performance indicators in sustainable transportation was and still is a

topic for several research projects resulting in a large number of indicators which are becoming more and more difficult to handle and understand.

Since EC policies will include sustainable transportation as one of key objectives, it seems that it is a time to observe PPPs and sustainable transportation under one umbrella. As PPP is an agreement for a specific project which implementation (design, build, finance, and operate) should reflect higher level policies toward sustainable transport system, this issue might be observed as a problem of sharing “sustainable” responsibilities between the public and the private sector.

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