

USING PERFORMANCE INDICATORS TO PROMOTE SUSTAINABLE TRANSPORT IN JAPAN

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ABSTRACT

The challenges associated with using performance measurement to steer transport policy towards sustainability include general aspects of measuring sustainability of transport systems with indicators as well as specific national and institutional conditions for adopting and responding to the information produced by such sustainability indicator systems. Japan is interesting in these regards, since the country has adopted strategies for achieving a more sustainable transport situation, as well as frameworks of policy performance measurement and management. The paper will describe a general framework for reviewing sustainable transport policy performance measurement and will apply it to Japanese transport policy, with a focus on two specific cases. The framework is based in current scholarly literature on performance indicators to support sustainable transport policy and more general literature on performance measurement. The information of Japanese cases is obtained by review of key policy documents, reports and academic papers and through a series of semi-structured interviews with experts and officials in Japan. The paper combines insights from two ongoing research projects supported by the Strategic Research Council of Denmark, ‘SUSTAIN – National Transport Planning’, and ‘Drivers & Limits. Transport - possible contributions to climate change.’

Keywords: sustainable transport, Japan, indicators, performance, frameworks,

INTRODUCTION

Transport systems provide essential services to modern societies, but also produce a broad range of negative impacts that affects present and future generations. In response, the notion of sustainability has been adopted in the formulation of transportation policies of several nations across the globe. However, the transition to a sustainable transportation system is widely seen as a huge challenge for governments, which will require a comprehensive and long term effort (EEA 2000; Banister 2008; ADB 2009, ECMT 2008)

Among the key tools that governments may apply to help face this challenge and support transitions towards sustainability are indicators and performance measures (Meyer 2005; Joumard & Gudmundsson H. 2010; Litman 2007; Ramani et al 2011). Indicators and performance measures may help to operationalize sustainability so the concept can be incorporated in the development, ex ante assessment, monitoring, and ex post evaluation of transport policies, programs, plans or projects. These tools may thereby help governments align or adjust their transportation policies and plans according to sustainability principles and goals (ECMT 2009; Ramani et al. 2011; Jeon & Amekudzi 2005).

While the use of such kind of tools has a strong basis in many Western OECD countries, where performance measurement and indicators form parts of general governance frameworks these tools are also increasingly being applied in policy making elsewhere.

This paper has a main focus on Japan. The aim of the paper is to analyze to what extent indicators and performance measures are used for the promotion of sustainability in the context of Japanese transportation policies.

There are two main reasons for focusing on Japan in this context. The first reason is that Japanese transportation accomplishments so far appear to be attractive from a sustainability point of view. These include features such as a very high share of rail in passenger transport; successful adoption of several technological innovations; significant reductions in air pollution and accident levels over the last decades, and ten years of steady decline in transport greenhouse gas emissions (MOE & MLIT 2009; Suzuki et al. 2011). Moreover, Japanese governments have committed to a further promotion of sustainability and implementation of low carbon transport strategies (Government of Japan 2007; MOE & MLIT 2009). The second reason is that the country nevertheless faces significant challenges that may severely constrain its abilities to invest sufficiently in the fulfillment of such promises. These challenges include the aging and decreasing population, restrained economic development, mounting public debt, increasing urban sprawl, and long shadows cast by devastating natural disasters. Faced with internal and external challenges, governments often seek new paradigms for governance and may initiate administrative reforms to enhance governmental performance (Moon and Ingraham 1998). Indeed, governance mechanisms such as administrative reform, regionalization, policy experimentation, and performance evaluations have increasingly been adopted as part of contemporary transport policy making in Japan (Nishio et al. 2006; Morichi 2005; Meyer 2005).

Interestingly, such mechanisms not only offer ways to manage current policy challenges, they are also seen by several international scholars and think tanks as important tools for promoting transitions to a more sustainable transport future (Fabian & Patdu 2011; Joumard

& Gudmundsson 2008; Zhang & Fujiwara 2007; Litman 2007, WBCSD 2004; Black et al 2002; EEA 2000). In other words, there is a potential for policy management tools such as indicators to be applied also in the service of sustainability.

The paper will look into how this plays out in the context of Japanese transport policies. The scope is limited to review the role of indicators and performance measures in fostering or supporting transitions towards sustainability in Japan. The aim is not only to describe the Japanese situation but to shed light on how particular national circumstances may condition the extent to which performance indicators may actually support sustainability.

METHODOLOGY

The paper will first derive a conceptual framework for analyzing the use and influence of indicators to promote sustainability in transportation policies generally. The framework is based on international literatures on sustainable transportation, indicator systems, and public performance measurement. Two aspects are particularly highlighted, namely a) the way in which the sustainability notion is represented and reflected in indicator systems, and b) the extent to which the actual use of the indicators is supported by the procedural and institutional context, that is, if the indicators are enabled to support and influence change or transition.

The framework is applied on two cases, namely two different programs within Japanese transportation policy. The first one is the overall approach to performance measurement adopted in road transportation policy by the Japanese Ministry of Land, Infrastructure, Transport and Tourism (hereafter, MLIT). The second is the experimental 'Eco-model' cities program also supervised by the MLIT and addressing the urban level. Both programs were instigated by former Liberal Democratic Party (LDP)-led government of Japan', which was in office up to September 2009 (and again from late 2012).

The empirical material for the cases consists of review of literature on Japanese administrative, environmental, and transport policies, study of selected Japanese policy documents in those fields, and a series of 10 interview sessions with groups of Japanese officials (particularly from the Ministry of Land, Infrastructure, Transport and Tourism, MLIT) and groups of transportation researchers. The written material (in Japanese and English) has been collected over the period 2008-2011. Two explorative interviews were undertaken in the summer of 2008 and the remainder during the first half of 2011. The transcripts of interviews have been approved by all interviewees. Citations from interviewees are given as anonymized 'personal communication' in order not to expose these individuals.

The work reported in the paper is still in progress. The work will also be extended to include comparisons with countries in Europe, America. It is eventually to inform the development of national systems for sustainable transport performance measurement in Denmark and elsewhere.

The following section of the paper will establish the conceptual framework that has been used. The framework is then applied in a presentation and review of the two cases of indicator

use in Japanese transportation policy. The section following the cases will discuss the findings and will suggest perspectives for further research. Finally a conclusion is provided.

CONCEPTUAL FRAMEWORK

Following the international debate on sustainable development after the Brundtland report of 1987, the formulation of transport policy and planning frameworks has in recent years become influenced by the notion of sustainability. The sustainability discourse in the transportation area has reflected growing concerns over the environmental impacts of transport, as well as the social and economic costs associated with the construction and maintenance of expanding transport systems. This has also been the case in several Asian countries including Japan.

While there is continuing difficulty in translating precautionary principles of sustainability into a clear vision of sustainable mobility, key features of the emerging global sustainable transport policy agenda or 'paradigm' (see e.g. Schiller et al 2010; ADB 2009; Banister 2008; Dalkmann & Brannigan 2007) include,

- Increased attention to long term environmental, social and economic consequences associated with transport systems, taking into account associated planetary boundaries and thresholds, and the need to integrate between goals for all dimensions of sustainability;
- involvement of broader groups of stakeholders from the start of the transport governance processes, and to get an early buy-in from politicians;
- Internalising environmental and societal externalities in the price of transport systems and services;
- Planning for and implementing broad schemes and measures that extend beyond traditional infrastructure projects, following 'Avoid-Shift-Improve' strategies, where,
 - Avoid means integrating transport with land-use planning and managing transport demand in order to reduce the need for transportation;
 - Shift means accommodating growing transport demand by making less resource- and energy- intensive modes - such as walking, cycling, rail and other forms of public transport – more attractive and by promoting multimodal transport;
 - Improve means promoting systems and technologies that are more energy and environmentally efficient;

To make the sustainable transport agenda operational and effective through governance it is often argued that broader integrated strategic policy and planning approaches are required. These should involve hierarchies of goals, targets, and associated performance indicators to monitor development and maintain change and progress (see e.g. Harata 2008; ECMT 2008; Black et al 2002; Ramani et al. 2011). This emphasis on policy performance allows connecting the sustainable transport agenda to another important worldwide governance trend namely 'New Public Management', or 'New Public Governance' reforms (Pollitt & Bouckaert 2011). These reforms have sought to modernize and generally improve the effectiveness of (costly) national public administrations, while also making them more responsive to citizen's needs, market trends and changing public concerns. Key elements in

those reforms include emphasis on the monitoring of policy performance via systems of indicators and targets. The delivery of the results may be trusted to dedicated independent agencies, public-private partnerships, or private market actors, as well as to traditional large public bureaucracies. Transport policy has in many countries been strongly influenced by such management reforms, for example through outsourcing of construction of road and rail infrastructure and the operation of public transport services to private operators, accompanied by performance based contracts and similar mechanisms to govern the measurement and delivery of results (Sager & Sørensen 2011; Hughes 2011)

Performance indicators are thus a key node where the ‘sustainable transport paradigm’ can be connected with the ‘new public management’ reform model. This connection could potentially allow for focused policy steering towards smarter, leaner and greener transport systems if goals and performance measures are adopted within the public management context. We will now look a little closer on the performance indicator instrument and its potential role.

Indicators can generally be understood as measurable variables that are selected for their ability to represent and communicate changes in certain phenomena of wider interest, such as quality of life, sustainability, or more specific aspects of those. *Performance indicators/measures* are indicators that measure performance in regard to specified objectives of organizations, policies or projects (Falcocchio 2004; Ramani et al, 2011). In transport, performance-based planning and management regularly include indicators, which measure *inputs* to the transport systems (e.g. costs of construction, or resources needed); *outputs* from them (e.g. traffic volumes, travel speeds), and not least *outcomes* of them (e.g. accessibility to jobs and services, congestion, safety, environmental impacts).

According to one recent typology of indicators for sustainable transport (adapted from 8), different types of indicators may serve a variety of planning and policy making functions such as:

- Awareness functions; using indicators to draw attention to emerging problems or possible solutions, even if not currently on the planning palette
- Diagnostic functions; using indicators to analytically distinguish the impacts of different background or policy variables on observed phenomena of interest
- Assessment functions; using indicators to detect and interpret real or projected developments compared to desired conditions, benchmarks or specified targets
- Decision functions; using indicators such as Cost/benefit ratio, Cost/effectiveness ratio, etc. to rank performance, help selection of projects, or allocate funds
- Monitoring and controlling functions, using indicators to track progress and monitor results of sustainable transport strategies
- Accountability functions, using indicators to track responsibility for performance in order to reward superior performers or ‘punish’ inferior ones (e.g. check performance of organization, project, personnel, even political decision makers)
- Communication functions, using indicators to engage citizens and stakeholders in policy, or to monitor satisfaction with services offered by the transport system

Using indicators in a combination of such functions will ideally foster learning and thereby help improve the management of projects, organizations or policies over time and lead to fulfillment of sustainability goals, e.g. through repeated cycles. It has thus been claimed that,

“...(t)he real value of performance measurement is in the development of an improved decision-making and investment process, not the achievement of many arbitrary short-term targets.” (Amekudzi & Meyer 2011).

However, it is also well-known that indicators have limitations as measurement, management or communication tools (Lyytimäki et al 2011; Marsden 2008). Limitations of indicators can arise in terms of limited accuracy, comparability, credibility, availability, or relevance for policy, which all may lead to unintended, harmful and even counterproductive results of the measurement exercise (Perrin 2011; Wankhade 2011; de Bruijn 2002). To counter such problems it is important to consider proper *frameworks* for the construction, selection and application of indicators. Frameworks have been defined as “... the conceptual and procedural constructs that assimilate, process and give meaning to information“ (Assmuth & Hildén 2008), p.73). A framework should thus make sure that an indicator set as a whole represent the relevant outcomes (conceptual aspect), is connected properly to the purpose, objectives, and activities of the organization who is to use it (procedural aspect), and reflects the general context in which it is to operate, e.g. in terms of culture, policy etc (contextual aspect).

For indicator frameworks to genuinely support sustainable transport Jeon and Amekudzi (2005) suggest three important characteristics. An effective indicator set for sustainable transport captures,

- a) the impacts of decisions on the three important areas that define sustainability, including, the economy, environment and social-well-being;
- b) the causal relationships that lead to progress toward or deviation away from sustainability (e.g. through use of policy interventions); and
- (c) the level of influence or control that the responsible agencies have over the causal factors of sustainability, through policy measures, resources, etc.

These essential aspects of indicators and frameworks will be considered in the Japanese examples reviewed in the following, where there will also be attention to the crucial links between indicator based reporting and actual decision making and policy learning processes.

JAPANESE EXPERIENCES WITH TRANSPORT POLICY INDICATORS

Japan is rather unique in how its transport systems have developed historically. Significant changes has occurred from the booming post war decades where rapid urbanization and centralization occurred and massive infrastructure investments were made, to the post-2000 years with growing emphasis on finding proper scales and diversifying strategies to accommodate environmental and economic constraints. Here we can only highlight a few features of the Japanese policy context that are particularly relevant for the following analysis (for general reviews in English see e.g. (Black & Rimmer 1982; Enoch & Nakamura 2008; JRCTP 2010). As mentioned above governance reforms seeking to control excessive public economic and environmental burdens associated with transport and infrastructure development have gradually been introduced. On the economic side these include for example

privatizations of the national railways systems in the 1980'es, partial privatization of the national express toll road network in the 1990'es, and the abandoning of a fuel tax formerly earmarked for road investments. On the environmental side Japanese central and local governments have introduced several partly successful and partly unsuccessful measures to limit transport emissions, noise, accidents and congestion during the last decades (Suzuki et al. 2011). Issues of oil dependence and climate change have also become paramount concerns, and specific Greenhouse gas reduction goals, targets and measures have been adopted. These programs, have - together with the effects of economic decline on car sales and traffic volumes - contributed to the remarkable downward trend in transport CO₂ emissions, which was observed already from 2001 (Suzuki et al. 2011). On the administrative side the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) was formed in 2001 by merging former separate ministries and agencies for transport, construction, and land use planning. The Diet also adopted the "Social Infrastructure Improvement Priority Planning Act" of 2003, which instated comprehensive intermodal "Priority Plans" for Social Infrastructure Development, to replace previous separate plans for each branch (JRCTP 2010). Inspired by New Public Management reforms in countries such as the US, UK and New Zealand, Japanese government adopted the Government Policy Evaluations Act' (GPEA), in effect from April 2001. This law requires ministries to evaluate their policies and programs before as well as after implementation. According to (Yamamoto 2003), Japan has thus advanced from 'talk' through 'decision' to 'action' in the area of performance management. Some scholars observe limitations, for example that legislation to preparing government budgets has not been reformed to a performance-based approach (Yamanaka 2002). Other policy initiatives have been embraced including extensive programs to experiment with new policy initiatives (such as charging level on toll roads) and to evaluate the result to redesign existing policies. In many of these policy areas there is an increased attention to and uses of indicators for performance measurement, which now permeates the transport policy area and also connects to the issues on the sustainable transport agenda (MLIT 2009; Ishida 2010; Suzuki et al. 2011).

Two examples of transport policy monitoring will now be described, and then analyzed with regard to their significance for the promotion of sustainability.

Policy evaluation in the MLIT with road transport as example

The first initiative to develop a framework for performance measurement in transport policy was undertaken in the 1990'es by the "Road Council", an advisory body, under the (then) Ministry of Construction (Hirai et al. 2004). The work was initiated on a background of growing public critique of expansive road policy with too little concern for negative impacts for urban environment (personal communication). As mentioned the Government Performance Evaluation Act of 2001 made generally it mandatory for all ministries to conduct ex ante as well as ex post evaluations of major policies, but the detailed way to implement these system was to a large degree decided by each Ministry itself (Yamanaka 2002).

The MLIT instated three procedures from 2003 onwards, 'Policy Assessment' performed before adoption of a policy; 'Policy review' evaluating detailed outcomes of adopted policies in an area; and 'Policy check-up' in an annual report focusing on goals and key performance

indicators (personal communication). Here we will briefly look at the ‘check-up’ using its 2010 version.

In the annual ‘policy check-up’ a range of existing transport policies and programs have their performance ‘checked’. This includes the ‘Social Infrastructure Improvement Priority Program’, the 5-year investment program required by law. This law states five aims that the program must reflect, including the promotion of sustainable development and environmental protection, which are therefore items for indicators used in the check-up. The current program is adopted for the period in 2008-12. A set of 12 overall goals are formulated for the five year period. For each there are a number of quantified performance indicators with associated annual targets. Apart from the Social Infrastructure program the check-up also assess policies for traffic safety, quality of housing for elders, climate change, etc. TABLE 1 illustrates the small selection of targets and indicators in the check-up dealing with ‘Road Construction’. In total more than 280 individual indicators are reviewed in the whole annual check-up (MLIT 2010),

TABLE 1 TRANSLATION FOLLOWING ROAD BUREAU (2010) (Adapted from MLIT 2010)

Theme	Measure	Performance indicator	Baseline 2007	Results 2008	Target 2012
Vitality	Construction of trunk road network	Development rate of ring roads in three major metropolitan areas	53%	53%	69%
	Alleviation of chronic traffic congestion	Time loss due to closed railroad crossings including “perpetually closed” crossings	Approx. 1.32 million person-hours/day	Approx. 1.31 million person-hours/day	Reduction by approx. 10% (Approx. 1.18 million person-hours/day)
Safety	Improvement of traffic safety	Incidence of death and injury accidents in road traffic	Approx. 109 accidents/100 million vehicle-km	Approx. 100 accidents/100 million vehicle-km (interim figure)	Reduction by approx. 10% (Approx. 100 accidents/100 million vehicle-km)
Quality of life and Environment	Improvement of the living Environment	Percentage of specially designated roads constructed or modified to be barrier-free	51%	Approx. 58% (interim figure)	Approx. 75%
	Reduction of greenhouse gas emissions	CO ₂ emissions in transportation sector	254 million t-CO ₂ (2006)	236 million t-CO ₂ (preliminary figure)	240 million to 243 million t-CO ₂ (2010)

Since 2008 the road transport indicators are incorporated in the full-check-up report of the MLIT, whereas previously there were separate annual ‘road performance’ report. However, this adjustment seems largely driven by cost cutting efforts (personal communication), rather than aspirations for deeper integration. In any case each subsector still has its own identifiable set of goals and indicators in the general report. An external ‘Policy Evaluation Committee’ has the task to review the results every year. Their role is primarily to comment the results and not to suggest indicators or targets for them. The committee is composed of academics and some sector stakeholders (personal communication). After review the Check-up report is approved by the Minister and made public.

In the Fiscal 2009 check up report it was reported that 60% of measures were on targets, whereas 26% were not. These results were reported in some news media. The results can be used in various ways to manage policies. Japanese Government policy evaluations are

generally supposed to inform the annual budget preparation process helping to identify where to allocate funding (GPEA 2001, article 4). In MLIT the items titles in the evaluation reports and in the budget documents have even been aligned to facilitate such joint consideration (MLIT 2008, p. 42). However the performance feed-in to the budget process is seen as an internal exercise within the administration, not as a political process. The performance reports are not sent to the Diet. The Diet is not involved in its processing and is not expected to respond to it. Moreover, the national budget for the road area is rather fixed, so the annual 'Check-up' reports do in fact rarely lead to any revision of the annual budget, for example in areas with low performance. Budget adjustments based on performance would rather be considered in connection with drafting the next 5-year Infrastructure program (personal communication). This corresponds closely to views in the general literature, commenting that the Japanese evaluation legislation only provides for vague linking of performance to budget allocations (Enoch & Nakamura 2008; Yamanaka 2002; OECD 2009).

The check-up results are not used directly in connection with allocation of funding to decentralized government bodies such as prefectures, but various parts of the performance information is used in connection with review of decentralized policies and measures, for example in the traffic safety area (personal communication). In general the MLIT Road Bureau (personal communication) considers performance measurement to be well engrained in the 'culture' of the ministry, but challenges remain, including needs to further streamline and reduce costs for data collection, which could lead to fewer (but possibly more solid) indicators. Meanwhile needs for additional indicators for example related to disaster prevention in the wake of the 3/11 Tohoku Earthquake has arisen. Some independent assessments suggest that performance measurement in MLIT may receive declining attention (Terabe 2011).

In review we can observe that the three dimensions of 'sustainability' (social, environmental, economic) are represented already in the limited selection of the full set of measures shown in table 2, although the topics do not refer to any particular sustainability concept, let alone provide a benchmark towards the goal of sustainable transport. The measures could thus inform a general discussion about sustainable transport, but hardly provide a clear conclusion, especially since the measures are not connected in any way; it is for example not possible to observe if improved performance on one indicator in one dimension is obtained at the expense of another indicator in another dimension. The particular Japanese understanding of 'sustainability' associated with resilience towards disasters, is discussed and will likely be incorporated in the future development, which could increase its relevance for a national debate further, if representative and actionable indicators in this area is found.

Some of the performance measures refer specifically to the national road network (under MLIT), and are thus more directly actionable for the Road Bureau while others target the whole national road system or even the whole transport sector, which make them seem less directly useful. The limited possibility to use performance measures for example to revise allocation of funding for programs in the administrative setting has meant that the direct control function is small, but the MLIT may see other internal control uses, than simply funding. The results are reviewed and publicized, but to what extent that contributes substantially to raise awareness of problems or issues is not immediately clear. The reporting no doubt contributes to make communication easier. Limitations to funding may force the

program to shrink further. Considering the rather large amount of measures reported today, it may not necessarily be harmful to concentrate limited funding to fewer, more solid indicators.

Eco-model cities program

Urban transport planning in Japan is governed by authorities at different levels from municipal to prefectural to central government (Enoch & Nakamura 2008). Land-use master planning is the responsibility of city governments. Integrated area wide transport planning is partly hampered by the small size of municipal boundaries. Central government is involved in a number of ways, through general spatial planning strategies, regulations, funding/subsidies and guidance (Matsuura 2005). Subsidies cover several areas from urban rail systems to urban 'revitalization' (MLIT2009; Morichi 2007). In some of these efforts performance indicators play a role; there is not a comprehensive system for monitoring urban transport or urban performance in general.

There have been a series of central government initiatives with specific aims to promote transition to sustainable, and/or low carbon urban transport systems. Often an experimental approach is adopted, due to uncertainty with regard to the effectiveness and feasibility of new measures. We will look at the so-called 'Eco-model cities' program initiated in 2008, where the government selected model cities, which were to *tackle pioneering initiatives* in order to *transform Japan into a low-carbon society*. 82 cities applied for the model city program in 2008, and 13 were selected as models, based on a set of criteria, including the ambitions of targets; achievability of the proposed measures, adaptation to regional context, ability to serve as role model, and ongoing efforts to improve (Murakami 2008).

One of the selected cities was *Toyama*, which is a prefectural capital city at the Japan Sea coast with 413.000 inhabitants. Toyama is particularly interesting because its unfavorable starting position from a sustainable transport point of view. It is among the regional cities with the highest levels of income, largest houses and highest car ownership and use (Mori, 2008), and the decade before the new policies were adopted had seen a steady decline in public transport patronage, closure of a rail line, and considerable loss of jobs in the inner city (Takami & Hatoyama 2008; Kono 2010). Regional cities like Toyama are also especially challenged in regard to rapid aging of population in surrounding areas (Kikodoro 2008). The aim for the political leadership in Toyama was to turn the negative trends around, not only for ecological reasons but to the economic and social decline.

Toyama was selected to the Eco-model program because of its ambitious strategy towards for 'compact city' development with a view to reduction in travel demand and modal shift. The overall goal for the project is to reduce CO2 emissions by 30% in 2010-2030, and 50% by 2050 (Mori 2008). The adopted policies include investments in Japan's first modern light rail line and several other public transport systems. Other significant elements include provision of subsidies for housing development in the city centre and around public transport nodes is given, as well as subsidies to families willing to relocate from outer suburban dwellings to more central ones are elements included in the strategy. Toyama has also managed to leverage central government support through several other programs, such as grants for revitalization investments in the inner city zone (including pedestrianization), and funding for

rebuilding of the main railway station to accommodate Shinkansen high-speed line opening service in 2014 (Takami & Hatoyama 2008).

Part of the Eco-model cities program is detailed monitoring and evaluation of progress. A secretariat and an evaluation panel have been established to conduct the monitoring process. Toyama city has defined detailed goals and performance measures for the various components of the strategy. These are evaluated based on several criteria that include (among others),

- progress rate of implementation for planned measures,
- effectiveness of measures
- change in location patterns (increased share of population living in centre)
- tram ridership (goal: increase 30% in five years)
- increase pedestrian flow in city centre
- CO₂emissions.

The Eco-model city evaluation panel collects the information and prepares a review of all reports from the cities and publishes an annual status report (so far on results for 2009 and 2010). Progress compared to plans and goals is assessed and an overall rank is given using a qualitative 4-step scale. The first year (2009) reports showed considerable progress on several indicators, although not all. Toyama was given the second highest grade “A”, meaning “Excellent progress, such as implementing innovative projects while working ahead of the planned schedule” (Joint Bureau for Regional Revitalization 2010). The city was also commended for submitting performance information with high (70%) degree of quantitative verifiability (personal communication). The second year (2010) report shows stagnation in the improvement of some indicators. The transport emissions are almost unchanged from 2009, which appears not to be according to plans. We did not yet explore if the reasons can be read from the indicators. The annual results are being discussed between the city and the evaluation panel in order to understand factors behind observed changes and possible policy implications (personal communication). According to Toyama city the detailed monitoring is primarily conducted to fulfill the requirements of the eco-model city program. However the results are also reported as public information to citizens and too many outside visitors. The city is very active in communicating results and nationally and internationally. In addition to the evaluation report, the Ministry of Environment publishes good example practices from cities including Toyama, in order to promote spread and uptake.

In review it can be noted that the evaluation of eco-model cities are solely focused on one dimension of sustainability – the environmental one. Progress towards low-carbon goal is often consistent with environmental sustainability. However, there is no mandatory monitoring of possibly additional - or potentially contradictory – effects on e.g. safety, travel costs, mobility etc, even if the measures adopted include shift to public transit and walking, which would thereby affect social and economic dimensions. Since the project is integrated with the city’s general urban and transport planning, it is likely that a comprehensive view of these impacts is considered by the city anyway. But the eco-model city program is not tied into the broader goals and measures at the central level, for example in the MLIT’s general ‘check-up, to allow a full evaluation of contribution to all sustainability dimensions.

It is clear that indicators can be key elements for learning in an experimental process such as this. The monitoring appears to be very close and detailed, tracking the implementation of

specific measures as well as more general effects, almost like a control effort. However, there does not appear to be any mechanism attached to the monitoring process that would allow the central government to steer the actions at the urban level; it is a voluntary program that is not directly connected to e.g. subsidies or rewards for performance, other than praise and encouragement. For the city, on the other hand the monitoring is target related and actionable, and based on data the city collects itself. This should provide directly useful information for the city. The collaboration with the external evaluation panel moreover seems to provide opportunity to support a learning process. In this regard it is highly relevant not only to publish positive results and promotion material, but also problematic results that may inform about unexpected weaknesses in the design or implementation of the planned measures. It is a weakness from the sustainability point that CO₂ emissions are the only indicators, but on the other hand the focus may be more useful from a learning point of view.

DISCUSSION

Performance measurement using indicators has been adopted in various programs under the MLIT, which have relevance for sustainable transport. The formal adoption of performance measurement is widespread, but still limited compared to a comprehensive system to promote sustainability, which would ideally a) cover all aspects of sustainable transport, b) be strongly linked to decisions and budgets, and c) connect local and central policy indicator sets. However, according to international literature all countries adopt such systems to varying degree and in their own way (Pollitt & Bouckaert 2011), and none seem to have such 'ideal comprehensive systems.

In Japan each ministry adopts its own specific approach to performance measurement, which may on the one side enhance the relevance and applicability for the particular ministry, but may on the other hand complicate monitoring that cuts across several ministries. The performance measurement systems applied by the MLIT seem to generally correspond according to prescribed procedures. It is less clear from the analysis what real use and influence this has in policy making processes, especially at the central level. The use seems limited for example by the fact that programs are not regularly revised in response to performance, and that performance is not directly linked to budgeting. It seems that the emphasis on collection of useful information for policy review and learning processes is stronger in the eco-model city case than at the level of policy check-up in the MLIT, where there appears to be fewer degrees of freedom to act based on what the indicators report. This is partly due to limited flexibility in the budget process, and partly because the multitude of indicators and subjects tend to point in different directions.

Still, the general system may support communication (although of a one-way kind), general awareness and stronger attention to outcomes. Whether the programs are a worthwhile effort will depend on the costs associated with the program versus the concrete use that the Ministry or other can make of the information. Here it may be relevant to recall the stipulation by Amekudzi and Meyer (2011) according to whom the real value of performance measurement is to be judged by its ability to support improved decision-making and investment processes, rather than the achievement of many arbitrary short-term targets. In the best case the measurements help the MLIT manage its programs and develop a deeper understanding of

how the various programs and measures work and interact. In the worst case it decays to a resource-demanding formal exercise of limited use.

Impacts associated with all three dimensions of sustainability are covered in the 'Check-up' in the MLIT, but not directly connected to any explicit interpretation of sustainability. Also there is no systematic consideration of how performance in one indicator may influence another. Hence the process can inform a general discussion of sustainability, but hardly a strongly conclusive one. The eco-model city program monitoring is directly relevant for the environmental dimension of sustainability, and if the program is maintained over time with rigorous reporting along the causal chain from policy interventions to behavioral adjustments, to emission impacts it might help to bring out greatly needed diagnostic information about the effectiveness of planned and adopted policies. Not least relevant if the information can identify types of measures, which may not produce quite as strong results as hoped for.

Another question is if the focus on the 'low-carbon' issue will remain sufficiently attractive for the cities, considering how remote the climate effect are. Possibly a program with more direct focus on issues of local concern such accessibility, and quality of life, monitored through a broader set of goals and indicators, addressing all dimensions of sustainability, would be more fit to maintain local attention.

In the continued research it would be relevant both to study more areas/programs for indicator applications, and to move a step closer and observe in more detail processes of definition, application and interpretation of particular indicators. Another approach could be to study policy decisions of major significance for sustainable transport at central or local level (e.g. the termination of certain programs, or decision on certain investments) and look into the role of available performance indicators had in informing such decisions.

CONCLUSIONS

Indicators are used in Japanese transportation policies within framework that have similarities with Western 'new public management' approaches, as well as in more experimental programs. The government has expressed ambitions to pursue sustainability, although with particular priorities. Sustainability concerns are reflected in the performance measurement systems, but not in a comprehensive or systematic way. Limitations can be observed with regard to the representation of sustainability dimensions and their interconnectedness as well as with regard to the connection of indicator performance to decision making. The use and influence of indicators seem more pronounced in the case of the centrally supported experimental eco-model city program than for road transportation policy. In either case governmental performance measurement has played a minor role in that has delivered the positive outcomes. The research suggests that the institutional context for indicator applications is highly important for how much they are able to promote sustainability. The influence of this context could be studied further through additional programs and through reviews of similar programs in other countries.

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