

THE USE AND INFLUENCE OF INDICATORS IN EUROPEAN SUSTAINABLE TRANSPORT POLICY

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ABSTRACT

The paper focuses on the use and influence of indicators in European sustainable transport policy from a 'knowledge utilization' research point of view, using a qualitative approach. The starting point is the contrast between a general proposition that indicators are important tools for sustainable transport policy making, and 'utilization' oriented research literature, which has often demonstrated that formal technical knowledge is used much less, or at least differently, than expected in policy and decision making .

The paper looks at two cases of indicators applied for strategic policy making within the sustainable transport agenda. The first case concerns indicators tracking the fulfillment of national transport policy objectives in Sweden. The case explores the use and influence of an annual monitoring and evaluation report produced for this purpose. The second case deals with indicators applied for the Mid-Term Review of the European Commission's transport policy White Paper 'Time to Decide' We focus on use and influence of the indicator based study 'ASSESS' conducted in 2005.

It is found that several indicators are in fact used in policy processes, as evidenced in policy documents as well as through interviews. However, use does not automatically mean influence on policies or processes in more than the most superficial manner. Indicators seem to play an – at most - limited instrumental role in the studied policy cases while some signs of symbolic, conceptual and process roles are found. In the EU case some evidence of what we call a rationalization role of indicators is found, meaning that indicators inform and help to rationalize a change in the European Commission's position towards key objectives, and gain influence in this way. Factors that characterize the indicators, the users, the policy setting and the economic and political background may all contribute to explaining the type of use and influence observed in both cases.

1. Introduction

Indicators have become pervasive elements in transport planning and policy making. So far the research on transport indicators has mostly been concerned with the production of suitable ones for various tasks of planning, assessment and monitoring and bridging information gaps in the knowledge frameworks. The general assumption seems to be that indicators are necessary, and – if they are also 'fit for purpose' (Tuominen et al., 2008) – they will be used as parts of the toolbox and thereby have a positive influence on transport decision making. In the context of the sustainable transport agenda, indicators have been put forward as vital tools to underpin a transition towards new objectives and practices. *In*

contrast, however, research in the use of knowledge, science and information for policy making inside and outside the transport sector has often found that to a large extent formal knowledge input, such as indicators, is ignored by decision makers, or used in more limited or entirely different ways than expected. This may even be the case where the information has been directly targeted - or 'fitted to purpose' to policy making (Eliasson and Lundberg, 2010; Innes, 1998; Sager & Ravlum, 2005).

This apparent mismatch between assumptions and reality as regard policy use of indicators is the topic of this paper. It will focus on the actual use and influence of selected indicators in sustainable transport policy making, using a qualitative approach. The aim is to identify to what extent and how indicators are actually used by intended users, and to critically examine the conditions under which they influence strategic transport planning and decision making within the 'sustainable transport' agenda. By way of two cases, the paper thus explores *if* indicators are used at all, *how* they are used, and also *why* they become influential or not. The paper is an output from the European research project POINT (Policy use and influence of indicators) supported by the 7th Framework Program. Other parts of the POINT project have studied indicator use and influence in other sectors (energy, environment) as well as for cross-sectoral indicators (on Sustainable Development). The project website is <http://bayswaterinst.squarespace.com/>.

In the paper we first introduce concepts and methodology used in the POINT project (section 2). Then the two transport case studies are presented, one about indicator use at the national level in Sweden (section 3), and one at EU level (section 4). In the subsequent chapter the cases are analyzed and discussed (section 5), followed by the conclusions (section 6).

2. Concepts and methods

The study draws on two strains of research outside of transport policy studies per se. The one is the general and technical literature on indicators; their proper design, application and functions in policy and decision making (e.g. Moldan and Billharz, 1997, EEA 1999, Giorgi, L., Franceschini et al., 2008 Giorgi and Pearman 2002). The other is the so-called 'knowledge utilization' literature on the use, and potential influence of various types of knowledge, information and evaluation in politics, administration, or governance (Weiss, 1999, Innes, 1998, Sanderson, 2004, Mickwitz and Birnbaum, 2009). The latter strain again draws on wider fields of research on policy decision making and implementation within public management and political science (Christensen and Lægreid, P 2002, Barker and Peters, 1993; Sabatier, 1999). In this literature policy and decision making is generally considered as a complex activity, where information and knowledge – including indicators – will play minor, but potentially distinct, and sometimes unintended roles.

The 'indicator', or rather its use, is the basic unit of analysis. We define 'indicators' in the standard way as *variables*; more specifically variables that are constructed and selected to operationally represent properties of entities of interest (see Gudmundsson et al., 2009). Three other aspects of indicators are considered. First, variables may be fed with corresponding *values* (=data), to allow measurement of actual or predicted conditions and changes. Secondly, a reference state of the variable (for example a future, or desirable condition) may be built into or connected with the indicator, which allows the indicator to perform assessment or *evaluation*, but also makes it more 'loaded' than a purely

descriptive one. Finally, individual indicators are often used together as sets embedded in *frameworks*, which organize the indicators according to a certain logic, or purpose; this framing may facilitate – or hinder - their application in a specific context.

There are many different types of indicators, which can serve different informational, managerial or political functions and applications. General indicator types are descriptive time series or cross-sectional comparative indicators; ratio, or efficiency type indicators, normative indicators, and composites. The former ones are comparatively neutral; the latter typically more assumption and policy-laden. Various type combinations exist to perform more sophisticated tasks. Indicators may be employed *ex an-ante* (for prediction), *ex.post* (for evaluation) or real-time (for monitoring). A clear framework and fitting-to-purpose ideally allows useful indicators to be selected for the proper applications. However, in this study we focus on reality, not ideals.

The study has looked at three outcomes in the application of indicators, namely their possible 'use'; 'influence', and 'role'.

By 'use' of an indicator (or an indicator set) we simply mean the way persons involved in some policy context handle the indicators when they receive and recognize them. Use can involve reading the information, processing in various ways, reference to the indicator in documents, transfer, etc. Non-use is certainly also an option, in which case there is no basis for extending the analysis.

The question of *influence* deals with, how (the use of) indicators *affects* policy content or process, if it does so. In the words of Rich (1997), 'influence' means "...that information has *contributed to* a decision, an action, or to a way of thinking about a problem" (our emphasis). The influence can more specifically regard formal, explicit aspects of policy such as goals, strategies, or specific decisions, as well as more informal aspects such as ideas, agendas, and processes. The influence can mean that one or more of these aspects *change*, but indicator use could also influence by *confirming* or *consolidating* existing policy agendas, goals, procedures etc.

Finally, we seek to interpret what *role* the indicators play in promoting sustainable transport policy; that is, through which kind of mechanisms their influence (if any) is released. We apply the following four categories of possible roles, inspired from evaluation research: (Weiss 1999, Shulha et al 1997),

- An *instrumental* role of indicators means that indicators are used directly as a tool to form a decision. This is the conventional understanding of the role of indicators
- A *conceptual* role means that indicators contribute to shape knowledge or introduce new ideas, but are not immediately used or influential in decisions
- A *process* role means that indicator use over time affects the way some aspect of policy making is conducted.
- A *symbolic* role means that indicators justify decisions that have already been formed or taken, or give a scientific appearance to them. This may still trigger influence e.g. on processes or balance or power.

By way of method two cases were selected and studied using the above concepts, one involving national transport policy in Sweden and one involving the European Commission. The Swedish case is chosen because the country is an advanced example both of the

adoption of a 'sustainable transport' policy agenda, and of a Management-by-Objectives (MBO) regime in policy, which should generally be conducive to the use and influence of indicators. The European case is chosen because of the significance of the European level for other policy venues and especially because the case was a pioneering example of the use an indicator set directly to a particular strategic policy application.

Both cases are based on reviews of relevant policy documents and indicator reports as well as semi-structured research interviews with selected interviewees, within the categories of civil servants, elected politicians (in Sweden), and experts on both the indicator user and producer side.

Each case has the following structure: First we outline the specific policy context, and then introduce the concrete indicator sets we study. Then follows a subsection analysing the use and influence.

The two cases are not directly comparable in their context or application, and are therefore not subject to a strictly comparative analysis. Rather they illustrate different ways that indicators have been used in strategic transport policy making for sustainability. Nevertheless an extensive cross-cutting discussion is conducted in section 5, in order to identify common or contrasting points.

3. Swedish case study

3.1. Context: Management by Objectives in the Swedish transport policy

The choice of the Swedish case is mainly due to the general policy regime, which is assumed to be conducive to use and influence of indicators. Since the late 1980s, the governance system in Sweden has been widely based on the idea of Management by Objectives (MBO), where the overall annual budget appropriation and reporting is one of the key processes to manage policy performance (Modell and Wiesel, 2008).

Key components of the Swedish MBO regime in transport policy consist of a long-term *overarching* objective for transport in Sweden, with a set of *subsidiary* objectives, and a range of *intermediate or short term* targets for each of those. The objectives are all agreed by the Swedish parliament and government. The present overall objective of transport policy is "to ensure socially and economically efficient and long-term sustainable transport resources for the public and industry throughout Sweden".

A range of documents and procedures are used to support and control progress towards the fulfillment of the transport policy objectives.

3.2. Indicator report studied

A central document - and the focus of this case study - is the annual reports *Follow-up of the Swedish Transport Policy Objectives*, produced by the (former) Swedish Institute for Transport and Communications Analysis, 'SIKA'. These reports were been published annually 1999-2009. A main function of the SIKA report is to provide input in time to prepare the 'communications' section in the annual state budget as part of the MBO

strategy. The report also feeds into preparations of the governmental strategy plans for transport, which is provided every four or six years.

We have studied the use and influence of these reports, in general, and with a special emphasis on the 2008 follow up report (SIKA, 2008) which was used, e.g. for preparing the budget for 2009 (Regeringen, 2008) and the transport strategy plan proposed by the Government in autumn 2008 (Näringsdepartementet, 2008).

The 2008 report has 80 pages divided into six main chapters, a general one for the overall objective and one for each of the subsidiary objectives (two are collapsed into one chapter). The main element is an assessment of progress and results with regard to the overall, subsidiary, and intermediate objectives, with some use of indicators, but not directly focused on a particular consistent set of indicators.

Each chapter employs a combination of statistical or other quantitative indicators, and qualitative assessments. Some data are presented in tables, others as figures. Some of the indicators are purely descriptive, while others are more directly evaluative with regard to certain objectives and targets. Most indicators apply time series data while the timeframes used vary greatly from just two years to more than 30 years for some general transport trends. Other indicators present cross sectional comparisons, such as the difference in accessibility from each airport; or differences in numbers of fatalities across transport modes. For one objective, the total number of fatalities in traffic, there is a clearly normative indicator showing explicitly the gap between the actual trend and the political target. For several other objectives, the indicators show a situation that allows an evaluation to be made in the text. For assessment of the overall objective, no indicators or composites are used, only text.

3.3. Use and influence of the indicators

If we consider specifically the 2008 transport policy context, the report from SIKA with associated indicators helped prepare the annual budget proposition, which is also the primary intended application of the report. We can observe that the report is directly *used* in this function by the Swedish Ministry of Enterprise, Energy and Communications, as it forms the basis for their preparation of a two page section with a current status for fulfillment of transport policy objectives in the chapter on 'communications' in the state budget. Another example of Ministry use is as feed in to the governmental transport strategy plan, as the plan contains a brief section directly using the SIKA assessment report on the transport policy objectives. Additional uses were confirmed in interviews. The report has also been used to some degree by a few Members of Parliament but less or not at all by most other members. It seems that the political opposition is more prone to use this report than politicians from the governing coalition. Further, the report has been used by a number of external agencies and stakeholders; in connection with preparation, assessment and commenting on strategic Swedish transport policy.

The *influence* of the report, on the other hand appears to be low generally, and its instrumental role stands out as quite limited. We did not detect any clear evidence of direct influence in any decisions, except possibly one decision on infrastructure budgets (but highly contestable). It is more likely that the repeated reporting on policy target performance has played a conceptual role in policy making processes, by contributing to

embed and sustain the objectives based thinking itself among decision makers and other stakeholders, while also helping to make at least one actual indicator (traffic fatality counts) stand clear in the mind of some policy stakeholders. A vague symbolic role of the indicator reporting is seen when it is drawn on to provide legitimacy to policy as being 'based on the agreed objectives', an opposite symbolic role is more clear when the Greenhouse Gas emission indicator is used to delegitimize government policy which do not appear to deliver to target..

The case findings suggest that indicators in a MBO policy system like the Swedish one can lead to use, but not necessarily strong influence; that some influence occur though conceptual and symbolic roles indicators play, and that quantitative targets and indicators can contribute to emphasize some issues in policy over others.

4. EU case study

4.1. Context: White Paper, Mid-term Review and ASSESS

European transport policy has gradually emerged as a major scene for the formulation of a 'sustainable transport' agenda. In 2001, the second White Paper "European transport policy for 2010: time to decide" (EC, 2001) was launched. It set out priorities and initiatives for the next decade. In this document was included a specific pledge to undertake a Mid-Term Review in 2005, to check if the measures were implemented and the objectives fulfilled. The results of this review were reported in the communication *Keep Europe moving* (EC, 2006a). While the communication in many ways represents a continuation of the Common Transport Policy, it also proposed a number of adjustments to the existing policy objectives and priorities that some observers see as significant. (Jarzembowski, 2007; Stead 2006). In particular, the objectives of 'decoupling of transport growth from economic growth' as well as to obtain a 'modal shift' in the transport systems by a certain future date were downplayed and modified after the review.

A series of studies was commissioned by the transport general directorate to assist in the review process, and in addition a number of research projects had been conducted. The main study was the so-called ASSESS study (De Ceuster. et. al. 2005a). In the ASSESS study, indicators were connected to a range of models and used to forecast effects of various scenarios for the adoption of transport policy measures towards 2010 and 2020

The context of the case is limited to the review process and outputs as undertaken by the European Commission, with a main focus on the changes occurring in the policy formulations compared to the situation before the Mid-term review. It does not address reactions in the member states or the complexities involved in the subsequent adoption or implementation of actual policy measures.

4.2. Indicator report studied

The reports from the ASSESS study were published by the end of October 2005. There is a main report (De Ceuster et al., 2005a) and 21 annexes, one of which dealt specifically with the indicator based analysis (De Ceuster et al., 2005b).

The application of indicators was different from the example from Sweden above, as it adopted a forward looking, ex ante approach. The European Commission had realized that

too limited information was available to measure the actual results of the implementation of policy measures adopted in White Paper of 2001, so it opted for a model based study, where indicators would be applied to review the expected future fulfillment of key policy objectives, with 2010 and 2020 as target years.

The indicators that were adopted in the analysis were ones that were considered most relevant for the European transport policy goals while also lending themselves to model based forecasting with an available set of models. Table 1 shows the chosen indicators along with the modeled results for a set of scenarios that were constructed, each with a different set of assumption about the adoption of policies.

With regard to the scenarios for 2010 and 2020, the overall conclusion was that while improvements in all parameters are observed for scenarios with gradually more measures implemented, the objectives of the White Paper are generally not met (De Ceuster et al., 2006). For example all scenarios see significant growth in freight and passenger transport volumes, although with variations. Some decoupling is seen, but little of it is found to be due to implementation of the policy measures. The indicators for modal split in 2010 and 2020 were not more positive (De Ceuster et al., 2005b: 42). The results are shown in relative terms, allowing comparison of trends over time and across scenarios without a need for direct comparison with quantitative targets.

Table 1 Transport performance in EU25 for all four scenarios, relative to 2000 (= 100). N = Null scenario, P = Partial scenario, F = Full scenario and E = Extended scenario (De Ceuster et al., 2005a: 70).

EU25		1990	1995	2000	2005	2010				2020			
						N	P	F	E	N	P	F	E
pkm	pkm/year	82	88	100	108	117	117	118	118	135	135	136	127
tkm	tkm/year	83	88	100	108	117	116	116	116	139	136	133	131
intensity pass.	pkm/population			100	107	114	114	115	115	130	130	131	123
intensity freight	tkm/ton			100	102	103	100	100	100	113	107	107	103
accessibility (travel time)	hours			100	99	99	98	96	95	98	97	95	94
GDP (baseline)	euro			100	113	127	127	127	127	162	162	162	162
GDP+ (impact)	euro			100	113	127	134	134	134	162	163	164	165
employment (baseline)	euro			100	104	108	108	108	108	116	116	116	116
employment+ (impact)	euro			100	104	108	108	108	108	116	117	117	117
car park	1000 cars	78	88	100	106	114	114	116	116	132	132	134	124
truck park	1000 trucks	66	82	100	115	119	118	118	117	135	134	132	128
safety	road fatalities	134	112	100	86	77	68	45	28	56	49	24	13
energy	toe			100	103	102	102	102	102	107	107	106	99
CO2	ton			100	103	102	103	103	103	107	108	107	101
PM	ton			100	87	76	77	77	77	67	69	68	65
NOx	ton			100	80	63	65	64	64	49	52	51	48
SO2	ton			100	96	92	89	89	89	94	90	89	84
noise	% hindered persons			100	104	107	107	108	108	115	116	116	113
land take	km ² road			100	100	102	107	120	118	107	113	123	121
fragmentation	km ² road			100	100	102	110	130	130	111	120	135	134

The study also diagnostically compares for 2010 and 2020 three different determinants of energy consumption in (and thus CO₂ emissions from) transport, namely the impacts of growth in transport volume, of modal shift, and of technological improvements. The comparison shows that the influence of modal shift is rather modest, while the

technological component almost balances out the impact of growth in transport volume (De Ceuster et al., 2005b: 76-77).

4.3. Use and influence of indicators

That *use* was made of the indicators in the ASSESS study is almost determined already by the setting. The review formally had to be performed, considerable investment was made to allow the production of the ASEES study and other indicators sources for it, and an institutional framework with competent personnel was available to take the information into account. It is clear from reviewing the key policy documents 'Keep Europe Moving' (EC, 2006a) and the associated impact assessment (EC, 2006b), that they are rather strongly supported by the ASEES study and its indicators. The use in the process to prepare the documents, e.g. as a basis for internal meetings and negotiations, is further confirmed by interviews with key informants in the Commission services.

The *influence* of the indicators on the observed changes in the policy priorities and goals is more difficult to unravel, even if it can be noted that the recommendations taken from the indicators correspond rather well to what became the policy conclusion in the official documents.

The difficulty of interpreting exactly the role of the indicators stem from several factors. First of all many factors contributed to the observed policy changes, some had to do with a changing economic situation in Europe (slower growth than expected); others with a shift in political leadership in the European Commission. Secondly some key informants rightly observe that the changes in the policy formulations may be less dramatic than they seem on paper (shifting emphasis rather than an entirely new direction). Thirdly different interpretations on the role of the indicators and the ASEES results are offered by different informants, each one perhaps keen not to undervalue their own role in the process.

However, we find that the balance of evidence obtained through interviews and document analysis allows concluding that indicators *did* influence the process and its results, although only as one minor contribution and in correspondence with a number of other factors pointing towards the same changes. The influence was generated through close involvement of indicator producers and users together in a focused, technically well equipped, interactive process where scenarios were defined and models were used to forecast future policy outcomes for the indicators. This process pointed towards results where some policy variables were revealed as not adequate or realistic presentations of policy aims, as also stated in the ASSESS final report, and these results contributed to convince the Commission of a need to reformulate the objectives; there was no better evidence available; and it was not easy to simply deny results that had been produced with strong involvement of the users.

We identify the influence with a novel label called a *rationalization* role, which combines elements of the 'standard' types of instrumental, conceptual and symbolic roles introduced in the theoretical framework. It is instrumental in the sense that the indicators inform a process where policy objectives are re-formulated (previous policy objectives are de-emphasized in accordance with the results); conceptual in the sense that the change is mostly terminological, strategic and frame-shaping rather than directly pointing towards implementation, and symbolic in the sense that it mostly codifies a change that has already in part been foreseen and accepted in light of changes in economic, political and more local leadership conditions.

5. Discussion

The study has looked at two different cases of indicators applied for strategic policy making in the context of a sustainable transport agenda, one at national level in Sweden and one at the EU level involving the European Commission. Even if the cases refer to the same sector and the same overall strategic policy agenda, they are very different as regards institutional and political setting and delimitation of the studies.

This means that the findings in terms of use and influence should not be expected to be similar.

The general question for this study was to what extent indicators are used, how they influenced policy in the context of strategic policy making for sustainable transport, and how we can explain why it is so.

5.1. Use of the indicators

First of all both cases illustrate examples where several indicators are actually used in policy processes, like long term planning and annual budgeting in Sweden, and the strategic Mid-Term policy review undertaken by the European Commission. The evidence of use is found in documents referencing the specific variables, actual values measured or predicted, and (sometimes) associated evaluations based more or less directly on indicators shown in reports or communicated otherwise. The use of indicators has also been referred to in interviews in both cases, especially with experts and civil servants directly involved in policy review and development. In Sweden opposition politicians also mention uses, whereas this seems less the case for politicians from the government.

As this is less surprising in those particular cases, we quickly move to the more interesting but elusive notion of influence

5.2. Influence of the indicators

In the EU case we clearly observe that the policy agenda and the associated objectives are undergoing changes in a way that conform to the indicator based evaluation. The projected indicator values suggest that existing policy objectives are unobtainable and existing policy measures insufficient. The political outcome of the review is to downplay and modify these objectives and to introduce new policy strategies and measures.

Depending on which interpretation of the process we lean on, the influence of the indicators in this process and outcome appears to be more or less significant. *More*, if we adopt a narrow view of the indicators and the specific Impact Assessment document being produced, and *less*, if we take a broad view including external factors like economic setback that was already underway, and shifts in the political leadership. It is clear that the indicators must have reinforced the tendency towards change and influenced the process of wording and underpinnings of conclusions. This we see as a specific kind of role, in a way, an instrumental one at a semantic level; but perhaps rather as partly instrumental, conceptual and symbolic one. We label it as *rationalization*, where policy conclusions already 'in the cards' as a result of some form of qualitative assessment backed by

existing statistics become more obvious, justifiable, and expressible, with the help of the indicators.

Our studies of indicator influence on Swedish transport policy do not enable us to point with certainty to specific political decisions which had been different had it not been for the indicators put forward in the SIKa follow-up reports, except for one possible (unconfirmed) occurrence. In general the direct influence seems (even) more limited in the Swedish case than in the EU one. The inclusion of the SIKa indicators in the chapter in the Transport Budget Section seems to be more of a convention or habit than something actually used as a starting point for the subsequent prioritizations in the budget process. Interviewees explain that for the Members of Parliament influence of the SIKa indicators possibly occur by way of the conceptual role, as something read and noticed, with importance in the background, but it was difficult to concretely expose such influences. The regularity of the (annual) reporting process was cited as a source of influence, in the sense that the continuous risk of being held accountable for results was reported to have a disciplining effect. This could suggest a 'process' role of the indicators although it was not clear that this had influenced actual performance. The Swedish study might allow considering if our conceptual distinction between use and influence should be maintained. It could be argued that 'use' is a form of 'influence', hence, in the Swedish case the mere use confirms e.g. the MBO-like approach and the overall transport policy objectives and by such a maintaining (and symbolic) role influences the management system and transport policy.

In summary we interpret indicators as playing a very limited instrumental role in some of those areas of transport policy we have looked at, in addition to some signs of symbolic, conceptual, and process roles. We are able to detect limited influence on policy agendas, and goals in the case of the EU Mid Term Review. Indicators inform and rationalize a change in the European Commission's position towards some key objectives, even if no direct influence on decisions regarding policy measures could be pointed to. We see this role as mixed between instrumental symbolic and conceptual elements, as the policy change observed is mostly on a semantic (but not necessarily insignificant) level. The indicator-carried information possibly also contribute to planning and agenda setting in the Swedish government, but direct influence was not uncovered, although a vague process shaping role was confirmed.

6. Conclusions

The overall conclusions are that several indicators are actually used in policy processes, and evidence of use is found in documents as well as interviews. However, use does not automatically mean that they influence policies or processes in more than the most superficial manner. Rather the indicators seem to play a very limited instrumental role in addition to some signs of symbolic, conceptual and process roles. In the EU case however some evidence of a rationalization role of indicators is found, thus indicators inform and rationalize a change in the European Commission's position towards key objectives.

A combination of factors may contribute to explain the use and influence we have observed. More specifically the paper allows us to suggest that indicators linked to quantitative, policy objectives gets increased attention and hence use and influence. The EU case further indicates that involvement of policy makers in the design and development

of indicators and indicator systems – and thus establishing of a trustful relationship between indicator producers and users – increases use and influence.

As regards MBO, the Swedish case indicates that indicators connected to a system of MBO are likely to increase use, while influence might not benefit from the attachment to such a management system.

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