CONTRIBUTI DI RICERCA CRENOS

TOP-DOWN AND BOTTOM-UP. TESTING A MIXED APPROACH TO THE GENERATION OF PRIORITIES FOR SUSTAINABLE URBAN MOBILITY

Gerardo Marletto
Francesca Mameli
Eleonora Pieralice

WORKING PAPERS

2015/01

CUEC

CENTRO RICERCHE ECONOMICHE NORD SUD
(CRENOS)
UNIVERSITÀ DI CAGLIARI
UNIVERSITÀ DI SASSARI

CRENOS was set up in 1993 with the purpose of organising the joint research effort of economists from the two Sardinian universities (Cagliari and Sassari) investigating dualism at the international and regional level. CRENoS' primary aim is to improve knowledge on the economic gap between areas and to provide useful information for policy intervention. Particular attention is paid to the role of institutions, technological progress and diffusion of innovation in the process of convergence or divergence between economic areas. To carry out its research, CRENoS collaborates with research centres and universities at both national and international level. The centre is also active in the field of scientific dissemination, organizing conferences and workshops along with other activities such as seminars and summer schools.
CRENoS creates and manages several databases of various socio-economic variables on Italy and Sardinia. At the local level, CRENoS promotes and participates to projects impacting on the most relevant issues in the Sardinian economy, such as tourism, environment, transports and macroeconomic forecasts.

www.crenos.it
info@crenos.it

CRENOS – CAGLIARI
VIA SAN GIORGIO 12, I-09100 CAGLIARI, ITALIA
TEL. +39-070-6756406; FAX +39-070- 6756402

CRENOS - SASSARI
VIA TORRE TONDA 34, I-07100 SASSARI, ITALIA
TEL. +39-079-213536; FAX +39-079-213002

Title: TOP-DOWN AND BOTTOM-UP. TESTING A MIXED APPROACH TO THE GENERATION OF PRIORITIES FOR SUSTAINABLE URBAN MOBILITY

ISBN: 978 88 8467 908 6

First Edition: January 2015

Via Is Mirrionis, 1
09123 Cagliari
Tel./Fax 070 291201
www.cuec.it

Top-down *and* Bottom-up. Testing a mixed approach to the generation of priorities for sustainable urban mobility

Gerardo Marletto*
University of Sassari (DiSEA) and CRENoS
Francesca Mameli
University of Sassari (DiSEA) and CRENoS
Eleonora Pieralice
Isfort

Abstract

This paper contributes to the debate on how to make operational the concept of sustainable urban mobility and advocates the use of a mixed – top-down *and* bottom-up – approach to the generation of priorities for sustainable urban mobility.

In particular, we tested whether a common list of priorities remain valid after a participated scrutiny performed in seven urban areas of southern Italy. The test was based on a 3-steps procedure. In step 1, we used a common conceptual framework (based on Mameli and Marletto, 2014) to generate seven area-specific lists of priorities. In step 2, local stakeholders participated to deliberative meetings aimed at amending or deleting each of the proposed priorities, as well as adding new ones. In step 3, citizens' opinion was gathered through seven sample polls and used to rank the list of priorities resulting from stakeholders' deliberation.

The test generated three main results: 1) Deliberation between local stakeholders was useful for adapting common priorities to the characteristics of each area. But, with the exception of Reggio Calabria – an urban area with very specific features –, the structure of the starting common conceptual framework was not altered. 2) Surveys on citizens' opinion were useful, not only for ranking priorities, but also for taking into account the relevant differences between car users and the rest of the population. 3) With great caution, reference may be made to a common set of six top priorities referring to: (accessibility by and economic sustainability of) public transport, air pollution, accidents, greenhouse gasses and transport waste. These top priorities cover all three dimension of sustainability (environmental, social and economic).

Keywords: Urban mobility; Sustainability; Participation; Transport policy; Italy.
Jel classification: L98, Q58, Q56.

* E-mail address: marletto@uniss.it

1. Introduction

The attempt to make operational the concept of sustainable urban mobility has generated an extensive literature.[1] In spite of this, the scientific debate remains open – also with reference to basic issues – without offering policy-makers and practitioners clear and shared prescriptions (Holden et al, 2013; Jeon et al., 2013).

Even the standard articulation of sustainable transport into its environmental, social, and economic dimensions, has recently been questioned. Starting from a worldwide survey, Jeon et al. (2013) added a fourth dimension: transportation system effectiveness. Holden et al. (2013) go further and argue that a different list of four dimensions of sustainable transport (long-term ecological sustainability of transport activities, basic transport needs, intra- and intergenerational transport equity) is more consistent with the classical Brundtland's definition of sustainability. Actually, similar results were already present in a less recent work by Gudmundsson and Hojer (1996), where four overall constituents of sustainable development were used to analyse the current level of transport (un)sustainability: natural resources for future generations; option value of human and man-made capital for future generations; quality of life for individuals; fair distribution of life-quality.

The matter becomes even more tangled when it comes to turn such dimensions into policy objectives. With reference to the numerosity of the set of policy goals, the debate spreads between two extremes: a limited – and more easily manageable – number of objectives, or a more extended list of objectives that cover all aspects of a transport system. For example – even if both starting from four sustainability dimensions – Holden et al. (2013) offer four policy goals (expressed as the threshold value for the year 2030 of as many indicators), while Jeon et al. (2013) provide 13 goals (and 30 indicators). May (2009: 185) – who refers to the three standard pillars of sustainability – lists 18 "more specific strategic objectives".

The generalization of policy goals is another relevant issue. For example, the ECMT (2002: 9) clearly states that "although definitions of and criteria for sustainability differ among countries and cities, most have common objectives for quality of life in urban areas that include, clean air, quiet neighbourhoods, and economic prosperity without detrimental health and environmental impacts and depletion of finite natural resources". That such common objectives must be adapted to specific situations is a somehow obvious remark; the real matter is how to accomplish such a task. Many scholars advocate for the bottom-up participation of stakeholder and/or citizens as an effective tool for the selection of 'customized' policy goals (May, 2009; Castillo and Pitfield, 2010; Baumann and White, 2014; Xenias and Whitmarsh, 2013). But other scholars support the need of a top-down common basis to local goals, not only because overall policy goals (whatever they are) are necessary to implement national and supra-national policy schemes, but also for conceptual reasons. For instance, Holden et al. (2013: 69) – who support the idea of a common vision of sustainable transport – "disagree with the proposition that the choice of sustainable dimensions, indicators and threshold values should depend on what local stakeholders agree to include".

[1] As references to this literature, see among the others: Jeon and Amekudzi, 2005; Hull, 2008; Banister, 2011.

This paper contributes to the latter debate by testing a mixed – top-down *and* bottom-up – approach to the generation and ranking of priorities for sustainable urban mobility (PSUMs).

The use of a mixed approach to environmental policy is not new, but it has never been applied to transport issues. In particular, Mark Reed and other scholars have provided several application to the selection of sustainability indicators (Reed and Dougill, 2002; Fraser et al., 2006; Reed et al., 2006). We share with these scholars the acknowledgement that a top-down component is needed to ensure the reference to both a common conceptual background and an overall policy scheme, but it is not sufficient to take due account of local specificities. Moreover, we share with many other scholars the understanding that participation can add many other benefits to policy, i.e. the gathering of opinion, the increased legitimation of final decisions, and – maybe more important – the generation of new knowledge and the empowerment of local communities (Stirling, 2008; Dreyer and Renn, 2011).

The test presented here, was aimed at checking if a top-down common list of PSUMs remained valid after a participated scrutiny and may be used as a reference for further testing and actual implementations. The testing procedure was based on two deliberative/participative tools: stakeholders of seven urban areas of Southern Italy had the option – through structured deliberation – to accept, amend or totally change a starting conceptual framework; afterwards, citizens of the same areas were asked – through sample opinion polls – to rank the resulting list of PSUMs. The testing procedure was designed also with the aim of taking under control the potential side-effects of participation: stakeholder deliberation was not supported by any complex technical tool (such as computer-aided multi-criteria analysis) in order to limit the risk of a "black box" effect (Stagl, 2007); opinion polls were also used as an ex-post citizen control on changes introduced by stakeholders, with the intentional aim of counterbalancing the risk that stakeholders' deliberation – and the whole testing procedure – was "manipulated" by more powerful or vocal groups of interest (Arnstein, 1969; Chilvers, 2009).[2]

The remainder of the paper is structured as follows: in Section 2, we describe both the methodological details of the testing procedure, and the basic features of the seven urban areas; Section 3 contains a detailed analysis of the results of the test; in Section 4, results are discussed against the relevant literature and conclusions are provided.

2. Methods

2.1. The testing procedure

The procedure was aimed at ranking the PSUMs in seven urban areas of Southern Italy, and was articulated in top-down (expert-led) and bottom-up (deliberative/participative) activities. First of all, referring to a previous study based on a thorough analysis of the relevant literature (Mameli and Marletto, 2014)[3] a starting conceptual framework – based on

[2] The benefits – and the eventual side-effects – of participation are discussed in more detail in Franceschini and Marletto (2014).

[3] Readers should be aware that in Mameli and Marletto (2014) the acronym PSUM stays for "policy for sustainability urban mobility".

four dimensions and fourteen objectives of sustainable urban mobility – was delivered (Table 1).

Table 1. The starting conceptual framework of sustainable urban mobility

Dimensions of sustainable urban mobility	**Objectives of policies for sustainable urban mobility**
Social sustainability/1: Accessibility	Increase the alternatives to mobility
	Facilitate non-motorized transportation
	Facilitate private motorized transportation
	Facilitate public transport
Social sustainability/2: Liveability	Increase the urban surface free of motorized vehicles
	Reduce noise generated by transportation
	Reduce the emissions of gasses generated by transportation that are harmful to human health
	Reduce transport accidents
Environmental sustainability	Reduce greenhouse gas emissions generated by transportation
	Reduce land consumption generated by city expansion
	Reduce transport waste
Economic sustainability	Reduce citizens' expenditure for public transport
	Reduce citizens' expenditure for private transport
	Make the management of the public transport system economically sustainable

The rest of the procedure was articulated in three steps, each of them focused on specific actors and tools and was expected to deliver an outcome to be used as input to the following step (Table 2).

Table 2. The ranking procedure: steps, actors, tools and deliverables

Step	**Actors**	**Main tool (Technique)**	**Deliverable**
0	Researchers	Secondary research (Analysis of the literature on sustainable urban mobility)	Starting conceptual framework (dimensions of – and objectives of policies for – sustainable urban mobility)
1	Local experts	Primary and secondary research. (Desk analysis of relevant data, documents and official plans; Face-to-face interviews with local experts)	Seven sets of priorities for sustainable urban mobility (PSUMs) (first version)
2	Stakeholders	Stakeholder meeting (Guided discussion)	Seven sets of PSUMs (final version)
3	Citizens	Opinion poll (Sample survey; Computer-Assisted Telephone Interviewing–CATI)	Seven rankings of PSUMs

Step 1: Preliminary analyses. Secondary data analysis and in-depth interviews with local experts were carried out in order to get a better understanding of current transport trends, public debates and future plans and policies. Interviews with local experts – representing different categories such as institutions, NGOs, transport and cultural experts – followed a semi-structured scheme, in which they were asked to identify the most relevant current issues and dynamics of the local urban mobility situation and discussion. All this primary and secondary information was systematized with the starting conceptual framework and used to generate seven area-specific sets of PSUMs.

Step 2: Stakeholder meetings. A facilitated discussion between participants – representing all relevant interest groups – took place with the aim of delivering the final version of the seven sets of PSUMs. In order to ease deliberation, the number of participants was limited to 15. The discussion was articulated into four sessions (one for each dimension) that may result in the amendment or deletion of existing PSUMs as well as in the addition of new ones.

Step 3: Opinion polls. A representative sample of 550 citizens (aged 14-80 years) for each urban area participated to an opinion poll performed with a CATI (Computer-Assisted Telephone Interviewing) technique. Each sample was stratified by age, gender, residence and occupation. Respondents separately evaluated each PSUM using a 3 point qualitative scale (top priority; relevant, but not a priority; useful, but not urgent). 'Top priority' resulted as the modal response to all PSUMs in all the seven test urban areas[4]; this is why the percentage of respondents that considered a PSUM as a 'top priority' has been used to generate the seven final rankings. For each test area, responses were cross-tabulated by sample strata,[5] and by transport mode; only the latter generated significant differences in resulting rankings. Transport mode is defined as follows: 'car and motorbike users' are those respondents that only used the car or the motorbike during the reference day of the opinion poll; 'users of other modes than the car' are all other respondents, except those who stayed at home during that same day (around 30% of all samples).

2.2. Test urban areas[6]

All the seven test urban areas belong to the four Italian southern regions covered by the EU Convergence objective (Calabria, Campania, Apulia and Sicily)[7]. The test urban areas – selected within the MUSA project[8] – are (listed from North to South): Phlegrean Fields,

---

4 The only exception was in Salerno where the responses to the PSUM 'Reduce urban space consumption deriving from city expansion' were: top priority (29.2); important, but not a priority (30.6), useful but not urgent (30.6).

5 These tables are available on request.

6 Source of all data and information: Isfort et al. (2012).

7 The Convergence objective for 2007-2013 applies to 100 European regions where GDP per head is less than 75% of the EU average, 2000-2002.

8 MUSA (Mobilità Urbana Sostenibile e Attrattori culturali-Sustainable Urban Mobility and Cultural heritage) is a project promoted by the Department for Public Administration of the Italian Government.

Salerno, Lecce, Cosenza, Reggio Calabria, Taormina and Syracuse. The main characteristics of the test urban areas are summarized in Tables 3-5.

With the exception of the area of Taormina (featuring only 25,000 inhabitants), all areas are medium sized, with a population between 96,000 (Lecce) and 187,000 (Reggio Calabria). It must be stressed that Salerno is at the centre of a conurbation of around 400,000 inhabitants (also hosting the University site and its 40,000 students), and that the Phlegrean Fields are part of the highly populated belt of the metropolitan area of Naples (counting more than 3.5 million inhabitants). This difference may help explain why these two areas feature higher levels of: a) population density (more than 2,200 people per km^2, while in Cosenza is about 1,100 and in the other areas is between 400 and 800), and b) public transport use (14% and 12% respectively, while in the other five areas is between 3% and 7%). Always with reference to population density, it must also be noted that – because of the orographic conformation of the area – 63.5% of the population of Reggio Calabria is concentrated on 7.2 km^2, with a resulting density of 16,000 people per km^2.

Table 3. The seven test urban areas: relevant data and information

Test urban area (Municipalities)	**Surface (km^2)**	**Population (thousands)**	**Density (population per km^2)**	**Other relevant information**
Phlegrean Fields (Bacoli, Pozzuoli, Quarto and Monte Procida)	74	164	2,210	Part of the metropolitan area of Naples (3.5 million inhabitans)
Salerno	59	139	2,240	Part of a conurbation of 400,000 inhabitants
Lecce	238	96	401	
Cosenza (Castrolibero, Cosenza and Rende)	103	116	1,120	
Reggio Calabria	236	187	795	Part of a conurbation of more than 250,000 inhabitants
Taormina (Castelmola, Giardini-Naxos, Letojanni and Taormina)	42	25	588	
Syracuse	204	119	581	

The Phlegrean Fields are an area at high seismic risk; this is reflected on the limited development of the road network (well compensated by the dense rail network serving the whole metropolitan area of Naples). Severe limitations to road circulation are also featured by the area of Reggio Calabria: because of its orography, national infrastructures and rivers can be crossed only through a limited number of bridges and underpasses, that in most cases are bottlenecks for car traffic and barriers to bus services. Also the areas of Cosenza and Lecce are served by local-national rail networks. Bus networks are usually barely adequate to serve the local demand for mobility, or poor as in the case of Syracuse. The only exception is the area of Salerno, featuring an extensive urban and suburban network. The centre of Taormina – located on the top of a hill – is connected to the seafront by a regular cableway service. With the exception of Cosenza, all test areas are tourist destinations (such as Lecce, Taormina and Syracuse) or are interested by a relevant through traffic to some tourist destination (e.g., from the port of Pozzuoli, in the Phlegrean Fields, to the islands of the Gulf of Naples).

All areas feature a very high level of motorization: summing the number of cars and motorbikes per 100 inhabitants, the resulting figure is between 67 (Phlegrean Fields) and 93 (Municipality of Taormina).

With reference to transport impacts, it must be said that almost no data is available on noise; it also must be added that small municipalities (such those of the Taormina area) do not even provide any data on air pollution and road safety. In all test urban areas – because of their positioning near the sea or on top of a hill – air pollutants are dispersed quickly. Nevertheless, air pollution is very near to EU emission thresholds in Reggio Calabria and Syracuse for PM_{10}, and in Cosenza for both PM_{10} and NO_2. Lecce features the worst performance in terms of road safety: in this area the indicator of accidents is almost the double of the Italian average, and the indicator of deaths is very near to it. Also Syracuse has a high number of accidents. In all other areas road safety indicators are good – or even very good, as in the case of Cosenza – if compared to the rest of the country. Reggio Calabria and Lecce are the only two areas where a survey on noise pollution was performed by local Authorities; results are striking: 80% and 100% of their respective population is exposed to noise beyond the official day and night time limits (55 and 45 dB respectively).

Table 4. The seven test urban areas: main transport data and information

Test urban area (Municipalities)	**Cars[a]**	**Motor-bikes[a]**	**Time spent moving (minutes per working day)**	**Modal split (%) (motorized, public, non-motorized)**	**National Infra-structures**	**Other relevant information**
Phlegrean Fields (Bacoli, Pozzuoli, Quarto and Monte Procida)	58	9	71	76, 14, 9	Highway	Extensive metropolitan rail network Through traffic to the islands of the Gulf of Naples (tourist destination)
Salerno	58	14	57	60, 12, 28	Highway High speed and traditional railway International freight port	Extensive urban/suburban bus network Five railway stops in the urban area Through traffic to the Amalfi coast (tourist destination)
Lecce	68	12	47	82, 3, 15	Railway	Tourist destination
Cosenza (Castrolibero, Cosenza and Rende)	65	6	55	78, 7, 15	Highway Railway	Three railway stops in the urban area
Reggio Calabria	60	11	52	84, 5, 11	Highway Railway Airport	Through traffic from and to Sicily
Taormina (Castelmola, Giardini-Naxos, Letojanni and Taormina)	66[b]	27[b]	50	81, 4, 16	Highway Railway	Tourist destination Cableway from the seacost to the centre of Taormina
Syracuse	65	18	56	86, 4, 10	Highway Railway	Tourist destination Poor bus network

[a] Per 100 inhabitants; [b] Municipality of Taormina only.

Table 5. The seven test urban areas: indicators of air pollution and road accidents (year 2012 or last available data)

Test urban area (Municipalities)	**PM_{10} (microg/mc Yearly average)[a]**	**NO_2 (microg/mc Yearly average)[a]**	**Road accidents (per 1,000 inhabitants)[b]**	**Deaths on road accidents (per 1,000,000 inhabitants)[c]**
Phlegrean Fields (Bacoli, Pozzuoli, Quarto and Monte Procida)	n.a.	n.a.	2.10	37
Salerno	22.2	21.2	3.81	22
Lecce	26.7	23.0	6.78	63
Cosenza[d] (Castrolibero, Cosenza and Rende)	35.3	39.9	1.10	29
Reggio Calabria	37.9	12.2	3.09	21
Taormina (Castelmola, Giardini-Naxos, Letojanni and Taormina)	n.a.	n.a.	n.a.	n.a.
Syracuse	37.7	31.0	6.22	34

n.a.=not available
[a] EU threshold = 40
[b] Italy=3.57
[c] Italy=69
[d] Municipality of Cosenza only

3. Results

3.1. Comparative analysis

In all areas, stakeholders have modified the list of PSUMs resulting from preliminary analyses, but only in the case of Reggio Calabria changes were radical. Modifications refer to both the adaptation of the content of preliminary PSUMs to the specific characteristics of each test area, and to the addition of new PSUMs (as well the deletion of existing ones). Additions made by stakeholders generated very different results in terms of citizens' support. In particular: 1) the separate PSUMs on accessibility by public transport (within the test area, and from/to it) rank high (Phlegrean Fields) or medium (Reggio Calabria and Salerno); 2) new PSUMs on the mobility of vulnerable groups rank high (Salerno and Reggio Calabria); 3) the merged PSUM on air quality and noise ranks low in the Phlegrean Fields and Reggio Calabria, but high in Salerno; 4) new PSUMs on freight distribution, and accessibility to cultural sites rank very low (Salerno and Taormina). In two cases, new PSUMs referring to

very specific characteristics of the test area were added by stakeholders, with opposite results in terms of citizens' support: in the Phlegrean Fields the two new PSUMs stay at the bottom of the ranking (14th and 15th positions); in Reggio Calabria some of the (many) new PSUMs rank very high (e.g. see the 3rd position of the PSUM on the reduction of the vulnerability risk of the transport network).

Table 6. Positioning of the top-6 priorities for sustainable urban mobility by test urban area[a]

Test urban area	**Positioning of top-6 issues for sustainable urban mobility**
Phlegrean Fields[b]	1[c], 2[c], 2, 5, 6, 11[d]
Salerno	1[c], 2[c], 3, 4, 5, 6, 8
Lecce	1, 2, 3, 4, 5, 8
Cosenza	1, 2, 3, 4, 5[e], 8
Reggio Calabria[f]	1, 7[g], 8[h], 14[d]
Taormina	1, 2, 3, 4, 5, 6
Syracuse	1, 2, 3, 4, 5, 6

[a] Top-6 priorities are: accessibility by public transport, air pollution, accidents, greenhouse gasses, transport waste, economic sustainability of the public transport system.
[b] Transport waste is not considered.
[c] Accessibility by public transport both to/from and within the area is considered.
[d] Noise and air quality are merged.
[e] With specific reference public transport services between the urban and suburban areas.
[f] The economic sustainability of the public transport system is not considered.
[g] Greenhouse gasses and waste (and energy) are merged.
[h] With specific reference to public transport services to the main attractors of the whole conurbation.

Focusing on the results of the opinion polls, it can be noticed that the test areas of Lecce, Cosenza, Taormina and Syracuse share the same list of top-5 PSUMs referring to (although in a different order): greenhouse gasses, air pollutants that are harmful for humans, accidents, accessibility by public transport, transport waste (see Table 6 for more details).[9] These five PSUMs are also within the first eight positions of the ranking for Salerno. In the Phlegrean Fields and Reggio Calabria three out of these five PSUMs stand within the 5th and 8th position respectively. However in both cases stakeholders merged the two issues of air pollution and noise in one single PSUM (ranking 12th and 14th respectively) while the PSUM on transport waste was deleted in the Phlegrean Fields.

Though the above top-5 PSUMs do not cover the dimension of economic sustainability, at least one PSUM referring to it ranks within the 7th position in all test areas. In four out of the seven test area such PSUM concerns the sustainable management of the PTS (while in Lecce, Cosenza and Reggio Calabria it refers to the reduction of citizens' expenditure for mobility). It must also be stressed that, in the case of Cosenza, the PSUM ranking 6th is about the governance of the whole mobility system, that is an issue of institutional sustainability. Area rankings feature other two commonalities: 1) somehow surprisingly, the

[9] These results are also in line with an opinion poll on Italians where 5 of such top-6 PSUMs ranked within the 6th position (the PSUM concerning the economic sustainability of the public transport system was not considered) (Mameli and Marletto, 2014).

PSUMs on the reduction of citizens' expenditures for mobility almost always ranks between the 7th and 9th position (with the exception of Reggio Calabria, where it ranks 4th); 2) the PSUM on noise almost always ranks lower than the 10th position. Exception are, respectively: Reggio Calabria, which is the only area where it is explicit that transport costs may be reduced thanks to new transport services (car-sharing, car-pooling, mobility management); Salerno, where noise and air pollution are merged in one PSUM (ranking 3rd).

Rankings by transport mode in the same test area always feature relevant differences; the only exception is Salerno, where rankings are almost identical. Differences by transport mode not only concern the specific interests of each segment of transport users, but apply to almost all PSUMs. In particular – and as expected – users of other transport modes than the car tend to be less favourable to the reduction of (private) transport costs (e.g., in Lecce, Taormina and Syracuse), and more interested in favouring non-motorized mobility (e.g., Phlegrean Fields and Lecce). Taormina is the only text area where the accessibility by public transport is more relevant for users of other transport modes than the car; in all other areas this PSUM always rank in an identical or similar (high) position.

3.2. Results by area

Phlegrean Fields (Table 7)

Public transport is the highest priority of this area. Stakeholders have split the starting objective of *Facilitating public transport* into two PSUMs referring to the improvement of: a) municipal and inter-municipal lines and on-demand bus services offered within the area, and b) railway infrastructures and services connecting the area to the metropolitan conurbation of Naples. They also took into consideration two separate PSUMs related to the economic sustainability and overall efficiency of the local public transport system (PTS). This concern is reflected in citizens' opinion: four out of the six higher ranking PSUMs refer to public transport; the other two pertain to the reduction of accident and greenhouse gasses. As a consequence, all four dimensions of sustainable urban mobility (accessibility, liveability, environmental and economic sustainability) are considered in the first six PSUMs of the ranking.

The two objectives of reducing noise and air pollutants that are harmful for human health were integrated by stakeholder into a single PSUM and ranked 11th by citizens. Both PSUMs referring to private transportation rank at the middle of citizens' concern, while those referring to non-motorized transportation rank at the bottom. A different ranking of some of such PSUMs is expressed by users of public transport and non-motorized modes, who also stress the relevance of the reduction of urban consumption (5th position in their specific ranking).

Other specific PSUMs added by stakeholder – such as the reduction of the through traffic to the near islands, and the impacts on the natural heritage – are considered as less relevant by citizens.

Salerno (Table 8)

Also in this case, stakeholders have split the objective about public transport into two separate PSUMs. Unlike the previous case, only the one referring to services offered within the area ranks very high (2nd position, with 82.4% citizens considering it as a 'top priority'), while the other referring to services to the urban area (by land and by sea) ranks lower (7th

position, 68.6%). Other PSUMs ranking high refer to: the accessibility of most vulnerable groups (1st position, 87.6%), the reduction of air pollutants and noise, and the economic sustainability of the PTS. It must be stressed that the latter was considered by stakeholder also as a way to reduce citizens' expenditure for mobility. All dimensions of sustainable urban mobility are covered by the top-5 PSUMs. Consistently with the already higher modal share of non-motorized mobility (see above, table 2), the two PSUMs relating to this issue are at the bottom of the final ranking (10th and 13th positions), also for citizens other than car users.

Also in this case, original PSUMs added by stakeholders (such as the improvement of both freight distribution and accessibility to cultural heritage) did not meet citizens' preferences and ranked low (11th and 12th position, respectively).

Lecce (Table 9)

Reflecting the high level motorization featured by this urban area (see above, Table 2), the reduction of the following transport impacts is considered a top priority by more than 80% of citizens: local and global air pollution (1st and 2nd position respectively), accidents (3rd position). Also a better management of transport waste ranks high (5th position). Only the reduction of noise ranks very low (14th position). The other top PSUM refers to the improvement of public transport services for both the city of Lecce and its whole conurbation (4th position). The first PSUM referring to the dimension of economic sustainability ranks 7th.

PSUMs referring to non-motorized mobility stay in the middle of the ranking of all respondents (6th and 9th position), but rank higher for users of transport other than the car (4th and 7th position). Rankings by transport modes differ also with reference to economic issues (that rank higher for car users) and to the availability of information (that ranks higher for the rest of the population).

Also in this case, original PSUMs added by local stakeholders rank low: improve information on mobility ranks 12th; the integration of public and private mobility ranks 15th.

Cosenza (Table 10)

Opinions expressed by citizens of Cosenza are very similar to those expressed in Lecce. More than 75% of inhabitants consider as a top PSUM the reduction of the following transport impacts: local and global air pollution (1st and 2nd position respectively), accidents (3rd position) and waste (4th position). The list of the top-6 PSUMs is completed by two other specific aims that are consistent with the polycentric structure of this urban area: the integration of all public transport services that connect the city to its suburbs; the improvement of the whole mobility system governance (that is, a better coordination between the several involved local Authorities and transport companies).[10] The relevance of these issues is slightly more important for users of transport modes other than the car.

[10] The full description of these two PSUMs is: Facilitate public transport (trains, buses, trams, metros, taxis), in particular between the city and the conurbation (Reorganize and improve the bus network; Integrate transport services; Taxis and buses on demand; Services for vulnerable groups; Integration between urban and suburban services; etc.); Improve the governance of the mobility system (Integration between transport companies; Coordination between Municipalities and with

Reggio Calabria (Table 11)

Given the particular orographic conformation and positioning of this urban area (see above, Par. 2.1), stakeholders made major revisions to the starting list of objectives. In particular, the explicit reference to the whole conurbation is present in several PSUMs.

Unlike the areas presented so far, some of the original PSUMs proposed by stakeholders are supported by citizens' opinion too: the reduction of the vulnerability of the transport network ranks 3rd; the accessibility of pedestrians, cyclists and vulnerable users to the old town ranks 5th; users of transport modes other than the car rank high the improvement of public transport services through the Messina Strait. Other top PSUMs refer to road safety (1st position), to the efficiency and efficacy of the PTS (2nd position) and to the provision of new transport services (car-sharing, car-pooling, etc.) as a way to reduce private transport costs (4th position).[11] Transport impacts other than accidents are considered of medium and low relevance (greenhouse gasses, 7th position; local air pollutants and noise, 14th position). Reggio Calabria is the only test area where no PSUM referring to the dimension of environmental sustainability stands at the top of the ranking.

Taormina (Table 12)

Citizens of the Taormina area are mostly concerned with the reduction of the impacts generated by their highly motorized transport system (see above, Table 2). More than 70% supports the reduction of: accidents (2nd position), local and global air pollutants (1st and 4th position respectively) and waste (3rd position). The PSUM referring to the accessibility by public transport complete the top-5 list and ranks 2nd for users of transport modes other than the car, who also consider slightly more important the increase of areas reserved to non-motorized mobility. The first PSUM referring to economic sustainability ranks 6th.

As in many other test areas, the PSUMs referring to the alternatives to mobility, and to the reduction of noise, are not considered as top priorities.

Syracuse (Table 13)

Also the mobility area of Syracuse is mostly based on private motorized transportation (see above, Table 2). Not surprisingly then, the ranking resulting from the opinion of the citizens of Syracuse is very similar to that of Taormina. The first five positions refer to the reduction of transport impacts, and to the PTS. In particular, the improvement of accessibility by public transport is considered a top PSUM by almost 83% of the population and stands at the 2nd position of their preferences. Users of transport modes other than the car also stress the relevance of the economic sustainability of the PTS (4th position of their ranking). On the contrary, they are much less interested to the reduction of transport costs; this PSUM ranks 10th for them, and 6th for car users. Other PSUMs referring to accessibility

---

the Province, the Region and other national Authorities; Promotion of horizontal subsidiarity; City logistics; etc.).

[11] The full description of this PSUM is: Reduce citizens' expenditure for private mobility (by, e.g.: the provision of alternative to the car: car-sharing, car-pooling, collective taxis, transport demand management, park&ride, etc.; the promotion of the alternative to mobility: teleworking, e-learning, e-commerce, etc.; the ex-ante assessment of additional traffic flows generated by malls and other commercial hubs; the reduction of congestion).

rank much lower: facilitate non-motorized transportation (9th position); regulate car and motorbike traffic (12th); plan freight distribution (13th position)

As in other areas, original PSUMs proposed by stakeholders do not rank high. In particular, see: the accessibility to cultural heritage (10th position), and the promotion of institutional sustainability (11th position).

Table 7. Phlegrean Fields: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Facilitate public transport outward the Phlegrean Fields	**1** (79.5%)	**1**	**1**
Facilitate public transport within the Phlegrean Fields	**2** (75.0%)	**2**	**3**
Reduce transport accidents	**3** (75.0%)	**5**	**4**
Improve the overall efficiency of the local public transport system	**4** (73.0%)	**4**	**2**
Reduce greenhouse gas emissions (CO2) generated by urban traffic	**5** (67.6%)	**3**	7
Ensure adequate financial resources to the local public transport system	**6** (65.2%)	**6**	**6**
Reduce land consumption generated by city expansion and the resulting building of new transport infrastructures	7 (61.0%)	7	**5**
Reduce citizens' expenditure for private transport	8 (60.7%)	8	9
Fluidify motorized private transport flows (cars and motorbikes)	9 (59.2%)	9	13
Reduce the need of moving and/or the kilometres travelled by increasing the alternatives to mobility	10 (54.2%)	11	9
Limit air pollution and noise generated by private traffic	11 (53.8%)	10	11
Facilitate non-motorized transportation (cycling and walking)	12 (52.5%)	12	8
Increase non-motorized areas	13 (51.2%)	14	12
Reduce the impact of traffic flows and parking on landscape and nature (lakes, SCIs, SPAs, etc.)	14 (47.3%)	13	14
Reduce traffic congestion caused by vehicles travelling to the islands	15 (42.5%)	15	15

[a] Respondents considering a PSUM as a 'top priority'

Table 8. Salerno: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Facilitate the mobility of the vulnerable groups, especially for disabled	**1** (87.6%)	**1**	**1**
Facilitate public transport within the urban area (buses, metros, elevators, escalators, etc.)	**2** (82.4%)	**2**	**2**
Reduce air emissions that are harmful to human health and noise generated by transportation	**3** (78.9%)	**3**	**4**
Reduce greenhouse gas emissions (CO2) generated by transportation	**4** (77.9%)	**4**	**3**
Ensure the economic sustainability of the public transport system management, also in order to reduce citizens' expenditure for public transport	**5** (76.0%)	**5**	**5**
Reduce transport accidents	**6** (70.3%)	**6**	**6**
Facilitate public transport inward the urban area (tramlines, buses, and above all sea transport)	7 (68.6%)	7	7
Ensure proper transport waste disposal	8 (61.7%)	8	8
Reduce citizens' expenditure for private transport	9 (57.7%)	9	9
Facilitate walking and even more so cycling	10 (49.8%)	10	10
Promote a new accessibility scheme for freight urban distribution, thus reducing the number of commercial vehicles circulating in the central areas	11 (44.7%)	11	12
Improve accessibility to the urban cultural heritage with an integrated and ecological public transport system, thus promoting the socio-economic inclusion of the old town	12 (40.2%)	12	11
Increase non-motorized areas	13 (36.8%)	13	13
Reduce land consumption generated by city expansion	14 (29.2%)	14	14

[a] Respondents considering a PSUM as a 'top priority'

Table 9. Lecce: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Reduce atmospheric emissions generated by transportation that are harmful to human health - carbon monoxide (CO), nitrogen oxides (NOx) , volatile organic compounds (VOCs) and fine particulates (PM_{10})	**1** (85.0%)	**1**	**1**
Reduce greenhouse gas emissions (CO_2) generated by transportation	**2** (83.1%)	**2**	**2**
Reduce transport accidents	**3** (81.5%)	**3**	**3**
Facilitate public transport (buses, trams, metros, and taxis) at both the city and conurbation level	**4** (69.9%)	**4**	**5**
Improve transport waste management	**5** (65.6%)	**5**	**6**
Facilitate non-motorized transportation (cycling and walking)	**6** (60.7%)	7	**4**
Reduce citizens' expenditure for mobility	7 (56.5%)	8	13
Ensure the economic sustainability of the public transport system management	8 (56.1%)	**6**	10
Increase non-motorized areas	9 (53.4%)	10	7
Improve the governance of the mobility system	11 (52.9%)	9	13
Improve the availability of information on urban mobility	12 (52.7%)	12	9
Increase the alternatives to mobility	10 (50.9%)	11	8
Reduce land consumption generated by city expansion	13 (47.1%)	13	11
Reduce transport noise	14 (45.8%)	14	12
Optimize private transport (car and motorbikes) by improving intermodality at both the city and conurbation level	15 (42.4%)	15	14

[a] Respondents considering a PSUM as a 'top priority'

Table 10. Cosenza: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Reduce atmospheric emissions generated by transportation that are harmful to human health - carbon monoxide (CO), nitrogen oxides (NOx) , volatile organic compounds (VOCs) and fine particulates (PM_{10})	**1** (81.7%)	**2**	**1**
Reduce greenhouse gas emissions (CO_2) from transport	**2** (79.8%)	**1**	**2**
Reduce transport accidents	**3** (78.6%)	**3**	**6**
Improve transport waste management	**4** (77.1%)	**4**	**3**
Facilitate public transport (trains, buses, trams, metros, taxis), in particular between the city and the conurbation	**5** (74.8%)	**5**	**4**
Improve the governance of the mobility system	**6** (70.1%)	7	**5**
Reduce citizens' and firms' expenditure for transportation	7 (69.9%)	**6**	8
Ensure the economic sustainability of the public transport system management	8 (63.7%)	8	7
Reduce land consumption generated by city expansion	9 (58.3%)	9	9
Facilitate non-motorized transportation (cycling and walking)	10 (57.7%)	10	11
Increase non-motorized areas	11 (55.4%)	12	10
Increase the alternatives to mobility	12 (53.5%)	11	12
Reduce transport noise	13 (46.1%)	14	13
Optimize private transport (car and motorbikes) by improving intermodality	14 (43.4%)	13	14

[a] Respondents considering a PSUM as a 'top priority'

Table 11. Reggio Calabria: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Improve road safety	**1** (77.8%)	**1**	**1**
Increase the effective use of public resources and the efficiency of transport services	**2** (71.9%)	**3**	**2**
Assess and reduce the metropolitan transport network vulnerability risk (seismic, hydro-geological, etc.)	**3** (68.2%)	**2**	**3**
Reduce citizens' expenditure for private mobility	**4** (62.6%)	7	**4**
Improve the accessibility on foot and by bike to the old town and the suburbs, and facilitate people with reduced mobility (e.g., elders, disabled, adults with children and children)	**5** (60.1%)	**4**	7
Facilitate accessibility to the metropolitan area	**6** (58.0%)	**6**	**5**
Reduce greenhouse gas emissions, energy consumption, and waste generated by transportation	7 (57.2%)	9	9
Prioritise the accessibility to metropolitan attractors by developing public transport services	8 (56.7%)	**5**	12
Boost the economic development of the metropolitan area by providing quality and innovative transport systems	9 (53.9%)	8	8
Improve the liveability and attractiveness of public transport facilities and pedestrian areas	10 (53.9%)	13	11
Facilitate the connection between the shores of the Strait by integrating ferry services with the local public transport network (buses and trains)	11 (53.6%)	12	**6**
Ensure the long term economic sustainability of transport projects	12 (50.5%)	11	9
Increase the accessibility to northern and southern suburbs, as well to hill and piedmont satellite towns	13 (49.5%)	10	13
Improve urban air quality and reduce the harmful effects generated by transport noise	14 (46.6%)	14	14
Reduce land consumption generated by city expansion	15 (42.4%)	15	15

[a] Respondents considering a PSUM as a 'top priority'

Table 12. Taormina: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Reduce atmospheric emissions generated by transportation that are harmful to human health - carbon monoxide (CO), nitrogen oxides (NOx) , volatile organic compounds (VOCs) and fine particulates (PM_{10})	**1** (76.8%)	**2**	**6**
Reduce transport accidents	**2** (76.1%)	**1**	**1**
Improve transport waste management	**3** (72.5%)	**4**	**4**
Reduce greenhouse gas emissions (CO_2) generated by transportation	**4** (72.3%)	**3**	**3**
Facilitate public transport (buses, trams, metros, taxis)	**5** (66.5%)	**5**	**2**
Ensure the economic sustainability of the public transport system management	**6** (59.6%)	8	**5**
Reduce land consumption generated by city expansion	7 (58.7%)	**6**	7
Reduce citizens' and firms' expenditure for mobility	8 (56.6%)	7	12
Facilitate non-motorized transportation (cycling and walking)	9 (54.3%)	11	9
Improve the governance of the mobility system	10 (54.2%)	9	13
Increase non-motorized areas	11 (52.1%)	10	8
Reduce transport noise	12 (49.3%)	14	11
Optimize private transport (car and motorbikes) by improving intermodality and logistic hubs	13 (45.9%)	13	10
Increase the alternatives to mobility	14 (44.9%)	12	14

[a] Respondents considering a PSUM as a 'top priority'

Table 13. Syracuse: rankings of priorities for sustainable urban mobility (PSUMs) (top-6 positions in bold)

PSUMs	**All respondents** ranking (%[a])	**Car and motorbike users** ranking	**Users of other transport modes** ranking
Reduce transport accidents	**1** (83.6%)	**3**	**3**
Facilitate public transport	**2** (82.9%)	**1**	**2**
Reduce air emissions generated by transportation that are harmful to human health	**3** (82.7%)	**2**	**1**
Reduce greenhouse gas emissions generated by transportation	**4** (75.3%)	**4**	**6**
Reduce transport waste	**5** (69.3%)	**5**	7
Ensure the economic sustainability of the public transport system management	**6** (65.6%)	7	**4**
Reduce citizens' expenditure for mobility	7 (65.0%)	**6**	10
Reduce land consumption generated by city expansion	8 (64.4%)	8	**5**
Facilitate non-motorized transportation (cycling and walking)	9 (59.6%)	10	8
Facilitate the access to the local cultural heritage	10 (59.2%)	9	11
Promote institutional sustainability	11 (55.7%)	11	9
Regulate motorized private transport (cars and motorbikes)	12 (49.7%)	13	n.s.
Plan the organization of freight urban distribution	13 (45.8%)	14	n.s.
Reduce transport noise	14 (45.2%)	15	n.s.
Increase non-motorized areas	15 (44.9%)	16	n.s.
Increase the alternatives to mobility	16 (42.9%)	12	n.s.

[a] Respondents considering a PSUM as a 'top priority'
n.s.=not significative (less than 5% of the sample)

4. Discussion and conclusions

The test presented here generated two main results: 1) a common top-down framework may be used as a basis for the participated specification and ranking of local priorities; 2) if needed, reference may be made to a core set of six common priorities concerning: accessibility by (and economic sustainability of) public transport, air pollution, accidents, greenhouse gasses, transport waste. It must be stressed that such results – and the following considerations – are not generalizable to all urban areas. In our test: a) no large city is considered (even if Salerno and the Phlegrean Fields are part of a large conurbation and a metropolitan area, respectively), and b) all test areas feature a very high level of private

motorization, and – again with the exception of the Phlegrean Fields and Salerno – a poor PTS.

On the whole, the starting conceptual framework of sustainable urban mobility has proven to be an excellent tool to be used in participative procedures. As already stressed above, only in Reggio Calabria, stakeholders delivered a list of priorities radically different from our starting proposal. Most other new or amended priorities emerging from stakeholders' deliberation were not considered as an actual priority by citizens. There are only two relevant amendments to our starting list of priorities that may be used as a common reference for further implementation and testing: the consideration of accessibility by public transport within and to/from the urban area as separate priorities; the addition of a PSUM concerning the accessibility of vulnerable groups (disabled, elderly, children).

The proposed reference to a common list of priorities that must be adapted to local specificities stands in the middle of the top-down versus bottom-up scientific debate. What is proposed here has the potential of ensuring the benefits (and reducing the side-effects) of both approaches. A starting list of priorities can be used as a common framework for multi-level policies for sustainable urban mobility; that is, for both the design of supra-local policies and funding schemes, and for the evaluation of resulting local actions and projects. These in turn may result from a participative procedure that is able to generate area-specific PSUMs. Thanks to such a top-down *and* bottom-up approach, both the risks of a too generic or too specific policy design can be kept under control. As the test proposed here clearly shows, different participative tools are needed to ensure that: a) stakeholders may propose alternative specifications of the starting list of priorities, and b) citizens may help select the more relevant (and discard the less ones). Moreover, differences between segments of transport users (and in particular between those who use the car daily, and the rest of the population) should be always taken in due consideration when assessing the ex-ante consensus on future actions.

Referring to our second main result, it must be stressed that the core set of six common priorities: a) may not be used in the case of Reggio Calabria, where a radically different list of priorities was adopted by local stakeholders; b) actually stands in the first six positions of the ranking only in two urban areas (Taormina and Syracuse); c) in all other areas, at least one of the top-6 priorities actually ranks 8th or lower. All that implies that the proposed set of six priorities does not fit to all situations, and – most important – is useless in the case of urban areas featuring very specific characteristics.

Bearing in mind these limitations, some considerations may nevertheless be developed. First of all, the core set of six priorities emerging from the test areas is exhaustive. The reduction of greenhouse gasses and waste refer to the environmental sustainability of urban mobility; the reduction of accidents and air pollutants that are harmful to humans, and the accessibility by public transport refer to its social sustainability. If the issue of the economically sustainable management of public transport is also considered, than the resulting set covers all the three standard pillars of sustainability. The latter issue may also be considered as part of the effectiveness of the urban transport system, that is, the fourth dimension of sustainable urban mobility recently suggested by Jeon et al. (2013). Moreover, the reduction of greenhouse gasses and transport waste, and the improvement of accessibility by public transport may be used to cover the overall dimensions of ecological sustainability, and both intra- and inter-generational equity proposed by Holden et al. (2013);

but no priority is provided here to cover their fourth dimension ("satisfaction of current transport needs").[12] Finally, our set of core priorities is consistent with Gudmudsson and Hojer (1996) who explicitly refer to the negative impacts of transport activities on the quality of life (accidents, noise, air pollution, etc.).

Starting from the result of the test presented here some overall hints for policy can be provided: 1) A common list of priorities may help to avoid the dispersion of attention and resources which often results from the reference to an extended set of goals; 2) Resources saved by focussing on a common list of priorities may be used to fund the deliberative and participative activities that are needed to adapt priorities to local specificities, and to rank them; 3) The resulting top priorities should be used as a basis for local plans and policies, and for the selection of a limited number of indicators and targets (Mameli and Marletto, 2014).

References

Arnstein S.R. (1969). A Ladder of Citizen Participation. Journal of the American Institute of Planners, 35: 216-224.

Banister D. (2011). Cities, mobility and climate change. Journal of Transport Geography, 19: 1538-1546.

Baumann C., White S. (2014). Collaborative Stakeholder Dialogue. International Journal of Sustainable Transportation, 9: 30-38.

Castillo H., Pitfield D.E. (2010). ELASTIC – A methodological framework for identifying and selecting sustainable transport indicators. Transportation Research Part D, 15: 179–188.

Chilvers J. (2009). Deliberative and Participatory Approaches in Environmental Geography. In: N. Castree, D. Demeritt, D. Liverman, B. Rhoads. A Companion to Environmental Geography. Wiley Blackwell, Chichester (UK).

Dreyer M., Renn O. (2011). Participatory Approaches to Modelling for Improved Learning and Decision-making in Natural Resource Governance: an Editorial. Environmental Policy and Governance, 21: 379-385.

ECMT-European Conference of Ministers of Transport (2002). Implementing Sustainable Urban Travel Policies – Final Report. OECD, Paris.

[12] At the same time, it is somehow surprising that, though starting from an explicit reference to the satisfaction of human needs, Holden et al. (2013) do not consider the negative impacts on human health generated by transport accidents and air pollutants. Isn't health a human need? Or is this need negligible when compared with that of mobility?

Franceschini S., Marletto G. (2014). A deliberative-participative procedure for sustainable urban mobility–Findings from a test in Bari (Italy). Working Paper Crenos, 2014/08.

Fraser E.D., Dougill A.J., Mabee W.E., Reed M., McAlpine A.J. (2006). Bottom up and top down: Analysis of participatory processes for sustainability indicator identification as a pathway to community empowerment and sustainable environmental management. Journal of Environmental Management, 78: 114–127.

Gudmundsson H., Hojer M. (1996). Sustainable development principles and their implications for transport. Ecological Economics, 19: 269-282.

Holden E., Linnerud K., Banister D. (2013). Sustainable passenger transport: Back to Brundtland. Transportation Research Part A, 54: 67–77.

Hull A. (2008). Policy integration: What will it take to achieve more sustainable transport solutions in cities? Transport Policy, 15: 94-103.

Isfort, Cittalia, AnciComunicare, Cles (2012). Rapporti di area (Area Reports). MUSA, Roma (I), July 2012. http://www.musainnovazione.it (accessed: September 2014).

Jeon C.M., Amekudzi A. (2005). Addressing sustainability in transportation systems: definitions, indicators, and metrics. Journal of Infrastructure Systems, 11: 31–50.

Jeon C.M., Amekudzi A.A., Guensler R.L. (2013). Sustainability assessment at the transportation planning level: Performance measures and indexes. Transport Policy, 25: 10–21.

Mameli F., Marletto G. (2014). Can National Survey Data be Used to Select a Core Set of Sustainability Indicators for Monitoring Urban Mobility Policies? International Journal of Sustainable Transportation, 8: 336-359.

May A. (2009). Improving Decision-making for Sustainable Urban Transport: An Introduction to The DISTILLATE Research Programme. European Journal of Transport and Infrastructure Research, 9: 184-201.

Reed M.S., Dougill A.J. (2002). Participatory selection process for indicators of rangeland condition in the Kalahari. The Geographical Journal, 168: 224-234.

Reed M.S., Fraser E.D.G., Dougill A.J. (2006). An adaptive learning process for developing and applying sustainability indicators with local communities. Ecological Economics, 59: 406-418.

Stagl S. (2007). Emerging Methods for Sustainability Valuation and Appraisal, Final Report. SDRN-Sustainable Development Research Network, London (UK).

Stirling A. (2008). "Opening Up" and "Closing Down"–Power, Participation and Pluralism in the Social Appraisal of Technology. Science, Technology & Human Values, 33: 262-294.

Xenias D., Whitmarsh L. (2014). Dimensions and determinants of expert and public attitudes to sustainable transport policies and technologies. Transportation Research Part A, 48: 75–85.

Ultimi Contributi di Ricerca CRENoS

I Paper sono disponibili in: http://www.crenos.it

14/14 *Fabio Cerina, Luca Deidda,* "Reward from public office, and selection of politicians by parties"

14/13 *Roberta Melis, Alessandro Trudda,* "Mixed pension systems sustainability"

14/12 *Gerardo Marletto,* "Socio-technical dynamics and political institutions: A multilevel Darwinian framework of sustainability transitions"

14/11 *Andrea Pinna,* "Shall We Keep Early Diers Alive?"

14/10 *Gianpiero Meloni, Dimintri Paolini, Juan de Dios Tena,* "American Beauty: an analysis of U.S. movies revenues in the global market"

14/09 *Silvia Balia, Rinaldo Brau, Emanuela Marrocu* "Free patient mobility is not a free lunch. Lessons from a decentralised NHS"

14/08 *Gerardo Marletto,* "A deliberative-participative procedure for sustainable urban mobility – Findings from a test in Bari (Italy)"

14/07 *Manuela Deidda,* "Insularity and economic development: a survey"

14/06 *Edoardo Otranto, Massimo Mucciardi, Pietro Bertuccelli* "Spatial Effects in Dynamic Conditional Correlations"

14/05 *Francesco Quatraro, Stefano Usai,* "Are knowledge flows all alike? Evidence from European regions"

14/04 *Angelo Antoci, Fabio Sabatini, Mauro Sodini* "Online and offline social participation and social poverty traps. Can social networks save human relations?"

14/03 *Anna Bussu, Claudio Detotto,* "The bi-directional relationship between gambling and addictive substances"

14/02 *Alessandro Fiori, Tadas Gudaitis,* "Optimal Individual Choice of Contribution to Second Pillar Pension System in Lithuania"

14/01 *Oliviero A. Carboni, Paolo Russu,* Measuring Environmental and Economic Efficiency in Italy: an Application of the Malmquist-DEA and Grey Forecasting Model

13/24 *Luca Deidda, José J. Cao-Alvira,* "Financial liberalization and the development of microcredit"

13/23 *Manuela Deidda,* "Economic hardship, housing cost burden and tenure status: evidence from EU-SILC"

13/22 *Vania Manuela Licio, Anna Maria Pinna,* "Measuring insularity as a state of nature. Is there a case of bad geography?"

13/21 *Vania Manuela Licio, Anna Maria Pinna,* "The European firms' export activity to the neighbouring countries"

13/20 *Kallioras Dimitris, Anna Maria Pinna,* "Trade activity between the EU and its neighboring countries: Trends and potential"

13/19 *Claudia Cigagna, Giovanni Sulis,* "On the potential interaction between labour market institutions and immigration policies"

13/18 *Romana Gargano, Edoardo Otranto,* "Financial Clustering in Presence of Dominant Markets"

13/17 *Ettore Panetti,* "Financial Liberalization with Hidden Trades"

Finito di stampare nel mese di Giugno 2015
Presso Centro Stampa dell'Università degli Studi di Cagliari
Via Università 40
09125 Cagliari

www.crenos.it

ISBN 978-88-8467-908-6