

*Expert Opinions for Promoting Green Transport in Islands*  
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# **EXPERT OPINIONS FOR PROMOTING GREEN TRANSPORT IN ISLANDS**

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## **ABSTRACT**

Island communities are often not capable of autonomously developing comprehensive plans for environmental protection, transport and tourism development; at the same time, they are increasingly anxious to preserve their identity, environment, natural and cultural wealth. Sustainable (green) transportation offers a solution in the form of an integrated system of policies in four major areas: Economy, Environment, Society, and Tourism. In this research, guided by literature findings on sustainable transport and green transport policies, a consultation event was organized and a questionnaire was employed to identify the state of the transport system and the attractiveness of alternative green transport policies that may address specific environmental problems. The consultation event promoted the support of local authorities for sustainable transport policy making and findings from the analysis of

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responses were synthesized into guidelines for the successful implementation of green transport measures in touristic island communities.

*Keywords: sustainable transport, green transport, tourism, island communities, public participation, questionnaire survey*

## **OBJECTIVE**

Island communities are often not capable of autonomously developing comprehensive plans for environmental protection, transport and tourism development. At the same time, they are increasingly anxious to preserve their identity, environment, natural and cultural wealth. In order to forge a unique place identity into a competitive product and export this image globally, island communities have to focus on their environmental (green) potential, tangible and intangible. Transportation represents a complex technological, economic and social system that is difficult to manage comprehensively, especially in view of increasing global demand for motorization and mobility (Goldman & Gorham, 2006). The vision of sustainable (green) transportation in particular, requires the development of an integrated system which will be able to compare different policies in four major areas: Economy, Environment, Society, and Tourism.

This research is part of the Green Transport in Islands (GRETIA) project (<http://www.gretia.aegean.gr>). It proposes a framework for the promotion of sustainable transport in touristic areas. This framework is based on the opinion of local authorities and stakeholders (i.e. all those with an interest in green transport in tourism), and may be a useful tool in guiding local actors to identify, signify, valorise and manage their resources. The literature indicates that stakeholder participation and public involvement generates many benefits and is a central component of Integrated Environmental Management (IEM), bringing together diverse societal groups in generating support for the implementation of green measures that oftentimes are intended to address very dynamic and complex environmental problems (Margerum, 1999; Reed, 2008).

This paper is composed of the following sections. Section 2 presents a literature review of sustainable transport and green transport policies and measures. Section 3 describes the research methodology. Section 4 analyses questionnaire data on the opinion of local authorities and transport stakeholders on green transport and its implications on the environment and tourism. Sections 5 and 6 synthesize our findings into guidelines for the successful implementation of green transport measures in touristic island communities.

## **LITERATURE REVIEW**

### **Green and Sustainable Mobility**

Green transport is an alternative term for sustainable transport. Of the numerous definitions of sustainability, we prefer to think of it as economic development in qualitative rather than quantitative terms: development that secures a satisfactory Quality of Life (QoL) for the current generation within the carrying capacity of the environment. By respecting the constraints imposed by the limited availability of natural resources, future generations are assured of equivalent (if not equal) development opportunities. Therefore, sustainable (or green) transport refers to transportation systems that are built and operate in a sustainable manner. Further deliberation on the services provided by transport, indicates that sustainable transportation essentially means sustainable mobility (Black, 1996) or, more accurately, access to transport services that enable mobility (Gudmundsson & Höjer, 1996).

Compared to the general transport picture, islands are geographically isolated; lack of capital is an issue for many islanders (Enoch & Warren, 2008); and tourism is both an important component of insular transport as well as an important source of income for local societies. In turn, income is an important determinant of car mobility, so tourism boosts transport demand both directly and indirectly (by increasing the income of islanders).

As pointed out by Goldman & Gorham (2006), transportation decisions tend to be made in the service of larger policy goals such as: economic growth, job creation, land use management, and geographic transfers of wealth. As to an appropriate conceptual framework for the consideration of sustainable transport policies, Black (1996) sites professional sources that consider transport policies falling into the following broad classes: (1) regulatory mechanisms to control emissions; (2) tax increases that favour energy-efficient transport modes; (3) support for new technologies and alternative fuels; and (4) planning approaches that decrease travel demand. To these one may add telecommuting solutions and options offered by smart mobility management.

Directing our attention to specific studies, most sustainable transport policies concern the passenger car. On car ownership in developed countries, it is noted that while income levels affects the number of cars (which are usually expressed in number of cars per 100 or 1000 people), it is gasoline prices that affect the size of cars (Enoch & Warren, 2008). Regarding car policies in less developed countries, it has long been established that there exists a strong relationship between car ownership and the rate of economic growth (Button, 1993). Overall, fuel price and income were found to be important influences in the short term (Enoch & Warren, 2008) with neither fuel price nor degree of isolation (remoteness) playing an important role.

Vieira, Moura, & Viegas (2007) discern two major technological strategies to overcome the burden of fossil fuels in transportation: increase fuel economy of vehicles as well as introduce end-of-pipe technologies to reduce traffic emissions; and introduce alternative fuels, such as biofuels. They also emphasize the importance of eco-driving (i.e. driving in a manner friendly to the environment), as it affects favourably energy use and vehicle maintenance e.g. by reducing accelerations and decelerations in driving behaviour. Their work brings forth the importance of driver education. In the second part of a lengthy study,

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Santos, Behrendt & Teytelboym (2010) argue for the promotion of an energy-efficient driving style and the stimulation of purchases of more energy-efficient cars (with education, even at the school level, and tax benefits as motives).

Bicycles are of particular interest in green transport in tourism since: (a) cycling is well suited to ecotourism; and (b) insular touristic destinations enjoy good weather for a large part of the year. It has been found (Santos, Behrendt & Teytelboym, 2010; Pucher, Buehler & Seinen, 2011) that:

- Cycling is promoted by: expansion and improvement of bicycle lanes and paths; traffic calming; sheltered and secure parking; bike-transit interaction and integration; bike sharing programs; education and training programs; and promotional events (such as rides, races, festivals, and special cycling events, that take advantage of the Internet).
- Cycling is concentrated in central cities and near universities, so the existence of neighbouring university campuses offer additional potential.

Coleman (2000) suggests that local authorities need to continue on the green transport path with awareness efforts, although he points out that this is likely to be a lengthy process with a slow return. He argues that the widespread implementation of green commuter plans is unlikely unless national legislation requires it. Interestingly, he suggests that targeting (large) businesses in urban and suburban locations may be a sensible short term way forward – this constitutes an interesting possibility for our study.

Implementing sustainable transport policies is not easy. The European Conference of Ministers of Transport's (ECMT) "Sustainable Urban Travel" (SUT) program (1997–2001) sponsored a series of workshops aimed at addressing "why implementation of integrated sustainable policies has proven to be so difficult" (Goldman & Gorham, 2006). As Woodcock et al. (2007) and Chapman (2007) point out, good sustainable solutions, such as walking and cycling, are at the same time the least preferred. Some of the barriers to the implementation of sustainable transport have been pointed out by Attard (2005):

- high status associated with the car; this may be of particular concern for the study area, which is reputed to have high car ownership levels;
- lack of infrastructural and professional investment in public transport operations;
- lack of professionals in the field of land transport planning;
- organizational fragmentation;
- lack of proper and accurate information;
- political issues; and
- funding problems.

Also, as Steg & Gifford (2005) point out, policy makers should take into account how policies may affect QoL, e.g. restrictions in freedom of choice may be ill received and psychologically resisted.

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All in all, there are indeed significant political, economic, social, institutional, and technological challenges to the implementation of sustainable transport systems. Therefore, of particular interest to GreTIA is the development of innovative measures for sustainable transport. Goldman & Gorham (2006) sketch out four types of policies and their related measures in sustainable transport:

1. *New Mobility*, referring to more flexible, convenient and competitive travel options. These include measures such as: distributed travel information (real time and making use of the Internet via mobile devices), fare integration (via e.g. smart cards), car sharing (with fuel efficient models, assured reserved parking and other perks), bike sharing (unlocked by telephone, charged on credit cards and equipped with sensors for better damage and maintenance control), auto-free housing (in coveted areas, with parking exceptions provided as bonuses), and other new service paradigms (such as integrated origin to destination planning).
2. *City Logistics*, referring to urban freight traffic.
3. *Intelligent System Management*, including measures such as congestion charging, comprehensive bus management systems (with smart bus routes that provide enhanced passenger information, real time arrival displays, low floor buses, more regular cleaning, better bus shelters, transit priority signals, automatic vehicle location and driver instruction systems), automated traffic enforcement, and full business plans and business case presentation for new proposals.
4. *Livability*, i.e. accessibility, public spaces, social engagement and recreation, and the overall health and economic welfare of city residents. Related measures include pedestrian realms (e.g. streets exclusively for the use of bicycles and pedestrians, banned parking on sidewalks), breaking the driving routine (e.g. with car free days or rationed access to the city during peak hours), rapid bus transit and zones of shared neighbourhood space.

The above-mentioned types of policies are used to categorise the most significant measures as per the results of the public consultation described in this paper.

### **Public Consultation Process**

Taking into account the opinions of stakeholders and the general public, has become widespread in the policy planning and implementation process (Shiple & Utz, 2011), although as a process is rather recent in the transportation field. Since 2005, the European Commission (EC) began to encourage European cities to involve all relevant stakeholders in the development of their sustainable urban transport plans (EC, 2005), as it became clear that sustainable transport can only be achieved with the participation of all the actors involved in the decision making process through public consultations.

However, one may reasonably be concerned though whether the intention to support a measure by local stakeholders will actually be translated to action by residents when the measure is implemented and applied in practice. In democratic societies, inputs to the

decision-making and planning process take into account expert opinions as well as public feelings and perceptions (Assefa & Frostell, 2007; Jobert, Laborgne & Mimler, 2007) acknowledging the problem that rational individual behaviour may conflict with the common good and hinder the efficient use of public resources. This has been famously pointed out by Hardin in his Tragedy of the Commons seminal work (1968) and depicted in the prisoner's dilemma, a game theoretic model where the equilibrium solution (which is dominant for individual players) is different from the cooperative solution (which is best for society). According to Banister (2008), public participation is a key factor for achieving behavioural changes, while for implementing successfully a policy measure; public acceptability is of great importance.

In addition, Gil et al. (2011a), found that an active involvement of interested stakeholders in policy decision-making process can minimize future conflicts, since it creates a sense of ownership of the decision made, thus guaranteeing a better implementation. Overall, it can be claimed that public consultations strengthen democracy and empower both citizens and society (Reed, 2008; O' Faircheallaigh, 2010).

France was the first country that a public consultation took place for the development of its regional transport plans, while the United Kingdom (UK), has the appropriate legislation to ensure consultation at all stages of the decision making process. The key point of success in UK is that engages the key actors as early as possible in the process, so that to achieve a common vision of the problem to be addressed and set the goals to be achieved. For instance, in London an extensive consultation of all interested parties took place in order to achieve the public acceptability for congestion charging (Hall, 2010).

In Ponta Delgada (Archipelago of the Azores), fifteen stakeholders (public, private, scientific and non-governmental institutions at national, regional and local levels) were involved in the development process of a sustainable mobility plan (SMP). These stakeholders included all actors who were directly or indirectly affected by mobility in the study area, formulating a heterogeneous and multi-domain specialized group. The outcome of their involvement was considered a success since through this process: (a) it became possible to have the public stakeholders financing the implementation of SMP; and (b) the stakeholders that were actively involved in the process, formed a working group after the conclusions for the SMP, that continues to work actively on the issue (Gil et al., 2011b).

The state-of-the and practice with regards to the role of public consultations on the decision making process of policy making led us to the development of the research methodology presented in the following section.

## **METHODOLOGY**

This research proposes a framework for the promotion of sustainable transport in touristic islands that is based on the opinion of local authorities and stakeholders (Figure 1). It focuses on the assessment of stakeholders for the potential application of green transport in the island of Chios in Northern Aegean.

The first stage of the proposed framework is the current situation analysis through which the research team gains an overall knowledge of the current situation in the study area regarding it's: (a) Transport Conditions; (b) Environmental Practices; and (c) Tourism Product. Based on the information acquired during this stage a number of proposed policies and measures can be formulated.

However, for the determination of the policies and measures for promoting sustainable green transport, participatory procedures are necessary, as well as dissemination of relevant information that has been derived from the study so far. The development and operation of a stakeholder network for the collection of relevant information and for the dissemination of the research findings is of great importance.

Thus the next stage involves the organisation of a public consultation event to explore: (a) major issues and problems faced by the Aegean islands with respect to transport, environment, and tourism; and (b) testing of the methodology proposed for developing a policy making tool that supports stakeholders decision making. The final outcome of the public consultation is a revised list of suggested policies and measures that should be evaluated.

The fourth stage of the proposed framework concerns the simulation of the study's area transportation network. The simulation depicts the current situation, as well as future scenarios where the suggested measures (outcome of the public consultation) will be evaluated. The fifth stage concerns the evaluation of the economic impact of the proposed policies/measures. This approach is based mainly on two decision methods that is the cost - benefit and multi-criteria analysis.

The sixth stage of the proposed framework involves the organisation of a second public consultation, where the results of policies/measures evaluation are presented to the stakeholders, aiming to have a consensus on the policies/measures that their implementation should proceed.

During the final stage of the proposed framework the policies and measures that should be implemented for promoting green and sustainable transport in the Aegean Archipelagos Islands is finalised.

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It should be noted that given the needs and preferences of a community changes over time, the process presented in this framework should be repeated periodically (every 5 years or earlier if needed due to extreme circumstances, such as economic recession, etc.).



Figure 1 Methodological Framework

## PUBLIC CONSULTATION

### Data Collection Process

Taking into account the findings of the literature that was reviewed in the previous section a questionnaire was developed on the state of the environment and alternative green transport policies that may address specific environmental problems (Freeman, Littlewood & Whitney, 1996). The questionnaire was filled out during the public consultation, possibly the oldest and simplest form of public participation (Shiple & Utz, 2011); community groups, business representatives, public authorities and other special interest groups were invited.

The consultation questionnaire was addressed to actors of the Chios island and consisted of two main sections. The first section included questions that polled respondents on the state



of the transport system and the environment in the study area. The second section requested the respondents to denote their agreement with specific green transport measures that were gleaned from the literature and matched the specifics of the study area. All answers in both questionnaires are Likert-scaled from 1 to 5 where 1 stands for strong agreement down to 5 for strong disagreement. The value of 6 was reserved for non-response.

### Public Consultation Findings

In the first public consultation that took place in Chios Island in June 2012, 50 stakeholders representing public, private, scientific and non-governmental institutions at regional and local level were actively involved. These stakeholders were asked about their perceptions concerning some important transportation problems and measures identified by the research team.

In Figure 2 the main transportation problems in Chios are identified. Most of the participants agreed that the situation is worse during summer months, regarding both the air pollution and the traffic congestion, while the vast majority believe that noise pollution is a big problem in Chios.

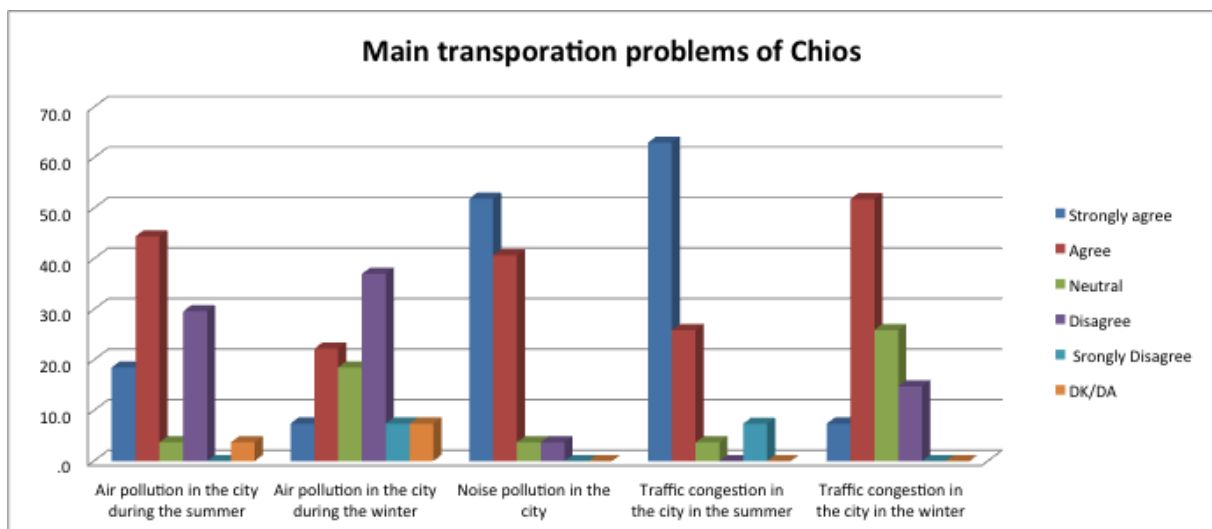


Figure 2 The main transportation problems in Chios

The perceptions of the stakeholders regarding parking, pedestrians, bikes and traffic measures are presented in Figure 3. The problem with parking space and the lack of wide pavements are highly valued problems. Most of the people asked are in favour of bicycle use in the city but more neutral about the use of it in the countryside. Opinions are divided regarding the efficiency of the current traffic safety measures.

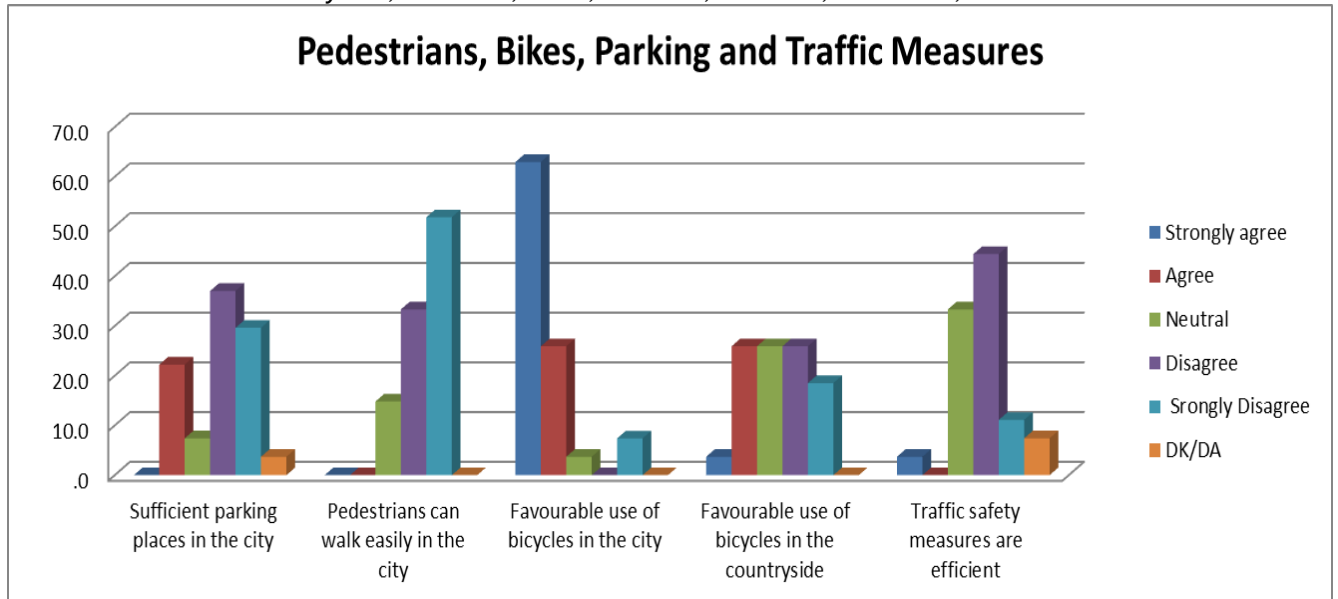


Figure 3 Parking, pedestrians, bicycles, traffic measures

The irrational use of non-renewable energy sources, the non existence of renewable ones and the insufficient protection of the island’s eco-system are pointed-out in Figure 4. Opinions vary on the performance of the waste treatment and management. This may occur because of the lack of information about the waste management among the locals. Most people are neutral about the deterioration of the historical and cultural environment, mainly due to the comparison with larger urban centers where the situation is much worse.

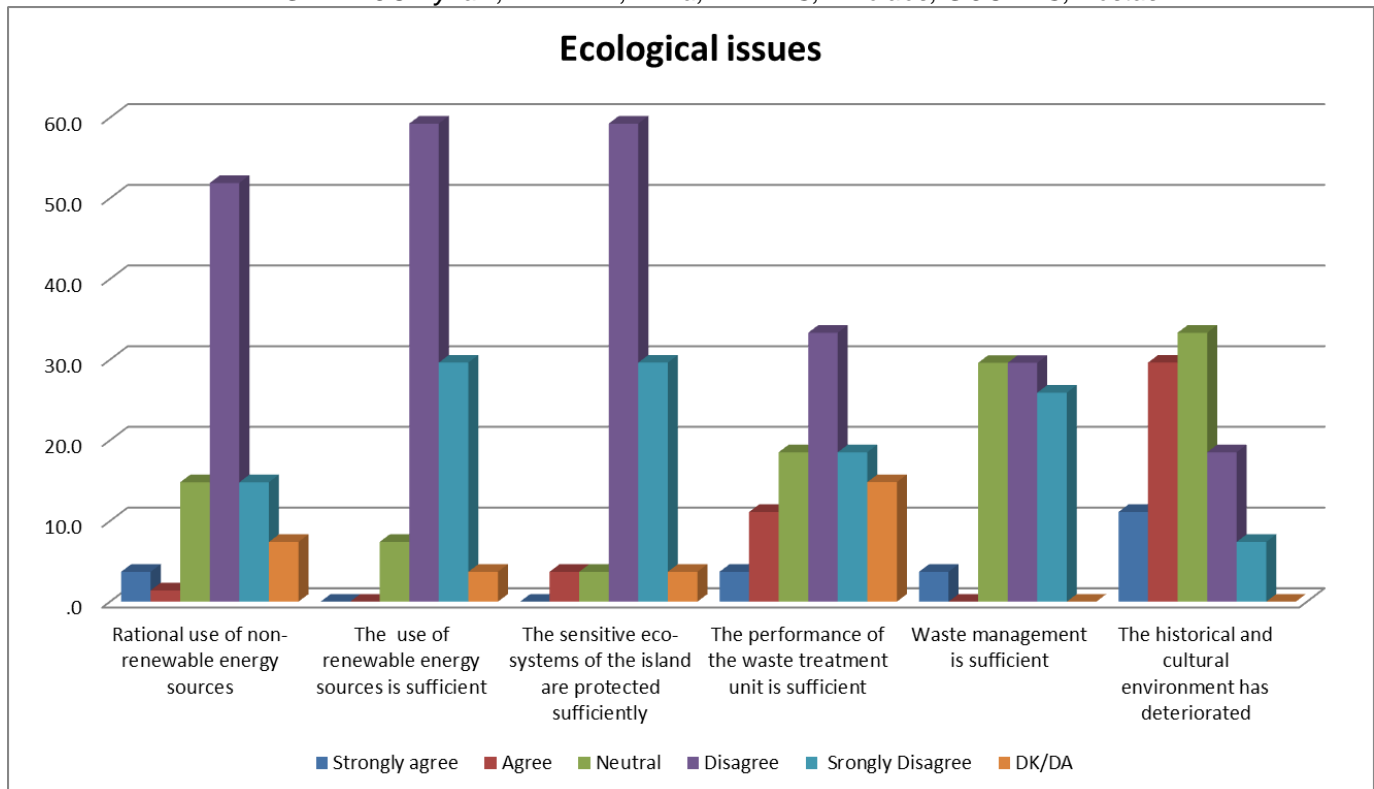
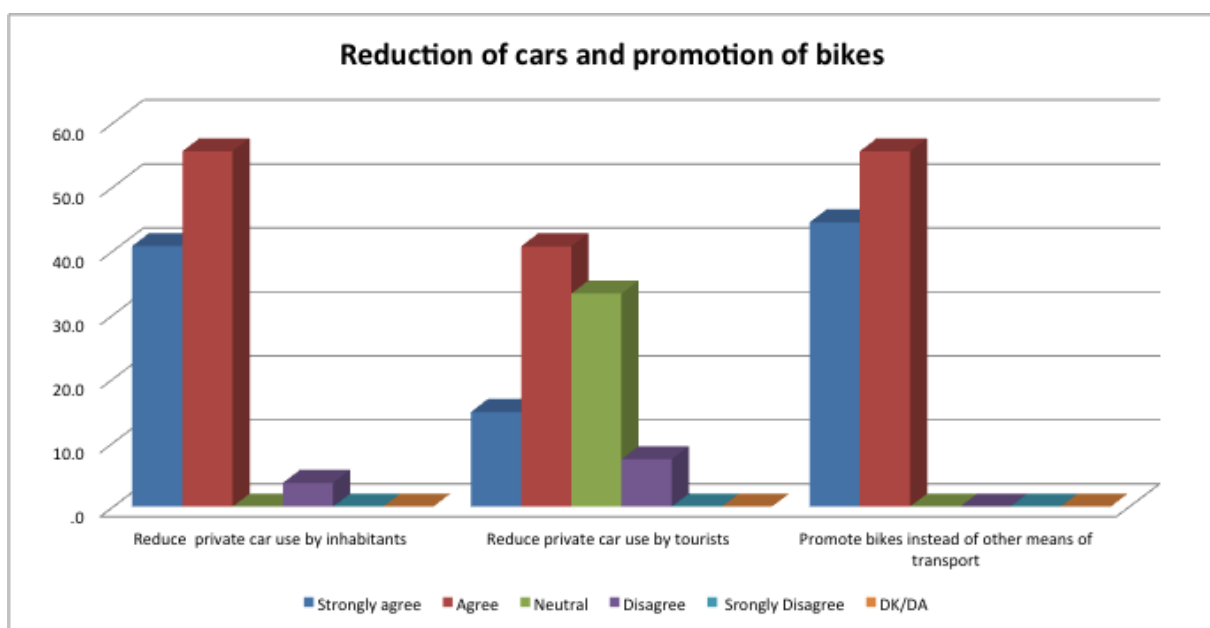


Figure 4 Ecological matters

In Figure 5 the perceptions of the respondents towards the reduction of car use and the promotion of bicycles is illustrated. The vast majority is in favour of the reduction of private car use; and the use of bikes is regarded as a feasible and positive alternative. However stakeholders are reserved towards the reduction of private cars by tourists most probably due to the lack of good alternatives.



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Figure 5 Reduction of cars and promotion of bikes

When asked about what type of vehicles should be promoted, most of the stakeholders stated that they prefer electric bikes or bike-sharing, while hybrid and electric cars also receive positive credit but in a more reluctant way (Figure 6).

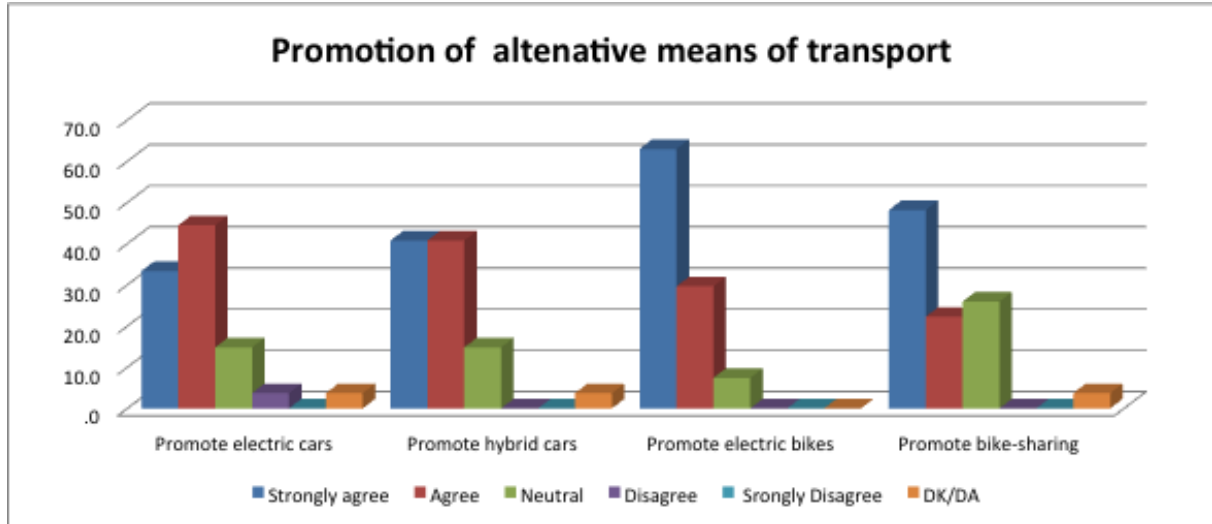


Figure 6 Promotion of alternative vehicles

According to Figure 7 the majority of the attendants agree that an improvement in the information received by users on the itineraries of public transport could be a solution towards the reduction of private cars. In addition, the promotion of public transportation by applying new technologies and social networks receives positive feedback.

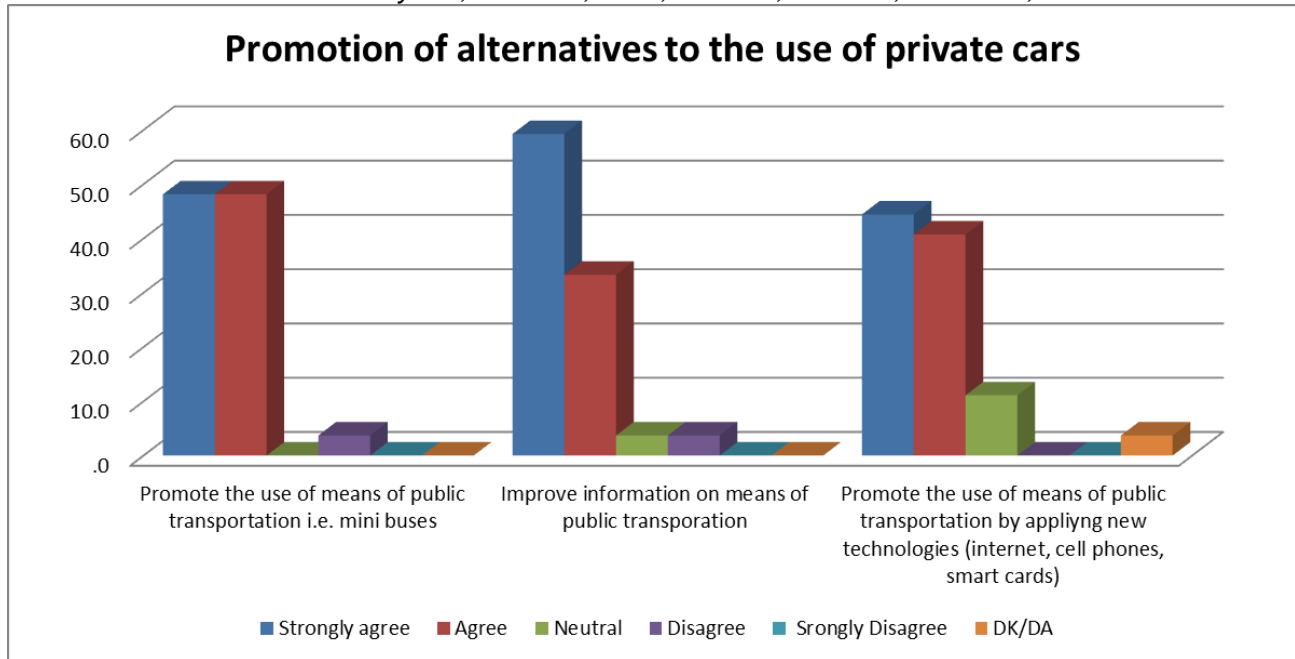


Figure 7 Promote alternatives to the use of private cars.

Furthermore, stakeholders were asked about the measures that can be imposed to improve traffic conditions in Chios. Strict measures against illegal car parking and improvement of road safety were highly valued. However the impose of green taxes were not so highly appreciated.

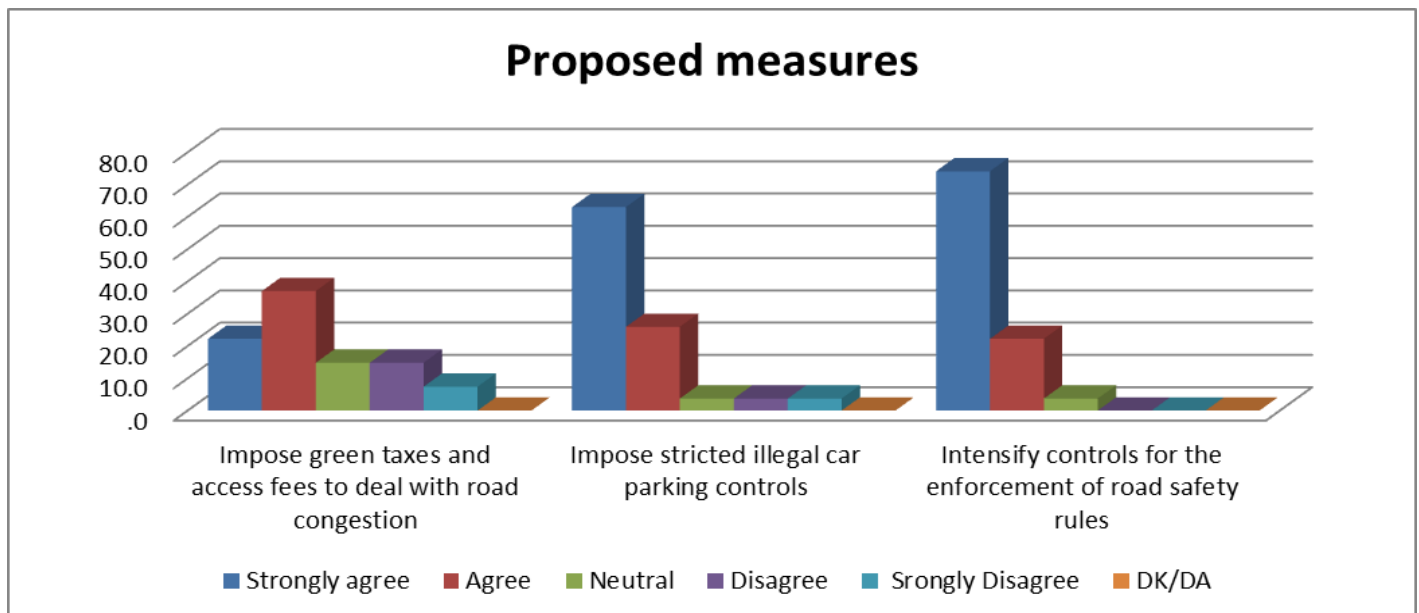


Figure 8 Measures and taxes

The stakeholders also highlighted the importance of promoting active transport programs. They also embraced the idea to promote a park and ride system in Chios.

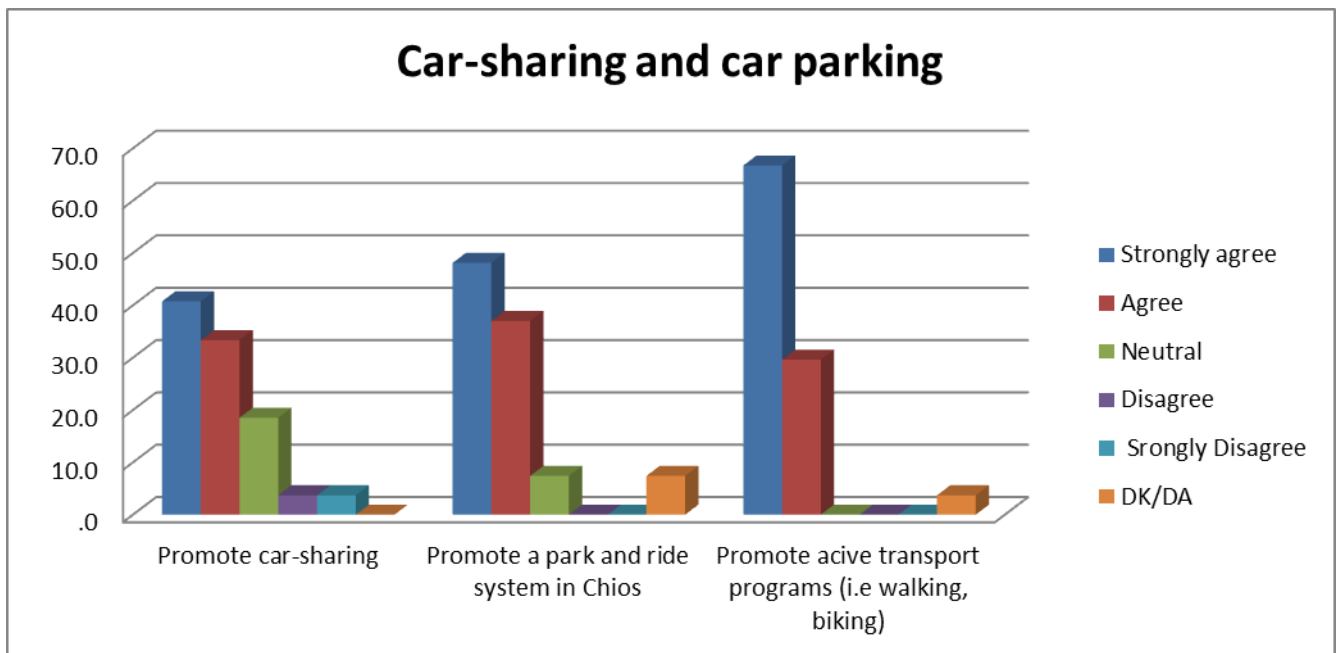


Figure 9 Car sharing

Figure 10 presents the opinions of the stakeholders towards the modification of shop and working hours, as well as citizens education on green transport measures and policies. The latter receives almost total positive opinions, while the modification of working and shop hours on the other hand, receive neutral opinions.

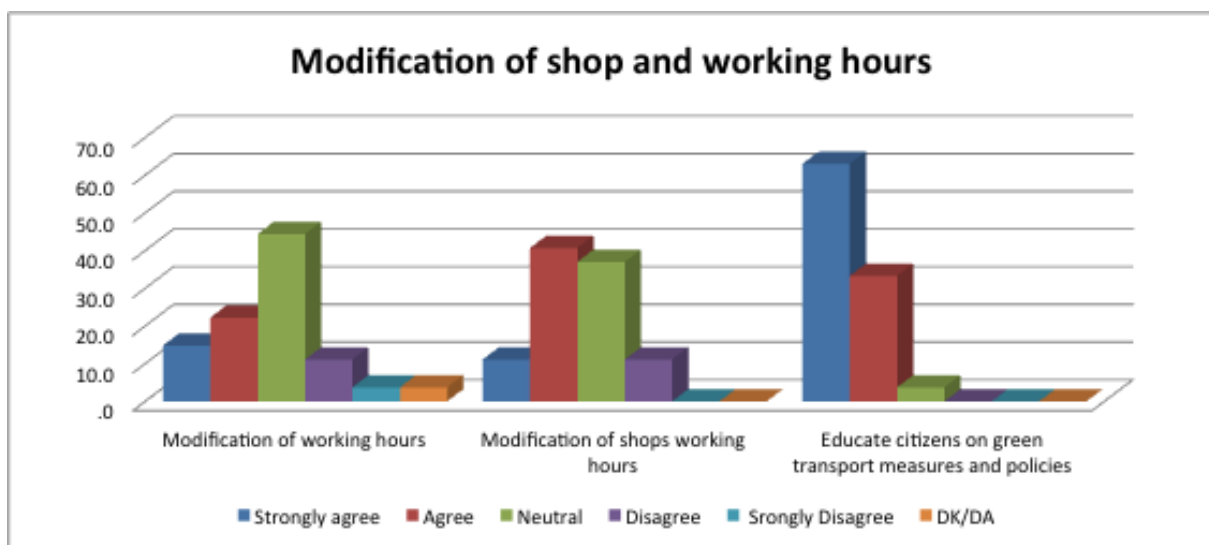


Figure 10 Modification of shop/working hours

Overall, respondents identified noise pollution and traffic congestion during summer months as the major transportation issues of Chios. Illegal parking as well as improvement of road safety were regarded as rather problematic areas. Stakeholders were positive towards promoting the use of bikes combined with green transport initiatives especially active

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transport and park and ride programs. They also agreed on improving the public transport service of the island. Measures against illegal parking and road safety were highly ranked but reluctance was observed towards imposing green taxes.

Table I summarizes the average value of Likert scale findings on the five questions dealing with green transport on tourism development. The respondents were asked to what extent they believe that green transport can support actions such as the reduction of seasonality, the emphasis on sea and sun, investment on Special Interest Tourism and improvement of service quality. Overall, respondents seem to consider the application of green transport means as favourable for the Tourism Development of Chios (majority of statements' average Likert value ranges from 1 to 2), yet some of them maintain a sceptical to neutral position.

A detailed analysis of statements reveals that over 80% of the respondents believe that green transport can lead to reduction of seasonality, 70% that there will be less emphasis on the sea and sun enhancing the focus on Special interest Tourism (100% agree) and 90% that the level of tourism services quality will be improved. Another 73% believes that green transport will improve the cooperation between local and national tourism authorities (average Likert score 2.1).

Table I – Contribution of Green transport to Chios' Tourism Development

<i>Impact</i>	<i>Average score (1=strong and 5=weak)</i>
Encourage Alternative forms of Tourism	1.40
Higher Quality of provided services	1.60
Decreasing Tourism Seasonality	1.87
Improve Cooperation among Local & National Tourism Authorities	2.10
Reduce Emphasis on Sea &Sun Tourism product	2.27

It is common ground that everyone is keen on development and tourism development in particular. It seems that there is a great expectation that green transport will reduce seasonality and the emphasis on Sea and Sun hence enabling the growth of Special Interest Tourism. It is promising that the respondents are interested and conscious about the impacts of the potential new transport and tourism developments. The majority are aware of the issues tourism is facing at local and national level. The same respondents believe that a new idea (such as green transport) may provide a valid solution to many of the problems challenging national and local tourism.

## **DISCUSSION**

Responses to the questionnaire distributed during the public consultation formulate a detailed guiding framework for the application of innovative measures to promote the adoption of green and sustainable transport in the Aegean Archipelagos islands. The

research team based on the findings of the public consultation will examine the policies and measures presented at Table II.

Table II– Suggested Policies and Measures

<b>Suggested Measures (with prioritization)</b>	<b>Type of Policy</b>
Support of bicycle use over other transportation media	Promote New Mobility
Education of citizens in green transport measures and policies	Promote New Mobility
Reduction of private car use by residents	Promote New Mobility
Support of public transport	Promote New Mobility
Intensification of road safety checks	Increase Islands Livability
Support of the use of electric bicycles	Promote New Mobility
Improvement of information of public transportation	Promote New Mobility and Intelligent Management Systems
Creation of pedestrian streets	Increase Islands Livability
Creation of bicycle lanes	Increase Islands Livability
Creation of paths	Increase Islands Livability
Support of active transportation (e.g. walking, biking)	Promote New Mobility
Increased use of new technologies in mass transport	Promote Intelligent Management Systems
Support of cars with alternative fuels	Promote New Mobility
Support of the use of electric cars	Promote New Mobility
Stricter control of illegal parking in the city of Chios	Increase Islands Livability
Support of car sharing	Promote New Mobility
Change in shop opening hours	Improve City Logistics
Reduction in the use of passenger vehicles by tourists	Promote New Mobility
Support of park-and-ride in the City of Chios	Increase Islands Livability
Support of bicycle sharing	Promote New Mobility
Use of green taxes and access tolls to fight traffic congestion	Promote Intelligent Management Systems
Change of working hours	Improve City Logistics

It should be noted that following the results of the public consultation and the promotion of the potential benefits of Green Transport in Islands, the municipality of Chios implemented as a first step several measures to promote bicycle riding such as:

- Promotion of events such as: "Bike to Work" 2013, <http://biketowork.gr>
- Invested in infrastructure of bicycle stands where riders can park their bicycles safely;
- Launched studies for the development bicycle paths; etc.



## **IMPLICATIONS FOR RESEARCH AND POLICY**

The consultation process has actively involved all key informants and stakeholders although keeping all stakeholders happy is quite difficult sometimes and may entail sacrificing the interests of one group to those of another. As a result, it constitutes a valid exercise with important policy implications from a bottom-up approach (Stabler, Papatheodorou & Sinclair, 2010); in other words, by expressing their opinions in an overt manner, expert active citizens and organizations may become able to shape or at least influence future green transport policies not only at a local (island) but also at a national level. The consultation event may also lead to the emergence of best practices with positive repercussions for future research.

In closing, we reiterate that the consultation event aims at promoting the scientific support of local authorities for green transport policymaking. The further capitalization of the scientific output, focuses on the prosperity and sustainable development, via new knowledge and the familiarization of residents with modern technologies and operating practices of green transport; and cultivation and encouragement of new attitudes and behaviour of travellers, regarding green transport modes.

## **ACKNOWLEDGEMENTS**

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