Session 1A: Social networks and traveler behavior I
Moderators: Odile Heddobbies, Phyllis Tsimbikou

The walkability of Thessaloniki: citizens' perceptions - Konstantinos Molaios, Evangelis Gentioumis, and Aristotelis Nalmpantis

Perception of smartphone applications about transportation among university students - Chorafis Chorafis, Roufis Roufis, and Ioannis Politis

Social networking and Driving: A study about young Greeks - Theophilos Kydonides, Pantelis Kopelis, Christos Maroulis Polyenopoulos, and Efthimios Demidavi

Crowdsourcing and visual research methodologies to promote data collection for sustainable mobility planning - Efthimios Bakogiannis, Maria Sti, Konstantinos Anthopoulos, Agis Vossi, and Choralempouky Kyriakides

Negotiations, a way to to interpret the future transport challenges - Vladimir Maros, Miljena Bagricanovic, Elmi Anoyrkati, and Alba Lina Ayavnto

Networking the potential of ITS: market research analysis - Ivan Stadlers, Elmi Anoyrkati, Alexis Garcia-Perez, Alba Lina Ayavnto, Viora Roykova, Xavier Leaf, and Vicor Donal

Urbanism and Regional: Reclaiming the right to use public spaces in Thessaloniki, Greece - Margarita Angelidou

How big data affects the design of urban furniture: An approach from the perspective of industrial design - Seim Komein Jahn and Fusan Cunzoulo

11:00-11:30
Coffee Break

Keynote Speakers Session
Moderator: Eftihia Nathanail

A Geospatial Perspective on Sustainable Urban Mobility in the Era of Big Data - Prof. Bin Jiang

Exploring social and economic implications of big data for mobility - Prof. Phyllis Tsimbikou

TEO: Driving Strategies and Impacts - Prof. Alexander Skayannis

Sponsors Session
Moderator: Eftihia Nathanail

ATTIKI ODOS Traffic Operations, Enhancing Road Safety with the use of new technologies - ATTIKI ODOS: Dr. Dimitris Seris

Capabilities and applications of ArcGIS - Marathon Data Systems

14:00-15:00
Lunch

Session 2A: Traffic emissions and environmental impacts I
Moderators: Fotini Kehaga, Dimitris Seris

Modellers of a methodology, using Multi-criteria Decision Analysis (MCDA), to choose between full pedestrianization and traffic calming area Impact zone type - Ioannis Vasilieides and Dimitrios Nalmpantis

Influence of traffic emissions on urban air quality: a case study of a medium sized city - Angelos Aggelakakis, Akrifti Anastopoulos, Alkiviadis Tsimaros, and Maria Biile

Cycling as a key component of the Athenian sustainable urban mobility plan - Efthimios Bakogiannis, Maria Sti, Christos Kontopoulos, and Choralempouky Kyriakides

Assessment of CO2 footprint of the new Athens Metro line 4 during the operation phase - Aristidis Giakoumis, Dimitrios Nalmpantis, and Aristotelis Nalmpantis

Considerations on sustainable mobility. The challenge of reducing the transportation time - Elisav Empestarodis, Maryn Korliss, and Antonia Athanasopoulou

Densification of cities or improved transport technology to curb CO2 emissions? - Harald Nils Rostvik

Traffic and environmental rehabilitation of the Agios Anargyrou square of the Municipality of Agios Anargyrou - Kimatista. Christine Margariti, Efthimioze Zervas and Dimitrios Nalmpantis

15:00-16:00
Coffee Break

Session 2B: Public transport and demand responsive systems II
Moderators: Umberto Crisi, Ioannis Politis

Investigating potential synergies among social entrepreneurship and public transport through experts' consultation in Greece - Acrifti Stamos, Evangelis Gentioumis, Dimitris Nalmpantis, and Aristotelis Nalmpantis

Modelling transit user travel time perception in a post-economic recession era: The case of Athens, Greece - Acrifti Stamos, Konstantinos Kepogekopulos, Elmi Vasilhagamani, and Christo Papadoulo

The aesthetic integration of a tramway system in the urban landscape: evaluation of the visual nuisance - Christos Plogyi, Dimitrios Lazouras, and Alexandros Dolanitis

Redefinition of public transport in the Alto Minho region, Portugal – an overview - Isabel Baizorro, Luis Barreto, and Antono Anmol

A criteria-based evaluation framework for assessing public transport related concepts resulted from collective intelligence approaches - Evangelis Gentioumis, Akrifti Stamos, Dimitris Nalmpantis, and Aristotelis Nalmpantis

Concept for smart transportation user-feedback utilizing volunteered geoinformation approaches - Benjamin, Johann and Michael Scholz

Operating resilience of severely disrupted urban transport systems - Sofia Douki, Alexandra, and Elmi Anoyrkati

Public transport in transnational peripheral areas: challenges and opportunities - Federico Cevallo and Giulia Sommacal

17:00-18:00
Coffee Break

Session 3A: Data security and legal issues
Moderators: Antonio Comi, Panteleone Skabardonis

Major limitations and concerns regarding the integration of autonomous vehicles in urban transportation systems - Panagiotis Fofakouris and Eftihia Nathanail

Data protection in smart cities: application of the EU GDPR - Maria Sti, Economou, and Konstantinos Kekkonis, and Efthia Nathanial

Connected and autonomous Vehicles – Legal issues in Greece, Europe and USA - Efthimios Demidavi, Pantelis Kopelis, Efthia Nathanial, and Alexander Skayannis

Implementing a blockchain infrastructure on top of vehicle ad hoc networks: Acrifti Giagkaides, Nikolaos Georgiadis, Georgios Katsoulis, and Ioannis Anthopoulos

Innovative autonomous electrical vehicles and urban mobility: a vision for Rome in 2035 - Agistis Giannou, Luca Persia, Antonio Comi, and Antonio Polimeni

Do urban transport planning principles apply to Norwegian medium-sized sprawling city regions? The case of Stavanger region - Danielle Waddell-French

17:30-18:00
Coffee Break

Session 3B: Application of big data technologies in transport
Moderators: Sigrun Vougrou, Irina Yatsky

Applying unsupervised and supervised machine learning methodologies in social media textual traffic data - Konstantinos Kekkonis, Efthia Nathanial, and Epinio Papageorgiou


Assessment of dynamic geo-positioning using multi constellation (GNSS) in challenging environments - Stella Stikoudi, David Bettege, and Jiri Hugentoble

An thorough review and analysis of journey planners - Dimitris Sours and Efthia Nathanial

Investigating multiple areas of mobility using mobile phone data (Smartcare) in Chile - Paul Elliott and Romain Deschamps

The contribution of open big data sources and analytics tools to sustainable urban mobility - Stavros Samaras-Kamilarakis, Petros Megatrends, a way to identify the future transport challenges - Vladislav Maras, Mirjana Bugarinovic, Eleni Anoyrkati, and Alba Lina Ayavnto

Beyond travel time savings: Conceptualizing and modelling the individual value proposition of mobility - Giuseppe Lugo, Zuzana Kunitova, Gadih Poonnamshen and Martin Nudat

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Dinner in My Ithaki Restaurant
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<th>Moderators: Irina Kuzmina-Martino, Ioanna Placina</th>
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<td>10:30</td>
<td>Integrating logistics and transportation simulation tools for long-term planning - Ioannis Karakikes, Wladimir Hoffmann, Lambros Mitropoulos and Mihalis Savvatious</td>
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<td>10:45</td>
<td>Development and simulation of priority based control strategies of ground vehicles movements on the aerodrome - Jad Alomar, Juri Toljew and David Weigert</td>
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<td>11:00</td>
<td>Design and prototyping of IoS shared service for small and medium enterprise - Alexandros Avramidis and Mihalis Savvatious</td>
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<td>11:15</td>
<td>Comparing the customer use and satisfaction in two Latvian transport interchanges - Irena Yatavsk and Vaira Gromule</td>
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<tr>
<td>11:30</td>
<td>Investigating the accessibility Level in Riga's international Coach Terminal: A comparative analysis with European Interchanges - Eveline Audlovich, Vassilis Magginas, Giannis Adamos, Irena Yatavsk and Maria Tsami</td>
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<tr>
<td>11:45</td>
<td>Impact of critical variables on economic viability of converted diesel city bus into electric bus - Kristina Molnaco and Irena Yatavsk</td>
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<tr>
<th>Time</th>
<th>Session 5A:driver-infrastructure management</th>
<th>Moderators: Socrates Basbas, Alexander Skabardonis</th>
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<tr>
<td>11:30</td>
<td>Performance evaluation of GLOSA algorithms under realistic traffic conditions using C2I-communication - Michael Kleppej, Jan Grimm, Severin Strahl and Rico Auerswald</td>
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<td>11:45</td>
<td>Have information technologies forgotten pedestrians? to what extent can it/its improve pedestrian’s mobility and safety - Hector Montero-I-Bort, Socrates Basbas, Charlotte Johannsen, Lars Leden and Per Gerder</td>
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<td>12:00</td>
<td>Trip generator rates for a University campus: the case of the Aristotle University of Thessaloniki, Greece - Socrates Basbas, Konstantinos Vakaloglou, George Mertisis, Christos Tzavliris and Ioannis Politis</td>
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<td>12:15</td>
<td>An analysis on drivers’ self-reported questionnaire responses, regarding aggressive driving, attitude toward cyclists and personal values - Erykises Andonis, Nikolaos Mavridis, Alexandros Dikounisim and Socrates Basbas</td>
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<tr>
<td>12:30</td>
<td>Redesigning the safe area of Palos - Spyridon Vougiouklis, Konstantinos Anastasiadou and Giorgos Vergas</td>
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<tr>
<td>12:45</td>
<td>Development of an aggregate indicator for evaluating sustainable urban mobility in the city of Xanthi, Greece - Anastasios Tsiropoulos, Apostolos Papagianakis and Dimitrios Loutsopoulos</td>
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</tbody>
</table>

| Time     | Lunch | Session 6A: City logistics systems | Moderators: Athanasios Galanis, Daniela Mueller-Ep | |
|----------|-------|------------------------------------|-----------------------------------------------|
| 13:00    | Coffee Break | A new gold mine? identifying crucial factors affecting the potential of a freight train for urban freight distribution - Kostis De Langhe, Nikos Vedeas, Christou Syl, Eddy Van de Voorde and Thierry Vanhaverlanda | |
| 13:15    | Development of a smart parking system in the warehouse - Raoul Apaslon and Gennady Gromov | |
| 13:30    | A conceptual framework for planning thematic parking lots for cars in last mile logistics - Tom Assmann, Evelyn Fischer and Sebastian Bobeth | |
| 13:45    | Exploring spatial and structural patterns of urban road accidents: some empirical evidence from Rome - Antonio Cono, Laura Petri, Agostino Nuzzolo and Antonio Palmeni | |
| 14:00    | SWOT analysis for the introduction of night deliveries policy in the Municipality of Thessaloniki - Eftathia Bouhras and Socrates Basbas | |
| 14:15    | Design of a digital collaborative tool to improve mobility in the Universities - Anelia Goldbard, Ana Velazquez, Rodrigo Rebollo, Erick Lopez, Octavio Mercado and Felipe Victoria | |
| 14:30    | The implementation of environmental friendly city logistics in south Baltic Region cities - Stanislav Iwon and Kirgo Kijewski | |

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<tr>
<th>Time</th>
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<th>Moderators: Giannis Adamos, Harald Nils Rostvik</th>
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<tr>
<td>15:00</td>
<td>Environmental aspects of urban freight movement in private sector - Afroditi Anagnostopoulou and Maria Boile</td>
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<tr>
<td>15:15</td>
<td>Assessing traffic and environmental impacts of smart lockers logistics measure in a medium-sized municipality of Athens - Vassilios Giouli, Efthia Nathanial and Ioannis Karakikes</td>
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<tr>
<td>15:30</td>
<td>Adaptability/transferability in the city logistics measures implementation - Stanislav Iwon and Kirgo Kijewski</td>
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<tr>
<td>15:45</td>
<td>Does the implementation of urban freight transport policies and measures affect stakeholders’ behavior? - Efthia Nathanial, Giannis Adamos, Ioannis Karakikes and Lambros Mitropoulos</td>
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</tbody>
</table>

| Time     | Lunch | Session 8A: Transport data and analytics | Moderators: Konstantinos Kokkinos, Agostino Nuzzolo | |
|----------|-------|------------------------------------------|-----------------------------------------------|
| 16:00    | Coffee Break | Measuring the spatial accessibility of public transport: the case of the new urban rail systems in the city of Thessaloniki, Greece - Ioannis Berolinos, Konstantinos Karagiorgis and Apostolos Papagianakis | |
| 16:15    | Assessing the impact of changes in mobility behaviour to evaluate sustainable transport policies: case of university campuses of Politecnico di Milano - Samuele Toulento, Alberto Bertolin, Paolo Berto, Elenora Perotto, Fabio Carlo Guereschi, Paolo Baglione and Stefano Giordano | |
| 16:30    | Neural network-based road accident forecasting in transportation and public management - Georgios A. Kroukoulis | |

| Time     | Conference closure | End of CSUM2018 | |
Crowdsourcing and visual research methodologies to promote data collection for sustainable mobility planning

Efthimios Bakogiannis¹, Maria Siti¹, Konstantinos Athanasopoulos¹, Avgi Vassi¹ and Charalampos Kyriakidis¹

¹ Sustainable Mobility Unit, National Technical University of Athens

Abstract. This paper aims to present and compare two methodologies in order to gather data from residents and visitors about their mobility behavior in the urban environment: crowdsourcing and visual research. These methodologies were used in two Sustainable Urban Mobility Plans (SUMPs) in the medium-sized cities Kozani and Drama in Greece. Public input proves to be efficient in recognizing problems, proposing priorities and describing detailed proposals towards achieving desired aims. Results show that the issues that were recorded through the applications of visual research were also perceived by the inhabitants, through the ideas they proposed. It was also found that residents are focusing on concrete proposals, mostly realistic, sometimes presenting a specific spatial reference. On the other hand, public participation in the crowdsourcing platform was low. Combining the two methodologies proves to be effective towards raising public input validity.

Keywords: crowdsourcing, on-line platform, visual research, sustainable urban mobility plan, medium sized cities

1 Traditional and innovative methods for studying the urban environment

In recent years, the use of modern tools, such as electronic applications and crowdsourcing, is at the forefront of understanding the city's environment in a quick and cost-effective manner, since the collection of the data is performed by citizens who act as "sensors", as pointed out by Pödör, et.al. [16], with the use of their smartphones [5], [25]. The development of such practices is rapid, resulting in a new type of geography called "Neogeography", which demonstrates a new approach of the city by its residents, as they do not just live in it but are becoming active members in the city’s planning process, contributing to the gathering of data as well as to traditional consultation meetings [20].

There are two elements that should be pointed out. The first relates to the importance of photography in Neogeography, as most users consider they recognize the space better through pictures, which are then uploaded to social media platforms or Flickr. Besides, photography provides an easy and tangible description of areas or situations that can be imprinted over time, which can not be done with the same ease with other forms of communication [12].
The second concerns the way that the public becomes active so that the necessary data is available when needed. New technologies, like smartphone applications, can be at the core of such methodologies that provide enough data in a series of plans, such as SUMP, which are strategic and integrated urban and transportation/mobility plans. However, due to the fact that not all population uses such tools, public engagement and involvement are not applied in overall following these methods. Indeed, as claimed by See et al. [18], the type of used tools results to a different degree of social participation in various plans.

Traditional visual techniques based on scientists’ observation have proven to be useful for understanding behaviors in public spaces as well as the development of cities and do not require participation of users. Indeed, according to Abbott [1], the Chicago School of Sociology was largely based on the observation of public spaces. Reiss [17] has accordingly systemized such approaches, arguing that systematic social observation can be a key strategy for measuring and understanding social phenomena. Finally, William Whyte [26], in his research on small public spaces in New York, was a strong supporter of observations with the help of videos and photography, in order to reassess spaces with clear mind. Tools used include photo assessment (monitoring photography/time lapse photography, re-photography of old pictures), as well as innovative and participative ways such as photo elicitation/auto driven photo elicitation and photovoice, where contact is immediate and face-to-face.

Based on the above, the topic of this particular research paper is to compare two techniques in terms of performance and effectiveness to record data useful for a Sustainable Urban Mobility Plan. At first it analyzes the success of a crowdsourcing platform to activate the public for city planning. The quality of the data collected is evaluated. On the other hand, the paper examines the success of visual research as a key methodology in implementing a SUMP. The paper deals with two study areas, Kozani and Drama, which are two typical medium sized Greek cities.

2 Case studies research

2.1 Aim and Objectives

The work presented is part of the SUMP that are currently under implementation in the cities of Kozani and Drama by the research team of the Sustainable Mobility Unit at NTUA. The presentation of these specific case studies constitutes a way to increase the understanding of two specific research methodologies, namely crowdsourcing data and visual techniques, in the context of implementing SUMP, which is allowed through the assessment of case studies, as a methodological tool [2].

2.2 Methodology

The two methodologies presented are part of a greater methodological framework organized under the implemented SUMP for the two case study cities. The two assessed cities are Kozani and Drama. They are two medium-sized cities, which, aside of the similar population size, exhibit a variety of other common characteristics: their central districts have been developed without strict city plans over the centuries; arterial roads are passing through their central districts; their central districts display
analogous land use dispersion and clustering; SUMPs are implemented. The aforementioned factors were considered for the selection of these two cities as comparable case studies [3], within the framework of the research. More details about the urban characteristics of the two cities can be found on table 1.

**Table 1 - Cities examined**

<table>
<thead>
<tr>
<th>City</th>
<th>Kozani</th>
<th>Drama</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (Dense Urban Core)</td>
<td>41,066</td>
<td>44,823</td>
</tr>
<tr>
<td>Population (Including Areas of Urban Expansion) (approximately)</td>
<td>47,000</td>
<td>51,500</td>
</tr>
<tr>
<td>Area (Including Urban Expansion) (approximately) (km2)</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Bicycle Infrastructure Length (km)</td>
<td>2.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Size of pedestrianized or traffic-calmed areas (hectares)</td>
<td>12.4</td>
<td>17.4</td>
</tr>
</tbody>
</table>

Indeed, in both Kozani and Drama, a series of methods formed the basis for the design of the designated policy to inform the public and its activation towards the successful planning of the SUMP. Tools utilized for the implementation of the specific action are both innovative, such as web applications, crowd sensing and crowdsourcing techniques, mainly through mobile appliances like smartphones and pads [15] and traditional, such as workshops [7]. In the context of this particular research, interest is mainly focused at the mechanics of the online platform, where citizens were invited to present their ideas on how they envisage their city.

Moving on to the next level, research is on the pursue of relating the ideas embedded on electronic platform, in connection to the outcomes that arose from inspection and examination of video and photographic material, obtained from non-participatory observation. Research took place under good weather conditions. More specifically, in Drama it was carried out on July and in Kozani on March, for a time period of one week per city. This observation was made at consecutive intervals between 7 am-10 pm and 8 am-12 pm, in proportion to their respective research work [8], [10], [13]. Photos were examined qualitatively and behavioral patterns were noted, particularly regarding the issue of mobility, both for pedestrians and drivers.

As it is obvious, the two procedures that were conducted simultaneously, aimed at answering three different types of questions. Visual research corresponds to “how the city has changed through time” and “how people behave in the public space” and the e-platform crowdsourcing research corresponds to “how people want to make/alter their cities”. These two methodologies function within the context of implementing a SUMP like complementary studies in order for the planners to collect data. These questions in fact are not independent. People have a view about the future having in mind how the city has changed through time and what problems they face when
moving in the public space. These consistencies allow the comparison of the methods in regard to their effectiveness to provide feedback to planners.

2.3 Looking for new ideas: Participatory planning through an on-line platform

In the context of the implementation of the two SUMP s, ideas were solicited in order to discover concepts of how inhabitants envisage their cities. The necessity for the aforementioned was based at the intention to raise the voice of citizens, who fully know their city and extended equally to the mobilization of the public towards the successful implementation of the derived SUMP. On these grounds, additionally to the traditional engagement methods, the research group decided to design an on-line platform where residents and visitors would be able to present their own ideas for the city.

In Kozani forty-two (42) ideas were submitted while the platform counted seventy-six (76) registered users. In Drama twenty-two (22) ideas were accrued, while the platform counted nineteen (19) users, meaning that there were some users submitting more than one ideas.

As to the substance of the interventions, with the exception of some general statements, which in the case of Kozani were higher than in Drama (e.g. A focus on changing attitudes/education residents, to make the city more calm), most of the ideas were specific and some were clearly documented. This is also met on the photo selected by each user to support his/her idea. Indeed, 58.2% of the e-platform users in Kozani, opted to post a photo. From this proportion, 11.9% reflected the idea very precisely. In Drama, 77.8% of the ideas posted on the e-platform were accompanied by a picture. Moreover, a percentage accounting for 22.7% of the images, are perfectly targeted demonstrating accuracy, particularly regarding the idea or the area of the proposed intervention.

In both cities, it was obvious to the public that a critical part of the city's problem was related to the strong presence of the car at their center. Indeed, this is evident in both cities, although travels within the city are short. This fact as identified from the proposed ideas, is directly linked to the perception of the researchers for the SUMP about the shift of motorized traffic from city centers and the overall SUMP objectives [14], [19], [21], [22], [23].

Participation of volunteers, in the case of e-platform was relatively small compared to the population of the two cities so far, as was the case for participation to environmental data collection [3].

The online crowdsourcing platform, additional to providing space to develop future ideas, provided a link to an online survey questionnaire. In particular, 1,829 questionnaires were completed for the city of Kozani and 528 for the city of Drama. For the city of Kozani, the profile of those responded to the survey can be described as follows: male 18-30-year-old, student or freelancer with an average income less than 1,000 Euros/month, who owns a bicycle and/or a private car, and he identifies himself also as a pedestrian. Accordingly, in Drama, the profile of the average respondent can be described as follows: male employee aged 31-45, with an average income less than 1000 Euros/month, owning a private car and using it to travel around
the city. The questions varied and were related generally to the traffic and urban problems presented in the two cities, as well as to the people’s behavior in terms of city traffic and their intention to use more sustainable means of transport. Focusing on the problematic issues of commuting, it is worth noting that the main issue recorded in the case of Drama was the lack of parking spaces in the city center. The same problem was categorized as the third priority in the case of Kozani, with the cost of transportation and pollution, occupying the first and second place of identified priorities. In overall, it was appraised that the quality of transport is assessed as being on an average level, as well as the state of the public spaces. A typical such case is the Aghia Varvara Park in Drama, which is believed to present places that need to be improved and maintained so that pedestrians’ presence will be increased in the future.

In overall, the results of the questionnaire are analogous to those of e-platform research, with some discrepancies relying on the small size of the sample participating in the e-platform. In any case, this participatory method is assessed as an important step in activating the public, through the provision of an official state for filing in the citizens’ opinion, which will be later re-evaluated after the completion of the research programs.

2.4 Visual Research

As previously stated, observation, video capture and taking photos took place in the framework of the research in order to understand the behavior of drivers and pedestrians. Besides, observation is an important methodological tool that can respond to "what's happening", but cannot answer to "Why" discovering an objective opinion [11], which is being explored through interviews or questionnaire research.

The most basic conclusions that emerged from reading the pictures and video snapshots support the conclusions that emerged during the observation. These could be summarized as follows:

● Connections between pedestrians and the public space: Pedestrians’ behavior is influenced by the form of the built environment, the traffic load and the overall attitude and habits of the inhabitants. The above is confirmed by the observation of pedestrians using the road at places where the pavements were of small width or of poor quality. At the same time, another important point is the issue of road crossings. In both Kozani and Drama the crossing of streets was observed at points without zebra-crossings or at points with zebra-crossings but at the time when the traffic light was red for the pedestrians.

● Drivers’ relations to public space: Drivers’ behavior was observed to mostly comply with the rules of the Road Traffic Code. In both cities drivers seemed to respect the traffic lights and the horizontal signaling, giving space and time to pedestrians to cross the roads. However, severe illegal parking issues have been encountered, concerning unregulated and illegally parked vehicles, without respect for public space.

● Drivers’ relations to pedestrians: Observing the behavior of the two categories, there was a clear difference. Drivers respect pedestrians in most cases and stop before zebra-crossings, so that there is adequate space for pedestrians to move/cross. At the same time, most of them slow down or stop in cases where
pedestrians use the road without warning. On the contrary, pedestrians do not respect the road rules, as they were observed to cross the roads while the traffic light was red for them. They also move from one side of the road to the other at points without zebra-crossings, resulting in conflicts with the vehicles, especially in urban areas, where the traffic flows are high.

- Infrastructure and the use of it: Most traffic lights and other traffic-related infrastructure work well in both cities. However, improvements could be made at bottlenecks. With regard to horizontal signaling and especially zebra-crossings, there is room for improvement. Regarding pavements’ condition there is also room for improvements although there are several provisions for children and disabled people.

3 Conclusions

In order to check the level of understanding of the city's problems by its citizens as well as the response of the proposed ideas to the existing issues, two methodologies were compared in regard to their effectiveness to provide input to planners, namely visual research (observation) and public participation through a crowdsourcing platform. The methodologies were conducted at the same stage of research but were independent. The aim of both was to collect information, especially qualitative, which would present a geographical reference. Through crowdsourcing, citizens were asked to step in and actively showcase the issues and participate in city planning by providing ideas on how to address some of them.

The issues that were recorded through the applications of visual research were also perceived by the inhabitants, through the ideas they proposed. The lack of parking spaces and high speed driving within the urban fabric, as well as the improper and sometimes illegal behavior in public spaces were observed and mentioned by the citizens in both Kozani and Drama. Indeed, there was an important need to regain public space and elements of the natural environment, through pedestrianized roads and more green areas. In fact, the demand for green spaces was greater in Drama, although a large lung of urban green is located at the center of the city. Realizing the “occupation” of several city areas by motorized traffic, was also reflected to the existence of several proposals for limiting car through traffic and promoting public transportation. Proposals were in favor of public transportation, cycling and vehicle sharing options along with the limitation of motorized traffic, recognizing the importance of pedestrianized surfaces for the promotion of urban sociability and social cohesion.

Through the research that emerged by applying this methodology, it was also found that residents are focusing on concrete proposals, mostly realistic, sometimes presenting a specific spatial reference. The suggested ideas have been applied abroad, hence researchers assume citizens have seen what they propose on one of their or their friends’ journeys or on websites, TV etc.
From the above it is clear that the public input proves to be efficient in recognizing problems, proposing priorities and describing detailed proposals towards achieving desired aims. But as public participation proves to be a difficult task, combining the two methodologies (visual research and crowdsourcing) could contribute to a more complete analysis of the urban phenomena (Table 2). Their operation is complementary since the information collected, is checked and evaluated by the study group, resulting in reliable data to be used within the SUMP planning process.

Table 2 - Topics recognized by the two methodologies.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Visual Research</th>
<th>Crowdsourcing Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal/ Excessive on-street parking</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Poor Quality of Pedestrian Infrastructure</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Behaviour of Drivers/ Pedestrians</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Concrete/ Realistic Proposals</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Recognize Social Priorities</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

References


