

TeMA

Journal of
Land Use, Mobility and Environment

This special issue collects a selection of peer-review papers presented at the 8th International Conference INPUT 2014 titled "Smart City: planning for energy, transportation and sustainability of urban systems", held on 4-6 June in Naples, Italy. The issue includes recent developments on the theme of relationship between innovation and city management and planning.

Tema is the Journal of Land use, Mobility and Environment and offers papers with a unified approach to planning and mobility. TeMA Journal has also received the Sparc Europe Seal of Open Access Journals released by Scholarly Publishing and Academic Resources Coalition (SPARC Europe) and the Directory of Open Access Journals (DOAJ).

INPUT 2014

papers selected

Smart City

planning for energy, transportation
and sustainability of the urban system

SMART CITY

PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

Special Issue, June 2014

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TeMA. Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of transport, land use and environment. Domains include engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science, and complex systems.

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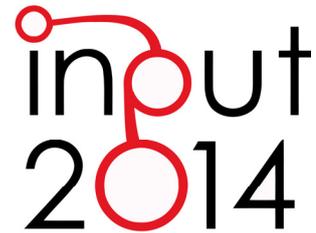
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This special issue of TeMA collects the papers presented at the 8th International Conference INPUT 2014 which will take place in Naples from 4th to 6th June. The Conference focuses on one of the central topics within the urban studies debate and combines, in a new perspective, researches concerning the relationship between innovation and management of city changing.



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EIGHTH INTERNATIONAL CONFERENCE INPUT 2014

SMART CITY. PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

This special issue of TeMA collects the papers presented at the Eighth International Conference INPUT, 2014, titled "Smart City. Planning for energy, transportation and sustainability of the urban system" that takes place in Naples from 4 to 6 of June 2014.

INPUT (Innovation in Urban Planning and Territorial) consists of an informal group/network of academic researchers Italians and foreigners working in several areas related to urban and territorial planning. Starting from the first conference, held in Venice in 1999, INPUT has represented an opportunity to reflect on the use of Information and Communication Technologies (ICTs) as key planning support tools. The theme of the eighth conference focuses on one of the most topical debate of urban studies that combines , in a new perspective, researches concerning the relationship between innovation (technological, methodological, of process etc..) and the management of the changes of the city. The Smart City is also currently the most investigated subject by TeMA that with this number is intended to provide a broad overview of the research activities currently in place in Italy and a number of European countries. Naples, with its tradition of studies in this particular research field, represents the best place to review progress on what is being done and try to identify some structural elements of a planning approach.

Furthermore the conference has represented the ideal space of mind comparison and ideas exchanging about a number of topics like: planning support systems, models to geo-design, qualitative cognitive models and formal ontologies, smart mobility and urban transport, Visualization and spatial perception in urban planning innovative processes for urban regeneration, smart city and smart citizen, the Smart Energy Master project, urban entropy and evaluation in urban planning, etc..

The conference INPUT Naples 2014 were sent 84 papers, through a computerized procedure using the website www.input2014.it . The papers were subjected to a series of monitoring and control operations. The first fundamental phase saw the submission of the papers to reviewers. To enable a blind procedure the papers have been checked in advance, in order to eliminate any reference to the authors. The review was carried out on a form set up by the local scientific committee. The review forms received were sent to the authors who have adapted the papers, in a more or less extensive way, on the base of the received comments. At this point (third stage), the new version of the paper was subjected to control for to standardize the content to the layout required for the publication within TeMA. In parallel, the Local Scientific Committee, along with the Editorial Board of the magazine, has provided to the technical operation on the site TeMA (insertion of data for the indexing and insertion of pdf version of the papers). In the light of the time's shortness and of the high number of contributions the Local Scientific Committee decided to publish the papers by applying some simplifies compared with the normal procedures used by TeMA. Specifically:

- Each paper was equipped with cover, TeMA Editorial Advisory Board, INPUT Scientific Committee, introductory page of INPUT 2014 and summary;
- Summary and sorting of the papers are in alphabetical order, based on the surname of the first author;
- Each paper is indexed with own DOI codex which can be found in the electronic version on TeMA website (www.tema.unina.it). The codex is not present on the pdf version of the papers.

SMART CITY PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM Special Issue, June 2014

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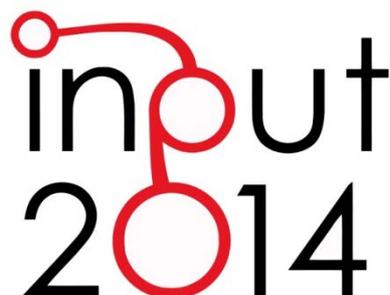
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SPECIAL ISSUE

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DESIGNING MOBILITY IN A CITY IN TRANSITION CHALLENGES FROM THE CASE OF PALERMO

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ABSTRACT

Transport policy is one of the most crucial sectors in the process of adaptation of contemporary cities to the challenge of sustainable development. For its close relation with social habits and people behaviors, in fact, innovation in transports play a strategic role both in the decreasing of the environmental impact of mobility and in the improvement of the quality of the built environment. To do so, however, cities need to reach a more effective integration between transport policy and land-use planning, as well as taking full advantage by the spreading of new technologies.

In this context, this paper discusses the challenges provided by the reshaping of the transport system in the metropolitan area of Palermo, the second larger city in Southern Italy. It attempts to explore, particularly, the potential connections between the future "hard factors" of the transport policy – as a result of the programme of infrastructural improvement under realization in the urban area –, with other "soft factors", such as the practices of social innovation in the field of mobility with the help of ICTs and other opportunities for urban regeneration linked to the reshaping of the transport system.

KEYWORDS

Urban planning, Smart mobility, Urban regeneration

1 INTRODUCTION

A common character in the most recent debate on sustainability is not only recognising cities and urban communities as crucial scales to adapt our pattern of development to the challenge of reducing the impact on the environment of human activities, but also the strategic role in this process given to technological and organisational innovation (UN-Habitat, 2011; World Bank, 2011). In fact, while the human settlements are still recognised as the places of greater consumption of non-renewable resources, it is also recognised that a fundamental step towards sustainability is removing the dysfunctions and increasing the “network effect” between existing and planned infrastructures. It means, in other words, conceiving every single transformations in a given urban areas as part of a complex process of adaptation in which every change in the factors composing the system can provide a broader range of resources and opportunities for the urban system as a whole¹.

It is widely agreed that a modern conception of transport policy can constitute a fundamental ingredient in the process of cities’ adaptation to the challenges of sustainability. On the one hand, transport planning has been increasingly influenced by the goals of reducing the impact on the environment together with the aim of making urban areas (through diversified transport networks and policies) better and more livable places. On the other, the spreading of “transit oriented” planning experiments in several western countries – to be intended as a paradigm to rethink urban development under the impulse of the creation of sustainable transport networks (Cervero, 1998; Curtis et al., 2009; Bertolini, 2012; Suzuki et al., 2013) – is providing new basis for the integration of different planning rationales towards in the perspective of combining efficiency of the networks with the quality of environment.

The relation between transport policy and urban development, however, is highly differentiated on the basis of several factors, including the adaptivity of urban form, the extent and efficiency of the existing transport networks, the capacity of local governance to create links between different visions of urban development. Beside to the urban areas whose development has been historically thought in relation to the development of public transit, in fact, there is a much larger group of cases including still car-dependent metropolis and cities with consolidated divergences between urban growth, functional structure and transport system. This reality makes the application of a transport oriented approach to urban planning and design an experimental field in which infrastructural development must be combined with a broader range of policies and interventions, not necessarily with material impact on the built environment, marked by flexibility and creativity. For example, the diffusion of smart technologies (including GPS applications) in the everyday life of people and communities is giving a new set of opportunities for the transport policy within urban areas and providing new bases for a convergence between conventional planning practices and processes of social innovation².

With this conceptual framework on the background, this paper discusses the challenges given by the reshaping of the transport system in the metropolitan area of Palermo, the second larger city in Southern Italy. In particular, it attempts to explore the potential connection between the “hard factors” of the transport policy – mainly given by the huge programme of infrastructure redevelopment under realisation in the city –, with some “soft factors” provided by the ongoing projects in the field of social innovation and

¹ See, for example, the recent concept of “urban retrofit” as an approach that look at urban areas as contexts requested to systemically reengineer their built environment and urban infrastructure in response to climate change and resource constraints (Eames et al., 2013).

² For the impact of new technologies on mobility and social innovation see, among others, Urry, 2007; Kingsley and Urry, 2009; Grieco and Urry, 2012.

mobility with the help of smart applications. Beside that, it tries to highlight the impact of the transport redevelopment on the built environment, with a critical discussion on the planning and governance conditions required in order to make it an opportunity for urban regeneration.

The paper, whose approach is mainly descriptive and proposes to constitute the cognitive base for further analysis, is structured as follows: in the following section the main infrastructural projects in progress at the urban scale will be described for their impact on the transport system and the built environment; in the third section it is made an overview of the attempts to innovate the practice and policy of mobility both from public and private initiatives; in the conclusive paragraphs it is attempted to draw some future challenges for the city given by the interaction of the “hard” and “soft” factors described in the previous sections.

2 THE CHANGING LANDSCAPE OF THE TRANSPORT SYSTEM

Despite the demographic size of the city and the metropolitan area (inhabited respectively by around 700,000 and 1 millions of resident) Palermo has been affected for decades by underdeveloped transit system and a cronic lack of investments on infrastructures. Public transport has been mainly based on the road system, while the rail system – conceived in the XIX century to serve primarily regional connections – has been only marginally reshaped to support urban and metropolitan mobility. In contrast, as it is better explained in the next paragraph, private movements by cars have assumed a dominant role with growing impact on city's environment in terms of congestion and pollution.

A sharp change of direction is given in 2002 with the approval of the “Integrated Plan for Mass Public Transport”³, which provided a wide programme of redevelopment of the transit system mainly based on the rail networks. This Plan, which can be considered an integration of pre-existing projects promoted by several public authorities including RFI (the national owner of the rail system), the province of Palermo and the municipality, was based on the interconnection of four major infrastructural projects:

- the completion of the Railway ByPass (Passante ferroviario);
- the completion of the Railway Ring (Anello ferroviario);
- the realisation of a Tram system and;
- the realisation of a Light Underground (Metropolitana leggera automatica).

The Railway ByPass is expected to be the project with greater impact on the metropolitan area. It consists on the redevelopment of around 30 kilometers of existing rail lines between the South-East gate of the city (Roccella) and the international airport (Punta Raisi) that is located 25 kilometers North-West the city centre. The logic of the intervention is to transform the existing line into an urban rail to serve the city's major functional nodes and commuting in the metro area. For this purpose the project includes the doubling of the line for its entire route, the undergrounding of 7 kilometers in order to avoid conflicts with the built environment and the creation of 10 new stations, most of which in underground. Some of this new stations are about to be opened in proximity of places and urban functions that catalyse a huge amounts of workers and city-users, such as the hospital district “Civico-Policlinico”, the University campus, the historic centre, the district of regional government and the courthouse. For two sections of its route the completion of the Railway ByPass (started in 2008) is scheduled for 2015, while the whole infrastructure is expected to enter in service in 2018.

The Railway Ring, as well as the Railway ByPass, is a reconfiguration of an existing – partly underground – rail line that linked the Central station and the harbour area. After being dedicated for decades exclusively to the freight traffic, in 1990 the line has been reconverted to metropolitan service with the opening of four

³ The original name is “Piano Integrato del Trasporto Pubblico di Massa” (2002) (Romano, 2006).

new stations. The project under realisation (started at the beginning of 2014) provides the extension of the line up to 6,5 kilometers with the closure of its route until the rail hub of Palermo Notarbartolo. It includes the opening of three new underground stations (Libertà, Porto and Piazza Politeama) which will cover central areas up to now touched only by bus routes. The Piazza Politeama station, particularly, will bring the rail system within the commercial and touristic core of the city, connecting it (through the link with the station Palermo Notarbartolo) with the Railway ByPass and the airport. This extension, together with the opening of the new stations, is expected to enter in service in 2018.

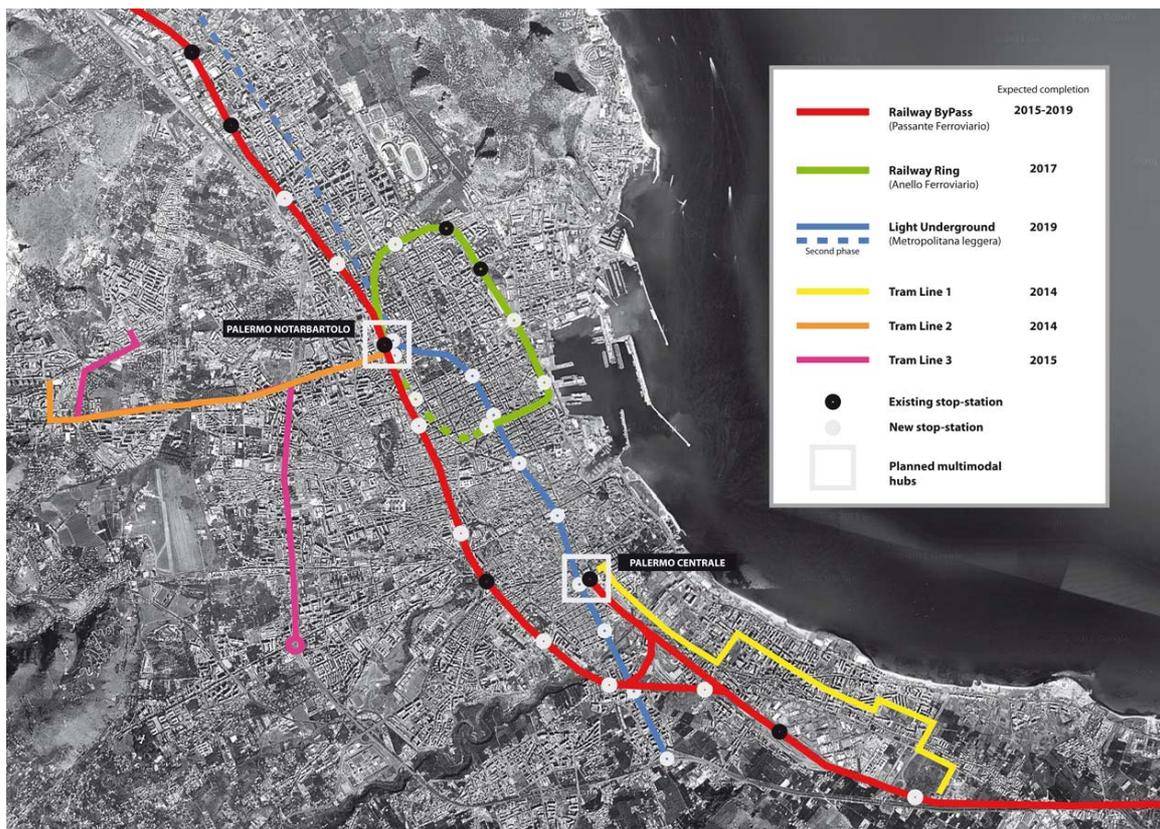


Fig. 1 Transport networks under construction in the core area of Palermo

The Tram system is a project launched at the beginning of the nineties which has faced several problem of financing before its implementation started in 2007. It is composed of three lines for a total extension of around 15,5 kilometers in response to the general aim of connecting the most remote and populated suburbs with the central area of the city in coincidence with the two rail hubs of Palermo Centrale e and Palermo Notarbartolo. The line 1, through 16 stops, connects the Central Station with the industrial suburb of Brancaccio, with a termination in correspondence of the ByPass station of Roccella and a major shopping districts (the Forum) opened in 2010. The lines 2 and 3 (with 12 and 26 stops, respectively) run between the popular neighborhoods of Borgo Nuovo and CEP and the north-western transit hub of Palermo Notarbartolo. A section of the line 3 departs from the common route with the line 2 to touch several neighborhoods along the highway (Circonvallazione) surrounding the urban area in the west side. There is a project (currently without funding) to extend the line 3 until the University campus and the Central station in order to better link the Tram system with the rail system.

The fourth project, the Light Underground, is currently that with less technical and financial definition. The broader and most ambitious version of the project provides a line running from the southern gate of the city

(Svincolo Oreto) to the coastal district of Mondello, a touristic attraction located north to the urban area. It is extended for approximately 17 kilometers, with 23 stations touching all the central districts along the main axis of urban development (south-north). The adopted technology is that of driverless trains, with a capacity of around 210 persons in the peak hours and a travel time of around 12 minutes among the two terminals (Romano, 2006). The lack of a full coverage of costs has pushed the municipality to develop an update of the project only for a first section between the south terminal and the rail hub of Palermo Notarbartolo. This section – including 10 stations for an extension of around 7 kilometers – is expected anyway to cover the busiest area of the city ensuring the links with the two rail hubs and the other modes of transport under implementation (Railway ByPass, Railway Ring and Tram system).

The above described four project in a few years will completely reshape the city's transport system at different territorial scales. On the one hand, they will impact significantly on the mobility of all users attracted for various reasons by the core city, currently served only by an inefficient and outdated bus network; on the other, the new network will ensure a linkage between the main transport nodes at metropolitan level, such as the airport, the port and the two rail hubs within the urban area. Moreover, the new linkages between the suburbs and the main metropolitan functions located in the core city should increasingly shift the mode of transport of commuters towards public transit.

In this context, however, what it is worth to highlight is also the impact of these massive infrastructural interventions on the physical and functional shape of the city.

The Tram system is changing the face of several kilometers of urban roads, most of which characterised by urban decay and low economic activity. The route of the line 1, particularly, which is aimed to reduce the remoteness of one of the most deprived district of the city (Brancaccio), is littered of abandoned urban spaces. The sites interested by the construction of the Railway ByPass with its stations cover several hectares of spaces which were, before intervention, largely underused despite their closeness to the core city. Most of these spaces are places without any consolidated identity or function, whose role, however, is going to change rapidly under the impulse of the reshaping of urban mobility. Until now, there is no deliberate strategy to design the future development of these new urban centralities: infrastructural interventions are carried out by operators (RFI, AMAT⁴) with no interest/competence towards the quality of the built environment; the municipality still lacks of an updated strategy of urban development (a new master plan is expected for the next year) which considers the local impact of infrastructural change.

3 INNOVATING MOBILITY THROUGH PLANNING AND SOCIAL INNOVATION

3.1 THE STARTING POINT

According to the TomTom *Traffic Index* (2013) – computed upon the percent of time spent in car for a same length trip – Palermo is the 5th city in the world for traffic issues (the former are, in order, Moscow, Istanbul, Rio de Janeiro, Warsaw). Furthermore, according to the 2012 ISTAT data, Palermo has almost 3500 cars per squared km, the fourth vehicle density in Italy after Naples, Milan, and Turin (Aosta, the first with 4050 vehicles per square km, is an improper confrontation for its size). Almost 5 times over the Italian average (725,9) and considering that the emission standards average of those vehicles is the one of the

⁴ RFI – Rete Ferroviaria Italiana is the state-owned operator of the national rail network. In the case of Palermo it is responsible for the implementation of the Railway ByPass and the Railway Ring and it will be the transit operator of the new networks once they will be completed. AMAT - Azienda Municipalizzata Auto Trasporti is owned by the municipality of Palermo. It is the operator of the urban bus network and will be the operator of the future Tram system.

worst in Italy and it records bad performances mainly regarding particulate matter concentration although it's a well ventilated sea shore city. This data are probably enough to draw a first sketch of the complex scenario we are dealing with.

	Rome	Milan	Turin	Naples	Palermo	Genova
Vehicular density (cars per sqm)	1.964,7	5.313,5	5.248,0	6.323,2	3.488,0	1.879,4
Euro 0,1,2,3 cars per 1000 inhabitants	333,9	256,5	294,9	411,0	358,2	234,8
Euro 0,1,2,3 motorbikes per 1000 inhabitants	97,3	75,8	58,5	97,6	130,3	148,9
Days of PM10 limits overcoming due to vehicles traffic	69,0	132,0	158,0	53,0	66,0	13,0

Tab. 1 Private vehicles impact (source: ISTAT, 2012)

The Palermo public transport system consists mainly in the bus service. The city, is covered by 341 km bus network (AMAT 2010) and served by one of the oldest bus float in Italy. The city has a good distribution of bus stations (14,7 stations per squared km – 3,6 points more than the 15 biggest cities average) but the offer (sits km per inhabitants) is broadly under the italian average. According to AMAT's data, recently released as "open data", the busses float on road is only the 51% of the busses available (in the 2010 only 287 busses circulated among 560 available) and by the way in the 2010 the number of passengers is +18% increased (the data is related to the previous year). Moreover it is significant to underline how besides those huge limitations, the monthly and the yearly subscription cost for the public bus service is still the most expensive in Italy.

	Rome	Milan	Turin	Naples	Palermo	Genova
Bus lanes km (2009)	2208	415	600	418	335	744
Metro lanes km (2012)	41,6	87,4	13,4	34,8	-	7,1
Bus/tram stops distribution per squared km (2007)	6,5	16,3	29,1	22,4	14,4	10,6
Euro 0,1 busses (2007)	28,5%	27,1%	43,0%	45,3%	51,3%	33,3%
LPT passengers per inhabitants 2012	528,2	699,2	217,3	227,3	46,0	254,8

Tab. 2 Public transport impact (source: elaboration on ISTAT 2012 and Comune di Palermo)

Palermo, according to the other mobility systems opportunities given by the administration, is experimenting only the car sharing system (the bike sharing is expected for the next year). The data available show how this policy should be considered more as a showcase attempt than a real and concrete investment for the city transport management. After five years, with just 35 cars, 29 parking areas and 755 users is one of the less impacting in Italy.

The other policies to improve private sustainable mobility systems were never concretely pushed by the city government. Although the city is warm at least for nine months per year and also orographically flat Palermo is below the Italian average (15,4) and stays still since 2009.

	Rome	Milan	Turin	Naples	Palermo	Genova
Bike lanes (km per 100 sqkm)	9,6	41	134	-	13,3	-
TLA (sqkm per 100 sqkm)	0,6	4,9	2,1	3,1	4,8	3,1
Pedestrians areas (sqm per 100 inh.)	14,4	27,2	44	28,5	7,3	5,1
Payable parking lots on streets (n. per 1000 vehicles on road)	38,4	43,9	89	39,7	46,7	71

Tab. 3 No-oil areas (source: ISTAT, 2012)

Until the 2007 the city was the worst (among the 15 metropolitan cities) in Italy for territorial density of traffic limited and no-cars zones. Recent data show a very quick increase of the square metres of the TLA but, effectively, the limitations, are really few (for example for the commercial vehicles there are no restrictions). Civic administrators are using the parking lots' pricing policies as a tool to face the mobility problems. Actually parking lots pricing seem to be the only tool administrators adopted in these last ten years. As shown by data, the number of payable lots increase vertically (the variation from 2007 to 2010 was higher than 1500%) with the double clear aim: calming the use of car and bring some money to the city wallet. But this strategy seems not working, the payable parking areas are mainly inside the congested city center, and interchange modality parkings are few and far to be effective. This situation, obviously, doesn't foster people to use other public transport services.

This scenario helps to explain one of the evidence of the Palermo urban condition. Years and years of no local transport policies pushed the city in a worrying paradox: although daily distances traveled are short (one of the shortest in Italy) and horrible traffic jams are daily routine, citizens still prefer moving by cars and they dream a future with more parking lots and less public transports. This means that urban traffic, besides being an infrastructural problem, is, primarily, a big social and cultural issue.

	Rome	Milan	Naples	Turin	Palermo	Genova
Cars	28%	17%	19%	27%	37%	21%
Urbano bus/tram/filobus	14%	16%	14%	16%	9%	19%
Metro	13%	16%	15%	7%	-	5%
Extrurban bus	2%	3%	6%	3%	2%	3%
Motorbikes/scooter	8%	6%	10%	3%	12%	12%
Bicycles	2%	8%	3%	7%	3%	2%
Taxi	2%	2%	3%	3%	2%	1%
Train	4%	3%	5%	3%	4%	6%
Walking	27%	27%	25%	31%	31%	33%

Tab. 4 Modal split (source: Cittalia, 2009, elaborated by the authors)⁵

⁵ Palermo hasn't a metro transport system yet, a train lane is now working as a metro service provided by Ferrovie dello Stato.

3.2 ATTEMPTS OF INNOVATION

For many years, the cities of Palermo and Catania were the only cities among the major Italian metropolitan areas without an urban mobility plan. This gap has been overcome only in March 2013, when the municipality adopted a new general urban traffic plan (the original name is Piano Generale del Traffico Urbano, PGTU). This tool, whose process of implementation is still ongoing, is based on four main strategic objectives: (a) improving of the traffic conditions (moving and parking); (b) improving of the street safety (a reduction of incidents); (c) reduction of GHG substances in atmosphere and the caustic noise; (d) energy saving. The PGTU also defined four action plans that will focus on specific mobility issues:

- plan to improve the pedestrian mobility (it foresees the definition of squares, streets, itineraries, pedestrian areas and traffic limited areas);
- plan to improve urban and suburban local public transport (it provides the definition of specific lanes, interchange nodes, existing lines and frequency reorganization);
- plan to re-organize urban and suburban private transport circulation (it will focus on a general traffic scheme, the issues due to the city crossing and the road types priorities);
- plan for the rationalization of parking areas (it will point out the parking streets also defining the fare system).

The planning process has been stimulated over time by a set of bottom-up initiatives in the wake of well known experiments made at international level, such as Nuride, Zimride in the USA or Moovel, Mo-bility, Moovit in Europe. “B.I.C. Bici in città” and iMove, for example, are local examples of smart community projects that encourage and organise people to be critical mass in terms of sustainable transports. A very popular web portal called “Mobilita Palermo” allows people to share informations about ongoing projects and policies focused on mobility, as well as sharing information about the traffic conditions via the most followed social networks.

The most relevant ongoing initiatives in this direction are probably the three innovative projects on Palermo funded with almost 4 millions euros by the Italian Ministry of University and Research in the framework of the competition “Smart Cities and Communities and Social Innovation”. The projects aim to stimulate local communities to change their habits fostering more responsible mobility behaviours with the help of smartphone applications. The three groups that won the fellowship are young multidisciplinary teams with a “social entrepreneurs” approach to the theme. They are working on different softwares – Muovity, CityFree and TrafficO2 – that will provide services of carpooling logistic (mostly focused on short distance commuters) and inter modality logistic to foster sustainable mobility values.

Muovity aims to give a contribution to the empowerment of the social and technological networks to improve sustainable and energy efficient transports in the sicilian territory. The mobile application offers a platform where is possible to easily plan carpooling trips and having real time information about the city mobility. The team – who is currently testing the main features of the application – is mostly the same who is leading the urban mobility blog “Mobilita Palermo” and is working inside Palermo University incubator “ARKA”.

Cityfree is developing an application which main feature will be an easy way to plan dates to reach the Universities facilities through the local public transport system. The application will not give to the user another social network platform but instead wants to be a mobility information system that supports the already existed social networks. The main goal is reaching the critical mass able to change college students behaviors. Currently the group activities are focused on the creation of the mobile application and on disseminating actions of carpooling concepts to the Palermo University community.

TrafficO2 is an info mobility decision supporting system that tries to foster a modal split through gaming policies and giving tangible incentives for each sustainable choice. The idea is to match the interests of two complementary actors on the city traffic scene: communities workers (communities that already need a mobility manager) and local business communities (places on the community workers daily-paths). The goal is to decrease traffic and pollution creating an equal agreement for both communities: prizes in exchange for a respectful behaviour towards the environment. So, all of the local businesses that belongs to platform (as sponsors) became the stations of a new kind of transport system that foresee only moving by foot, by bicycle, by local public transport and by carpooling. Each trip from station to station gives O2 points to the user, those points are the system virtual money users can collect to get prizes from the sponsors. The aim of the project is to generate a “win-win” situation that creates new city development opportunities just matching the right needs. A first test of the mobile application (an alpha version) has started during December 2013 with 30 students selected through a workshop from three different Palermo University departments: computer science, design and marketing.

Regarding this last project, a first survey of the testers behaviors confirms widely the 2009 ISTAT data about the modal split. It also shows how most of the times, despite over the 75% of the interviewed are less then 10 km far from the University, they prefer use the car to get there and just the 20% carpool regularly. Moreover it's interesting to underline that just the 10% of the interviewed has a local public transport subscription and no one joined the car sharing project.

	Cityfree	Muovity	TrafficO2
Events logistic management	x	x	-
Intermodality system logistic	-	-	x
Infomobility	x	x	-
Extra-urban scale	x	x	-
Payment service	x	x	-
Benefits for users	-	x	x
Sponsors	x	x	x
Social network	-	x	x
Feedbacks	x	x	-
Gaming	-	x	x
Testing	x	x	x

Tab. 5 Comparative analysis of the main features of the mobility social innovation projects

All of the funded projects, as we see, will involve firstly the big urban community of the Palermo University. This decision, taken individually by the teams, is motivated by the target selected to address their products: young and curious students are probably the first best social community where experiment behaviors' changing project driven by social media technologies. But all of these proposals, than the difficulties given by controversial structural, social and cultural aspects of the city itself, have also to overcome other constrains that belong broadly to all these kind of projects. Probably the bigger limits of those approaches are the constraints given by the chosen technologies itself. These kind of apps need powerful smartphones always connected to the web and this means an high consume of the battery and of the personal band

connectivity (Palermo has not yet a public service for internet connectivity). All of those factors (with many others) could discourage users to use one of the systems they're delivering and, moreover, the presence of the three could be confusing for the little target they're approaching.

4 FUTURE CHALLENGES: TOWARDS A TRANSIT ORIENTED URBAN COMMUNITY?

As we have described in sections 2 and 3 of this paper, the physical and functional context of transport in Palermo is going towards a rapid process of change under the impulse of infrastructural projects, a new phase of planning and the spreading of social innovation practices. The city resulting from this process will be the outcome of the interaction between some "hard factors" for mobility – infrastructures with their material impact on the built environment – and a much more flexible and uncertain group of "soft factors" including the management of the networks, the interaction between transport policy and urban policy as whole, a better governance and a new propensity of people to change.

In this paragraph we try to focus on a series of open questions related to this interaction, in order to explore the potential benefits for city's development of an increased integration between transport policy and urban regeneration. These questions can be summarised into the following three challenges:

- a challenge of effectiveness of the transport system;
- an urban regeneration challenge;
- a governance challenge.

The first challenge arises from the basic step to complete the ongoing projects and provide the city of the first potentially integrated transport system. Its future effectiveness derives from the capacity to create functional connections between the different modes of transport, which are based on networks that have been planned separately and will be under the management by different operators. The creation of a new governance of the transport system, consequently, seems to be a first problem to be solved in order to overcome the gap of effectiveness that could be given by the different rationales of the transit operators. An investment on the ICT resources, in the short term, could significantly help to increase the added value given by the intersections of the different modes of transport, as well as in reducing the negative impact of the missing links existing in the networks.

The challenge of urban regeneration derives by the broader objective of making the nodes of the new transport system as parts of future city's development. There are some obstacles to this perspective depending by the different planning rationales of which the projects under implementation are expression. A first obstacle is the approach to design of the operators responsible for the implementation of the transport projects: in the case of the Railway ByPass, particularly, the new stations have been placed in the urban areas with less constraints to infrastructural development in order to reduce the conflicts with the built environment and to lower the construction costs. The poor design of the new stations, together with the state of decay characterising several of these empty urban spaces, will apparently provide no direct contribution to the regeneration of the interested districts in the short term. As a consequence, an additional challenge for the future of urban policy will be, on the one hand, to improve urban design around the transport nodes and think them as places fully integrated in the surrounding urban environment and, on the other, to target on these urban spaces additional policies (i.e. direct or indirect incentives to the private sectors, new public functions) in order to revitalise them as new epicenters of urban development.

The two previous challenges are intimately bound by the need of a new and more effective governance at different scales and dimensions of urban development. Firstly, from a more sectorial perspective, it will be required a convergence in the planning and management activities of the two main operators of the

transport system: the municipal corporation AMAT, which will be required to manage the future Tram System (together with the bus system and the parking system); the national operator RFI, which is responsible of the rail network, including the new and redeveloped Railway ByPass and Railway Ring. An other relevant player in this new governance framework is the regional authority, if not for the relevant role it exercises as the main financial provider in the field of local public transport. A more effective convergence between the strategies of these players (together with others such as the Airport and the Port authorities) appears as a crucial step, particularly, in the creation of an integrated transit system at the metropolitan level.



Fig. 2 The redevelopment area of Imera-Tribunale, near the Cathedral and the Regional Government Palace

In this evolutionary context for local governance, an important stimulus might come from the innovative projects on mobility under implementation at the urban and metropolitan scale. In fact, since the environmental impact of transport and mobility is intimately related to social habits and people behaviours, the networks established by bottom up initiatives like those described in this paper is a potential a resource to improve the awareness on mobility issues, as well as establishing new forms of public-private cooperation. This last, particularly, via the technological resources on which the social networks are based (GPS, primarily), could help to better match demand and offer of transport and overcome the gaps of missing modal integration due to governance problems. The municipality, in this process, is expected to play a “melting role” between the different expectation of citizens and stakeholders, with the broader objectives to anchor the immaterial resources in operation on a processes of urban regeneration which requires, in the case in question, also drastic material changes and reshaping of urban places.

This case witnesses once again the “systematic nature” of urban mobility (Bertolini, 2012) and the problematic role of urban planning when asked to cope with the integration of different (sectoral and

individual) views on city's development. Adapting the rigidity of urban form to the changing pattern of the transport networks and, by contrast, make mobility as flexible as the process of social change within urban areas is a challenge that requires the recognition of a broad range of technical and political variables. The extent of this challenge in several urban areas has meant a rapid change in the perception of the traditional feedback between transport and land-use planning and a shift of urban policy towards a more strategic and holistic approach to city's development. Reorienting the urban agenda to this perspective seems an obvious choice for a city in transition like Palermo.

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IMAGES SOURCES

Figg. 1 and 2: Elaboration by the authors on Google Earth data.

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