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The cover image shows the Irpinia hills at sunset, highlighting the enhancement of two renewable energy sources: sun and wind. The photo was taken by Giuseppe Mazzeo in August 2022, in S. Andrea di Conza, Avellino, Italy.

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REVIEW NOTES – Urban practices Planning for sustainable urban mobility in Italy. Insights from Palermo and Cagliari

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Abstract

Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always following a rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of a continuous updating of emerging topics concerning relationships among urban planning, mobility and environment, through a collection of short scientific papers. The Review Notes are made of four parts. Each section examines a specific aspect of the broader information storage within the main interests of TeMA Journal. In particular, the *Urban Practices* section aims at producing, analyzing and reporting data on recent and relevant policies in the urban domain. The present note in particular reports on the recent initiatives undertaken by two major Southern Italian cities to foster sustainable mobility: Palermo and Cagliari. To this aim, the note briefly introduces the legal background and current developments of the Sustainable Urban Mobility Plan (SUMP), a framework developed by the European Commission to support local administrations in developing holistic urban mobility strategies. This is followed by (i) an overview of the mobility situations in Palermo and Cagliari and by (ii) an analysis of the objectives, the strategies and the measures set in their respective SUMPs.

Keywords Sustainable Mobility; SUMP; Palermo; Cagliari.

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1. Introduction

Urban mobility — the movement of people and goods in urban areas — has a significant impact on sustainability and quality of life in cities. Mobility indeed generates significant externalities such as air pollution, noise, congestion, occupation of public space, and increased morbidity and mortality caused by traffic accidents and pollution (Chatziioannou et al., 2021; Gargiulo & Russo 2017). Furthermore, mobility externalities are unequally distributed on society, since they particularly burden the most disadvantaged communities (Lucans & Jones, 2012). Additionally, the impacts of urban mobility — and in particular that of motorized mobility — extend far beyond the cities' boundaries where they are generated. Indeed, the use of fossil fuel combustion engines in urban areas greatly contribute to the global climate change crisis and to the human perturbation of the global environment (IPCC, 2014).

Due to these negatives externalities, promoting sustainable mobility in urban areas has become an issue of main concern for policy makers and, as such, one of the most widespread objectives in transportation planning worldwide: nowadays, no plan, project, or policy direction concerning the transport sector does not (at least) mention the concept of sustainable mobility (Gallo & Marinelli, 2020). Yet, sustainable mobility — as a complex socio-technical phenomenon — remains quite challenging to operationalize (Geels, 2012) while different frameworks have been proposed by researchers and practitioners to foster its implementation in planning practices (Gallo & Marinelli, 2020).

This short note focuses on one particular implementation framework: the "Sustainable Urban Mobility Plan" (SUMP), a concept/framework developed by the European Commission to support local level authorities in exploring new urban mobility strategies. Within this context, this note reports on the recent initiatives undertaken by two major Southern Italian cities to foster sustainable mobility: Palermo and Cagliari. To this aim, the note briefly introduces the legal background and current developments of the SUMP framework in Europe. This is followed by (i) an overview of the mobility situations in Palermo and Cagliari and by (ii) an analysis of the objectives, the strategies and the measures set in their respective SUMPs.

2. What is a Sustainable Urban Mobility Plan?

In recent years, the European Commission has been increasingly focused on the development of sustainable urban transport and has introduced legislation and formal directives in this domain. In its 2013 Communication on competitive and resource-efficient urban mobility, the Commission has acknowledged the importance of supporting local authorities "so that all cities across the Union can achieve a step-change in their efforts for more competitive and resource-efficient urban mobility" (EC, 2013a). Still, the impact assessment accompanying the 2013 Urban Mobility Directive (EC, 2013b) found that most European cities have not solved their urban mobility challenges, and that deficient planning practices on the local level endangered key European objectives, including a competitive and resource-efficient transport system, the EU's future prosperity and its international competitiveness. In an attempt to address these shortcomings, the Commission introduced the concept of Sustainable Urban Mobility Planning (SUMP) in Annex I of its 2013 Urban Mobility Package (EC, 2013c). The package advocates "a step-change in the approach to urban mobility" (...)" to ensure that Europe's urban areas develop along a more sustainable path and that EU goals for a competitive and resource-efficient European transport system are met.". It sketches out the guiding principles of the planning process and the topics to be addressed in a SUMP.

Within this legal background, a SUMP can be regarded as "a strategic and integrated approach for dealing effectively with the complexities of urban transport" (EC, 2013c). Its core goal is to improve accessibility and quality of life by achieving a shift towards sustainable mobility. SUMP advocates fact-based decision making guided by a long-term vision for sustainable mobility. As key components, this requires (i) a thorough assessment of the current mobility situation, (ii) a widely supported vision with strategic objectives, and (iii) an integrated set of infrastructure, regulatory and financial measures to deliver the objectives – whose

implementation should be accompanied by systematic monitoring and evaluation. In contrast to traditional planning approaches, SUMP places particular emphasis on the involvement of citizens and stakeholders, the coordination of policies between sectors and broad cooperation across different layers of government and with private actors. The concept also emphasises the need to cover all aspects of mobility (both people and goods), and all modes and services in an integrated manner, and to plan for the entire "functional urban area", as opposed to planning for a single municipality within its administrative boundaries.

Implementation of SUMPs across Europe has been supported by numerous and diverse EU initiatives aimed at funding SUMPs adoption, providing strategic guidance, and foster network opportunities for cities and functional areas. As result, more than 1,300 SUMP initiatives are reported on the Eltis City Database (Elstis, 2022), as of November 2022, while the SUMP — as a planning instrument— has taken over the role of the main strategic transportation planning document in most EU cities (Gallo & Marinelli, 2020). Italy is no exception: according to the Eltis City Database, 116 SUMP initiatives have occurred in Italian cities since the launching of the SUMP framework. This high number is possibly the result of innovative regulation in the transport sector. Indeed, in 2017, the Italian law D.M. 4 agosto 2017 was approved, which provides national guidelines for the development of SUMPs in Italian municipalities. The law establishes the approval of the SUMP as a compulsory step for local authorities to get State-level public funding for public transport projects. The two paragraphs below, reported on the case studies of Palermo (3.1) and Cagliari (3.2), two Southern Italian cities that have recently developed their respective Sustainable Urban Mobility Plans.

3.1 Palermo



Palermo and its metropolitan area

Palermo is the capital and the largest city of the autonomous region of Sicily, and it is considered its political, economic and cultural center. The population of Palermo is estimated to be 855,285 inhabitants, while its metropolitan area is the fifth most populated in Italy with around 1.2 million inhabitants. The Metropolitan Area of Palermo includes 82 municipalities, and its extension is approx. $5,000 \text{ km}^2$.

Mobility challenges

Most of the mobility challenges currently faced by the Metropolitan Area of Palermo are the results of decades of poorly regulated urban development and inadequate provision of public transport services and infrastructures, especially in peripheral areas. These circumstances have resulted in the dominance of car as the preferred mode of transport that accounts for more than 75% of daily trips (Osservatorio PUMS, 2021a). The excessive use of the private car is a problem in Palermo more than in other Italian cities. In particular, according to the most recent data from the Global Traffic Scorecard (IRIX, 2021), Palermo is the 9th most congested city of the world while its inhabitants spend approximately 110 hours a year in the traffic. The motorization rate, i.e., the number of cars circulating per 100 inhabitants, is also quite high: 58.2 cars per 100 inhabitants circulate. The public transport use (which does not exceed 9% overall) is low, but it is positively observed that cycling and walking are a quarter of the total commuter mobility. Urban buses and trams are little used in Palermo and its metropolitan area because the citizen associates to them a sense of distrust and insecurity, caused by a poor service regularity and by a transport supply not able to meet the mobility needs of the transport demand (Migliore et al., 2019). The shared-mobility ecosystem is also relatively underdeveloped if compared with other major Italian cities such as Milan or Rome. For instance, only in May 2022 the first free-floating bike sharing services was introduced in the Sicilian capital.

SUMP objectives

In order to cope with these challenges, the Metropolitan Council approved the SUMP of the Palermo Metropolitan City. The main aim of plan is to improve the quality of life of the citizen of the metropolitan area by developing a systemic vision of urban mobility that is well integrated with the urban planning initiatives and ongoing environmental restoration efforts.

The plan's main aim is further articulated in six objectives:

- Reduce the consumption of traditional fuels.
- Improve air quality and reduce noise pollution.
- Improve the attractiveness of public transport and biking.
- Improve the energy performances of the fleet of both public and private vehicles.
- Improves safety and security.
- Contribute to the attractiveness of the territory and the quality of the urban environment.

Measures

In order to support the modal shift from car to public transport and reduce the longstanding city's car dependency, the plan envisions the extension of the city's subway system toward the peripherical areas, the construction of new urban rail corridors and the introduction of a congestion charge zone in the city center. Beside building new lines and new stations, the plan also envisions the redevelopment of most of the existing stations to improve station access and create multimodal hubs with new parking and extended facilities. Furthermore, in order to reduce the high levels of morbidity and mortality caused by traffic accidents, the plan identifies a number of interventions on the city's most critical car axes. These measures are coupled with interventions aimed at promoting active mobility by (i) improving the safety condition of pedestrians, (ii) expanding the city's bike network with of additional bike lanes and (iii) establishing "car free islands" in several city's neighborhoods.

3.2 Cagliari



Cagliari and its metropolitan area

Cagliari is the capital and the largest city of the autonomous region of Sardinia, and it is considered the region main political, economic, tourist, and cultural centre. The population of Cagliari is estimated to be 154,460 inhabitants, while its metropolitan area is home to 418,353 inhabitants. The Metropolitan Area of Cagliari includes 12 municipalities, and its extension is of approx. 1,250 km².

Challenges

Most of the mobility challenges currently faced by the metropolitan area of Cagliari are strictly connected to its monocentric urban structure, to the spatial imbalance between home and workplaces, and to the lack of adequate provision of public transport services connecting the capital city with it surrounding municipalities. These circumstances have resulted in the dominance of car as the preferred mode of transport that accounts for more than 75% of daily trips (Osservatorio PUMS, 2021b). Transport policies implemented in recent years in Cagliari tried to curb the dominance of private cars with special efforts being devoted to expanding the public transport network to the outer municipalities. Despite these recent developments, public transport services remain fragmented: services are indeed provided by several companies that often operate in competition and overlap with each other and not in a system logic. Shared mobility services are also relatively limited and have been developed in an uncoordinated fashion. For instance, four different bike sharing systems have been introduced so far. However they are managed independently and cover only a small portion of the territory. Beside these issues, the metropolitan area of Cagliari faces also important logistic challenges connected with the Cagliari port activities and the flow of tourists, mainly coming to Cagliari by ferry, that determine seasonal peak in transportation demand.

SUMP objectives

The main aim of the SUMP of the Metropolitan Area of Cagliari is to is to promote accessibility for all and to better connect its capital city with the surrounding municipalities in a way to reduce the high reliance of private car. This high-level aim is further articulated in six general objectives:

- Provide all citizens with public transport options that enable them to access key destinations and services.
- Improve safety and security conditions.
- Reduce air and noise pollution, greenhouse gas emissions and energy consumption
- Improve the efficiency and cost-effectiveness of passenger and freight transport.
- Contribute to improving the attractiveness of the territory and the quality of the urban environment and the city in general to the benefit of citizens, the economy and society as a whole.

The plan furthermore recognizes the specific territorial characteristics of each municipality. For this reason, the abovementioned objectives are further elaborated at the municipal level to meet specific needs of the territories involved.

Strategies

To meet the objectives listed above, the PUMS develops 22 integrated strategies addressing different aspect of urban mobilities. A selection of these strategies is reported below:

- Integration of the existing public transport services into a single physical network by building new links, new stations and new modal interchange facilities and integration and establishment of metropolitan-wide management of transport tickets and fares;
- Creation of Low Emission and Accessibility-controlled Zones with differentiated entry policies based on the mode of transportation and the emission class, also for urban freight logistics operations;
- Development of a metropolitan network of bicycle routes, by connecting and expanding existing routes in both urban and rural setting in order to connect the new 30 km/h urban areas with green areas and parks of the city, the rural areas and the riverbanks of the territory.
- Actions to improve the accessibility of the Port of Cagliari and better connect it with the rest of the city, by improving walking path and regenerate large portions of the territory that are in close proximity to the port area.
- Development of Mobility as a Service (MaaS) solutions to integrate existing shared mobility services and accommodate new private initiatives aimed at offering different modes/types of shared mobility services.

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