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Peri-Urban Settlement's Public Spaces: a Tool for their Investigation.

A Case Study in Southern Switzerland.

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ABSTRACT

How can we characterize "peri-urban settlement's public spaces" and how can we measure their quality and potential? This paper offers a methodological tool for their investigation, applied to a case study in southern Switzerland (Rivera sector settlements, part of Monteceneri municipality in the Ticino Canton). The Geographical Information for Public Space Investigation (GIPSI) tool combines a traditional GIS approach to a qualitative examination of public space, with the purpose of classifying, evaluating, and comparing peri-urban public spaces in a simple and systematic way. The dynamic nature of its qualitative components allows adapting this analysis tool to different perspectives and research goals. GIPSI gives a general overview and a clear evaluation of public spaces configuration in peri-urban areas, emphasizing their improvement potential, and their differences and similarities. For our case study, the tool highlighted that traditional settlement spaces have a better quality than recent residential ones, although both have an improvement potential. We believe that this type of analysis is beneficial for other similar peri-urban contexts in Switzerland and abroad. Hence, GIPSI is a starting point for the revaluation and promotion of public space; it is mainly addressed to policy-makers and urban planners, but it could potentially implicate an interdisciplinary participation at different scales involving local authorities and residents.

1. INTRODUCTION

How can we characterize "peri-urban settlement's public spaces" and how can we measure their quality and potential? In an attempt to answer this question, this paper offers context, challenges, potential approaches, and an investigation tool.

Public space has been one of the main topics of Urban Planning and Geography for decades. Its precise definition varies according to specific purposes and needs. Taking as a reference Garau (2015) public spaces are a framework of places, accessible by everyone and in which citizens can experience recreational or sedentary activities mainly involving social interaction. Open spaces, such as squares or parks, are significant public spaces. Also other places like cafés, bars, and restaurants or even public transportation platforms (railway and bus stations, airports, etc.) can be considered as public spaces because of their role as meeting points (see among others, Lévy et al., 2012; Ravazzoli and Torricelli, 2017). In general, public spaces are associated with the urban fabric of a city. Among a rich body of knowledge, only few studies address public spaces characterizing outskirt urbanizations, such as peri-urban areas or little towns and villages in rural and mountainous areas (see among others, Périgois, 2006; Garlandini, 2014).

The importance of the peri-urban context lies in the fact that a large proportion of Europeans are living in a territory that is neither urban nor rural, but something "in between" urban settlement areas and their rural hinterland. These spaces could be identified as peri-urban, which include a wide range of definitions in terms of morphology and extension. The common aspect of peri-urban areas is their transitional character; they are a dynamic transition zone related with both urban and rural uses (Wandl and Magoni, 2017; Wandl, Rooij and Rocco, 2017; Piorr, Ravetz and Tosics, 2011). In Switzerland and in the whole Alpine area, peri-urban settlements are characterized by certain features that make them different from urban fabrics of cities; they often consist of small agglomerations surrounded by unbuilt areas – partly natural, partly woods, fields and pastures – which gives the surrounding landscape greater importance than the one surrounding the city.

Because of phenomena tied to the urban sprawl and recent urban expansions, European peri-urban areas are increasingly included in discussions around sustainable planning and policy challenges as spaces functionally related to cities (Piorr, Ravetz and Tosics, 2011). However, the typology and use of their public spaces remains largely unknown, leading to a clear need for more investigation. This need is also timely, as there are indications that the COVID-19 pandemic has most likely changed the potential of peri-urban public spaces (Honey-Rosés et al., 2020). During the lockdown, these places have gained importance with an increase in frequentation by local residents, which previously relied mainly on cities both for work and for leisure activities. Hence, the pandemic brought the question of whether the frequentation of these spaces could

increase, which would provide a rationale for their reevaluation and development by governments and local authorities. For promoting peri-urban areas vitality and quality of life, public spaces should first be identified, for then being evaluated and enhanced. Our survey distinguished three main types of peri-urban spaces: traditional public spaces (e.g. squares, parks…), public structures (e.g. worship places, historic places, sport facilities, playgrounds…) and free and accessible grassy lots in residential areas, considered as temporary loose spaces created mainly by residents' actions (for more details about how to observe public space in peri-urban areas and similar investigation approaches see chapter 3).

The concept behind our tool (GIPSI, Geographical Information for Public Spaces Investigation) is to provide a general overview of peri-urban public spaces configuration in a systematic way, which enables qualitative comparisons among them. Therefore, results are cartographically represented by means of four thematic maps, which express accessible spaces distribution but also their qualities in terms of pedestrian's walkability, urban furniture quality and proximity to facilities and places of interest. Qualitative criteria are classified with a numerical score, allowing the comparison of lacking, fairly good and excellent accessible spaces in peri-urban areas. Hence, GIPSI can support policy makers and urban planners in designing and enhancing public spaces. The tool is conceived as a starting point for public spaces planning and promotion and could involve an interdisciplinary participation process, potentially implicating residents, governmental authorities and urban planners.

2. GEOGRAPHICAL AND URBAN PLANNING CONTEXT

GIPSI has been tested on several peri-urban areas in the Swiss Canton of Ticino, on the southern side of the Swiss Alps. It is the only Italian-speaking Canton of Switzerland and it is juxtaposed to the large metropolitan area of Milan and its outskirt urbanization (OST, 2014; OST, 2017).

Nowadays, most of the canton's population (351,500 inhabitants in 2019) lives and works in the valley floor areas below 500 m a.s.l (86% of the inhabitants and over 90% of the jobs), which nevertheless represent a small portion of the canton's territory (12.2%) (OST, 2020). In the last three decades settlement areas have increased in the valley floors by almost 28%. They are characterized by scattered urban fabrics, mostly villages, interconnected with each other and to several small towns (e.g. Chiasso, Mendrisio, Lugano, Bellinzona, and Locarno) by road and railway networks. As described by Guerra (2005), these new settlement areas of Ticino are mainly occupying ancient agricultural lands, used in the past as vineyards or fields. The construction of the main roads and railway lines has had a major impact on the lots structure of these areas and had often generated fragmentary spaces in their surroundings. We consider these urban fabrics as peri-urban areas because of their

transitional nature, interconnecting both urban and rural uses. They are more or less surrounded by nature and inserted in an agricultural landscape. Nonetheless, they have a proper urban structure, even if strongly interconnected with city references. In fact, the majority of the residents rely on city's facilities, taking advantage of its services, places of work, and its recreational spaces.

Peri-urban urbanizations in Ticino Canton are characterized by three settlement's typologies:

a) *Traditional settlements*, often located higher in altitude than the other settlement types, are generally fashioned by patrimonial elements (e.g., churches, chapels, and rural houses mostly from the XVI-XVII centuries), pedestrians' paths, and few meeting points such as small traditional restaurants (e.g., the grotto restaurant), cafés, bars and small shops.

b) *Semi-intensive residential settlements and working areas*. During the 1950-60, the enhancement of the road networks and a higher motorization of the society led to new urbanization settlements, mainly composed of residential housing intertwined with working areas. In those kind of urbanizations, public spaces are fragmented (or even missing) and limited to functional spaces related to personal transportation, railway stations or other public transportation platforms.

c) *Extensive residential settlements*. Since the 1980-90, extensive residential settlements occupied hilly areas and valley floors; these kind of settlements are characterized by single or duplex residential houses, often enclosed by fences, where the public spaces is limited to the street networks serving private housing entries, often not easily accessible by pedestrians.

Peri-urban villages and settlements are surrounded by an abundant natural or rural landscape, which plays a major role as panorama and in terms of recreational activities linked to it than the one enclosing the city's urban fabrics. For further information about the structure of settlement in peri-urban areas of Ticino, see Guerra (2005) and OST (2014).

Figure 1 - Traditional settlement of Capidogno, Rivera sector (OST, autumn 2020).

Figure 2 - Extensive residential settlement, Rivera sector (OST, autumn 2020).

3. HOW TO OBSERVE AND INVESTIGATE PUBLIC SPACE IN PERI-URBAN AREAS?

Although 30% of Ticino population lives in peri-urban areas, it seems that a majority of their residents relies in city public spaces. Empirical field observations suggest that public spaces in peri-urban settlement areas are poorly attended and often neglected.

Moreover, their potential (and the potential of free spaces in general) as good public spaces goes supposedly unnoticed. According to Garau (2015, p. 4):
"Public spaces are a vital ingredient for successful cities. They help build a sense of community, civic identity and culture…"
And also:
"Public spaces are, and must be seen as, multifunctional areas for social interaction, economic exchange and cultural expression among a wide diversity of people…"
We believe that public spaces are of vital importance to peri-urban communities too, in particular for enhancing social interaction, cultural heritage, and recreational activities. Hence, for promoting peri-urban areas vitality and quality of life, these places need first to be identified for then being evaluated and enhanced.
Public space survey should start by identifying areas already recognized as public spaces, but also areas that have the potential to become ones (Garau, 2015). Therefore, we based our analysis on accessible spaces, both located in traditional and recent residential settlements. Places such squares, parks and pedestrians paths are free and accessible to everyone, and they are actually considered as traditional public spaces, which should be preserved and enhanced and where accessibility and safety should be guaranteed. Also public structures (such as worship places, historic places, sport facilities, playgrounds, school areas, railway stations, and so on) are public and so considered as accessible spaces; they can be found both in traditional and residential settlements, are intended for a collective use and should be safeguarded according to their purposes. Taking into account traditional public spaces and public structures, we can assume that peri-urban public spaces fulfill the same purpose than city public spaces in terms of meeting points, leisure, religious activities and social representation. However, in peri-urban communities, we can often find some particular places that cannot be easily found in the city; they are free and accessible grassy lots, scattered within residential settlement areas, which have the potential to be employed, at least temporarily, as public spaces. These undeveloped sites are generally the only free spaces that can be found in residential settlements; they are not (yet) occupied by housing, but according to local plans, most of them are suitable for construction[1]. Hence, their accessibility is only temporary and their social function as public spots ephemeral. Even if these spaces cannot be politically defined as public, they are in fact collectively employed by residents as such (e.g. for walking the dog, as meeting points between residents, for running…). So, in a way they become the "loose spaces of peri-urban areas", analogue to a certain type of city's loose spaces presented by Franck and

[1] With very few exceptions, such as undeveloped areas originally zoned for public use, but forgotten or left behind through time.

Stevens (2007), such as accessible empty lots, abandoned by their owners or where ownership is not enforced, is unclear or under dispute. These places are often temporarily free of official planning and so the people appropriate them for other public uses not legitimately directed or intended (ibid.). Since in peri-urban residential settlements there are often no actual public spaces, but only loose spaces created through residents actions, we decided to investigate them along with traditional public spaces and public structures.

The size, extent and quality of accessible spaces can be represented on a map, using for instance available land register data, eventually combined with fieldwork survey outcomes. These kind of thematic maps can help rising interest at a local level, involving for example municipalities and resident's participation in the promotion of good public spaces (Garau, 2015).

The cartographic representation of accessible peri-urban spaces introduced in this paper is inspired to the Roman Nolli map, realized by Giovanni Battista Nolli in 1748. Nolli's Pianta Grande di Roma allows easily distinguishing Rome private and public spaces by "a binary mapping of built space (object) and empty ground (field)" (Torres-Bustamante, 2020, p. 39), with an accurate figure-ground representation, in which the figure represents the not-accessible space in black, while the ground the public space in white (including publicly accessible buildings). The insertion of interstitial figures (which are neither only solid figures, neither only ground void spaces, but contains both) by means of color nuances allows adding more information levels to this kind of thematic map (ibid.). We applied the interstitial figures concept to the public structures representation; in fact, in our spaces typology map we represented inaccessible spaces in black, free accessible spaces in white and public structures (which are also accessible spaces, but occupied by a structure dedicated to precise collective purposes) with a creamy-yellow tint (see Figure 3).

The figure-ground technique can be adapted to a GIS representation of public spaces. On one hand, the spatial distribution and typology of accessible and inaccessible spaces can be computed and represented almost completely in a GIS environment. On the other hand, the qualitative characteristics of accessible spaces are more difficult to identify and classify. In fact, an accessible space could have a large variety of observable qualitative characteristics and social implications, which are not retrievable by traditional quantitative GIS methods (Schoepfer and Rogers, 2014). Thus, accessible spaces qualities should be observed directly during field surveys and then the retrieved information can be transferred to a GIS environment. There are several investigation approaches taking into considerations qualitative aspects as indicators for evaluating public spaces (see among others Ravazzoli and Torricelli, 2017; Mehta, 2014). In our case, the pedestrian is the main actor of public space, thus the qualitative analysis of accessible spaces concentrates in three major characteristics affecting

pedestrians everyday life: walkability, state and functionality of the urban furniture and proximity to facilities and places of interest.

4. METHODS

The methodology aims at characterizing and qualifying peri-urban accessible spaces; it is encapsulated in a tool we called GIPSI (Geographical Information for Public Spaces Investigation), developed in a hybrid GIS environment. GIPSI was successfully tested on several peri-urban areas of the Ticino Canton by a team of four geographers with a good knowledge of GIS technology and a background in spatial development. The tool can be applied at a local scale and allows mapping peri-urban spaces distribution, typology and qualities. Because peri-urban areas are not similar to city fabrics in terms of urban spaces occupation, GIPSI is not easily replicable for densely populated urban sections. The methodology follows four main steps of analysis (see Figure 3):

4.1 Geodata collection

For characterizing and qualifying a certain peri-urban area of study, several digital geodata are needed, such as cadastral and landscape data (settlement areas, parcels, buildings), facilities data (services related to public spaces, like restaurants, public transportation platforms, cultural and leisure services), road and railway networks data (Figure 3). Since GIPSI was tested on peri-urban areas, this kind of spatial data were collected to perform the analysis. Hence, the data processing is based on Swiss geodata: application to other European cases of study should be adapted to available national and/or regional geodata. Since peri-urban areas are analysed at a local scale and are generally small settlements, an eventual lacking of geodata is not so problematic. In fact, they can be elaborated using satellite imagery, photogrammetry and manually retrieved information directly in situ.

4.2 Automatic data-processing

By means of an automatic data processing (developed in a Python environment with the support of ready-to-use GIS tools) each peri-urban area taken in consideration is classified in two main categories: settlement and proximity area. While the first comprises areas with buildings, the latter consists of the landscape surrounding the settlements. Since peri-urban settlement areas are the focus of this research, they are further categorized into accessible spaces, public structures and inaccessible spaces (private built parcels, fenced spaces and other inaccessible spaces to pedestrians). Because the data processing is automatic, it is quickly replicable for other peri-urban areas.

4.3 Data verification

The available land register data employed in this research is not conceived for the analysis of accessible spaces and thus could lead to some geometrical overlaps. Therefore, the processed data need to be verified and eventually corrected with a semi-automatic method, which relies on satellite imagery and fieldwork comparisons. Fieldwork surveys were supported by the QField application [2], which allows systematic and rapid data check and correction in real time.

4.4 Qualitative data acquirement

To acquire and evaluate qualitative data, we developed an analytical framework that aims at detecting and comparing accessible spaces qualities in a simple and dynamic way. While the literature offers several options for the elaboration of this kind of analysis frames (see for instance Garau, 2015; Flükiger and Leuba, 2015; Ravazzoli and Torricelli, 2017), our qualitative analysis was realized through a systematic classification based on pedestrian walkability, urban furniture and proximity to facilities and places of interest (Table 1). Qualitative criteria are classified with a numerical score, allowing identification of lacking, fairly good, and excellent accessible spaces in peri-urban areas. Moreover, the numerical classification allows comparing accessible spaces within one or multiple areas of study. An additional strength of GIPSI analytical frame is its dynamic nature: the elements can be modified according to the research focus and goals. However, for doing so qualitative criteria must always be translatable into a numeric score. This means that qualities characteristics are preconceived and the subjective perception of public spaces is constrained by the frame's numeric rules. The qualities of accessible spaces identified in the settlement areas were retrieved with the help of the QField application during fieldwork surveys and then added to the verified database (Figure 3).

[2] www.qfield.org

Figure 3 - GIPSI tool workflow methodology. Dark grey boxes show GIPSI main four steps; lighter grey boxes detailed steps and intermediated results.

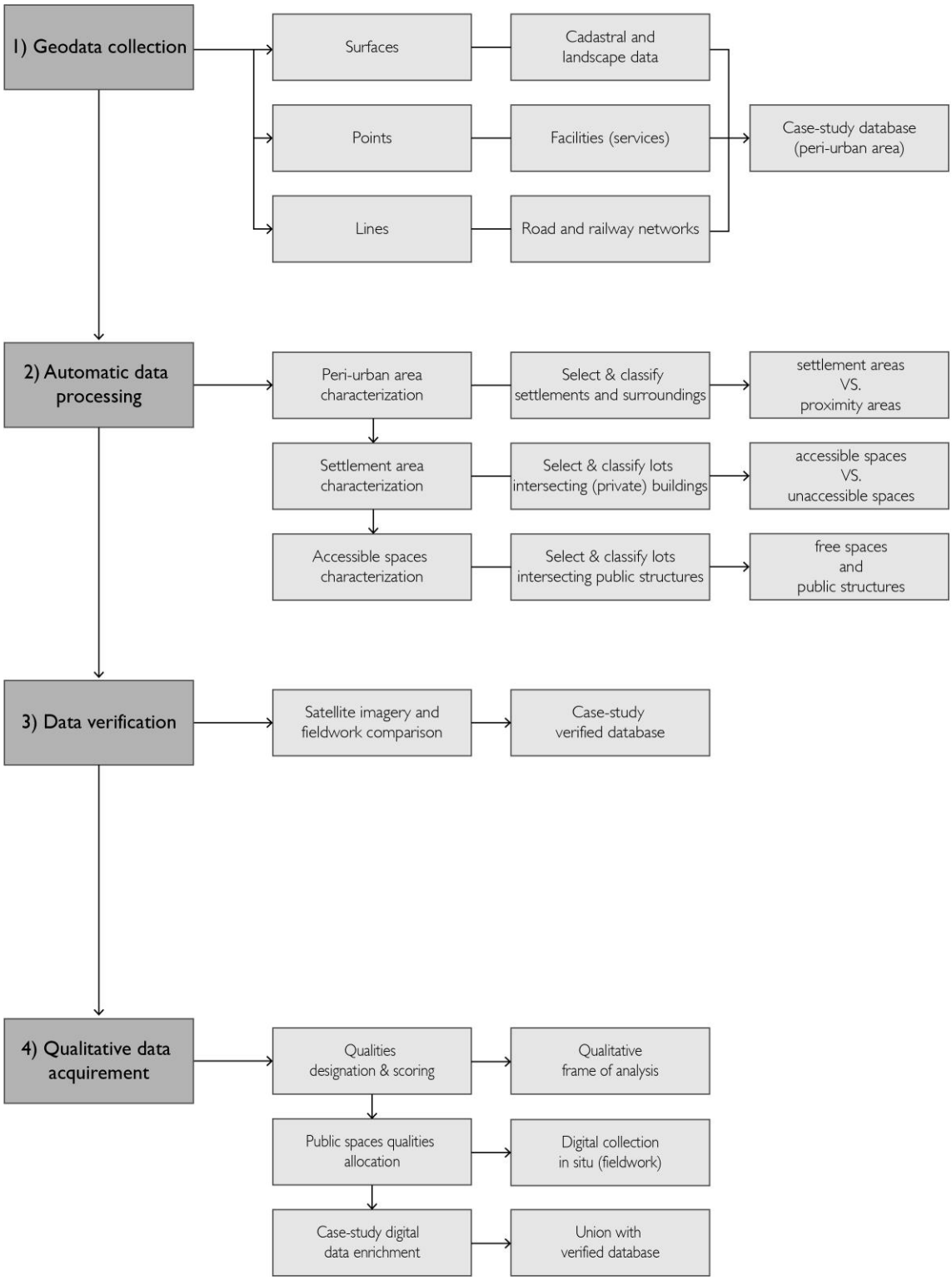


Table 1 – GIPSI Qualitative frame of analysis.

Topic	Qualitative criteria	Evaluation
Walkability	Pedestrian's walkability into accessible spaces.	0 = There is no pedestrians-friendly traffic structure. 1 = Limited slow mobility: pedestrians and bicycles can cross the space with some limitations. 2 = slow mobility is fairly good: there is a sidewalk and a roadway. 3 = Traffic structure is organized with separated lanes for pedestrians, bicycles and cars. 4 = Motorized transportation is forbidden or strictly limited. The space is dedicated to slow mobility and eventually to public transportation.
Urban furniture	Available furniture items: • Benches; • Water (e.g. fountain); • Trash bin; • Playground; • Signage; • Toilets; • Vegetation; • Lighting; • Shading.	Items amount defines if the place is less or more equipped: 0 = no items 1 = at least one item 2 = at least two items … 9 = all listed furniture items are available.
	Furniture items quality	0 = usable, of good quality -1 = ruined, of bad quality
Proximity to facilities, places of interest and public transportation platforms	Proximity to: • One or more facility (≤ 150 m) • One or more place of interest (≤ 200 m) • One or more public transportation platform (≤ 300 m)	0 = no proximity to facilities, places of interest or public transportation platforms 1 = proximity to at least one criteria 2 = proximity to at least two criteria 3 = proximity to all criteria

Source: OST, Buob G. et al.

RESULTS

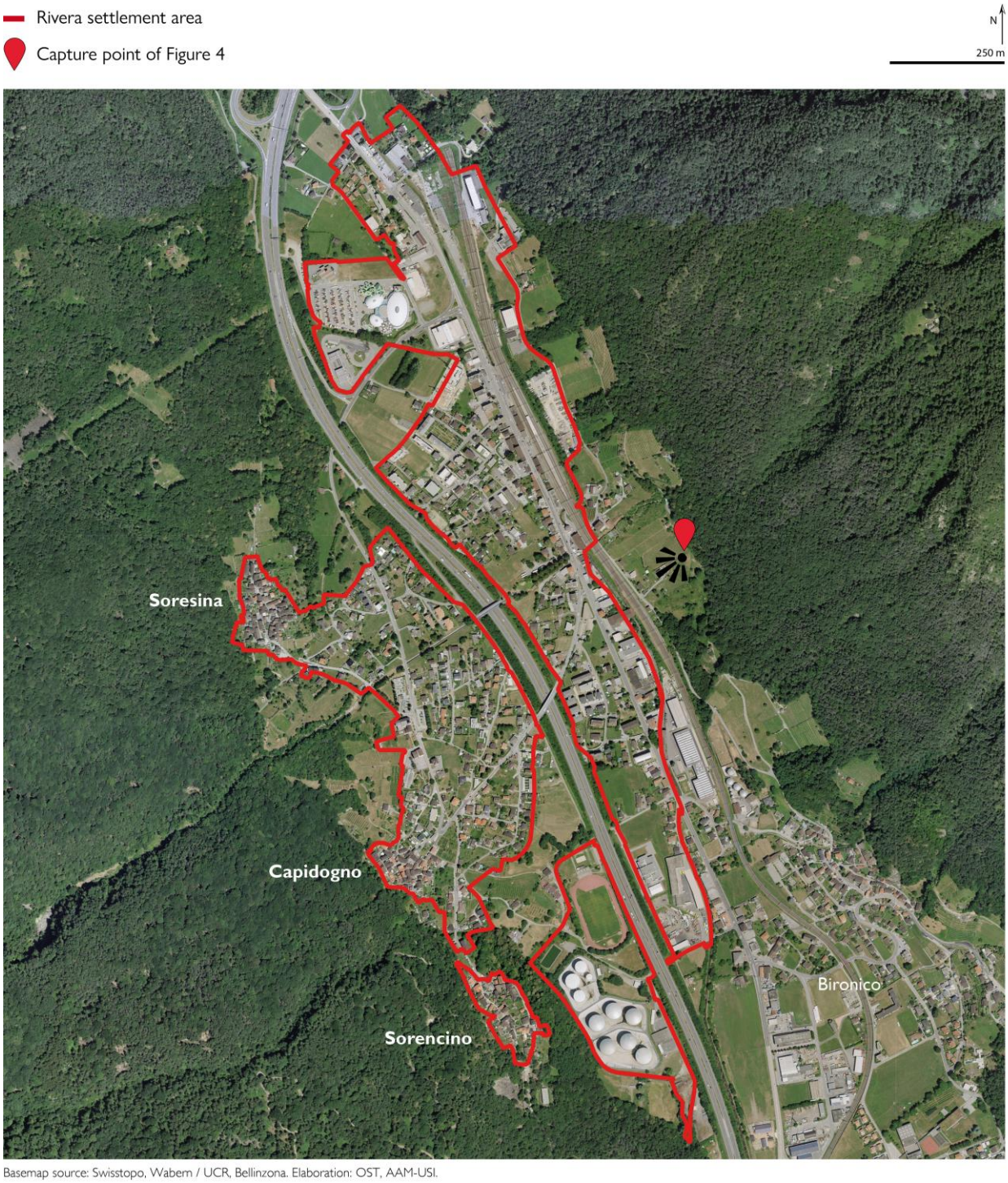
The GIPSI tool and methodology was applied to a peri-urban municipality of Ticino Canton. The Rivera sector (part of Monteceneri municipality) is a typical peri-urban area, with three traditional settlements (Soresina, Capidogno and Sorencino, at about 500 m a.s.l) located higher in altitude than the residential and working areas built in the valley floor (below 450 m a.s.l). Rivera valley floor is crossed by the highway, the main road and the railway line (Figure 4 and Figure 5).

The tool was tested also on several other peri-urban areas so that the methodology could be sharpened and improved. The GIPSI results are characterized by a descriptive map (e.g. spaces distribution and typology), as well as accessible spaces qualitative maps (e.g. quality of pedestrians walkability, urban furniture quality, proximity to facilities and places of interest). Figure 6, Figure 7, Figure 8 and Figure 9 show the most significant GIPSI results for Rivera peri-urban area[3]. Their cartographic interpretation is summarized in Table 2.

Figure 4 - View of Rivera sector (OST, autumn 2020).

[3] Since the road network is unsuitable for a qualitative mapping because of its transit function and linear nature, it was treated just indirectly through the quality of pedestrian's walkability of accessible spaces (see Table 1). The road network quality can be better investigated during more focused approaches at a larger scale, perhaps directly during enhancement interventions supported by local authorities. See for instance the federal Model project 2020-2024 **Terre di Pedemonte (TI): neighborhood streets as a potential neighborhood space**.

Figure 5 - The Rivera settlement area (in red) is surrounded by pastures, woods and rocky reliefs (proximity space). The nearby settlement of Bironico is another administrative sector, therefore is not part of the study area.



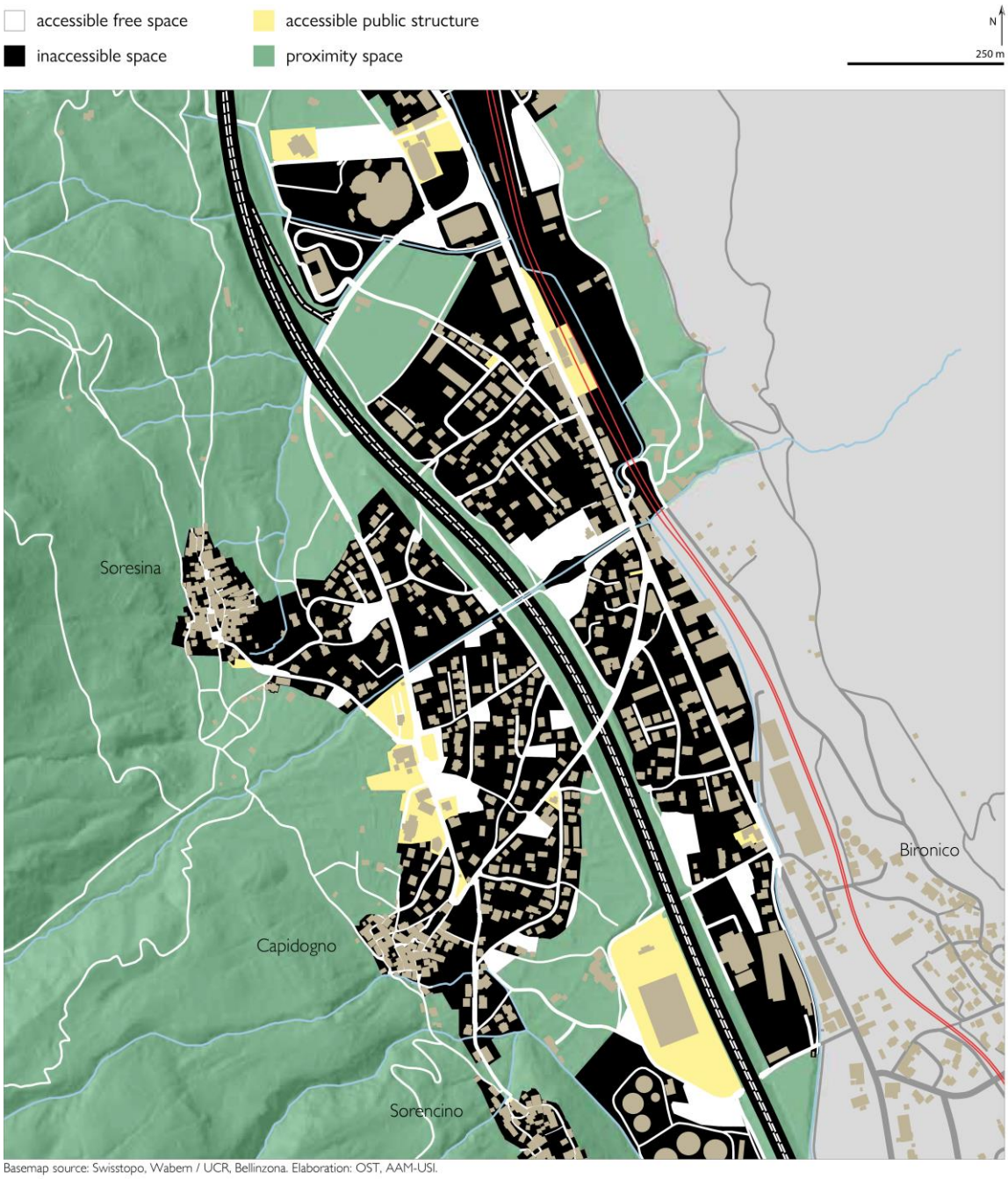
Basemap source: Swisstopo, Wabern / UCR, Bellinzona. Elaboration: OST, AAM-USI.

Table 2 – GIPSI cartographic results interpretation.

Results		**Traditional settlements: Soresina, Capidogno, Sorencino**	**Residential settlements**
Accessible spaces distribution and typology	Figure 6	Rivera traditional settlements are densely occupied by constructions; accessible space concentrates in traditional alleys and squares, and few public structures (mainly churches and chapels) which were formerly realized for inhabitants collective use in the context of a rural community.	In the residential and working areas there are only few accessible spaces to pedestrians, mainly grasslands and few public structures (for instance a couple of sport facilities and the railway station). Hence, the majority of these areas is not accessible to residents and visitors and is densely occupied by private and working buildings.
Quality of pedestrian's walkability	Figure 7	The pedestrian's walkability of Rivera traditional settlements is of high quality: in most of the alleys, car access is strictly limited and slow mobility is safe and guaranteed.	In the residential settlement areas pedestrians' walkability is classified between challenging to fairly good; in general, public structures have good pedestrian accessibility, while in the other accessible spaces car access is facilitated at the expense of slow mobility.
Urban furniture quality	Figure 8	The urban furniture of accessible spaces in Soresina and Sorencino is of good quality: pedestrian pathways, alleys and squares are well marked and lit; there are trash containers and greenery in almost all the accessible spaces. In Capidogno there are only few urban furniture elements and that is why the urban furniture of this traditional settlement is judged just enough.	With the exception of public structures, residential accessible spaces are not equipped and there is a lack of facilities promoting recreational or sedentary activities (e.g. benches, vegetation, shadow, playgrounds, and public toilets). Residential free accessible spaces are of poor quality in terms of urban furniture.
Proximity to facilities and places of interest	Figure 9	Traditional settlements are always near to at least two facilities and/or places of interest, such as small shops, restaurants, churches and chapels. Capidogno has a bus stop nearby (≤ 300 m), whereas Soresina and Sorencino are not near any public transportation platform.	Accessible spaces in residential settlements have always at least one facility or place of interest nearby within walking distance in a short time. So accessible spaces are well interconnected with facilities or leisure activities in their proximity.

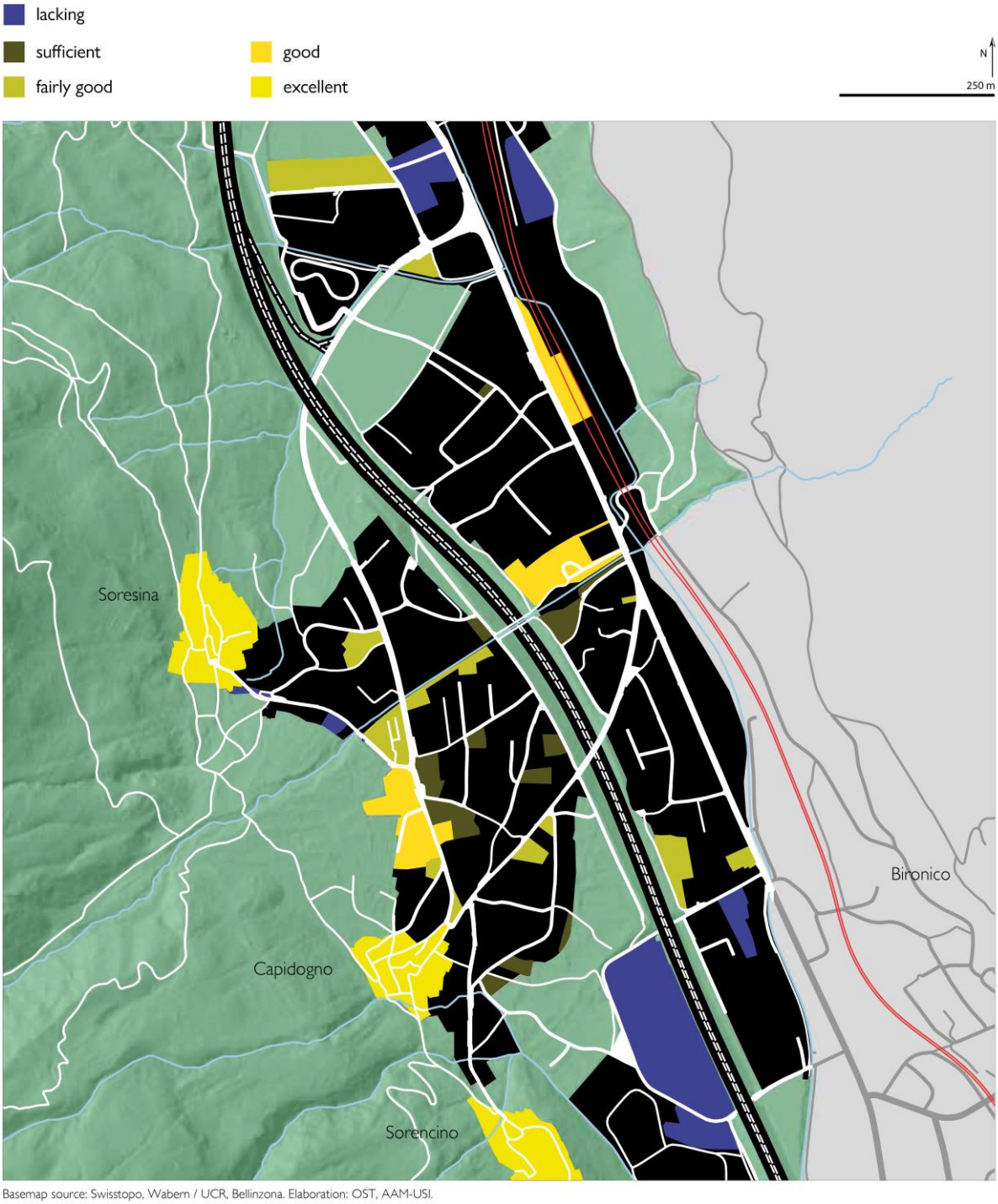
Source: OST, Buob G. et al.

Figure 6 - Rivera sector spaces distribution and typology according to GIPSI tool data elaboration. Proximity space (in green) represents the landscape surrounding settlement's areas (e.g. pastures, woods, rocky relief…). Accessible free spaces (in white) are free spaces accessible to pedestrians, whereas public structures (in yellow) are also accessible spaces to pedestrians but occupied by public structures such as sport complexes, churches, pools, railway station and public transportation platforms. Inaccessible spaces to pedestrians are represented in black.



Basemap source: Swisstopo, Wabern / UCR, Bellinzona. Elaboration: OST, AAM-USI.

Figure 7 - Rivera quality of pedestrian's walkability to accessible spaces. The quality is based on GIPSI walkability criteria (see Table 1) and ranges from a blue color (there is no pedestrians-friendly traffic structure) to an intense yellow color (The space is dedicated to slow mobility and eventually to public transportation). For details about the road network crossing settlements see footnote 3.



Basemap source: Swisstopo, Wabern / UCR, Bellinzona. Elaboration: OST, AAM-USI.

Figure 8 - Rivera urban furniture quality of accessible spaces. Based on qualitative frame of analysis criteria (see Table 1). Urban furniture quality ranges from lacking in blue (≤ 2 furniture items) to excellent in intense yellow (≥ 8 furniture items).

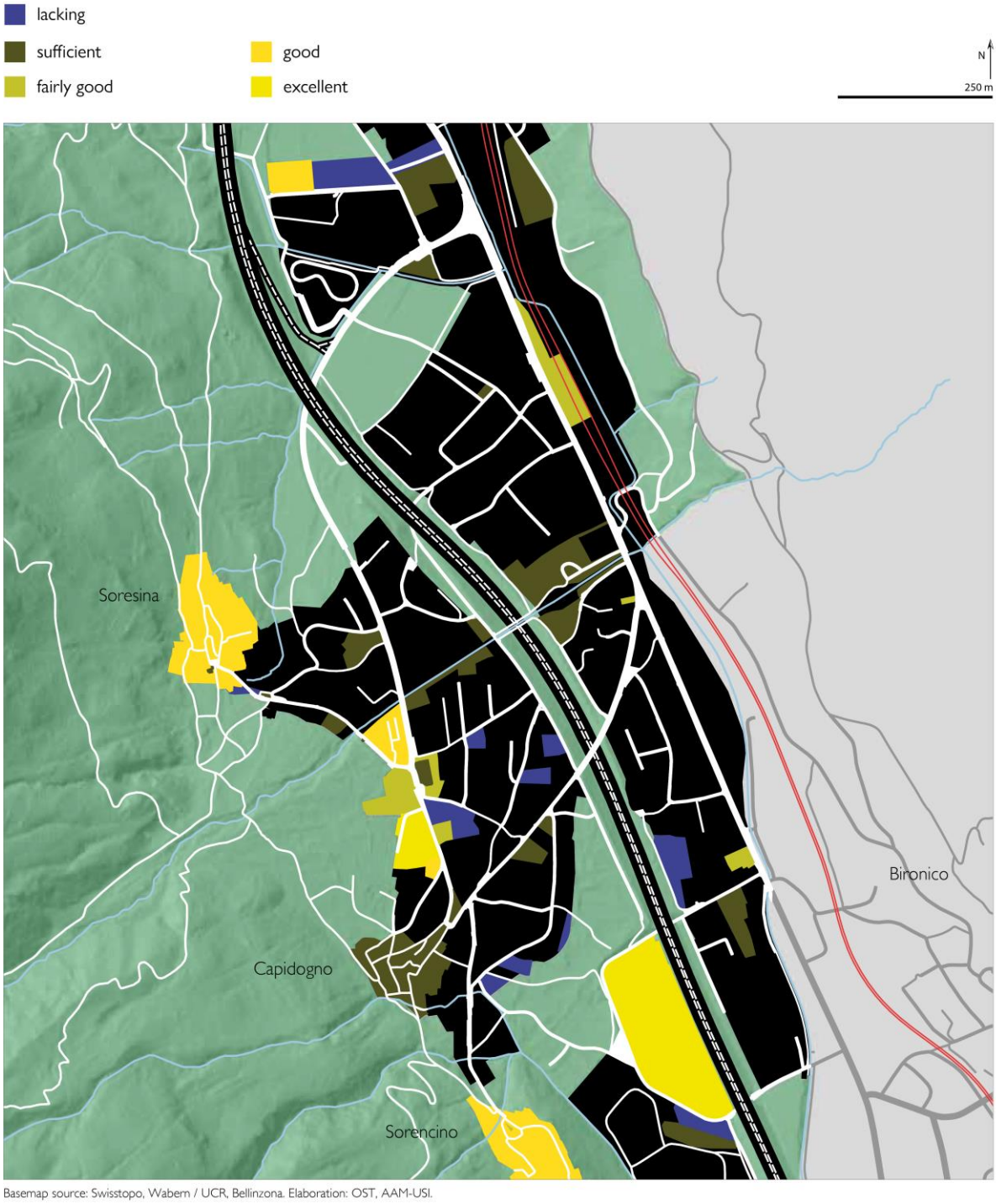
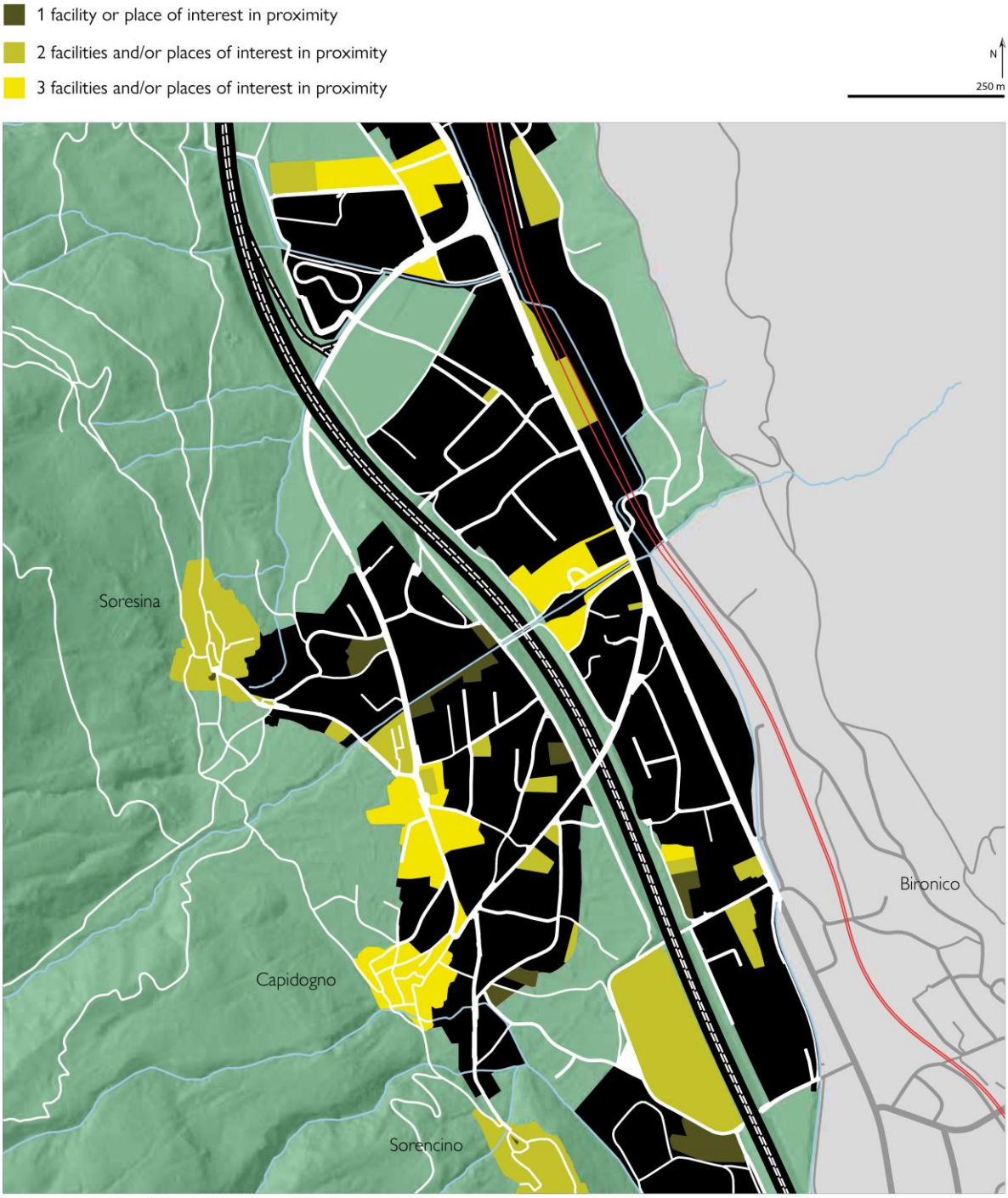


Figure 9 - Rivera's accessible spaces proximity to facilities (including public transportation platforms) and places of interest according to qualitative frame of analysis criteria (see Table 1).

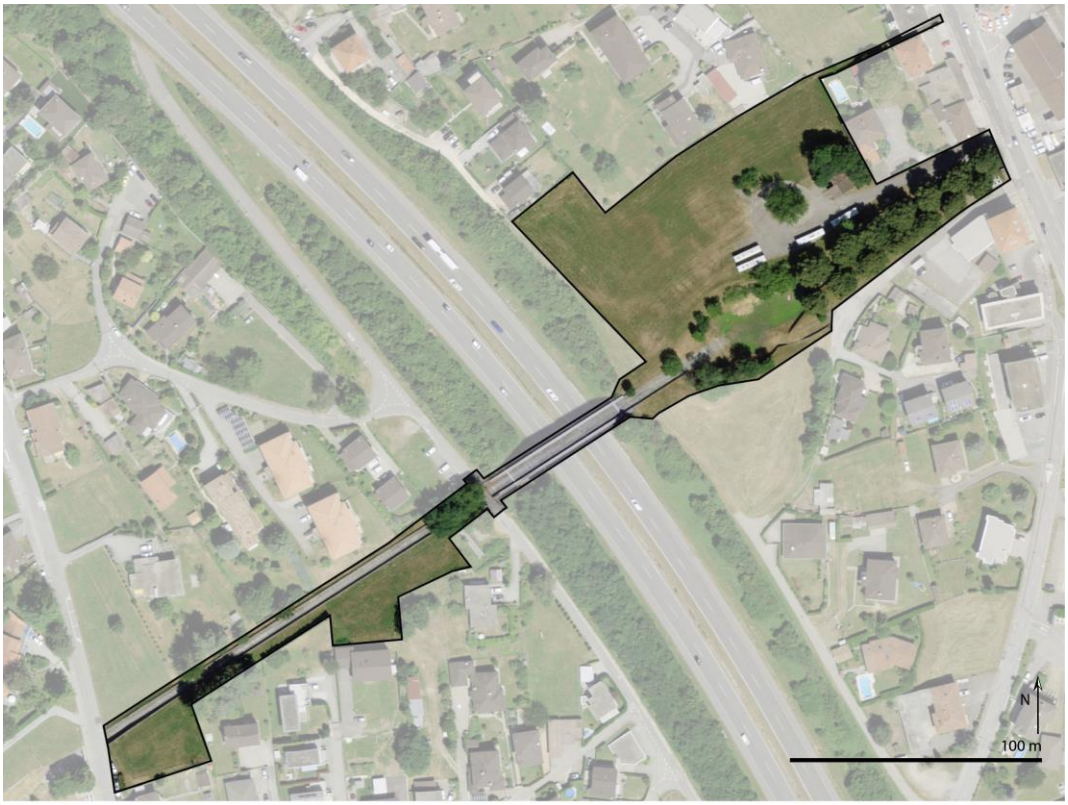


Basemap source: Swisstopo, Wabern / UCR, Bellinzona. Elaboration: OST, AAM-USI.

DISCUSSION

The GIPSI tool highlighted that traditional settlement spaces in the area of Rivera have a better quality than recent residential settlement, which are often residual and fragmented, scarcely equipped and with challenging pedestrian walkability. Nevertheless, both traditional and residential settlements have potential for development. For instance, even though traditional settlements have a weak improvement potential because of their proven good quality, they could be slightly enhanced by means of straightforward improvements. Residential settlement areas need more important and contextualized renovations involving different actors in the promotion of public space. In fact, in these areas there are only few accessible spaces and often of bad quality. An example of this are the free accessible spaces surrounding the tributary Zarigo creek, which are undeveloped sites even though zoned for public use. The creek crosses the highway from southwest to northeast and flows into the stream Leguana. It is artificially channeled and its shores are of poor quality (Figure 10). Nevertheless, these accessible spaces have a great potential: their location is strategic since they link two residential areas separated by the highway by means of a bridge accessible to pedestrians. Moreover, a vast and empty space (northeast from the highway) is available and in principle suitable for a meaningful and interconnected public space. These results were confirmed by fieldwork observations. Given this general overview, the Rivera sector has now a rationale for analyzing these characteristics closely with a more focused urban planning approach, potentially involving residents, architects and urban planners in a meaningful renovation project.

Figure 10 - Free accessible spaces surrounding the tributary Zarigo creek in Rivera sector.



Basemap source: Swisstopo, Wabern / UCR, Bellinzona. Elaboration: OST, AAM-USI.

CONCLUSION

This paper discusses the topic of public spaces in peri-urban areas of Southern Switzerland and offers a methodological tool for investigating their typology, distribution and qualities. The GIPSI tool allows recognizing the peculiarities and improvement potential of peri-urban accessible spaces. For the Rivera case of study, the tool highlighted a significant qualitative difference between traditional settlement's public spaces, formerly realized for collective use, and residential settlement's free spaces, which are mainly residual and not specifically structured for a public use. These distinctions have been observed in several others peri-urban areas of Ticino Canton, where the tool has been tested or employed for specific analysis of public spaces. From the first tool trials, it emerges that the comparison with the reality by means of fieldwork surveys is essential for correctly characterizing accessible spaces at the local scale and for actually attesting their improvement potential. Once well established, the GIPSI's workflow was easy to apply and results were obtained

quite quickly. However, a potential lack of initial geodata about the case-study area could result in a more time-consuming process of data acquisition, production and validation. Besides, GIPSI's current state of the arts needs that experts in the field of GIS and spatial development lead and supervise the data transformation, acquisition and enrichment.

Anyway, GIPSI gives a general overview of public spaces configuration in peri-urban settlements in a systematic way and it enables a qualitative comparison among them. Nevertheless, the tool is not limited to a generic investigation: the dynamic nature of its qualitative frame of analysis allows focusing on more specific research elements, according to local perceptions, perspectives, and goals. The scale of analysis can vary from a local scale (settlement as a whole) to a more targeted and specific scale (neighborhood, specific places such as streets, traditional public spaces, loose spaces…). Therefore, this tool can be adjusted or enhanced to other peripheral public space analysis in Switzerland and in other European similar contexts. It is a preparatory stage for urban planning projects aiming at the enhancement and networking of public spaces in peripheral settlements. Hence, GIPSI can lay the foundations for deeper and more concrete public space discussions and reconfigurations in peri- urban areas, potentially involving interdisciplinary knowledge, planning approaches and participative processes.

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