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Special Issue 3.2024

Living and Walking in Cities

New challenges for sustainable urban mobility

This Special Issue intended to wonder about the new challenges for sustainable urban mobility, aligning with the European Sustainable & Smart Mobility Strategy. Contributions come from selected papers of the XXVI International Conference "Living and Walking in Cities" and have been collected around two main topics: the relationship between transport systems and pedestrian mobility and the transformative potential of temporary urban changes. Reflections and suggestions elaborated underline a collective great leap forward to reshaping urban mobility paradigms.

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TeMA

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Special Issue 3.2024

Living and walking in cities: new challenges for sustainable urban mobility

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Cover photo: Herrengasse street in Graz (Austria), baroque pedestrian avenue and centre of public life, provided by Michela Tiboni (June, 2024)

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Living and walking in cities: new challenges for sustainable urban mobility

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Redesigning "schools squares" for a public city

A proposal of classification and intervention

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Abstract

The conquest of new public spaces is one of the main options in processes of urban regeneration. It seems essential in contemporary cities, since our life occurs more and more indoors and in private contexts, reducing the role of public and outdoor activities. Among cultural-based urban regeneration projects that operate within those spaces waiting for an improvement of the existing public functions, schools can play a particularly prominent role, as well spread and symbolic institutions with an educational mission for young people. From this perspective, the paper discusses how school squares, namely the urban areas close to the entrance of schools, can be designed and regenerated to produce a real public space where the city meets the school and vice versa. The paper presents a methodology to classify different typologies of school squares, based on an extensive analysis on over 600 school squares, located in the provinces of Milan, Turin and Varese. On the basis of such classification, some guidelines are discussed in order to propose a strategy to redesign these symbolic spaces and to conquer them as public areas.

Keywords

School squares; Public spaces; Urban regeneration; Design.

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1. Urban regeneration for a public city: the case of the school squares

The paper aims at presenting a proposal to classify different typologies of urban areas related to schools and discussing some guidelines to re-design these areas in order to make them a real public space where the city meets the school and vice versa. Such reflection can be seen as part of the recent debate about some good practices of urban regeneration related to the urban spaces close to schools, quite spread in Italy (Ciaffi et al., 2022; Pileri et al., 2022; Mattioli et al., 2021; Renzoni & Savoldi, 2022) and in European and International contexts¹ (Giles-Corti et al., 2011; Goodman et al., 2021).

The conquest of new public spaces is one of the main options in processes of urban regeneration (Arendt, 1961; Lefebvre, 1976), both as a temporary and permanent strategy (Bruzzeze, 2019; Lino, 2014; Zali et al., 2016). This kind of action is not just a recent approach; on the opposite, it was already studied and applied since the Sixties. In that period, Jane Jacobs published her seminal book *The Death and Life of Great American Cities* (Jacobs, 1961), where she pointed out how the dramatic increase in car traffic and the urban planning ideology of modernism, that separates the uses of the city and emphasizes free-standing individual buildings, would put an end to the urban space and city life and result in lifeless cities devoid of people. At present, after many years, this message is still actual and can inspire urban regeneration processes: the awareness of the importance of public spaces in contemporary cities should bring to the definition of public policies to design a lively, safe, sustainable and healthy city (Gehl, 2010).

Reflecting on the relevance of public areas in the city is crucial. On the one hand, since, shortly after the millennium, for the first time in history the majority of the global population became urban rather than rural (UNCTAD, 2022): cities have grown rapidly and urban growth will continue to accelerate in the years ahead. This means that cities need crucial changes to the bases for planning; they should focus on the needs of the people who will use cities increasingly. On the other hand, public spaces give planners and architects unique opportunities of designing. In this sense, it seems emblematic and still actual what Jan Gehl wrote in the introduction of his *Life between Buildings*, an interesting book where the focus is totally devoted to the public and open spaces spread all over the city: "This is not a book about "special occasions" – major events, festivals, street markets, carnivals, and block parties. Nor it is a book that concentrates on main streets and bustling city centers. Its focus is, rather, on ordinary days and the multitude of outdoor spaces that surround us. It is a book about everyday activities and their specific demands on the man-made environment" (Gehl, 1987, p.9). Such bases give us a double point of view: (1) every outdoor place, even the residual and less relevant, can be an occasion of re-designing and re-thinking the public city; (2) we always experience the outdoor places of the city by performing daily activities. Such activities can be described as necessary (e.g., going to school or to work, shopping, waiting for a bus), optional (e.g., taking a walk to get a breath of fresh air, standing around enjoying life or sitting and sunbathing) and social (e.g., all the activities that depend on the presence of other people in public spaces, such as children at play, greetings and conversations) (Gehl, 1987). It is quite intuitive that optional and social activities take place only when urban surroundings allow them. In other words, when outdoor areas are of poor quality, only strictly necessary activities occur. Focusing on creating or re-creating urban public areas (of high quality) appears as a priority if we want to experience all the huge range of the outdoor activities.

Starting from this general framework, the specific case of the urban area related to school is chosen as emblematic to tackle the issue of reconquering public urban areas. Indeed, among cultural-based urban regeneration projects that operate within those spaces waiting for an improvement of the existing public functions, schools can play a particularly prominent role (Munarin et al., 2011; Wilson, 2005; Zhu & Lee, 2009). School, as an institution closed in its educational mission (Rossi Doria, 2015), emerges as a local cultural device that is alive and pulsating, as it enables a plurality of relations, but also project opportunities for spaces

¹ Interesting examples of projects done on public areas related to the entrance of schools are reported in Pileri et al. (2022, p. 82-109).

within and beyond the school service, embedded in the needs and requirements of the neighborhoods in which schools are located (Cannella, 2023; Cancellieri et al., 2022; Shbeeb & Awad, 2013). The deep relation between school and city was thoroughly studied (ARUP, 2017; De Maio et al., 2022). From these studies the urgency of enlarging the space of the school also in public areas of the city has emerged. Firstly, it is regarded as a right for children to experiment the city in an autonomous and safe manner (Balzani & Borgogni, 2003; Borgogni, 2016; Renzi et al., 2014; Ward & Fyson, 1973). Secondly, this specific public area is seen as essential in the growth process of children (Borgogni, 2019; Casagrandi & Pileri, 2020): for many years, everyone has to frequent schools and their proximity, while at the same time is not forced to enjoy parks, sport centers or other similar places. Therefore, the urban area related to the school is the first urban place where all children begin to experience the city (Dolto, 2000; Tonucci, 1996; Ward, 1979): here, they start to learn how to live the city in the act both of staying in that place (for instance waiting for other students or having a conversation at the end of classes) and moving, by daily repeating the commuting from home to school. In this sense, the urban surroundings of the school are essential, since they can encourage or discourage the choice of active mobility practices (Bianchi et al., 2023; Strak et al., 2018a) and, thus, influence both the psychomotor and cognitive abilities (Ross, 2007; Stark et al., 2018b) and the health (Masoumi, 2017) of the children.

Quite recently, such urban areas related to schools were defined as "school squares", namely as "public space in front of a school, regardless of whether the toponymy calls it an actual square" (Pileri et al., 2022, p. 14). In other cases, the same areas were defined as "school street" (Belingardi, 2022; Cannella, 2023; Thomas et al., 2022; Varma, 2021). The idea of the squares seems more suitable for this paper, since it emphasizes the symbolic strength of the place and its public potential. From a spatial point of view, it does not mean that these areas are squares or that they are already high-quality public areas where optional and social activities can occur. On the contrary, in many cases the urban area in front of the school entrance is just a road space, designed for cars and not for people, or in a special way for the students. These data emerged from an extensive analysis, carried out on over 600 school squares, located in the provinces of Milan, Turin and Varese (Italy). Thanks to this rich analysis, the paper discusses a proposal of classification of four different categories of school squares. On the basis of such classification, some guidelines are discussed, in order to propose a strategy to redesign school squares and to conquer this symbolic urban area.

The paper is structured as follows. A sample is presented and, subsequently, four typologies of school squares are introduced by describing their main characteristics and possible actions to transform them in real public urban places. The general proposal of classification is better analyzed thanks to four case studies, one for each typology; for each of these, we tailored a re-design program. In the conclusion, a synthesis is provided, together with possible future developments concerning other design aspects (such as those relating to how the design of the school squares as public area of high quality can influence also the daily active mobility of the children towards school).

2. The sample of the analysis and a proposal of school squares classification

The aim of the analysis was to better know the main spatial features of the school squares in the Italian context. How do they appear? Do they have some similar characteristics to cluster them? To answer these questions, an extensive investigation was carried out on 606 school squares², studied with a similar

² The study sample is located in three areas in Northern Italy, divided as follows:
 - 56 municipalities of the metropolitan city of Milan, analyzed during the research project "HABITAT@SCUOLA" (research conceived due to the collaboration between the Department of Electronics, Information and Bioengineering and the Department of Architecture and Urban Studies, supported by Fondazione Cariplo in 2018-2020. The area includes the city of Milan, the municipalities of the first and second belt, the ones to the east and to the south of the metropolitan city. The squares analyzed refer to primary and secondary schools, covering the group age 6-13.
 - 6 municipalities of the metropolitan city of Turin, analyzed during the research project "La città va a scuola" (research developed within the Department of Architecture and Urban Studies and supported by Fondazione Compagnia di San

methodology (site inspections and description of the spatial characteristics related to the outdoor spaces in front of the main entrance of the schools). Although it is not possible to consider it as an exhaustive and definitive analysis, it still allowed us to get some first results. One of the main outcomes is the classification of the school squares, categorized in 4 typologies, with their relative distribution (Fig.1):

- Type 1 – Sidewalk (39% of the cases, 240 out of 606 schools). It is a protected strip along the street, which develops linearly and is indifferent to the presence of a school. Hence, it is just a minimum standard school square for pupils, being more of a transit space than a place to stay;
- Type 2 - Lay-by (32% of the cases, 192 out of 606 schools). It is a localized widening of the sidewalk at the school entrance, for example a "peninsula" facing the road or an indentation obtained from setbacks of buildings, with a variety of shapes, sizes and paving. Pupils and their parents have more space than on a sidewalk and are invited to stay and spend their time there;
- Type 3 - Car park (17% of the cases, 101 out of 606 schools). It could be a public car park also used by other citizens or a specific area within the school complex with regulated access. The presence of cars and the lack of attention to pedestrians are predominant, so pupils are usually taken by adults right to the school entrance;
- Type 4 - Park or pedestrian area (12% of the cases, 73 out of 606 schools). It is a large and protected place entirely dedicated to pedestrians, like an urban park, the main square of the municipality, or an entire road closed to traffic. Here pupils can move and play freely under safe conditions and in a pleasant place.

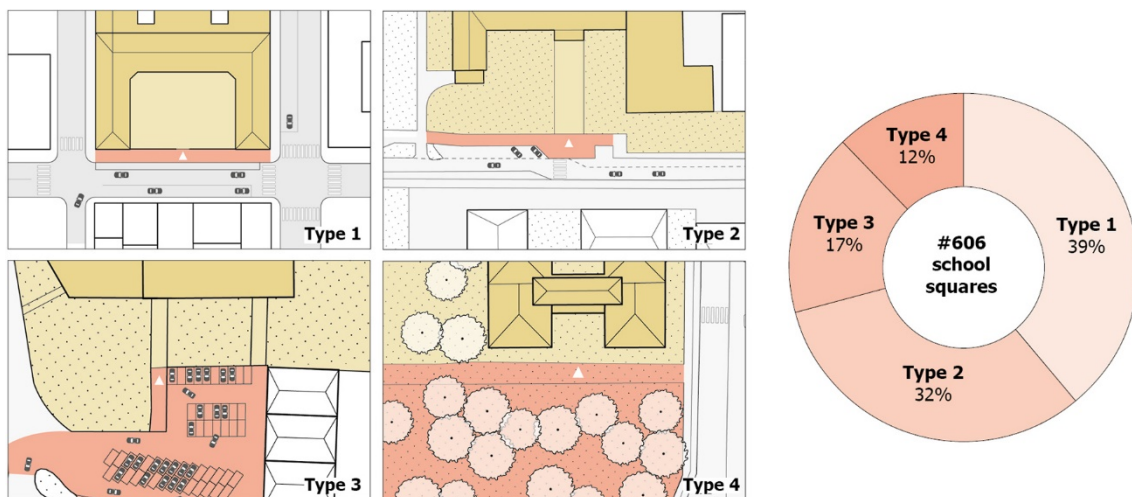


Fig.1 Types of school square (in red) and their distribution within the sample area

3. From different typologies of school squares to different public spaces and design proposals

The four types of school square seem different firstly because of the public spaces they generate. Type 1 is a typical space of transit, without any intention of being a specific outdoor area related to the entrance of a school. Likewise, Type 2, despite a widening of the sidewalk, is mainly a space of transit because the lay-by

Paolo in 2020-2021, shared with Politecnico di Torino and a diverse group of local associations coordinated by Laqup). The area includes the city of Turin and a selection of municipalities of the first belt (one north, one east, one south and two west). The squares analyzed refer to schools from nursery to high grade, covering the group age 3-18.

- 36 municipalities of the province of Varese, analyzed during the research project "MOVE ON - Mobilità leggera in valle Olona" (research developed within the Department of Architecture and Urban Studies and supported by Fondazione Cariplo and Lombardy Region in 2021-2023, coordinated with the Province of Varese and in cooperation with a broad partnership). The area includes primarily municipalities along Olona valley and a selection of other municipalities scattered in the province of Varese. The squares analyzed refer to schools from nursery to high grade, covering the group age 3-18.

is often dull and too small related to the amount of people who could frequent it. We call them "school squares", even if they do not have any spatial feature, both quantitative and qualitative, similar to such a complex and rich public area. Types 3 and 4 have spatial features more suitable for a real public space since they both present a large area exclusively dedicated to the entrance of the school. Here the difference between these two typologies can be found in the quality of the space: Type 3 can be defined as car-designed (devoted mainly to parking cars), while Type 4 as people-designed (where cars are excluded and the space can be devoted to people, students or not). In sum, different types of school squares generate different kinds of public space. A simple way to visualize such relation can be provided by the scheme of necessary, optional and social activities, discussed in the introduction (Gehl, 1976). As a matter of fact, it is possible to associate the four types of school squares with the activities that can occur or be enhanced due to the different spatial features (Fig.2).

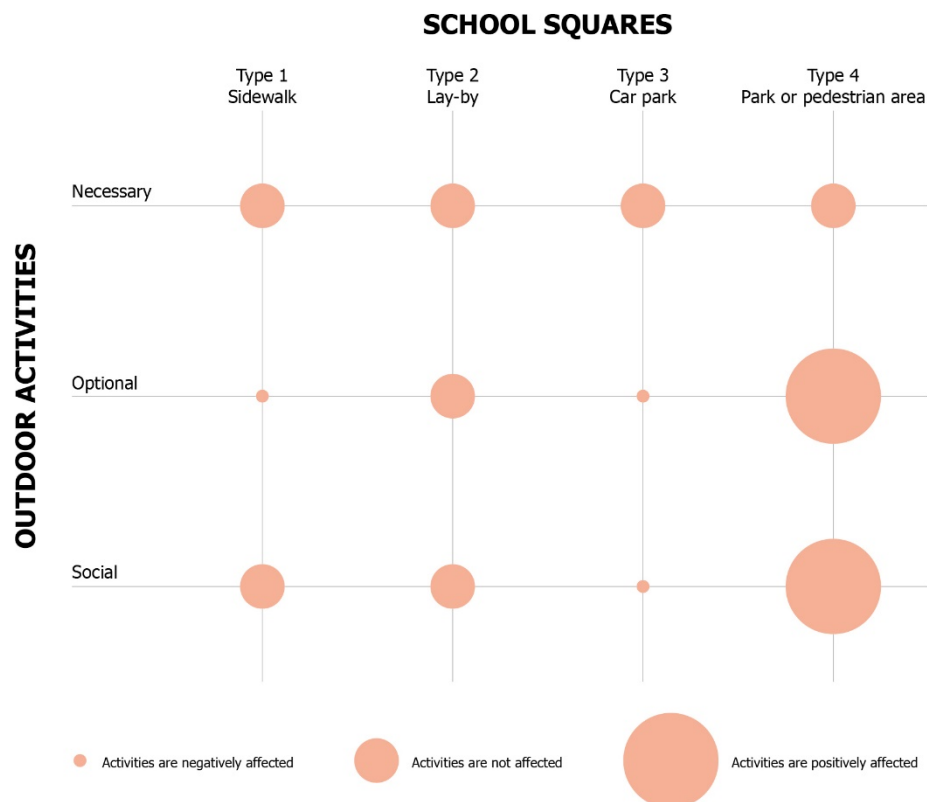


Fig.2 Correlation between the types of school square and the outdoor activities in such spaces

Fig.2 shows the correlation between the types of school square and outdoor activities: in Type 1, being the sidewalk a small line, optional activities are negatively affected; in Type 2 outdoor activities are not positively nor negatively affected by the place; in Type 3, being car-designed, optional and social activities are negatively affected; in Type 4, being people-designed, optional and social activities are positively affected. It has to be noted that necessary activities occur in every school square and are not affected by the place.

These assumptions do not consider the quality of the public spaces which, of course, plays a crucial role in affecting certain activities. However, they give us an idea of the necessity to intervene on school squares: if we really want to make them a public place where outdoor life occurs and children can experience a livable city, we need to redesign and conquer these symbolic areas. This assumption seems even more urgent considering the distribution of the typologies, from which it emerges how over 50% of the cases is represented by school squares (types 1 and 3) where almost only necessary activities can occur; on the contrary, just in 12% of the cases school squares are potentially suited for optional and social activities (Type 4).

In the next paragraphs, we discuss some interventions to make a school square a public space of good quality, namely able to enhance optional and social outdoor activities. Such interventions are applied to four specific

cases, one for each type of school square. The cases will be first presented through the analysis of their specific features, by considering both the urban surroundings and the spatial characteristic of the school square. Later, the design proposal is introduced by discussing two different kinds of actions: one related to the quantitative dimension (e.g., how to enlarge and conquer more urban spaces) and another related to the qualitative aspects (e.g., how to increase the pleasantness and the livability of the space). In order to be more effective and concrete, these actions are proposed in an incremental way, from the simplest with limited outcomes (Step 1), to the most complex with more incisive results in enhancing optional and social activities (Step 4). The actions here proposed differ in outcomes, complexity degree, costs and involved actors as follows:

- Step 1 - Maintenance. Small maintenance and management interventions carried out by the school, to make the school square tidier and inviting (e.g., maintenance of fences, decoration of the walls, waste management). The greater care towards this place invites people to live it and to take care of it in turn, experiencing it actively;
- Step 2 - Appropriation. Temporary interventions to test a new school square (e.g., temporary closure of the road, furnishing, ground painting), designed and implemented in collaboration with the school, the community and the administration. These are "tests" for future interventions, which involve the participation of many citizens;
- Step 3 - Upgrade. Definitive interventions on the school square, carried out by the administration in collaboration with the school and with the support of professionals such as architects and urban planners (e.g., sidewalk widening, repaving, furnishing, planting greenery). Optional and social activities are encouraged by the fact that more space and better quality are reserved for people;
- Step 4 - Encroachment. Definitive interventions on the entire street of the school square, carried out by the administration with the support of professional such as architects and urban planners (e.g., road section redesign, traffic calming interventions, definitive closure of the road). Vehicular traffic is physically inhibited, thus even more space and better quality are reserved for people, both in front of the school and in the surrounding areas.

Step 1 includes interventions on qualitative aspects, while Step 4 on quantitative and spatial extension of the school square; steps 2 and 3 comprise both qualitative and quantitative actions, respectively developed in a temporary and permanent way.

3.1 Type 1 - Sidewalk: the case of Martiri della Resistenza Primary School (Lonate Ceppino, VA)

The "Martiri della Resistenza" Primary School (M.R. School) is taken as example of a sidewalk school square (Type 1). It is located in Lonate Ceppino, a small municipality with ca. 5,000 inhabitants in province of Varese (Fig.3).

M.R. School, attended by 102 pupils (Ministero dell'Istruzione e del Merito, 2023), serves the peripheral S. Lucio district, while the only other primary school of the town is in the center. M.R. School and its school square are located in a block with different kind of sport services as the sports field, the tennis club and the municipal gym, surrounded by residential buildings; they are accessible from the east side through a two-way street that connects several blocks of houses (via S. Lucio, a cross street of the provincial road via Piave), which becomes one-way for a 130-meter stretch in front of the school. This part of via S. Lucio is a long straight line of 350 m along which cars tend to speed up; at the school entrance there is a raised crosswalk slowing down the speed but, actually, its design is not functional for this purpose because the height difference is too low, and the crosswalk approach ramp is too short. Along via S. Lucio there is also a cycle path that connects the neighborhood with the center, and we can also find bicycle racks in the schoolyard.



Fig.3 Martiri della Resistenza Primary School in Lonate Ceppino (VA)

The school square consists of a section of the sidewalk at the school entrance, 45 meters long and 1.8 meters wide, with a surface area of approx. 80 sqm (on average 0.8 sqm available for each pupil). The sidewalk in this section can be used by bicycles as well, and it is covered with smooth red paint to be more recognizable within the urban context; nevertheless, this feature does not help increase the sense of identity to the school and its school square. On the contrary, we noted the absence of a coherent design that confers a sense of place and, instead, we observed many different paving materials (such as cobblestones, pebbles, stone, traditional and colored asphalt). Along the school square there are 13 parking spots separating the sidewalk from the street, and other 22 can be found along the sidewalk of via S. Lucio; plus, there is a large parking area with 39 spots 250 meters away from the school entrance and another one with 26 spots inside the schoolyard. There is no greenery or furnishing on the school square, just a pin board and some signage; occasionally there are big rubbish bins for door-to-door collection. During the peak hour of school entry, most of the pupils enter the school yard, probably because there is not enough room outside and because the school square is not a suitable place for them: this type of school square encourages mainly necessary activities. Additionally, the road is crowded with the cars of the parents, either in transit or parked, making the space around the school square dangerous, chaotic and noisy.

The school square at the M.R. School in Lonate Ceppino needs substantial redesign, and similarly, mobility in the surrounding areas also needs it. The interventions on the school square at the M.R. School could take place as follows (Fig.4):

- Step 1 - Repainting and reordering the school fence, removing the big rubbish bins for door-to-door collection and changing the waste management method;
- Step 2 - Implementing the current school square with some space temporarily subtracted from the car parks in front of the school (13 spots);
- Step 3 - Setting up a permanent school square at the school entrance removing car parks (13 spots). Fixing the crossing by lengthening the bump ramp, so that cars would slow down before they reach the crosswalk, and increasing the height difference between the new school square and the crossing; repaving the sidewalks and the school square with consistent materials. In addition, providing the new school square with benches and greenery, and removing poles and other obstructions;
- Step 4 - Redesigning via S. Lucio permanently with traffic calming interventions (e.g., chicanes) to slow cars down; extending the school square to the entrances of the other activities on the street, removing the car parks (35 spots); repaving the new extended school square with consistent materials, removing poles and other obstructions. Consequently, rethinking of the whole mobility at urban level.

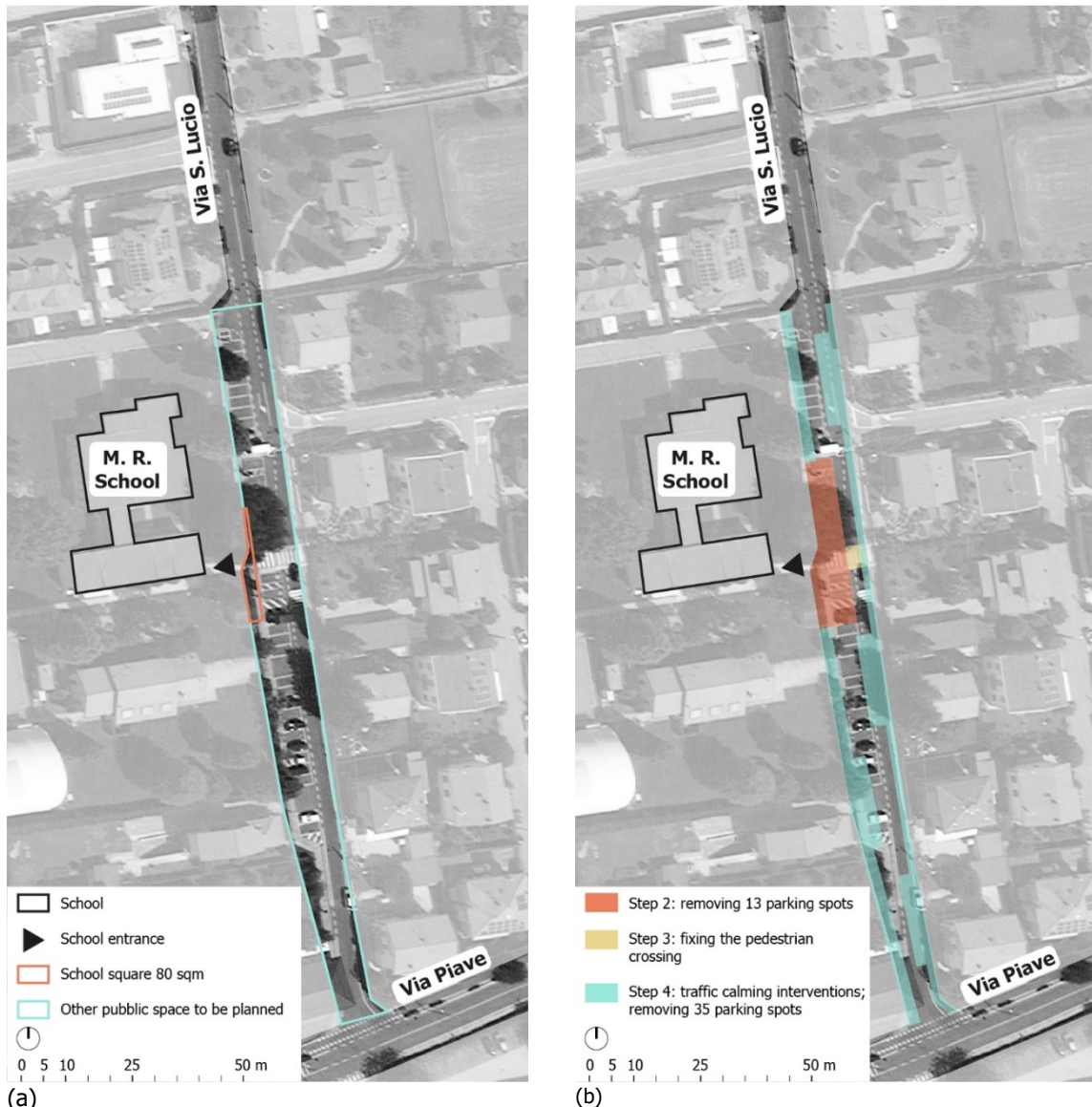


Fig.4 (a) M.R. school square in the current state and (b) with the project proposal

3.2 Type 2 - Lay-by: the case of G. Rodari Primary School (Pioltello, MI)

The "G. Rodari" Primary School (G.R. School) is taken as example of a lay-by school square (Type 2). It is located in in Pioltello, a municipality with over 36,000 inhabitants in the east of Milan (Fig.5).

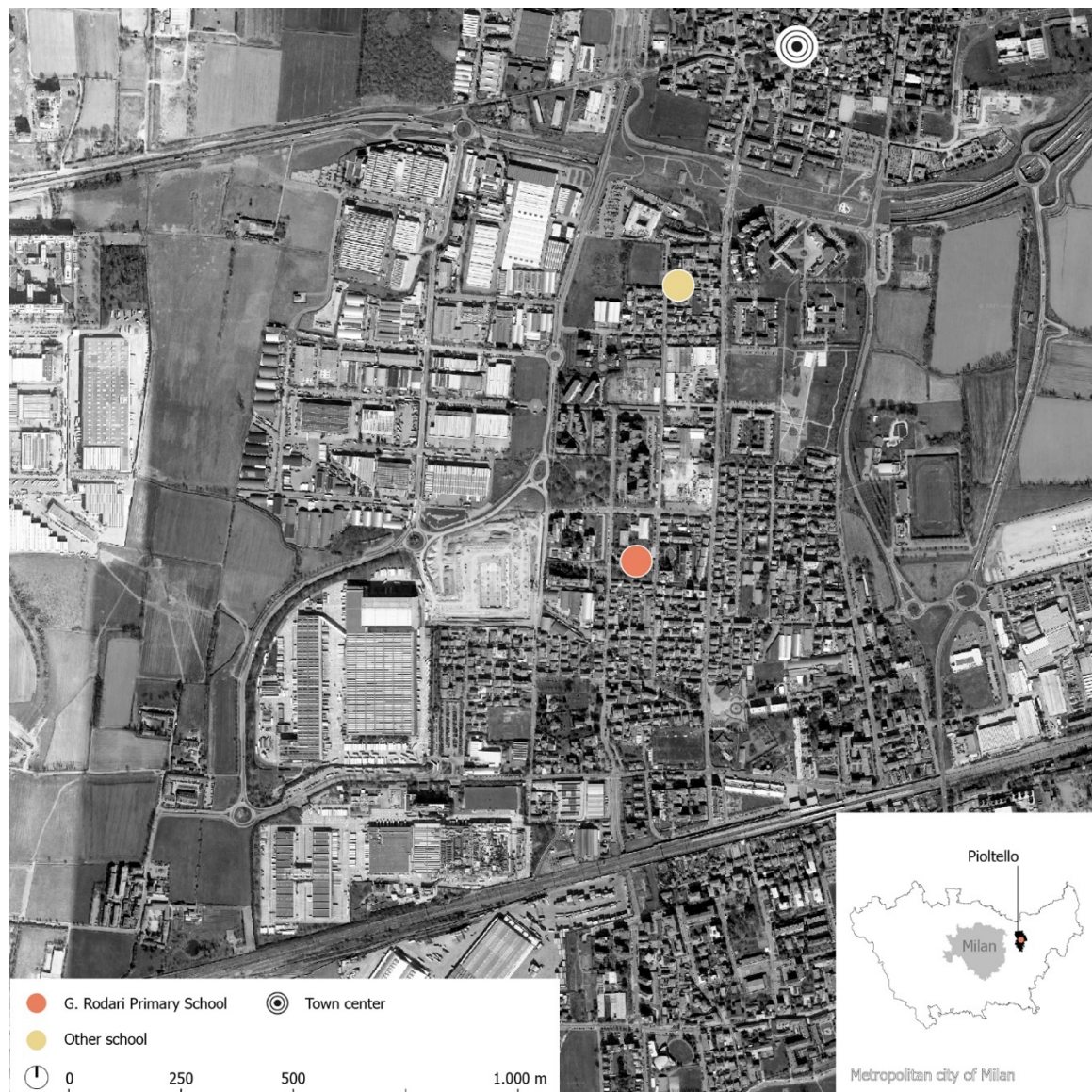


Fig.5 G. Rodari Primary School in Pioltello (MI)

G.R. School is attended by 197 pupils (Ministero dell'Istruzione e del Merito, 2023); it is one of the six primary schools in Pioltello and one of the three in the southern and peripheral area of the town. G.R. School and its school square are located in a residential area adjacent to an industrial area and are accessible from the east side through a two-ways street that connects several blocks of houses and warehouses (via G. Galilei). In the same area there is also the kindergarten "W. Tobagi" with an access on via W. Tobagi, perpendicular to via G. Galilei and equipped with five raised crossings, and the public park "A. Frank" with an access on via G. Galilei right on the opposite side from the school square to which is connected by a raised crossing.

The school square is a "peninsula" on via G. Galilei with a surface area of approx. 220 sqm (on average 1 sqm available for each pupil), it has an irregular shape given by the setback of the school's fence and it is highly recognizable thanks to the pattern of the paving, the same we found in part of the schoolyard and in front of the kindergarten, that makes it a landmark compared to the surrounding areas. There is no greenery or furnishing (present, however, in the schoolyard along with bicycle racks), just a pin board, three rubbish bins

and some signage. During the peak hour of school entry, a part of the schoolchildren stays in the school square (where necessary and optional activities are performed), another part plays in the park, and others enter the schoolyard; via G. Galilei is temporarily closed to traffic in a section of 100 m between via Udine and via Arezzo, so parents are used to stopping their cars at the road closure barriers. It emerges that, on one hand, the road section closed to traffic encourages children to socialize and play safely, while on the other hand the section open to traffic is still crowded with cars.



Fig.6 (a) G.R. school square in the current state and (b) with the project proposal

Therefore, such a partial and temporary closure of the road, that expands the school square for just one hour in the entire day, is not enough to make a proper school square, which should be an important place for the city and for the extended community, and also fails to support active mobility practices. Interventions on the school square at the G.R. School in Pioltello could take place as follows (Fig.6):

- Step 1 - Repainting and reordering the school fence, keeping the pavement clean, maintaining vegetation facing the road;
- Step 2 - Implementing the current school square with some space temporarily subtracted from the car parks close to the lay-by and to the park (19 spots), beyond the existing traffic closure time on this road;

- Step 3 - Setting up a permanent school square removing car parks (19 spots) and replacing them with an extension of the lay-by; repaving the road section between the lay-by and the park (approx. 30 m) making it coplanar to the sidewalks; removing poles and other obstacles from the lay-by;
- Step 4 - Closing via Galilei between via Udine and via W. Tobagi permanently, maintaining the access just for the owners of driveways; repaving the road section between the school and the park (approx. 50 m) making it coplanar to the sidewalks; widening the sidewalks on via G. Galilei by permanently removing 60 parking spaces along the street; eliminating changes in elevation or interruptions in sidewalks at driveways in via G. Galilei, so that they are easier for pedestrians (including the disabled) to cross.

3.3 Type 3 - Car park: the case of I. Alpi Secondary School (Trezzano Rosa, MI)

The "I. Alpi" Secondary School (I.A. School) is taken as example of a car park school square (Type 3). It is located in Trezzano Rosa, a small municipality with ca. 5,400 inhabitants in metropolitan city of Milan (Fig.7).



Fig.7 I. Alpi Secondary School in Trezzano Rosa (MI)

I.A. School is attended by 244 pupils (Ministero dell'Istruzione e del Merito, 2023) and is the only secondary school in the town. I.A. School and its school square are located in a suburban area south of the city, outside the urban fabric and surrounded by agricultural fields; in the same area, there is also the urban park "Volano Oasi Naturalistica" of 4.3 ha and the municipal sport field "G. Facchetti" with a 74 spots car park. The school is accessible from the north side through a two-way street with a dead end (via G. Brambati), along which there is a cycle path ca. 150 m long between the school and the nearest neighborhood.

The school square consists of a car park within the school complex, with 62 spots and a school bus space, with a surface area of approx. 2300 sqm (on average 9.4 sqm available for each pupil). However, over the 90% of the area is conceived for the cars and a general lack of quality and sense of identity has been noted, since every element on the school square is related to the presence of adults and their cars (e.g., bollards, billboards, horizontal and vertical signage). Consequently, despite of the large size of the school square, this type allows only necessary activities: in fact, during the peak hour of school entry most of the pupils enter in the school yard (equipped with greenery and bicycle racks), since the school square is crowded with cars, either in transit or parked, making it dangerous, chaotic and noisy. Of course, the peripheral location of the school and the lack of slow mobility connections with the city are important issues that impact on encouraging car use, and practices related to active mobility are difficult to be activated.

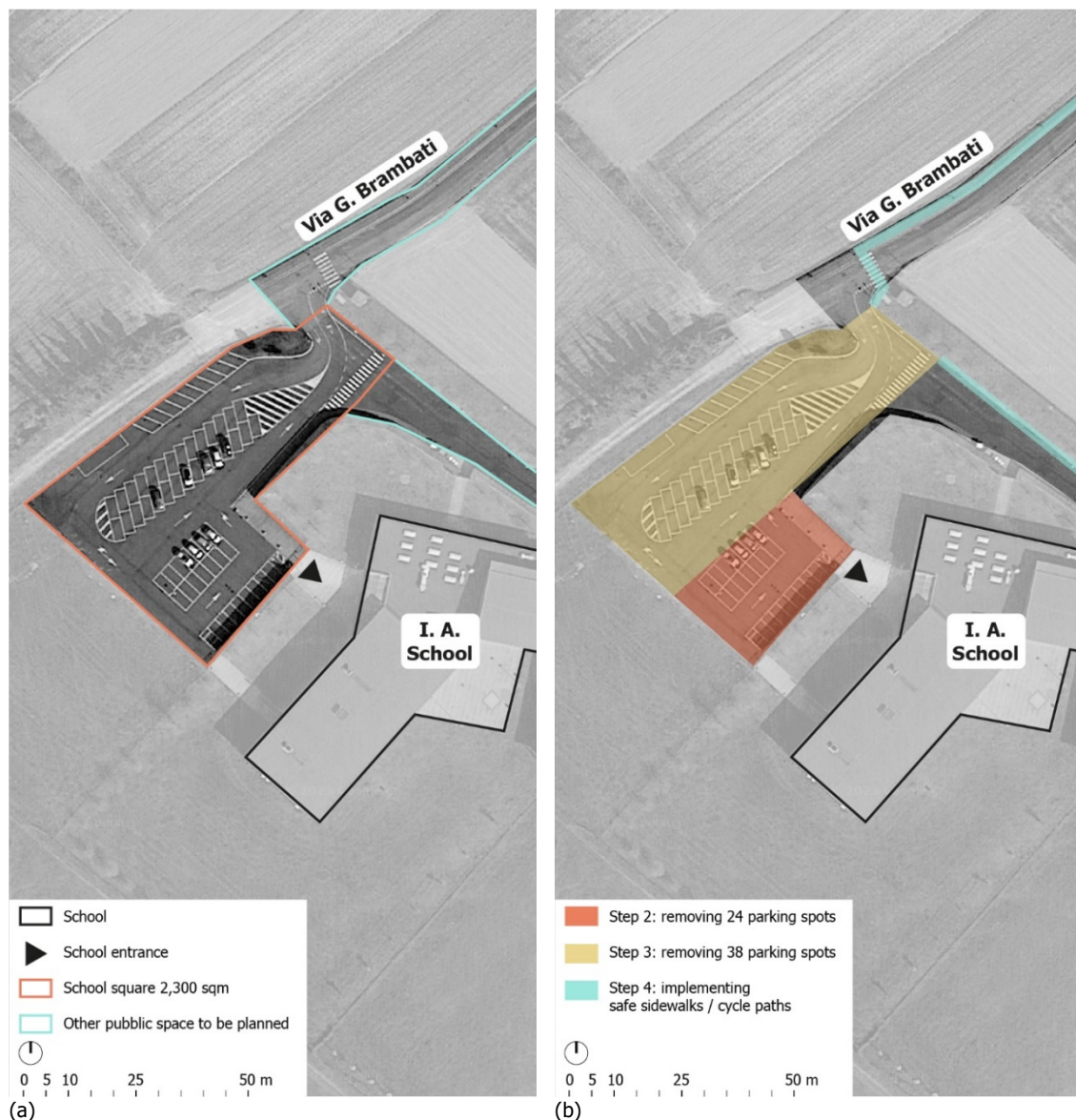


Fig.8 (a) I.A. school square in the current state and (b) with the project proposal

The school square at the I.A. School in Trezzano Rosa and the general urban mobility need a radical intervention, which could take place as follows (Fig.8):

- Step 1 - Repainting and reordering the bollards (maybe with pupils' help), removing the big rubbish bins for door-to-door collection and changing waste management, doing maintenance of the school hedges;
- Step 2 - Temporarily removing the car parks at the school entrance (24 spots) and setting up the resulting space with benches, play equipment and colored pavement;
- Step 3 - Permanently removing the car parks at the school entrance (24 spots) and setting up the resulting space with benches, play equipment and a new pavement; removing unnecessary poles and bollards. In addition, temporarily removing the remaining car parks (38 spots) making it possible to park at the sport field, ca. 400 m away;
- Step 4 - Redesigning the whole school square permanently and adding greenery (maybe de-paving some portions of asphalt), shading, play equipment and new pavement, drawing inspiration from case studies already implemented in Northern Europe (Pileri et al., 2022). Implementing safe sidewalks/cycle paths toward the sport field and the town center, to recompose the fragmentation of the existing infrastructures for the youngest.

3.4 Type 4 - Park or pedestrian area: the case of L. Moglia Primary School (Collegno, TO)

The "L. Moglia" Primary School (L.M. School) is taken as example of a park school square (Type 4). It is located in Collegno, a belt municipality with over 48,000 inhabitants in the east border of Turin (Fig.9).

L.M. School is attended by 104 pupils (Ministero dell'Istruzione e del Merito, 2023); it is one of the ten primary schools in Collegno and one of the six located along the major thoroughfare "corso Francia" starting from the center of Turin and connecting three different municipalities. L.M. School and its school square are located in a mainly residential area and are accessible from the south side through a two-way street that connects several blocks of houses (via C. Battisti) and from the north side through a dead-end street with a car park (via Bolzano, a cross street of corso Francia). The school square consists of the park "Martiri XXX aprile", with a surface area of approx. 1,600 sqm (on average 15 sqm available for each pupil): it is a green area with trees, equipped with benches and play equipment, a pleasant place to spend time despite some signs of carelessness (e.g., dirty and uneven pavements, scarped and written walls, garbage). An observation conducted during the peak hour of school entry shows that a part of the schoolchildren experiences the school square as a quiet and protected place to wait for classes to begin, where absence of cars makes room for optional and social activities; however, other pupils tend to immediately enter the schoolyard identifying this very yard as their comfort zone. It was also noted how the surrounding streets (via C. Battisti and via Bolzano) are invaded by cars, either in transit or parked, of parents accompanying their children up to the threshold of the school square, making the space around the school square dangerous, chaotic and noisy.

Although the school square at the L.M. School in Collegno belongs to a typology (the park) that already involves the presence of a good place to stay and is a potential activator of optional and social activities, it emerges that interventions are still needed so that this square can be a relevant place for both schoolchildren and the extended community. Interventions on the school square at the L.M. School could take place as follows (Fig.10):

- Step 1 - Removing the garbage, keeping the pavement and garden clean, repainting the school wall;
- Step 2 - Coloring the pavement of pathways, playground area and by the school gate, activating the involvement of pupils and increasing their sense of belonging to the place. Furthermore, outdoor activities related to the school's educational offerings could be organized so that schoolchildren can easily become familiar with the city's public space and feel like protagonists;

- Step 3 - Doing maintenance of greenery, seating and play equipment of the school square (e.g., removing graffiti, repainting, fixing...); removing car parks near the school square (20 spots not regulated by signage on via C. Battisti and 10 spots on via Bolzano) and installing bicycle racks that are safe, easy to use and do not obstruct the passage of pedestrians (since there are none in the schoolyard either);
- Step 4 - Intervening on the sidewalks and roads around the school, making them safer and more pleasant for active mobility and inhibiting vehicular traffic. Widening the sidewalks on via C. Battisti by permanently removing 40 parking spaces on the north side of the street (the same side of the school), while regulating parking that is currently self-managed on the south side; securing the three crosswalks along the street by making them coplanar with the sidewalks and creating elevation changes on the driveway surface (thus slowing down passing cars); eliminating changes in elevation or interruptions in sidewalks at driveways so that they are easier for pedestrians (including the disabled) to cross. Permanently removing 20 parking spaces by the park in via Bolzano and projecting the resulting space as an integrating part of the school square. Repaving sidewalks, pathways and school doorstep in a consistent way.



Fig.9 L. Moglia Primary School in Collegno (TO)

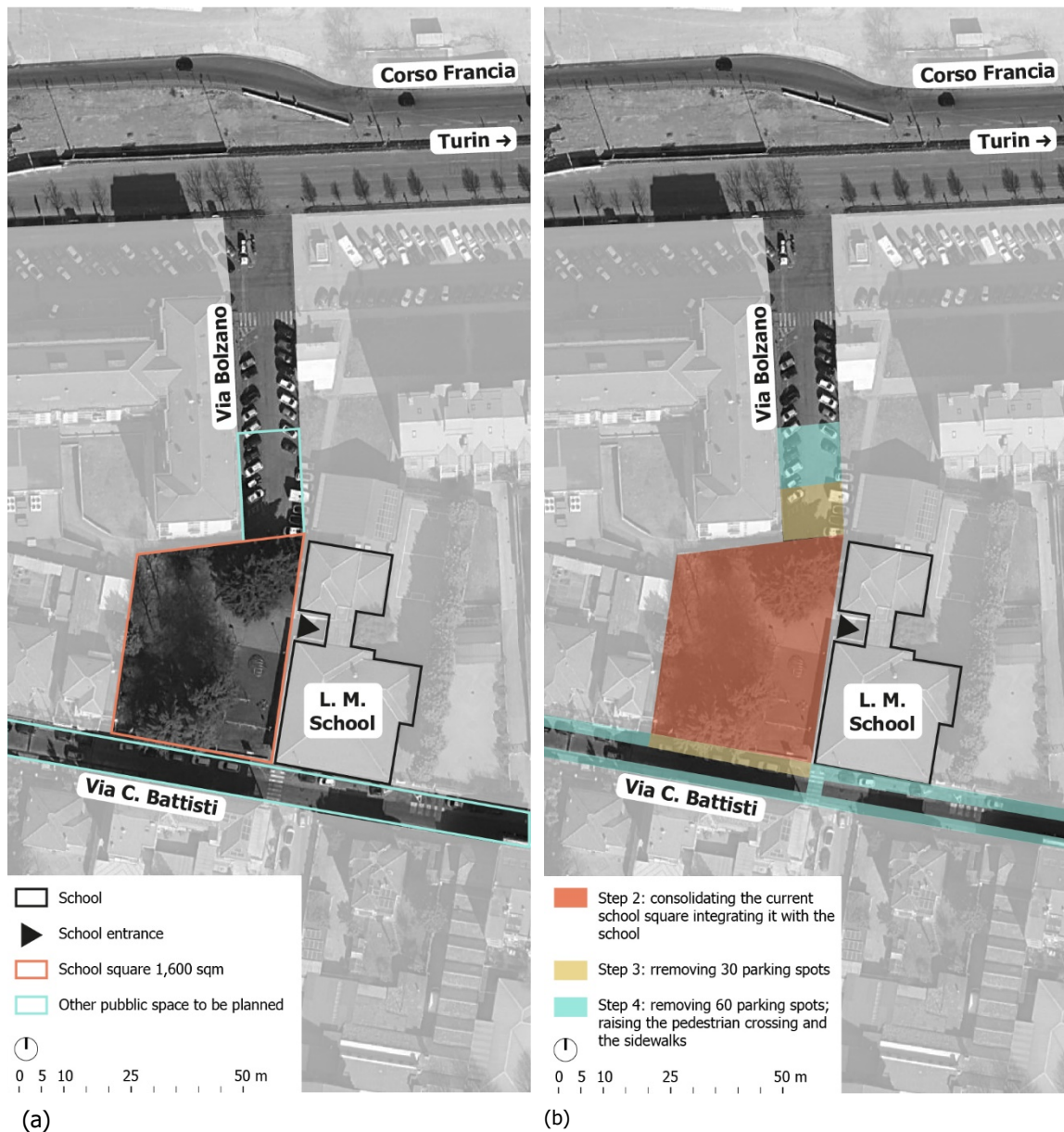


Fig.10 (a) L.M. school square in the current state and (b) with the project proposal

4. Conclusion: redesigning school squares as a place to live and move

The paper has presented a proposal to classify different typologies of urban areas related to schools, according to their spatial features, and to introduce some guidelines to re-design these areas in order to make them public spaces of good quality, namely able to encourage outdoor activities and livable cities. The results of the analysis on over 600 school squares in Northern Italy show how the four detected types are in different ways suitable for outdoor activities and can enhance or discourage them. The identification of the types of school squares is quite innovative since does not have any reference in other research, as similar classifications were done just for the schoolyards, being the playground spaces inside the school (Andersen et al., 2015; Anthamatten et al., 2015).

The same classification was already discussed by the authors by questioning how school squares, in their spatial features, can become triggers of the so-called active mobility³ (Bianchi & Moscarelli, 2024). By crossing

³ Active mobility, a branch of sustainable mobility, includes physical activity and non-motorized transport means, for example cycling and walking, but also all the recent human-powered variants (e.g., push scooter, roller skates/roller blades and skateboards (Scotini et al., 2017; Maltese et al., 2021).

two different approaches, one focusing on the analysis of the school square seen as a public space (proposed in this paper), thus as a place of staying, and the other where school square is seen as a starting or arrival point of daily movements, thus as a place that can encourage some modal choices, an interesting result emerges. Those types of school squares that are more suitable for every kind of outdoor activities are also more suitable for active mobility and, vice versa, those types which discourage optional and social activities, discourage active mobility as well (Fig.11).

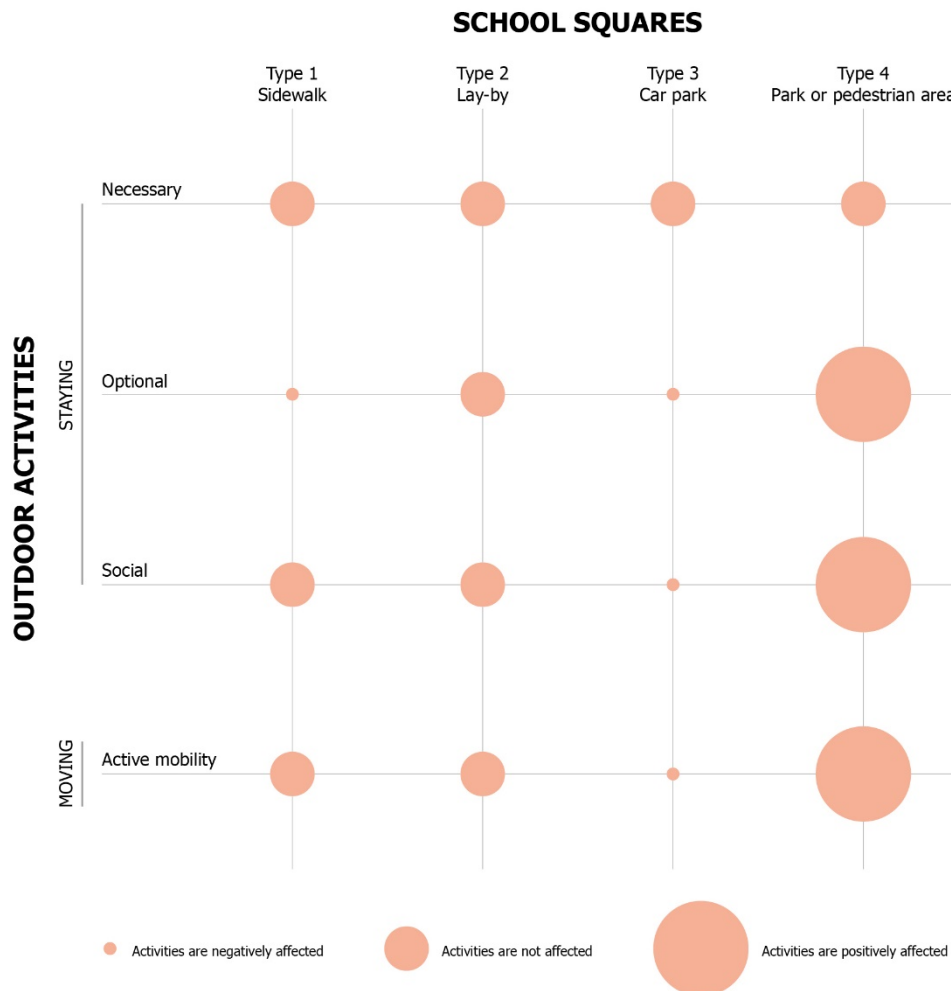


Fig.11 Correlation between the four types of school squares and active mobility, implementing Fig.2

Fig.11, by improving the Fig.2, implements the correlation between the four types of school square and the outdoor activities that may or may not occur (Fig.12): active mobility has a neutral correlation with school squares of types 1 and 2 since these types do not encourage nor discourage this practice; Type 3 negatively affects active mobility practices since is car-designed and little space is left to pedestrians and cyclists; on the contrary, Type 4 provides plenty of space to be experienced on foot or by bicycle and, consequently, enhances active mobility.

Fig.12 shows a sidewalk as a school square, where occur necessary and social activities; optional activities are inhibited, while active mobility is not encouraged nor discouraged.

The fact that a public space of high quality can influence the modal choice and in particular the choice of moving by bike or on foot is confirmed by several studies that have investigated the correlation between active mobility and urban context (Carlson et al., 2016; Wang et al., 2016). The analysis proposed here is just a first attempt to introduce this complex correlation and should be deepened with other specific studies able to consider not only the spatial features but also more in detail the presence and the quality of the physical and symbolic affordances in the school squares (partially discussed in Bianchi et al., 2023).



Fig.12 An example of a school square belonging to Type 1 - Sidewalk

Beyond the analytical part, the other relevant result discussed in the paper concerns the strategies to redesign school squares as public spaces of high quality. As we have seen in each case study, the school square of every type could be improved, through actions both on the extension of the area and on the qualitative aspects. Also, in this case there are some limits that have to be declared: one is of course the fact that the redesign proposals are just general guidelines, useful to identify some categories of possible actions, but not perfectly tailored on each specific case which requires, as seen, accurate analysis and unique solutions. For this reason, the design proposal presented in the paper do not have to be intended as prototypical interventions suitable for every context; instead, what emerges is the necessity of a complex and multidisciplinary approach toward the project of school squares, and generally of public spaces, requiring a deep knowledge of the place and how people live it.

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The authors have shared the concept of the paper. F.B. has written the paragraphs 2 and 3. R.M. has written the paragraphs 1 and 4. The part written by R.M. is a result of the study carried out within the MOST – Sustainable Mobility National Research Center and received funding from the European Union Next-GenerationEU (PIANO NAZIONALE DI RIPRESA E RESILIENZA (PNRR) – MISSIONE 4 COMPONENTE 2, INVESTIMENTO 1.4 – D.D. 1033 17/06/2022, CN00000023). This manuscript reflects only the author' views and opinions, neither the European Union nor the European Commission can be considered responsible for them.

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Image Sources

Fig.1: Elaboration by authors.

Fig.2: Elaboration by authors, based on Gehl, 1976.

Fig.3: Elaboration by authors.

Fig.4: Elaboration by authors.

Fig.5: Elaboration by authors.

Fig.6: Elaboration by authors.

Fig.7: Elaboration by authors.

Fig.8: Elaboration by authors.

Fig.9: Elaboration by authors.

Fig.10: Elaboration by authors.

Fig.11: Elaboration by authors, based on Gehl, 1997 and Bianchi & Moscarelli, n.d.

Fig.12: Credit F.B.

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