Chapter 85
Inclusive Neighborhoods in a Healthy City: Walkability Assessment and Guidance in Rome

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Abstract With the increasingly global and European attention toward healthy inclusive cities, the focus on pedestrian-friendly environments, as a tool to encourage and support healthy lifestyles for people of all social groups and ages, continues to rise. This article aims to assess "walkability" as one of the main conditions of a built environment that enhances "healthy living", a core theme of the Zagreb Declaration for Healthy Cities. Transit-Oriented Development Standard (TOD Standard) is used as a tool to evaluate the walkability level in San Giovanni area in Rome, Italy. Through urban plans and measurements of the pedestrian realms, the research evaluates the state of walkability through a metric scoring method of the walkways' segments. The analysis demonstrates the percentages of all-accessible walkway segments and crosswalks that are safe in all directions; segments with visually active frontages; physically permeable frontages; and segments that incorporate adequate shade or shelter. The results show the pedestrian realm's level of safety, completeness, accessibility to all; its activeness and vibrance; and its level of comfort. The conclusions provide guidance for areas of intervention to make walking accessible for everyone and support decision-making processes to develop inclusive neighborhoods, as a part of the future policies for equitable access and mobility in a healthy city.

Keywords Healthy living · Neighborhood accessibility · Pedestrian-friendly · Transit-oriented development

85.1 Introduction

The WHO European Healthy Cities' movement aims to make a difference in health and well-being and to improve equity through action on underlying urban factors (WHO European Healthy Cities Network 2014). According to the Zagreb Declaration, a healthy city offers a physical and built environment that enables and supports health, recreation and well-being, safety, social interaction, accessibility,

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and mobility to the needs of all its citizens (World Health Organization 2009). Physical activity and walkability have been linked to positive health outcomes and well-being in all age groups, especially among older adults (Cauwenberg et al. 2016; Wang and Yang 2019). In Rome, the aging index is 166.2% and the demographic dependence ratio is 54.7% where 22% of the population is 65+ years old, and 5.2% of the Italian population is with severe health limitations or a disability (Roma Capitale 2018; Istituto nazionale di statistica 2019). This puts emphasis on the importance of developing pedestrian-friendly neighborhoods, where all have the right to access, to reach close and distant destinations easily and affordably, and to live a good life free of dependence on cars.

85.2 Methodology

This paper aims to investigate walkability as a tool to increase accessibility and inclusiveness on a neighborhood scale, with consequent benefits to support healthy lifestyles in Rome, Italy. The first step was to choose a case study that respected the following criteria: densely populated residential area, representative of the Roman population demography, representative of a consolidated urban morphology with well-defined building typologies, and presence of a high-quality transit station (i.e., metro station connected to more than one line).[1] Accordingly, San Giovanni (SG) in Municipality area VII was chosen. It is the densest neighborhood in Rome with 20,910 residents/km^2, 26.1% of its population over the age 65 years old, 13.9% over 74, and 11.1% under the age of 15. SG's buildings (developed between 1920 and 1980s) which can be classified into four types: Palazzo (4–8 story apartment block, most common type), Palazzini (3–4 story apartment building), Villino (two-story building), and Container (non-residential, single-purpose building style). It is considered to have few public spaces, and the street typologies are high volume traffic artery, two-lane road, and local single-lane road (Shin et al. 2017).

The second step was the definition of the study area with the selection of the assessment tool. Urban plans and G-Earth imaging of the area were revised. City's urban department website and other public administration's resources were reviewed for zoning and strategic plans (Roma Capitale 2022). Three field visits were performed for comparison and calibration between the plans and the neighborhood and to assess the behavioral patterns. Parallelly, the choice of an assessment tool was based on the following criteria: based on health and inclusiveness principles, well-established (i.e., officially recognized standard), applicable to urban areas and to existing built environments, and based on numerical metrics that can be independently and easily observed and verified.

[1] A mobility system that is safe, healthy, and sustainable encourages two things: the adoption of soft travel methods or non-motorized means and the switching between transport methods. For this, the vicinity to a transit station represented a selection criterion.

Transit-Oriented Development (TOD) Standard, defined by the Institute for Transportation and Development Policy (ITDP), was chosen. It is used to score products of urban development according to their adherence to a set of principles, with easy walking and cycling, and near-excellent transit service to the rest of the city (ITDP (Institute for Transportation and Development Policy 2017). It represents a recognition system based on a 100-point score, distributed between eight principles. For this study, principle 1 (walk) is used to provide a reference with clear definitions and a rapid assessment of the pedestrian realm. Its objectives and measurement methods are applied through 15 points. It motivates three key implementation objectives:

- Objective A: The pedestrian realm is safe, complete, and accessible to all.
- Objective B: The pedestrian realm is active and vibrant.
- Objective C: The pedestrian realm is temperate and comfortable.

It is recommended that the walking distance between the transit station and the building entrance in the project farthest from the station should be 500 m (10-min walk). This was applied to SG's metro station, overlapping it with the area within the jurisdictions of Municipality VII to define the case study area (Fig. 85.1). Between January and March 2022, six visits were performed to assess the urban properties of the pedestrian realm, measure the metrics, apply scoring, and perform interviews.

Objective A: The pedestrian realm is safe, complete, and accessible to all

The most basic feature of urban walkability is the existence of a complete and continuous walkway network including safe crossings. It must be accessible to

Fig. 85.1 Study area in San Giovanni, Rome, Italy

all persons, including older people and people with disabilities. This objective is measured by the following metrics:

1.A.1. Walkways (3 points). This metric shows the percentage of segments with safe, complete all-accessible walkways, where a block's walkway is measured as a segment between two adjacent intersections in the pedestrian network and can be of the following types:

(a) Dedicated sidewalks protected from vehicular traffic by a curb or other adequate device.
(b) Shared streets designed for sharing between pedestrians, cyclists, and vehicles (speed limit).
(c) Pedestrian paths or pedestrian–cyclist shared paths.

The percentage is calculated by dividing qualifying walkway segments measured by the total segments abutting the block, where qualifying walkways are:

(a) Designed for easy pedestrian access to all abutting buildings on the block frontage.
(b) Unobstructed and barrier-free for people with disabilities, including wheelchair users and people with low vision.
(c) Receive street lighting at night (adequate for pedestrian safety and security).

Although almost all segments are considered safe and secure due to the adequate night lighting, no walkway segment can be considered qualifying due to the lack of the first two conditions in all the study areas, i.e., a complete absence of accessibility (to all) to almost all buildings on the block frontages, and they are obstructed for users of walking or carrying aids and severe long-term limitations due to a health problem.[2] None of the segments were found free or near free of architectural barriers, especially steps at entrances of apartment blocks and stores. The walkways' condition is poor with inadequate surface materials, irregular surfaces, and unsafe changes in elevation, incompliant gaps, and grates, causing tripping hazards and difficulties for pedestrians, especially those with vision and mobility disabilities (Fig. 85.2). For this reason, 1.A.1. walkways obtained 0 out of 3 points (walkway network that is complete is less than 80%).

1.A.2. Crosswalks (3 points). This metric shows the percentage of intersections with safe, all-accessible crosswalks in all directions (compliant with the below):

(a) Barrier-free for people with disabilities, including wheelchair users and people with low vision.
(b) Minimum 2 m width and are demarcated.
(c) Feature all-accessible refuge islands if crossing more than two traffic lanes.
(d) Receive adequate street lighting at night.

[2] According to the data from the Istat survey "Aspects of daily life", 6.2% of females and 4.1% of males in Lazio region have severe long-term limitations in usual activities due to a health problem according to the Global activity limitation indicator (Gali).

Fig. 85.2 Walkways in the case study. **a** An architectural barrier at building entrance in Via Urbino. **b** Irregular surfaces in Via Fregene. **c** Incompliant gaps in Via Veio

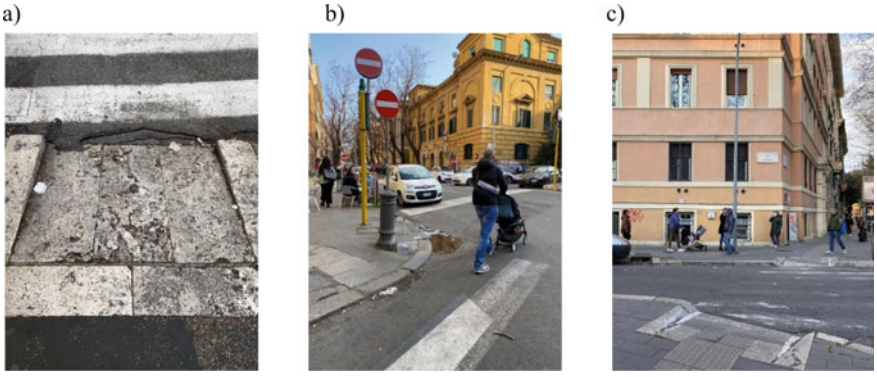

Fig. 85.3 Crosswalks in the case study. **a** Cracks and holes on the ramp in Via Appia Nuova. **b** Inadequate slope and change in level in Via Magnagrecia. **c** Faded crosswalk paint in Via Ardea

Eighteen intersections (67%) were found compliant (i.e., safe and all accessible) of 27 intersections. Therefore, 1.A.2. crosswalks obtained 0 out of 3 points (less than 80% complete crosswalks). The assessment was based on local and international standards (Il presidente della repubblica 1996; The Department of Economic and Social Affairs 2013).

Even though multiple intersections were, presumably, compliant when realized, the maintenance is low, presenting cracks and holes on the surfaces, irregular ramps, inadequate slopes and changes in level, and inadequately painted crosswalks (Fig. 85.3). This was less evident in the main streets,[3] especially Via La Spezia and Via Taranto, with significantly higher safety and all-accessible crosswalks.

Objective B: The pedestrian realm is active and vibrant.

[3] Streets with a right of way from building line to building line of 20 m or more.

A fundamental stimulant of walking is the level of activity. Animated, populated sidewalks make walking attractive, secure, and productive, especially with the presence of commercial services and ground floor activities like storefronts, restaurants, etc. This objective is measured by the following metrics:

1.B.1. Visually active frontage (6 points). This metric shows a percentage of walkway segments with a visual connection to interior building activity. A segment is active if 20% or more of its ground floor frontage abutting public walkways is visually penetrable with a visual connection to interior building activity. This comprises partially transparent materials and windows (even with operable curtains or shutters) at any point between ground level and 2.5 m. Therefore, all 73 segments studied were found active. This is due to the significant commercial presence. Even, walkways with no commercial activity (e.g., segments in Via Isernia, Via Amiterno, or Via Ardea) have frontages that are more than 20% active (i.e., with openings). Except for Via La Spezia, visual activity is higher on main streets such as Via Magnagrecia, Via Aosta, and Via Appia Nuova, which was considered 100% active on both sides. Therefore, this metric obtained all 6 points.

1.B.2. Physically permeable frontage (2 points). This metric represents the average number of shops, building entrances, and other pedestrian access per 100 m (m) of block frontage. To quantify this metric, the total length of block frontage that abuts public walkways (12,106 m) is divided by 100 m. Then, the number of entrances along walkways (744) is divided by the previous measure. The average number of entrances per 100 m of block frontage is 6.15 entrances. Therefore, this metric obtained 2 out of 2 points (100 m frontages with more than 5 entrances).

Objective C: The pedestrian realm is temperate and comfortable.

This objective is measured by one metric:

1.C.1. Shade and shelter (1 point). This metric reflects the percentage of walkway segments that incorporate adequate shade or shelter amenities, including trees, building elements (e.g., arcades, awnings, cast shadows), freestanding structures (e.g., public transport shelters), and vertical wind and solar screens (e.g., walls and lattices). Fifty-six segments (77% of the total) were incorporating climate-adequate shade and shelter elements. The shade or shelter was mainly provided by trees and buildings (compact urban fabric cast shadows). The field visits were in January–March, where the solar angles are low and the deciduous trees' impact is different from summer; therefore, measurements were supported by a conceptual solar analysis (LoD1) and interviews for the residents' feedback. The street with the least shade and shelter was Via La Spezia, especially the northern sidewalks. This metric obtained 1 out of 1 point (75%+ adequate).

Table 85.1 TOD (walk) score in San Giovanni

Metric		Case study points	Maximum score
1.A.1	Walkways	0	3
1.A.2	Crosswalks	0	3
1.B.1	Visually active frontage	6	6
1.B.2	Physically permeable frontage	2	2
1.C.1	Shade and shelter	1	1
Total		9	15
Total %		**60% Bronze-standard**	

85.3 Results of the Scoring and Assessment

San Giovanni study area was assessed according to TOD principle 1 (Walk) scoring (Table 85.1). No points were obtained for the completeness and safety of walkways and road-crossings, indicating that the pedestrian realm is not safe and accessible to all, especially for users of walking or carrying aids. The pedestrian realm, however, is active and vibrant; building frontages are highly visually active and physically permeable, where both metrics scored the maximum points. The assessment of the walkway's temperateness and comfort was also evaluated positively, indicating adequate shade and shelter in the neighborhood. The final score is 9 out of 15 points (60%), corresponding to a Bronze-standard TOD (if, hypothetically, the other seven principles were to obtain the same score), indicating an area that satisfies most of the objectives of best practice. The assessment and recommendations of each metric are described in Table 85.2.

85.4 Conclusion

This study has provided a methodological assessment of the walkability, as a tool to enhance "healthy living" and increase accessibility and inclusiveness. The case study was found active and vibrant, due to the mixed-use and commercial presence on the ground floor. This encouraged foot traffic, enhanced commercial activity due to the exposure of retail and services. It also reinforced a sense of security due to the visual interior–exterior interactions, through passive and informal observation and surveillance. The work highlighted that the study area has multiple challenges regarding accessibility and safety of the pedestrian realm, creating difficulty for aging inhabitants, an issue for the inclusion of people with vision and mobility disabilities, and those with limitations due to a health problem. This calls for the activation of programs for the walkway network maintenance, and the architectural barrier removal, which on one hand, is already on the agenda of the local administration and, on the other hand, requires major efforts to be achieved. Additionally, there is a

Table 85.2 Evaluation and recommendations of the walkability metrics

Objective		Performance	Recommendations and comments
1.A.1	Walkways	0% very weak	Major requalification interventions are needed to reach complete, all-accessible walkways, especially for people with disabilities and people with severe long-term limitations in usual activities due to a health problem
1.A.2	Crosswalks	0% very weak	With minimal requalification and maintenance interventions, it is possible to adapt the crosswalks to local standards, reaching a full score
1.B.1	Visually active frontage	100% excellent	Highly present in the whole study area. Highest score is reached in the main streets with commercial activity on ground floor
1.B.2	Physically permeable frontage	100% excellent	Highly present in the study area. Highest score is reached in the main streets with commercial activity on ground floor
1.C.1	Shade and shelter	100% excellent	Highly present in the study area due to the compact urban morphology and the presence of trees in most streets. The main streets, however, are the ones lacking adequate shading and shelter, especially during the hot season

lack of amenities and streetscape-enhancing elements. Future projects should ensure the availability of universal design furniture. It is necessary to provide action plans and design solutions that aspire to reach the aims of a healthy city, a city for all citizens, inclusive, supportive, sensitive, and responsive to their diverse needs and expectations.

85.5 Limitations and Future Work

TOD is a simple scoring system that can be independently and reasonably applied for a prompt evaluation. It was designed by ITDP, operating in urban contexts that are different from Rome/Italy. However, it has a margin of adaptability in the evaluation of some aspects (for example, it indicates to use local or international regulations' references). This could be seen both as a limit or a strength based on the work scope. It is possible to furtherly define its application method(s) according to the work objectives, especially for research purposes. Future work could perform detailed

climatic simulations to achieve a developed evaluation of comfort (1.C.1). It could also measure the other TOD principles for a comprehensive assessment of the study area.

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