

IMPROVING THE WALKABILITY FOR NEXT-GENERATION CITIES AND TERRITORIES - Through the reuse of available data and raster analyses

*Original*

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DIPARTIMENTO INTERATENEEO DI SCIENZE  
PROGETTO E POLITICHE DEL TRERRITORIO  
POLITECNICO E UNIVERSITÀ DI TORINO

## IMPROVING THE WALKABILITY FOR NEXT-GENERATION CITIES AND TERRITORIES

Through the reuse of available data  
and raster analyses

XXIV International Conference  
LWC 2019  
**PEDESTRIANS, URBAN  
SPACES AND HEALTH**  
12-13 September 2019  
Brescia

<http://lwc.unibs.it/home>

From 12 to 13 September 2019 was held in Brescia (Italy) the XXIV International Conference “Living and Walking in Cities” (LWC). This year the event was called “Pedestrians, Urban Spaces and Health”. The Conference “traditionally looks at different themes concerning the quality of life in urban areas” and represents an excellent meeting in which “discuss problems that affect the safety of pedestrians in the city, especially of children and persons with reduced mobility”. The Dist Department – jointly to **LINKS Foundation** – has presented a paper that summarise our research started with the **ASITA Conference (2018)**.

Starting from the availability of “open data” we decided to follows the three class of macro indices proposed by **ITDP**: “feasibility, safety and confort/pleasure”. Starting from this assumption, we built a matrix of indices assigning to them a weighted, normalized to 100, value. To consider in a correct way the specificity of places we have thought to developed two scale of analysis: the former, a neighborhood investigation (“San Salvario” district) and, the latter, aimed at to the whole city (Turin).

For the neighborhood level, the background base map used is the Municipal Technical Map (CTC) of the City of Turin (nominal scale: 1: 1000), a very detailed database in which the information are displayed in a very detailed mode (Figure 3).

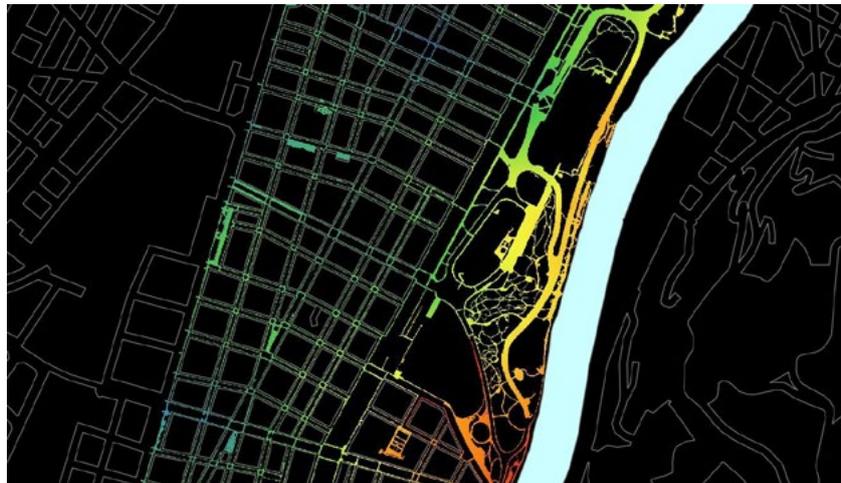


Figure 1. Analysis of overall accessibility to intermodality points

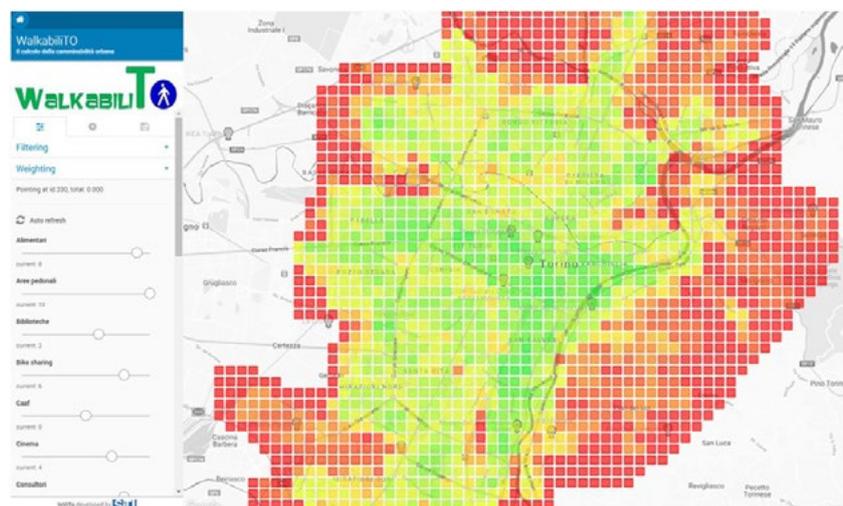


Figure 2. Links Foundation - WalkabilTO

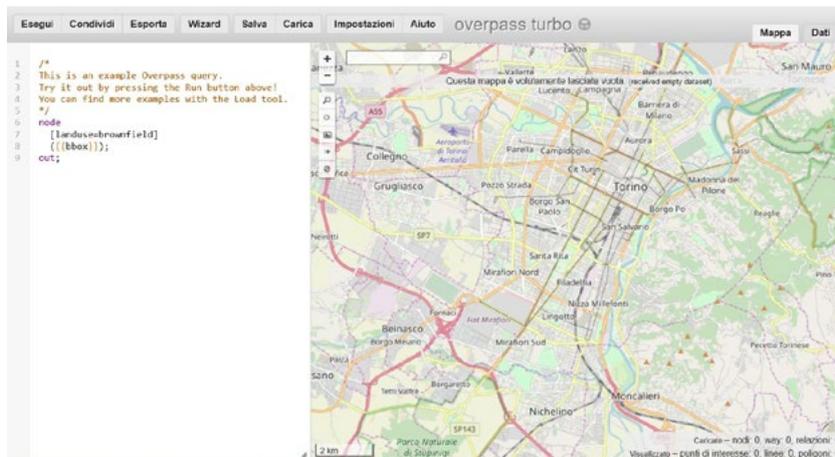
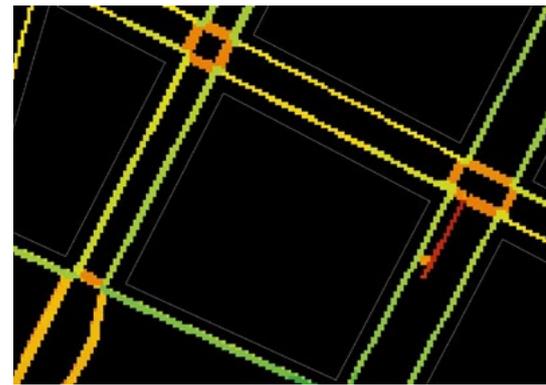


Figure 3. Municipal Technical Map (CTC)

Figure 4. The “walkable” urban space as modeled using a 1m x 1m raster data set. Each cell is given an impedance to be traveled on foot

Figure 5. Overpass Turbo, Landuse = Brownfield

The data set is structured according to the content specifications for the **IntesaGIS geotopographic DBs** and other datasets were downloaded from the “**Geoportale**” of Turin. Both a proprietary software (**ESRI ArcGis**) and an open source one (**QGIS**) were used, especially tools on raster analysis (cost raster/local cost, cost distance, kernel density estimation). Despite a fine availability of data some layers were missing (i.e. “pedestrian crossings”) and other have been published in an “encrypted way” (i.e. pedestrian injuries and safety matter in general). To integrate the database we proceeded autonomously building - as far as possible - the missing data sets letting out the unachievable information (i.e. the cross side, the street lighting level, and so on, Figure 1).

The research, rather than obtaining final and unequivocal results, has highlighted a series of problems, from the construction of indices to their normalized weight, up to the availability of information. Sometimes we have followed the **OpenStreetMap** project and, maybe, this could be a valid data provider as long as people feed the missing information or update the existing ones. For example, using an **Overpass Turbo** query to display the “[**landuse=brownfield** in the Turin area get no results (Figure 2).

This means that no data is available even if a variety of industrial buildings have been abandoned or old buildings have been demolished and cleared. This information could be useful not only for the planners and practitioners but also for the urban policies and the citizens.

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#### Tools on raster analysis

[http://courses.washington.edu/gis250/lessons/raster\\_analysis1/index.html](http://courses.washington.edu/gis250/lessons/raster_analysis1/index.html)

<https://grass.osgeo.org/grass74/manuals/r.cost.html>

[https://docs.qgis.org/testing/en/docs/user\\_manual/processing\\_algs/saga/grid\\_analysis.html](https://docs.qgis.org/testing/en/docs/user_manual/processing_algs/saga/grid_analysis.html)



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