GeoCHOROS

Geospatial Analysis & GIS Research Group

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Geospatial Analysis & G.I.S Research Group
National Technical University of Athens

http://geospatial.ntua.gr

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GeoCHOROS at glance

146
Number of undergraduate and graduate theses completed

18
Number of PhD Theses completed during the last decade

53
Number of Papers published in peer – reviewed journals

31
Number of research innitiatives and projects conducted

9
Number of international networks established or joined

Research Areas:

Geospatial Analysis
Integrated Urban Models
Time Geography – Spatiotemporal Databases
Location Analysis & Locational Planning
Spatial Decision Support systems
Location - Allocation models
Geography of Health – Spatial epidemiology
Walkability Analysis & Neighborhood Planning

Teaching:

Geography & Spatial Analysis
Undergraduate – Required
Geographic Information Systems
Undergraduate – Elective
Planning Applications of Geographic Information Systems
Graduate – Elective
Methods & Techniques of Geographical Research
Graduate – Elective
Geographic Information Systems & Environmental Management
Graduate – Required

GeoCHOROS

Welcome to GeoCHOROS, the Geospatial Analysis and GIS Research Group at the National Technical University of Athens. The Group focuses on research and education with regards to Geographical and Spatial Analysis, Geographic Information Systems (GIS) as well as Locational Planning and Location – Allocation Models. Our website is intended to provide information about our research, education, and outreach activities of the GAGIS-RG to researchers, students, and spatial planning professionals.

The GeoCHOROS Research Group provides access to hardware, software and data, performs research and research project consulting, provides curriculum support, and develops tools and platforms for use with open source and proprietary GIS systems. The Group is located within the Department of Geography and Regional Planning at the School of Surveying Engineering in the Vei Building.

People

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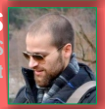
Research & Teaching Assistant, Geography & GIS Specialist

George PANAGIOTOPOULOS
PhD Candidate, Senior GIS Specialist



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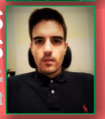

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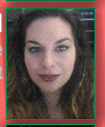

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WALK & the CITY

Measuring walkability in European cities through open & crowdsource data

Visit our website at:
http://geochoros.survey.ntua.gr/walkandthecity/

MYGEOSS
APPS FOR YOUR ENVIRONMENT

European Commission

1. Introduction

Walkability is a composite quantitative index of the built environment and combines neighborhood design attributes likely to reflect how conducive a location is to walking. Nowadays, walking matters more than ever before in the fields of urban planning and public health management. This is due to the extensive and with increasing frequency embracement and adoption of car-dependent lifestyles by many European citizens. Car commuting is detrimental to the environment as well as the daily quality of life of people living in modern cities. Extensive car trips contribute, among others, to the negative aspects of climate change, pollution through emissions, heavy dependency on crude oil markets, increased noise and vibration levels in the streets, and a sedentary lifestyle with extremely low physical activity levels. In turn, this leads to obese and overweight populations with complex and sometimes severe health issues demanding extensive medical care accompanied by higher death rates and a grim forecast for the future. According, to the World Health Organization (W.H.O) insufficient physical activity is one of the ten leading risk factors for death worldwide and a key risk factor for non-communicable health problems such as cancer, diabetes and cardiovascular diseases. On the other hand, sustainable and health promoting modes of active transportation, such as walking and biking, are a priority in the urban mobility planning agenda of many European cities. Such modes of transportation can successfully mitigate the majority of the aforementioned issues and challenges. Travelling through walking is largely accepted as a self-sufficient, human-powered and environmental-friendly mode of transportation. To this end, many researchers and practitioners have revealed and established significant associations between walking and being physically active by proposing alternative building constructions attributes and spatial development patterns of urban neighborhoods. The mixed-use development entailing street network connectivity, residential density and proximity to public transport are some of the key factors of the urban built environment, which affect walking behavior. Within this framework, the concept of "walkability" is significant for both urban transport planners and public health practitioners.

2. What is our mobile app & web-based platform about?

WALK & the CITY is a project designed for citizens, scientists and public authorities dealing with open walkability data and information in European cities, either crowdsourced or objectively measured. It is consisted of two interconnected modules, an Android mobile app and an interactive website:

- The WALK & the CITY Android app can be used by registered users in order to record their walking routes and trip purpose, on a voluntary basis and by utilizing the GPS functionality of their mobile device. At the end of any walking trip an evaluation questionnaire pops up on the screen. Users are then asked to answer nine (9) questions regarding the built environment's characteristics of the route they followed. All collected geospatial and qualitative data and info about the users walking journeys are online uploaded to a web-based open source database and from there, are accessible for free download, preview and comments to the Walk and the City community. The second feature of the mobile application is the picture and photo capturing function of problematic and dynamic walkability related concepts. Furthermore, users are able to categorize as pedestrian-friendly or pedestrian-unfriendly instances and submit their geotagged photos on the webmap, as well as to point out their concerns about active mobility and accessibility in their neighborhood or district by submitting their comments, ideas and thoughts on each available photo depicted on the map.
- The WALK & the CITY website is an open web-based interactive platform where users can have access to both the crowdsourced and the objectively measured (regarding the European Walkability Index) datasets.

More specifically, all the crowdsourced data generated by the users of the mobile application can be viewed and filtered on the relevant map. Thus, European Citizens can get informed about the walkability problems home or visited cities are facing today, as well as to contribute and communicate their ideas and concerns by commenting on submitted by other users photos and geodata. Data pertaining to the walking routes are also accessible for free and can be processed as well as analyzed by every interested stakeholder in order, for him/her, to find out his/her walking environment's state of play. Moreover, on the website users can "discover" and check out the proposed European Walkability Index (E.W.I.) levels and spatial distribution in more than 100 major Functional Urban Areas (F.U.A).

- The E.W.I Map: It depicts an index assessed via the quantitative combination of eight (8) variables of available open geodata sources, in terms of the built environment characteristics, in order to spatially and qualitatively evaluate the levels of walkability or car-dependency in a user-defined area of any of the studied cities. Specifically, the index is composed by the following variables: the land-use mix, the population density, the "walkable" street network connectivity, the "walkable" street density, the pedestrian streets density, the access (400m) to public transport, the access (400m) to food stores and the slope. Firstly, the index has been internally processed and computed in a Geographic Information System environment and afterwards results for each urban area have been uploaded to the online Walkability Index Map. Additionally, scores have been geo-visualized in a web-GIS module and the open European 1km² Reference Grid (provided by the E.E.A) has been used for that purpose.

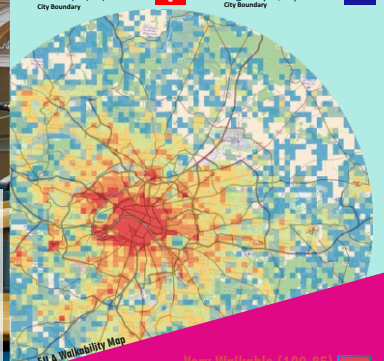
3. Why is this an innovative idea?

- The WALK & the CITY mobile app and web-based platform provide the ability to European citizens to publicly report or/and dynamically analyze critical and/or problematic urban features - characteristics with respect to the walking accessibility and potential of their city area.
- Our project constitutes the first pan-European attempt to create an index which delves into the walkability level of our cities as well as urban districts in a comparative and objective manner.
- Our applied methodological approach for the walkability index calculation is totally based on open and free datasets reducing in this manner, its development and application costs.
- The index assists citizens and urban authorities in making better spatial decisions as well as organising less car-oriented (depended) and more sustainable and healthy lifestyles (e.g by developing a walking strategy or by making a district more accessible & livable).
- Scores stemming from crowdsourced data and European Walkability Index (EWI) can be combined by stockholders, researchers, practitioners and active citizens in an advanced and more complex walkability analysis framework.
- Finally, our web-based interactive platform can act as a prototype observatory for urban active mobility and walking accessibility through which citizens are able to comment and in-situ report issues and characteristics of the built environment the live or visit.

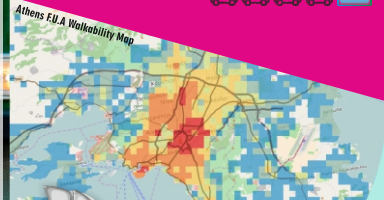
Discovering the most walkable European cities

(Our ranking includes EU.A with population of more than 1.000.000 people)

1	Munich (75,37) City Boundary	11	Barcelona (73,33) City Boundary
2	Torino (75,34) City Boundary	12	Frankfurt (73,27) City Boundary
3	Brussels (75,32) City Boundary	13	Berlin (72,96) City Boundary
4	Vienna (75,04) City Boundary	14	Stockholm (72,95) City Boundary
5	Copenhagen (74,71) City Boundary	15	Seville (72,84) City Boundary
6	Bremen (74,38) City Boundary	16	Paris (72,51) Greater City Boundary
7	Krakow (73,67) City Boundary	17	Amsterdam (72,35) City Boundary
8	Helsinki (73,45) City Boundary	18	Valencia (72,26) City Boundary
9	Praha (73,39) City Boundary	19	Dublin (72,14) Greater City Boundary
10	Zurich (73,39) City Boundary	20	Zagreb (71,20) City Boundary



Very Walkable (100-85)
Walkable (70-84)
Somewhat Walkable (55-69)
Somewhat Car-Dependent (40-54)
Car-Dependent (25-39)
Completely Car-Dependent (0-24)



The WALK & the CITY app developed by the GeoCHOROS Research Group at National Technical University of Athens.

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This application has been developed within the **MyGEOSS** project, which has received funding from the European Union's **Horizon 2020** research and innovation programme. The JRC, or as the case may be the European Commission, shall not be held liable for any direct or indirect, incidental, consequential or other damages, including but not limited to the loss of data, loss of profits, or any other financial loss arising from the use of this application, or inability to use it, even if the JRC is notified of the possibility of such damages.