



Image: Burgas Municipality



**GO GREEN
ROUTES**

**Knowledge Brief
#04**

METHODOLOGIES FOR MONITORING AND ASSESSMENT OF IMPACTS FROM GREEN SPACE INTERVENTION

EXECUTIVE SUMMARY

Over the last four years, GoGreenRoutes has sought to evoke shifts in perception of public spaces and increase active transport for improvement of health and well-being. However, in order to accurately assess these aims, long term monitoring and assessment of the impacts of green spaces on physical and mental well-being are needed. Many initiatives related to urban green space lack consensus of monitoring and assessment methods ([Battiston A, Schifanella R. 2024](#)). In light of this, the Sustainable Development Goal ([SDG](#)) [11.7](#), which emphasises universal access to safe, inclusive, and accessible green spaces, various health organisations, local authorities, and institutional bodies have established a range of green-related targets. These targets not only guide the implementation of greening initiatives but also serve as benchmarks for monitoring and evaluating their effectiveness.

CONTEXT: WHAT IS THE SITUATION AS IT IS NOW AND WHY MUST WE ACT?

Nowadays, more than 50% of the world's population live in cities ([World Bank, 2024](#)). However, gaps remain for monitoring and assessing impacts on the wellbeing for green spaces, especially in the long-term and in a holistic manner.

According to the [World Health Organization \(2017\)](#), there is a need for an improved monitoring of local green space management and related health and equity impacts. Factors to take into account to improve monitoring include:

- designing a pre-post intervention or controlled post-intervention measurement of a green space;
- engaging user groups to enhance ownership and duration of the analysis;
- apply a future longitudinal research to explore direct evidence;
- allocate a sufficient budget for the long-term measurement;
- use equity data to assure that interventions do not have negative or unintended side effects for specific groups.

Additionally, it is important to create **diverse, multidisciplinary and cross-sectoral collaboration** ([WHO 2017](#)). GoGreenRoutes has bolstered these efforts through Citizen Monitoring and a Gender Diversity and Inclusion Panel.

While researchers and practitioners have made significant strides in developing indicators for green accessibility, much of the focus has been on isolated metrics, such as proximity to the nearest park or total green exposure. These approaches, though valuable, often fail to capture the multi-dimensional nature of greenspace accessibility. During the GoGreenRoutes project, great effort

was taken to include residents in the co-creation of green spaces that served their needs. You can read more about this co-creative process in the [Seedbed Reports](#).

Urban residents' interaction with greenspaces is influenced by a range of factors, including proximity, usability, connectivity, and the socio-economic and cultural contexts of their environments. Despite the existence of multilevel targets and guidelines from public health authorities and policy bodies, there is no consensus on a standard methodology to measure greenspace accessibility comprehensively ([Battiston A, Schifanella R. 2024](#)).

EVALUATION OF APPROACHES

The fragmented nature of current approaches presents significant challenges. Many studies have focused on specific geographic areas, employing limited datasets and single indicators. For example, accessibility is often measured using administrative land-use data, crowd-sourced geodatabases like [OpenStreetMap \(OSM\)](#), or processed satellite imagery. These indicators range from evaluating minimum distances to parks to more complex metrics, such as green exposure measured through

satellite-derived vegetation indices. While these methodologies provide valuable insights, they fail to offer a holistic perspective or address the broader complexities of accessibility on a global scale. Additionally, the interchangeability of these different metrics is poorly understood, leaving significant gaps in our understanding of how various measures align or conflict in their depiction of greenspace accessibility ([Battiston A, Schifanella R. 2024](#)).



CASE STUDY

ASSESSING GREEN SPACE WITH ATGREEN FRAMEWORK

Context

As urban populations grow rapidly, researchers, practitioners, and policymakers are increasingly focused on developing strategies to enhance the livability and sustainability of cities. Among these strategies, urban greening interventions and nature-based solutions have emerged as essential tools for improving public health, fostering community well-being, and mitigating the environmental impacts of urbanisation. In alignment with the objectives of Sustainable Development Goal [\(SDG\) 11.7](#), which emphasises universal access to safe, inclusive, and accessible green spaces, various health organisations, local authorities, and institutional bodies have established a range of green-related targets. These targets not only guide the implementation of greening initiatives but also serve as benchmarks for monitoring and evaluating their effectiveness.

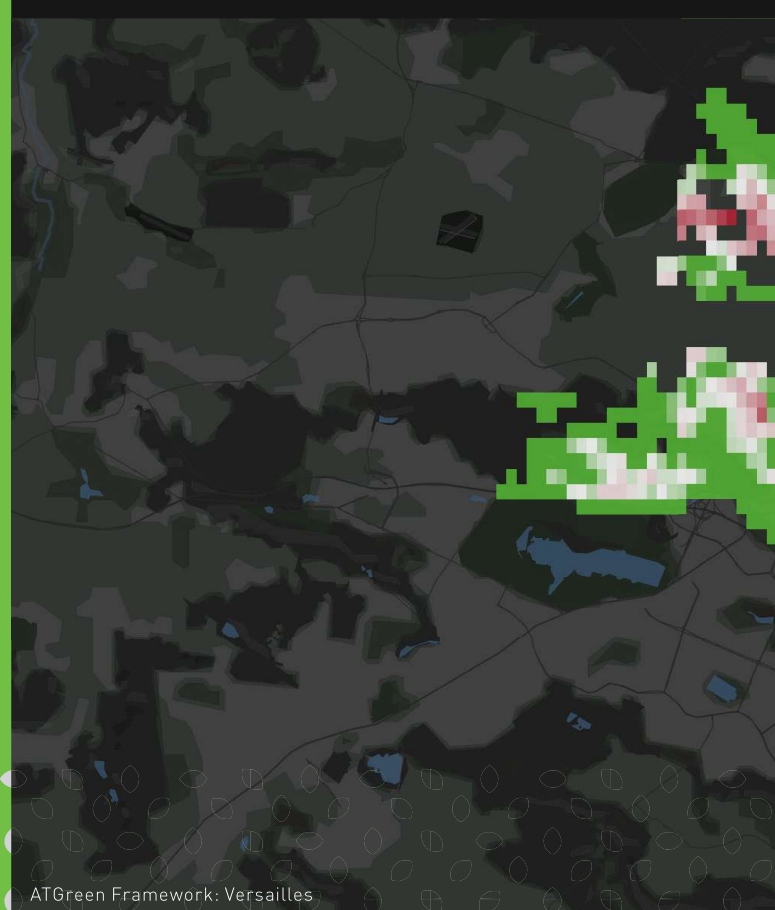
A critical aspect of urban greening interventions lies in ensuring accessibility to greenspaces, as the mere presence of such spaces is insufficient if they remain out of reach for certain populations. Greenspaces play a vital role in enhancing physical and mental health, improving air quality, mitigating urban heat, and supporting biodiversity. However, equitable access to these spaces is necessary to ensure their benefits are enjoyed by all, particularly marginalised or underserved communities. Accessibility encompasses factors such as proximity, walkability, safety, and connectivity via public transport, all

of which determine who can realistically use and benefit from greenspaces. Understanding these dynamics allows urban planners and policymakers to identify gaps in access and address inequities in greenspace distribution.

Challenges

The assessment of greenspace accessibility remains complex largely due to fragmented methodologies and data sources. While progress has been made in developing indicators, many approaches fail to integrate the multi-dimensional nature of accessibility, such as usability, connectivity, and

ATGreen Versailles



ATGreen Framework: Versailles

socio-economic disparities. Current methods often rely on limited datasets or focus narrowly on specific geographic contexts, overlooking the broader patterns of greenspace inequities.

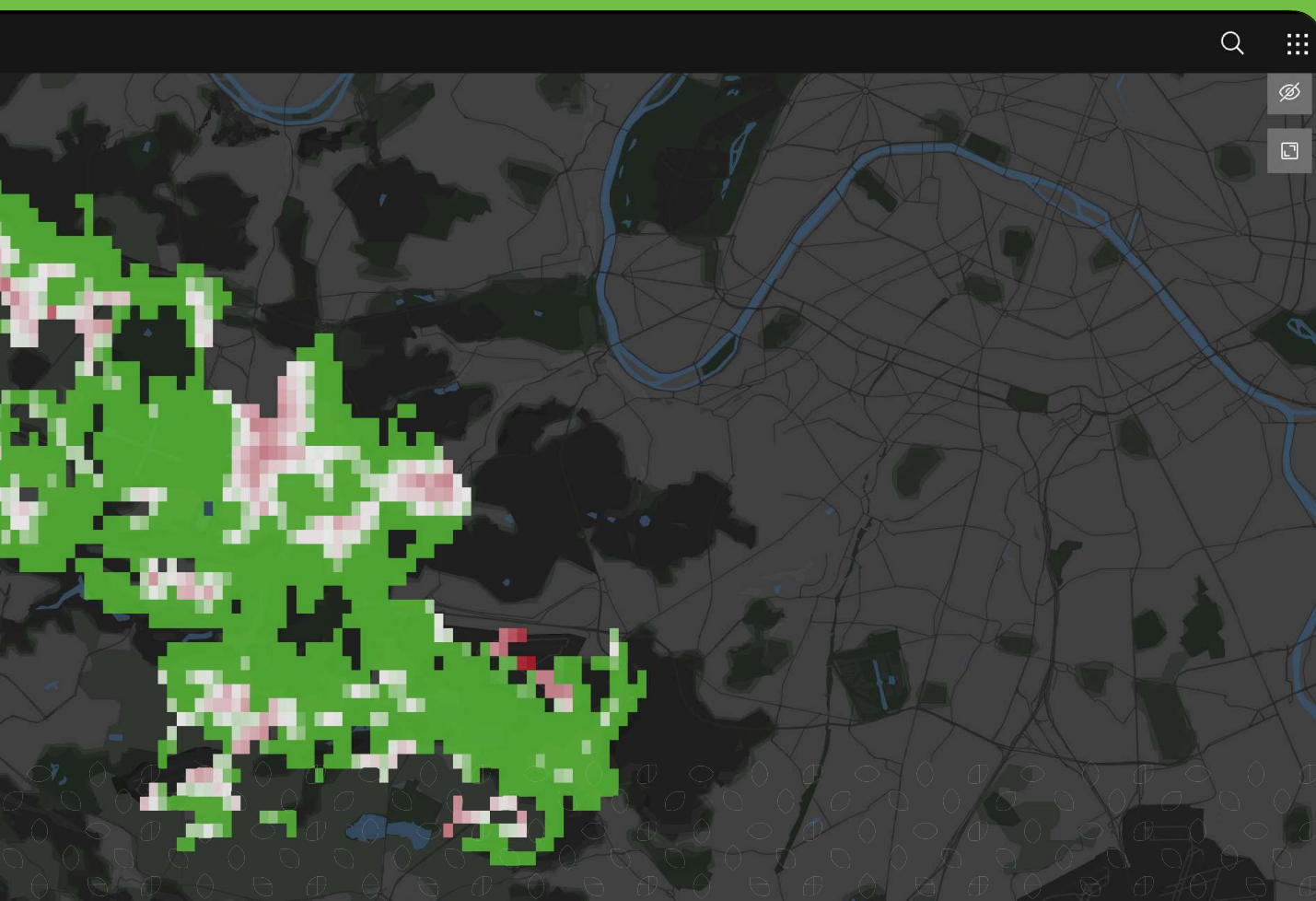
Moreover, translating theoretical frameworks into practical tools for urban planners poses a significant challenge. Accessibility metrics, though valuable, are frequently complex, requiring advanced technical expertise. This creates barriers to their adoption, particularly in cities with limited resources or capacity. Additionally, the variability in data quality and the lack of consensus on standard methodologies hinder consistent evaluations across diverse urban environments.

Finally, there is a persistent gap in addressing the interplay between structural accessibility metrics and behavioural factors, such as how residents use and value greenspaces. Without integrating these dimensions, even well-designed interventions risk falling short of their potential to foster equity and inclusivity. The following example illustrates an approach that is more holistic in nature and takes accessibility into account.

Approach

To tackle the complexities of evaluating and improving greenspace accessibility in urban environments, the **ATGreen framework** provides a multi-dimensional, integrated methodology. This framework moves beyond traditional single-metric assessments by incorporating various accessibility dimensions, including proximity, connectivity, and demographic inclusivity. By combining geospatial data, land-use information, and socio-demographic statistics, the framework enables a comprehensive analysis of greenspace accessibility and its disparities across urban environments.

A key innovation of this research is the development of an **interactive, web-based tool** designed for urban planners and policymakers. This tool allows users to visualise accessibility metrics, compare different urban scenarios, and simulate the potential impact of interventions, such as the addition of new greenspaces. The tool's scalability is ensured by its reliance on open-source data and adaptable methodologies, which allow it to be applied to a wide range of urban contexts globally.



CASE STUDY

The framework introduces three critical contributions:

- 1) **Flexible Data Integration:** It offers a pipeline for integrating publicly available datasets to calculate three types of accessibility metrics—minimum distance, exposure, and per-person metrics—allowing for customisation based on various urban conditions and policy goals.
- 2) **Interchangeability of Indicators:** The framework investigates how different accessibility indicators align and differ, emphasising the importance of using a range of metrics to capture the full complexity of accessibility.
- 3) **Interactive Platform:** The web platform democratises access to the generated data and algorithms, making them accessible to non-experts. It allows users to create custom indicators, visualise data, and simulate interventions, empowering data-driven decision-making and fostering transparency in the urban planning process.

This tool is available for use in over 1,000 cities across 145 countries, ensuring that it can be applied in diverse geographical, cultural, and infrastructural contexts. It supports the design of inclusive and equitable urban policies, offering valuable insights to help planners and policymakers address gaps in greenspace access effectively.

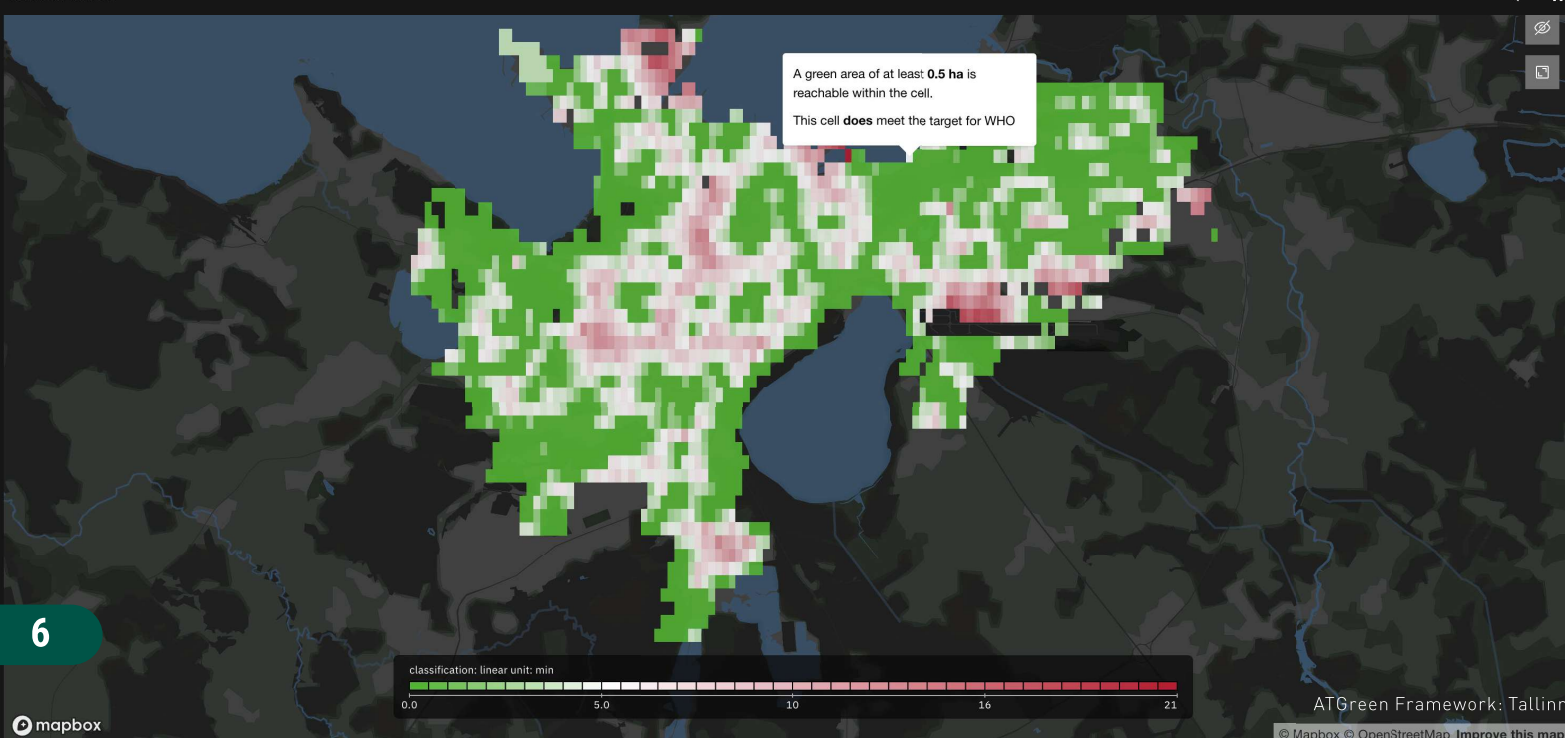
Successes

The **ATGreen framework** provides a comprehensive, multidimensional approach to assessing greenspace accessibility, successfully addressing the limitations of single-metric evaluations. By integrating a range of accessibility dimensions, such as proximity, connectivity, and demographic inclusivity, it offers a more holistic understanding of urban greenspace provision.

The interactive web-based tool is a significant success, enabling users to visualise and compare different accessibility metrics across diverse urban contexts. Its ability to simulate the potential impact of greening interventions, such as the addition of new greenspaces, provides valuable insights for urban planners and policymakers. Furthermore, the tool's scalability, based on open-source data and adaptable methodologies, ensures that it can be applied across a wide range of cities, facilitating global comparisons and insights.

The flexibility of the framework to integrate various data sources and calculate multiple types of accessibility metrics further enhances its utility. This adaptability allows urban planners to tailor the framework to meet specific local conditions and policy objectives, ensuring its relevance to a broad spectrum of urban environments.

ATGreen Tallinn



Shortcomings

Despite its successes, the [ATGreen framework](#) is not without limitations. One challenge lies in the quality and resolution of the data used to generate accessibility metrics. The framework's effectiveness is highly dependent on the availability of high-quality geospatial and socio-demographic data, which can vary significantly between cities. In regions with limited data or poor data resolution, the accuracy and applicability of the framework may be compromised. Another shortcoming is the complexity of the framework itself. While its multi-dimensional approach provides a more comprehensive assessment, it may be overwhelming for cities with limited technical capacity or resources. The need for advanced technical expertise to interpret and apply the framework's findings may restrict its use in smaller cities or regions with fewer resources for urban planning.

Additionally, the framework's focus on structural accessibility metrics may overlook softer, yet important, factors such as social perceptions, cultural barriers, and personal safety, all of which influence the actual utilisation of greenspaces. To fully capture the complexities of greenspace accessibility, future iterations of the framework may need to better integrate these softer aspects into the assessment process.

Policy Connection

The [ATGreen framework](#) offers significant policy implications, providing urban planners and policymakers with a robust, multi-dimensional tool for addressing inequities in greenspace access. By integrating a variety of accessibility metrics, the framework enables a more comprehensive understanding of urban greenspace provision, helping to identify underserved areas and populations. This allows for more targeted interventions that can promote greater equity and inclusivity in urban environments.

The framework also supports the optimisation of resource allocation by providing insights into how

urban greenspaces can be developed and distributed to maximise social and environmental benefits. By simulating the impacts of different interventions, policymakers can evaluate the potential outcomes of various greening strategies, ensuring that resources are directed to areas of greatest need. This capability makes the framework an invaluable tool for cities aiming to balance equity-driven goals with practical considerations, such as financial and infrastructural constraints.

Furthermore, the [ATGreen framework](#) aligns with global sustainability goals, particularly [\(SDG\) 11.7](#), which advocates for inclusive and accessible greenspaces for all urban residents. By helping cities design and implement policies that enhance greenspace accessibility, the framework contributes to the broader objectives of environmental resilience and public health.

The framework's flexibility in adapting to different urban contexts further enhances its value to policymakers. Its capacity to accommodate a wide range of geographic, cultural, and infrastructural conditions ensures that it can be used effectively in diverse cities worldwide, facilitating the creation of policies that are both locally relevant and globally informed.

Recommendations for Improvement of ATGreen framework

- **Incorporate user behaviour data:** develop methods to integrate behavioural data (e.g., mobility patterns, user satisfaction) to enhance the framework's applicability.
- **Expand policy toolkits:** complement the measurement framework with recommended interventions and strategies tailored to urban contexts.
- **Account for socio-cultural variables:** adapt the framework to include localised socio-cultural dynamics that influence accessibility and utilisation.

[Access the platform](#)

RECOMMENDATIONS FOR TECHNICAL AUDIENCES

The current approaches to greenspace accessibility and monitoring face significant limitations, including fragmented methodologies, insufficient integration of multi-dimensional metrics, and the lack of long-term evaluation frameworks. To address these shortcomings, the following measures are proposed:

PRACTICAL STEPS FOR IMPLEMENTATION

Adopt Multi-Dimensional Metrics

- Develop and standardise metrics that integrate proximity, connectivity, usability, and demographic inclusivity to capture the multi-dimensional nature of greenspace accessibility. These should also consider the impact of greenspaces on physical activity levels, although this should be just one part of the overall evaluation;
- Collaborate with academic and research institutions to design and validate these metrics, ensuring their applicability across diverse urban contexts.

Leverage Digital Tools for Data Collection and Visualisation

- Implement interactive platforms like the [ATGreen framework](#) to visualise greenspace accessibility, compare urban scenarios, and simulate the effects of interventions;
- Train local policymakers and urban planners in the use of these tools to ensure effective application and decision-making.

Establish Robust Monitoring and Evaluation Mechanisms

- Integrate monitoring systems from the inception of greenspace projects, ensuring sufficient budget allocation for long-term data collection and analysis;

- Use innovative, cost-effective methods such as observational data collection, user satisfaction surveys, and citizen science initiatives to enhance community engagement and reduce monitoring costs.

Promote Equity in Greenspace Access

- Use socio-demographic data to identify underserved areas and implement targeted greening interventions to address disparities;
- Ensure that greenspace projects include input from local communities, particularly marginalised groups, to foster co-ownership and inclusivity ([Seedbed Reports](#)).

Align Policies with Global and Local Objectives

- Design policies that align with Sustainable Development Goal (SDG) 11.7, which emphasises safe, inclusive, and accessible greenspaces;
- Adapt these policies to local contexts, working within existing governmental frameworks and urban planning systems for seamless implementation.

CLOSING EMPHASIS ON ACTION

The integration of multi-dimensional metrics, digital tools, and robust monitoring systems is essential to addressing the limitations of current greenspace approaches. By prioritising equity, promoting collaboration, and ensuring alignment with global and local policy goals, cities can create sustainable, accessible greenspaces that contribute to public health, environmental resilience, and social well-being. Implementing these measures will not only enhance urban greenspaces but also strengthen their role in tackling broader challenges such as climate change and social inequality.

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