FinEst Centre
for Smart Cities

Hizmete Özel - Kişisel Veri içermez

SMART CITY CHALLENGE 2025

City Challenge – Happy Cities
Challenge Title – Freedom to Move in the City
City/and country: Bursa/Türkiye
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1. What is the future urban challenge that would need a solution to?

Bursa's primary urban challenge is the lack of digital wayfinding and independent mobility within the city, particularly for elderly people, persons with disabilities, and citizens with limited mobility. The issue is not limited to physical access; it also directly affects fundamental social objectives such as participation and digital inclusion. For this reason, the challenge is addressed under the "Happy Cities" category and represents a serious barrier to achieving a dignified and accessible urban life. According to the Bursa Transportation Master Plan 2035, approximately 12% of the city's population—around 130,000 people—experience structural and systemic problems related to independent mobility. This figure clearly demonstrates the scope and strategic importance of the issue. Similar accessibility challenges are not unique to Bursa. In Türkiye, major metropolitan areas such as Istanbul and Ankara also face such gaps, influenced by dynamics like rapid urbanization and an aging population. In Europe, pioneering cities in digitalization such as Helsinki and Tallinn have launched various pilot initiatives in accessibility (for example, NaviLens and WCAG-compliant digital services). However, these solutions are often deployed only in limited areas and are rarely scaled citywide. Research shows that accessible digital wayfinding systems are still not being addressed with a holistic approach in many cities.

What differentiates Bursa is that it does not merely identify the problem but has also defined it as a priority within its Smart City Transformation Strategy (2021–2025), specifically focusing on supporting the mobility of disadvantaged groups through digital systems. In addition, by participating as an observer city in international projects such as metaCCAZE, Bursa has the capacity to study zero-emission and user-centric mobility solutions on-site and adapt them locally. This approach positions Bursa not only as a city tackling a local challenge but also as a natural partner in developing solutions at the European scale.

2. Innovation

Bursa Metropolitan Municipality has implemented various physical arrangements to ensure that disadvantaged groups can benefit equally from urban transport systems. Solutions such as audio announcement systems in public transport vehicles, accessible bus stops, low-floor buses, and ramps

are important steps in this regard. However, these measures fall short in addressing users' digital needs, such as real-time location tracking, personalized route planning, and independent mobility. In high-density areas such as Bursa Intercity Bus Terminal, the absence of digital guidance systems that would enable elderly, disabled, and mobility-impaired individuals to navigate independently is particularly evident. Existing solutions mainly focus on physical accessibility but do not provide flexible, digitally supported wayfinding systems tailored to different types of disabilities. Although Türkiye has a legal framework guaranteeing access to public services, the lack of practical guidelines and technical standards for innovative applications—such as indoor navigation, iBeacon technology, and visual/auditory guidance—remains a major limitation. Moreover, the principle of digital inclusion is still not systematically applied in planning processes.

The ideal solution to these challenges is a modular system that integrates an AI-powered mobile application with IoT and iBeacon infrastructure. This system would offer personalized solutions based on user profiles: audio guidance for the visually impaired, visual avatars and text descriptions for the hearing impaired, and obstacle-detecting route algorithms for individuals with mobility limitations. It would also be compatible with wearable technologies such as smartwatches and Bluetooth headsets, ensuring ease of use. By integrating environmental data such as pedestrian density, the system could optimize routes in real time. In addition, environmental sensors placed at critical points would detect issues such as illegal parking, physical barriers, and temporary closures, updating guidance instantly. In cases of irregularities, relevant authorities would be notified so that obstacles could be promptly removed from routes. The developed system will be designed for easy replication in other cities, fully aligning with the scalability and transferability vision of the FinEst program.

3. Expected impact of your pilot solution.

The implementation of accessibility-oriented digital wayfinding systems will generate multi-dimensional transformations in Bursa's urban infrastructure, social participation, and governance structures. In particular, AI-powered guidance systems deployed in high-density public areas such as the Bursa Intercity Bus Terminal will make pedestrian circulation more efficient and organized, reducing problems such as disorientation and loss of time. Supported by iBeacon, IoT, and environmental sensor data, the system will respond to contextual factors—such as weather, road congestion, or temporary obstacles—by optimizing routes in real time, thereby contributing concretely to Bursa's goals of becoming a sustainable, low-carbon city.

For citizens, the solution will enable more active, safe, and independent participation in urban life, especially for elderly people, individuals with disabilities, and those with limited mobility. Through personalized audio-visual guidance systems and mobile applications, these groups will be able to navigate public spaces without losing their way or requiring assistance. This will reduce the risk of

social isolation and increase trust in digital services. The approach directly aligns with Bursa Metropolitan Municipality's "Gönül Bağı" project, an innovative smart care system that provides 24/7 digital monitoring of elderly and at-risk individuals and ensures emergency intervention when needed. The initiative highlights the municipality's commitment and technical capacity to develop digital solutions for disadvantaged groups. From a governance perspective, the solution will contribute to the institutionalization of real-time, data-driven decision-making processes, ensuring that services are implemented in a transparent, measurable, and user-responsive manner. By adopting an innovation management approach aligned with ISO 56002, the sustainability of the system will be secured, while a dynamic governance model based on user behavior and performance metrics will be developed.

Piloting

Bursa is positioned as a pilot city with both the technical infrastructure and operational experience required to test and co-develop digital accessibility solutions for urban mobility. Testing solutions that support the independent mobility of disadvantaged groups—such as the elderly, persons with disabilities, and individuals with limited mobility—under real-life conditions is critical for ensuring both their effectiveness and long-term sustainability. Bursa aims not only to provide a testbed but also to act as a development partner, actively contributing to the co-design of solutions, their refinement through user feedback, and their integration into the local context. This capacity has been strengthened through experience in European Union projects. Within the Horizon 2020 TeamAware project, AI-powered decision systems, wearable sensors, and enhanced situational awareness technologies for crisis management were tested on-site in Bursa. Similarly, under the INCIT-EV project, electric vehicle infrastructure was piloted in different urban contexts with a user-centric approach, producing significant insights on social acceptance and infrastructural compatibility of mobility technologies. At the local level, initiatives such as the "Gönül Bağı" smart care system and VR-based therapy models have demonstrated the municipality's strong role in technology-driven social innovation, receiving national awards and being recognized as best practices.

Bursa's existing digital infrastructure, open data ecosystem, and service experience with diverse user groups make it a strong partner for pilot activities at the European level. In this context, the proposed solution is planned to be tested simultaneously with Tallinn, a pioneer in digitalization. Parallel piloting in these two cities will provide the opportunity to evaluate the scalability and adaptability of the system across different social, physical, and governance contexts. Through joint user testing and an open API-based architecture, the solution will not only meet Bursa's local needs but also evolve into a transferable model that contributes to accessible mobility solutions across Europe.