# THE ROLE OF 3D LASER SCANNING IN HISTORICL CITY DIGITAL TWINNING

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## 1. INTRODUCTION

The rapid growth of population in the 21st century and the urbanization of territories have clearly revealed trends of high building and population density, transport overload, mobility, provoked pollution and urban waste problems.
These issues need to be survived by the way of data collection, knowledge base development in order to solve and manage the acute negative issues. The digitalization and creation of virtual urban reality make possible to get visual and inviseable data, develop the scenarios for urban districts, thus predict painful results of wrong urbanization. The Data set make possible to develop the strategy of smart management, city governing, public behaviour, especially in historical part of the city in order to predict the chaotic development and anti-sanitary in old districts.
These multifactorial urban research became possible through a new conceptual approach 3D Scanning, Photogrammetric survey, GIS and CAD technologies.

## 2. SUPERBLOCKS OF HISTORICAL TBILISI CITY CENTER

The case of Tbilisi Superblocks Analize which was developed based on Twining method of investigation make possible to develop the concept of historical districts based on five key urban pillars of urbanization - social, mobility, building stock phisibility, greening, landscape and cultural heritage preservation.
Such approach help to organize the surveys of old districts in a precise quality and short time. The investigations were developed by the groups of design, technical support, economists, sociologists in close cooperation with the implementers of the developed urban concept - Tbilisi City Hall, Tbilisi Development Fund and local population.

## 3D LASER SCANNING AND SUPERBLOCKS ANALYSIS

The implementation of multi-component analysis was hampered due to the lack of time for the project and the large volume of work.
Therefore, the pre-project survey was divided into two phases
- Selection of the research methodology
- Research
The research method was chosen by studying the development of a trial street, where the work was evaluated in terms of time and human resources. All agreed that it was impossible to develop the required urban Cultural Heritage studies using traditional methods within the public request, project budget and timeline.
For Digital Data set were used field and desk surveys based on Scanning, photogrammetry, CAD principles and GIS methods. In combination with experts' assessment the knowledge base was developed.
The following applications were used – agesoft, revit, autocad, arc map, recup.
As a result it was created a virtual digital environment twitted with the real physical urban fabric and its behaviour properties. The scenarios were developed on digital virtual CAD and GIS platform. There
The Historical Districts were investigated, conceptually developed through the way of knowledge base and smart shaping which became possible through area digitalization.

## RESULTS

This article illustrates the importance of 3D laser scanning in twinning transformations in terms of Data creation, knowledge base management, prediction of time waste, loss of human and financial resources; identification and prediction of specific urban problems by the way of digital technologies, twinning approach. The article illustrates the role of 3D laser scanning in twinning transformations from virtual to real physical urban problems solving platform, support BIM technologies in the project and urban design process.