

MANAGEMENT AND ASSESSMENT OF HERITAGE BUILDINGS IN THE CITY OF HAVANA THROUGH THE PRIORITIZATION OF EMERGENCY ACTIONS

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ABSTRACT

Declared a World Heritage Site by UNESCO, in 1982, the Historical Center of Havana, occupying an area of 2.14 km², has 3,510 buildings, many of which now severely dilapidated. In fact, the Historical Center is in need of preferential action, due to the severity of the deterioration of its buildings. The situation is continually worsened following each hurricane season, and their accompanying tropical storms that have caused irreparable damage to buildings over the years. After a careful inspection of the heritage buildings of the Historical Center, it was possible to identify those in danger of imminent collapse and those with a useful life that could be prolonged through the implementation of the necessary emergency actions. In response to both challenges, a multi-criterion instrument based on the MIVES system was applied, with the purpose of prioritizing in an objective and justifiable way the necessary repairs and degrees of intervention. This instrument is based on requirements, criteria and indicators, all of which are selected, analysed and approved by a specially appointed panel of experts that quantifies all the factors in the value chain.

Keywords: building, historic heritage, MIVES, prioritization, rehabilitation

1 INTRODUCTION

The TECNALIA RESEARCH & INNOVATION Foundation and the Office of the Historian of the City of Havana (OHCH) have been collaborating together since 2002, through joint projects to manage the conservation of the Historical Centre of Havana, promoting the innovation, technology transfer and sustainable rehabilitation of Old Havana.

This project in particular is aimed at raising awareness among the local population for the preservation of the buildings and heritage, as well as training the technical staff of the OHCH in new rehabilitation technologies, providing them with a management tool for the prioritization of actions within the building stock of Old Havana.

The objective of this project emerged in response to the difficulties that the staff of the Master Plan for the Integral Revitalization of Old Havana (the planning body of the Office of the Historian) encountered with the prioritization of the repair work. There was an obvious need to develop a tool to support the prioritization of decision-making concerning emergency actions. A hierarchical scheme was first developed in which the different characteristics of the damaged buildings of the Historical Centre of Havana were described and classified, for the subsequent prioritization of the interventions in an objective and justifiable manner. The degree of each priority intervention was represented by an indicator based on the Integrated Value Model for Sustainability Assessment (*MIVES Modelo Integral de Valor de Evaluación Sostenible*), which resulted in an effective tool with which to plan the rehabilitation of the building stock.

Table 2: Different priority intervals for buildings requiring emergency action.

Priority	Range SPI	Number of buildings
High	1–0.57	56
Medium-high	0.57–0.41	338
Medium-low	0.41–0.26	453
Low	0.26–0	186
Total	1–0	1,033

It must be highlighted that the tool provides a list of buildings and that the first one is not necessarily the most suitable for rehabilitation. The tool provides a list of buildings that will support the decisions over which buildings should be considered for intervention, justifying their prioritization and providing reasons for a proper choice. It is not an automatic process and is never a replacement for the on-site judgment of qualified experts.

The versatility of the tool was demonstrated by means of exporting the list to a spreadsheet to produce filters, graphics etc. so that the Master Plan management team could use the information to take the proper decision more easily and effectively.

7 CONCLUSIONS

This project has made it possible to develop a methodology for the management of building information in a systematic way. A process involving both field and office work has been developed, and specific checklists are used to gather information for processing. Additionally, a prioritization tool based on MIVES methodology has been developed. The tool has allowed the experts to establish a list of buildings based on the index of sustainable prioritization for renovation purposes, identifying necessary constructive actions to maintain the building stock of the Historical Centre of Havana and the 'Prioritized Area for Conservation'.

Furthermore, the results of the management software tool and the display of the geo-referenced plans have demonstrated that the results matched the spatial intervention strategy previously developed by the Master Plan technicians.

ACKNOWLEDGEMENTS

The authors appreciate the participation of the **Research Group formed by the UPV/EHU and TECNALIA under the agreement IT781-13 with the Basque Government**. They also wish to express gratitude to the MIVES research group for its support in the use of the methodology, and to Patricia Rodríguez Alomá, Pablo Fornet, Raimundo de la Cruz and Juan Carlos Bresó for their assistance in this project. Finally, the authors would like to extend their gratitude to all those who have collaborated in the expert decision-making panel for their dedication and participation, freely sharing their experience and good judgement.

REFERENCES

- [1] Plan Maestro. Special plan for integral development. *Office of the Historian of the City of Havana, Office of the Historian of the City of Havana, Havana, Cuba*, 2011 (in Spanish).
- [2] Mutal, S. & Carrión, F. A unique experience. Valuations on the integral management model of Old Havana, World Heritage Site. *UNESCO – Office of the Historian of the City of Havana*, Ed. Boloña, Havana, Cuba 2006 (in Spanish).