

# Preventive conservation and sustainability of heritage collections in transit

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## Abstract

This paper aims to present the complexity of the preventive conservation and sustainability of the collections that are included in the temporary exhibition 'Auschwitz. Not Long Ago. Not Far Away', opened in Madrid in December 2017 and scheduled to travel to new destinations over the next 7 years. It was produced in co-operation with the State Museum of Auschwitz-Birkenau, Poland. The exhibit objects belong to more than twenty international collections concerned with the Heritage of the Holocaust.

The methodology to analyze the sustainability of a traveling exhibition has been introduced, in the stage of the preparation, production, assembly, operation, disassembly, and transportation to the next venue, in order to take into consideration the whole Life Cycle of the exhibition. The indicators to consider its impact in the three dimensions of sustainability: environmental, economic and social has been proposed.

## Key words

Preventive conservation, Sustainability, Temporary Exhibitions, Strategic Management, Life cycle, Database.

## Introduction

### Preventive Conservation and sustainability

Preventive conservation refers to a systematic and integrated approach to care, based on strategies developed for the maintenance and upkeep of the heritage (Council of Europe, 2018).

To address the concept of sustainability in conservation, let us first refer to the definition issued by Brund Brundtland in 1987: "sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Negri, 2013: 34)

Promoting sustainability means taking into account socio-ethical principles and a model of production and consumption economically feasible (UNCED, 1992).

The life cycle sustainability assessment (LCSA) framework (Kloepffer, 2007; Finkbeiner et al., 2010; Valdivida et al., 2013) is a perspective to consider interdependencies between ecological and socio-economic systems. According to UNEP's guidelines (UNEP/SETAC, 2009),

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the socio-economic impacts can be divided into five stakeholder categories: workers, local community, society, consumers and value chain actors. Another alternative classification is based on social issues such as human rights, working conditions, health and safety, cultural heritage, governance and socio-economic repercussions (Benoît et al., 2010). The Life Cycle Assessment for the production is defined by ISO 14040a (2006). Some of the concepts presented in the norm can be applied in the evaluation of the sustainability of the cultural institutions' services.

### **Sustainability in cultural institutions**

If being sustainable means to be able to be sustained over time, how does this intention/philosophy affect the conservation of museum collections in a traveling exhibition?

Some of the conclusions are found in the field of museums, in their need to become more sustainable institutions, which derives into actions identified and focused on several parameters:

Regarding the financial parameter, it has been identified that, in recent years, the approach of a sustainable museum was based on those smaller institutions, with a scarcity of resources or in times of crisis. It results in the need to reduce energy due to a lack of means. (Buey, 2013).

The environmental aspect in the sustainability of museums focuses on improvements of both infrastructures, that is, what affects the building, as well as the services of museums, minimizing the use of resources (Rieradevall, Oliver, Farreny, 2013:32).

The following vectors applied to museums can be distinguished:

- The energy vector focused on the use of renewable energy;
- The water vector and its efficient management;
- The waste vector with special emphasis on waste generated in museum assembly materials at the temporary exhibitions.

With regard to services, it is pointed out that museums should address their community taking into account the ecological footprint and the impact on the environment, minimizing the use of resources and assessing the impact of the generation of resources and air pollution, a relevant aspect in the conservation of the collections. However, beyond the actions related to energy saving, the concept of the Green Museum goes through organization sustainability, considering the social impact.

In this regard, it should be noted that economic and socio-cultural, as well as environmental indicators have been included in local Agenda 21 (Rieradevall, 2013) to achieve a greener, more sustainable cities. The institution integrated into a green city, therefore, has a more favorable context to develop its actions in favor of an efficient and sustainable museum.

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Therefore, this chain affects the direct actions of conservation of the collections of these museums.

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The itinerary exhibitions depend on the collections of museums that guard them and make them known to a wider public by temporary transfer and its exhibition in different placement. That is why our context in this study is going to be the museum institution that keeps and makes its collections known through the temporary transfer of them.

Professional cooperation is essential, involving all agents related to the exhibition: creation team/curators, design team, production team, hosting museums, museums that own the collections and receiving communities. It is precisely the object of this study, to know the implications of each professional (also a member of the social community of the present) to adjust and measure the indicators whose compilation will offer the necessary data to analyze, program and execute a preventive conservation plan in each of the exhibition cycles.

The discipline of preventive conservation included and the development through plans, as a strategic management tool, is being implemented gradually over the past 25 years. In Spain, since the National Preventive Conservation Plan was launched in 2011, public administrations have recognized the need to take the lead and implement the European Meeting of Vantaa (2000). The technical review on preventive conservation is being carried out taking into consideration what is already in operation, from an eminently practical perspective supported by international quality standards (CEN, TC 346, UNE-EN 1898. March 2012) and ISO 311000 for risk management.

The recognition of the need to protect heritage and the concept of significance (ISO 15898) (emotional axis) is accompanied by the pragmatism that assumes that we are talking about a tool (rational axis). Thus, society, economy/resources and the environment as a context in which heritage is integrated, are shaping three dimensions of sustainability.

Without disregarding the technical methods of preventive conservation, the strategy to address the heritage collections should be based on the holistic approach of cultural heritage as a carrier of intangible values and a message that gathers social memory. It forms the framework that demonstrates that the strategy for the future effectiveness and efficiency of preventive conservation actions is sustainability or sustainable conservation. This perspective is also recognized in the Strategic Agenda for research and innovation for CITAR culture and cultural heritage until 2030.

The philosophy of sustainable conservation or green conservation is indeed applied if sustainable conservation actions take into account the participation of society (both responsible for cultural policies and communities), the proper management of the economic and professional resources, as well as the protection of the environment as a natural, cultural and human landscape in which the collections are integrated and from which they arise.

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### **Methodology**

The methodology used in this study includes a Life Cycle Analysis approach applied to a specific case of a traveling exhibition. The descriptive character of this work is aimed as a case study inventory, essential for future sustainability evaluation.

The different phases of a life cycle of the exhibition have been defined in each phase the stakeholders, the preventive conservation actions, as well as the usefulness of a software designed to facilitate the work of collection management have been indicated.

The scope of this study is limited to one Life Cycle, from the preparation of the exhibition to its dismantling and transport to a new location.

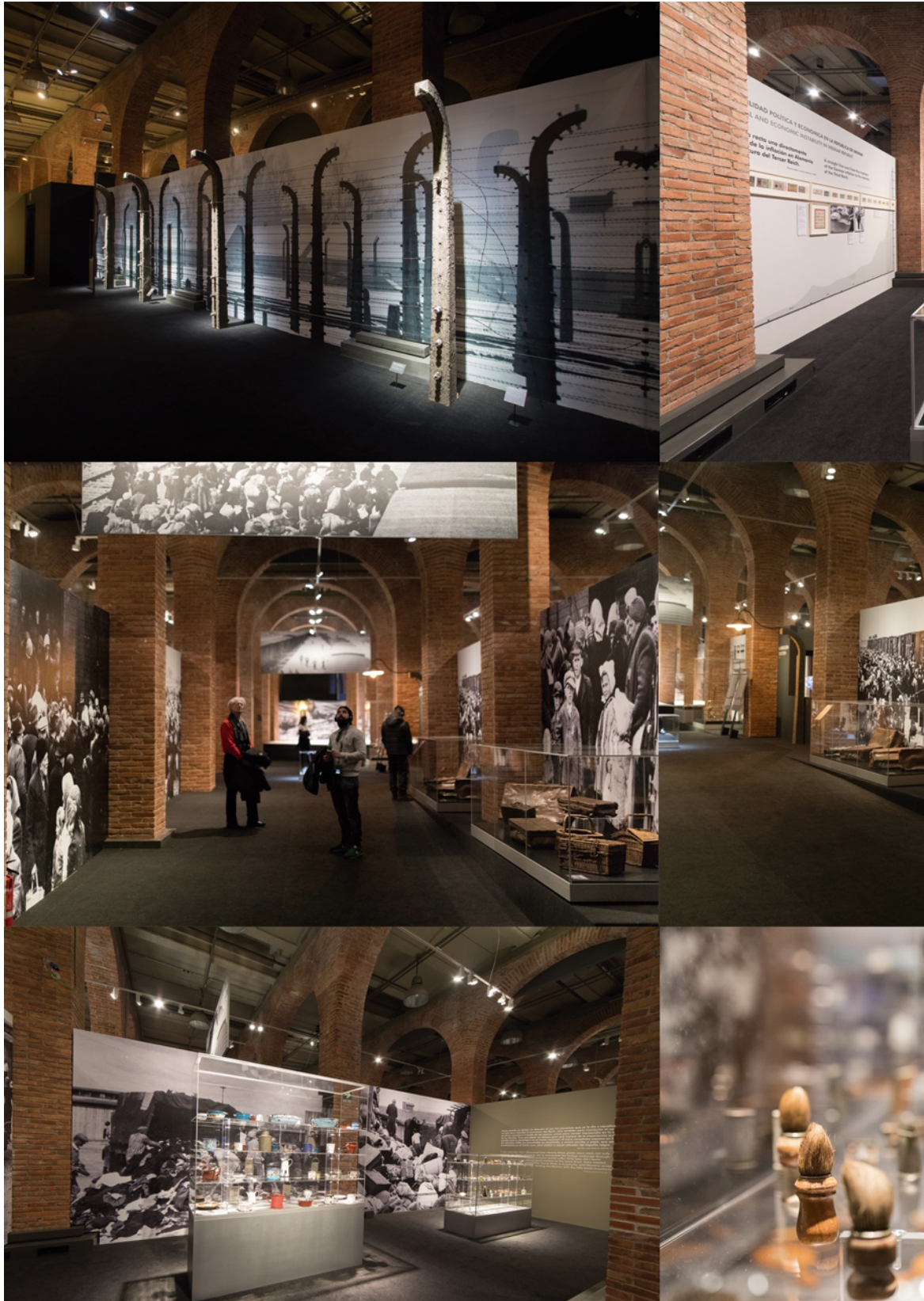
### **Case study: Auschwitz. Not long ago, not far away"**

The temporary exhibition "Auschwitz. Not long ago, not far away", was opened in Madrid (Spain) at the Canal de Isabel II venue in December 2017 produced by Musealia in cooperation with the Auschwitz-Birkenau State Museum in Poland (ABSM) (Fig.1). Currently, it is exhibited at the Museum of Jewish Heritage in New York (USA), and it is planned to roam in Europe and America through the upcoming years. Formed by more than twenty international collections of a sensitive heritage such as the one coming from the Holocaust period, it brings together more than 600 objects that must be preserved taking sustainability into consideration. This temporary exhibition planned duration is of 7 years, 2017-2024; and as it is a traveling one, the initial objective is to showcase it in 14 cities. It means at least 14 times of the life cycles of conservation management; development of the installation (assembly and disassembly), in collaboration with the reception museum and its staff as well as 20 to 40 companies involved in the production of the museography.



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**Figure 1** – General views of the exhibition (@Musealia, 2018)

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To analyze properly each of the Life Cycle it has been divided into 6 stages (Figure 2)



**Figure 2** – Life Cycle Stages of an Itinerary Exposition (Figure by authors)

### **PREPARATION**

In this first phase (Fig.3), the documentary management of the collections from its museums and owners stands out. The documentation is the basis for correct identification of each of the objects, as well as knowing its constituent material, its origin, history and significance. Following the information management systems, the entire system of protocols and documentary processes was developed. In addition to these initial administrative protocols, a large amount of documentation has been generated throughout the entire exhibition. The need to generate a large archive was revealed.

In the relation to the origin of the objects, the international regulations were applied, such as the export and import requirements of the collections from various provenance: Europe, the United States, and Israel and the certificate of non-confiscation (European Union, 2012).

The characteristics of the host museum were gathered to learn in-depth the relevant information of the space: Facility report, safety plan and risk management report.

The planning of the exhibition, lights and cabinets' design also took place in this phase. As well as the schedule of actions, agents and collections involved for the following phases.



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**Figure 3** – Preparation

### **PRODUCTION**

In this phase, the production of all the previously planned elements is executed from the preparation of exhibition dividing elements to the production of the showcases and the frames that will house the artifacts. The selection of the appropriate materials, the guarantees that the different products offer for the conservation of the objects will influence the subsequent actions of the conservation.

### **AssEmbly**

In this phase, (fig.4) a collection management schedule for the collections in their places of origin, packaging, transport and reception in the museum, where the exhibition was to be hosted, was prepared. This is a crucial phase, in which the coordination of package displacement must be adapted to the loading area and security spaces available to each museum. In this same schedule, the coordination of the transports and the couriers of each museum, the trip and the arrival to the city were planned.

The reception of the collections was also managed through a previous planning, to which the certificates of reception of the transport company and the review by the courier were added:

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as well as the opening of the boxes after the acclimatization period and the completion of conservation status records.

Regarding the manipulation and placement of the collections, one of the greatest challenges was the assembly of large objects, and the preparation of access and roads to reach the room with the transport box. Sometimes to plan the placement of large objects, various boxes were moved to the exhibition area and were opened gradually. It occurred for example, in the case of the cauldron and the ABSM berth, both large objects for which a team of six people was required. The museums that requested it, placed the object inside the showcase and subsequently signed the Placement Minutes.



Figure 4 – Assembly



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### Operational Stage

Once the exhibition was inaugurated, a calendar of preventive conservation technical reviews has been established. This report was sent periodically to the lending institutions and includes environmental measures, control and resolution of incidents. In addition to the technical reviews, once the exhibition is underway, it is very important to be in communication with the staff present on the exhibition space (the cleaning staff, the security guards, etc.) to evaluate and control the risk management. The management of risks related to the impact of society through visits is constant. Given its didactic mission, the exhibition is receiving groups of schoolchildren. The continuous communication with the room guards, who advise the teachers of these groups, is important. (Galán 2015).

### Disassembly

This phase begins with the collection of artifacts, evaluation of their status, application of restoration actions if necessary, and appropriate packaging to ensure their safety and proper conditions during storage and transport (fig.5). In the case analyzed, the ABSM collection has returned to Poland in order to be reviewed by the Collections Department of the Museum.



**Figure 5** – Disassembly

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### Transportation

Transportation planning to the new location took into account the requirements of the different elements that compose the exhibition (fig.6). The collections, to a large extent, have traveled by plane to minimize risks, except for items of considerable size and weight such as the Carriage or Steel Wheels that have traveled by sea along with the exhibition elements as showcases, etc. The planning of the displacement of large elements by land towards the ports has represented a challenge that sometimes required night operations and traffic limitation in the area.



Figure 6 – Transportation

### The collection management software

After analyzing the internal factors of the various collections that make up the exhibition “Auschwitz. Not a long ago. Not far away”, as well as the external factors that influence its

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conservation due to the permanent mobility of a traveling temporary exhibition, we conclude that a specific software was necessary to control all the registration, documentation, and conservation processes, as well as manage the generated documentation. The creation of the software (fig.7) has been determined by the interest in defining the priorities and assessing the risks of the different collections, classifying them according to their typology and support, in order to structure and define the risks and possible solutions.

The implementation of software to create, consult, modify the data of all the collections and also be able to visualize its topographic location in the place of the exhibition (area and room), has been one of the main challenges. It also facilitates the control of all different objects that are being included or excluded from the exhibition in its different moments.

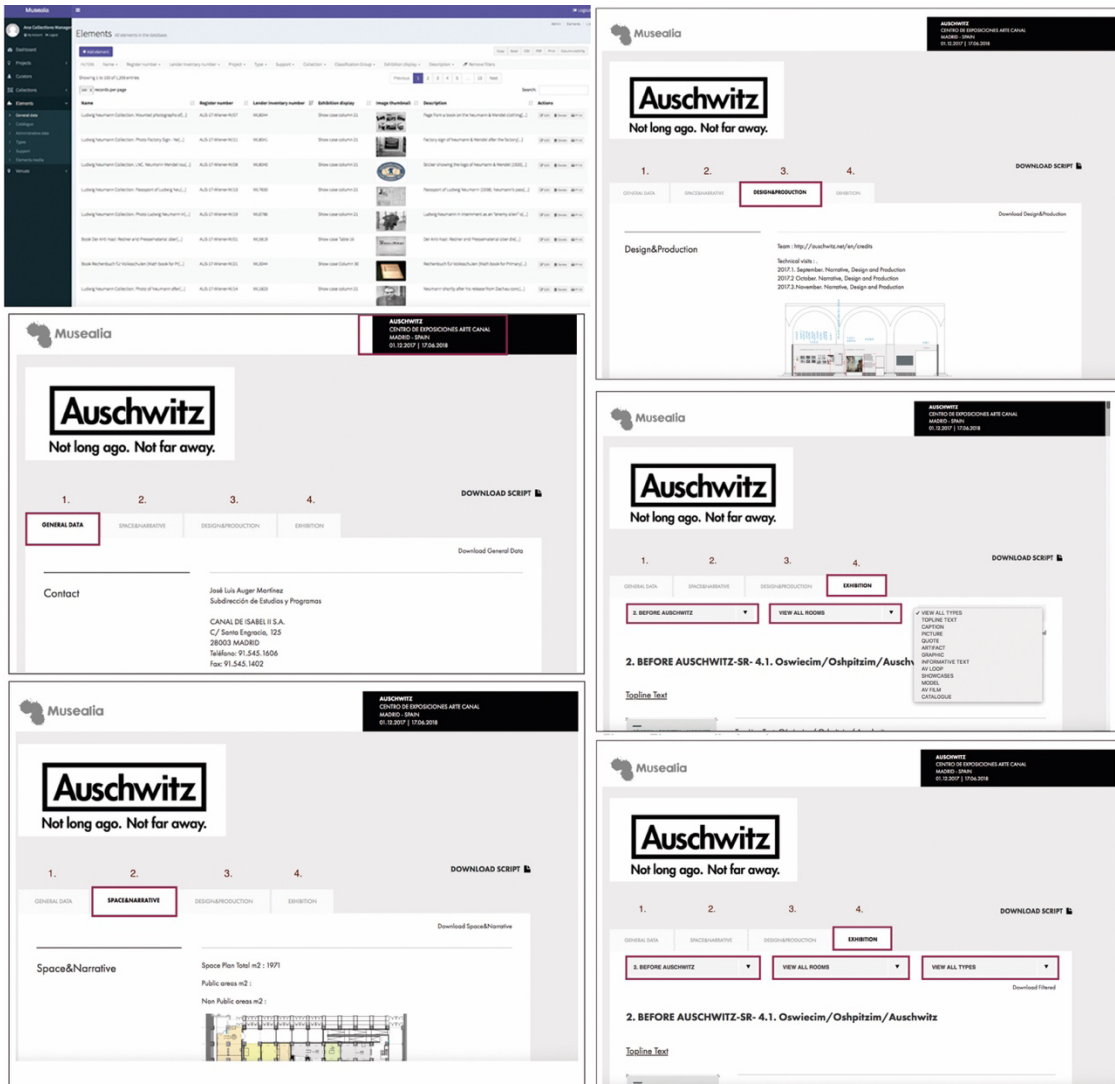
An integrated system of documentation and museum management of the objects, adapted to the exhibition life cycle that repeats along the seven-year time agreed with the ABSM (main lending museum). It takes into account the agreements contained in the Contract of the Loan that defines that the object can be replaced depending on their grade of conservation.

The software provides two work areas:

- a) Manager, which includes the area of insertion, edition and data recovery, exclusively accessible to the Collections Department, and
- b) visible public area in which the entire team could visualize the collections with their description and topographic location, integrated into the exhibition project (Galán 2018). A computer management tool whose objective is to compile the methodology of preventive conservation in each of its phases of a temporary exhibition (Biedermann et al 2018, 2019). The relation between life cycle stages and actions, stakeholders, preventive conservation, and software utility has been presented in the table 1.

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**Figure 7 – Software Printscreen.**



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Life cycle Stage	ACTIONS	STAKEHOLDERS	PREVENTIVE CONSERVATION	SOFTWARE UTILITY
<b>preparation</b>	The planning and conceptualization of the exhibition and agreements with the collaborating institutions	-representatives of the collections -commissaries -representatives of the temporary headquarters of the exhibition -design Team	-document management -export and import requirements -Facility report -Security plan -Risk management report -exhibition design -schedule of future actions	-Database to facilitate document management
<b>production</b>	Production of the different exhibition elements: - walls -showcases -frames etc.	-production manager -manufacturers -construction companies	-control of the characteristics of the exhibition elements - Control of the spaces and routes for collections installation - Handling and storage Monitoring	- database of exhibition elements
<b>assembly</b>	placement of the different exhibition elements and the objects in the space.	-construction companies - audiovisual and lighting staff	-The protocols and records of receipt of couriers conditions report. -Coordination of transport, -The exhibition installation, placement and handling of objects. - Handling and installing Monitoring	- Assignment of artifacts to showcases and frames -Location of objects in different rooms. -Schedule of collection management in their places of origin, packaging, transport and reception in the museum where the exhibition was to be hosted.
<b>operation</b>	In this phase, the exhibition is open to visitors. Different events are organized (press, special visits). Maintenance and cleaning Works take place.	-room staff -cleaning and maintenance staff -security -personal for control of collections preservation -audiences	- collection status control -Risk management. -Environment management Temperature, Relative Humidity, Luxes	- collection status record
<b>disassembly</b>	Collection and packaging of artifacts Disassembly and packaging of the exhibition elements that will be used in the next venue. Waste management.	-construction companies - specific packaging manufacturers	-collection and manipulation of objects - Conservation actions if necessary. -specific packaging	- object collection schedule -database of conservation applied to objects.
<b>transportation</b>	The complete displacement of the collections and exhibition elements by land, sea and air.	-insurers -transporters	- output control -control of transport conditions	-database of the location of objects in packages -schedule of means and transport deadlines

**Table 1** – Relation between life cycle stages and actions, stakeholders, preventive conservation, and software utility (authors)

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### **Remarks for the Future sustainability evaluation**

After analyzing the Life Cycle of the cultural service based on a traveling exhibition (table 1), it is possible to indicate the actions that will have to be carried out to proceed with the evaluation of the sustainability of the system. The holistic vision of the service is essential to understand and analyze it with all the products and services that are involved and to carry out the exhibition. However, for the sustainability evaluation, system boundaries as well as a functional unit must be defined in order to be able to define the scope of the assessment. The possible functional unit that will allow to compare the results with different exhibition could be 1visit per square meter. Thereafter, an inventory analysis must be performed using data collection and calculation procedures. The inputs and outputs related to the functional unit should be identified and quantified, as well as the resources used in the transformation processes. The environmental, economic, and social impacts can be obtained once the appropriate indicators have been selected. The indicators are considered particularly useful for developing the methodology in two aspects: they can be used to study different systems and provide quantitative information.

To quantify the environmental impacts the following indicator could be used: the Global Warming (GW) that represents the total emissions of the greenhouse gases (expressed in Kg of CO<sub>2</sub>), in a case of economic dimension, the total costs of the system could be quantified expressed in euro (€) and in social dimension, the total of work time could be taken into consideration expressed in hours (h).

Finally, the interpretation phase will combine the results of the inventory analysis with the impact evaluation to obtain the necessary conclusions and recommendations for the decision-making process. This allows determining the impact focus of the system that should be improved. The quantified assessment will be provided in future studies.

### **Conclusions**

For the proper management of the collections, prior knowledge of conservation has been fundamental, as well as the management of the diverse documentation produced, to deeply know the material and intangible characteristics of the Holocaust collections and their significance. However, the different stakeholders that have participated in such management have been transmitters of the same, but not active agents in risk prevention. We have thus detected a need for improvement whereby through the completion of protocols, risk situations during handling, transporting and at the storage place for collections can be detected and prevented.

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It is also necessary to integrate the philosophy of sustainability and sustainable conservation, analyzing what factors are essential to take into account to carry out concrete preventive actions in the different processes and phases of the life cycle of an itinerant exhibition.

Over the last years, significant advances in European cultural policies occurred as a result of the actions of the European Year of Cultural Heritage 2018. Progress in the implementation of the National Plan for Preventive Conservation as well as the implementation of tools from ICCROM.

Therefore, the research is being proposed in order to recognize risk indicators, and register them in the form of a protocol. It should include methods that are already being applied, those that have been disseminated through various scientific congresses and journals specialized in preventive conservation. This recognition of the public entities to lead and implement the prevention in the risks of the patrimony, develops in parallel to the last studies and proposals of qualitative and quantitative control of reference institutions in this discipline.

The need arises to create a protocol in the form of a manual with qualitative and quantitative indicators necessary to help prevent future risks, involving the present generations, to transmit the cultural legacy to future generations. It should address all aspects of the preventive conservation of the collections that are part of a temporary itinerary exhibition.

It is also necessary to control spatial and temporal conditions in the prevention of risks of itinerary collections, linked to sustainability, to a greater extent. The integration of three axes in a protocol is needed: space (the place where actions take place), and time (moment in which they occur, planning, development and end) and stakeholders that are relevant for the various phases of the progress.

The need to expand the capabilities of the created software was revealed. Based on the accessibility of conservation, and the possibilities of digitalization of the collections as well as their management in response to the needs of space and time, it is intended to improve the software for managing collections and managing the exhibition in which technology allies with conservation, and with the variables of preventive conservation in each of the phases.

After an analysis of the entire Life Cycle of the exhibition, together with the advances in the subject, as well as the patrimonial policies resulting from the European Year of Cultural Heritage in Europe, we propose the need to continue researching to innovate and provide a new sustainable vision, as well as the proposal of standardized formulas for sustainability evaluation for this type of expositions.

Future Actions:

- improvements of a created database tool to include the measurement of risk management, guidelines and regulations for itinerant collections.
- introduction of the sustainability assessment in the different phases of the life cycle of the exhibition.

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### References and Bibliography

- Alcántara, R. (2002). Standards in preventive conservation: meanings and applications. *ICROM*. Retrieved on 9 May 2019, [http://www.icrom.org/eng/02info\\_en/02\\_04pdfpubs\\_en/IC-CROM\\_doc04\\_StandardsPreventiveConser.pdf](http://www.icrom.org/eng/02info_en/02_04pdfpubs_en/IC-CROM_doc04_StandardsPreventiveConser.pdf).
- Alcouffe, D. (2001). *Préserver les objets de son patrimoine. Précis de conservation préventive*. Spri-Mont: Mardaga.
- Baglioni, R., Losada, J. Ma. (2000). Hacia una estrategia europea de conservación preventiva P.H. *Boletín del Instituto Andaluz del Patrimonio Histórico*, 33 87-91.
- Ballart Hernández, J. y Joan Treserras, J. (2001). *Gestión del Patrimonio Cultural*. Barcelona: Ariel Patrimonio.
- Benoît-Norris, C., Vickery-Niederman, G., Valdivia, S., Franze, J., Traverso, M., Citroth, A., Mazijn, B., (2011). Introducing the UNEP/SETAC methodological sheets for subcategories of social LCA. *The International Journal of Life Cycle Assessment* 16, 682-690.
- Bermúdez, A. (2004). *Intervención en el patrimonio Cultural. Creación y Gestión de Proyectos*. Madrid: Patrimonio Cultural. Editorial Síntesis.
- Biedermann, A., Ferreiro, L., Galán Pérez, A. (2018). Preventive conservation at the exhibition 'Auschwitz. Not Long Ago. Not Far Away'. *Memoria, Memory, History, Education. Auschwitz-Birkenau State Museum Magazine*, 13.
- Biedermann, A., Galán, A., Ferreiro, L. (2019). Auschwitz -una exposición itinerante- diseño, gestión de colecciones y de la información. In C. Foradada Baldellou & P. Irala-Hortal (Eds.), *Re\_Visiones sobre Arte, Patrimonio y Tecnología en la Era Digital*. IAACC Pablo Serrano, Gobierno de Aragón.
- Brokerhof, A., Meul, V., Miichalski, S, Perderson, J.L. (2007). Advancing research in risk management application to cultural property. In *ICCROM Newsletter*, 33, 10-11.
- Canadian Conservation Institute. *Basic requirements of preventive conservation*. Retrieved June 30, 2019, from <https://www.canada.ca/en/conservation-institute/services/preventive-conservation/guidelines-collections/basic-requirements-preventive-conservation.html#a2>.
- Carrasco Garrido, R. (2013). Documentar el patrimonio: cuando la información se transforma en un recurso sostenible. In *Museos.es*, 120-125. Retrieved from <http://www.culturaydeporte.gob.es/dam/jcr:152134ba-0c95-4589-9ef1-00aca6c18a13/documentar-patrimonio.pdf>.
- Council of Europe, Strategy 21, Factsheets in Preventive Conservation (2018) Retrieved April 25, 2019 <https://rm.coe.int/strategy-21-preventive-conservation-of-cultural-heritage-in-less-than-/16807bfb9>.
- Cultural Heritage Agency (Holland), Assessing Museum Collections. Collection valuation in six steps. Retrieved on 30 July 2019, <https://cultureelerfgoed.nl/sites/default/files/publications/assessing-museum-collections.pdf>.
- Culubret Worms, B, Hernández Azcutia, M. et Alii. (2008). Guía para un plan de protección de colecciones ante emergencias. Ministerio de Educación y Cultura. Retrieve from [http://www.mcu.es/museos/docs/MC/CERES/Guia\\_plan\\_proteccion\\_colecciones.pdf](http://www.mcu.es/museos/docs/MC/CERES/Guia_plan_proteccion_colecciones.pdf).
- FECYT, Fundación Española para la ciencia y la Tecnología. Libro Blanco de Investigación en Humanidades (2007). Retrieved June 16, 2019, from <https://www.fecyt.es/es/publicacion/libro-blanco-en-investigacion-en-humanidades>.

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Fernández Buey, F. (2011). Sostenibilidad: palabra y concepto. Retrieved June 16, 2019. Retrieved from <http://www.culturaydeporte.gob.es/dam/jcr:c0de2191-6add-40a9-84c3-85c2f63991a9/sostenibilidad-palabra-concepto.pdf>.

FCT, Fundação para a Ciência e a Tecnologia. Agendas Temáticas de Investigação e Inovação. *Cultura e Património Cultural*. Retrieved June 16, 2019, from [https://www.fct.pt/agendastematicas/docs/Agenda\\_I&I\\_Cultura\\_e\\_Patrimonio\\_Cultural\\_Documento\\_de\\_Trabalho.pdf](https://www.fct.pt/agendastematicas/docs/Agenda_I&I_Cultura_e_Patrimonio_Cultural_Documento_de_Trabalho.pdf).

European Commission. Culture Policies. Work Plan for Culture. Retrieved June 16, 2019, from <http://data.consilium.europa.eu/doc/document/ST-13948-2018-INIT/en/pdf#http://data.consilium.europa.eu/doc/document/ST-13948-2018-INIT/en/pdf>.

European Commission. Four principles of the European Year of Cultural Heritage 2018: engagement, sustainability, protection, innovation. June 16, 2019. Retrieved from [https://europa.eu/cultural-heritage/european-year-cultural-heritage\\_en](https://europa.eu/cultural-heritage/european-year-cultural-heritage_en).

Dalley, J. (1995): *The Conservation Assessment Guide for Archives*. Canadian Council of Archives.

Davies, M. UK Museums Association. *Museums and sustainability*. <https://www.museumsassociation.org/campaigns/sustainability>.

De Guichen, G. (2013). Conservación preventiva. ¿En qué punto nos encontramos çen 2013? *Revista Patrimonio Cultural de España, 7*, IPCE. En número especial "Conservación Preventiva: revisión de una disciplina", 15-23.

De Guichen, G. (2013) Reorganizar un depósito no es tarea fácil. *Revista Patrimonio Cultural de España, 7*, IPCE. En número especial "Conservación Preventiva: revisión de una disciplina", 91-101.

De Guichen, G. (2009). Medio siglo de conservación preventiva. *Revista GE-IIC*, no 0, 35-44. Retrieved June 16, 2019, from [www.fds.es/docftp/fi11881\\_RevistaGEIIC0.pdf](http://www.fds.es/docftp/fi11881_RevistaGEIIC0.pdf), [http://ge-iic.com/files/Cursos/Gael\\_de\\_Guichen.pdf](http://ge-iic.com/files/Cursos/Gael_de_Guichen.pdf).

De Tapol, B. (2013). La necesaria adaptación de la conservación preventiva al concepto de sostenibilidad con especial atención a las herramientas de gestión. *Revista Patrimonio Cultural de España, 7*, IPCE. En número especial "Conservación Preventiva: revisión de una disciplina", 81-89.

De Tapol, B., Campuzano, M. (2010). *Software para la recogida y utilización de datos en conservación preventiva: Un camino todavía por hacer*. París: ARAAFU.

Fernández, Ch.F. Arechavala, F., Muñoz-Campos, P. y Tapol, B: Grupo Español de IIC y Fundación Duques de Soria, Madrid, (2008). *Conservación preventiva y procedimientos en Exposiciones Temporales*, Monográfico de GE-IIC. Retrieved from <https://drive.google.com/file/d/0B6u9FpQfrTwctFVFLTJLeDNsYUE/view>.

Finkbeiner, M., Schau, E.M., Lehmann, A., Traverso, M., (2010). Towards life cycle sustainability assessment. *Sustainability 2*, 10, 3309-3322.

García Fernández, I.M. (2014). Historia de la Conservación Preventiva. Parte II. *Ge-conservación*, 5-18. ISSN 1989-8568. Retrieved from <https://ge-iic.com/ojs/index.php/revista/article/view/237>.

García Fernández, I.M. (2013). Historia de la Conservación Preventiva. Parte I. *Ge-conservación*, 27-41. ISSN 1989-8568. Retrieved from <https://ge-iic.com/ojs/index.php/revista/article/view/195>.

Galán Pérez, A (2019). Conserving Testaments to Human Survival. *Catálogo de la Exposición "Auschwitz. Not long ago, Not far away"*. ISBN-13 978-0-78921-331-0. Abbeville Press, New York.

## Preventive conservation and sustainability of heritage collections in transit

Ana Galán Pérez; Anna Biedermann; Francisco Javier Galán Pérez & Luis Ferreiro

Galán Pérez, A. (2018). La gestión de la colección de colecciones de Auschwitz: sensibilización, código deontológico y aplicación técnica. *Catálogo de la Exposición "Auschwitz. Not long ago, Not far away"*. Madrid: Editorial Palacios y Museos.

Galán Pérez, A. (2018). Conocer, conservar y comunicar el patrimonio de hechos traumáticos ¿Y después? Control y mantenimiento del patrimonio cultural, una opción sostenible. In *Actas Ge-IIC*, Vitoria. Retrieved from <https://www.congreso2018.ge-iic.com/es/programa-preliminar/actas/>

Galán Pérez, A., Ruiz de Lacanal, MD. (2015). Las Colecciones Científicas, Técnicas y Didácticas en los centros educativos y su conservación preventiva. Estado de la cuestión, *CITAR*, Universidad Católica de Oporto, 227-240. Retrieved from <http://artes.ucp.pt/citar/pt/node/1326>.

Galán Pérez, A. (2014). Propuesta de clasificación del Patrimonio Educativo para establecer planes estratégicos de Conservación-Restauración. La Universidad de Sevilla. In *Actas del Congreso Pedagogía Museística, Practicas, usos didácticos e investigación del Patrimonio Educativo*, (pp. 45-58). Madrid: SEPHE Sociedad Española de Patrimonio Histórico Educativo Español. Universidad Complutense de Madrid.

Galán Pérez, A. (2014). El examen científico para la Conservación y Restauración de Patrimonio Histórico Educativo: el análisis organoléptico. *Cabás: Revista del Centro de Recursos, Interpretación y Estudios en materia educativa (CRIEME)*, 12. Consejería de Educación, Cultura y Deporte del Gobierno de Cantabria (España). Retrieved from <http://revista.muesca.es/documentos/cabas12/El%20examen%20cientifico.pdf>.

Grasp (2011). Guide and Resources for Archival, Strategic Preservation. Atlanta: National Association of Government Archive and records Administrators (NAGARA). Basado en la presentación de la reunión del Instituto Americano de Conservación, celebrada en 1990: International Storage Survey. ICCROM-UNESCO. Retrieved from <http://asemus.museum/news/unesco-iccrom-museum-storage-survey-results/>.

Herráez, J. A., y Rodríguez Lorite, M. A. (1999). La Conservación Preventiva de las Obras de Arte. *Arbor, Conservación del Patrimonio Artístico*, CLXIV, 645, 4. Madrid: Consejo Superior de Investigaciones Científicas.

IPCE, Instituto del Patrimonio Cultural de España y Museo del Prado (2017). Herramientas para la implantación de la conservación preventiva en las exposiciones temporales. Recurso informático. Retrieved from

<https://www.museodelprado.es/actualidad/multimedia/conservacion-preventiva-en-exposiciones/d71272eb-c109-4b9c-960f-b4c37a8c8147>.

ISO, 2006a. ISO 14040 International Standard. In: *Environmental management - Life cycle assessment - Principles and framework*. International Organisation, Geneva, Switzerland.

Jeanen, M. Safeguarding the spirit of an historic interior on the basis of the 'Naragrid', ICOMOS, Retrieved on 30 July 2019. Retrieved from [https://www.icomos.org/quebec2008/cd/toindex/77\\_pdf/77-j1F6-282.pdf](https://www.icomos.org/quebec2008/cd/toindex/77_pdf/77-j1F6-282.pdf).

Kalman, H. The evaluation of Historic Buildings, Retrieved on 10 July 2019. Retrieved from <http://www.historicplaces.ca/media/36196/the%20evaluation%20of%20historic%20buildings%20300%20dpi.pdf>.

Kloepffer, W., (2008). Life cycle sustainability assessment of products (with comments by Helias A. Udo de Haes, p. 95). *The International Journal of Life Cycle Assessment* 13 (2), 89-95.

Levenfeld, C. Fernández, C. Monereo, A. (2013). La evaluación de riesgos en el patrimonio. Del diagnóstico al pronóstico. *Revista Patrimonio Cultural de España*, 7, IPCE. En número especial "Conservación Preventiva: revisión de una disciplina", 57-69.



**Preventive conservation and sustainability  
of heritage collections in transit**

Ana Galán Pérez; Anna Biedermann; Francisco Javier Galán Pérez & Luis Ferreiro

Marcon, P. (1991). Shock, vibration, and protective packing design. In *Art in transit: studies in the transport of paintings*. Washington: Mecklenburg, M., (pp. 107-120).

MCCord, M., Antomarchi, V. (1996). *A preventive conservation calendar for the smaller museum*. ICCROM.

Michalski, S. (1994). Sharing responsibility for conservation decisions. In *Durability and change: the science, responsibility, and cost of sustaining cultural heritage*. Report of the Dahlem workshop, December 6-11, 1992/Krumbein, Wolfgang E. (ed.); Brimblecombe, Peter (ed.); Cosgrove, Denis E. (ed.); Staniforth, Sarah (ed.), Chichester: John Wiley.

Michalski, S. (2004). Care and preservation of collections. In *Running a Museum: A Practical Handbook*. Paris: P. Boylan, International Council of Museums&UNESCO.

Michalski, S. (2007). Preservación de las colecciones. En: *Cómo administrar un museo, manual práctico*. UNESCO-ICOM, pp.51-90. Retrieved October 10, 2013 from [www.ge-iic.com/files/.../Michalski\\_preservacion\\_colecciones.pdf](http://www.ge-iic.com/files/.../Michalski_preservacion_colecciones.pdf).

Michalski, S. (2009). Los niveles ABC para la evaluación de riesgos en las colecciones museísticas e información para interpretar los riesgos derivados de una incorrecta humedad relativa y temperatura. In *II Seminario del Grupo de Conservación Preventiva*.

Museos.es (2011) 7-8. Dossier Monográfico, *Museos y sostenibilidad*. Retrieved June 16, 2019, from <http://www.culturaydeporte.gob.es/cultura/areas/museos/mc/mes/revista-n-7-8-2011-2012/dossiermonografico.html>.

Museo sostenible, en Museos+ Sociales. Ministerio de Cultura y Deporte. Retrieved June 16, 2019, from <https://www.culturaydeporte.gob.es/museosmasociales/otras-practicas/museo-sostenible.html>.

Negri, M. (2011). La aparición del concepto de sostenibilidad en el ámbito de los museos de Europa. Posibles directrices para la evolución de los museos como organizaciones sostenibles. En Dossier monográfico: *Museos y Sostenibilidad* Museos.es (2011-2012) Revista de la Subdirección General de Museos, 34-43.

Levenfeld, C. Fernández, C. Monereo, A. (2013). La evaluación de riesgos en el patrimonio. Del diagnóstico al pronóstico. *Revista Patrimonio Cultural de España*, 7, IPCE. En número especial "Conservación Preventiva: revisión de una disciplina", 57-69.

Oliva Puertas, M., (2014). Conservación preventiva en el Museo Nacional de Antropología. Octubre de 2012 - Junio de 2013. *Anales del Museo Nacional de Antropología XVI* (pp. 298-327). Retrieved June 16, 2019, from <https://sede.educacion.gob.es/publiventa/d/20106C/19/0>

Paolini, A., Vafadari, A., Cesaro, G., Quintero, M. S., Van Balen, K., & Pinilla, O. V. (2012). *Risk management at heritage sites: A case study of the Petra world heritage site*. UNESCO.

Plan Nacional de Conservación Preventiva. *Ministerio de Cultura y Deporte*. Retrieved June 20, 2019, from <http://www.culturaydeporte.gob.es/planes-nacionales/planes-nacionales/conservacion-preventiva.html>.

Plan Nacional de Conservación preventiva (2013). *Ministerio de Cultura y Deporte*. Videos en Canal Youtube. Retrieved June 20, 2019, <https://www.youtube.com/user/canalmcu/search?query=Plan+nacional+conservaci%C3%B3n>.

Reed, C. (2012). *Reviewing Significance 2.0, a framework for assessing museum collections' significance, management and use*. Retrieved July 10, 2019, from <http://collectionstrust.org.uk/resource/reviewing-significance-2-0/>.

## Preventive conservation and sustainability of heritage collections in transit

Ana Galán Pérez; Anna Biedermann; Francisco Javier Galán Pérez & Luis Ferreiro

Russell, R., Winkworth, K. Significance 2.0. Retrieved on 10 July 2019, from <https://www.arts.gov.au/sites/g/files/net1761/f/significance-2.0.pdf>.

UNCED, (1992) Agenda 21, *United Nations Conference on Environment and Development*. Rio de Janeiro, June 1992. UNEP/SETAC (2009). Guidelines for Social Life Cycle Assessment of Products. *United Nations Environment Programme*, Paris.

Valdivia, S., Ugaya, C.M.L., Hildenbrand, J., Traverso, M Mazijn, B, Sonneman, G. (2013). A UNEP/SETAC approach towards a life cycle sustainability assessment-our contribution to Rio+20. *The International Journal of Life Cycle Assessment* 18,(pp.1673-1685).

Van Balen, K. *The Nara Grid. An Evaluation Scheme Based on the Nara Document on Authenticity*. Retrieved July 30, 2019, from <http://orcp.hustoj.com/wp-content/uploads/2016/01/2008-The-Nara-Grid-An-Evaluation-Scheme-Based-on-the-Nara-Document-on-Authenticity.pdf>.

Waller, R. (2002). A risk model for collection preservation. In *Triennial meeting* (13th), Rio de Janeiro, 22-27 September: pre-prints/ICOM Committee for conservation. London: James & James.

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