SALAMANCA AS A RESILIENCE MODEL: HERITAGE PROTECTION IN THE CONTEXT OF CLIMATE CHANGE

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Abstract: This article examines the urban resilience strategies adopted by the city of Salamanca in response to the challenges posed by climate change, sustainability and historic heritage conservation. It aims to assess the extent to which adaptive measures have been integrated into urban planning, with particular emphasis on sustainability and the preservation of cultural heritage. Drawing on an analytical methodology that includes the review of local policies and flagship initiatives, such as *Low Emission Strategy, Savia Salamanca and Life Vía de la Plata*, which combine nature-based solutions with urban regeneration; jointly with secondary literature, progress in the implementation of these initiatives and persistent challenges will be reviewed. Despite advances reflected in the Local Action Plan of the Urban Agenda, which underscores Salamanca's commitment to a resilient and sustainable urban model, there are still significant challenges in the long-term implementation of these policies. Achieving a balanced and resilient development model will require enhanced cooperation among stakeholders, improved environmental indicators and the promotion of social inclusion.

1. INTRODUCTION

In a world characterized by economic uncertainty, the effects of climate change and accelerating urbanization, the concept of resilience has emerged as a crucial framework for understanding and addressing contemporary challenges. Although its origin lies in sciences and engineering, aiming to describe specific risk situations (Gifreu i Font, 2018), the term has evolved into a multidisciplinary symbol with applications in ecology, social sciences and urban studies.

Salamanca is a medium-sized city located in western Spain, in the autonomous community of Castilla y León. Declared a UNESCO World Heritage Site in 1988 due to its rich architectural cultural legacy, Salamanca faces specific challenges related to climate change and urban development. Its historical urban fabric, combined with increasing tourism and environmental pressures, makes it an ideal case study for exploring the integration of urban resilience and cultural heritage preservation.

During the 1960's and early 1970's, ecology adopted the resilience to analyse the accelerated changes in ecosystems due to human activity (Forke, 2006). Holling, in his work *Resilience and stability of ecological systems* (1973), defined the concept as the capacity of ecosystems to adapt and persist in the face of disturbances, giving rise to the theory of ecological stability. Subsequently, this concept extended to fields such as geography, where studies have sought parallelisms between ecological and social resilience, analysing how transformations in ecosystems can be linked to human responses. This approach has facilitated empirical research on phenomena such as land degradation and social strategies to deal with it. However, applying the concept directly from ecology to social sciences or urban studies present limitations (Amat Montesinos, 2013).

Over time, this ecological perspective has influenced the way urban and territorial challenges are approached, especially given the growing economic and environmental uncertainties. In the urban area,

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resilience has gained prominence for two main reasons. Firstly, it is considered a conceptual tool for addressing the economic, political and environmental risks exacerbated by globalization. Secondly, it has been consolidated as a framework for analysis to understand the crisis of the dominant economic model and the socioecological crisis that characterizes the 21ˢᵗ century (Christopherson, Michie y Tyler, 2010; Méndez, 2012). These approaches have made it possible to classify the literature in four areas: urban ecological resilience, urban hazards and disaster risk reduction, resilience of urban and regional economies and promoting resilience through urban governance and urban institutions (Leichenko, 2011).

In this context, the concept of "resilient city" has acquired a central role, especially in relation to urban adaptation to climate change. Understanding resilience as a relational system implies balancing various dimensions of urban systems and seizing opportunities in previously ignored areas (Díez Bermejo, Hernández Aja y Sanz Fernández, 2022). Nevertheless, as Chelleri (2012) points out, this "ability to cope with disruptions" in multiple domains has resulted in a trivialization of the term, underscoring the importance of more targeted and contextualized approaches.

To prevent the risks of collapse in complex urban systems, it's essential to implement comprehensive policies that tackle specific problems within a broader view. This requires not only the participation of the public sector, but of the private sector and civil society organizations as well, to ensure proper resource management and effective urban planning. This creates a more holistic approach (Economics of Climate Adaptation Working Group, 2009). However, the urban environment is not exempt from risk factors derived from a weak local governance and the scarce participation of stakeholders in urban management, or in mitigating the impact of climate change (United Nations, 2012).

Analysing how historic and heritage cities manage resilience not only provides specific examples of good practices, it also reveals key strategies for preserving cultural heritage while facing global challenges. In particular, this paper focuses on the case of Salamanca, a city that has started to integrate the dimensions of urban resilience and cultural heritage preservations in innovative ways. We will explore how this city, like other heritage cities, is implementing policies and strategies to face the risks associated with climate change and the socioeconomic crisis, becoming a paradigm of resilience for other cities with similar characteristics.

Although the concept of urban resilience has been extensively explored in recent years, few studies have analysed how medium-sized heritage cities are integrating climate adaptation and cultural preservation. This creates a knowledge gap concerning the specific challenges and strategies such cities adopt to remain resilient. By analysing the case of Salamanca, this study seeks to address this gap and provide insights that can inform broader urban resilience frameworks, especially in contexts rich historical and cultural significance.

The objective of this paper is to analyse how the city of Salamanca integrates resilience and heritage preservation into its urban policies in the context of climate change. In particular, the study aims to: identify the main urban challenges faced by Salamanca, evaluate the policies and strategies implemented to promote resilience, assess how cultural heritage is preserved within this framework and compare Salamanca's approach with other international examples.

2. THEORETICAL FRAMEWORK

As a complex urban system, the city demonstrates that the concept of resilience does not have a single definition, but several, depending on the dimension of the ecosystem on which it is focused. In 2016, Meerow, Newell y Stults, in their work *Defining urban resilience: A review*, offered the most comprehensive definitions by integrating different perspectives. According to them, *'urban resilience refers to the capacity of an urban system, and all of its sociological and sociotechnical networks across temporal and spatial scales, to maintain or quickly resume its desired social functions in the face of a*

disturbance, adapt to change, and rapidly transform systems that limit the current or future adaptive capacity'. This conceptualization encompasses the different existing approaches around resilience and brings to light its functional complexity, which also generates vulnerabilities to the multiple impacts faced by cities.

In this respect, the Rockefeller Foundation drove, in 2013, the *100 Resilient Cities* initiative, currently known as Resilient City Network, for promoting the adaptation and implementation of early resilient projects. Since 2014, the international consultor Arup has elaborated the *City Resilience Framework*, a key tool to evaluate and strengthen the urban resilience (Resilient City Network, 2023). This framework is structured around four dimensions related to clean areas that impact the regenerating capacity of the cities; **health and wellbeing**, to ensure the quality of life of all people living in the city; **infrastructure and environment**, which provide critical services, connect and protect citizens; and **local governance and planning**, essential for an inclusive and integral decision-making process (Arup, 2024). In a cross-cutting manner, culture and heritage impact urban systems directly, strengthening social identity, preserving historical values and encouraging community creativity. The culture allows the preservation of customs, traditions and life forms, promoting community work and solidarity, offering the necessary basis for achieving a sustainable and regenerative development (Arista Castillo, Barrera Fernández e Hiriarto Pardo, 2023).

The interrelationship between urban resilience and cultural heritage has gained relevance in recent decades, recognizing that disasters not only affect physical structures, they also impact identities and social relationships that define culture. To that effect, culture is also considered an essential factor for strengthening resilience, promoting creativity and innovation in the face of urban challenges.

Even though heritage conservation has historically been linked to risk mitigation and material loss, a resilience approach goes beyond, considering the interconnection between culture, economy and social cohesion to build stronger communities, with solid local economies and renewed identities (Ruiz Barajas, 2018; Genova, Sáenz, Caimanque, Kopelman y Navarrete, 2020). Examples of this approach are found in projects developed in international organizations such as the Getty Conservation Institute and the World Monuments Fund which have, since the 80's, raised awareness of the need to protect heritage from disasters. The United Nations Educational, Scientific and Culture Organization (UNESCO), through documents such as the report *Climate change and world heritage* (2007) (Genova, Sáenz, Caimanque, Kopelman y Navarrete, 2020) and the *Recommendation about the historic cityscape*, has guided countries in the integration of resilience with the preservation of the heritage, recognizing the need to balance urban modernization with the conservation of the historical ensembles.

One of the most paradigmatic examples is the historic centre of Quito (Ecuador), the first city declared a UNESCO World Heritage site in 1978 and which is also integrated in the Resilient City Network. Through integral conservative policies, the city has succeeded in protecting its urban and monumental Urban fabric while incorporating it into modern growth. Initiatives as the *Partial Plan of the Historic Centre of the City of Quito-Resilient Management*, the pedestrianization of the Historical Centre, the recovery and rehabilitation of historical buildings, the revaluation of public spaces and the promotion of local tourism have allowed Quito to preserve its authenticity, maintaining its role as cultural and social centre to the country (100 Resilient Cities, AECOM, Ayuntamiento de Quito, 2017; REDEUS-LAC, 2025; Quito Informa, 2024).

Likewise, the historic centre of Morelia (México), declared a UNESCO World Heritage site in 1991, is a leading example of how tourism and services can be integrated in sustainable heritage management. Through urban conservation and emergency policies, in the face of growing social insecurity and organized crime, together with the cultural promotion strategies, the city has refurbished its colonial monuments and public spaces, fostering cultural and commercial activities, that have revitalized the local economy guaranteeing the preservation of the centre's historic character (Hiriart Pardo, 2018).

Amsterdam, for its part, has also integrated resilience with heritage conservation. Aware of the climate change risks and its sea level location, the city has implemented innovative policies, such as storm water management through the *Resilience Network of Smart Innovative Climate-Adaptive Rooftops* (Resilio) project, that implements roofs capable of absorbing rainwater, thus reducing flood risks. Adittionally, the protection of the historical floodgates and their integration with the ecological resolution reinforce the comprehensive approach of the city, preserving its historical centre while adapting to the new climate change threats (Simon, 2004; Potts, 2021).

Globally, initiatives such as the *Paris Agreement* (2015), the Sustainable Development Goals (SDGs) in the framework of the *2030 Agenda for Sustainable Development* (2015) and the *Sendai Framework for Disaster Risk Reduction 2015–2030*, have recognized culture and heritage as essential building blocks for the urban regeneration, promoting social cohesion and economic opportunities, as well as urban greening as a tool to mitigate climate impacts and foster communities' resilience. (United Nations Climate Change Secretariat, 2017; Anguelovski, Connolly, Pearsall, Shorky, Checker, Maantay, Gould, Lewis, Roberts, 2019).

3. METHODOLOGY

The study adopts a mixed-methods approach to evaluate the strategies developed in Salamanca to promote urban resilience while preserving its cultural heritage. The methodology combines qualitative analysis of planning and policy documents with a set of urban indicators selected to measure the effectiveness and implementation of these strategies.

The qualitative analysis focused on the content review of key local strategic documents, including the Local Action Plan, the Savia Strategy, the Special Plan for Green Infrastructure and Biodiversity and the regulation for the Low Emission Zone. These documents were analysed in light of relevant academic literature and international frameworks such as the European Green Deal, the UNESCO Recommendation on the Historic Urban Landscape and the Agenda for Sustainable Development.

To complement the policy analysis, the study incorporates a selection of descriptive urban indicators that allow for a measurable assessment of Salamanca's progress in areas linked to resilience: sustainability, mobility, carbon reduction and historic preservation. These indicators are contextualized with relevant targets such as those proposed by the World Health Organization (WHO) or the European Union's 2030 Climate Targets.

Table 1

Sustainability and urban resilience quantitative indicators in Salamanca

Indicator	Current Value	Target 2030 (if available)	Source
% of Surface per inhabitan.	18m^2/inhab.	10–15m^2/inhab. (WHO)	Salamanca City Council (2025e)
Nº of rehabilitated houses	140	+ 327 under development	Salamanca City Council (2025f)Construible.es (2025)
% of projected reduction of CO$_2$ emissions	No specific local data	55% (2030 Climate Target Plan of European Union)	European Enviroment Agency (2025)
Total length of bicycle lanes (km)	39,23 km	+ 100 km	Salamanca City Council (2025g)
% of the historic centre pedestrianized	90%	100%	Oliva (2025)

Source: prepared by the author based on data obtained from the different sources cited in the table.

These indicators were chosen for their relevance to the key dimensions of urban resilience, including environmental quality, sustainable mobility, built environment regeneration and heritage-sensitive urban design. Although they do not represent an exhaustive model, they offer a practical approximation to assess the local implementation capacity of resilience-oriented planning.

The methodological process consisted of three stages:
1. Identification of strategic lines of action in Salamanca's urban planning that relate to resilience and cultural heritage.
2. Assessment or implementation status, using the selected indicators and content evaluation of planning instruments.
3. Interpretation and synthesis, relating the Salamanca case to resilience literature and frameworks, and identifying transferable lessons for other heritage cities.

4. CASE STUDY: RESILIENCE IN THE CITY OF SALAMANCA

4.1. Resilience in the Spanish Case: Heritage and City

Spain has assumed international and European commitments in terms of resilience by adopting different plans and strategies that address climate, social and economic challenges. One of the key milestones is the *Spanish Urban Agenda* (2019), which introduces a preventive approach to managing natural disasters and promote the resistance, adaptation and retrieval of cities in the face of a changing environment. This framework recognizes that perturbances represent not only represents challenges, but also opportunities to convert the urban areas towards a more sustainable and resilient development (Díez Bermejo, Hernández Aja, Sanz Fernández, 2022). The arrival of the Covid-19 pandemic accelerated the necessity of resilient measures, giving place to two important strategic instruments.

The first one, the *Resilience, Transformation and Recovery Plan* (2012) aimed at mitigating the socioeconomic impact of Covid-19 through a long-term sustainable development, structured in four main lines of action and ten key policies. Its target is restructuring the national territory in the face of external hazards, pushing adaptability and sustainability in the economic, social, territorial and environmental spheres.

The second one, *Spain 2050* (2021), a multidisciplinary and long-term holistic strategy designed based on public-private cooperation and coordination between the different levels of government. Based on frameworks such as the *Resilience, Transformation and Recovery Plan* and the *2030 Agenda*, it develops structural reforms that promote resilience in the economic, social and environmental context, taking into account the risks and opportunity of each territory.

In the field of heritage cities, the Group of Spanish World Heritage Cities has adopted the resilience principles in its 15 registered cities in the UNESCO World Heritage List. These cities, known for their cultural and monumental wealth, face large challenges derived from their functional use as tourist destinations (Troitiño Vinuesa 2010); Palmer, 2018; Basurto-Cerdeño, Pennington-Gray y Basurto-Cerdeño, 2016). The main tensions include urban sprawl, loss of residents, deterioration of natural and cultural resources, functional and social changes, and the implementation of insufficient and/or ineffective policies. In this context, urban resilience emerges as an essential approach to addressing these issues, promoting a balance between heritage conservation and the sustainable development of communities (Troitiño Vinuesa, Troitiño Torralba, 2013).

Among the 15 World Heritage Cities in Spain, Salamanca stands out as an emblematic example of the implementation of strategies that combine heritage preservation with the sustainable development. In the following section, we analyse how this city has implemented key policies in this area, addressing its challenges and results.

4.2. Salamanca Facing Current Challenges

Salamanca, as a World Heritage City, faces a series of problems that affect both its heritage fabric and its sustainable urban development. Climate change, with phenomena such as rising extreme temperatures and declining water resources, poses a direct threat to the conservation of its cultural heritage (Table 2). Likewise, tourist pressure, although vital to the local economy, generates tensions on the carrying capacity of historic spaces and the demographic balance due to the gentrification and the loss of residents in the historic centre.

In the social field, the inequality regarding the access to public services and the fragmentation between historical urban areas and modern expansion areas are challenges to achieving sustainable community cohesion. In addition, there is a growing need to reframe mobility and urban infrastructure, seeking solutions that mitigate environmental impact and promote a more accessible and equitable environment.

Table 2

Climate Projections in the City of Salamanca

Indicator	Period	Minimum	Mean (Anomaly)	Maximum
Number of Hot Days	**Historical (1950–2005)**	18.04	34.86	53.25
	2006–2040	29.93	49.90 (+15.03)	71.89
	2041–2070	41.95	63.82 (+28.96)	87.33
	2071–2100	46.57	68.41 (+33.55)	92.47
Maximum Duration of Heatwaves (Number of Days in the Longest Heatwave)	**Historical (1950–2005)**	2.90	11.02	22.43
	2006–2040	6.17	15.64 (+4.62)	32.39
	2041–2070	9.28	21.70 (+10.68)	46.18
	2071–2100	1.30	25.47 (+14.45)	53.87
Maximum 5-Day Accumulated Precipitation	**Historical (1950–2005)**	37.41	67.91	115.79
	2006–2040	37.94	72.23 (+3.09)	129.26
	2041–2070	38.40	73.16 (+4.03)	138.79
	2071–2100	37.68	70.91 (+1.63)	125.10
Maximum Number of Consecutive Dry Days	**Historical (1950–2005)**	18.08	40.49	82.65
	2006–2040	18.76	43.98 (+3.49)	90.84
	2041–2070	18.32	46.31 (+5.82)	102.60
	2071–2100	19.72	50.15 (+9.66)	104.75

Source: Own elaboration on data mentioned in Lavola (2020).

In response to the problems identified, Salamanca has adopted a strategic focus through the formalization of the *Salamanca Urban Agenda* (AUSA) and its *Local Action Plan* (PALSA), approved in August 2022. These initiatives, aligned with the ODS in which the municipality was already working, reflect a compromise with sustainability and urban resilience. The design in the AULSA and the PALSA are based on a collaborative transversal and integrated work model, that seeks to promote common progress in three key dimensions: improvementing the physical environment, strengthening the local economy, and ensuring social cohesion. In addition, these initiatives are aimed at ensuring the functional adaptability of the city in the face of future challenges facing urban systems.

PALSA's actions and objectives are structured around three main axes, which seek to address the challenges of sustainable development in Salamanca:

Axe A. Salamanca as a quality physical space: centreed around the reinforcement of the *Infrastructure Strategy Verde SAVIA*, Salamanca promotes a green and blue infrastructure reconversion that spans from the micro scale to the neighbourhood, city, metropolitan and interregional levels. This

strategy seeks to integrate nature-based solutions to move towards a renaturalized and resilient city model, adapted to contemporary challenges. As a World Heritage City, it requires special sensitivity in the implementation of this strategy, ensuring that interventions respect and enhance their historical and cultural heritage. It includes the promotion of innovative environmental solutions aimed at the requalification of built assets, which implies concrete measures to mitigate and adapt to climate change. These actions will not only contribute to the protection of the environment and cultural heritage, but will also generate direct benefits for the health and quality of life of citizens.

Axe B. Salamanca as a space for opportunities and social cohesion: focuses on strengthening the economic system and social dynamics by promoting a sustainable and innovative urban economy, as well as fostering population stability by supporting entrepreneurship, employability and equal opportunity.

Axe C. Salamanca as a meeting forum: it prioritizes empowerment and social responsibility at all levels. Its objective is to form an autonomous population in the digital field sphere, humanizing the digitalization process and generating new opportunities. It also addresses the integration of various groups, reducing barriers and improving intergenerational relations, in order to enrich the cultural, social and economic life of the city.

In short, Salamanca confronts multiple urban challenges that require a comprehensive resilience approach, especially in the cultural heritage context. Climate change, mass tourism and urban imbalances not only affect the physical integrity of its heritage assets, but also the social and economic dynamics of the city. These challenges require the implementation of adaptive policies that not only seek to preserve its historical heritage, but also to promote a functional adaptation to changes in the urban environment. In this sense, the urban resilience model applied to Salamanca must consider both environmental sustainability and social well-being, in order to guarantee an equitable city capable of facing the challenges of the future.

These results show that Salamanca has established a solid strategic framework for resilience and sustainability, with particular strengths in pedestrianization and the integration of nature-based solutions. The advancement of key actions such as the expansion of green infrastructure, bicycle connectivity and historic centre pedestrianization reflects a tangible shift towards a more liveable urban model. However, despite this progress, the pace of implementation remains uneven, with important components, such as CO_2 monitoring, emissions reduction and broader citizen engagement, still in preliminary stages or lacking data. The evaluation of urban indicators also reveals a need for more consistent metrics and tracking systems to ensure alignment with European targets. While the foundation is strong, the city's resilience strategy must now focus on execution, coordination and measurable impact to consolidate its position as a reference model among heritage cities.

The implementation of the Salamanca AUSA and its PALSA reflects a strong institutional commitment to sustainability and heritage-sensitive resilience. However, a review of key urban indicators reveals that the degree of implementation remains uneven. While the city exceeds the WHO recommendation by 18 m^2 of green space per inhabitant and has achieved a remarkable 90% pedestrianization of its historic centre, other areas lag behind. For instance, the projected expansion of bike lanes remains limited compared to the +100 km target and there is a notable absence of local data to measure progress towards the EU's 55% CO_2 emission reduction goal. These gaps suggest that although Salamanca's strategic framework is aligned with international resilience standards, the translation of these plans into measurable outcomes is still partial. A stronger monitoring system and the integration of resilience indicators into regular policy evaluation would strengthen the city's capacity to adapt to future challenges while preserving its historical identity.

5. RESULTS

This section analyses the results of the implementation of urban resilience strategies in the heritage context of Salamanca. As one of Spain's World Heritage Cities, Salamanca has adopted several initiatives under the Local Action Plan of the Salamanca Urban Agenda (PALSA9 and within the framework of the national Recovery, Transformation and Resilience Plan. The city has implemented measures in areas such as urban mobility, renewable energy generation, digitalization of municipal services, the expansion of green areas and the ecological connectivity and conservation and rehabilitation of historical heritage (Ayuntamiento de Salamanca, 2025). These initiatives aligned with the objectives of sustainability, adaptability and regeneration of urban systems. Below, key actions from PALSA are analysed to assess the city's progress towards a greater resilience (Table 3).

Table 3

Selected Actions from PALSA to Assess Resilience

AXIS A. SALAMANCA AS A HIGH-QUALITY PHYSICAL SPACE			
Actions	**Subactions**	**Development Status**	**Implementation Timeline**
A01 **Promotion of a More Livable and Resilient City Model and Sustainable, Integrated Mobility**	**A01.1.** Development of Integrated Territorial Strategies (ITS) (Strategy Edusi Tormes +)	Complete	
	A01.2. General Urban Planning Plan	To be implemented	Medium
	A01.3. Monitoring of the Urban Planning Plan	To be implemented	Medium
	A01.4. Strategy for an Accesible and Proximity City	To be implemented	Medium
	A01.5. Sustainable Urban Mobility Plan	Under development	Short
	A01.6. Low Emission Strategy	Under development	Short
	A01.7. Electrification of Urban Mobility	To be Implemented	Medium-Long
	A01.8. Modernization of Urban Distribution in the Last Mile, through Rationalization and/or Electrification	To be implemented	Medium
A02 **Urban Resilience Strategy Against Climate Change**	**A02.1.** Municipal Strategy for Climate Change Adaptation	Under development	Long
	A02.2. Urban Resilience Plan for Extreme Events (RCP-8.5 scenario)	To be implemented	Long
	A02.3. Strategy for Carbon-Neutral Salamanca	To be implemented	Long
	A02.4. Greenhouse Gas Emission Modeling	To be implemented	Long
	A02.5. Energy Autonomy Strategy	To be implemented	Long
	A02.6. Circular Economy Strategy	Under development	Long
A03 Renaturalization of the City and Connection with the Environment	**A03.1.** Special Plan for Protection of Green Infrastructure and Biodiversity	Under Development	Long
	A03.2. Savia Salamanca. Renaturalization with Nature Based Solutions	Under development	Long
	A03.3. Life Vía de la Plata	Complete	
	A03.4. Strategy for Characterizing Ecosystem Functioning of Green Infrastructure	To be implemented	Long
	A03.5. Strategy for Conservation and Mitigation Banks on Green Infrastructure	To be implemented	Long
A04 **Neighborhood Renovation, Rehabilitation and Promotion of Built Park Usage**	**A04.1.** Comprehensive Strategies for Building Rehabilitation and Urban Regeneration	Under development	Short
	A04.2. Building Rehabilitation and Urban Regeneration Plan	Under development	Long
	A04.3. Public Building Rehabilitation Strategy	Under development	Medium
	A04.4. Strategy for Reusing Buildings and Local Spaces	Under development	Medium
	A04.5. Public Housing Park Promotion Strategy	Under development	Long
A05 **Salamanca as a High-Quality Physical Space**	**A05.1.** Adapt Clima CENCYL	Under development	Medium
	A05.2 Green Transition CENCYL	Complete	
	A05.3. Cross-Border Urban Agenda CENCYL	To be implemented	Medium

Table 3 (continued)

AXIS B. SALAMANCA AS A SPACE OF OPPORTUNITIES AND SOCIAL COHESION			
Actions	**Subactions**	**Development Status**	**Implementation Timeline**
B04 Diversification and Tourism Dynamization	**B04.1.** Sustainable Tourism	Under development	Medium
	B04.2. Destination Management	To be implemented	Medium
	B04.3. Development of Tourism Attractiveness Linked to Natural Resources	Under development	Medium
	B04.4. Tourism Linked to Spanish Language Teaching	Complete	
	B04.5. Promotion of Congress Tourist	Under development	Short
B05 Boosting Cultural, Artistic and Sports Activities	**B05.1.** Strategies for Developing Activities Linked to the Promotion and Valorisation of Spanish	Under development	Medium
	B05.2. Support for the Development of Cultural, Creative and Audiovisual Content Industries	Under development	Medium
	B05.3. Promotion of Sports Activities	Under development	Medium

Source: own elaboration based on the data mentioned in the Patronato Municipal de Vivienda y Urbanismo (2022).

The table above presents key PALSA actions focusing on improving urban resilience, sustainability and heritage preservation. Through these initiatives, the city aims to implement a more livable and resilient urban model, emphasizing sustainable mobility, climate change adaptation and urban regeneration. Actions address critical areas such as transportation electrification, urban renaturation through nature-based solutions, building rehabilitation, and integration of green infrastructure. Additionally, the plan promotes tourism diversification and the strengthening of cultural offerings, contributing to social and economic cohesion.

The Low Emission Strategy is a key example of the city's commitment to resilience and heritage protection.

Low Emission Strategy:

The City Council has begun implementing an automated vehicular access control system for Low Emission Zones (LEZ), prioritizing road safety, universal accessibility and active mobility. This system restricts access based on vehicles pollution level, promoting ECO and O labels while gradually phasing out the most polluting vehicles.

Approved in June 2024, the initiative, *Creation and Management of Low Emission Zones in the Municipality of Salamanca*, aims to reduce CO_2, NO_x and particulate emissions by promoting pedestrian zones, low emissions public transport and efficient loading and unloading systems. The restrictions will be applied progressively between 2009 and 2039, across two defined perimeters: Zone 1, which is fully pedestrianized and Zone 2 a surrounding buffer zone. This measure promotes quality of life, public health and heritage preservation, positioning Salamanca as a sustainable and resilient city (Patronato Municipal de Vivienda y Urbanismo, 2022; Ayuntamiento de Salamanca, 2025).

Several specific actions are under development to support the LEZ strategy (Table 4), including pedestrianization of downtown and adjacent areas and improved bicycle infrastructure. These efforts align with the city's *Sustainable Mobility Plan*, which includes initiatives like electric public transport to reduce emissions and promote environmentally friendly mobility.

Table 4

Main actions of the Low Emission Strategy and their development

Actions	Executed	Areas
P1-1 Implementation of Low Emission Zones.	No	
P2-2 Complementary actions to Low Emission Zones.	No	
P4-1 Bicycle lanes to access Low Emission Zones. Network of bike lanes to connect to the Low Emission Zone	Yes	- Comuneros Av. - Paseo de San Gregorio-San Vicente - Alfonso Castro-Av. Mirat - Cordel de Merinas
P4-2 Periurban connection bicycle lanes. Execution of 3 bicycle routes (two of them consecutive), connecting the previously existing network of lanes with peripheral neighborhoods of bicycle lanes to connect with the Low Emissions Zone.	Yes	- Brick Bridge Connection - Felipe VI Bridge Connection - Felipe VI Bridge Connection-Joaquín Rodrigo Crossing
P6-1 Pedestrianization of Cuesta San Blas, Calle Ancha and Ramón y Cajal. Urbanization of the Streets surrounding the center to be included in the Low Emission Zone.	Yes/Part of	- Calle Ancha
P6-2 Pedestrianization of the downtown area. Pedestrianization of several streets in the city center with a total length of 2 km	Yes/Part of	- Correhuela-Plaza del Corrillo - Poeta Iglesias-Plaza de Colón - Plaza del Corrillo-Peña Primera - San Justo-Varillas-Gonzalo Santana
P6-3 Pedestrianization of the San Juan Bautista Church and Barrio San Juan.	Yes/Part of	- Surroundings of the San Juan and San Juan de Sahagún churches.
P6-4 Pedestrianization of the University-Congress Center area.	Yes/Part of	- Various streets in the University area. - Remodeling of Fray Luis de León square
P7-1 Signaling of traffic calming.	No	
P11-1 Extension of bicycle loan bases and new bicycles.	No	

Source: prepared by the author based on the results mentioned in Salamanca's City Council (2025b).

As shown in Figure 1, the bicycle infrastructure strategy focuses on reinforcing active mobility as a pillar of the LEZ implementation. The map displays a network of bike lanes designed to ensure safe and efficient access from peripheral areas to the historic centre. Key corridors such as Comuneros Avenue, Paseo de San Gregorio and Alfonso Castro Avenue have been prioritized to facilitate east-west and north-south connections. Additionally, three periurban routes, most notably over the Felipe VI and Brick Bridges, connect the outer districts to the LEZ buffer. This network not only supports emission reduction goals, it also enhances connectivity and accessibility across the city.

While some projects, such as the implementation of the LEZ itself and traffic calming signage, have not yet been executed, considerable progress has been made in complementary initiatives. These include the construction and connection of bike lanes, both in access areas to the LEZ and in peri-urban areas, promoting active and sustainable mobility. In addition, partial progress has been made in the pedestrianization of streets in the historic centre and emblematic areas, such as the University and the

Congress Palace, although their coverage is still limited. Figure 2 displays the pedestrianization interventions carried out with and around the LEZ. These efforts primarily target emblematic areas such as the University district and religious heritage zones, including the surroundings of San Juan Bautista and San Juan de Sahagún churches. Additional pedestrian corridors, such as Calle Poeta Iglesias and Calle San Justo, enhance the livability of the urban core and contribute to reducing motorized pressure. While these interventions mark a major step in reclaiming public space, they remain fragmented and require greater continuity to ensure an integrated pedestrian network. In contrast, initiatives such as the expansion of loan bicycle bases have not yet begun. Overall, progress reflects a commitment to change towards a more accessible and sustainable urban model, although crucial challenges remain to achieve the objectives.
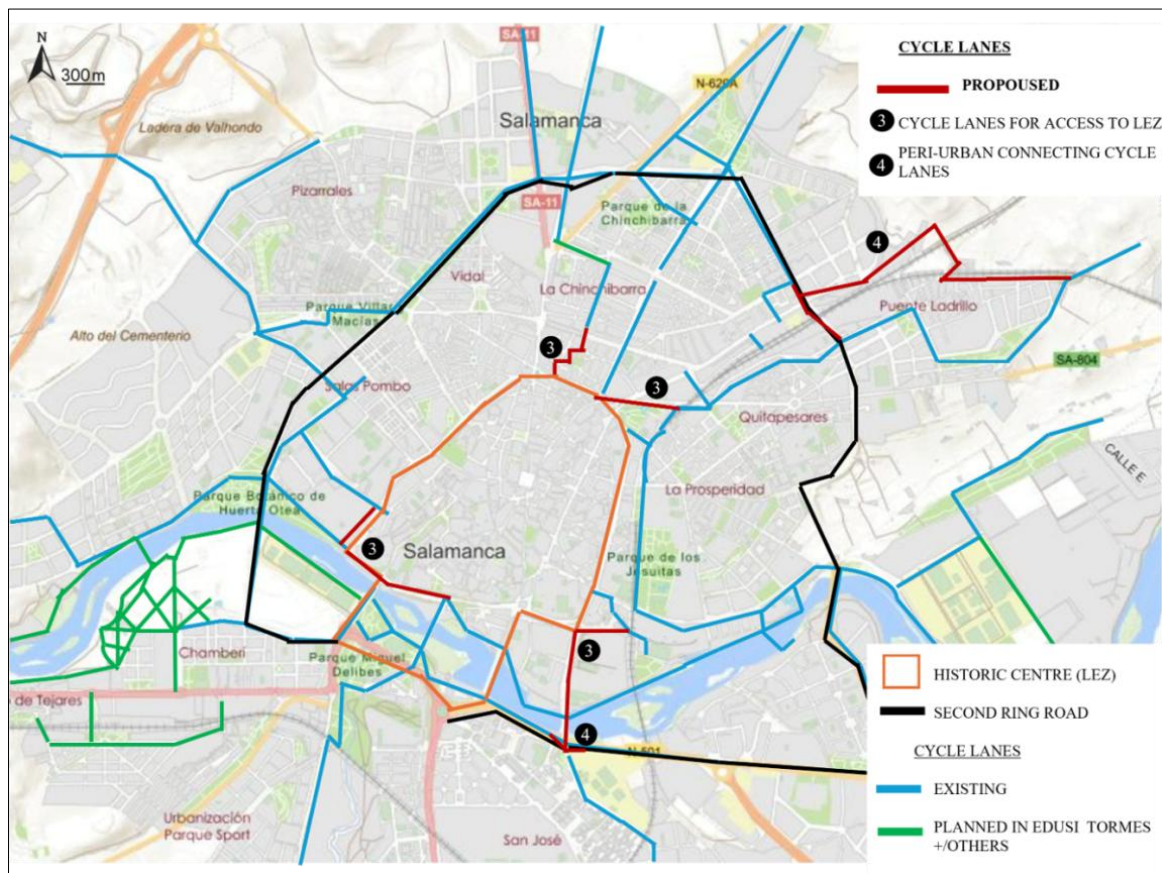

Fig. 1 – Bicycle Lane Infrastructure. The map highlights new and existing bike lanes connecting peripheral neighbourhoods and key corridors with the LEZ perimeter Source: Ayuntamiento de Salamanca (2025b), retrieved from https://aytosalamanca.es/zona-bajas-emisiones-fase-1.

To support the implementation on the LEZ, the City Council plans to introduce an automated access and exit control system, covering both pedestrian and vehicular zones. This initiative is directly tied to the protection of Salamanca's historic heritage. By gradually limiting the access of polluting vehicles and prioritizing sustainable transport models, this measure not only improves air quality and encourages active mobility, it also contributes to reducing the negative impacts associated with vehicular traffic in emblematic areas.

Fig. 2 – Pedestrianization Interventions in the Historic Centre of Salamanca. This map illustrates the urban pedestrianization projects implemented or partially completed within the LEZ perimeter. Key interventions include streets around San Juan Bautista and San Juan de Sahagún churches, the University-Congress area and central corridors like Poeta Iglesias, San Justo and Plaza del Corrillo. Source: Ayuntamiento de Salamanca (2025b), retrieved from https://aytosalamanca.es/zona-bajas-emisiones-fase-1.

As illustrated in Figure 3, the automated access control system covers both pedestrianized streets and surrounding vehicular corridors. This initiative forms part of a broader strategy to reinforce compliance with LEZ restrictions, using real-time monitoring technologies. By limiting the presence of polluting vehicles and streamlining delivery and service access, the system not only enhances urban mobility, it also contributes to preserving the physical and environmental integrity of Salamanca's historic core. The spatial scope of this system reflects a clear prioritization of areas with high cultural value.

These restrictions, combined with broader urban planning initiatives, reflect the city's strong commitment to the preservation of its historical legacy. Traffic management and calming measures in sensitive areas help protect the physical integrity and the cultural value of Salamanca's heritage, reinforcing its identity as a model for resilient and sustainable heritage city management.

The complementary initiatives also reinforce Salamanca's adaptative strategy. The *Special Plan for the Protection of Green Infrastructure and Biodiversity* (SPPGIB) aims to safeguard natural values and promote ecosystem services across the municipality. This plan supports a greener and more sustainable urban model, which is reinforced through coordination with other strategies such as the EDUSI Tormes+, the *Old City Management Plan* and the *Sustainable Urban Mobility Plan.*

The SPPGIB integrates flagship projects such as Savia Salamanca, centreed around urban renaturalization through nature-based solutions, and the *Life Vía de la Plata*, that culminated with outstanding results in the renaturalization of this historic road. This plan materialized renaturalization in key areas, achieving a desirable model of sustainability and laying the groundwork for extending its benefits to the rest of the city and other strategic areas (Life Vía de la Plata, 2023).

On the other hand, the *Tourist Sustainability Plan for Destination* is being implemented, which positions sustainable tourism as a strategic axis in local policies. It seeks to balance heritage preservation with economic development, promoting a diversified tourism offer linked to historical heritage, natural resources and culture. Moreover, it fosters complementary tourist products, such as cultural and congress tourism with the aim of expanding and diversifying said product range.
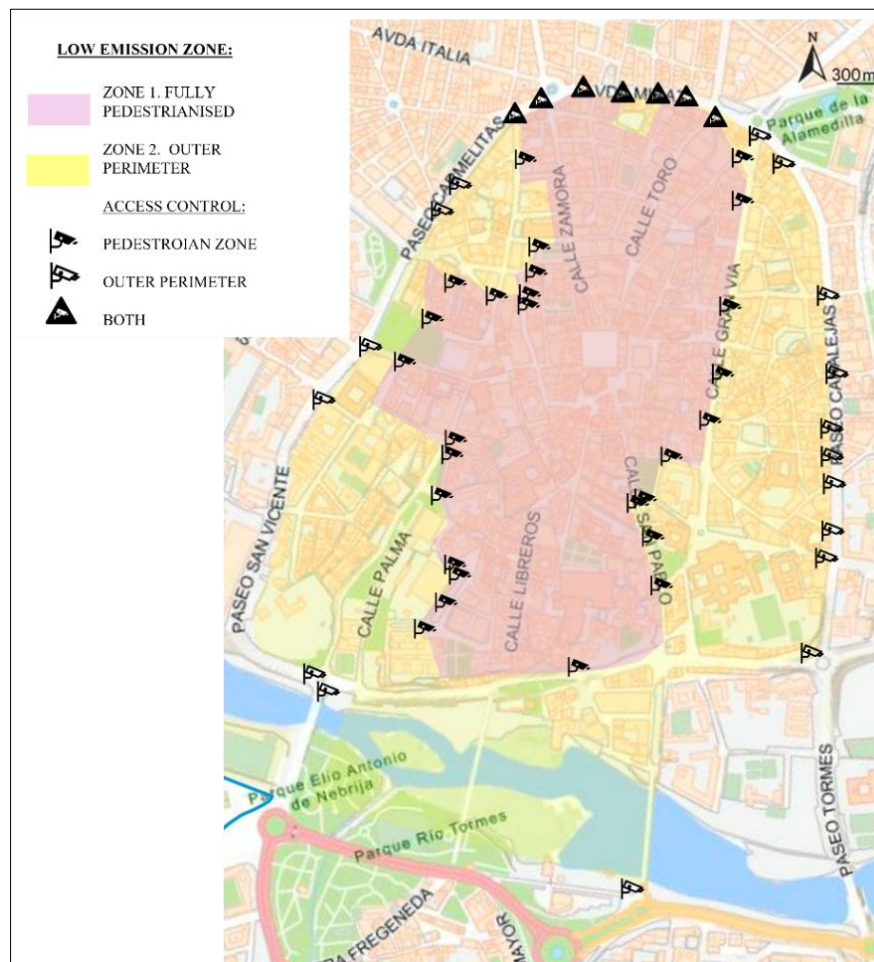

Fig. 3 – Access Control System for the Low Emission Zone (LEZ) in Salamanca. The map indicates the planned zones for the automated vehicular access and exit control system that will monitor both pedestrian and vehicular flows in the LEZ. The system aims to limit polluting vehicles and ensure safe, regulated mobility within heritage-sensitive areas. *Source:* Ayuntamiento de Salamanca (2025c), retrieved from https://www.saviasalamanca.com/sites/default/files/2022-03/ZONA%20DE%20BAJAS%20EMISIONES%20SALAMANCA.pdf.

Although diverse in their focus, these initiatives converge in promoting a more resilient, inclusive and liveable urban environment. They aim not only to improve ecological and spatial aspects, but also to foster stronger connections between sustainability and heritage protection. Pedestrianization, sustainable mobility and urban renaturalization are key pillars of this strategy. The integration of green infrastructure planning (SPPGIB), sustainable tourism strategies and the LEZ implementation demonstrates Salamanca's commitment to creating a greener, more balanced and future-ready city. The convergence of these efforts is shaping a resilient Salamanca that is better equipped to preserve its historical identity while facing the environmental, economic and social challenges of the 21st century.

6. DISCUSSION

The initiatives adopted by Salamanca in the framework of urban resilience strategies align with the broader climate change adaptation objectives, the residents improvement of the quality of life and the historic heritage preservation. In particular, the implementation of the *Low Emission Strategy*, with complementary projects like *Savia Salamanca* and *Life Vía de la Plata,* shows an integrated approach that not only prioritizes sustainability and emission reduction, but also compromises with the restauration of the natural values inside the urban context. This interaction between heritage and nature is essential, as it's mentioned in the book *Strengthening Cultural Heritage Resilience for Climate Change. Where the European green deal meets cultural heritage* (2022), which highlights the relevance of integrating ecology in urban planning to ensure an effective and long-lasting resilience, especially in highly cultural value areas. This approach is reflected in the Salamanca initiatives, that not only seek to reduce CO_2 emissions, but also to restore and preserve the balance in nature and culture in the city.

Authors like Genova, Sáenz, Caimanque, Kopelman y Navarrete (2020) emphasize the relevance of building resilient strategies that not only react to threats, such as extreme climate change phenomena, but also ensure that the patrimonial wealth is not compromised. Subsequently, the actions that are carrying out the LEZ and the pedestrianization in key areas of the historic centre, align with these suggestions, seeking to protect the heritage while promoting the adaptability of the city. However, these efforts face challenges, particularly in relation to the progressive implementation of the LEZ, whose full implementation is planned for 2039.

Internationally, cities like Amsterdam have, implemented policies that combine heritage preservation with the adaption to the sea level rise, using nature-based solutions and drainage systems integrated into the urban design. For its part, Morelia has developed successful public space revitalization programmes promoting community development and heritage protection. In comparison, Salamanca still faces significant challenges in the effective implementation of its mobility, emission control and sustainability policies, although the aforementioned initiatives, such as *Savia Salamanca* and *Life Vía de la Plata*, are promising examples of nature integration into heritage environment. However, in comparison with cities like Amsterdam, where resilience strategies are integrated into all levels of urban planning, Salamanca's initiatives still face institutional, technical and social barriers. The lack of permanent funding mechanisms and community-led governance limits the scalability and long-term impact of its current programmes.

This approach follows the international recommendations that advocate for adapting cities to climate change through nature-based solutions, respecting the historic urban environment and connecting all strategies in a coherent model. In this sense, the comparison with Quito seems relevant, as this Ecuadorian city has achieved a balance between urban development, sustainability and cultural preservation, creating a holistic model that could serve as reference for the city of Salamanca.

Although Salamanca has advanced significantly, some limitations remain. The lack of clear indicators to evaluate the impact of the adopted strategies, limited finance and poor integration with sustainable tourism initiatives highlight the need to strengthen collaboration between the public, private

and academic sectors. In addition, the challenges of the gradual implementation of the LEZ, the expansion of green infrastructure and the full integration of sustainable mobility still require further evaluation. It is crucial that future research delve deeper into several key aspects of the strategies, such as the long-term impact of the LEZ, especially on air quality and urban accessibility, as its development is projected for the long term. It would also be useful to investigate how the Green infrastructure contributes to urban resilience, especially in the face of external climatic phenomena, and how to improve its connectivity. Furthermore, sustainable tourism needs to be better integrated with heritage preservation, which is why studies on how to harmonize these two areas would be valuable. Finally, citizen participation in urban planning is another crucial aspect for the success of these initiatives, so it is recommended that their role in sustainable policies be explored.

AS Meerow, Newell and Stults (2016) argue, urban resilience requires multi-scalar and cross-sectoral strategies. The case of Salamanca illustrates how heritage cities must combine technical adaptation with governance models that embrace cultural identity. In light of growing climate threats, flexible and context-sensitive strategies, rather than generic sustainability, are essential to address the spatial, social and cultural complexities of historic urban environments.

All in all, Salamanca still faces significant challenges, such as the full implementation of its low-emissions system, the expansion of its green infrastructure and the consolidation of a sustainable tourism model. Its efforts reflect a clear commitment to sustainability, resilience and the integration of nature into urban development. This approach not only responds to any environmental and social needs, it also ensures the protection and enhancement of its historical heritage, in line with international best practices. Drawing on models from cities such as Amsterdam, Morelia and Quito can provide a valuable framework for overcoming the remaining challenges and consolidating an urban model that effectively balances sustainable development with cultural heritage conservation, in line with international practices in urban resilience.

7. CONCLUSIONS

The article has explored the strategies adopted by the city of Salamanca to face the challenges of climate change, urban sustainability and cultural heritage conservation. Through the analysis of the Low Emission Strategy, Savia Salamanca, the PEPIVB and other complementary initiatives, a commitment to urban transformation in line with the principles of resilience and sustainability that taken centre stage.

The implementation of measures in historic areas and the integration of nature-based solutions not only reinforces Salamanca's environmental value, but also demonstrates its willingness to protect its heritage. These actions reflect a model that seeks to balance contemporary demands with respect for the city's historical and cultural richness. As a connoisseur of this reality, I especially appreciate the fact that green solutions are starting to be implemented even in the historic centre, where expanding the vegetation are mitigating the effects of climate change is essential, especially given the rising temperatures during the increasingly frequent heat waves.

However, I have also identified fundamental shortcomings. I believe that there is still a lack of closer and more effective communication with citizens, as well as a shortage of greater accessibility to participatory processes. The strategies are well thought out, but their success depends, to a large extent, on their continuity over time and on making citizens feel that they are really part of them.

Compared to other cities such as Amsterdam or Quito, Salamanca presents a unique approach to integrating heritage into the sustainability discourse. Nevertheless, I believe there is still room for innovation, especially in how to connect its history with the present and future environmental challenges.

In short, this analysis has reaffirmed the idea that Salamanca can, and should, become a benchmark of urban heritage resilience. It is not enough to preserve the material legacy; it is necessary to adapt it, to make it habitable and sustainable for future generations. The balance between identity and transformation will be the key for the city to prosper in the 21st century.

REFERENCES

100 Resilient Cities, AECOM, Ayuntamiento de Quito (2017), *Estrategia de resiliencia. Distrito metropolitano de Quito*, retrieved from https://resilientcitiesnetwork.org/downloadable_resources/Network/Quito-Resilience-Strategy-Spanish.pdf.

Amat, Montesinos X. (2013), *La resiliencia del territorio alicantino: una interpretación desde la geografía ecocrítica*, Edit. Universidad de Alicante, Alicante, p. 24.

Anguelovski, Isabelle, Connolly, J.J.T., Pearsall, H., Shorky, Galia, Checker, Melissa, Maantay, Juliana, Gould, K., Lewis, Tammy, Roberts, J.T. (2019), *Why green "climate gentrification" threatens poor and vulnerable populations*, PNAS: Procedings of the National Academy of Sciences, **116**, *52*, pp. 26139–26143.

Arista-Castillo, Leticia, Barrera, Fernández, D., Hiriarto Pardo, C.A. (2023), *Significación de la cultura para la resiliencia sociourbana en contextos rurales patrimoniales*, Journal of Tourism and Heritage Research: JTHR, **6**, *2*, pp. 204–218.

Arup (2024), *City Resilience Framework 2024 Edition. Preparing for the next decade*, retrieved from https://resilientcitiesnetwork.org/downloadable_resources/Publications/City%20Resilience%20Framework%202024%20FINAL.pdf.

Ayuntamiento de Salamanca, retrieved January 17, 2025a, from https://www.aytosalamanca.es/w/zona-de-bajas-emisiones.

Ayuntamiento de Salamanca, retrieved January 17, 2025b, from https://aytosalamanca.es/zona-bajas-emisiones-fase-1.

Ayuntamiento de Salamanca, retrieved January 17, 2025c, from https://www.saviasalamanca.com/sites/default/files/2022-03/ZONA%20DE%20BAJAS%20EMISIONES%20SALAMANCA.pdf.

Ayuntamiento de Salamanca, retrieved January 17, 2025d, from https://aytosalamanca.es/transparencia/proyectos-europeos/prtr-y-fondos-next-generation.

Ayuntamiento de Salamanca, retrieved May 16, 2025e, from https://www.aytosalamanca.es/w/el-84-de-las-primeras-medidas-de-la-estrategia-de-infraestructura-verde-del-ayuntamiento-de-salamanca-est%C3%A1n-cumplidas-o-en-v%C3%ADas-de-ejecuci%C3%B3n.

Ayuntamiento de Salamanca, retrieved May 16, 2025f, from https://aytosalamanca.es/w/regeneraci%C3%B3n-de-barrios.

Ayuntamiento de Salamanca, retrieved May 16, 2025g, from https://www.aytosalamanca.es/w/el-ayuntamiento-de-salamanca-ampliar%C3%A1-la-red-ciclista-hasta-superar-los-100-kil%C3%B3metros-de-carril-bici%C2%A0.

Basurto-Cerdeño, Estefanía M., Pennington-Gray, Lori, Basurto-Cerdeño, X. (2016), *Adopción del pensamiento resiliente en destinos turísticos patrimoniales*, Revista Turydes: Turismo y Desarrollo, **21**, retrieved from https://www.eumed.net/rev/turydes/21/patrimonio.html.

Chelleri, L. (2012), *From the "Resilient City" to Urban Resilience. A review essay on understanding and integrating the resilience perspective for urban systems*, Documents d'anàlisi geogràfica, **58**, *2*, pp. 287–306.

Christopherson, Susan, Michie, J., Tyler, P. (2010), *Regional resilience: theoretical and empirical perspectives*, Cambridge Journal of Regions, Economy and Society, **3**, *1*, pp. 3–10.

Construible.es, retrieved May 16, 2025, from https://www.construible.es/2024/08/06/cerca-5-millones-euros-rehabilitacion-nivel-barrio-327-viviendas-salamanca?utm_source=chatgpt.com.

Corcho Bragado, E., Diosdado Calvo, Beatriz (2019), *Plan Especial de Protección de la Infraestructura Verde y Biodiversidad de Salamanca (PEPIVB). Documento I Memoria Vinculante. Memoria Informativa*, retrieved from https://drive.google.com/drive/folders/1ktzI8Ch8CkaP_4K3pxkg6zSrTM3DQx52.

Díez Bermejo, Ana, Hernández, Aja A., Sanz Fernández, Ana (2022), *Resiliencia urbana: discurso e institucionalización de un concepto*, Ciudades, **25**, pp. 1–18.

Economics of Climate Adaptation Working Group (2009), *Shaping Climate Resilient Development: a framework for decision-making*, retrieved from https://www.preventionweb.net/files/11138_ECAShapingClimateResilentDevelopmen.pdf.

European Enviroment Agency, retrieved 16 May, 2025, from https://www.eea.europa.eu/policy-documents/2030-climate-target-plan?utm_source=chatgpt.com.

European Union (2022), *Strengthening Cultural Heritage Resilience for Climate Change. Where the european green deal meets cultural heritage*, Publications Office of the European Union, Luxembourg, 5–8 pp.

Folke. C. (2006), *Resilience: the emergence of a perspective for social-ecological systems analyses*, Global Enviromental Change, **16**, *3*, pp. 253–267.

Genova. J., Sáenz. L., Caimanque. R., Kopelman. Tatiana, Navarrete. J. (2020), *Aprendiendo del desastre: Fortaleciendo la resiliencia de la ciudad a través del patrimonio cultural en Nueva Orleans*, Edit. Banco Interamericano de Desarrollo (BID), pp. 17–27 BID, retrieved from https://publications.iadb.org/en/publications/spanish/viewer/Aprendiendo-del-desastre-Fortaleciendo-la-resiliencia-de-la-ciudad-a-traves-del-patrimonio-cultural-en-Nueva-Orleans.pdf.

Gifreu i Font. Judith (2018), *Ciudades adaptativas y resilientes ante el cambio climático: estrategias locales para contribuir a la sostenibilidad urbana*, Revista Aragonesa de Administración Pública, **52**, pp. 102–158.

Gobierno de España (2021), *Plan de Recuperación, Transformación y Resiliencia*, retrieved from https://www.lamoncloa.gob.es/temas/fondos-recuperacion/Documents/160621-Plan_Recuperacion_Transformacion_Resiliencia.pdf.

Hiriart Pardo. C.A. (2018), *Estrategias de resiliencia y escenarios adversos para la recuperación turística y gestión del patrimonio del centro Histórico de Morelia, Michoacán, México (2011-2017)*, Intervención (Méx. DF), **9**, *16*, pp. 32–47.

Holling, C.S. (1973), *Resilience and stability of ecological systems,* Annual Review of Ecology and Systematics, **4**, pp. 1–23.

Lavola (2020), *Estrategias de adaptación al cambio climático de las ciudades CENCYL*, retrieved from http://www.rjgeo.ro./atasuri/article%20format_rjgeo.pdf.

Leichenko, R. (2011), *Climate change and urban resilience,* Current Opinion in Environmental Sustainability, **3**, *3*, pp. 164–168.

Life Vía de la Plata (2023), *Proyecto Layman*, retrieved from https://drive.google.com/file/d/13KkAzNrO-nWvqfiywy-pTdaWWZ11MLk6/view.

Méndez, R. (2011), *Ciudades y metáforas: sobre el concepto de resiliencia urbana*, Ciudad y territorio: Estudios territoriales, **44**, *172*, pp. 215–232.

Meerow, Sara, Newell, J.P., Stults, Melissa (2016), *Defining urban resilience: A review*, Landscape and Urban Planning, **147**, pp. 38–49.

Oficina Nacional de Prospectiva y Estrategia del Gobierno de España (Coord.) (2021), *España 2050: Fundamentos y propuestas para una Estrategia Nacional de Largo Plazo*, retrieved from https://www.lamoncloa.gob.es/presidente/actividades/Documents/2021/200521-Estrategia_Espana_2050.pdf.

Oliva, retrieved 16 May, 2025, from https://www.salamancahoy.es/salamanca/ciudad/mapa-salamanca-peatonal-290-calles-desequilibrio-centro-20250402100721-nt.html.

Palmer, R. (2018), *Athens City Resilience Through Culture*, retrieved from https://www.britishcouncil.gr/sites/default/files/athens-city-resilience-through-culture-full-report-april-2018.pdf.

Patronato Municipal de Vivienda y Urbanismo (2022), *Plan de Acción Local. Agenda Urbana de Salamanca*, Edit. Ayuntamiento de Salamanca, Salamanca.

Potts, A. (2021), *El papel de la cultura en el desarrollo resiliente al clima*, retrieved from https://agenda21culture.net/sites/default/files/files/documents/es/report_10_-_culture_and_climate_resilient_development_-_es.pdf.

Quito Informa, retrieved December, 2024, from https://www.quitoinforma.gob.ec/2024/12/02/mas-verde-seguro-y-habitable-la-primera-fase-de-recuperacion-del-centro-historico-se-entrego-este-lunes/.

Redeus-Lac (2024), *Rehabilitación del centro histórico*, retrieved from https://redeus.org/plataforma-idus-2-rehabilitacion-del-centro-historico/.

Resilient City Network (2023), *Our Story*, retrieved from https://resilientcitiesnetwork.org/our-story/#.

Ruiz Barajas Carol, Andrea (2018), *Patrimonio, paisaje y resiliencia. Un encuentro en lo colectivo*, Millcayac: Revista Digital de Ciencias Sociales, **5**, *9*, pp. 321–334.

Simon, M. (2024), *Las ciudades esponja del futuro recolectarán agua de lluvia en las azoteas*, retrieved from https://es.wired.com/articulos/ciudades-esponja-del-futuro-recolectaran-agua-de-lluvia-en-las-azoteas.

Troitiño Vinuesa, M.A. (2010), *Ciudades Patrimonio de la Humanidad y turismo: un marco general de referencia,* en *Dinámicas funcionales del turismo y sus impactos en las ciudades Patrimonio de la Humanidad: estudios comparados entre México y España* (coord. Troitiño Vinuesa M.A., de la Calle Vaquero M., Ruiz Lanuza A., Hiriart Pardo C.A.), Edit. Universidad de Guanajuato, México, pp. 13–36.

Troitiño Vinuesa, M.A., Troitiño Torralba, Libertad (2013), *Planificación de destinos patrimoniales del interior*, en *Turismo de interior. Planificación, comercialización y experiencias* (coord. Melgosa Arcos F.J.), Edit. Pirámide, Madrid, pp. 97–118.

United Nations (2011), *Recomendación sobre el paisaje urbano histórico*, retrieved from https://whc.unesco.org/uploads/activities/documents/activity-638-100.pdf.

United Nations Climate Change Secretariat (2017), *Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework Disaster Risk Reduction 2015-2030*, retrieved from http://www.rjgeo.ro./atasuri/article%20format_rjgeo.pdf.

United Nations International Strategy for Disaster Risk Reduction (2012), *Como desarrollar ciudades más resilientes. Un Manual para líderes de los gobiernos locales*, United Nations, Ginebra, p. 8.