

Applying Sustainability Measures to Heritage Conservation In De Pere, WI

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Table of Contents

1 Introduction and Problem Statement	4
1.1 Aim of Study	5
1.2 Research Questions	5
2 Methodology	5
2.1 Pilot Study	6
2.2 Literature Review	7
Table 1. Keywords by Themes	7
2.3 Case Studies	7
3 Results and Discussion	7
3.1 Pilot Study	7
3.1.1 Summary	8
3.1.2 Summary of Literature Review	8
Table 2 Summary of Literature Review	8
3.1.3 Analysis and Findings	9
3.2 Literature Review	10
3.2.1 How are Heritage Conservation and Sustainability Intertwined?	10
Table 3 United Nations Foundation Sustainable Development Metric	11
Table 4 Selected Tools and Documents of Heritage-related Indicators	12
3.2.2 Good Design and Recommended Features	13
3.3 Application of Heritage Conservation Principles to Local Cases	14
Table 5 Proposed Approach for Site 1	16
Table 6 Proposed Approach for Site 2	17
Table 7 Proposed Approach for Sites 1 & 2	17
4 Challenges	18
5 Conclusion	18
References	20

Abstract

Heritage conservation is essential to preserving the cultural and historical identity of a specific place. Small towns and communities are losing their individuality as the world becomes more homogenized and globalized. This paper aims to examine and discuss the heritage conservation efforts in De Pere, Wisconsin, as an example to understand the challenges and opportunities faced by small communities in preserving their unique sense of place. It also addresses the misconception that it is difficult and inefficient to retrofit old buildings into energy-saving structures. It highlights the possible overlap between historical preservation and sustainability objectives and makes the case that these two aims can be reconciled through innovative and adaptable techniques. Through analysis of the preliminary pilot study data and a literature review into the various approaches and strategies that have been used in conservation, techniques are extracted and applied to De Pere, Wisconsin. Beyond implementation the paper hopes to maintain the heritage conservation should be considered conservatively, considering the true needs of the community based on occupancy rates, income, price points, safety, and other factors. This study aims to convey that heritage conservation and old building reuse is the most sustainable option to preserve America's small towns unique heritage.

Keywords: heritage conservation, retrofit, sustainability, revitalization

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1 Introduction and Problem Statement

The downtown areas of small American towns have experienced a significant decline over the last 40 years. Various factors have contributed to this decline, such as urban sprawl, suburbanization, the rise of online shopping, and the decline of manufacturing industries (Mc Mahon, 2016). This decline has led to the underuse and sometimes dereliction of historic buildings that give communities their unique sense of place. This paper examines the role of heritage conservation in addressing the decline and current revitalization efforts of America's downtowns and how it can be tied to sustainability, using De Pere, WI as a case study throughout.

Preserving a building is often called the ultimate recycling project, yet preservationists commonly fight the misconception that historic buildings are inefficient and require daunting corrective measures to retrofit for energy saving devices and systems (WBDG,2023). Sustainable design and green initiatives like Leadership in Energy and Environmental Design (LEED)¹ have risen in popularity in new construction and preservation sectors. Green initiatives and heritage conservation goals overlap providing that both sides can be flexible in design while adhering to code standards. Combining these goals can ensure that communities retain their sense of place through preservation² while also implementing energy saving measures that can benefit them well into the future. The purpose of this paper is to explore how these initiatives can support and be integrated into the city of De Pere's revitalization efforts.

¹ This paper focuses on sustainable design and will use the acronym 'LEED' for 'Leadership in Energy and Environmental Design' throughout.

² This paper focuses on heritage conservation and uses the terms 'heritage conservation' and 'preservation' interchangeably.

1.1 Aim of Study

This paper assesses preliminary data from a pilot study conducted within the city of De Pere, WI. It supports the findings with literature references from nationwide heritage conservation efforts and green building initiatives in similar sized downtowns and applies the techniques to the city of De Pere.

1.2 Research Questions

The present study aims to answer four research questions:

1. What is the importance of heritage conservation and sustainability in the long run for a community?
2. What techniques can be used to achieve sustainability-based heritage conservation?
3. What are the most significant heritage sites in De Pere, and what are the current conservation efforts being implemented to preserve them?
4. How can heritage conservation and sustainability improve the lives of residents in smaller communities?

The following sections will contain the methodology used, review findings and results, and discuss how heritage conservation and sustainability can coexist through various projects.

2 Methodology

This paper utilizes a mixed-methods approach, literature review and pilot study analysis, to answer the research questions. This refers to the ways in which qualitative (observations, documents, and interviews) and quantitative (survey responses and trends) research activities are brought together to achieve greater insight. Mixed methods are not simply having quantitative and qualitative data available or analyzing and presenting data findings separately. The integration process can occur during data collection, analysis, or in the presentation of results (Meissner, 2017).

2.1 Pilot Study

A pilot study conducted in the city of De Pere examined the possibility of combining heritage conservation and sustainability to revitalize the downtown area through a mixed methods approach. Primary data was collected through a questionnaire and distributed to residents and government officials of the City of De Pere during a town hall meeting. This study focused on the needs and wants of residents within the structure of government regulations, code compliance, and preservation standards.

2.2 Literature Review

The objective of the literature review is to contextualize the relationship between heritage conservation, sustainable built environments, and the use of urban space while attempting to provide thorough answers to the research issues. The study-specific review looks at the body of work regarding factors to be considered during the design and implementation process. Google Scholar and the University of Arizona Libraries website were used to search literature with keywords such as: 'heritage conservation and sustainable development,' 'heritage conservation America's downtown,' 'economic and social aspects of sustainability,' and 'preservation guidelines.' *Table 1.* organizes the keywords used by themes with a summarization. The sources for literature collection include books, manuals, guidelines, articles, and reports from organizations dedicated to historic preservation, federally funded research programs.

Table 1. Keywords by Themes

<i>Theme</i>	<i>Keywords</i>
Heritage Conservation	Importance, green, resurgence, history, misconceptions
Sustainability	Urban design, architecture, design guidelines, goals, LEED
Energy Saving	Green initiatives, energy use, policies
Public Realm	History, placemaking, community space

2.3 Case Studies

Findings of elements of good practice were carefully chosen to illustrate potential improvements to heritage conservation procedures in De Pere, Wisconsin, in addition to the literature research and pilot study analysis. Noting that the case studies chosen are not all-inclusive and are only used to illustrate areas that can be improved upon the city's goals for sizable improvements that are outlined in its strategic downtown revitalization plan are not discounted.

3 Results and Discussion

3.1 Pilot Study

3.1.1 Summary

A pilot study was conducted in 2023 in the city of De Pere, WI to study the relationship between heritage conservation and sustainability through a cross-sectional mixed-methods approach. To determine whether there was a correlational relationship between heritage conservation and sustainability, a literature review of the most recent research was first carried out. Data was collected through a questionnaire and distributed to a sample population of the target population in government and residents.

3.1.2 Summary of Literature Review

The original pilot study literature review evaluated past research of the relationship between sustainability and heritage conservation in America's downtowns. *Table 2* summarizes the findings.

Table 2. Summary of Literature Review

<i>Source</i>	<i>Findings</i>
Mc Mahon, 2016	1. Downtown revitalization creates places of shared prosperity, access to opportunity, and engagement while maintaining places of historical importance.
Brooks, 2013	<ol style="list-style-type: none"> 1. More than half (55%) of Americans would choose to live in a smaller house in a walkable neighborhood over a larger house in an area inhospitable to pedestrians. 2. About two-thirds (65%) think it is important to live in an established neighborhood with older homes and mature trees, similar to those found in and around rural downtown.
National Trust for Historic Preservation, 2014	<ol style="list-style-type: none"> 1. Despite a place's cultural significance, many areas face a range of challenges and threats. Including development pressure, demolition of historic properties, displacement of current residents, and zoning changes. 2. These challenges impact affordability, cultural riches, and character.

3.1.3 Analysis and Findings

The pilot study studied quantifiable data of historic downtown De Pere’s amenities. These include walkability, age of established homes and landscaping, cultural significance, and environmentally friendly, sustainability factors. The results showed that the age of established homes and landscaping ranked as most important to residents with a 75% rating as “very important”; walkability of the area ranked “important” by 50% of the respondents, cultural significance was ranked “important by 50% of the residents, and “sustainability” was ranked as “slightly important and “not important” by an equal 25% of residents.

These results line up the University of Cambridge (2012) study that conservation serves not only the environmental, but also the economic and social aspects of sustainability. The study surveys rural downtown residents and church goers to compare and contrast what is important to them in their experiences of their city and which environmental features would be the highest on their list. The most important features to residents were history and sustainability, to retain the sense of place and uniqueness while not relinquishing it to modernity for the sake of sustainability.

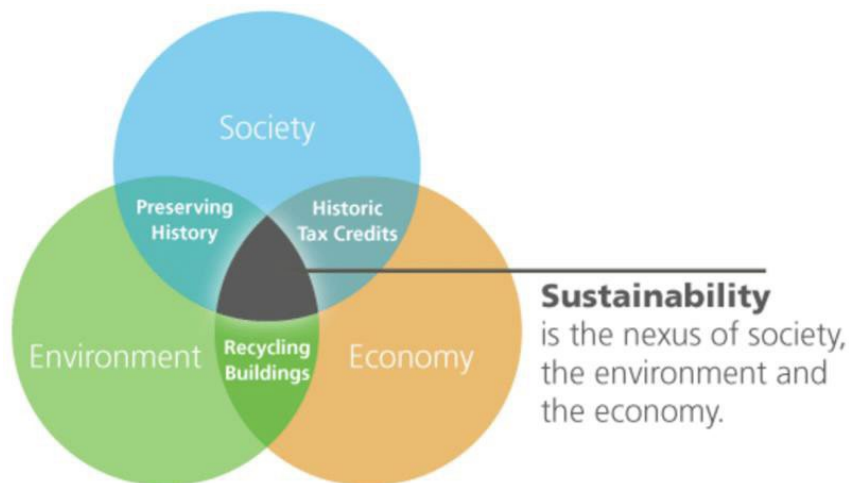
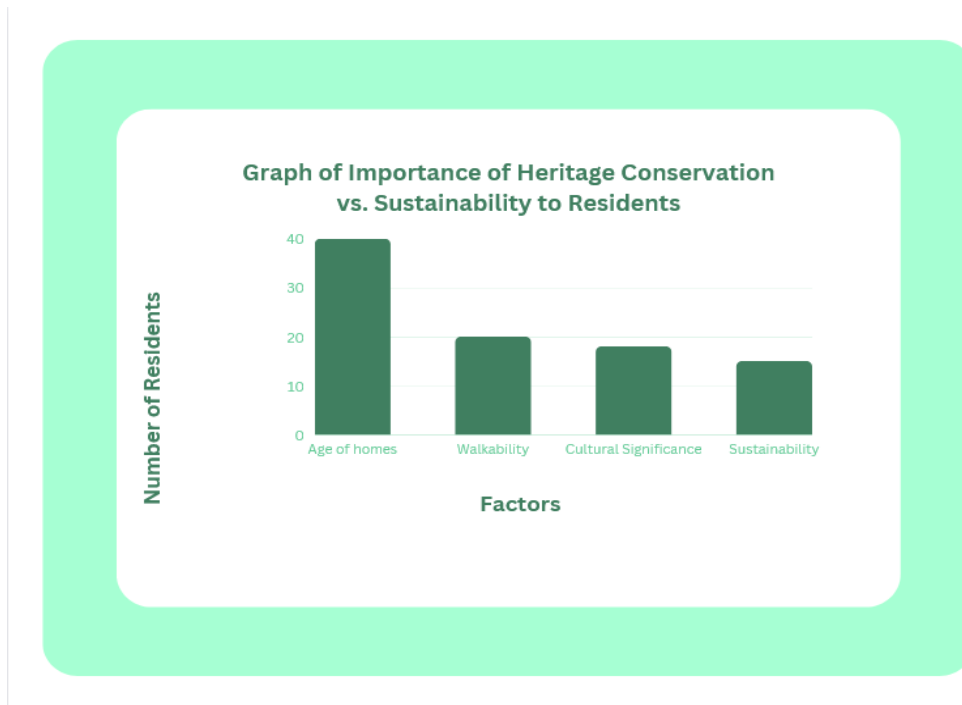


Figure 1. Graph of Importance of Heritage Conservation vs. Sustainability (n=50)



3.2 Literature Review

3.2.1 How are Heritage Conservation and Sustainability Intertwined?

This section will review different types of data provided by the United Nations Foundation in conjunction with their Sustainable Development Goals (SDG) program under goal eleven and in prior research assessing the sustainability of heritage conservation. To focus on the sustainability aspects of preservation and how residents interpret it, any performance based on ASHRAE standards or energy ratings was excluded from the search. Metrics that focused on qualitative aspects, but may still include quantitative measurements, were considered relevant and included in this review.

The first metric is a basic outline of what is considered a successful downtown with historical elements intact. This is a basic example of an untouched downtown area, usually in a rural area. A simple checklist can be used to compare and contrast other cities.

Table 3. United Nations Foundation (2015) Sustainable Development Metric

<i>Considerations</i>	<i>Elements</i>
1. Resisting Cultural Homogenization	<ul style="list-style-type: none"> - Less cultural standardization - Retain relation to cultural specificities - Retain sense of place & diversity - Geographical, social, economic, environmental uniqueness - Safeguard & nurture cultural specificities of location
2. Preserving Climate Responsive Buildings	<ul style="list-style-type: none"> - Historic buildings are climate friendly - Employ passive design techniques; solar orientation, compactness, layout, window sizing and location - Traditional architecture is low-impact to start, retrofitting would be minimal
3. Incubating Local Traditions and Values	<ul style="list-style-type: none"> - Architecture embodies communal meanings, values, beliefs, and traditions passed down generations - Acts as a collective database that can not be recreated - Regenerate these areas by including arts, food, music, and performance
4. Strengthen Community Inclusion	<ul style="list-style-type: none"> - Bond communities together by shared lineage and destiny - Create a sense of belonging in societies - Create a sense of pride and ownership - Helps communities pass down values and solidifies intergenerational connection
5. Conserving Resources and Reducing Waste	<ul style="list-style-type: none"> - Valuable resources preserved by not destroying neighborhoods - Need for raw material extraction and associated energy is reduced - Downstream value chain manufacturing and transport energy use is reduced - Construction waste is diverted from landfills - Costs of demolition and construction can be diverted to the community
6. Developing Tourism and Diversifying Jobs	<ul style="list-style-type: none"> - Diversify the local economy - Historic neighborhoods become assets with their intrinsic value - Stimulate economic growth as unique destinations - Other sectors benefit from the increased foot traffic
7. Improving Spatial Attractiveness and Property Values	<ul style="list-style-type: none"> - Tourism equates higher property values - Increased tax revenues for the city - Spatial attractiveness is achieved by retaining the unique blends of architectural influences and qualities

142 heritage-related indicators were found in the 26 documents and tools that were analyzed, as set out in the table below *Table 4* (Appendino, 2021). The initial summary emphasizes that there are only a limited number of indicators, particularly with regard to the assessment instruments. Even though there are more indications of culture in these instruments, they still fall short of providing a comprehensive measurement of the advantages of heritage conservation for environmental, economic, and social sustainability. The explanatory variables were treated as continuous and analyzed to determine which features increased the likelihood of a town adopting sustainable practices in preservation and representing what the sample group perceived to be admirable features of historic downtowns.

Table 4. *Appendino List of Selected Tools and Documents of Heritage-related Indicators (2021)*

<i>Organization</i>	<i>Heritage/ Sustainability Indicators</i>
1. BREEAM Communities	<ul style="list-style-type: none"> - A review of the area surrounding the proposed development is undertaken to establish the key aspects of the local character - The designer/developer has demonstrated that the key elements identified in the review and consultation will be implemented in the design of the site - Members of the local community and appropriate stakeholders have been identified for consultation - An assessment of any existing buildings and infrastructure (including their materials) is carried out to determine what can be refurbished, re-used, recycled or maintained - The developer commits to recycling building and/or infrastructure materials and (where possible) using the materials on the development site
3. LEED for Neighborhood Development	<ul style="list-style-type: none"> - Includes a historic building(s), and rehabilitates if necessary - Reuses and restores at least 20% of the existing building stock
4. CASBEE for Urban Development	<ul style="list-style-type: none"> - Conservation and use of historical, cultural, and natural assets - Formation of urban context and scenery - Harmony with the surroundings - Conservation of the built environment
5. City Keys	<ul style="list-style-type: none"> - Connection to the existing cultural heritage - Design for a sense of place - Preservation of cultural heritage
6. UN Sustainable Development Goals	<ul style="list-style-type: none"> - Strengthen efforts to protect and safeguard the world's cultural and natural heritage - Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and

local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship).

7. UN Monitoring Human Settlements
with Urban Indicators

- Number of buildings in city on heritage or monuments lists
 - Expenditure in rehabilitation and upgrading of buildings in city on heritage or monuments lists
 - Incentives to private owners for rehabilitation and upgrading of buildings in urban areas part of cultural heritage
-

This section gave a broad review of metrics, ranging from simple assessments that focus solely on function to more elaborate ones that consider environmental and placemaking factors. When we compare the measures, we can observe that the United Nations Foundation (2015) and Appendino, (2021)'s metrics consider how a historic district's surroundings effect the community and the general public's impression of the area, but not how sustainable it is. Sustainability is both a necessary element and a clear objective of people-centered development. A sustainable society must have self-sustaining social and economic structures, which are essential components of people centered development and design.

3.2.2 Good Design and Recommended Features

As mentioned above, city planning and green initiatives specifically design guidelines for public spaces to create human centered environments, which was the original goal of downtown areas. Focusing on walkability, placemaking, community, and historic preservation are long standing issues of city planning. It is worth considering the inherent costs and constraints of building reuse in historic neighborhoods beyond the factors polled by the community members, this consideration will quantify the overall values of built environment reuse and its impact on sustainability.

3.3 Application of Design Principles to Local Cases

This section will apply the above compliance guidelines and strategies to two buildings in De Pere's downtown historic district. They are both mixed zoning for commercial and residential and both present issues of historic district guidelines non-compliance that can be remedied with reuse and new construction. The main criteria in selecting which criteria to use comes from the City of De Pere Master Plan (2018) and guidelines from the above organizations with interest in sustainability and heritage conservation. These sites were selected based on their size and the impact they can have on the community, housing numbers, and new business opportunities in a walkable area.

The current zoning for these two areas is B1 (central business district), this does not accurately represent the diverse and neighborhood sensitive scale. A more aligned district would focus on building a Neighborhood Pedestrian Commercial District or a commercial district to use in combination with housing developments. Federal tax incentives, the preference of residents in urban districts, and examples of other successful mixed used heritage conservation efforts can encourage city zoning officials of safe, residential use of upper levels of buildings with street facing retail. The city should provide technical assistance to help downtown property owners to re-habilitate downtown structures. The city should also consider reasonable design standards to guide reuse and rehabilitation projects (De Pere, 2018).

Site 1

Present Condition

Source: Author’s own

Location: 480 N. Broadway St.



Site 1 Analysis

1. Empty strip mall
2. On main thoroughfare
3. Retail, parks, and river access nearby
4. 4 acres of developable land dual zoned
5. Does not fit in with surrounding historic district

Precedent Study

Source: Leslie, 2022

Location: El Camino Real, CA



1. Easily identifiable yet not out-of-place with surroundings
2. Mixed use
3. Improved walkability
4. Increased housing and retail
5. Not out of place with the surroundings

Table 5. Proposed Approach for Site 1

<i>Techniques</i>		<i>Implementation</i>
Design Guidelines	Build-to Lines	- A range of minimum and maximum setbacks that encourage buildings to be located near the street, and prevent separation by large parking areas
	Hide Parking Lots	- Encourage parking locations and designs that limit the amount of parking directly visible George Street, or provide a landscaped edge along the street.
	Sustainable Landscapes	- Internal parking lot landscaping and establish maximum impervious surface percentages on a site.
	Uniform Landscaping	- Provide specific landscaping requirements for front yards between the building façade and the street property line
	Pedestrian Walkways	- Require a clear, safe, and defined path from public sidewalks to the primary entrance of adjacent buildings.
	Signage	- Establish neighborhood-scaled sign and street graphic standards that place business identification signage at or near the ground plane, or use small, well-designed projecting signs attached to buildings.

Site 2

Present Condition

Location: 100 S. Broadway

Source: Press Gazette, 2019



Site 2 Analysis

1. Mixed zoning area
2. 3 building structure
3. Access to bike trail and river
4. Main thoroughfare
5. High walkability score
6. No restoration possible, but adjoining to existing structures is possible

Precedent Study

Source: Leslie, 2022

Location: El Camino Real, CA



1. Easily identifiable yet not out-of-place with surroundings
2. Mixed use
3. Improved walkability
4. Increased housing and retail
5. Not out of place with the surrounding architecture

Table 6. Proposed Approach for Site 2

<i>Techniques</i>		<i>Implementation</i>
Guidelines	Transitions	- Unmanaged expansion of commercial uses can degrade adjacent residential areas, and neighborhoods adjacent to shallow commercial corridors like this. The current districts do not require buffering or other methods that can manage the commercial/residential transition
	Zoning Overlay Districts	- Establish clear limits on the expansion of non-residential uses north or south of their existing lines - Allowing no new non-residential uses north of James Street or south of Charles Street.
	Limited Local Historic Districts	- Mandatory use of existing structures - Prohibition of off-street parking in yards oriented to streets - Limitation to low-intensity office use.

Table 7. Proposed Approach for Site 1 & 2

<i>Techniques</i>		<i>Implementation</i>
Historic Preservation & Restoration	Flexible Building Codes	- Encourage upper-level residential use
	Gap Financing	- Provide gap financing for major rehabilitation projects - Appropriate historic rehabilitation may not be possible without financial assistance - Historic tax credits - Tax increment financing - Community Development Block Grants - HOME Housing Investment Partnership Funds - Preservation Easements for building facades
	Retain Character	- Respect existing character of the district - New construction retains street orientation - Use design guidelines, Secretary of the Interior Standards - Preserve scale, materials, and character of traditional architecture

4 Challenges

Heritage conservation and sustainability projects in small cities face a number of difficulties, such as:

1. **Limited resources:** The scope and efficacy of conservation projects may be constrained in small cities due to a lack of financial and human resources to devote to heritage preservation. **Lack of knowledge:** Small cities might not have access to specialized information or expertise regarding heritage conservation, which might restrict their ability to create and implement efficient conservation policies.
2. **Minimal public awareness:** It may be difficult to obtain support for conservation efforts in small cities due to little public understanding of or appreciation for the significance of cultural assets.
3. **Demographic shifts:** The perceived significance and viability of small communities may be impacted by demographic shifts, such as diminishing numbers of population or changing economic priorities.
4. **Regulatory issues:** They might encounter issues with zoning, building ordinances, or other rules that restrict the capacity to preserve historical landmarks or buildings.
5. **Private property ownership:** In small towns, heritage sites or buildings may be owned by private people or businesses, which might restrict the ability of governmental bodies or conservation organizations to take action to ensure their preservation.

Addressing these challenges may take a collaborative and imaginative approach to overcoming these obstacles, forming partnerships with private businesses, nonprofits, and community groups to pool resources and knowledge. Through educational programs, community events, and outreach campaigns, public knowledge of and support for heritage conservation projects will increase. The long-term sustainability of heritage conservation programs in small cities can also be supported by overcoming regulatory obstacles and identifying sources of funding for conservation efforts.

5 Conclusion

As a result, the pilot study conducted in De Pere, Wisconsin, offers proof that heritage conservation and sustainability are correlated. The results of the study indicate that, over walkability, cultural relevance, and sustainability, the age of established residences and landscaping rank as the features that inhabitants value most highly. These findings are consistent with earlier studies and demonstrate that sustainability's financial and societal aspects are well supported by heritage conservation efforts. The literature review further emphasizes the value of heritage preservation in safeguarding important historical sites while fostering shared prosperity, access to opportunities, and engagement.

The literature review further demonstrates a connection between heritage preservation and sustainability, with preservation of heritage sites being essential to advancing sustainable development. Metrics provided by the Sustainable Development Goals program of the United Nations Foundation emphasize the significance of maintaining cultural distinctiveness, preserving climate-responsive structures, nurturing regional customs and values, enhancing community inclusion, conserving resources, promoting tourism, and diversifying employment. These measures

show that historical preservation and sustainability are not diametrically opposed but rather beneficial to one another.

In conclusion, the literature review and the pilot study conducted in De Pere, Wisconsin show how crucial heritage preservation is to expand sustainable development. It is essential to protect the cultural and historical relevance of our built environment as cities develop and thrive. Through the promotion of social, economic, and environmental sustainability, heritage conservation can be a key factor in achieving sustainable development. We can design more livable and sustainable cities for the current generation as well as future generations by understanding the connections between cultural preservation and sustainability.

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