

BUILDING A BETTER FUTURE ON THE FOUNDATIONS OF THE PAST:
INCORPORATING HISTORIC DISTRICTS INTO ECOCITIES

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In an effort to become more sustainable, many cities are embarking on ecocity projects: city-wide urban projects intended to minimize environmental impacts as a result of urban development through a combination of environmental policy and urban planning. This thesis discusses how the ecocity movement can complement and conflict with historic preservation. The case studies of Strasbourg, France and Alexandria, Virginia shed light on how preservation can be successfully incorporated into ecocity plans. A best practices guide, synthesized from the case studies, outlines how preservation should be incorporated in the various planning stages to further a city’s sustainable goals. This thesis concludes that in many cases preservation goals and the sustainable goals identified in ecocity plans align, but without the inclusion of and collaboration with preservation professionals during the early planning stages, preservation can be left out of ecocity plans and historic fabric can ultimately be threatened by new “sustainable” development.

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Introduction

“Over 50% of the world’s population lives in cities, and although covering only 3% of the world’s land mass, they consume 75% of the world’s resources and emit a corresponding proportion of greenhouse gas emissions.”¹

Despite any benefits that have been gained by current environmental policies, a growing population consuming higher levels of fossil fuels and resources results in an unsustainable situation. Local policies must become more interconnected with other levels of government, more must be known about actual results from implemented strategies, and overall behaviors in everyday life must change to truly make a difference in resource conservation, reduction of pollution, and preservation of undeveloped land. In an effort to become more sustainable, many cities are embarking on ecocity projects: city-wide urban projects intended to minimize environmental impacts as a result of urban development through a combination of environmental policy and urban planning. However, many ecocity projects do not consider preservation a relevant part of their plan and so do not engage local preservationists or use preservation as a way to reach their specific sustainable goals. Preservation does have the potential to align with the sustainable goals of ecocities, but without increased preservation advocacy and collaboration between preservationists and governmental departments, it will not be adequately incorporated into ecocity plans, leaving historic resources susceptible to destruction. This thesis will explore the potential conflicts and compatibilities between historic preservation and typical ecocity plans, culminating in a best practices guide that outlines how preservation should be included in the

¹ Seymoar, Nola-Kate, Zoe Mullard and Marena Winstanley. “City-to-city Learning.” *Sustainable Cities International*, Aug. 2009. Web. 22 Dec. 2012.

various planning stages to further a city's sustainable goals. Knowledge of the compatibility between preservation and the ecocity movement, as well as the potential conflicts, will be advantageous for preservationists. It will allow them to come to the table at the beginning of the planning stages with evidence to support the preservation of historic districts within ecocities. This thesis is therefore primarily intended for an audience of preservationists and planners. It will discuss the areas in which the typical ecocity planning framework must be altered to utilize preservation as a tool to further sustainability within cities, but it will also shed light on areas in which preservationists themselves must alter their thinking in regards to change. Preservationists must become more flexible and work with planning authorities and developers if the field is to remain relevant. It may seem that ecocities, which can involve new development, are bad for preservation, but this is not strictly the case; weak heritage legislation, a lack of specific ecocity standards, and the lack of communication between preservationists and urban planners are the primary reasons that historic resources within ecocities are at risk.

"Ecocity" is a recently coined term defined in various ways. There is currently no globally accepted definition, framework, or standards with which to identify and evaluate an ecocity. This is a problem with labeling cities as "ecocities" because, although many steps are taken to try to make the urban environment more sustainable, there needs to be a way of measuring the actual results obtained from sustainable policies to determine where, or if, improvements are needed. A lack of standards also means that any city can technically label itself as an ecocity without being required to successfully implement sustainable changes or be held accountable for any claims it may make. Without this framework and set of standards, the ecocity label could be appropriated by individuals with agendas that may not be aimed at truly

bettering the urban environment or that may be contrary to the best interests of historic preservation.

During the 2008 Ecocity World Summit, which is a meeting for sustainable practitioners from many different fields, an official definition of an ecocity was developed.² For the purposes of this paper, this definition will be used to analyze how well preservation aligns with standard ecocity practices. According to the group of professionals in attendance that year, in order for a city to label itself as an ecocity it must address the following:

Ecological security - clean air, and safe, reliable water supplies, food, healthy housing and workplaces, municipal services and protection against disasters for all people.

Ecological sanitation - efficient, cost-effective eco-engineering for treating and recycling human excreta, gray water, and all wastes.

Ecological industrial metabolism - resource conservation and environmental protection through industrial transition, emphasizing materials re-use, life-cycle production, renewable energy, efficient transportation, and meeting human needs.

Ecoscape (ecological-landscape) integrity - arrange built structures, open spaces such as parks and plazas, connectors such as streets and bridges, and natural features such as waterways and ridgelines, to maximize biodiversity and maximize accessibility of the city for all citizens while conserving energy and resources and alleviating such problems as automobile accidents, air pollution, hydrological deterioration, heat island effects and global warming.

Ecological awareness - help people understand their place in nature, cultural identity, responsibility for the environment, and help them change their consumption behavior and enhance their ability to contribute to maintaining high quality urban ecosystems.³

The same group that created the Ecocity World Summits is currently working on the International Ecocity Framework and Standards (IEFS), the first attempt at a globally recognized set of ecocity standards that is still in its early phases. With established definitions and standards

² This summit was held in San Francisco, California and the location changes yearly.

³ "Ecocity World Summit 2008." *Ecocities*, 2008. Web. 12 Oct. 2012.

a city can measure its success and consider different strategies that may help it reach its goals. Since the IEFS is so early in its creation, there is still time for preservationists to engage ecocity practitioners in an effort to make historic preservation a tool with which to reach their sustainable goals. Although the work of the IEFS group has still not resulted in universally accepted definitions and standards, their framework and standards will be more fully explored in later chapters to determine how historic preservation can align with ecocity goals. The 2008 Ecocity World Summit definition was ultimately selected as the framework through which preservation's compatibility with ecocities will be analyzed because it was created by an international group and the IEFS, which has the potential to become the global ecocity standard, was based on that same definition.

Ecocities are currently sprouting up around the globe. There is no source that lists each and every ecocity, but several include: Vancouver, British Columbia, Canada; Montréal, Québec, Canada; Yangzhou, China; Alexandria, Virginia, U.S.; Treasure Island, California, U.S.; Arcosanti, Arizona, U.S.; Portland, Oregon, U.S.; Seattle, Washington, U.S.; Strasbourg, France; Kehl, Germany; Masdar City, Abu Dhabi, United Arab Emirates; Waitakere City, New Zealand; and Clonburris, Dublin, Ireland. Preservation is part of the ecocity plans in some of these cities; the preservation elements of Alexandria, Yangzhou, Kehl, and Strasbourg will be discussed in more detail within the following sections. Alexandria, Virginia and Strasbourg, France in particular will be analyzed within the case studies chapter in order to determine the best practices for using preservation as a tool during the creation of sustainable ecocity projects. These two projects were chosen due to the prominent role preservation played within the various planning stages and policies of each project. However, not all preservationists within ecocities are

engaging planners or other sustainable authorities; “locally there isn’t any historic preservation community engagement on this issue...[there is an] engagement gap.”⁴

Some of these plans, such as Vancouver’s “Greenest City: 2020 Action Plan,” mention the importance of improving the efficiency of existing buildings however there is no mention about historic preservation itself or what values historic neighborhoods can bring to the table. The Vancouver Heritage Foundation created its own report to stress the link between preservation and sustainability, extensively surveying the public on what they thought about the subject and if they valued their city’s historic buildings. It was discovered that many Vancouver residents valued their historic buildings and believed they should be a part of the city’s sustainable plans. A set of recommendations originated from the report that included creating projects targeted at making historic buildings more efficient, instigating a dialogue between preservationists and local government in Vancouver, and ideally having the Vancouver Heritage Foundation involved with all planning decisions that affect heritage properties. “While this might not come down to advocating for specific properties, it would include having a representative from the organization participate on all major committees and in public consultation processes.”⁵ Such collaboration between preservationists and local authorities needs to take place in order to increase the efficiency of the entire building stock as a whole while protecting significant physical historic elements and cultural heritage imbued within these sites.

To label a building or city as sustainable, one can look beyond environmental sustainability to encompass economic and social sustainability as well. Preservation has the ability to hit on each of these three sustainable platforms. Historic buildings are often thought of

⁴ Green, J. “Aligning Historic Preservation and Sustainable Design.” *The Dirt: Uniting the Built and Natural Environments*, 28 Mar. 2011. Web. 6 Mar. 2013.

⁵ “Conserving Heritage Buildings.” *Vancouver Heritage Foundation*, 2012. Web. 6 Mar. 2013.

as an inherently sustainable due to their use of organic, local materials, the presence of embodied energy, and the positioning and design of the building to take advantage of its surrounding environment.⁶ *The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability* provides a set of guidelines for individual historic buildings in the United States and dictates how they can become more efficient without destroying their integrity. Numerous studies have also shown that, through specific retrofits, many historic buildings can exceed newly built "sustainable" buildings in terms of operational efficiency. Historic districts also have the potential to tap into economic sustainability, by fostering tourism, and social sustainability, by bolstering a community's identity.⁷ This is something that non-historic districts within a city will typically not be able to do. Ultimately, historic buildings can offer a myriad sustainable benefits to ecocities so historic districts should not be compromised for new "sustainable" development.

⁶ "Sustainability." *National Park Service*, 2012. Web. 12 Oct. 2012.

⁷ The sustainable benefits of historic districts will be discussed in more detail within the body of this paper.

Chapter 1: The Issue of Sustainability

“The state of the urban landscapes we live in is a testament to the popular perception that natural processes have little significance for or relevance to design process and form...What makes rational environmental sense, it would seem is usually achieved only when change is perceived as absolutely necessary to survival.”⁸

With a rapidly growing population and rapidly depleting resources, it is no surprise that the issue of sustainability has steadily been making its way to the forefront of concerns. In just twelve years, from 1975-87, the world’s population grew by nearly one billion people and, though the rate of growth will decline, the human population is expected to expand from just over 7 billion today to almost ten billion by 2050.⁹ A growing population means a growing need for housing across the country, including urban areas. The urban population alone multiplied tenfold during the 20th century.¹⁰ As the need for housing increases within cities, which typically have limited space, developers and planners must look to sustainable practices when making city planning decisions in order to mitigate pollution, declining environmental quality, noise, vanishing open spaces, and other general threats to the quality of life for city residents. One way in which planners are anticipating solving this issue is through increased population density in city centers, near public transport and already-built up areas with nearby amenities.

⁸ Platt, 41-43.

⁹ Platt, Rutherford H. and Rowan A. Rowntree. *The Ecological City: Preserving and Restoring Urban Biodiversity*. Amherst: University of Massachusetts Press, 1994. Print.

¹⁰ Platt, 1.

In 1987 sustainable development was defined by the *Report of the World Commission on Environment and Development* as that which “meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹¹ It hinges on the primary factors of environmental, economic, and social sustainability and their overlapping

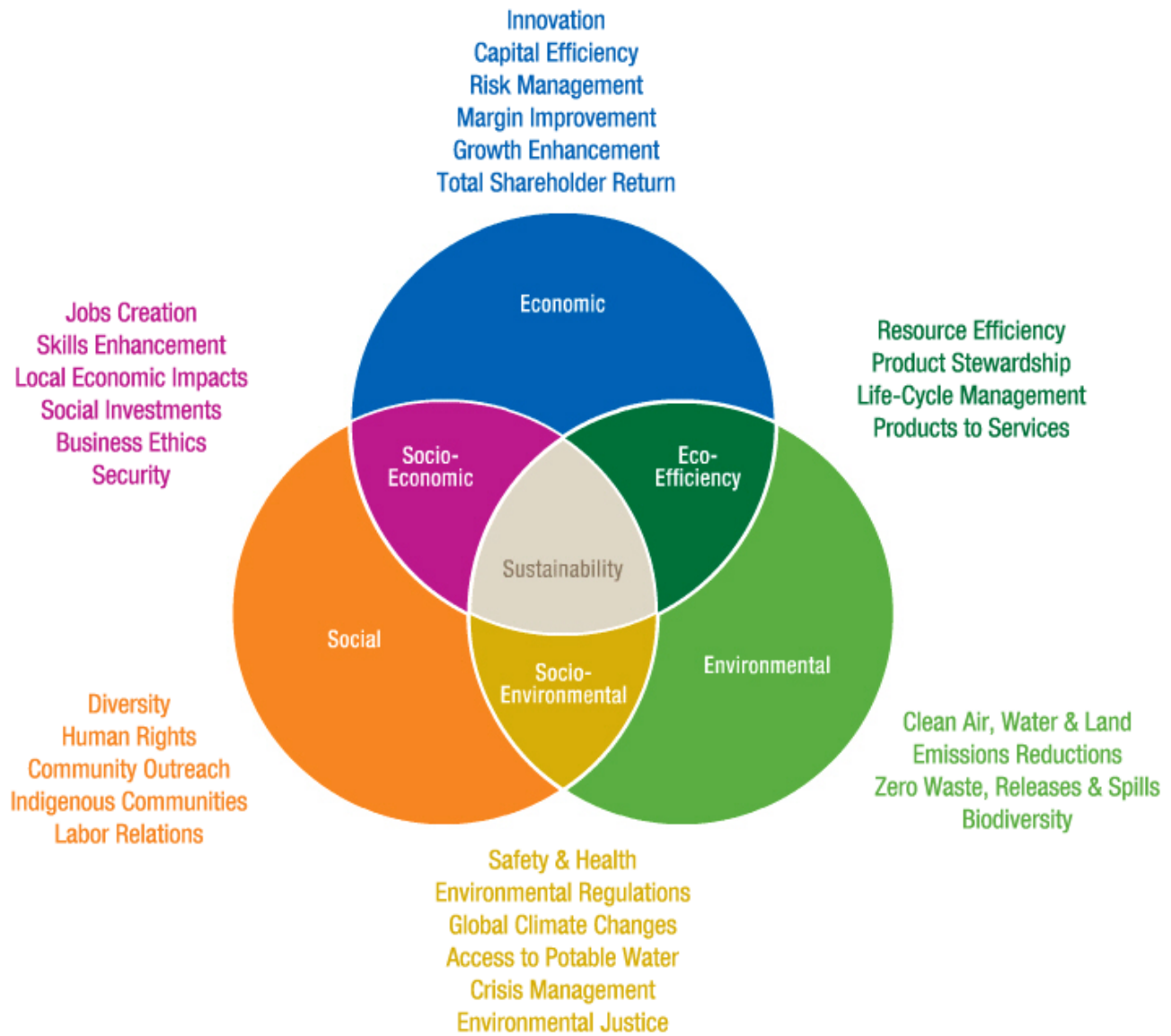


Figure 1: The three platforms of sustainable development: environmental, economic, and social sustainability. (ConocoPhillips)

¹¹ “Our Common Future.” *U.N. World Commission on Environment and Development*. Oxford: Oxford University Press, 1987. Print.

issues. To this day there are many definitions of sustainability so it may seem to be a somewhat ambiguous word; however, in each case the goals of urban projects that are termed “sustainable” are very similar: reduce waste and sprawl, diminish energy and water usage, reuse materials, avoid the creation of harmful emissions, and preserve open land and virgin resources. As seen in Figure 1, sustainable development as defined by ConocoPhillips includes multiple factors and many different issues must be addressed, and programs must be created, to produce an urban project that is as “sustainable” as possible. Preservation does have the capability to align with several of the subsections identified within this chart; however this is not the specific framework by which ecocities are typically evaluated.

Ecocities fall under the umbrella of sustainable development and so they address the three primary platforms of environmental, economic, and social sustainability. Ecocities are both the focus of this paper and are likely to be the type of projects that will greatly influence the makeup of our cities in future. Therefore, the definition of ecocities as created during the 2008 Ecocity World Summit will be the way in which preservation will be analyzed as a tool for promoting sustainable development in the urban environment. This 2008 definition is also utilized by the IEFS who are in the process of creating the global framework and standards by which future ecocity projects will be evaluated. It then makes sense to analyze preservation’s compatibility with the requirements identified during the 2008 Ecocity World Summit. Some scientists believe that urban environments cannot ever be truly sustainable, but if the requirements listed within the ecocity definition are addressed in all urban environments, there will be visible, positive changes. Ultimately the sustainability movement is not just about conserving resources and reducing pollution; it is a combination of practices that are intended to provide a multitude of benefits to the public at large.

Legislation

Through public outreach programs and the dissemination of information sustainability has become a household word. It has also become a global issue addressed in numerous laws. In America, legislation promoting sustainability is present at Federal, state, and local levels. For example, the Federal government has passed a number of executive orders in an attempt to reduce harmful impacts on the environment. One, the Executive Order 13514, requires Federal agencies to “measure, report, and reduce greenhouse gas pollution from agency operations.”¹² Individual states often have their own sustainability laws; for example, Washington State has legislation spanning environmental, economic, and social sustainability issues. Law RCW 70.235.020 requires the reduction of greenhouse gas emissions based on previously benchmarked levels and the Evergreen Jobs Act approves state investment into renewable energy in hopes of improving the environment and creating jobs for Washington residents.¹³ In many jurisdictions it is commonplace to have mandatory programs supporting some sustainable goals, such as recycling. Increasingly, sustainable policies affecting the built environment are being implemented at the local level in hopes of counteracting harmful consequences that have resulted from poor decisions within the building sector including the depletion of resources and dependence on HVAC systems and artificial lighting. In some jurisdictions, it is now mandatory that any new or retrofitted building projects achieve green certification. As this trend gains momentum, it is likely that more cities and states will adopt similar legislations, influencing the design of future retrofits and new construction. Although there are many programs that focus on increasing sustainability at the municipal level, including Architecture 2030 and Building Energy

¹² “Leading by Example in Environmental, Energy and Economic Performance.” *Performance.gov*, 2013. Web. 5 Mar. 2013.

¹³ “Sustainability Laws and Executive Orders.” *Washington Department of Ecology*, 2013. Web. 3 Mar. 2013.

Quotient, the sustainable framework that many towns turn to is the Leadership in Energy and Environmental Design (LEED) system, which is primarily focused on individual buildings.

There is no official “green” standard but the LEED system is one of the most well-known sustainable rating systems. The LEED system, created by the U.S. Green Building Council (USGBC), is internationally recognized, with certified buildings throughout the U.S. and 91 other countries.¹⁴ The rating system can be applied to a variety of projects from new construction to existing buildings. Robert Watson, a founder of the LEED system, estimated that the percentage of spaces qualifying for LEED certification will continue to grow in the coming years and have increased annually despite the economic downturn.¹⁵ The choice to become LEED certified is therefore one that building owners are now making more frequently. Since it is becoming more widely used, evaluating any green building project based on the LEED system is becoming the norm and a building with a LEED certification is more marketable: “Studies have found that green-labeled buildings command a rent premium of between 3 and 6 percent; in addition, the green properties that sold during [2011] sold for a premium of 11 to 19 percent.”¹⁶ Despite additional economic benefits, LEED certification is not the final answer to making a city more sustainable and is therefore not the only step ecocities take when addressing the sustainability of the built environment. In fact, incorporating the LEED program is not one of the requirements of ecocities; they simply promote more efficient building systems. Ecocities also address the environment as a whole, looking to buildings, their surroundings, transportation systems, and more, rather than only focusing on sustainability at the building level as evident in the LEED system.

¹⁴ “LEED.” *U.S. Green Building Council*, 2011. Web. 25 Feb. 2012.

¹⁵ Watson, 16.

¹⁶ Watson, Robert. *Green Building Market and Impact Report 2011*, Nov. 2011. Web. 12 Oct. 2012. Page 8.

Preservation as a means of sustainability

Some of the earliest environmental concerns hinged on nature itself rather than cities and the built environment. Over time this has changed as individuals have realized how much of an effect the built environment has on the natural environment. It has been found that the building sector contributes to a large amount of solid waste, emissions, energy and water use, and is therefore considered one of the principal offenders in terms of unsustainable practices. Modern buildings in particular have been found to be some of the worst offenders. They have been influenced by the throwaway mentality, resulting in shorter life spans than those of many historic buildings. The use of energy and modern building products has also changed the way buildings are constructed, altering the overall appearance of modern buildings, and affecting our expectations regarding how they should perform. When working in a building in the 19th century, for example, you could control indoor air temperature by opening a window. This isn't possible for workers in a 40-story office building. Inexpensive energy supplies resulted in architects focusing primarily on the aesthetic design of the building rather than building performance, "...making it possible to design buildings without considering the direction of the sun, winds, or other local conditions."¹⁷ As energy has become more expensive and issues of sustainability have become more talked about, traditional building techniques and the reuse of historic buildings are being recognized as potential strategies to mitigate the harmful environmental impacts of the building sector.

Many early sustainable policies were aimed at reducing the harmful impacts large scale industry had on the environment, overlooking the issues of sustainable building operations and potential benefits to be obtained through building preservation. With more tailored, bottom-up

¹⁷ City of New York. *PLAN NYC*, April 2011. Web. 12 Mar. 2012. 168.

policies being developed for ecocities, preservation can be highlighted in the sustainability conversation. However, many ecocity advocates, planners, and local governments still do not understand the full social, economic, and environmental benefits that are possible to obtain through the preservation of their historic resources. These specific benefits will be discussed later, but it is important to note that preservation needs to have a more prominent role in terms of public awareness. Additionally, it must be recognized that issues pressuring planners and other local officials to develop sustainable strategies for cities, including increased population, can directly affect historic resources within those cities; “To accommodate this growth in population over the next decades, development pressure will mount in urban areas and pose complex social and physical challenges, particularly in older, historic cities.”¹⁸

The modern sustainability movement

According to Mazmanian's and Kraft's *Toward Sustainable Communities*, there have been three epochs of the modern environmental movement beginning in the 1960s and 70s when sustainability became a national issue: the rise of environmental regulation, where national policies were first adopted and the focus was on pollution and the disposal of toxic chemicals; the period of flexibility and regulatory reform, when the focus shifted to include public health benefits in concordance with environmental issues; and the drive toward sustainable development. These eras overlapped; some happened simultaneously and some are still ongoing.¹⁹ Ecocities are part of the most recent movement toward sustainable development, hoping to transform both the environment and actions of one community at a time.

¹⁸ “2010 World Monuments Watch.” *World Monuments Fund*, 2011. Web. 23 Feb. 2013.

¹⁹ An outline for the three epochs of the modern sustainability movement is included within the appendix.

The first national and international environmental laws and policies began surfacing in the 1970s and 1980s.²⁰ During this period of the modern sustainability movement, the issue of environmental sustainability began to be looked at as a global problem, spurring international meetings such as the 1972 United Nations Conference on the Human Environment, which resulted in 113 nations agreeing to make individual changes in an effort to mitigate environmental issues at a global scale. The World Commission on Environment and Development (WCED), which was created to report on environmental problems, was established in 1983 and produced the *Report of the World Commission on Environment and Development*. This report was the document that formally defined sustainable development.²¹ Over the next few years international conferences led to the identification of specific strategies to both stop and reverse the effects of environmental decline. In 1992, at the U.N. Conference on Environment and Development, the Agenda 21 Program was created. Agenda 21 is a plan of action to promote sustainable development at many different levels: globally, nationally, and locally. It was voluntarily adopted by 178 governments from its onset. Since it “is not a treaty or legally binding document and does not infringe upon the sovereignty of any nation, state, or local government,” it serves as a guiding framework for governments that are trying to reach predefined sustainable goals.²² In addition to global strategies for sustainability, environmental committees and laws were being created in the United States during this period.

The National Environmental Policy Act (NEPA) was adopted by the U.S. in 1969. It was one of the first laws in the United States that focused solely on protecting the environment:

“NEPA's basic policy is to assure that all branches of government give proper consideration to

²⁰ The “Seven Pillars,” or environmental laws, of the first sustainability epoch can be found in the appendix.

²¹ “The Environment.” *United Nations Dag Hammarskjöld Library*, 2013. Web. 6 Mar. 2013.

²² “ICLEI, the United Nations, and Agenda 21.” *International Council for Local Environmental Initiatives*, 2013. Web. 6 Mar. 2013.

the environment prior to undertaking any major federal action that significantly affects the environment.”²³ The creation of the U.S. Environmental Protection Agency came soon after: “born in the wake of elevated concern about environmental pollution, EPA was established on December 2, 1970 to consolidate in one agency a variety of federal research, monitoring, standard-setting and enforcement activities to ensure environmental protection.”²⁴ The EPA continues to work towards sustainable goals and is responsible for the creation of some smaller-scale community based projects that will be discussed in a later chapter.

The next, and most recent, era of the sustainability movement focused primarily on a bottom-up approach to sustainability. Some problems that were noted with national environmental policies include: the use of complex, confusing language; a lack of policies geared toward preventative measures and sustainable development; and a top-down approach that was suited for national policies, but not flexible enough for state or local governments.²⁵ These problems, and the ensuing changes in thought and political shifts since the beginning of the modern environmental movement, resulted in many communities developing their own strategies and policies for sustainability, including ecocities. “Many of the most promising sustainability efforts today...can be found in the growing application of new approaches at the state, regional, and city levels of government...as they strive to transform themselves and their communities.”²⁶ Ecocity projects then, it would seem, will likely become more commonplace and have the potential to be adopted at local government levels throughout the nation.

²³ “Summary of the National Environmental Policy Act.” *U.S. Environmental Protection Agency*, 24 Feb. 2013. Web. 3 Mar. 2013.

²⁴ “EPA History.” *U.S. Environmental Protection Agency*, 15 Feb. 2013. Web. 3 Mar. 2013.

²⁵ Mazmanian, Daniel and Michael Kraft. *Toward Sustainable Communities: Transition and Transformations in Environmental Policy*. Cambridge, Mass.: MIT Press, 1999. Print.

²⁶ Mazmanian, 5.

The term ecocity is a relatively recent creation used to define cities that are attempting to become more sustainable through a combination of environmental policy and urban planning. A 1987 quote regarding ecocities suggests that although they were talked about before this date, this was about the time that the idea started to more fully develop: “An ecocity is an ecologically healthy city. No such city exists. There are bits and pieces of the ecocity scattered about in present-day cities and sprinkled through history, but the concept – and hopefully, the reality – is just beginning to germinate.”²⁷ Ecocities are geared towards creating more livable communities and target environmental, economic, and social issues. Through the creation of ecocity plans, local governments are able to engage the public and disseminate environmental information in a transparent method. Ecocities are essentially the creation of feedback loops to inform citizens and local businesses as to how their individual actions affect the community as a whole. In an ecocity it is also important to inform the public about new environmental policies that can affect new construction, renovations, and waste disposal, among other aspects of everyday life.

²⁷ Downton, Paul F. *Ecopolis: Architecture and Cities for a Changing Climate*. Collingwood, Vic.: CSIRO, 2009. Print.

Chapter 2: The Rise of the Ecocity

“Urban environments that are sustainable are also place-specific; they belong here, but not there; they are rooted in their particular landscape and, consequently, establish regional identity.”²⁸

While ecocities as they are known today may be a recent concept, the idea that it is important for cities to be clean, livable places is not: “public perception of the conditions and social costs of urban overcrowding was stimulated by the pioneering research of Sir Edwin Chadwick in England in the 1830s and 1840s,” who documented the link between public health and the physical environment.²⁹ Soon after, laws and building standards that influenced the amount of light, air, and general quality of life afforded to each housing unit became common place. Today’s sustainable cities are still focused on improving the environment and the quality of life for residents, touting the livability and walkability of neighborhoods within city boundaries. Although there is no set global definition or standards for ecocities, both have been developed and are in use by a group of ecocity practitioners.

Ecocity Builders, located in Oakland, California, was founded by Richard Register in 1992 and accredited by the United Nations. It is a nonprofit organization that acts as a consultant on projects all over the world, teaching local governments or activists about ecocity principles and strategies. Ecocity Builders is made up of international networks and associates. The individuals who are a part of, or collaborate with, Ecocity Builders come from varied backgrounds. Noted ecocity practitioners include volunteers, professors from prominent

²⁸ Platt, 40.

²⁹ Platt, 3.

universities throughout the world, members of planning departments in various cities throughout the U.S., politicians, and more.³⁰ Together, members of this organization have created a definition, framework, and set of standards with which to identify and evaluate ecocities.

Nine Ecocity World Summits, conferences founded by Ecocity Builder's Richard Register, have taken place since 1990 in international locations.³¹ These meetings bring together professionals from different sectors to provide input on sustainable methods used in ecocities. During the 2008 Ecocity World Summit, held in San Francisco, California, it was declared that:

...ecocity development requires the comprehensive understanding of complex interactions between environmental, economic, political and socio-cultural factors based on ecological principles. Cities, towns and villages should be designed to enhance the health and quality of life of their inhabitants and maintain the ecosystems on which they depend. Ecocity development integrates vision, citizen initiative, public administration, ecologically efficient industry, people's needs and aspirations, harmonious culture, and landscapes where nature, agriculture and the built environment are functionally integrated in a healthy way.³²

As noted in the introduction, it was determined during the 2008 Ecocity World Summit that in order for a city to label itself as an ecocity it must address the following issues:

Ecological security - clean air, and safe, reliable water supplies, food, healthy housing and workplaces, municipal services and protection against disasters for all people.

Ecological sanitation - efficient, cost-effective eco-engineering for treating and recycling human excreta, gray water, and all wastes.

Ecological industrial metabolism - resource conservation and environmental protection through industrial transition, emphasizing materials re-use, life-cycle production, renewable energy, efficient transportation, and meeting human needs.

³⁰ "Ecocity Practitioners." *Ecocity Builders*, 2010. Web. 6 Mar. 2013.

³¹ The first conference in 1990 drew over 800 people from 13 different countries. To date, over four thousand people have participated in the Ecocity World Summit conferences series.

³² "Ecocity World Summit 2008."

Ecotope (ecological-landscape) integrity - arrange built structures, open spaces such as parks and plazas, connectors such as streets and bridges, and natural features such as waterways and ridgelines, to maximize biodiversity and maximize accessibility of the city for all citizens while conserving energy and resources and alleviating such problems as automobile accidents, air pollution, hydrological deterioration, heat island effects and global warming.

Ecological awareness - help people understand their place in nature, cultural identity, responsibility for the environment, and help them change their consumption behavior and enhance their ability to contribute to maintaining high quality urban ecosystems.³³

As can be seen in the above definition, ecocities are not just about environmental sustainability; they address social and economic sustainability as well, in an effort to produce a well-rounded, healthy environment for all city residents.

Ecocities are a model of sustainable development. The ecocity framework is being used by municipalities as a way to create the best possible land-use patterns to ensure cities provide a high quality of life to residents while still maintaining their diversity and open land. These cities acknowledge that they are growing and want to accommodate new residents without increasing sprawl or overextending their current resources. It is no surprise then, that the arrangement of buildings, efficient transportation, and conservation of natural resources are mentioned within the Ecocity World Summit definition. One way in which many cities reduce sprawl and provide a higher quality of life to citizens is through the adoption of smart growth principles. Smart growth is an urban planning concept in which new development is more sustainable than typical development models. Development is strategically planned to reduce urban sprawl and ultimately provide as many amenities as possible to citizens by creating denser, walkable neighborhoods. It is believed by many that sprawl is a factor in determining a citizen's quality of life; "If quality of life refers to individuals' abilities to access necessary and desired resources for

³³ "Ecocity World Summit 2008."

living, then sprawl, logically, diminishes quality of life by promoting the inefficient use and distribution of resources.”³⁴ So, the creation of more compact neighborhoods could not only be considered sustainable but also a better choice for people living within the urban environment. Through the creation of these attractive, diverse neighborhoods and changing the way in which people view the urban environment, communities developed using smart growth principles could someday replace the previous ideal of owning a detached house on a private property.³⁵ There are multiple ways in which both smart growth principles and the requirements of an ecocity project can align with preservation. These will be discussed in the following pages.

Policies and standards

There is no shortage of sustainable policies across the globe; in many nations, including the United States, they are present at all levels of government and focus on a variety of goals. Due to these numerous policies, which differ between states and even counties, it can be extremely complicated to determine an appropriate solution to environmental issues or even measure the success of a project at local levels. “We already have many examples of successful implementation of Ecocity principles around the world. What is needed is an integrated systemic approach and strategy that prioritizes actions, coordinates efforts, and condenses it all into a single framework.”³⁶ In the Eco-City Alexandria project, which will be discussed in detail in Chapter 4, there were so many different sustainable policies underway that they had to be inventoried and sorted in an effort to understand them and how they related to each other. Many

³⁴ Wood, Katherine Tucker. “The Best Laid Plans: Anticipating Potential Conflicts Between “Smart Growth” and Historic Preservation. A Case Study of Downtown Reading, Pennsylvania.” MS Thesis. Columbia University, 2001. Print.

³⁵ Land developer Orrin Thiessen admitted that he could build on 10 acres what would probably require 50 acres if it was developed it using a traditional sprawl model. (*Building Better: A Guide to America’s Best New Development Projects*, 9)

³⁶ “International Ecocity Framework and Standards.” *Ecocity Builders*, 2010. Web. 7 Mar. 2013.

cities identify a set of sustainable goals and create charters in which principles can be listed to act as a framework for sustainable policies; charters ultimately organize the ecocity project and are necessary for creating ecocity plans that will guide urban planning and development.

Collaboration is a necessary element during the creation of both charters and policies. Public opinion and cooperation is directly linked to the success of ecocity projects that seek to make operations within all facets of daily life align with sustainable goals. When planning an ecocity project it is imperative to include all stakeholders so the project is participatory and transparent. In addition to guiding principles and policies, it is necessary to have some sort of standards and benchmarks with which to measure the success of an ecocity project and determine if outlined goals were actually achieved.

Since there are no globally accepted standards for ecocities, it is ultimately up to the discretion of individual cities as to which elements of sustainability will be required and measured in their final plans. There are however, a relatively new set of standards developed specifically for the evaluation of ecocities throughout the world. The International Ecocity Framework and Standards (IEFS) is the first set of ecocity standards that will allow practitioners to determine their success in certain categories. In addition to being a tool for analyzing and measuring the success of ecocity projects, the IEFS includes a program designed to help cities establish their own principles and tailor strategies for reaching identified goals.

The IEFS advisory committee is made up of individuals with varied backgrounds in the sustainability industry including architects, planners, university professors, individuals with political backgrounds, engineers, and even an architectural historian: committee member Sudarshan Tiwari has a background in architectural and cultural history, urbanism, and

conservation.³⁷ The diversity of the group is intended to create a well-rounded perspective of all elements that go into the creation of a sustainable city. Ecocity Builders, the same individuals who spurred the creation of the Ecocity World Summit, also promoted the development of the IEFS and is currently part of the advisory committee. This means that the previously mentioned 2008 ecocity definition was created and accepted by the creators of the IEFS as well.



Figure 2: The 15 categories of the IEFS broken down into: green for environmental, blue for economic, and pink for social. Access by proximity is considered an aspect that is required of all ecocity projects and not a part of any distinct category. (Ecocity Builders)

³⁷ "International Ecocity Framework and Standards," pp. 15.

The IEFS is relatively new; it was developed in 2010 and launched in 2012. It is still being field tested by select “Early Partner Cities” that include Curitiba, Brazil; Montreal, Canada; Kirtipur, Nepal; and Vancouver, Canada. These particular cities volunteered to be a part of the project and were chosen as candidates based on a wide range of differences in population, density, and climate in an effort to test how the IEFS system will work with projects all over the world. It is possible that the success of these early trials could eventually result in international adoption of the IEFS. IEFS analyzes projects based on 15 categories broken up into sections devoted to environmental, economic, and social sustainability (see Figure 2). The following pages identify each of the 15 categories along with the minimum requirements for a project to become labeled as an “ecocity”:

Access by Proximity: The city provides the majority of its residents with walkable access from housing to basic urban services. It also provides walking and transit access to close-by employment options.

Clean Air: The city maintains a level of air quality that is conducive to good health within buildings, the city’s air shed, and the atmosphere.

Healthy Soil: Soils within the city and soils associated with the city’s economy, function and operations meet their ranges of healthy ecosystem functions as appropriate to their types and environments; fertility is maintained or improved.

Clean and Safe Water: All residents are ensured access to clean, safe, affordable water; the city’s water sources, waterways and water bodies are healthy and function without negative impact to ecosystems. Water consumed is primarily sourced from within the bioregion.

Responsible Resources/Materials: The city’s non-food and non-energy renewable and non-renewable resources are sourced, allocated, managed and recycled responsibly and equitably, and without adversely affecting human health or the resilience of ecosystems. Resources/Materials are primarily sourced from within the bioregion.

Clean and Renewable Energy: The city's energy needs are provided for, and extracted, generated and consumed, without significant negative impact to ecosystems or to short- or long-term human health and do not exacerbate climate change. Energy consumed is primarily generated within the local bioregion.

Healthy and Accessible Food: Nutritious food is accessible and affordable to all residents and is grown, manufactured and distributed by processes which maintain the healthy function of ecosystems and do not exacerbate climate change. Food consumed is primarily grown within the local bioregion.

Healthy Biodiversity: The city sustains the biodiversity of local, bioregional and global ecosystems including species diversity, ecosystem diversity and genetic diversity; it restores natural habitat and biodiversity by its policy and physical actions.

Earth's Carrying Capacity: The city keeps its demand on ecosystems within the limits of the Earth's bio-capacity, converting resources restoratively and supporting regional ecological integrity.

Ecological Integrity: The city maintains essential linkages within and between ecosystems and provides contiguous habitat areas and ecological corridors throughout the city.

Healthy Culture: The city facilitates cultural activities that strengthen eco-literacy, patterns of human knowledge and creative expression, and develop symbolic thought and social learning.

Community Capacity Building: The city supports full and equitable community participation in decision making processes and provides legal, physical and organizational support for neighborhoods, community organizations, institutions and agencies.

Healthy and Equitable Economy: The city's economy consistently favors economic activities that reduce harm and positively benefit the environment and human health and support a high level of local and equitable employment options that are integrated into the ecocity's proximity based layout and policy framework - the foundation for "green jobs" and "ecological development".

Lifelong Education: All residents have access to lifelong education including access to information about the city's history of place, culture, ecology, and tradition provided through formal and informal education, vocational training and other social institutions.

Well Being--Quality of Life: Strong citizen satisfaction with quality of life indicators including employment; the built, natural and landscaped environment; physical and mental health; education; safety; recreation and leisure time; and social belonging.³⁸

³⁸ "International Ecocity Framework and Standards," 7.

It is important that elements deriving from economic and social sustainability are included within ecocity standards because these provide extra opportunities for preservation to align with ecocity goals. In an interview sustainable architect Maria Casarella said that historic preservation vs. sustainable design isn't necessarily a conflict that is happening, however sustainable standards such as LEED still fail to account for "a building's historic or cultural value because elements such as cultural values cannot be assigned through a points system."³⁹ The economic and social categories within the IEFS seems like a step in the right direction, allowing for historic resources to strengthen an ecocity's overall success and perhaps even promoting preservation in ecocity projects where it would otherwise not be considered. Since the program is still in its developing stages, the IEFS program is actively reaching out to identified stakeholder organizations and experts in the form of surveys, workshops, and symposiums in an effort to obtain feedback. Historic preservation is not specifically mentioned in the most up to date draft of the standards and corresponding sustainability indicators; perhaps this is an opportunity for preservation groups to insert themselves into the conversation about the standards that may someday be commonplace for urban environments throughout the world.

Benchmarks

When determining the success of sustainable urban projects, benchmarks will naturally differ depending on the scale at which one is looking at them; be it a local, national, or global level. Although there are similar ecocity goals, and therefore similar charters and policies, each city benefits from tailored benchmarks since each city is different in terms of land use, population, materials used in the built environment, and of course the surrounding climate. An issue such as water conservation may be important in an Arizonan city, but a city located in

³⁹ Green, pp. 3.

Washington would likely not have to focus on it as much. According to the IEFS site, “Depending upon individual circumstances, each city will have a different path forward to ecocity conditions based on factors like location, natural resources, weather conditions, soil/slope, etc.”⁴⁰ So, although there are standards used to analyze an ecocity, there is no prescriptive path or universal benchmarking within this program.

There are, however, different levels of sustainability that have been identified within the IEFS framework; through the use of sustainable indicators the IEFS system will be able to determine different levels of success in each of the mentioned categories and certify projects as: Unhealthy Cities, Greener Cities, Ecocities, or Gaia-Level Cities. “Since all measures are important, a city will only reach Ecocity status when it achieves an “Ecocity” or higher designation in all [15] categories.”⁴¹ Both the Greener Cities and Ecocities sections are further divided into 3 separate categories. Once individual indicators are established for each category, IEFS will begin certifying projects ranging from neighborhood to regional scales. Indicators must be looked at collectively to determine if a community is truly meeting its sustainable goals.⁴²

In early 2013 an internal document was released by IEFS describing some possible indicators within each category. Even though the ‘Lifelong Education’ category cites the importance of history of place, culture, and tradition, no indicators mention preservation within this section; current indicators focus primarily on literacy.⁴³ In fact, no indicators within the 110 page document suggest the preservation or reuse of the built fabric as measures of success within

⁴⁰ “IEFS Early Partner Cities.” *International Ecocity Framework and Standards*, 2011. Web. 7 Mar. 2013.

⁴¹ “International Ecocity Framework and Standards,” 2.

⁴² Communities using sustainable indicators have created online networks to share information. Several groups, as noted in *Toward Sustainable Communities*, include the Global Footprint Network, Maureen Hart's community indicator network and the International Sustainability Indicators Network.

⁴³ “Draft Ecocity Goals, Indicators, Measures and Targets.” *Ecocity Builders*, Feb. 2013. Web. 8 Mar. 2013.

any of the 15 categories even though these strategies would align with identified goals. However, the indicators are still in draft form and the IEFS team is currently looking to other establishments for recommendations on what should be included. One document referenced by the IEFS document was the Urban Land Institute's *Cultural Vitality in Communities: Interpretation and Indicators*, which specifically mentions the preservation of both tangible and intangible history and culture, historic preservation, and various levels of designation within the U.S. (National Register, state, and local) that could affect the built fabric. It is therefore possible that the final indicators will incorporate preservation, but this is only likely if preservation organizations attend relevant meetings, such as the Ecocity World Summits, and become targeted stakeholders in the IEFS discussions.

Sustainability is a topic continually being discussed by countries, local governments, coalitions, and other organizations; however, there are few tools to measure the success of what is being done or if the outlined sustainable goals being discussed are even possible to accomplish. Much like the situation with LEED at the building level, there is a general lack of data about the actual performance of "green buildings" and a lack of data regarding the success of macro environmental policies. Even at national levels there have been debates about who should gather information regarding the current pollution levels of water and air, energy use, etc., and how that information can be linked to individual national, state, or local policies that are in action.⁴⁴ A small excerpt from *Toward Sustainable Communities* outlines some of the current issues facing the sustainability movement:

At the heart of the [sustainability] controversy is the extent to which communities...can and at what pace move toward the dual goals of vibrant economic development on the one hand and environmental protection and a high

⁴⁴ Mazmanian, 23.

quality of life on the other. Moreover, what actions or policies actually constitute successful movement along this path remains open to question. Everyone can agree that both goals are desirable...but no one knows exactly how to balance the two and at what societal and governmental level they are most likely to be implemented and effective.⁴⁵

With a lack of a universally-recognized definition, framework, and set of standards, it is still difficult to identify or label a city as an ecocity. In a world where labels are so important, particularly with the additional attention or money that can be gained when an environmental label is affixed to a building, organization, or town, this can be a real issue. Ultimately, each ecocity is attempting to achieve a similar goal: these communities are coming together and attempting to better their immediate surroundings and the environment as a whole through learning about and initiating more sustainable practices. Preservation must become a recognized tool with which these ecocities can reach their goals.

Potential conflicts between preservation and ecocities

There is a perception that historic preservation is at odds with sustainability and that the two ideas are mutually exclusive; however this is not the case. For example, one of the principles strives to help the public change their consumption behavior, aiming to reduce things such as building energy usage. Sometimes it is thought that due to age, the retention of historic fabric will cause a detriment to the efficiency of a building. This is particularly true of the retention of original windows. The historic window issue has been noted by several preservationists as an area in which knowledge had to be distributed to the public who otherwise viewed preservation as conflicting with building efficiency. One of the case studies, Eco-City Alexandria, held a series of workshops in order to educate residents about the sustainable possibilities for the city's

⁴⁵ Mazmanian, vii.

historic homes, including how each can improve energy efficiency while retaining its original windows, citing studies that have found historic windows are “negligibly less efficient than new replacement windows.”⁴⁶ In this case there is clearly a need for more preservation authorities to establish these sorts of informational programs to demonstrate how preservation can align with each respective city’s sustainable goals to ultimately ensure that valuable historic material is not lost.

Additional potential conflicts between ecocity strategies and preservation result from limitations to visual changes within historic districts. Since architectural elements that contribute to the significance of districts and individual buildings cannot be altered, some strategies that may work towards achieving goals within other areas of the city may not be suitable for historic districts. For example, the addition of solar panels to reduce energy use or the installation of a rainwater harvesting systems to conserve potable water, both noted as important principles within the 2008 Ecocity World Summit definition, may not be appropriate strategies within historic districts. There are however alternative strategies to achieving the identified principles such as simply adding new weather stripping to improve the efficiency of a building and installing new low-flow fixtures on the interior of the home to reduce water usage.

While not always the case, sometimes it is necessary to make exterior alterations to historic buildings to make them more efficient. The possibility of receiving approval for this type of large-scale change is dependent on the historic district in question as some cities have much more rigid legislation and perceptions about change. This could be considered an actual threat to preservation, but in many cases throughout the U.S. it is usually only a perceived threat. Historic

⁴⁶ “Balancing Energy Efficiency and Historic Values: Best Practices for Windows.” *Eco-City Alexandria: Green Building Resource Center*, 27 Jul. 2012. Web. 7 Mar. 2013.

buildings and districts are generally considered paramount; they will not be allowed to be altered simply for the sake of making them more efficient if the alteration were to damage a significant aspect of the building. Some cities, however, understand the need for change provided it does not damage significant architectural elements, and invite residents to submit proposals for changes to improve building efficiency. Local preservation departments should follow suit and become more flexible in terms of what changes are allowed within designated districts. Looking at projects on a case-by-case basis would allow the city to be certain that significant features of properties are retained and proposed alterations are appropriate. Preservation departments ultimately need to become more aware of possible acceptable alterations that will further sustainable goals while continuing to protect historic resources and should not simply shy away from all change. Without a change in attitude, preservationists have the potential to become the biggest conflict between preservation and ecocities.

Perhaps the most formidable threat that select ecocity principles pose to historic preservation is the complete removal of low-rise historic fabric in an effort to build upwards and increase population density within downtown neighborhoods. Within the U.S., this threat is typically targeted at historic resources that are not yet protected by any sort of designation while threat of complete removal of historic cores has been found in international examples discussed in the following paragraphs. One example of an American project calling for the removal of low-rise buildings in favor of high-rise towers took place in Berkeley, California. Here, an urban project aimed at creating a more sustainable downtown called for the demolition of historic buildings in favor of larger structures to increase density. This plan, known as the Downtown Plan, was created in the summer of 2009 and sought to place out-of-scale towers in a historic

area of downtown Berkeley.⁴⁷ Preservationists within the city opposed the original Downtown Plan and called for a district designation in addition to policy changes. Instead of simply rejecting the original Downtown Plan and designating the district, activists worked with the city to create a new Downtown Plan that would allow for densification at a more sensitive scale. The new Downtown Plan also encouraged the preservation of existing buildings in addition to creating the historic district. Ultimately preservation was recognized as a tool to help the city achieve its sustainable goals of conserving energy, reducing carbon emissions, and reducing solid waste.

Although there are many ways that preservation can align with sustainable goals and contribute to sustainable cities, there are still instances in which new development may be favored over historic preservation in the urban environment. As seen in the examples thus far, sustainable cities in particular strive for higher density, putting added development pressure on central low-rise historic districts. There are many reasons that could account for a city's choice to demolish or alter the significance of its historic resources in favor of new "sustainable" development: weak heritage legislation, a lack of incentives to preserve historic buildings, no city-wide inventory of historic resources, and a possible lack of knowledge about the different types of benefits that can be provided through the retention of its cultural heritage.

An example of development pressure to maximize space is given in the *2010 World Monuments Watch* report, which describes what happened in Buenos Aires, a city with little protection for historic resources: "Weak heritage legislation has enabled the demolition of many significant buildings in the vibrant historic core of Argentina's capital in order to maximize

⁴⁷ City Council District 4. "Jesse's Record." *The City of Berkeley*, 2013. Web. 3 May. 2013.

square footage through new construction.”⁴⁸ This is not an isolated incident and in this publication alone cities from Japan and Bahrain are cited as undergoing similar projects. Since ecocities are promoting density and the eradication of sprawl, this replacement of historic buildings is an issue that will come up for many cities. This loss of historic fabric will destroy the physical character of the city and also “deprive it of the social base that sustains the life of the community.”⁴⁹ It is therefore crucial that authorities understand all of the benefits that the preservation of historic resources can provide to their respective cities. “An historic building or district can be a tangible symbol of a community's interest in honoring its heritage, valuing its character and sense of place, getting the most out of prior investments in infrastructure and development, and encouraging growth in already-developed areas.”⁵⁰

Preservation incentives in the form of Federal tax credits can be used within any jurisdiction in the country. There are, however, limitations to the types of buildings and projects are eligible. A 20% tax credit is available for the rehabilitation of commercial buildings that have been certified as historic structures by the National Park Service. The rehabilitation work must also meet the Secretary of the Interior’s Standards for Rehabilitation. These standards cover the use of the building, permitted alterations, strategies, and types of materials or chemical treatments that are permitted.⁵¹ A 10% tax credit is also available for the rehabilitation of commercial buildings constructed before 1936. The building cannot be certified as historic but the rehabilitation must meet three criteria: “at least 50% of the existing external walls must remain in place as external walls, at least 75% of the existing external walls must remain in place

⁴⁸ “2010 World Monuments Watch,” 7.

⁴⁹ “Cairo: Urban Regeneration in the Darb Al-Ahmar District.” *Aga Khan Trust for Culture: Historic Cities Support Programme*. Rome, Italy: Xpress, 2005. Print.

⁵⁰ “Smart Growth and Sustainable Preservation of Existing and Historic Buildings.” *U.S. Environmental Protection Agency*, 2012. Web. 18 Nov. 2012.

⁵¹ “20% Historic Rehabilitation Tax Credit.” *National Park Service*, 2012. Web. 24 Mar. 2013.

as either external or internal walls, and at least 75% of the internal structural framework must remain in place.”⁵² Historic preservation easements can be used to obtain tax benefits for historic properties that are listed on the National Register of Historic Places or are a contributing feature of a historic district listed on the National Register.⁵³ There are also tax incentives offered at state levels to further encourage building reuse, but these are only present in some states and so cannot be assumed as a potential incentive for all historic building rehabilitation projects.

In some ecocities where historic buildings are threatened by development pressures, developers are still demolishing historic buildings in favor of new high-rises despite access to Federal tax credits. While the existing Federal credits offer substantial incentives to preserve and rehabilitate buildings rather than destroying them, there are many limitations on the types of buildings that can qualify, restrictions on the types of alterations that are acceptable, and documentation requirements that may discourage local developers who don’t have knowledge about the process. State Historic Preservation Offices assist property owners hoping to obtain Federal tax credits but more information could be provided at local levels to make developers aware of all financial incentives linked to preservation. Additionally, city officials in Portland, Oregon believe that the primary issue leading to the demolition of older buildings within their city is a lack of local incentives to redevelop those properties.⁵⁴ In the case of Portland, incentives *are* offered at the local level for new developments, ultimately increasing the pressure to demolish extant structures. Ideally municipalities should offer incentives for preservation at a local level, but at the very least local policies that clearly undermine preservation in favor of new development should be revoked.

⁵² “Tax Incentives for Preserving Historic Properties.” *National Park Service*, 2012. 24 Mar. 2013.

⁵³ “Tax Incentives for Preserving Historic Properties,” pp. 4.

⁵⁴ Graf, Tyler. "Does Sustainability Trump Historic Value in Portland?" *Daily Journal of Commerce* (2009). *ProQuest Education Journals*. Web. 12 Oct. 2012.

A lack of developer experience dealing with reuse projects is another potential barrier to preservation: "...rehabilitation work is typically regarded as far riskier than new construction, because the process can be less predictable, and many developers fear being surprised by unforeseen challenges once rehabilitation is underway."⁵⁵ It has been suggested that additional knowledge regarding preservation tools and a wider skill set could help to resolve this issue. A general lack of knowledge about a city's historic resources also contributes to new development over preservation. In a 2012 article, *Does Sustainability Trump Historic Value in Portland?*, it was stated that the local authorities in Portland do not know enough about their buildings, old and new, to properly determine what should be preserved and where new development is acceptable. The creation of a total building inventory is valuable within any city in order to assess which buildings are worthy of added protection.⁵⁶ It is not just a lack of knowledge on the part of city officials, though. Even preservationists within the city agree that they must learn more about the issue of sustainability and preservation; "more could be done at the local level to understand which historic buildings deserve the sustainability treatment," as opposed to demolition.⁵⁷

Density vs. quality of life

Increased density is usually linked with reduced sprawl and is therefore seen as a positive goal for the urban environment. However, it is not necessarily the best practice to favor high-rises for reducing sprawl; urban development and planning must result in diverse neighborhoods with amenities and open spaces to meet the needs of residents and improve their quality of life or

⁵⁵ "The Greenest Building: Quantifying the Environmental Value of Building Reuse." *Preservation Green Lab*, 2011. *The National Trust for Historic Preservation*. Web. 2 Mar. 2013.

⁵⁶ Graf, 2.

⁵⁷ Graf, 2.

they will seek it elsewhere, nullifying potential sustainable benefits achieved from creating dense neighborhoods.⁵⁸ Kaid Benfield, the Director of Sustainable Communities, Energy & Transportation Program of the Natural Resources Defense Council, acknowledges the tension between existing lower-scaled, diverse neighborhoods and more intense, dense developments; “we need density for sustainability, yes, but it needn’t be uniformly *high* density, and if it isn’t people-friendly...we will make things worse, not better... if we cannot provide residents and businesses what they want and need, we will never achieve the more sustainable future for cities and suburbs that we seek.”⁵⁹ Historic urban neighborhoods are often mixed-use, compact, and near transportation, aligning with many of the elements identified as necessary for the success of a neighborhood.

One of the biggest proponents of the belief that preservation stands in the way of sustainable development is Edward Glaeser. He believes that high-rises are central to sustainable cities, relying primarily on the idea of high-density, compact cities; he “sees densely populated, vertical cities not only as environmentally responsible, but as engines of innovation and prosperity — and the best hope for developing nations.”⁶⁰ Compact, connected neighborhoods do align with sustainable goals but simply clustering new high-rises together does not account for any of the benefits afforded by the buildings that would need to be demolished for this new development to happen. Historic districts can provide economic benefits, such as local

⁵⁸ Julie Campoli, an urban planner and designer notes the importance of walkable neighborhoods with open spaces; well-connected, mixed-use neighborhoods “make walking and biking convenient and enable mobility with a vastly reduced carbon impact...A few other physical qualities may not contribute directly to lowering a place’s carbon footprint but are also essential ingredients in a successful urban neighborhood. These elements, which can be designed in a place to add value, include the things all of us need in varying degrees – greenery, privacy, variety, and a sense of spaciousness.”

⁵⁹ Benfield, Kaid. “Not All Density is Created Equal.” *The Atlantic Cities: Place Matters*, 4 Mar. 2013. Web. 7 Mar. 2013.

⁶⁰ Gorney, Douglas. “City Limits: A Conversation with Edward Glaeser.” *The Atlantic*, 8 Feb. 2011. Web. 8 Mar. 2013.

preservation or tourism jobs, social benefits that promote a neighborhood's identity and tradition, and environmental benefits. Environmental benefits in particular should be taken into account during the argument for the destruction of extant buildings to make way for new high-rise buildings in the name of sustainability. Glaeser praises the idea of compact high-rise districts because there would be less need for driving and smaller living spaces that use less energy and therefore reduce carbon emissions; however, the waste of materials, use of energy, and output of carbon emissions that go into the demolition and construction processes alone are not addressed.⁶¹ High-rise towers may provide more housing units within a single building footprint, but this density does not ensure a higher quality of life for residents.

Glaeser admits that preserving historic buildings conserves character, beauty and a sense of place but argues that legislation in historic districts should be relaxed to allow for increased new development: "if you move too far in the direction of keeping things as they are, you create a museum rather than a living city."⁶² While this idea of a balance between preservation and growth is the ideal situation for ecocity projects, weak heritage legislation is not the answer. A lack of tools for the protection of historic districts leaves decision about their future in the hands of individuals who may not have the required background to make an informed decision. This perception that preservation is a barrier to all new development is also not accurate. Building additions and infill are not unheard of within historic districts. The important thing to consider is *how* development is being incorporated into historic districts. Strong heritage legislation will guarantee that qualified officials are evaluating each project on a case-by-case basis to ensure that alterations do not harm the individual building or the character of its surrounding environment.

⁶¹ Glaeser, Edward L. "Why N.Y.C. Must Scrape the Sky." *New York Daily News*, 22 Apr. 2012. Web. 8 Mar. 2013.

⁶² Gorney, pp. 18.

Glaeser also argues that there are too many historic districts preventing new development from occurring within cities. The size and amount of historic districts naturally differs in each city, but there is generally a larger amount of developable space within already-established city boundaries that is not protected by preservation laws. In the Strasbourg case study, which will be discussed in further detail, infill and rehabilitation of compromised properties was used as a way in which new development could be added within city boundaries, preventing both sprawl and the destruction of historic resources. Glaeser cites New York in particular as having vast historic districts that encompass “thousands of utterly undistinguished structures.”⁶³ He supports his argument by stating that 16% of the developable land in southern Manhattan is under the jurisdiction of the Landmarks Preservation Commission.⁶⁴ That, of course, still leaves 84% of the developable land without any attached preservation legislation. It is certainly more difficult to be limited in terms of where development can be placed and what sort of development is appropriate; simply razing everything and starting from scratch would be easier, but not necessarily more sustainable. Given potential benefits from preservation that range across all three components of sustainability, it makes sense to at least approach historic districts with an open mind instead of harboring perceptions that they will automatically conflict with sustainable development.

Potential compatibility between preservation and ecocities

Historic preservation has the potential to align with several ecocity goals. First, it has the ability to align with the principles of smart growth, which are often utilized within ecocity projects. The ten principles of smart growth, as identified by the Smart Growth Network, an

⁶³ Glaeser, Edward L. “Preservation Follies.” *City Journal* Vol. 20.2 (Spring 2010), 62-67.

⁶⁴ “Preservation Follies,” pp. 10.

organization supported by the U.S. Environmental Protection Agency, focus on: supporting mixed land use, creating compact designs, establishing varied types of housing, fostering walkable neighborhoods, promoting neighborhoods with unique character, preserving open space, ensuring development is congruous with the existing community, providing transportation choices, making transparent development decisions, and encouraging community collaboration in development decisions. These principles, which are similar to those created during ecocity projects, can align with preservation goals. Historic urban neighborhoods are often compact, located close to transportation, and have unique characteristics that embody the cultural heritage of the surrounding city. Their compact design leads to the preservation of open space and results in more walkable neighborhoods where a variety of amenities are within reach. Finally, the preservation system within the U.S. allows community collaboration through citizen-based nominations of properties to the National Register and public review at the local level.

Preservation has the ability to align with general sustainable project guidelines that rely on the three general platforms of environmental, economic, and social sustainability. The preservation of already extant buildings means less construction activity resulting in a cleaner environment with more plentiful resources. Preservation is also a tool for promoting social and economic sustainability. Later discussion will focus on some of the economic benefits linked to historic preservation that have been identified by Donovan Rypkema, one of the leading academics on the subject:

“In the final analysis, the economic impacts of preservation...are greater and more far-reaching than first imagined. Preservation does not operate within its own isolated sphere, but touches many areas of the local economy, and affects different sectors of community life. It touches finance, real estate and

government. It affects retailing, employment and tourism. It impacts the mayor, the merchant and the homeowner.”⁶⁵

Identified social benefits obtained through preservation include increased quality of life through the improvement of the access to local amenities and improved environmental quality, which both affect the health and well-being of local residents. Preservation also naturally preserves the cultural heritage of cities, helping residents to maintain a link to their past and bolster their identity in an increasingly globalized world. Many social benefits are closely linked to techniques utilized for achieving environmental sustainability and so will be discussed in more detail within the next chapter.⁶⁶

Historic preservation can also align, both directly and indirectly, with many of the ecocity elements established in the 2008 Ecocity World Summit definition. This demonstrates that preservation has a place within the IEFS framework, which is based upon that same definition, and should be addressed within the framework accordingly. Using extant buildings can conserve material resources and reduce the need for new construction and the exertion of energy, thereby reducing energy usage and lessening the amount of emissions in the air. This ultimately betters the environment and the health of the general public. Using extant building also lowers the amount of solid waste production and with less manufacturing taking place, ensures waterways are cleaner. The location of urban historic districts, typically in central areas of town near public transport, ensures that residents have access to alternative transportation and a variety of amenities. Preserving historic districts can also help to protect the cultural identity of a town.

⁶⁵ Rypkema, Donovan. *The Economics of Historic Preservation: A Community Leader's Guide*. Washington, D.C.: The National Trust for Historic Preservation, 1994. Print.

⁶⁶ Further reading on social sustainability within historic districts can be found within UN-Habitat's *Best Practices on Social Sustainability in Historic Districts*.

Despite the fact that preservation aligns with many of the requirements of an ecocity definition, it is not mentioned as a specific requirement itself. The 2008 Ecocity World Summit definition was created through the input of many professionals from a variety of fields but perhaps the presence of more preservation professionals at these sorts of sustainable conversations could have resulted in a definition that specifically targeted preservation as a part of ecocity development. There is clearly a gap on both the preservation and planner/developer side of the ecocity issue. Preservationists must begin to insert themselves in the conversation and clearly state how preservation can be used to promote sustainability within their town. Speaking the same language, the language of potential benefits, will allow preservationists to make a stronger case for the inclusion of historic districts within ecocity projects. As seen in the Berkeley case, flexibility and compromise are key to the success of preservation projects. Preservationists must recognize that cities must change and grow and, in order to remain relevant, the field of preservation must follow suit. Sustainability is becoming a more prominent aspect of projects within the built environment. Preservationists should publicize the fact that there are so many ways in which sustainability and preservation are compatible in order to further their goal: to protect significant historic resources.

Chapter 3: The Sustainability of Historic Districts

“Currently, the challenge is to prove that an old building is so valuable that it ought to be saved; rather, the owner/developer should be required to prove that an old building cannot be adapted to new use.”⁶⁷

Numerous studies over the past 40 years have focused on the energy efficiency of historic buildings and what sorts of changes need to be performed in order to make them more efficient. The majority of these studies concentrated on individual buildings, rather than entire historic districts. Although individual building improvements may seem too small to make a difference in reaching city-wide goals, it is still useful to investigate the efficiency of individual buildings because if many individual buildings within historic districts follow suit, the impact can be substantial. Even though numerous organizations, including federally funded researchers, have tried to discover the sustainable benefits of historic preservation, there is still a lack of data regarding actual building performance, particularly on a district-wide scale. This makes it difficult to create reasonable benchmarks for new policies within ecocity plans because there is often no starting point at which to gauge increased building efficiency. This issue was specifically mentioned as an impediment during the creation of ecocity policies for Alexandria, Virginia.

Only a few cities have begun to investigate the energy efficiency of specific districts due to a fear of privacy invasion expressed by citizens. A completed study in New York City, called *PLANYC 2012 Local Law 84 Benchmarking Report*, showed that urban historic districts use less

⁶⁷ Frey, Patrice. “Making the Case: Historic Preservation as Sustainable Development.” *The National Trust for Historic Preservation*, Oct. 2007. Web. 12 Oct. 2012.

energy than other neighborhoods within the city. Findings demonstrated a correlation between lower energy use intensity (EUI), a unit of measurement to describe the amount of energy a building uses, and entire historic districts.⁶⁸ More research must be done at this district-wide scale to see if this is true within other cities as well. It is possible that urban historic districts across the globe could actually be performing better than city officials realize and may be able to meet the same energy benchmarks as those developed for non-historic buildings.

The following sections within this chapter discuss: the history of studies investigating the link between preservation and sustainability; sustainable benefits provided by individual historic buildings and entire districts in terms of density, energy use, and solid waste and emissions; strategies for individual building and district-wide improvements of historic resources; gaps in information; and additional tools that can be used to further align preservation with sustainable goals. The makeup of historic districts is naturally different in every town so not all of the tools for measurement or individual techniques to increase building efficiency will be appropriate for all historic districts, at least not without specific tailoring by municipal governments. The following sustainable studies show just some of the possible benefits that can be achieved through historic preservation.

History of studies

The idea that the greenest building is one that is already built was popularized by Carl Elefante in a 2007 edition of *Forum Journal*. While not necessarily supporting preservation, Elefante stressed the importance of utilizing the built fabric that already exists in order to reduce carbon emissions created from the demolition, material harvesting, and rebuilding processes;

⁶⁸ City of New York. *PLANYC: New York City Local Law 84 Benchmarking Report*, August 2012. Web. 12 Oct. 2012.

“Largely, the green building movement remains blind to its most troubling truth: We cannot build our way to sustainability.”⁶⁹ While this notion certainly supports preservation, it does not mean that already extant buildings will perform better than their newly constructed counterparts. For this reason, many studies have been conducted to find the sustainable merits of preservation.

Studies investigating the actual sustainability of historic buildings have been taking place since the 1970s, which was relatively early in the sustainability movement. One of the earliest studies undertaken by Richard Stein, an associate at the Center for Advanced Computation at the University of Illinois, focused on the embodied energy of historic buildings. This study was touted by preservationist James Marston Fitch as a way of justifying historic preservation in an age when sustainability, particularly energy conservation during the oil crisis, was a relevant topic. The argument for preservation developed by this study was the idea that preserving buildings was inherently energy efficient because it used already harvested and processed materials, reducing the need for virgin materials and the need to create more solid waste through demolition. Essentially, the energy used in creating and harvesting the materials, transporting to the jobsite, and constructing them was “harnessed” in the actual material of the building itself, something that goes hand-in-hand with preservation, a field that places value on the retention of original material. Later calculations developed by Booz, Allen & Hamilton also measured the embodied energy of buildings. These studies have not been updated since the 1970s and are “still the most thorough evaluation of the embodied energy of building materials that has been produced in the U.S.”⁷⁰ The argument for the preservation of a building due to embodied energy has lost some of its power over time; today embodied energy is viewed as less significant than

⁶⁹ Elefante, Carl. “The Greenest Building Is...One That Is Already Built”. *Forum Journal* Vol. 21.4 (Summer 2007): 26-38. Print.

⁷⁰ Frey, 4.

building operations, which account for a substantially larger portion of the building's energy consumption over its lifetime. However, it has been found that it would take a number of years to recover energy lost through the demolition and construction of a new building in the stead of an already existing building, so the argument for embodied energy is still valid.

A new tool used to measure the efficiency of existing buildings is the life cycle assessment (LCA), which “evaluates the direct and indirect environmental impacts associated with a building,” including assessments of carbon emissions and air pollution as a result of material extraction, transport, manufacture, building construction, operations, demolition, and disposal.⁷¹ Although LCAs look at the efficiency of buildings, there are still issues with the method due to a lack of established benchmarks and lack of consensus on sustainable indicators used to evaluate buildings across the world. The Athena Institute, one of the primary developers of LCA software, claim that their software looks at a variety of indicators when determining a building's environmental impact and can model and assess up to 95% of the building stock in North America, ultimately assisting users in the creation of benchmarks to improve the performance of their buildings.⁷²

The topic of preservation as a means of sustainability is clearly still relevant today and studies are still being done to evaluate the true sustainability of historic preservation; in 2007 the National Trust for Historic Preservation began working with experts to explore how historic buildings could contribute to environmental, economic, and social sustainability. A 2011 study on the actual performance of buildings undertaken by the Preservation Green Lab, the section of the National Trust for Historic Preservation that focuses on sustainability, is perhaps the most

⁷¹ Frey, 6.

⁷² Frey, 8.

useful for demonstrating the compatibility between historic buildings and sustainability. Using LCA tools, researchers compared the environmental impacts of building reuse/renovation to new construction over a 75-year building life span and found that when comparing buildings of similar size and functionality, “building reuse almost always offers environmental savings over demolition and new construction.”⁷³

Density

To increase density in already built-up city cores with limited land space, building vertically is often the chosen solution. Many historic districts are composed of low to mid-rise buildings, meaning a more modern high-rise would be able to house more people on a lot of proportionate size and therefore have increased density. That is not to say that historic districts cannot be dense. In the case study of Alexandria, discussed in detail in the next chapters, the historic districts were among the densest areas of the city. Despite the fact that many urban historic districts are compact and typically utilize all available land within district boundaries, in areas with weaker preservation policies historic neighborhoods are being razed in favor of new high-rise developments.⁷⁴ It is then even more important that those seeking to reduce sprawl in order to meet ecocity principles realize that historic districts can afford unique social and economic benefits that new high-rise developments cannot.

In an effort to reduce urban sprawl, planners typically recommend the densification of urban areas. However, simply increasing density without special consideration as to where that density is will not provide the best results possible. “Much of what we consider sprawl is determined less by the density of people or jobs, and more by how buildings and parking are

⁷³ “The Greenest Building: Quantifying the Environmental Value of Building Reuse,” vi.

⁷⁴ This is not a primary threat within the U.S., which has stronger preservation legislation, but is a reality in other countries implementing ecocity plans, such as China.

arranged on the street, and whether streets are designed in a way that makes walking and biking safe and comfortable.”⁷⁵ It is therefore imperative to implement smart growth principles to achieve increased quality of life at the same time that sprawl is mitigated through the thoughtful placement of new housing, amenities, public space, and transportation. The case study of Strasbourg, discussed in the next chapter, gives an example of how “bubble urbanization” can be used within historic cities to target appropriate areas for new development while remaining sensitive to surrounding historic fabric.

Simply applying smart growth principles to an urban project does not guarantee the preservation of a city’s historic districts. Smart growth must go hand in hand with both strong municipal preservation policies and local governments that understand the value of preservation and what is significant about a city’s historic fabric. If not, conflicts could arise in the form of inappropriate alterations to historic buildings, insensitive new infill development, or even demolition. Katherine Tucker Wood’s 2001 thesis *The Best-Laid Plans*, discusses the conflicts and compatibilities between smart growth principles and historic preservation in more detail, citing specific examples within Reading, Pennsylvania. Wood found that while preservation professionals such as Richard Moe, the former president of the National Trust believed that “preservation itself is an alternative to sprawl,” it needs specific mechanisms for protection within public policy to be successfully integrated into smart growth projects.⁷⁶ Without added protection through increased review processes or stronger protection policies, Wood ultimately believes that smart growth has the potential to pose as much of a threat to historic preservation as urban renewal did in the twentieth century due to the focus on densification that can lead to the

⁷⁵ Eidlin, Eric. “What Density Doesn’t Tell Us About Sprawl.” *Access*, Vol. 37 (2010): 2-9. Web. 12 Oct. 2012.

⁷⁶ Wood, 16.

demolition of smaller, older buildings in favor of large towers.⁷⁷ The same is true of ecocity projects although, as seen in the previous examples, threats of demolishing entire historic cores typically occur outside of the U.S. Still, it will be beneficial to preservationists throughout the world if they are aware of potential conflicts between sustainability and preservation within their respective cities and are prepared to resolve conflicts through collaboration with planning authorities and potentially increased measures of protection; “Unless preservation is recognized and ingrained as a core value in sustaining quality of life,” smart growth and ecocity projects may promote development that jeopardizes historic resources.⁷⁸

Energy use

Historic buildings have the potential to be as energy efficient, if not more efficient, than comparable new development. A 2009 Athena Institute study showed that an existing building originally used 570 gigajoules of energy and, once it had undergone a green retrofit, only used 335 gigajoules.⁷⁹ It also found that a comparable new green building would use about 390 gigajoules of energy to maintain operations, showing that in this case the historic building had the capacity to outperform a newly-constructed green building. This certainly is not true for every single historic building, but suggests that it is possible to achieve significant energy savings in historic buildings. Retrofits on individual buildings can be quite successful but saving energy can also be done on a larger scale.

⁷⁷ Some solutions Ms. Wood identified to combat the loss of historic fabric were: the creation of local conservation districts to further monitor and review alterations and new construction within historic environments; making compliance with preservation policies mandatory rather than advisory; instructing developers about the potential of preservation tax incentives; creating disincentives, such as fines, for non-compliance with preservation policies; and ideally providing funding at a state level for local governments to access when they are attempting to incorporate preservation into local laws.

⁷⁸ Wood, 179.

⁷⁹ Athena Institute. “A Life Cycle Assessment Study of Embodied Effects for Existing Historic Buildings”. *Morrison Hershfield Ltd*, 14 July 2009. Web. 18 Nov. 2012.

Research by the National Trust for Historic Preservation has suggested that in historic neighborhoods, it may be more useful to implement district energy systems rather than individual retrofits since district energy systems can improve building efficiency by up to 20% and do not alter visible fabric. District energy systems are “neighborhood-scale utilities that deliver heating, cooling, and hot water,” through sustainable methods including waste-water recycling and

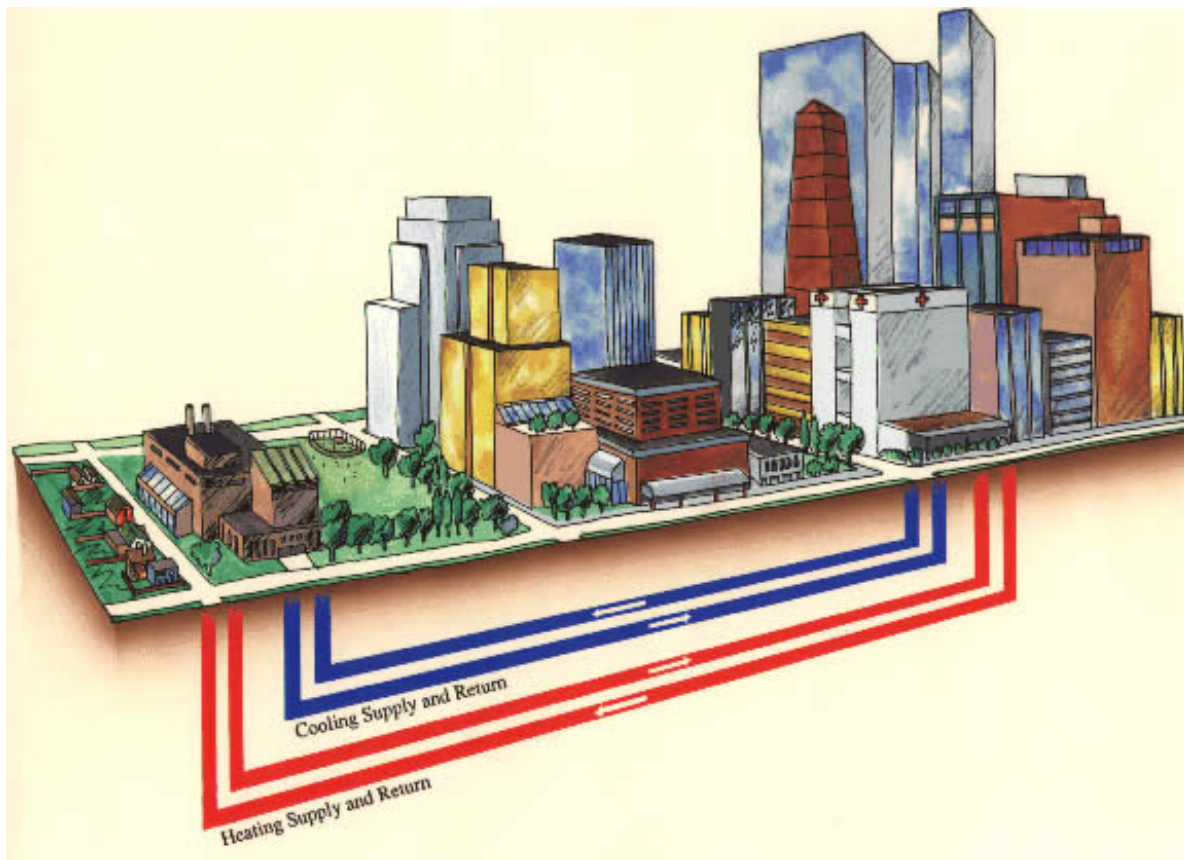


Figure 3: A single provider services an entire neighborhood (International District Energy Association) recapturing waste heat from customers.⁸⁰ Entire neighborhoods are serviced by one central provider, as seen in Figure 3, eliminating the need for boilers, furnaces, or smoke stacks, meaning this method would be ideal for historic neighborhoods that have limits on visible or invasive alterations. These providers focus on offering heating and cooling, however they have

⁸⁰ “The Role of District Energy in Greening Existing Neighborhoods.” *Preservation Green Lab*, Sep. 2010. *National Trust for Historic Preservation*. Web. 1 Mar. 2013.

the capability to also supply electricity through “the use of combined heat and power technologies.”⁸¹ District energy systems were used as early as the beginning of the 20th century but were put aside when energy was cheap and land was plentiful, resulting in sprawl. These systems are now being used by cities trying to meet established benchmarks in efforts to reduce energy use and greenhouse gas emissions in their building sectors, typical goals of ecocity plans.⁸² Thus, district energy systems may be an ideal solution for further aligning the preservation of historic districts with the increased building efficiency benchmarks established during ecocity projects.

There is an issue at present regarding lowered requirements for historic buildings in terms of energy efficiency. Some energy codes provide historic buildings with lower energy benchmarks or even exemption from them altogether. In the U.S., historic buildings that are exempt from energy codes include those listed or eligible for listing on respective State Registers or the National Register of Historic Places. This is largely due to the types of codes that typically govern energy use. The three types of energy codes are prescriptive, performance-based, and outcomes based codes.

At present most energy codes at all levels of government are prescriptive: prescriptive codes outline specific actions that buildings must perform in an effort to become more energy efficient. Since this could require altering the built fabric, these types of codes are not ideal for already-built structures and are more appropriate for new buildings. Prescriptive codes are also not ideal in terms of sustainability because they don't encourage whole-building approaches to

⁸¹ “The Role of District Energy in Greening Existing Neighborhoods,” 6.

⁸² Ultimately these systems provide benefits in the environmental, economic, and social realms that are all part of ecocity goals. To implement district energy systems, support through financing and policies is required from the municipal government. An excerpt from the National Trust's paper on the role of cities in making district energy happen and a policy road map for creating district energy systems in existing neighborhoods is available on their website www.preservationnation.org.

improved energy performance and do not usually require building commissioning after the prescribed energy systems are installed.⁸³ Commissioning, the process of ensuring that the new building operates as intended, is required to determine if buildings are actually meeting established sustainable goals.

Utilizing performance-based or outcomes-based energy codes would be more ideal for adoption by new and existing buildings. Performance-based codes determine the baseline level of energy use from existing building data and set goals to become a certain percentage better than the baseline.⁸⁴ This is more flexible for historic buildings since it is possible to implement appropriate technology and techniques to achieve certain established energy benchmarks. There are, however, drawbacks to this code system in terms of sustainability; building compliance is based on a computer generated model so it is not guaranteed that the building is actually performing as expected.

Outcomes-based codes look at actual building performance over extended periods of time and buildings must simply meet pre-negotiated benchmarks without having to comply with any prescriptive methods.⁸⁵ This would be the most ideal situation for historic buildings and for improved energy performance in general. Individual building owners who understand the significance of their historic structures could utilize techniques that would not damage the property and the actual monitoring of building performance would ensure that those techniques achieved their purpose. A pilot project for implementing outcomes-based codes across historic neighborhoods is currently taking place within Seattle, Washington with the help of Preservation

⁸³ "Comparative Analysis of Prescriptive, Performance-Based, and Outcome-Based Energy Code Systems." *Alaska Housing Finance Corporation*, May 2011. Web. 1 Mar. 2013.

⁸⁴ "Comparative Analysis of Prescriptive, Performance-Based, and Outcome-Based Energy Code Systems," 10.

⁸⁵ "Comparative Analysis of Prescriptive, Performance-Based, and Outcome-Based Energy Code Systems," 14.

Green Lab and can be read about on the National Trust website. Eventually energy code exemptions for historic buildings may become a thing of the past.

Solid waste and emissions

Demolition of an existing building in order to build a new structure, even if it is constructed with sustainable methods, will result in wasted materials, energy, and increased carbon emissions. A 2004 study by the Brookings Institute estimates that one third of all buildings, or 82 billion square feet, will be torn down by the year 2030 with the resulting materials filling our landfills.⁸⁶ Additional research by the U.S. Department of Energy (DOE) found that in 2011 construction and demolition debris accounted for roughly 24% of the municipal solid waste stream.⁸⁷ The preservation of historic buildings can reduce the amount of material entering the solid waste stream, help sustain natural resources, and ensure that materials will be available for future generations.

Even if a new green building utilizes recycled material, preserving a historic building still reduces energy use and CO₂ emissions.⁸⁸ According to the U.S. Environmental Protection Agency (EPA), “it is estimated that a new, green, energy-efficient office building that includes as much as 40 percent recycled materials would nevertheless take approximately 65 years to recover the energy lost in demolishing a comparable existing building.”⁸⁹ The demolition and construction process also causes CO₂ emissions to be released into the atmosphere. A 2009 study

⁸⁶ “Preservation’s Essential Role in Addressing Climate Change.” *National Trust for Historic Preservation*, Mar. 2009. Web. 17 Dec. 2012.

⁸⁷ “Buildings Energy Data Book,” Chapter 1.

⁸⁸ Material selection is important to the success of preservation projects as well. The 2011 Preservation Green Lab study found that the quantity and type of materials used in building reuse projects can reduce or even eliminate any environmental advantages associated with reuse. “Therefore, care must be taken to select construction materials that minimize environmental impacts.” (“The Greenest Building: Quantifying the Environmental Value of Building Reuse,” 84.)

⁸⁹ “Smart Growth and Sustainable Preservation of Existing and Historic Buildings,” pp. 1.

by the Athena Institute estimates that preserving just one building could avoid demolition emissions equivalent to the annual emissions of 473 private homes for an entire year.⁹⁰ New

This study finds that it takes between 10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to the construction process. This table illustrates the numbers of years required for new, energy efficient new buildings to overcome impacts.

Building Type	Chicago	Portland
Urban Village Mixed Use	42 years	80 years
Single-Family Residential	38 years	50 years
Commercial Office	25 years	42 years
Warehouse-to-Office Conversion	12 years	19 years
Multifamily Residential	16 years	20 years
Elementary School	10 years	16 years
Warehouse-to-Residential Conversion*	Never	Never

*The warehouse-to-multifamily conversion (which operates at an average level of efficiency) does not offer a climate change impact savings compared to new construction that is 30 percent more efficient. These results are driven by the amount and kind of materials used in this particular building conversion. As evidenced by the study's summary of results, as shown on page VII, the warehouse-to-residential conversion does offer a climate change advantage when energy performance for the new and existing building scenarios are assumed to be the same. This suggests that it may be especially important to retrofit warehouse buildings for improved energy performance, and that care should be taken to select materials that will maximize environmental savings.

Figure 4: Existing building reuse versus new construction (The Greenest Building, 9)

construction to replace the demolished structure requires energy to erect the new building and creates additional CO₂ emissions through the harvesting, transportation, and installation of new materials. As seen in Figure 4, the 2011 Preservation Green Lab study found that it could take between “10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate

⁹⁰ Athena Institute, 6.

change impacts related to the construction process.”⁹¹ Reducing demolition through the practice of preservation is one solution to mitigate harmful impacts on the environment caused by the demolition and construction processes but other measures to make buildings more efficient must take place as well.

The preservation of open spaces within historic districts can also result in reduced carbon emissions while maintaining the character of a neighborhood. Preserving plantings in open spaces has been shown to reduce the heat island effect.⁹² This is important because studies have found that urban temperatures have been steadily increasing in cities around the world and raised temperatures result in increased levels of energy usage to combat the heat; “approximately 3 to 8 percent of the current U.S. Electricity used for air conditioning is needed to compensate for the heat island effect caused by an increase in city temperatures.”⁹³ Cooling urban environments means an increased level of carbon emissions, further exasperating the problem of global warming and worsening local air quality. Open spaces may not be relevant in all historic neighborhoods but in the case study of Strasbourg open spaces, including green spaces and public plazas, were noted as significant to the historic district.

Gaps in information

The largest identifiable gap in information is the lack of building performance data on a larger scale. “Wayne Trusty, President of the Athena Institute in Canada, notes ‘while it may seem intuitively obvious that retaining and renovating older buildings has environmental merit,

⁹¹ “The Greenest Building: Quantifying the Environmental Value of Building Reuse,” viii.

⁹² The urban heat island effect is the phenomenon when, “daytime heat storage by the urban fabric delays the onset and retards the rate of nocturnal cooling...because cities have less vegetation and more impervious surfaces than rural areas, more energy is available to warm the air,” resulting in much higher temperatures in urban environments than rural environments. (Platt, 155)

⁹³ Platt, 156.

the case is difficult to prove without access to the appropriate data and tools.”⁹⁴ This sort of information would be helpful during the creation of ecocity benchmarks and would also help preservationists make a stronger case for the retention of historic districts: being able to show that historic districts typically use less energy could clearly demonstrate the compatibility between preservation and sustainability. While there is considerable research and data concentrated on discovering the benefits of individually preserved historic buildings, there is a lack of data for the sustainable benefits provided by entire historic districts. The fact that numerous sustainable benefits can be provided by individual historic buildings is certainly compelling, but in order to make a more convincing argument demonstrating the environmental sustainability of entire historic districts, researchers must begin finding measurable data. This includes water and energy use, the comparable densities of historic districts and the surrounding area within the urban boundaries, and much more.

Finding more economic information to support preservation would also be an incentive for many ecocities to implement stronger preservation policies. The National Trust for Historic Preservation has shown, at least in a large public school project in Chicago, that preserving and reusing a historic building rather than demolishing it in favor of new construction can ultimately save on project costs. In this case, the public school system was spending \$2.5 billion to upgrade its facilities; bare-bones new construction was \$155 per square foot but renovation was just \$130.⁹⁵ A 2011 Preservation Green Lab study also found that there could be financial benefits to reusing a building instead of constructing a new one in its place: savings from building reuse can range from 4 to 46 percent over new construction when comparing buildings with the same

⁹⁴ Frey, 3.

⁹⁵ Bernstein, Ken. “The Top Ten Myths About Historic Preservation.” Web. 18 Nov. 2012.

energy performance level.⁹⁶ If cost savings due to preservation could be demonstrated for most projects, the argument for historic preservation would certainly be bolstered.

A lack of data to demonstrate the true sustainability (environmental, economic, and social) of the built environment is currently being recognized and some cities have recently begun uncovering water and energy usage data. As previously mentioned, New York City's Benchmarking report investigated energy use throughout the city, specifically calling out historic districts for their reduced energy usage. Preservationists are also recognizing the importance of discovering the metrics. In 2012 the National Trust's Preservation Green Lab launched a project called "Place Based Sustainability Metrics for Older Neighborhoods," in which researchers will "gather and map geo-coded data in order to explore the relationship between older, finer-grained neighborhoods and" the economic and social sustainability of historic districts.⁹⁷ This project will also touch on the subject of density and discern the difference between the quantity and quality of density that go into making successful sustainable communities. Recent articles by Ed McMahon of the Urban Land Institute, Kaid Benfield of the National Resources Defense Council, and Richard Florida, the leader of the "creative class" movement, "suggest that simply increasing the number of people living or working per acre is not sufficient for improving community outcomes."⁹⁸ Ultimately all realms of sustainability, environmental, economic, and social, must be further investigated to truly determine the sustainability of any neighborhood but knowledge about economic and social impacts may be perhaps the most important resources for historic districts that possess unique characteristics that cannot be duplicated.

⁹⁶ "The Greenest Building: Quantifying the Environmental Value of Building Reuse," vi.

⁹⁷ "Preservation Green Lab Launches Place-Based Sustainability Metrics for Older Neighborhoods Project with support of The Summit Foundation." *Preservation Green Lab*, 2012. *The National Trust for Historic Preservation*. Web. 2 Mar. 2013.

⁹⁸ "Preservation Green Lab Launches Place-Based Sustainability Metrics for Older Neighborhoods Project with support of The Summit Foundation," pp. 8.

Additional tools

Although this paper focuses on ecocities, they are not the exclusive option for neighborhoods trying to become more sustainable. The following projects can be implemented by themselves or even in conjunction with ecocity programs. The smaller-scaled projects that can be tailored to individual neighborhoods and adapted to promote and protect historic districts within ecocity projects include community action plans and eco-districts. The Community Action for a Renewed Environment (CARE) program, a federally funded project that is therefore unique to the U.S., is more similar to ecocity projects in that it is city-wide.

Community Action Planning (CAP) can be used as a tool to increase sustainability within older neighborhoods. In Yangzhou, China a CAP that focused on urban conservation was put into place for the historic area, called Old City, in 2007. Yangzhou was in the process of becoming an ecocity and it was decided by officials that there was a need to target the historic areas of the city to ensure their preservation. In the last few years more than 200 cities within China announced plans to become ecocities and many of these ultimately lost their respective historic districts to new development.⁹⁹ The rapid economic development and urbanization within China have also led to enormous amounts of construction activity, demolition, and redevelopment within city centers; “In many cities, the historic areas are being swallowed, resulting in a loss of cultural heritage.”¹⁰⁰ Yangzhou was a very different case because officials recognized the economic and social benefits to be had through saving their historic resources and bolstering the unique identity of their historic district, Old City. Old City was in serious need of rehabilitation in order to ensure the safety of the built fabric and the increased quality of life for

⁹⁹ MacLeod, Calum. “China Builds Most Ecologically Friendly Cities.” *USA Today*, 15 Jul, 2012. Web. 12 Oct. 2012.

¹⁰⁰ Longbin, Dr. Zhu. “Community Action Planning in Urban Conservation of the Old City Yangzhou.” *University of Washington*, Apr. 2007. Web. 28 Feb. 2013.

residents, so the CAP focused on “establishing a participatory planning approach for rehabilitating and upgrading” the neighborhood.¹⁰¹ Since one of the primary strategies was public engagement, officials asked locals to record what they personally saw as “good” historical and non-historical architectural elements throughout the neighborhood. Officials also completed a thorough survey to identify historic resources and any issues affecting them, such as deterioration or structural problems. Workshops then took place to develop an awareness of Old City. Here the findings of the locals were discussed and used to create policies for both the protection of historic buildings and financial assistance to promote historic building rehabilitation. The primary question used to engage residents was “What would you want to pass on to your children?”¹⁰² Ultimately this helped to bring a different perspective to the idea of preservation and successfully brought together local authorities, international consultants, and the residents of Yangzhou’s Old City. Guides were created to outline proper building rehabilitation steps for the residents. Representatives for each city street were elected to oversee alterations and report to planning authorities. The CAP in Yangzhou, which was extremely successful in promoting the awareness of both sustainability and preservation, was a component of the larger ecocity project. This suggests that historic districts within ecocities may be able to use CAPs as another strategy to promote sustainable goals while ensuring extra protection for historic fabric.

Eco-districts are another way in which sustainable projects can be implemented at a district-wide scale and strategies can be specifically tailored for individual neighborhoods. Eco-districts are neighborhoods focused on community energy performance and other community resource issues such as carbon emissions and water use. Several cities have created eco-district

¹⁰¹ Longbin, 3.

¹⁰² Longbin, 9.

initiatives including Portland Oregon, Denver Colorado, and Oberlin, Ohio.¹⁰³ The primary goals of these initiatives as described by the Portland Sustainability Institute, which helped to develop Portland's eco-district initiative, include: engaging the community and building community support; setting benchmarks and goals; implementing a variety of sustainable projects and techniques, and establishing municipal policies to support eco-district goals (see Figure 5).¹⁰⁴ These are very similar to goals and methods used when creating an ecocity framework and it would be valuable to include these district-wide initiatives under the umbrella of the ecocity project. Other cities have realized this compatibility and Portland Sustainability Institute expects their eco-district initiative to “produce a set of tools and strategies that cities can use in support of integrated policy goals around climate change, green building, mobility, watershed and ecosystem health, economic development, and community wellbeing.”¹⁰⁵ Eco-districts could ultimately be used to specifically target the nuances of implementing sustainability programs within historic districts, and they are perhaps one of the most appropriate ways in which to think about improving the sustainability of entire historic districts since eco-district initiatives tailor both strategies and monitoring systems for specific neighborhoods.

The Community Action for a Renewed Environment (CARE) group, sponsored by the U.S. Environmental Protection Agency (EPA), is a program that assembles and distributes examples of their sustainable methods to interested towns. This group acts as a sort of freelance expert on sustainability, traveling all over the nation at the request of towns wishing to become more sustainable. Their services include providing advice for strategies that will help towns achieve specific goals and how these towns can secure money from the EPA to achieve these

¹⁰³ “The Role of District Energy in Greening Existing Neighborhoods,” 14.

¹⁰⁴ “Eco-districts: Building Blocks of Sustainable Cities.” *Portland Sustainability Institute*, 2012. Web. 1 Mar. 2013.

¹⁰⁵ “Eco-districts: Building Blocks of Sustainable Cities,” pp. 6.

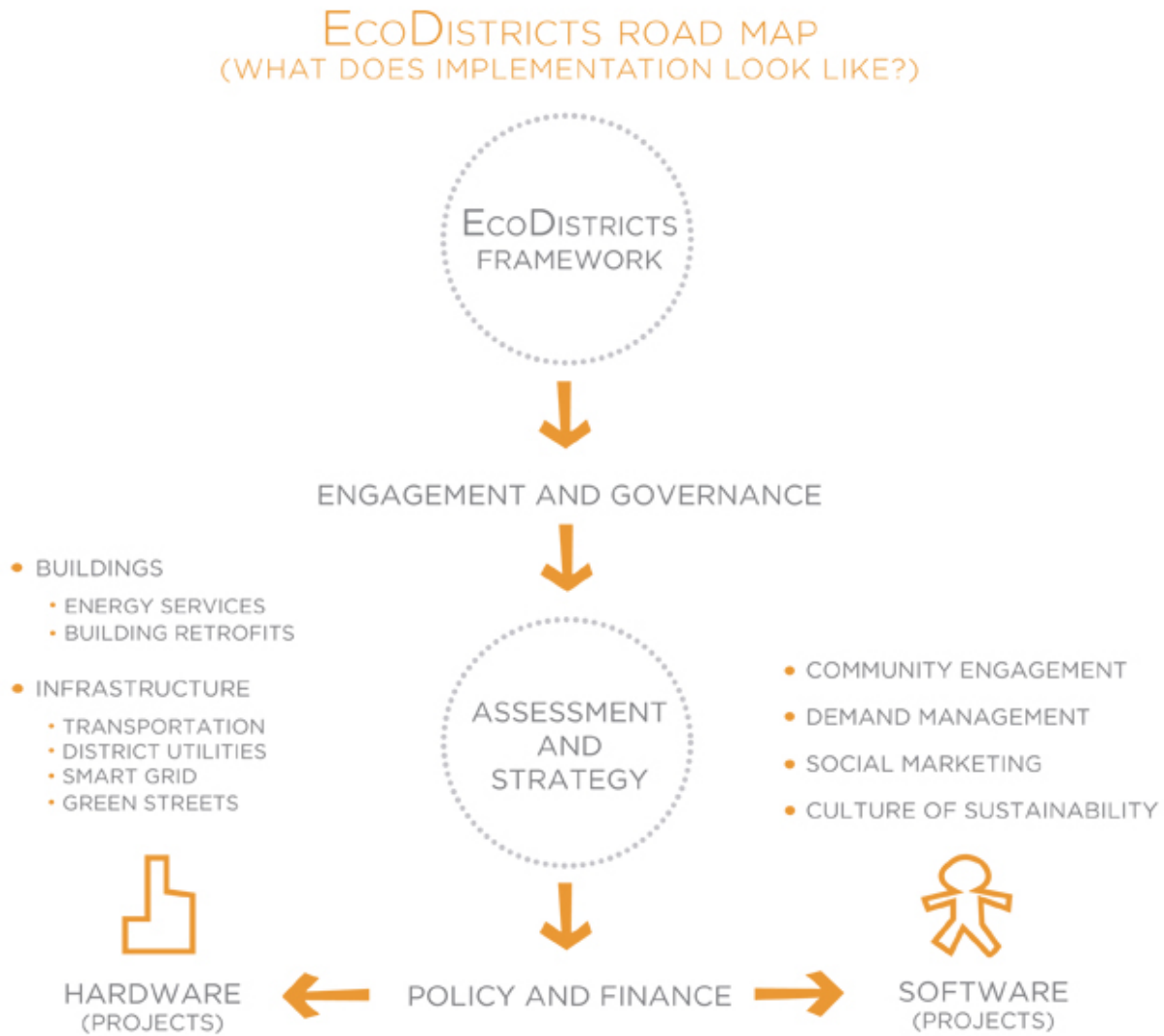


Figure 5: The EcoDististrict Road Map shows the components of this type of project (Portland Sustainability Institute)

goals. Currently, 68 CARE communities have taken advantage of this service since 2005. Their 2010 *Tips for Better Care* document describes techniques such as establishing special groups within local government to oversee sustainable programs, instituting new local regulations and standards that support specific sustainable goals, and, in every given example, involving the local

community in sustainability efforts. All of these methods are integral to ecocity projects, demonstrating how these smaller programs can be compatible within a larger ecocity framework.

It is possible for preservation to align with the above-mentioned tools and the implementation of any of these tools could help cities and neighborhoods make positive strides in their effort to become more sustainable. However, these types of projects were not chosen as the basis of analysis within this study. The smaller-scaled community action plans and eco-districts have the potential to fit under the larger ecocity umbrella and therefore can be selected and used by cities that determine this step is appropriate, which may not always be the case. It is imperative then, to look at the bigger picture, which is the establishment of the overarching city-wide ecocity plans. The CARE program is a federally funded project that is, therefore, only used in the U.S. and so is not a global answer to the issue of sustainability. Ecocities have the potential to affect the future of our cities on a global scale; the IEFS is currently developing a framework and set of standards that can make identifying and measuring individual projects simpler. Ecocity projects, then, are the projects in which preservation must begin to have a role since they have the potential to drastically affect urban fabric all over the globe, including urban centers containing historic districts.

Chapter 4: Case Studies

“From an ecological perspective all of these variables – population growth, land development, quality of life, and the environment – are interdependent.”¹⁰⁶

Two case studies will be investigated within this paper: Alexandria, Virginia and Strasbourg, France. Both cities have historic districts and are implementing ecocity plans. Each city also utilized preservation as a way for furthering its sustainable goals. They were chosen in the hopes that the best practices for incorporating preservation into ecocity plans can be identified. These cities were also chosen because each is at a very different stage in its plans; Alexandria has already completed the majority of ecocity planning while Strasbourg is just beginning its project. Looking at an already-established ecocity plan makes it possible to see how well some of the sustainable measures have actually met intended goals and if there were any changes based on discoveries in the field. Strasbourg differs from Alexandria because it is expanding its historic district while creating ecocity plans, leaving more room for boundary changes and other tradeoffs to be made in an effort to be more sustainable. Due to this expansion, Strasbourg will have an opportunity to survey its entire building stock to determine which resources must be protected and which can be altered under the ecocity plan, resulting in valuable examples of best practices for other cities. Comparing these particular cities will also provide additional insight into the differing national dynamics between city planning and preservation departments within the U.S. and France.

¹⁰⁶ “Eco-City Alexandria: A Green-Ventory of City Environmental Policies, Plans, and Programs.” *Virginia Tech Department of Urban Affairs & Planning*, 2007. Web. 12 Oct. 2012.

Each of the selected each case studies will undergo the same analysis. First, their origins and basic histories will be investigated to determine each city's general size, population, and the characteristics of its built fabric. Within this section each city's local historic districts will also be identified. Next, each ecocity project will be studied by looking at its background history, including goals and charters, and how historic districts were approached by individuals implementing the respective projects. The compatibility and conflicts that may arise between preservation and ecocity goals will be identified, and potential resolutions to those conflicts will be provided in each case. Finally, an analysis of both projects will take place in order to determine the best practices that should be included within the final chapter of this paper. This analysis will also look at how these best practices can directly align with the requirements of the 2008 Ecocity World Summit definition.

Strasbourg, France

Strasbourg is located within the Bas-Rhin (lower Rhine) region of Alsace, an area that runs along France's eastern border with the Rhine and Germany (see Figure 6). The city today stretches over about 78.26km² (30.22mi²) with a population of over 272,000 in the urban area and another 200,000 within the surrounding suburbs.¹⁰⁷ The beginnings of the city date back almost two thousand years. Originally the land upon which Strasbourg is built was home to Celtic tribes, though the knowledge of the specific tribes has been lost to time. The story of the city begins with its settlement by the Romans in about 16 A.D. The Romans established a fort on what is now the site of Strasbourg, calling it Argentoratum, or, silver fort and used it as their

¹⁰⁷ "Strasbourg Population Statistics." *Map France*, 2007. Web. 21 Feb. 2013.

headquarters during battles with the German tribes.¹⁰⁸ Within two centuries the local Gallic civilians moved into the Roman fortress for protection from German invaders.¹⁰⁹ Argentoratum was strategically sited close to the Rhine River, which acts as a natural border line between France and Germany to this day. The historic city of Argentoratum was located on a central island, now known as the Grande Île in present-day Strasbourg, which provided further protection for the Romans (see Figure 7). The outpost continued to be used by the Romans until the city of Argentoratum was destroyed by Attila the Hun in 451 A.D.¹¹⁰ Soon after the city's destruction Gaul was conquered by the Franks, a German tribe from whom France derives its name. The city was then rebuilt by the Franks as 'Stratoburgum' (city of the highways); the city's strategic location at the center of three great European highways, one to Milan, one to Trèves, and one to Belgium, was acknowledged in its very name.



Figure 6: Strasbourg, France (Encyclopedia Britannica)

The entire region of Alsace, at one time part of Lotharingia, changed hands over the years and, during certain periods of time, was considered an entity separate from the countries now known as France and Germany, which have continuously quarreled over ownership (see Figure 8). Even though Lotharingia was an entity defined by natural river boundaries and agreements between local nations, the population of the empire was a mix of many different ethnicities including

¹⁰⁸ Wilson, H.W. "Argentorate." *A Guide to the Ancient World*. Bronx: The H.W. Wilson Company, 1986. *Credo Reference*. Web. 10 Jul. 2012.

¹⁰⁹ Wilson, pp. 1.

¹¹⁰ Wilson, pp. 1.



Figure 7: The Grande Île in the center of Strasbourg visible within the red circle (Google Maps)

Frisians, Franks, Alemans, and Walloons.¹¹¹ Lotharinga was also known as a transit zone because of its location in the center of Western Europe. Lotharingian valleys, and highways parallel to them, were historically used by “travelers, pilgrims, merchants, and armies.”¹¹² This surrounding melting pot, and the fact that Strasbourg was located at the crossroads for major routes, resulted in a unique blend of architectural style and influence throughout the city.

¹¹¹ Parisse, Michel. "Lotharinga." *The New Cambridge Medieval History c.900-c.1024*, 1999. *Cambridge Histories Online*. Web. 9 Jul. 2012.

¹¹² Parisse, 15.

The city's location along the border of two powerful nations also resulted in many invasions throughout its history. During the Roman period Strasbourg was constantly under siege from Franks, Burgundians, and Visigoths.¹¹³ As a result, fortifications around the city were an integral part of Strasbourg's survival and have been a significant feature maintained until recent times. During the 17th century Vauban, a civil and military



Figure 8: Alsace, France (Europa)

engineer to the King of France, was commissioned with re-fortifying the city of Strasbourg. He restructured and strengthened the defenses around the city.¹¹⁴ The biggest addition by Vauban was the Citadel, a stronghold between the Rhine and the city itself, from which soldiers could monitor the river. During his time in the city, he also constructed several covered bridges that still stand today. Vauban worked on many city-fortresses throughout France and believed that Strasbourg was the largest in Europe and therefore could not be conquered. Less than a century later, in 1871, he was proven to be wrong.

In 1870 the city of Strasbourg experienced heavy bombing during the Franco-Prussian War and in 1871 Strasbourg, along with the entire region of Alsace and part of Lorraine, was

¹¹³ "France." *Merriam-Webster's Geographical Dictionary*. Springfield: Merriam-Webster, 2007. *Credo Reference*. Web. 26 June 2012.

¹¹⁴ "Vauban en Alsace." *Les Archives de Strasbourg*, 2012. Web. 19 Dec. 2012.

forcefully taken back by Germany.¹¹⁵ Fortifications were then extended to cover 618 hectares (2.39mi²), where only 232 hectares (0.9mi²) of Old Town in Strasbourg was originally protected. This expansion considerably increased the area of Strasbourg's urban fabric. During the 1871-1918 occupation, the German government built Neustadt ('new city'), now sometimes referred to as the 'German District,' a large expansion to the city that was built to the north of the historic Grande Île.¹¹⁶ Neustadt is characterized by open spaces, long, wide avenues, public squares, and parks that were created in an effort to beautify the urban environment.¹¹⁷ This rebuilding took place for two reasons. First, portions of the city were damaged by the war so the German government rebuilt damaged buildings to erase traces of the war and to appease citizens. Second, the redevelopment was a way for the Germans to showcase their power through the modernization of the city and the creation of an entire district in distinctly German architectural styles including Wilhelminian and Jugendstil, the German variant of Art Nouveau, which were seen as a very modern addition to the city at that time.¹¹⁸ Modernization was also achieved with the development of wider avenues for automobile traffic and with the introduction of newer technology to provide residents with running water, links to sewers, gas, and electricity.¹¹⁹ Several structures developed in the area were also created to service the German military, including barracks and an extension of the fortifications built by Vauban, further supporting the idea that Germany was powerful and dominant within Strasbourg.

In the early 1900s business within the urban center began to boom, resulting in the need to clean up the city center and demolish some buildings in order to facilitate modern levels of

¹¹⁵ "La Neustadt de Strasbourg: Un Patrimoine en Projets." *Ville et Communauté Urbaine Strasbourg*. Strasbourg: Imprimerie Cusin, Jun. 2012. Print.

¹¹⁶ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg." *Ville et Communauté Urbaine Strasbourg*. Strasbourg: Imprimerie Cusin, Aug. 2011. Print.

¹¹⁷ "La Neustadt de Strasbourg: Un Patrimoine en Projets," 5.

¹¹⁸ "La Neustadt de Strasbourg: Un Patrimoine en Projets," 5.

¹¹⁹ "La Neustadt de Strasbourg: Un Patrimoine en Projets," 5.

traffic. In 1907, a project called the Grande Percée, or ‘Great Breakthrough,’ began with the goal of solving overcrowding and unsanitary conditions within the center of Strasbourg.¹²⁰ Areas were cleared to provide public open space and allow for access to public transportation, creating grand boulevards up to 60 feet wide that linked up major areas such as Place Kléber, a large public square, and the Place de la Bourse tramway station.¹²¹ This resulted in the displacement of many families and the construction of additional public transportation and low-cost housing that continued through the 1930s.¹²² It was at this point that the city adopted building regulations, introducing zoning requirements and shaping Strasbourg’s more modern additions to the urban fabric. World War II bombing destroyed 20% of the city, allowing Strasbourg to further “ventilate” its city center to accommodate new public spaces.¹²³ Most of the public housing projects that were necessary after such destruction took place outside the city center, to the northeast of Neustadt. Many streets and alleys throughout the city were widened to accommodate automobiles and large roads were established to allow the city to grow outwards while remaining connected. Some areas that were once dedicated as large, pedestrian plazas were repurposed to become spaces for parking, leading to a public outcry that eventually resulted in the banishment of cars from most of the historic city center in favor of public transportation and alternative modes of transportation, such as bicycles.¹²⁴

After two successive wars, and massive building campaigns, the region ultimately came under French rule once again and remains so today. Strasbourg is now the principal city of the

¹²⁰ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 46.

¹²¹ Although the Grande Percée project was originally intended to accommodate for public transportation, the large boulevards became congested by automobiles, causing the city to designate the Grande Île as a primarily pedestrian-only area. This pedestrianization aids the city in its attempt to become more sustainable and the compatibility of this measure is discussed in more detail within later parts of the chapter.

¹²² “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable.” *Ville et Communauté Urbaine Strasbourg*. Strasbourg: Imprimerie Cusin, Aug. 2011. Print.

¹²³ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 20.

¹²⁴ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 21.

Bas-Rhin region and home to one of the largest universities in the area, the Université de Strasbourg. Strasbourg is also considered by some as the capital of Europe. It is the meeting place for a number of prestigious institutions including the Council of Europe and the European Parliament, representing its continued tradition as a cultural center and ultimately the crossroads of Europe.

Despite Strasbourg's rich, long history, the preservation of historic fabric governed by law is a relatively new development. The first historic monuments and sites were designated within the city in the 1920s. When the Malraux Law, which provided incentives to restore historic properties, was passed in 1962 it spurred the creation of the French *Code de l'Urbanisme*, also created in 1962. This in turn influenced Strasbourg's *Plan Local d'Urbanisme* (PLU), the primary planning document at the municipal level.¹²⁵ This ultimately enabled Strasbourg to begin to develop a more detailed protection plan for its historic resources.¹²⁶ A formal preservation department was eventually established in 1974 and the first historic district in Strasbourg was proposed in the department's 1981 preservation plan called the *Plan de Sauvegarde et de Mise en Valeur de Strasbourg* (PSMV). This plan was approved by State Council decree on February 1st, 1985.¹²⁷ The newly established historic district, amounting to about 73 hectares (0.28mi²), covered only the southern half of the Grande Île within the city center and, because of this location, primarily protected structures created during the Roman, Middle Ages, and Renaissance periods (see Figure 9). The PSMV plan protected the interior of

¹²⁵ "Article L313-1." Code de l'urbanisme, 1962. *Legifrance*. Web. 21 Feb. 2013.

¹²⁶ Article L 313-1 of French Code de l'urbanisme gave local governments the ability to create conservation areas within their cities provided that they could clearly identify historic significance within the urban fabric.

¹²⁷ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 7.

buildings, the exterior of buildings, and contained information about acceptable alterations allowed inside historic buildings during interventions.¹²⁸

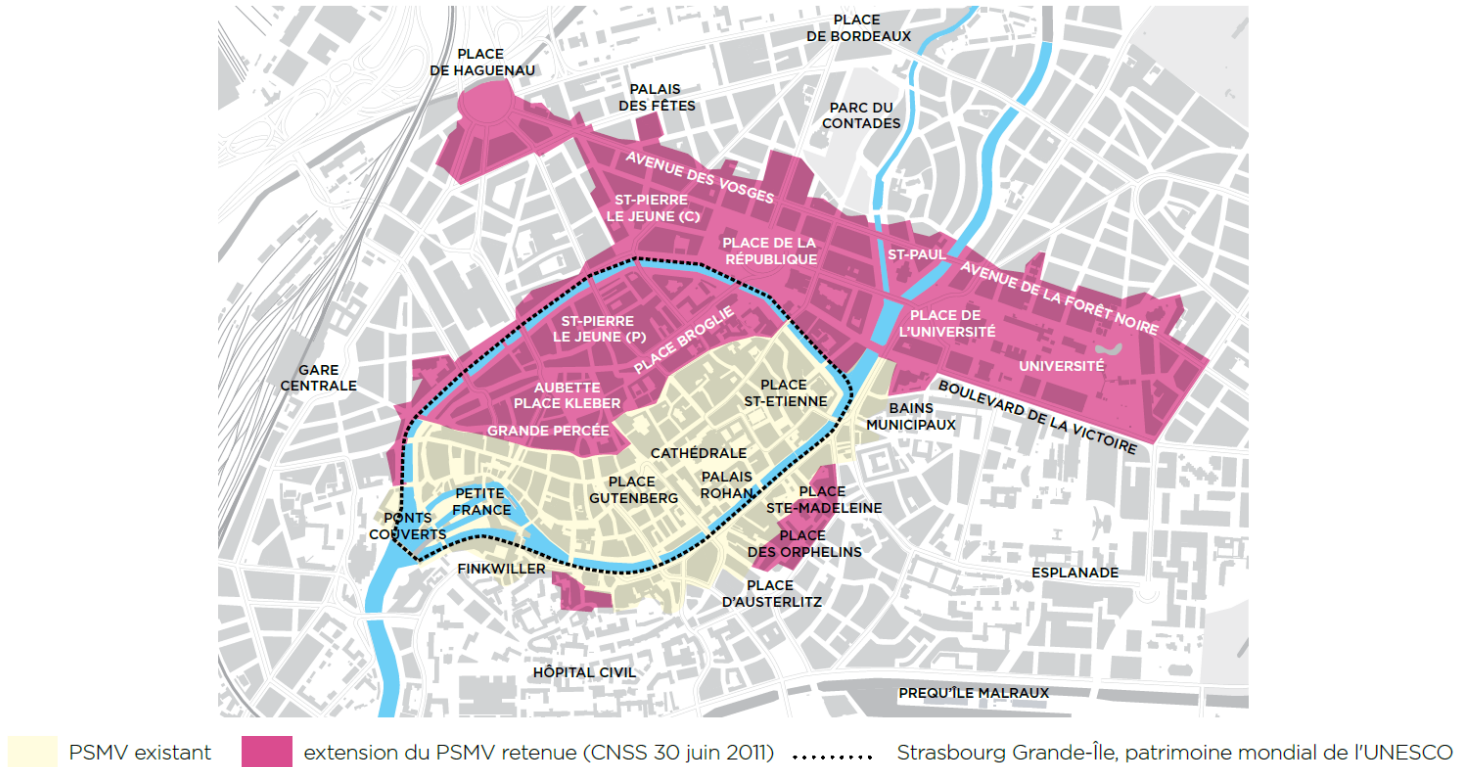


Figure 9: The historic district of Strasbourg. Beige represents the original district, pink represents the newly approved district extension, and the dotted line represents the area currently designated as a UNESCO World Heritage site (Ville et Communauté Urbaine Strasbourg)

The entire Grande Île was internationally recognized for its architectural significance several years later when it was classified as a World Heritage site by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 1988.¹²⁹ It was the first city-center in its entirety to be given this title and was recognized as significant by UNESCO because it encompassed historic architecture over a broad time period that was influenced by many

¹²⁸ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg." *Ville et Communauté Urbaine Strasbourg*. Strasbourg: Imprimerie Cusin, Aug. 2011. Print.

¹²⁹ "Strasbourg - Grande Île." *UNESCO.org*. United Nations Educational, Scientific, and Cultural Organization, 2013. Web. 21 Feb. 2013.

different cultures. The specific significance identified by UNESCO was the evolution of the city from the 15th to 18th century. It was claimed that this area of Strasbourg “exemplifies medieval cities.”¹³⁰ Even though UNESCO identified the entire Grande Île to have global significance, the city did not extend the historic district to cover it in its entirety. It did, however, make an amendment to the original PSMV plan in the early 1990s by extending more protection to some of the 19th century buildings located on the Grande Île.

Early on it was apparent that the small local district approved in 1985 was not sufficient to protect the diverse architectural fabric of the city. Although reviews took place as early as 1991, an historic district extension was not approved until 2011. This approval came after a 2009 study of the northern part of the Grande Île identified numerous buildings of exceptional significance.¹³¹ The new district extension will now preserve the entirety of the Grande Île along with Neustadt, which is an excellent representation of German Wilhelminian architecture. Much of Wilhelminian architecture was destroyed during World War II, emphasizing the need to protect this area of Strasbourg.¹³² There has also been a proposed extension to the area covered by UNESCO’s designation as a World Heritage site, which would match the boundary extensions created by the revised PSMV.

The planning and preservation departments in Strasbourg are working together during the expansion of the city’s historic district. An inventory of buildings within the extended area, particularly Neustadt, is currently being performed by the Service de l'Inventaire du Patrimoine de la Région Alsace in partnership with the Communauté Urbaine de Strasbourg (CUS). The district extension will be divided into eleven sectors in order for the two governmental bodies to

¹³⁰ "Strasbourg - Grande Île," pp. 4.

¹³¹ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 35.

¹³² "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg," 2.

obtain in-depth historic backgrounds about each neighborhood and therefore equip them with the knowledge necessary to identify which sites are significant within each sector. The updated PSMV is expected to be largely completed by 2015 with additional public collaboration and revisions taking place until 2017.¹³³ Final documents should be produced and approved by the municipal government in 2018. In addition to this PSMV document, the planning department is concurrently adapting Strasbourg's PLU to create stricter heritage guidelines within different sectors.¹³⁴ Ultimately both documents will serve to promote preservation at varying levels within three different sections of the city: the historic district covering the Grande Île and Neustadt; the neighborhoods directly around this designated historic district; and finally the outer and most recently built urban sections of Strasbourg.

With the historic district extension, the entire area encompassed by the historic district will consist of 210 hectares (0.81mi²) made up from over 3,910 parcels of land. This includes the rest of the Grande Île, which is about 94 hectares (0.36mi²), and 116 hectares (0.45mi²) outside the city center.¹³⁵ Although not currently protected under the city's PSMV plan, areas outside of the district are also promoting preservation. Individual neighborhoods have begun to identify and conserve heritage that is the most significant to them. Elements being investigated include entire urban areas, individual buildings, public spaces, and green spaces. As of 2000, after preliminary research was completed, neighborhoods began compiling guides describing individual neighborhood history, architectural styles, and the significance of each neighborhood.¹³⁶ With this combination of preservation ordinances, urban planning documents, and neighborhood

¹³³ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg," 4.

¹³⁴ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 40.

¹³⁵ "Rapport de Présentation du Plan de sauvegarde et de mise en valeur de Strasbourg." *Préfecture de la région Alsace et du département du Bas-Rhin*, 6 Aug. 2009. Web. 21 Feb. 2013.

¹³⁶ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 38.

associations, the proposed ecocity plan for Strasbourg needs to be created in close collaboration with representatives in each area: the preservation, planning, and public sectors.

Strasbourg-Kehl Ecocity Project: Metropolis of the Two Riverbanks

The ecocity project in Strasbourg called *Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives*, or the Strasbourg-Kehl Ecocity Project: Metropolis of the Two Riverbanks, was launched by the *Ministère de l'Écologie* (Ministry of Ecology) in 2009. The project was developed as a response to the 2007 Grenelle de l'Environnement conference in which French national and municipal authorities discussed goals related to sustainable public policy.¹³⁷ Strasbourg was one of the first of 13 French cities labeled as an ecocity resulting from this national call toward sustainability. The city has already been internationally recognized for its effort; a 2011 article stated that sustainable architecture will now be one of the defining features of Strasbourg.¹³⁸ *Projet Écocités Strasbourg-Kehl* is intended to serve as an inspiration for European cities in the future with a hope that similar projects will eventually be adopted throughout Europe. The selection of Strasbourg in particular, with its location at the cross-roads of Europe and its dynamic demographic makeup, was a strategic move to ensure this intention has a greater chance of being realized. It was also conceived as an “opportunity for [Strasbourg] to acknowledge its responsibilities and assert its values and principles that will guide its development in the coming years.”¹³⁹

Kehl, a German city directly across the Rhine, will be linked to the city of Strasbourg through tram-lines and bridges to form a united metropolis. Although Strasbourg and Kehl will

¹³⁷ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives.” *Ville et Communauté Urbaine Strasbourg*. Strasbourg: Imprimerie Cusin, Oct. 2010. Print.

¹³⁸ Cartes, Cristina. “Eco-architecture in Strasbourg: All Hands on Deck.” *Cafebabel.com*, 7 May 2011. Web. 22 Feb. 2013.

¹³⁹ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 10.

technically remain as separate cities, they will work in close collaboration during the project and both cities will adopt sustainable urban policies in an effort to achieve goals set out by *Projet Écocités Strasbourg-Kehl*. An ecocity committee will be developed to discuss the state of the project annually. The committee will be chaired by Jacques Bigot, president of *Communauté Urbaine Strasbourg*, Roland Ries, the Mayor of Strasbourg, and Günther Petry, the Mayor of Kehl, in an effort to ensure that each invested party is adequately represented.¹⁴⁰ Joint council meetings will also be held in Strasbourg and Kehl each year and a cross-border working group made up of urban planners and developers from each city has already been developed to support this ongoing partnership. Additionally, each city will partner with any local organizations that could assist with the development or implementation of sustainable policies and techniques including local universities, research organizations, or industrial companies focusing on green technologies. Authorities who have developed *Projet Écocités Strasbourg-Kehl* clearly see collaboration as a necessary component to achieve their intended goals.

In addition to creating a larger metropolis, the linkages of Strasbourg to the German city of Kehl in concurrence with the recognition of Neustadt's significance to Strasbourg's heritage also serve as symbols of a Franco-German reconciliation, which the city of Strasbourg has decided to finally pursue as enough time has passed to "overcome the memories of a painful history."¹⁴¹ It has been acknowledged by the city that the Neustadt area has long been ignored because of its ties to painful memories from the result of war. After World War II the Palais du Rhin, a former Kaiserpalast (German 'Imperial palace'), which was situated within Neustadt, was threatened with destruction on several occasions. According to Mayor Ries, "It is time for

¹⁴⁰ "Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives," 44.

¹⁴¹ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 49. Translated by author.

Strasbourg to reclaim its fundamental history,” and individuals must recognize the period of German occupation, particularly from 1871-1918, to “understand how Strasbourg became a capital city.”¹⁴²

Since *Projet Écocités Strasbourg-Kehl* takes place in two cities highly affected by waterways, the Rhine River that runs between the two has been chosen as the project’s emblem: “The river was the origin of [Strasbourg’s] wealth, and has opened it up to Europe. Separated from the historic center due to the industrial development of the Port, it has gradually ceased to be part of the inhabitants’ image of their city.”¹⁴³ By using the river as an emblem the project will reinforce its historic significance and revitalize the areas surrounding the riverbanks. The small area between Strasbourg and Kehl, nearest to the riverbanks, is therefore seen as the primary place for new development within the ecocity project and will be part of the *Projet Deux-Rives*, or the Two Banks Project.

Projet Deux-Rives will essentially be the project that links the cities of Strasbourg and Kehl the most, opening the areas of both cities along the Rhine and linking them through transportation lines and coherent land-use plans. New green technologies will also be put into place within the boundaries of the *Projet Deux-Rives* by Electricité de Strasbourg (EDF). Geothermal heating, a technique largely unprecedented in France, will provide energy to the housing units that will be created in the surrounding area in an effort to reduce energy use required for traditional heating methods.¹⁴⁴ Although *Projet Deux-Rives* will mean new development is taking place within both cities, the project plans to protect open and agricultural land as much as possible, focusing redevelopment on brownfields and abandoned properties in

¹⁴² “La Neustadt de Strasbourg: Un Patrimoine en Projets,” 3.

¹⁴³ “*Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives*,” 10.

¹⁴⁴ “Strasbourg en reconquête urbaine: L’axe Deux Rives,” 7.

an effort to reduce sprawl. Projet Deux-Rives will largely deal with derelict, abandoned properties that once served industrial maritime functions along the river. The plan is described as employing “bubble urbanization” because development will bubble up around already built properties.¹⁴⁵ The 20-year project, designed by Reichen & Robert Architects, will attempt to create a mixed-use area to combine development necessary for modern urban functions with the preservation of traditional industry in the area. By revitalizing some of the more traditional maritime activities that once took place along the Rhine, Projet Deux-Rives is supporting both preservation and the Projet Écocités Strasbourg-Kehl objective to reconnect Strasbourg with its surrounding waterways, renewing the image of Strasbourg. Much of the built environment that will need to be adapted was created during the post-war building boom and both cities have expressed a wish to conserve as much individual and shared history as possible by reaching out to local citizens during a series of project workshops.¹⁴⁶

Other new development within the city will follow Projet Deux-Rives’ example of land-preservation in part because it makes social and economic sense: “the biggest reserves of open land are situated in the outer-ring suburbs which are less well served by public transport and which would require considerable efforts to improve amenities.”¹⁴⁷ The current *Plan Local d’Urbanisme* document was discovered to be lacking; it was found that land-use policies within the plan compared to the available land resources would only be sufficient to meet development needs for at most 20 years if land continues to be consumed at the same rate as it has been over the past few years. New development is therefore a large part of Projet Écocités Strasbourg-Kehl because the city anticipates up to 50,000 new inhabitants within the next 20 years and hopes to

¹⁴⁵ “Strasbourg en reconquête urbaine: L’axe Deux Rives,” 16.

¹⁴⁶ “Strasbourg en reconquête urbaine: L’axe Deux Rives.” *Ville et Communauté Urbaine*. Paris: L’Agence Innovapresse, Sep. 2011. Print.

¹⁴⁷ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 14.

make it a more attractive, healthy place to live so many more people will be drawn to it in future.¹⁴⁸

During the early stages of *Projet Écocités Strasbourg-Kehl*, the government was most concerned about the state of the local environment, the quality of life for residents, and risk prevention in order to make Strasbourg more resilient against climate change and other disasters. According to the city, the ecocity project “draws on the roots of the city – its geography, its history, its cultures – to create a metropolis of the future.”¹⁴⁹ When developing the plans, the city was clearly aware that it was dealing with an urban area rich in architectural and cultural heritage, seeking from an early stage to preserve the significance of its urban landscape as much as possible. A way in which officials planned to do this was through collaboration within different government sectors and also with the local community. Strasbourg’s planners sought to create a project that was a “democracy” in which all stakeholders would be heard. In an effort to promote as much discourse as possible, *Communauté Urbaine Strasbourg* has developed *l’Atelier Urbain*, the Urban Workshop, which serves as a meeting place for local authorities, professionals within the building sector, and the public. Here all of the identified groups can view documents and discuss changes that will be made within Strasbourg on its quest to achieve its sustainable goals; “the aim is to debate projects from the earliest stages of their development.”¹⁵⁰

Projet Écocités Strasbourg-Kehl will focus on three distinct areas, or frameworks: the environment and waterways; green spaces and biodiversity; and public transportation. The blue

¹⁴⁸ “*Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives*,” 8.

¹⁴⁹ “*Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable*,” 28. Translated by author.

¹⁵⁰ “*Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives*,” 42.

framework is tied to the quality of the environment, particularly water quality since the river is central to the design of the project (see Figure 10). The green framework is tied to parks, forests, and greenways along the river in an effort to protect biodiversity and the economic value of small agricultural zones surrounding the city (see Figure 11).¹⁵¹ Finally, the transportation framework represents the public tramway that will be extended to connect various areas of the city and open up sectors that were previously only accessible by car (see Figure 12). It is estimated that the extension of tramways will help to connect over 18,000 homes.¹⁵² By simply connecting more areas to the urban core, densification among already-built up spaces will occur and more areas will have access to amenities, increasing the quality of life for individuals residing there.

The ecocity of Strasbourg will be a place for a “new, attractive and desirable mode of urban living” attained with the six founding principles that were developed by *Projet Écocités Strasbourg-Kehl*: preserving greenfields, creating diverse neighborhoods, utilizing public transportation, minimizing the carbon-footprints of buildings, connecting the urban environment with nature, and facilitating an economically dynamic and innovative city. While preservation itself is not mentioned within these principles, it is a part of the planned strategies that accompany them, particularly the protection of greenfields and the creation of diverse neighborhoods. Greenfields will be preserved by focusing new development within already-established city boundaries, redeveloping derelict land, renovating city neighborhoods, and reusing abandoned properties.¹⁵³ Diverse neighborhoods will be established through the creation of mixed-income housing and the connection of neighborhoods to local amenities. Public

¹⁵¹ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 18.

¹⁵² “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 20.

¹⁵³ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 24.

transportation will be extended to reach more areas of the city so pollution from individual automobiles will be reduced. Carbon footprints will be mitigated through the reduction of energy

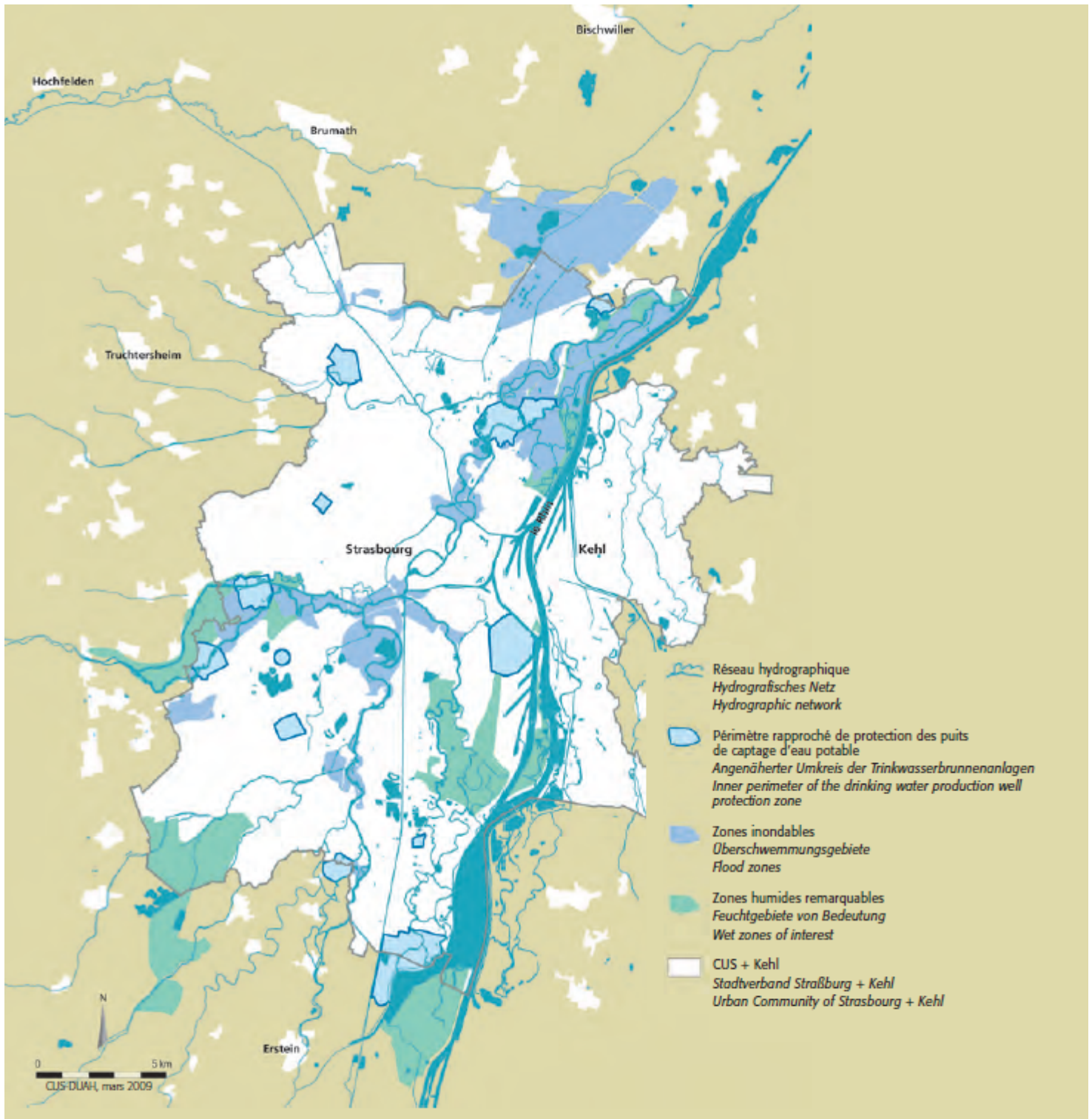


Figure 10: The blue framework consists of policies that address the numerous waterways, water sources, and flood zones around the cities of Strasbourg and Kehl (Ville et Communauté Urbaine Strasbourg)

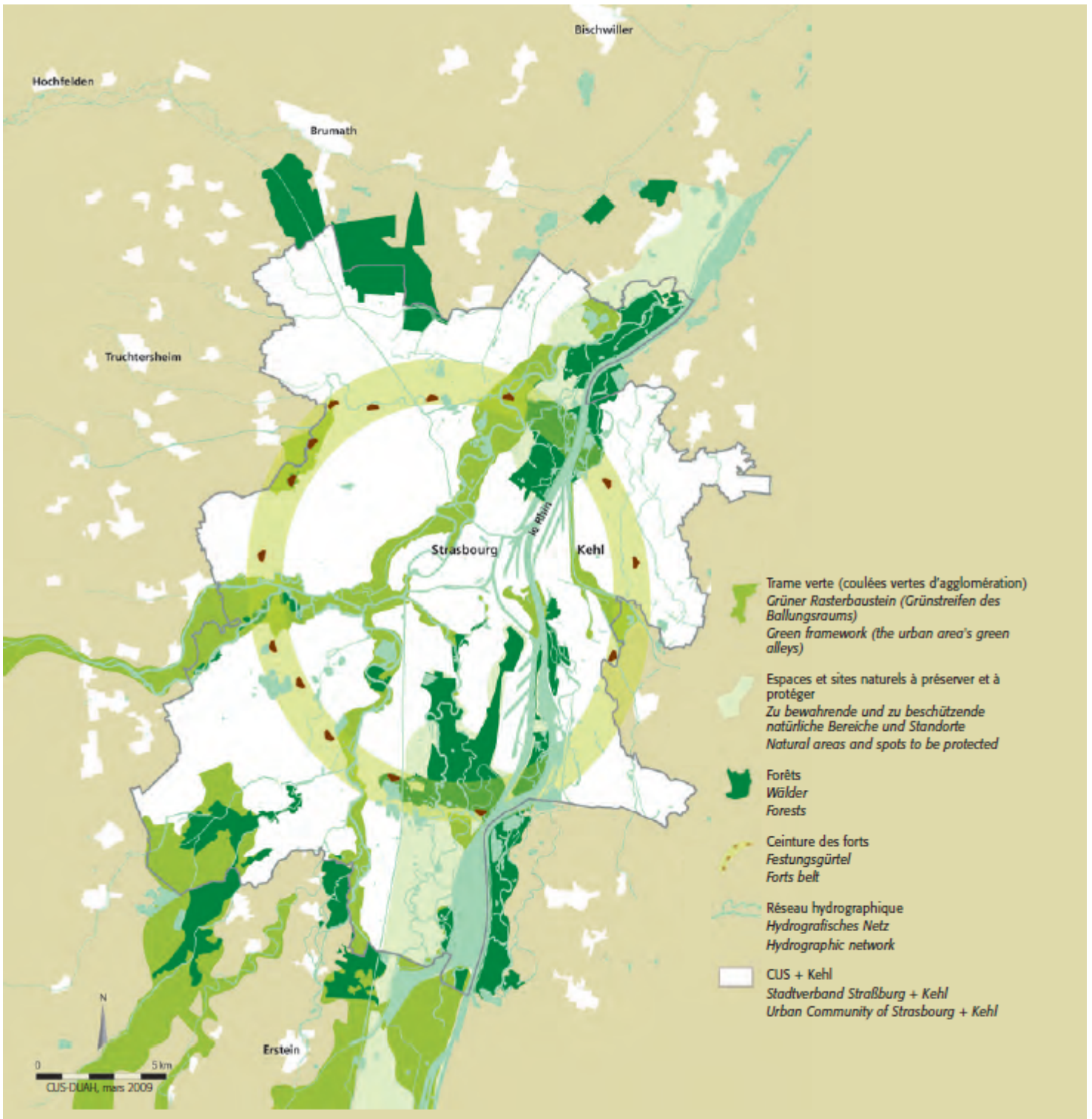


Figure 11: The green framework consists of policies that address biodiversity, the protection of green space, and the preservation of open land (Ville et Communauté Urbaine Strasbourg)

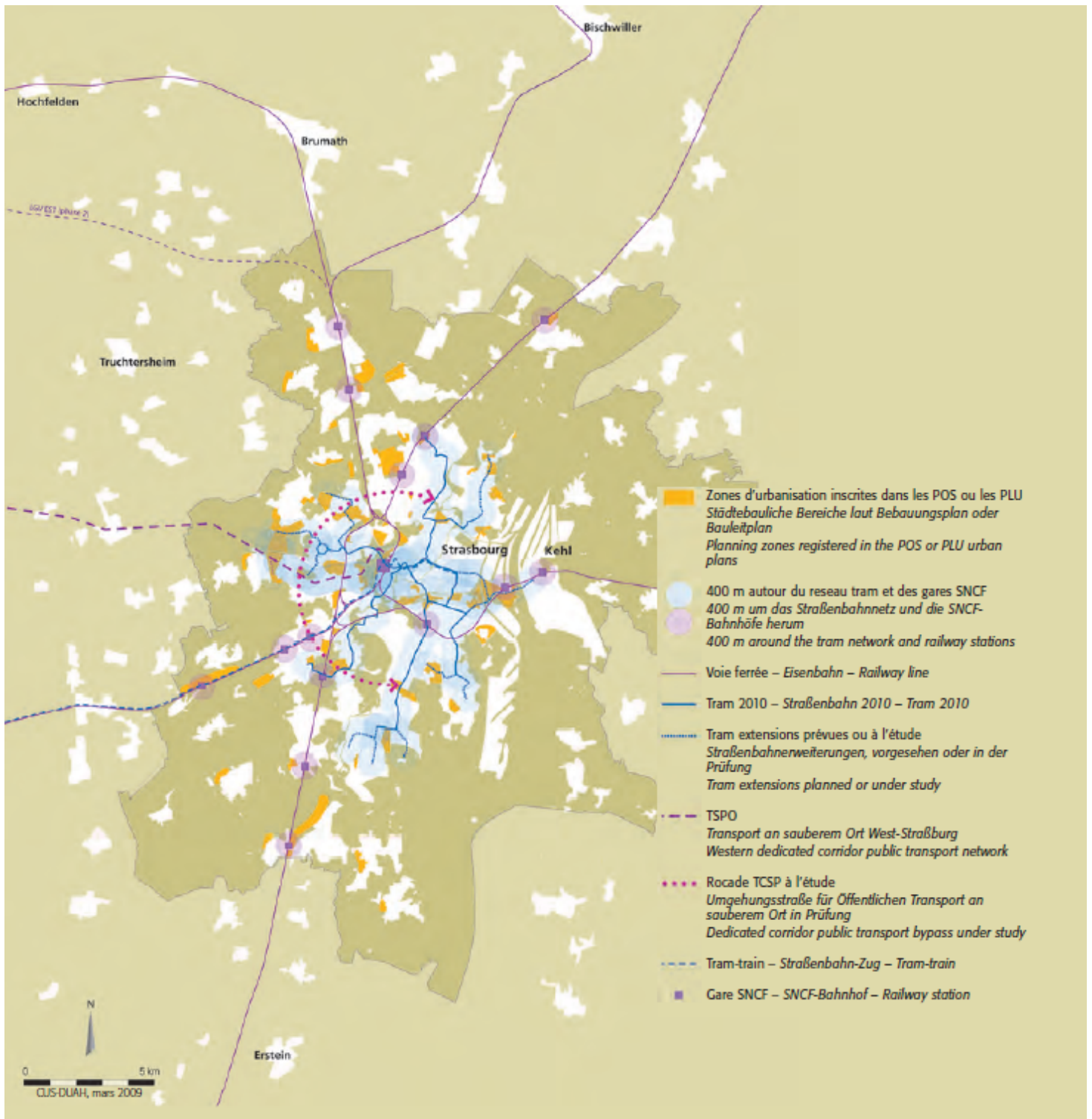


Figure 12: The transportation framework addresses the extension of various transportation lines which will link the center of the city to outlying areas, thereby providing transportation to existing residents and outlining the areas for new development on the newly-built tram lines (Ville et Communauté Urbaine Strasbourg)

consumption and greenhouse gas emissions. This will be achieved “by the valorization of local resources and the recycling of urban waste into new resources.”¹⁵⁴ The urban environment will be more closely connected to nature through the preservation of green, open spaces throughout the city, the promotion of small agricultural properties within city boundaries, and the renewal of the relationship of the city to its nearby waterways. Plans to stimulate the economy and concurrently create a more innovative city include local authorities promoting “eco-activities” developed by local companies and education through outreach programs and access to city-wide internet coverage.

Several sustainability initiatives are being developed to accompany the implementation of *Projet Écocités Strasbourg-Kehl*: the “eco-quarters” initiative; framework documents and methods of monitoring urban, architectural, and environmental quality; and the drawing up of charters for public spaces. The “eco-quarters” initiative, created by local planning authorities, will call for the implementation of cutting edge environmental techniques in small, specific areas during the beginning phases of the project; “the objective is to be able to transpose these methods in the medium term to the whole of the building...and renovation sector.”¹⁵⁵ The development of frameworks and methods dealing with monitoring the success of policies is perhaps one of the most important initiatives and one that is often overlooked in sustainable projects across the board. Monitoring is such an important step because without the ability to track its progress, the city will not be able to determine which policies are truly working and which need to be further tailored.

“The ecocity project is an opportunity to set up an ongoing system of assessing and monitoring projects in order to measure their ability to build a sustainable

¹⁵⁴ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 26.

¹⁵⁵ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 38.

metropolis. A long-term initiative, this will provide opportunities to re-adjust the project regularly and material for the work of the partnerships. Based on the six principles of the [project], it will use a reference system to measure and qualify the sustainability of the metropolitan area and assess the contribution of each of the driving projects to the sustainable development of the metropolitan district.”¹⁵⁶

Finally, drawing up charters for public spaces will ensure that each space follows the same design principles and the same level of quality is achieved throughout the territory.¹⁵⁷

In addition to *Projet Écocités Strasbourg-Kehl*, several other large-scale projects will affect Strasbourg’s historic resources within the next several years: adaptive-reuse building projects for the CHU de Strasbourg civil hospital and the Marcot barracks are currently underway with ending dates estimated for 2020; additions to the urban fabric will be made to the Wacken-Europe international business district and the Université de Strasbourg, both located near the heart of the city; and finally the project *Strasbourg Éco 2020* will, among other things, attempt to economically revitalize historic areas through the inclusion of amenities and diverse housing options within the city.¹⁵⁸ According to the *Projet Écocités Strasbourg-Kehl* brochure, up to 24 other projects will be implemented over the next several years, each corresponding to one of the three frameworks mentioned before, and each project will have a different timeframe. However, all have been, or are being, planned under the larger umbrella of *Projet Écocités Strasbourg-Kehl* in an effort to help the project meet its sustainable goals. The city has realized that in order to achieve its goals for *Projet Écocités Strasbourg-Kehl* by the intended end-date of

¹⁵⁶ “*Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives*,” 44.

¹⁵⁷ “*Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives*,” 38.

¹⁵⁸ “*Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable*,” 33.

2030 it will be required that “the concern for sustainable development be integrated into all urban projects, whatever their scale.”¹⁵⁹

Historic districts incorporated into the ecocity project

Since the district extension was only recently approved, surveys of the built fabric within the identified areas within the city are still taking place. Being in the early stages of research and planning, boundaries have only recently been confirmed. In an effort to preserve what was most important to the public, the city provided opportunities for them to voice their opinions through public surveys, exhibitions, and meetings.¹⁶⁰ After building and public opinion surveys were completed, boundary proposals were voted on by the municipal government before becoming officially defined in late 2011. Since the city was aware of the planned ecocity project, the surveys, exhibitions, and meetings discussed potential additions to the city’s fabric in an attempt to be more sustainable. In order to help officials pinpoint where new development should be placed, additional surveys focusing on the significance of local public spaces and greenfields were also conducted before the ecocity project began.

Compatibility

The pedestrianization of the Grande Île is an example of how the historic district is compatible with typical ecocity goals. Within this area, public transport is highly accessible thanks to the Grande Percée project, resulting in almost 50% of households having no car and relying only on alternative transportation methods.¹⁶¹ This reduces the amount of air pollution caused by automobiles, which is beneficial to the health of residents and to the preservation of

¹⁵⁹ “Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives,” 40.

¹⁶⁰ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg,” 4.

¹⁶¹ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 23.

the historic fabric. It also promotes more healthy alternatives like walking and bicycling. However, the Neustadt area, included within the recent historic district extension, does not show the same results; within this part of the city, cars are owned by about 68.5% of households. These statistics may change with the expansion of transportation lines throughout the city but it shows that one cannot simply assume that historic districts will be utilizing alternative transportation.

Preservation within Strasbourg is also compatible with smart growth principles implemented by the city's tailored plan called the *Projet d'Aménagement et de Développement Durable* (PADD). This plan, basically amounting to a smart-growth guide, will help planning officials who are working with adaptive reuse projects, additions to extant buildings, or new development projects. PADD, which was only recently created, will be implemented across the city at the same time Strasbourg is striving to become labeled as an ecocity. This plan is just one of the ways in which local policy will help Strasbourg to achieve sustainable goals. Some principles of smart growth that are seen within the plan include: the preservation of greenfields through the limitation of urban sprawl; the revitalization and increased quality of life for already-built central areas that are close to public transportation; the creation or adaptation of buildings with lower carbon footprints; and the promotion of public open spaces.¹⁶² Preservation naturally aligns with these goals: the use of extant buildings will help to preserve greenfields; revitalization and increased quality of life within central areas would specifically focus on the dense historic districts already identified by the city; the use of extant buildings, particularly those which have undergone green retrofits, will result in projects with overall lower carbon

¹⁶² "Projet d'Aménagement et de Développement Durables." *Ville et Communauté Urbaine Strasbourg*, 5 Jul. 2012. Web. 21 Feb. 2013.

footprints; and public open spaces are an important part of the preserved character of the historic neighborhoods of Strasbourg.

The historic district and other historic resources in Strasbourg have proven that they are compatible with the economic purview of an ecocity as well. The recognition of the city's historic resources is one of the primary ways in which Strasbourg officials have decided to further develop the city; "the valorization of the Grande Île... a World Heritage site, must be used as a starting point to increase the city's renown. The [resulting] policies will concern not only the improvement and recognition of the buildings concerned, but also the enhancement of the surrounding public spaces."¹⁶³ Through a number of studies it was discovered that thanks to tourist draws such as the Strasbourg Cathedral, local museums, and special events, attendance is either stable or has been growing. During the holiday season almost two million visitors trek through the Grande Île to experience the Christkindelsmärik, a traditional Christmas market set up near the Strasbourg Cathedral since the 16th century.¹⁶⁴ Tourism as a result of its built heritage is clearly a vital economic component for the city of Strasbourg.

Conflicts

Some of the issues mentioned by the City of Strasbourg during its preliminary study of the historic district expansion dealt with the adaptations required for a historic area to increase the quality of life for residents and help meet ecocity goals. The city has noted the need to adapt areas of Neustadt to create more public space in order to promote alternative transportation such as walking or cycling. It is also mentioned that creating more aesthetically pleasing public areas would serve as a draw to increase the population density within this historic area. Buildings

¹⁶³ "Projet Écocités Strasbourg-Kehl: Métropole des Deux-Rives," 31.

¹⁶⁴ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 26.

themselves will need to be adapted to integrate sustainable techniques dealing with energy conservation and renewable energy in addition to quality of life issues such as increased accessibility through the installation of elevators. “These issues must be addressed so as to strike a balance between compliance [with historic district protective measures] and upgrading these historic buildings.”¹⁶⁵ At this point the city is still devising a set of principles and requirements for integrating new technology and sustainable measures into historic buildings.¹⁶⁶

While not necessarily a conflict, it was found that the population density within the historic districts of Strasbourg is lower than other areas within the city. As of 2010, the overall density of the urban environment was 3,472 inhabitants per square kilometer (8,995 per square mile).¹⁶⁷ In a survey of a portion of the Grande Île within the original historic district boundaries, it was found that there are on average 132 inhabitants per square kilometer (342 per square mile). There are 4 parcels of vacant land and 9,236 housing units.¹⁶⁸ The remainder of the district is built-up or reserved as public open space. Most of the buildings within the center of the Grande Île are only a couple of stories while larger buildings are situated around the perimeter. The same survey showed that the protected area of Neustadt had lower population statistics with 103 inhabitants per square kilometer (267 per square mile) and only 4,124 housing units. In Neustadt, however, most of the buildings have much larger footprints than those found within the Grande Île. The majority of citizens live outside of the historic district with 125,368 housing units available in the urban area surrounding the Grande Île and Neustadt and another 88,363 within

¹⁶⁵ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 27. Translated by the author.

¹⁶⁶ Strasbourg’s Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

¹⁶⁷ “Strasbourg Population Statistics.” pp. 2.

¹⁶⁸ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 22.

the outlying suburbs.¹⁶⁹ Despite having a lower population density, between 1982 and 2007 the population of the Grande Île increased 12.5% while the rest of the city only increased by 9.5%.¹⁷⁰ “This shows that this area of the city is attractive, which is rare for ancient cities. In France, Strasbourg is one of the few cities that have increased the population of its city center.”¹⁷¹

The historic district of Strasbourg is primarily commercial and institutional, resulting in the low level of inhabitants. In 2009 it was shown that the Grande Île has almost 3,400 commercial establishments that offer locals 151,500 jobs; it houses about 16% of the city’s commercial buildings while the density of establishments diminishes significantly the further one looks from the heart of town (see Figure 13).¹⁷² At one point, city officials considered moving these commercial and institutional uses to other areas of the city in order to create more available housing in the heart of Strasbourg. However, it was decided that since these buildings were historically significant, their original uses should continue. It was also decided that the center of the city should remain an economic draw for both tourists and locals who wish to shop or have access to culture and amenities.

“For us, the old city is a sustainable city; one that can constantly adapt and provides qualities of urban planning that is difficult to repeat. It is important that this area remains very attractive because you see a lot of cities in the world with centers that are remarkable and yet people are no longer investing in them. So, for us it is important to have a lively city center for both citizens and tourists. It is part of a model to demonstrate that downtown Strasbourg provides a high quality of life with public transportation, shops, green spaces, and more.”

- Strasbourg’s Preservation and Planning Departments¹⁷³

¹⁶⁹ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 22.

¹⁷⁰ “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 22.

¹⁷¹ Strasbourg’s Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

¹⁷² “Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable,” 24.

¹⁷³ Strasbourg’s Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.



Figure 13: A map showing the concentration of commercial buildings represented in red dots. The Grande Île has a particularly high concentration of commercial spaces (Préfecture de la région Alsace et du département du Bas-Rhin)

When this issue of lower density was discussed with individuals from Strasbourg's preservation and planning departments, they indicated that it was not something that would threaten the historic district because, unlike some other cities, the preservation of the city's cultural heritage is considered paramount and therefore is incorporated into many of the city's planned strategies.¹⁷⁴ Preservation is represented in planning decisions due to the city's preservation department having an active voice during the ecocity project. Individual citizens, including local preservation groups, can also voice concerns they have regarding any issues, including threats to individual neighborhoods or historic buildings within the city. There are several plans occurring at the same time under the umbrella of *Projet Écocités Strasbourg-Kehl* and thus far plans regarding new development appear to also have preservation in mind. New

¹⁷⁴ Strasbourg's Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

development is planned for areas within city boundaries but not at the expense of already-built fabric. The waterfront plan is a good example of how the character of an already-built area can influence the design of new development and integrate new buildings with the existing fabric. This element of preservation within most strategies results in sensitive infill and additions even in areas not protected by heritage legislation.

Potential resolutions

One of the primary conflicts between preservation and sustainability within Strasbourg is the need to alter the built fabric in order to meet modern demands and increase the quality of life for locals. This focus on public need is not new in Strasbourg. The urban fabric has been adapted many times in past projects so that the city could meet its more modern needs. Large scale urban projects and real estate investments similar to those discussed earlier in the chapter have continued through to more recent times. In the 1980s and 90s, areas surrounding the St. Thomas and St. Madeleine schools of the Grande Île were rehabilitated. However, even as changes are being made to revitalize the city, the preservation of its historic character appears to be important to city planners; the *Charte des Terrasses*, signed in 2006, limits visible street furniture within the historic Grande Île to maintain the historic character of the streets.¹⁷⁵ Many new projects are inspired by the traditional architectural heritage seen in Strasbourg. For example, the façade of the clothing store Printemps references the traditional half-timbered style seen throughout Alsace. In an effort to incentivize the preservation of buildings during this time of adaptive-reuse and new development, the city of Strasbourg has extended financial aid to projects willing to preserve their historic buildings; if a building is situated within the historic sector the city will subsidize the restoration of its façade and the Malraux Law is still in effect to provide further

¹⁷⁵ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg: Étude préalable," 32.

financial incentives for preservation.¹⁷⁶ Although this solution is voluntary and therefore not enforceable, financial incentives could be enough motivation for many projects to attempt to preserve more historic fabric than they would normally be willing to.

Alexandria, Virginia

The city of Alexandria is located in northern Virginia along the Potomac River, about six miles south of Washington, D.C (see Figure 14). The site was settled around 1749 and was originally part of Alexandria County. For a period between 1801 and 1847 the city was a part of Washington, D.C., but was returned to Virginia and has since remained a part of that state.¹⁷⁷ The city of Alexandria is an independent city of Virginia, meaning it is not a part of any county; however, it is bordered by Arlington County to the north and Fairfax County to the south and

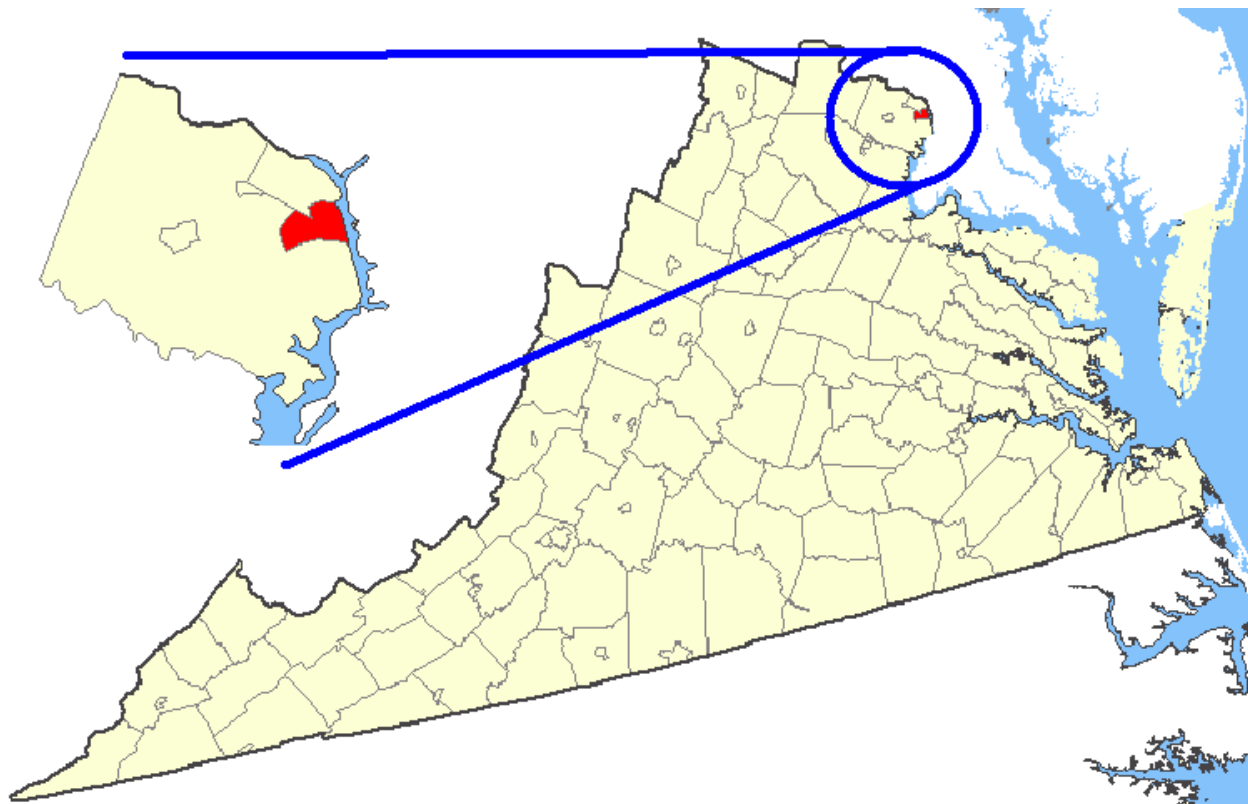


Figure 14: The state of Virginia showing the city of Alexandria in red bordered by Arlington County to the north and Fairfax County to the south/west (National Atlas)

¹⁷⁶ "Révision-extension du Plan de sauvegarde et de mise en valeur de Strasbourg," 4.

¹⁷⁷ "Alexandria." *Britannica Concise Encyclopedia*, 2009. *Credo Reference*. Web. 26 Dec. 2012.

west. The city's location along the Potomac resulted in the growth of Alexandria as a major port town, which took a large part in the trade of tobacco and wheat. In the late 18th century Alexandria became "the leading port of Northern Virginia" and thus experienced a period of growth.¹⁷⁸ After the Revolutionary War, the town continued to utilize its prime location and was a center of trade and a place in which merchants constructed homes, resulting in Alexandria becoming a center for both commerce and culture.¹⁷⁹ The creation of rail lines and large-scale roadways has kept the city connected to its surrounding region and maintained it as an attractive area for development. The city's population as of 2010 was about 140,000 people spread over almost 15.2mi² with an additional .2mi² of the city covered by nearby waterways.



Figure 15: The historic area of Alexandria (Home Finders)

¹⁷⁸ National Register of Historic Places, Alexandria Historic District, Alexandria, Virginia, National Register #66000928.

¹⁷⁹ Alexandria Historic District, Alexandria, Virginia, 1.

The city is home to many historic buildings, several of which date to the Colonial Period. Alexandria became one of the first cities in the United States to recognize the importance of preserving its cultural heritage via the built fabric, resulting in the 1946 establishment of historic district zoning in order to protect its historic resources from development.¹⁸⁰ Alexandria ultimately created two historic districts: the Old and Historic Alexandria district and the Uptown/Parker-Gray district, both located in the dense downtown area along the city's waterfront (see Figure 15).

The Old and Historic Alexandria district, encompassing much of downtown Alexandria, was originally established in 1946 in an effort to protect historic buildings and control development along the George Washington Memorial Parkway, which passes through the city center.¹⁸¹ The area covered by this large historic district was inhabited by Native Americans for an estimated 10,000 years before the earliest recorded buildings were erected by Europeans in the 1730s.¹⁸² Since the town's founding, this area has been an urban center because of its close proximity to the water and fertile land, which was used for growing some of the most sought after products of the time, such as tobacco. Old Town still contains over 1,000 historic buildings from the 18th and 19th centuries and is considered the "core of Alexandria's urban heritage."¹⁸³

The Old and Historic Alexandria district was listed on the National Register of Historic Places in 1966. The district as listed on the National Register is smaller than the local district and completely enclosed by the boundaries of the local district. The Old and Historic Alexandria

¹⁸⁰ "Historic Preservation Master Plan." City of Alexandria Virginia, 1992. Web. 10 Feb. 2013.

¹⁸¹ "Old and Historic Alexandria District Board of Architectural Review." *City of Alexandria*, 24 Sep. 2012. Web. 22 Dec. 2012.

¹⁸² "Historic Preservation Master Plan," 111.

¹⁸³ "Historic Preservation Master Plan," 112.

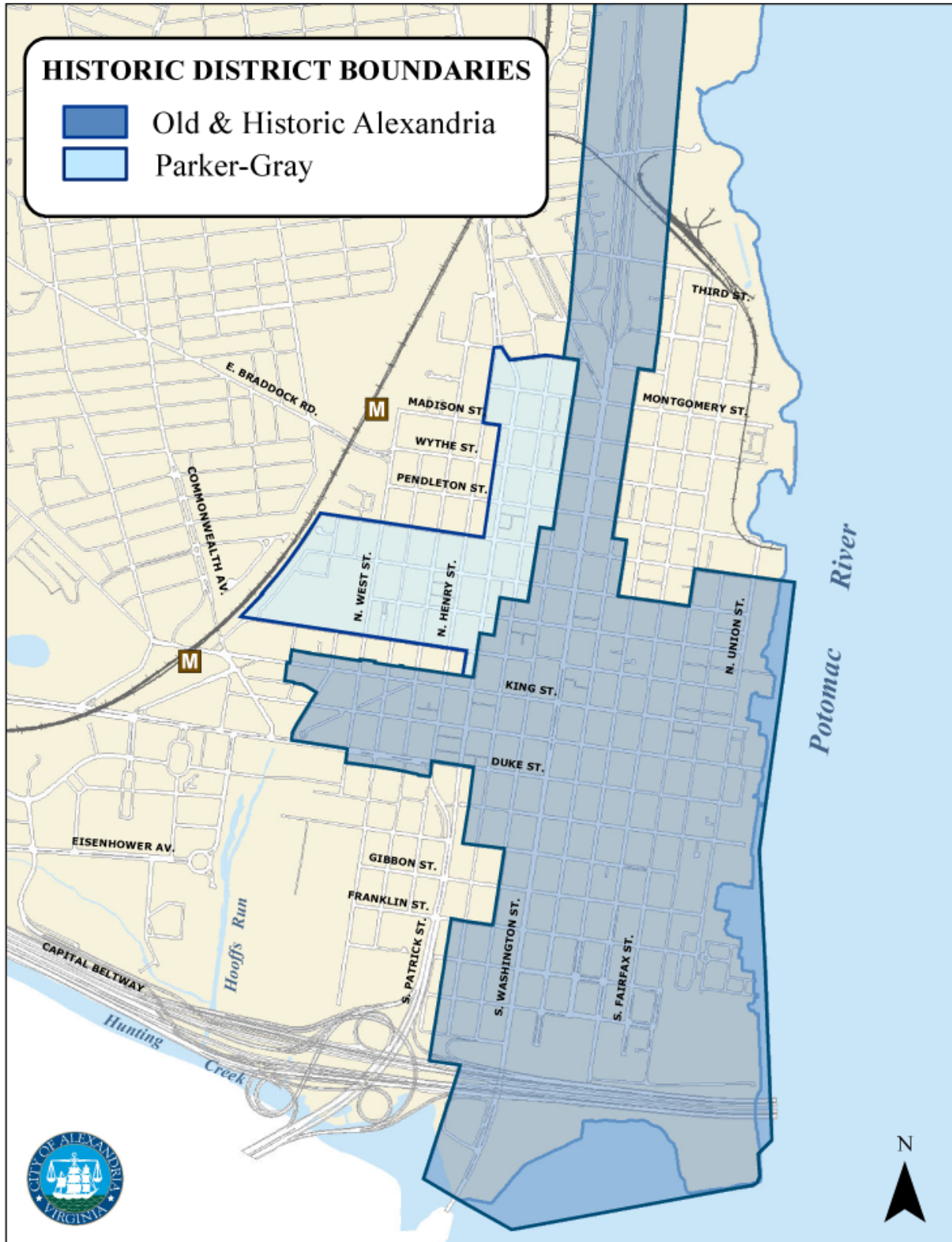


Figure 16: The two local historic districts, Old & Historic Alexandria and Parker-Gray, in Alexandria Virginia (City of Alexandria Virginia)

district is comprised of residential and commercial buildings including those designed in the Victorian style, American Four Square style, Bungalow style, Second Empire style, and many more.¹⁸⁴ A number of independently listed National Register and National Historic Landmarks lie within district boundaries. The district's commercial buildings are primarily located along South Washington and King Streets and several factories are located along the once industrial waterfront. The boundaries of the local district, which have changed since its inception, are visible in Figure 16. Buffer zones have been provided around the George Washington Memorial Parkway, which is within the historic district itself.

The Parker-Gray historic district, also referred to as “Uptown,” covers a 40-block area bounded by First Street to the north, Cameron Street to the south, Alfred Street to the east, and N. West Street to the west (see Figure 16). The district was named after John Parker and Sarah Gray who were the principals of two prestigious city schools during the late 19th century.¹⁸⁵ Parker-Gray was nominated as a historic district of Alexandria in 1984 and was also listed on the Virginia Landmarks Register in June of 2008 and the National Register of Historic Places on January 12, 2010.¹⁸⁶ According to its nomination on the National Register of Historic Places, the Uptown/Parker-Gray district, which contains the City of Alexandria’s largest historic African-American neighborhood, is significant because of its architecture and its cultural heritage.

The City of Alexandria planned for the land-use in the district as early as 1798, but most of the area remained vacant until the 1860s.¹⁸⁷ As a result, many of the extant historic buildings

¹⁸⁴ Alexandria Historic District, 4.

¹⁸⁵ “Parker-Gray Historic District Board of Architectural Review.” *City of Alexandria*, 24 Sep. 2012. Web. 22 Dec. 2012.

¹⁸⁶ “Uptown/Parker-Gray National Register of Historic Places District.” *City of Alexandria*, 24 Jun. 2010. Web. 22 Dec. 2012.

¹⁸⁷ National Register of Historic Places, Uptown/Parker-Gray Historic District, Alexandria, Virginia, National Register #9001232.

date from the 1870s or later with large areas being developed up until the 1980s. The district is made up of 984 contributing residential and commercial buildings in a variety of styles including Queen Anne, Colonial-Revival, and Italianate.¹⁸⁸ The period of significance was identified in the National Register nomination as lasting from 1810 to 1959. While development slowed within the district after 1960, the city outside of the district boundaries continued to grow; new housing was added to the western half of the city until older urban neighborhoods became an interest to developers in the 1980s.¹⁸⁹ Limited new development occurred within the district's boundaries in more modern styles that are considered visually intrusive by some residents, but for the most part the integrity of the historic fabric remains intact.¹⁹⁰ Many of the infill buildings within the historic district, built during the 1980s, copied the historic details of their authentic neighbors, making it sometimes difficult to distinguish which houses were more recently constructed.

Most historic functions of the district, such as education, commerce, and recreation, are carried through to the present day; noted additions, as seen in the nomination, indicate specialty stores and mortuaries as being new additions to this historic district. Residential uses have also continued into the present, including rental housing developments that have been created from the early 20th century to more recent additions in the late 1980s. While warehouses and other large commercial buildings do make up a percentage of the building stock within district boundaries, some of the city's largest industrial locations are just outside of the Parker-Gray boundaries.¹⁹¹ The boundaries to the north and west were in part determined by physical barriers in the form of railroad tracks and newer development projects.¹⁹² The boundaries to the south

¹⁸⁸ Uptown/Parker-Gray Historic District, 2.

¹⁸⁹ Uptown/Parker-Gray Historic District, 305.

¹⁹⁰ Uptown/Parker-Gray Historic District, 18.

¹⁹¹ Uptown/Parker-Gray Historic District, 284.

¹⁹² Uptown/Parker-Gray Historic District, 313.

and east of the Parker-Gray district meet the boundaries of the George Washington Parkway and the previously-established Old and Historic Alexandria district, both of which are listed on the National Register.

Additional historic resources, including individual buildings and archaeological sites, are inventoried in Alexandria's *Historic Preservation Master Plan*, which was created in 1992. This plan outlines the significance of each resource as well as recommendations for how the city should continue to safeguard them. Several sites have been identified by the State of Virginia's Landmarks Register and are listed along with locally-recognized sites within the city's *Historic*

Preservation Master Plan. In addition to the Old and Historic Alexandria and Parker-Gray districts, there are several other historic neighborhoods that have been listed by the National Register of Historic Places including: the Rosemont district, added in 1992; the Parkfairfax district, added in 1999; and the Town of Potomac district which encompasses the Del Ray neighborhood, added in 1992 (see Figure 17). Listings on the state and national historic registers will offer these historic resources added protection from

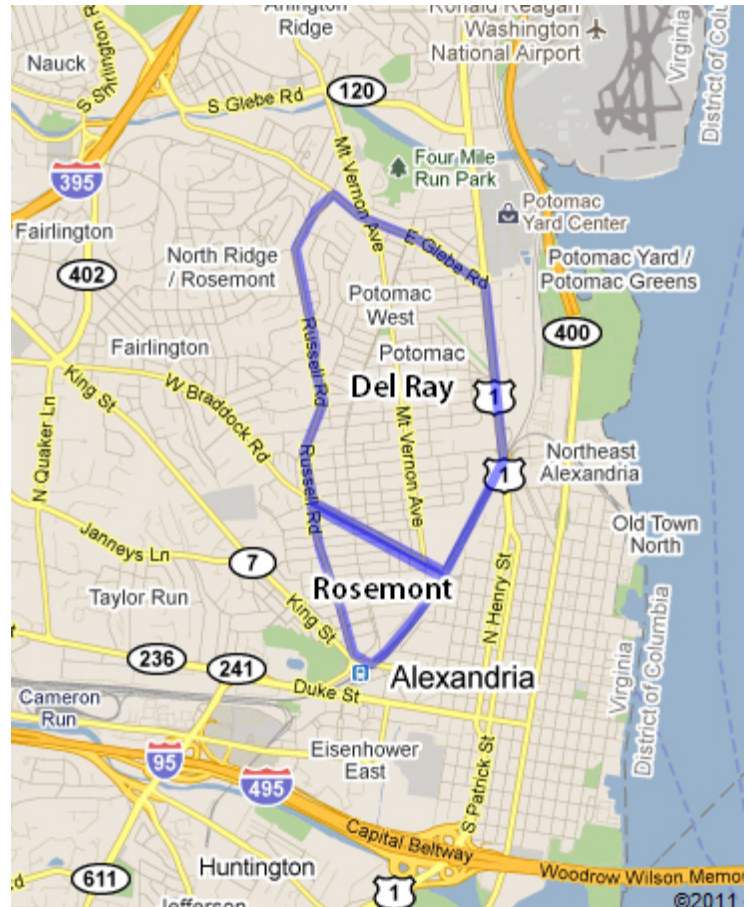


Figure 17: The National Register districts of Rosemont and the Town of Potomac, also known as Del Ray. Parkfairfax, not shown here, is to the north-west of these districts (The Upham Group)

development, although even listed buildings can be lost to development if the proper pressure is applied and they are removed from said lists. Ultimately, a city must be aware of all its historic resources when creating plans or policies for large scale projects such as Eco-City Alexandria.

Eco-City Alexandria

Alexandria began its ecocity project, “Eco-City Alexandria,” in 2007 with the help of students from the Urban Affairs and Planning Program at Virginia Polytechnic Institute and State University (Virginia Tech). Although the official project began in 2007, Alexandria had been contemplating becoming more environmentally friendly since it established the Alexandria Environmental Policy Commission in 1970, a group of citizens who were volunteers and not appointed by the city. Ideas about becoming an ecocity also occurred well before the project began; as early as 1998 the city of Alexandria held collaborative meetings with community members to discuss the state of local environmental policy.¹⁹³ Since the city had implemented a series of environmental policies for many years, the Eco-City Alexandria project was seen as a way of packaging them together in an effort to achieve specific goals and as a way of marketing itself as a sustainable city, something that surrounding Virginia counties had already been doing.¹⁹⁴

The project was initially spearheaded by Alexandria City Council members who served as liaisons with the Environmental Policy Commission.¹⁹⁵ Alexandria’s vision for the Eco-City Alexandria project was the creation of a city:

¹⁹³ “Eco-City Alexandria: A Green-Ventory of City Environmental Policies, Plans, and Programs,” 19.

¹⁹⁴ Professor of the Virginia Tech Team. Interview with Nicole Ambrose, Alexandria, VA. 16 Feb. 2013.

¹⁹⁵ These same individuals were also responsible for bringing Virginia Tech on as consultants.

- “where social well-being is supported by a strong economy and sustained by a healthy environment.”
- that plans wisely, preserving historic and natural resources.
- that embraces natural beauty through the creation of parks and open spaces.
- that improves water quality by reducing storm water runoff and sewer overflows.
- that clears the air of pollution.
- that has smart transportation through mass transit, electrical vehicle charging ports, and opportunities for bikers.
- that conserves energy and water use.
- that minimizes waste through recycling materials and reducing the volume of solid waste that is produced.
- that supports healthy living via environmental policy and programs.
- that readies for change by becoming more resilient to the shifting climate.
- that implements change across different areas under city management,.
- and shares responsibility by educating and involving the community to achieve Alexandria’s environmental goals.¹⁹⁶

As previously noted, an ecocity’s full range of goals goes outside simply looking at environmental sustainability and touches on other fundamental aspects of a successful city. Likewise, Alexandria’s plan outlines changes to the local government that affect these aspects. The project will touch on city finances, services the local government provides or plans to provide to locals, and the relationship between the government and the surrounding community.

The Eco-City Alexandria project involved a large amount of research at its onset. In 2007 the city and Virginia Tech team created an inventory of existing city plans that dealt with sustainability, considering all the state and Federal environmental policies that would ultimately affect the local policies that would need to be developed for Alexandria’s ecocity project. The

¹⁹⁶ “Eco-City Charter.” *City of Alexandria Virginia: Environmental Policy Commission*, 14 Jun. 2008. Web. 12 Oct. 2012.

resulting document containing this information was called *Eco-City Alexandria: A Green-Ventory of City Environmental Policies, Plans, and Programs*. In addition to pointing out which committees are responsible for developing a variety of policies within local government, the team researched which higher-level laws needed to be addressed by local environmental policy. “Many Federal and state environmental laws and policies govern and guide Alexandria’s environmental policies and programs;” some examples stated within the report were the Federal Clean Water Act, the Clean Air Act, and the Resources Conservation and Recovery Act.¹⁹⁷ Since these environmental policies are implemented at a higher level, any local policy would have to be developed within the extant framework. During 2007 the city and Virginia Tech also looked at environmental policies put in place all over the world in an effort to discover the best practices for the creation of an ecocity. They worked with individuals who were proponents of the ecocity movement and with locals to ultimately discern what sustainable techniques would work for Eco-City Alexandria. This study of best practices stretched over four different Virginia Tech urban planning studios. Students ultimately identified 12 exemplary ecocity plans that were then presented to the city.¹⁹⁸ As a result, the city of Alexandria adopted its first ecocity charter on June 14, 2008, drafted with input from the students of Virginia Tech.

In Alexandria’s ecocity charter, the concept of sustainability is explicitly defined. The concept of sustainability can sometimes seem muddled and is interpreted differently in different contexts, so defining the term in the context of the project helps to clearly identify the purpose of Eco-City Alexandria:

“Sustainability means meeting our community’s present needs while preserving our historic character and ensuring the ability of future generations to meet their

¹⁹⁷ “Eco-City Alexandria: A Green-Ventory of City Environmental Policies, Plans, and Programs,” 9.

¹⁹⁸ Professor of the Virginia Tech Team. Interview with Nicole Ambrose, Alexandria, VA. 16 Feb. 2013.

own needs. It involves balancing and integrating environmental, economic, health and social issues so as to maximize the quality of life for all of Alexandria's residents. Sustainability also requires us to consider the impacts of our decisions and actions beyond the City of Alexandria and seek the continuous evolution of policies and programs."¹⁹⁹

The definition clearly draws from some of the earlier internationally adopted concepts of sustainability that were developed within the *Report of the World Commission on Environment and Development*. It is also important to note that within the very definition itself, Alexandria has included a mention of historic preservation and how important it is to the city.²⁰⁰ In this regard, Alexandria stands out from the typical ecocity because the latter generally does not address the importance of its historic districts or the preservation of the city's heritage directly within founding ecocity definitions or principles. Alexandria put a lot of emphasis on the preservation of the distinct character of its historic districts, so this case study provides an excellent example of how historic districts can be incorporated into a city's ecocity plan. Alexandria involved its preservation department and preservation professionals, which were part of the Virginia Tech team, during many stages of Eco-City Alexandria's development, suggesting that cities that consider historic preservation during all stages of the planning process will be able to more successfully integrate historic resources into sustainable programs.

One of the city's first steps towards sustainability was to develop and adopt the *2015 Strategic Plan*. This document contained both the plan and goals the city hoped to achieve by the year 2015. It was the basis for all of Alexandria's individual departmental plans, as seen in figure 18. Goals within the published plan were laid out according to the date they should begin and the

¹⁹⁹ "Eco-City Charter," 5.

²⁰⁰ Within Alexandria's Eco-city Charter, all of the guiding principles for the implementation of the project highlight the importance of historic preservation and the city's character numerous times.

date they should be accomplished. To create an easy checklist, each goal was clearly defined with a list of objectives, policy actions, and management actions listed by priority. Within the



Figure 18: "This constellation of plans...shows that the City Council's Strategic Plan is the basis for all of the departmental plans. In our vision, the Eco-City Charter and Action Plan...will be based on the Council's Strategic Plan and also help to guide current and future planning and programs within the city departments." (Virginia Tech Department of Urban Affairs & Planning)

plan, and Alexandria's charter, it was noted that the city realizes there is a need to revisit and update the environmental policies that are implemented so the city can analyze the results and

understand what works and what doesn't, thereby ensuring the city of Alexandria achieves the best results possible and is able to meet its intended goals more efficiently.

In addition to looking at other issues, an entire section of the *2015 Strategic Plan* is devoted to outlining the goals the city of Alexandria has created in regards to historic preservation:

“We preserve and celebrate our historical roots and diverse heritage; we preserve our historic resources including neighborhoods, buildings, structures, places, and archaeological sites; we maintain our distinctive architectural character and design; we plan new developments so that they are compatible with historic buildings and neighborhood character; residents understand and appreciate Alexandria's heritage; and Alexandria's history contributes to the local economy through tourism development.”²⁰¹

Several of the city's top-priority projects listed in the *2015 Strategic Plan* are geared towards the preservation and revitalization of historic and natural resources. One, the Waterfront Development Plan, directly influences Alexandria's Old and Historic Alexandria district. Preservation is considered important enough to be included in policies geared towards new development in this area and within the overall goals the city has for revitalizing the waterfront. This project is discussed in detail within the compatibility section below, as it is an excellent example of how historic preservation and ecocity goals can be blended to create a viable project.

Historic districts incorporated into the ecocity project

Since the city's two historic districts were already established by the time Alexandria implemented its ecocity project, boundaries of the districts were not changed. Regulations concerning the alteration of the built fabric within historic districts are, naturally, more stringent

²⁰¹ “2004-2015 Strategic Plan: A Guide to the Future.” *City of Alexandria Virginia: Mayor and City Council*, 14 Sep. 2004. Web. 22 Dec. 2012.

than fabric outside of the established boundaries. The boundaries therefore are relevant when deciding exactly what sort of changes are made to the built fabric; however, blanket policies requiring sustainable building practices were put in place covering the entire city. For example, within the *Eco-City Charter*, green building practices include integrating “green building and sustainability standards into all private and public development, including historic preservation, renovation, and new construction.”²⁰² Within this section it is also stated that preservation and the adaptive reuse of existing buildings will be encouraged throughout the city. In this way, preservation of historic buildings is being promoted while historic districts are not being excluded from the changes expected from both residential and commercial property owners within Alexandria.

As previously discussed, historic buildings are sometimes given more leeway in terms of green expectations or benchmarks; for example, this paper discussed the allowance for historic buildings to go over established energy-use benchmarks used to measure the efficiency of more modern buildings. While historic buildings, particularly those governed by specific regulations put in place through designation, are more restricted in the types of changes they can implement, studies have shown that many have the capability to meet or even exceed energy benchmarks used by new buildings. Historic districts should therefore not be completely excluded from sustainable changes established during ecocity projects. The appropriateness of proposed changes should simply be evaluated more critically by the city’s preservation staff on a case-by-case basis to ensure the historic significance of established historic districts or landmarked buildings is not compromised. Alexandria successfully incorporated historic districts within proposed sustainability changes while emphasizing the importance to retain the city’s historic

²⁰² “Eco-City Charter,” 8.

character and identity. The following paragraphs highlight several examples of changes within the city that were compatible or conflicting with preservation goals. Interviews with individuals working on the projects have also provided insight into how some of the conflicts were resolved.

Compatibility

The historic Parker-Gray and Old and Historic Alexandria districts are both located in downtown Alexandria, which has been largely built up. There are very few empty properties within this area. Many homes are near or within the downtown area, which is home to a number of amenities. The historic areas of town are in fact quite dense and, with access to public transportation and a diverse array of shops and venues, the quality of life is quite high for locals. This ultimately leads to many opportunities for preservation to be compatible with ecocity goals. Compatibility between preservation and typical ecocity plans is found in Alexandria's: sensitive new development, reduced sprawl, population density, and diverse neighborhoods.

Much of the new development throughout the city, even if it is not within the district boundaries, has been created to complement the typical architectural styles seen throughout Alexandria (see Figure 19). While not part of the Eco-City Alexandria project, the James Bland Redevelopment project provides an example of compatibility between new development and historic preservation. In 2008 the James Bland Redevelopment project was approved. In 2010 it broke ground for phase 1 and phase 2 is currently underway. The plan proposes the demolition of 194 existing public housing units and the construction of 379 new residential units "of which one third (134 units) will be public housing units and two thirds (245 units) will be market rate units."²⁰³ Since the site is located entirely within the boundaries of the Parker-Gray historic

²⁰³ "James Bland Redevelopment." *City of Alexandria*, 13 Jul. 2012. Web. 4 Feb. 2013.



Figure 19: New development, Potomac Yard, located outside the historic district shows sensitivity to the historic fabric (Ambrose)

district, the development could have potentially caused conflicts between sustainable development and preservation. Developers worked with the city's preservation and planning staff to ensure that the non-contributing buildings were replaced with new structures that are sensitive to the surrounding historic fabric through both style and scale; new buildings will primarily be the size of townhouses with only several buildings along highway 1 reaching four floors in height (see Figure 20).²⁰⁴ Not all of the newly acquired space will be filled with structures. Within the plan an area is allotted for open space in the form of a city park, adding to the overall quality of life, in terms of both mental and physical health, for the surrounding residents. Since the James Bland Redevelopment plan only targets non-contributing buildings and fosters a close

²⁰⁴ "James Bland Redevelopment," pp. 2.

partnership between developers and local preservationists and planners, the project can be looked at as an example of how future development within Alexandria should transpire.



Figure 20: A rendering of the completed James Bland Redevelopment Project (EYA)

Another example of compatibility between ecocity goals and historic preservation can be seen in the Waterfront Small Area Plan. Typical revived waterfronts may feature new office towers or aquariums to draw tourists, all at the expense of historic landscapes featuring industry and natural diversity; if that is wiped away, the historic area loses its identity and significance. The city of Alexandria was aware of the importance the historic fabric would have to its town and the individuals hoping to visit it one day. The Waterfront Small Area Plan, approved in January of 2012 will revitalize the city’s waterfront by, “incorporating Alexandria’s history as a foundation for planning and design, expanding and enhancing public open spaces, improving public access and connectivity, promoting the waterfront as an arts and cultural destination, [and]

ensuring compatible development.”²⁰⁵ This plan will allow for greater density within the waterfront area, adding up to another 160,000 square feet of space for developers in addition to the 349,000 allowed under new zoning. However, the city has outlined many rules as to what sort of development is allowed, specifically citing the importance of history and the need to be cognizant of Alexandria’s architectural and historical character when placing new additions within this area. The plan specifically calls for sensitive architectural and site design so the entire areas of new development will be able to blend more easily with the surrounding fabric. As with the James Bland Redevelopment project, density in the waterfront area will be increased, the significant historic fabric will be preserved, and new additions will need to be sensitive to extant historic buildings. In this way, the city is able to reduce sprawl on the fringes of the already-built areas of the city, one of the primary goals of typical ecocities, and use historic preservation as a means of revitalizing areas of the city through tourism or just reinforcing the cultural history of the city for its own citizens.²⁰⁶ Although the Waterfront Small Area Plan is an example of how sensitive densification can be added to a historic area, preservationists within the community were not completely receptive to the plan; many had issue with increasing the density at all as they were fearful that historic fabric could be lost or diminished. Informational handouts describing the project, including its focus on preservation, was disseminated to the citizens and serves as an example of preservationists mistakenly opposing appropriate change.

Population density is another area in which Alexandria's historic districts have proven to be compatible with ecocity goals regarding sprawl. As of 2000, the city of Alexandria was cited

²⁰⁵ “Waterfront Small Area Plan.” *City of Alexandria*, 13 Jul 2012. Web. 10 Feb. 2012.

²⁰⁶ A brochure describing the benefits that additional density within the waterfront could provide to the city of Alexandria was distributed to citizens and can be found on the city’s Planning & Zoning website.

as having an overall population density of 8,452 people per square mile (see Figure 21).²⁰⁷ Updated information from 2010 shows an increased population density of 9,208. Within the city's *Historic Preservation Master Plan* it is stated that the Old and Historic Alexandria district, which encompasses the waterfront, has the highest density of historic buildings and most variety of historic resources within the modern city of Alexandria, but its population density was slightly lower than the overall density of Alexandria in 2000.²⁰⁸ This has changed over time. According to City Data, the Old and Historic Alexandria district, covering 1.36mi², only had an approximate population density of 7,299 people per square mile in 2000 but as of 2010 it has a density measuring approximately 9,879 people per square mile which is slightly denser than the overall city. There are a large number of residential units within the Old and Historic Alexandria district, 3,196 total, comprising 77% of the total buildings. There are also many commercial and mixed-use buildings; as of 2010 there were 357 commercial and 249 mixed-use buildings accounting for 14.6% of the total buildings.²⁰⁹ The highest buildings within the district are 9 stories but 87.5% of the total buildings fall within the 1-3 stories range. Only 0.7% of the total buildings are over four and a half stories.

The Parker-Gray historic district, covering 0.22mi², had a population density of 12,107 people per square mile in the year 2000.²¹⁰ According to the 2010 U.S. Census, the density had increased to 14,382 people per square mile. The Parker-Gray district still has a significantly higher population density than the Old and Historic Alexandria district and was also one of the densest neighborhoods of those documented by City Data during the year 2000. Within Parker-

²⁰⁷ "Budget Memo no. 15: Alexandria Population Density." *City of Alexandria, Virginia*, 10 Apr. 2003. Web. 23 Feb. 2013.

²⁰⁸ "Historic Preservation Master Plan," 112.

²⁰⁹ U.S. Census Bureau. *2010 U.S. Census*. Web. 30 Apr. 2013.

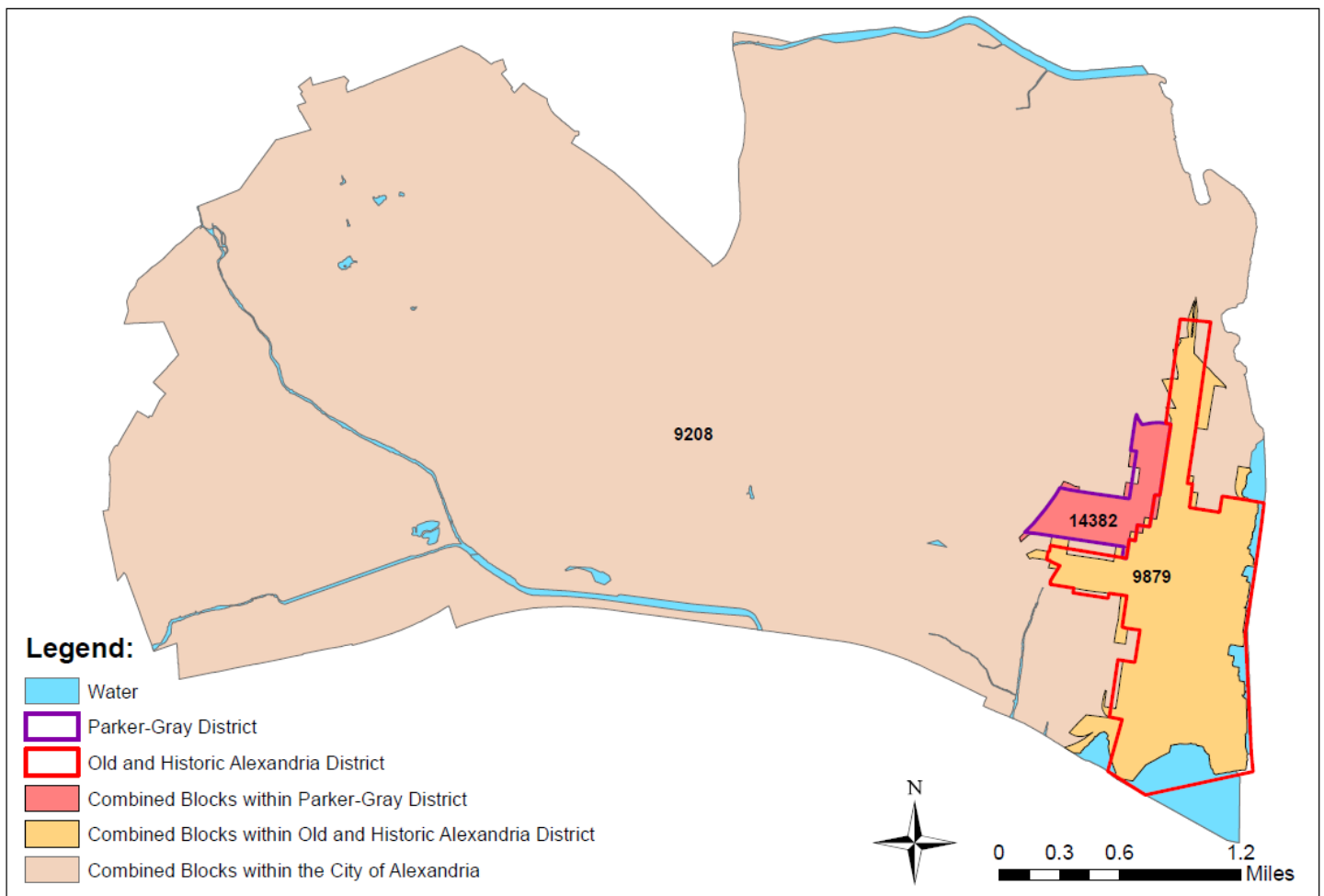
²¹⁰ "Alexandria, Virginia Neighborhood Map." *City Data*, 2011. Web. 23 Feb. 2013.

Population Density of Alexandria Neighborhoods, 2000		
Density per square mile	Neighborhood name	Size of neighborhood
12,107	Parker-Gray	0.22mi ²
10,842	Alexandria West	2.33mi ²
10,550	Northeast	0.20mi ²
9,259	Del Ray	2.33mi ²
9,150	Braddock Road Metro	0.49mi ²
8,792	Van Dorn	2.41mi ²
7,299	Old & Historic Alexandria	1.36mi ²
5,379	Seminary Hill	3.87mi ²
5,215	Southwest Quadrant	0.49mi ²
5,128	Old Town North	0.43mi ²
4,866	North Ridge	2.26mi ²
4,836	Bradlee (Farlington)	0.13mi ²
3,862	Bren Mar Park	0.87mi ²
1,470	Eisenhower East	0.61mi ²
1,312	Eisenhower Avenue	1.18mi ²
456	Potomac Yard	0.56mi ²
453	Arcturus	0.79mi ²
Overall population density: 8,452 per square mile		
*Source: City-Data.com		

Figure 21: A table showing the population density within Alexandria as of 2000 broken down by neighborhood. The two local historic districts are highlighted in red. It is important to note that some areas slightly overlapped on the map and one census tract was missing, resulting in neighborhood density numbers that serve as approximations rather than exact amounts. (Ambrose)

Gray 80% of the total buildings are residential units while there are very few commercial and mixed use buildings. The highest buildings are only 4 stories within this district but the majority, 83.7%, falls within the 1-2 stories range.²¹¹

Although the Old and Historic Alexandria is shown to be denser than most of the other neighborhoods surveyed by City Data, it has a lower density than the much smaller Parker-Gray district. This is likely affected by the number of commercial buildings and larger building



Data Source: U.S. Census Bureau; 2013 TIGER/Line Shapefiles & 2010 U.S. Census
 Historic Districts: Alexandria City Planning and Preservation Department, 2013

Author: Nicole Ambrose, April 2013

Figure 22: The population density of Alexandria and its two local historic districts as of 2010. The limitation with this map is due to the historic district boundaries not conforming to the city block layout; some blocks extended further than district boundaries. The density of both districts is therefore an approximation only. (Ambrose)

²¹¹ U.S. Census Bureau.

footprints of many of these commercial buildings compared to the compact, primarily residential layout within Parker-Gray. Despite being comprised of low to mid-rise structures, both of the historic districts within Alexandria are denser than the overall city density of 9,208 people per square mile (see Figure 22). The historic districts in this example are able to achieve a comparable population density without using high-rise towers and, while not all historic districts will provide the same results, this study should serve as a justification to city authorities to at least take the time to further investigate the density of historic neighborhoods in order to make well-informed decisions regarding preservation in the face of a sustainable urban project favoring urban densification.

Preserving the diversity of these historic neighborhoods is also a way in which Alexandria's effort to reduce sprawl can align with preservation. Within Ecocity Alexandria's *2015 Strategic Plan*, the issue of diverse neighborhoods is addressed under the "Urban Villages" principle. Alexandria's urban plan states that urban villages, mixed-use developments containing housing, shops, and recreation space, will be integrated with nearby neighborhoods while still maintaining Alexandria's historic character. Preserving the land use diversity in downtown historic districts will reduce sprawl because a variety of amenities can be located in a compact area. Reducing sprawl will achieve the ecocity goal of preserving open land and compact, diverse communities are ideal examples of smart land-use. Additionally, a compact and more walkable area closer to transportation can contribute to reduced carbon emissions (through the use of alternative transportation) and increased public health.

Conflicts

One of primary conflicts identified in interviews with individuals who worked on Eco-City Alexandria was a lack of collaboration between all stakeholders during early stages of the project. The primary players who were involved in its early inception were the Environmental Policy Commission, a citizen group; Virginia Tech, an outside consultant; and the city's Environmental Services Department. This differs considerably from the collaborative efforts seen taking place in Strasbourg, as only one governmental department was present during Eco-City Alexandria's early stages. The preservation and planning departments were absent from these early meetings and did not become involved with the project until later stages. Individuals from both departments stated in interviews that they were not invited to be a part of these early meetings and, if they were, they would have attended.²¹² Although elements of preservation are discussed within plans and goals, the presence of representatives from relevant government departments may have helped preservation to become a stronger element in the city's sustainable strategies. Since the urban fabric may not always be seen as a major contributor to the environmental state of a city, it is possible that similar oversights may take place elsewhere. A blanket solution to this problem that should be applied in all ecocity projects is early and continuous collaboration with all stakeholders of different backgrounds: the public, private, and government who live or work in the area in question.

The disconnect between the preservation department and those responsible for Eco-City Alexandria was further exemplified in some early adaptive-reuse projects that attempted to implement green building techniques. The strict preservation ordinances that governed the

²¹² It is possible that additional tension was added between the groups involved in the project because much of the ecocity project planning was not up to typical city departments and was instead largely the domain of outside consultants.

Parker-Gray and Old and Historic Alexandria districts naturally won out if there were any threats that sustainable building posed to the significant character of the districts; however, in these early stages it was difficult for building owners to gain approval for many techniques that did not harm significant characteristics of contributing buildings. One example is an early adaptive-reuse project in which a warehouse was being converted for a new use and in the process attempting to become more environmentally friendly. One "green" technique used in this project, the addition of a green roof, was contested by the city and ultimately required extra time and effort on the part of the building owner to gain approval. Although approval was finally obtained, elongating project schedules, which translates into extra expenses, could be discouraging to building owners who are attempting to implement new environmentally friendly technology or techniques into their projects.²¹³ In early meetings, there was a discussion about whether historic districts should receive exemption from sustainable plans and benchmarks although ultimately this was not pursued.²¹⁴

Once the preservation and planning departments became involved, they were able to begin to wed the ideas of preservation and sustainability. They put on a number of workshops and handed out pamphlets in an effort to educate homeowners about sustainable changes they could make to their everyday lives, including promoting the preservation of residential historic fabric such as historic windows. Two years ago the city revised window and roofing standards to allow for more modern sustainable materials or methods to be used. More recent developments include the reassessment of Alexandria's preservation ordinance for the Parker-Gray historic district. As of the past 3 months the ordinance is undergoing changes that will allow more modern green building materials and will attempt to balance green building strategies with the

²¹³ Professor of the Virginia Tech Team. Interview with Nicole Ambrose, Alexandria, VA. 16 Feb. 2013.

²¹⁴ Alexandria, Virginia's Preservation and Planning Departments. Interview with Nicole Ambrose. 20 Feb. 2013.

preservation of the district's overall character.²¹⁵ Although the same is not true for the Old and Historic Alexandria district, individuals within the preservation and planning departments have stated that sustainable projects are welcome to apply for alteration approvals and the departments are attempting to work with people as much as possible to further Eco-City Alexandria's sustainable goals.

While not a conflict between preservation and sustainability, several issues that impeded the success of the ecocity project were identified within Alexandria. A lack of building performance data made it difficult to establish any performance benchmarks that would show increased operational efficiency. Alexandria's preservation and planning departments specifically cited the importance of developing measurable targets from an early stage but this was overlooked during the creation of Eco-City Alexandria due to a lack of available information and was difficult to remedy. Limited air and water quality data also made it problematic to establish a method of monitoring the improvement of the natural environment. During an interview with preservation and planning departments, they disclosed that environmental monitoring took place annually, but only select government buildings were currently being monitored. They also did not indicate that this was due to Alexandria being in the early stages of its ecocity project and there was no mention of requiring more buildings to be monitored in the future. Although policy informs building owners of improvements they should make, there is no way of knowing if their actions are making a difference and meeting certain established benchmarks. The final issue was the presentation of sustainability to the public. Sustainable changes to meet established goals were not presented with any sense of urgency, so public participation ultimately suffered. When city projects presented climate change as a pressing

²¹⁵ Alexandria, Virginia's Preservation and Planning Departments. Interview with Nicole Ambrose. 20 Feb. 2013.

issue, such as the Waterfront Small Area Plan that addressed rising water tables and city flooding issues, people understood the need to change now rather than waiting.²¹⁶

Potential resolutions

Some of the conflicts within Alexandria have already been resolved. For example, a lack of collaboration between the preservation department and those initiating the ecocity project is no longer an issue. Preservation professionals became involved with the project and are still disseminating information to the public and even discussing changes to the local preservation ordinance and individual historic buildings to further align them with the city's sustainable goals. The lack of information on building performance is, however, still an issue. This could be resolved through the implementation of building monitoring plans throughout the city. This type of building data could also shed light on the differences in building performance between historic and modern structures, much like what was shown in New York City's *PLANYC 2012 Local Law 84 Benchmarking Report*. If findings within Alexandria are similar to those in New York City, preservation professionals could further bolster their argument for the preservation of historic buildings.

Analysis

Collaboration

Strasbourg and Alexandria both incorporate historic preservation into their plans, but there are several differences between the two projects. The ecocity project taking place in Strasbourg differs from the one in Alexandria on several counts: it is only in the planning phases at this point and little has actually been done; it is taking place at the same time as the historic

²¹⁶ Professor of the Virginia Tech Team. Interview with Nicole Ambrose, Alexandria, VA. 16 Feb. 2013.

district expansion; Strasbourg's ecocity project is uniting two cities; and the dynamics between the preservation and planning departments of Strasbourg are naturally different than those in Alexandria since the cities are located in different countries. This last difference is extremely relevant to the case of preservation because of the importance of collaboration during an ecocity project.

During an interview Strasbourg's preservation and planning departments credited the collaboration between governmental departments for the success of their *Projet Écocités* Strasbourg-Kehl plan thus far. Without constant and continued collaboration, an ecocity plan that addressed preservation so thoroughly would not have been possible. "This is the first time we connected heritage and urban policy. We never had a document that wove a link between the two."²¹⁷ In the case of Alexandria, the city's preservation department was not involved in the earliest part of Eco-City Alexandria's development, which could have resulted in the formation of principles, policies, and strategies that did not incorporate preservation. Ultimately that is not what happened in Alexandria, but it has happened in other ecocities. For example, the previously discussed Chinese ecocities in which historic fabric has been removed in favor of modern, dense, "sustainable" buildings. Cities should then look to Strasbourg as an example of how to approach an ecocity project while including all relevant governmental departments to ensure the best result possible. For this reason, collaboration has been identified as a best practice for incorporating preservation into ecocity plans. Collaboration between preservationists and planning officials will result in policies and strategies that take advantage of the sustainable benefits available through preservation: improved clean air and water; reduced urban sprawl; buildings located

²¹⁷ Strasbourg's Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

within close proximity to existing infrastructure; and a strengthened cultural identity, which are all ecocity requirements according to the 2008 Ecocity World Summit definition.

Research

Strasbourg also differs from Alexandria in how it approaches the issue of open space. Although both of the case studies, and ecocities in general, strive to reduce urban sprawl, Strasbourg placed a high value of historic significance on its surrounding green landscape and public open spaces within the city: “Public spaces, streets, trees, all of this is part of the city’s heritage.”²¹⁸ Before the project began, additional historical research and surveys were conducted to learn about the local landscape of the city to ensure that any landscape connected to significant cultural heritage was preserved during the implementation of new development under *Projet Écocités Strasbourg-Kehl*. Officials believed that this preservation of open spaces would help to preserve the identity of the city itself, but would also “anchor *Projet Écocités Strasbourg-Kehl* to the environment.”²¹⁹ The city of Alexandria mentioned the development of open spaces in its plans but did not appear to place as much historic significance on it. Landscapes that hold significance to local residents could be overlooked without research and surveys like those undertaken by the city of Strasbourg. Therefore, it would be best to include not only building analysis but also landscape analysis within the scope of research that takes place before the implementation of an ecocity project. They will therefore be included as a component of the final best practices guide. Knowing the history and makeup of a city in addition to the values and needs of its residents will ultimately allow goals and strategies to better align with preservation. Strengthening a city’s cultural identity is also a direct requirement for ecocities.

²¹⁸ Strasbourg’s Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

²¹⁹ Strasbourg’s Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

Policies and benchmarks

Each case study city has approached sustainability within its preservation ordinances differently. At this point, Strasbourg has not altered its historic preservation ordinance to include any sustainability information, but it has not ruled it out. As of a 2013 interview, city officials stated that they are watching *Projet Écocités Strasbourg-Kehl* closely and will make alterations to the preservation ordinance as necessary.²²⁰ Since the ecocity is still in its planning phases, officials have not yet determined the sustainable strategies that will be most successful for the city and so they are waiting for feedback before attempting to make any changes to preservation legislation. Alexandria has had its ecocity project in place for several years and has been able to determine what changes should be made to their historic legislation. At this point Alexandria is in the process of altering its historic ordinance to become more lenient for the Parker-Gray historic district and the preservation department is becoming more flexible in terms of the types of sustainable projects that they will allow within historic districts. The choice of each city to wait to change legislation until they determine the best sustainable strategies for their region appears to be the best practice. It will ensure that preservation legislation is flexible and will allow alterations but only those that will provide the best result possible.

Each case study differs because of their geographic location, history, and the officials who made planning decisions, however they have many things in common. Both Strasbourg and Alexandria are excellent examples of how ecocity projects can include preservation within their principles, policies, and strategies. Neither city used the IEFS guidelines when making its plans so each city's principles and benchmarks are naturally different from one another. Use of the IEFS framework would have made it possible to more easily compare and contrast the two case

²²⁰ Strasbourg's Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

studies. It will also make issues such as policy creation simpler. Within the IEFS system, which may eventually be adopted globally, preservation can find a permanent place as a component that cities can use to help reach sustainable goals. It is therefore concluded that the IEFS framework for creating policies and standards is the best practice for all ecocities, including those hoping to include preservation within their plans.

Preservation was recognized as an important element that could not only promote environmental sustainability but foster economic and social sustainability as well. Both cities understood the benefits that could be obtained through the preservation of historic resources and the value of historic preservation as a means of protecting each city's unique cultural identity. Each city's inclusion of preservation within its policies and benchmarks is naturally seen as a best practice and will be included within the following guide. Again, tapping into the benefits afforded by in the inclusion of preservation within a sustainability project can help to meet many of the defined requirements within the 2008 Ecocity World Summit definition: clean air, safe and reliable water supplies, healthy housing and workplaces, municipal services, resource conservation, materials re-use, and more.

Strategies

Strasbourg and Alexandria addressed similar issues that would conform to each of the three platforms of sustainability: environmental, economic, and social. Since each city created its own charter full of tailored goals, the strategies were different in each case. Tailored strategies are expected to be the norm, even if a city were to use the IEFS system, so this is not unusual and will be cited as a typical practice for ecocities. Under the IEFS system, however, there is a list of suggested strategies to help cities achieve rankings within the established categories. Since the

IEFS program has the potential to be adopted globally, it has been selected for incorporation within the best practices guide where the compatibility of preservation and the IEFS suggested strategies will be further examined.

Dissemination of information

Both Alexandria and Strasbourg felt it was necessary to provide sustainability information to citizens, including those who owned historic properties. In Strasbourg a series of workshops discussing sustainable strategies for historic properties have already been created. Additional guidelines are in the process of being created for homes located within historic district boundaries and this information will soon be disseminated to property owners. Currently, city officials are also informing homeowners within district boundaries of potential regulation changes in addition to subsidies that may be available to help cover the costs for alterations.²²¹ Alexandria also held workshops and distributed information to historic property owners. One cited example was a workshop created solely as an effort to conserve original windows within the historic districts while simultaneously trying to achieve sustainable goals such as reduced energy use. One of the projects under the ecocity plan, the Waterfront Small Action Plan, included densification within the downtown area of the city. As previously noted, citizens, including preservationists, feared that this meant the loss of historic fabric despite preservation clearly being a goal within the city charter. Handouts citing exactly what would be happening in the project, the benefits that could be obtained from densification, and that preservation was still an important aspect of the plan were distributed to individuals in order to alleviate their concern. The dissemination of information to all stakeholders is clearly a best practice that must be undertaken by any city planning to implement a similar plan.

²²¹ Strasbourg's Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

Incentives

Incentives are available to promote preservation in both Strasbourg and Alexandria. Within France, the Malraux Law provides financial incentives to restore historic properties. The city of Strasbourg also recognized the importance of financial incentives and has created a fund available to projects that preserve and/or restore the façade of historic buildings within the designated historic district. Preservation projects within Alexandria have the potential to tap into Federal historic tax credits. A lack of financial incentives was previously cited as a barrier to preservation, so the inclusion of financial incentives was found to be a best practice for promoting preservation within ecocity projects. Financial support is required for all projects so, although not directly representing an alignment between preservation and ecocity requirements, finances facilitate the programs and plans that demonstrate this compatibility.

Conclusion

Simply obtaining the label of an ecocity was not the driving force for either case study; both Strasbourg and Alexandria strove to also create a higher quality of life for citizens through thoughtful development. Officials in Alexandria saw an ecocity plan as a way to package already established sustainable policies. According to Strasbourg's director of urban planning, "Labels do not interest me too much. What interests me is thinking to design differently."²²² Although obtaining the label of ecocity will help a city market itself as a more attractive place to live, officials must approach the ecocity planning process with the intention of improving the built fabric for the benefit of residents by using a variety of tools, including preservation.

²²² Strasbourg's Preservation and Planning Departments. Interview with Nicole Ambrose. 18 Mar. 2013.

Ultimately, Strasbourg and Alexandria are case studies that represent the best practices for both historic preservation and building reuse within ecocity projects. Although each city's plans clearly differ, the policies of both encourage the reuse of all existing buildings, including those outside historic districts. This paper strives to highlight the importance of preserving historically significant buildings and landscapes within ecocities. However, the reuse of extant buildings, even if they are not presently found to be historically significant, has been found to be more environmentally sustainable in almost all cases. The reuse of buildings and sensitive infill development will ensure the unique character of each city is preserved for future generations and perhaps the abandoned buildings that have found new uses will someday prove to be historically significant themselves.

Chapter 5: A Best Practices Guide

“...accommodating growth and development while stewarding heritage places is not a new challenge, but it is increasingly influenced by the quest for sustainability.”²²³

A best practices guide for implementing preservation into typical ecocity plans would be invaluable to cities seeking to implement a city-wide sustainable urban project. If cities have existing buildings, particularly those within historic districts, it is critical that officials are aware of the value in preserving these buildings in terms of sustainable, economic, and social benefits. In a 1995 Canadian study about barriers to sustainability, the most common barriers were: “lack of understanding about the issues, perceived lack of empowerment to affect change, competing issues, inadequate funds to implement policies effectively, fear of losing constituent support, and limitation of jurisdiction.”²²⁴ Looking to other cities that may have encountered and solved these issues could help local governments and urban planners to recognize strategies that may work for their own towns. Ultimately, a best practices guide for incorporating preservation into typical ecocity plans could help preservationists understand when and where to interject themselves into the conversation, potentially resulting in the prevention of buildings being torn down in favor of new “green” replacements.

Since not all practices would be feasible for any given community, the following compilation of best practices was developed in hopes that communities can start to see what

²²³ “2010 World Monuments Watch,” 8.

²²⁴ Moore, Jennie L. "EcoCity: Barriers to Sustainability." *New City Magazine* 1995: 28-9. *ProQuest Research Library*. Web. 2 Jan. 2013.

preservation is capable of bringing to the table and where preservation should enter the discussion. The ecocity components that will be discussed include: collaboration, research, policies and benchmarks, strategies, dissemination of information, and incentives. As seen in the Chapter 4 analysis, these components were identified as best practices based on the case studies of Strasbourg, France and Alexandria, Virginia. Each of the selected components was analyzed based on its compatibility with the 2008 Ecocity World Summit definition, which was selected as the framework through which preservation's compatibility with ecocities was analyzed throughout this paper. Although there are varying sustainable viewpoints, the 2008 definition was ultimately selected because it was created by an international group made up of varying backgrounds and the IEFS, which has the potential to become the global ecocity standard, was based on that same definition.

Collaboration

Collaboration is by far the most important component that needs to be achieved during all phases of an ecocity project. As previously discussed, preservation may suffer unless representatives are present during all phases of decision-making. In Alexandria, the historic preservation department was not present during early stages of the project and only later became involved. Despite this early gap in communication between the preservation department and those implementing the ecocity project, preservation was integrated into city plans and used as a guiding principle to strengthen the identity and sustainability of the city. However, this could easily have been an example of an ecocity plan in which preservation was not represented.

During an interview with Alexandria's preservation and planning departments, the communication gap was chalked up to not being invited to sit in during these early meetings, but

clearly preservationists need to become more active and interject themselves into the ecocity process. They must present other city departments with information supporting preservation as a valid strategy for reaching typical ecocity goals. Engagement with stakeholders outside of the government sector is also important because it is necessary to discover their needs and values that should be addressed by ecocity plans. Including the public in the planning phase of ecocity projects will help the overall process remain transparent and encourage more participation; many sustainable goals will be more easily accomplished with the combined efforts of all residents within a city.

Research

Before ecocity plans are drawn up, each city should research the built environment it is working with in addition to sustainable strategies that may have worked in other cities. The local government and individuals in charge of the project need to understand the location and layout of the city in addition to the needs and values of residents in order to make appropriate decisions for alterations and new development. Specific areas to be looked at include: information about the local climate; existing laws, including local preservation ordinances; the existing layout of the city including all streets, public transportation lines, etc.; the boundaries of the planned urban projects; what makes up the city's existing building stock including the significant historic buildings that have been or should be designated; and the needs/values of the local residents.

Information about the local climate could identify which sustainable measures are most important for a specific city and which strategies may be appropriate for that specific location. Looking to historic buildings within the city could provide potential strategies for combating climate-specific issues. For example, in a city with a hotter climate residents need to rely heavily

on cooling systems. Before the advent of modern HVAC systems, historic buildings in the area would have had to employ alternate strategies such as site selection and building design to combat the heat. Looking to these examples, researchers may be able to identify location-specific strategies for more passive buildings with less reliance on HVAC systems, resulting in lowered energy use and carbon emissions.

Existing environmental and preservation laws at all levels of government have the potential to influence ecocity plans. Policies developed for ecocities must line up with higher-levels of existing legislation, but, as seen in case study examples, it is sometimes difficult to identify all of the existing sustainable policies because of their sheer number. In the case of Alexandria, the *A Green-Ventory of City Environmental Policies, Plans, and Programs* was created to fully understand the state of environmental policies affecting the ecocity.

Understanding the limitations placed on certain historic buildings and districts within a city is also imperative for determining where and how new development should be added to an ecocity. This knowledge can indicate when or if visually-altering strategies are appropriate, such as the installation of rainwater harvesting systems, solar panels, etc. In interviews with Alexandria's preservation department it was discovered that the two city historic districts were regulated locally but several National Register districts were not. This sort of information could simplify later planning stages of an ecocity project and ensure that historic resources remain protected.

Knowledge of the existing layout of the city and city boundaries could identify areas appropriate for new development. In ecocities it is particularly important to offer citizens access to public transportation, meaning densification along existing or planned extensions of transportation lines is generally an employed strategy. In Strasbourg, for example, the ecocity plan includes an extension of tramlines to connect suburbs to the city, and therefore more

amenities, while new development is planned in more recently developed areas. In this way new development is still located within the city, still connected to existing amenities and public transportation, and is not threatening the historic urban core of the city. It is therefore also important that the makeup of the city's existing building stock is understood.

In order to identify local historic resources, an inventory of extant buildings should be created at the onset of an ecocity project if one does not exist or if an old inventory is out of date. This inventory would help to determine if any resources are in need of protection or if existing districts should be expanded before, or in conjunction with, the ecocity project. In the case study of Strasbourg, the expansion of the city's only historic district is taking place at the same time as the ecocity project while all plans and strategies throughout the city hinge on the importance of the city's cultural heritage. Since Strasbourg's heritage was used as an underlying consideration throughout the ecocity project, preservation and consideration of historic resources is a reoccurring theme; new development plans focus primarily on areas outside the historic districts and infill projects are designed to be sympathetic to the size and style of nearby historic buildings in addition to the historic character of the neighborhoods. Using historical character as the backbone for much of the ecocity plan, Strasbourg was able to create plans for the city to become a more attractive draw for future residents and tap into economic benefits of preservation through increased tourism.

Finally, it is necessary to understand the needs and values of the local residents. New development, the expansion of transportation lines, and the addition of more amenities are done in order to meet the needs of current and future residents. Historic preservation has much to offer in social and economic benefits so making a case for how it can align with current needs may promote building reuse over new development. The cultural values of residents are particularly

important to preservation during an ecocity project; they can help to identify which extant structures or open spaces are significant to residents. In the case of Yangzhou, China, a Community Action Plan was employed as part of the larger ecocity project. Locals documented new and historic architectural elements that they felt should be preserved. In conjunction with professional analysis, protection plans were then developed based on the assessments of both parties. In the case of Strasbourg, public surveys took place to determine if there were any culturally significant open spaces or landscapes that should be protected from new development. In this way the city was able to ensure that none of their heritage was lost and the location of new development was optimal. Strategies like this can promote engagement with the public and foster cultural pride for local resources.

Policies and benchmarks

Before specific strategies are selected, ecocity authorities must collaborate with stakeholders in order to define the guiding principles and goals that should be achieved as a result of the project. In the example of Alexandria, sustainability was clearly defined by government officials; they were able to tailor an ambiguous word to encapsulate what was important for their city to achieve in terms of environmental, economic, and social sustainability. Their vision for the city expressed their ideals and acted as a kind of framework indicating what sorts of policies they would need to implement in order to reach their goals. They also noted that their initial decisions regarding how they should reach those goals may change; they acknowledged that they must revisit their plans and policies to ensure the selected strategies are as successful as possible. However, this is only one example of how a city can craft goals and policies.

Public policies geared towards achieving sustainable goals must be created during all ecocity projects and, although there are no globally accepted standards for ecocities, the IEFS identified 15 categories that can act as a framework for policymakers. The IEFS has noted that “While cities clearly differ from each other, they also share basic conditions and requirements...we all need clean air to breathe, clean water to drink, healthy soil in which to grow food, renewable resources to build with, education, employment, and a chance at a happy and productive life.”²²⁵ So there is no prescriptive path, but categories relating to environmental, economic, and social sustainability are addressed and measured through the IEFS system.

While policymakers may have good intentions when developing certain strategies, they must also consider how these strategies will be monitored; how will they know if their policy is in fact achieving its sustainable goal? No matter which standards and goals are used within an ecocity project, it is imperative that monitoring policies are established in relation to both the built and natural environment. In the case study of Alexandria, the focus on environmental monitoring ultimately overshadowed monitoring the built environment. This was surprising because the city was aware of the importance of improved building efficiency. Monitoring the success of policies, particularly those involving certification of buildings under any green rating system, is one of the most important aspects to achieving sustainable goals. Post occupancy surveys and audits for buildings adhering to environmental policies could determine if performance levels are on track; if policies addressing green purchasing, cleaning, and recycling policies are being upheld; and if there are any changes necessary to help the project meet or exceed its sustainable goals. It has been suggested that commercial buildings implementing sustainable policies adopt a municipal Environmental Management System (EMS). A building

²²⁵ “International Ecocity Framework and Standards,” 6.

feeds data into the EMS system in order to find out if it is meeting projected targets, how it can increase its operating efficiency, and create a plan to reduce its environmental impacts if necessary; “the most commonly used framework for an EMS is the one developed by the International Organization for Standardization (ISO) for the ISO 14001 standard.”²²⁶ Creating requirements for the monitoring of both existing and new buildings, however a city chooses to do so, is therefore a best practice for all ecocity projects.

In many ecocity projects, indicators are used as a form of monitoring the success of a project. The IEFS is currently working with a variety of experts and ecocities in an effort to establish a series of indicators that will be used, in conjunction with the 15 category standards, to measure the success of ecocity projects. As previously mentioned, there are no indicators within the most recent document geared towards preservation or the reuse of the built fabric as a measure of success within any of the categories. This indicates a lack of regard for, and perhaps ultimately a threat to, historic resources. Without including preservation aspects as key indicators, it will not be viewed as a priority and, when conflicts arise, which they inevitably will, individuals may see this as an opportunity to demolish existing buildings in favor of new “green buildings.”

Some examples of preservation-based indicators in regards to development decisions can be seen in Figure 23. These were developed for World Heritage Sites, but give an idea of what sorts of indicators should be included within ecocity plans to ensure the protection of their historic built fabric. These suggested indicators support the identification of significant elements within the historic built fabric and the identification of local values. This clearly supports the

²²⁶ “Environmental Management Systems.” *U.S. Environmental Protection Agency*, 15 Dec. 2011. Web. 21 Apr. 2012.

Table 1: The heritage attributes of a well-managed historic city will authentically reflect its significant heritage values	
Key Questions	Indicators
Is there consensus around the heritage values of the historic city?	Has an explicit "Statement of Significance" been prepared for the historic city?
Are the World Heritage values of the city integrated within the heritage values defined for the historic city?	
Is it understood how the defined heritage values are reflected in characteristic attributes (features, patterns, traditions etc.)?	Does the "Statement of Significance" link heritage values to significant attributes?
Is the authenticity of significant heritage attributes clearly understood in relation to defined heritage values?	Does the "Statement of Significance" make reference to the authenticity of significant heritage attributes?
Table 2: A well-managed historic city will ensure that development decisions do not compromise significant heritage values	
Key Questions	Indicators
Is impact on heritage values the determining factor in review of development decisions?	Is the "Statement of Significance" used in development decision-making?
	Are key stakeholders aware of and using the "Statement of Significance" in their discussions?
	Does the press refer to the "Statement of Significance" in media treatment of heritage issues?
Table 3: The heritage values of a well-managed historic city will be understood by the public as critical factors in decision-making	
Key Questions	Indicators
Is there general understanding and acceptance of defined heritage values within the community?	Are the heritage values of the historic city presented in education programmes for the young?
	Are the heritage values of the historic city exposed in tours and public information made available to visitors?
	Are the heritage values of the historic city exposed in public information made available to residents?
Source: UNESCO, <i>Maintaining Heritage Values in Historic Cities</i>	

Figure 23: Select preservation indicators for World Heritage Sites (UNESCO)

European <i>Livable Cities</i> Project		
Indicator	Measure	Technique
Immediate Economic		
Pedestrian activity	People flows	Manual counts, cameras, surveys of special events
More Expenditure	Expenditures (retail, leisure, hotel, on street event)	Interviews, surveys (on street, self-completion, operators)
More uses on street	Number of: cafes, street traders, stalls, events	Before & after survey
More repair/regeneration of sites	Level of activity	Exterior condition surveys, planning applications, repair frequencies, occupier surveys
Increased local distinctiveness	Number of independent shops Number of distinctive events User attitude Image change	Audit of shops Audit of events User surveys Survey of distinctive elements
Strategic Economic		
Improvement in town's performance	Performance of shops Tourism performance Quality of life	National retail rankings National tourism rankings Various surveys
New strategic roles for public space	Role changes	Before & after surveys
Integration of latent economic assets	More effective use	Audit of new economic activity Before & after surveys of vacant sites
Creation of new economic quarters	Diversity	Audit of changes in cultural/social/econ offerings
Improvement in quality of life	Overall quality	User surveys

Figure 24: Indicators of neighborhood revitalization in which preservation is used as a strategy (Time and Space Innovateurs)

base motive of preservation, which is to conserve and protect significant aspects of buildings. This also directly aligns with one of the requirements of ecocities as established in the 2008 Ecocity World Summit's definition: help people understand their cultural identity.

Additional preservation-based sustainable indicators should be included within ecocity projects to complement the unique makeup of the city. Preservation indicators measuring economic sustainability were created in 2011 by Donovan Rypkema, Caroline Cheong and Randall Mason. Suggestions from this group include measuring: the number of jobs created

through the rehabilitation of historic buildings; property values within historic districts; the amount of heritage tourism in a town; environmental contributions from historic resources; and the success of preservation's role in downtown revitalization.²²⁷ Economic focused preservation indicators could align with the IEFS "Healthy and equitable economy" category, which looks to economic activities that benefit the environment and human health while providing employment opportunities for local residents. Since preservation has the potential to foster tourism and economic growth, these types of indicators would be suitable for inclusion within an ecocity project.

Further examples of preservation based indicators can be seen in Figure 24. These indicators, which were created to measure the success of city-revitalization projects that used historic preservation as a tool, were established by the European Union for their 2008 Livable City Project. As seen in the table, elements including local distinctiveness, diversification, and building repair are addressed. These elements all touch on preservation subjects: local distinctiveness can incorporate historic architectural elements and diversification touches on additional cultural offerings within the city, which can encompass the built cultural heritage areas open to the public. These indicators can directly relate to the 2008 Ecocity World Summit requirements. They measure how well people understand their cultural identity and also ensure that the public is provided with healthy housing and workplaces through measuring building conditions and repairs in addition to occupant surveys. These indicators can also directly relate to the IEFS system under the "well being – quality of life" category. This particular category measures citizen satisfaction with various elements within their city including, but not limited to, the built and natural environment and access to services. These indicators measure the

²²⁷ Rypkema, Donovan, Caroline Cheong, and Randall Mason. "Measuring Economic Impacts of Historic Preservation." *Advisory Council on Historic Preservation*, Nov. 2011. Web. 17 Jan. 2013.

satisfaction of building repairs through occupant surveys and measure the success of the project by the diversity of services offered to the public. Indicators within ecocity projects should look to these, and other, examples of preservation indicators and use them along with strictly sustainable indicators to measure the success of their project. This will ensure that both sustainable and preservation goals will be achieved under the newly established policies.

Strategies

There are several IEFS categories with strategies that have the potential to align with preservation. The 15 categories identified by the IEFS are: access by proximity, clean air, healthy soil, clean and safe water, responsible resources/materials, clean and renewable energy, healthy and accessible food, healthy biodiversity, earth's carrying capacity, ecological integrity, healthy culture, community capacity building, healthy and equitable economy, lifelong education, and well being – quality of life. Out of these 15 categories, preservation clearly aligns with the suggested strategies of 7: access by proximity, clean air, responsible resources/materials, clean and renewable energy, healthy culture, lifelong education, and community capacity building.

- “Access by proximity” is achieved when a city can provide the majority of its residents with walkable access from housing to transit, jobs, and basic amenities. Suggested IEFS strategies that can align with preservation include: mixed land use, compact city centers, open green spaces, walkable neighborhoods, and access to public transportation.
- “Clean air” is achieved when a city can reduce levels of pollution in both buildings and the natural environment. Suggested IEFS strategies that can align with preservation include: conversion to cleaner fuel sources, promoting renewable energy sources,

retrofitting buildings for energy efficiency, automobile reduction, and strengthening energy performance standards.

- “Responsible resources/materials” is achieved when a city selects environmentally friendly materials and food sources and reduces its overall requirement for materials. Suggested IEFS strategies that can align with preservation include: source reduction, reuse and repair, and recycling.
- “Clean and renewable energy” is achieved when a city utilizes energy sources that do not create a significant negative impact on the environment. Suggested IEFS strategies that can align with preservation include: using photovoltaic power, district energy, energy efficiency building audits, passive house design, fuel free transport, and reduced travel time.
- “Healthy culture” is achieved when a city facilitates cultural activities to promote knowledge, creative expression, and thought. Suggested IEFS strategies that can align with preservation include: education and the presence of opportunities for cultural participation.
- “Lifelong education” is achieved when a city provides access to all residents in regards to the city’s history of place, culture, ecology, and tradition. Suggested IEFS strategies that can align with preservation include: traditional and skills-based education.
- “Community capacity building” is achieved when a city supports full and equitable community participation within decision making processes. Suggested IEFS strategies that can align with preservation include: the participation of citizen and community organizations to defined and resolve issues; encouraging participation from a diverse

network of community participants; the promotion of collaboration in an effort to conserve resources; and the creation of clear community values.

Although not apparent according to IEFS standards and recommended strategies, historic preservation has the capacity to promote the categories of “healthy and equitable economy” and “well being – quality of life.” “Healthy and equitable economy” is achieved when a city favors economic activities that benefit the environment and human health while providing employment opportunities for local residents. Suggested IEFS strategies focus on the creation of credit unions and a variety of community loan programs that will assist in business start ups, business expansion, and affordable housing. As seen in the 2011 economic sustainability research undertaken by Rypkema, Cheong and Mason, preservation has the capability to: create jobs through the rehabilitation of historic buildings, increase the amount of tourism within a town, and revitalize downtown commercial areas.²²⁸ Preservation has the ability to create jobs through building rehabilitation through the increased need for skilled construction workers and other architecturally-related professionals. Increased tourism as a result of preservation can lead to the creation of tourism-related jobs and increased cash flow for already-established commercial areas. Finally, the revitalization of downtown areas through preservation-related activities such as building rehabilitation can result in a more attractive commercial area that serves to once again draw locals to the city center as both patrons of businesses and prospective workers.

“Well being – quality of life” is achieved when a city’s citizens report their satisfaction with various elements within their city including employment, the built and natural environment, education services, safety, recreation, public health, a strong sense of community, and more. Suggested IEFS strategies focus on increasing public services such as access to health care, clean

²²⁸ “Measuring Economic Impacts of Historic Preservation,” 33.

water, safety, etc. and creating a stronger connection between the city government and local community. This stronger relationship is intended to foster communication and collaboration between the local government and community regarding issues of importance to local residents. These strategies are clearly important but preservation strategies could also help to increase the quality of life for local residents, particularly through the avenues of satisfaction with the built environment, recreation, public health, and a strong sense of community. Historic districts are often in the center of cities near public transportation. They are also typically composed of mixed-use buildings. Both of these increase the public's quality of life because they provide easy access to amenities while maintaining the traditional, unique character of the historic district, thereby reinforcing the sense of community within the city.

Dissemination of information

Collaboration with all relevant stakeholders, including local residents, ensures that the public is involved throughout the ecocity planning process. Once research has been completed and a set of principles, policies, and standards is created, city officials must distribute that information to the citizens. This is a particularly important element in regards to historic districts where owners of historic properties need to be aware of how they can appropriately contribute to the city-wide project and why their participation is essential. Many people don't realize the benefits of preservation, sustainable or otherwise, so the creation of a best practices guide could not only provide that information in a printed, easy to access format, but could contain suggestions for how a city implementing a city-wide sustainable urban project should make contact with the locals; the establishment of community groups, forums, and the dissemination of relevant information will be a fundamental step that will determine the success of any project as ecocity projects are reliant on collective change. The case studies provided excellent examples of

how cities should keep citizens informed throughout all stages of the ecocity planning process. In some instances, dissemination of information was key to the retention of historic fabric or to quell fears regarding changes within historic districts. In addition to planned changes within the city, information about available financial incentives for the retention of historic properties should be provided for local residents. The city of Strasbourg set up a fund to help cover the costs of any changes required under the ecocity plan, promoting not only preservation but also improved building efficiency.

Incentives

Incentives are important as they help to encourage owners to not only meet benchmarks, but to exceed them given the appeal of the incentive offered; “When something costs an owner, [they] think twice about it...incentives work extremely well in the real estate industry.”²²⁹ Some examples of incentives to increase building efficiency include tax credits or rebates. There are numerous credits available; for example, under EPA Code Sec 179D, a tax deduction up to \$1.80 per square foot is available for buildings that achieve energy reductions beyond the required the ASHRAE 90.1-2007 standards.²³⁰ Tax credits are constantly updated, expire, and require the use of approved computer modeling software to determine a building’s eligibility for the credits, so it would be important that each municipality offers their citizens the most up-to-date incentive information. By informing building owners of the possible benefits they can obtain through monitoring their building’s performance levels, it is likely owners will be more willing to undertake that task.

²²⁹ Kelly, Douglas R. "A LEED Reorganization." *Buildings* 102.11 (2008): 69-70. *ProQuest Research Library*. Web. 21 Apr. 2012.

²³⁰ Goulding, Charles, Taylor Goulding, and Amelia Aboff. "How LEED 2009 Expands EAct Tax Savings Opportunities." *Corporate Business Taxation Monthly* 10.12 (2009): 11-3. *ProQuest Research Library*. Web. 21 Apr. 2012.

There are also a number of Federal tax incentives, discussed in detail within Chapter 2, which could encourage building owners to take part in rehabilitation projects rather than demolishing existing buildings in favor of new development. In these cases the process of obtaining the credits is quite complicated and there are many restrictions on the types of projects

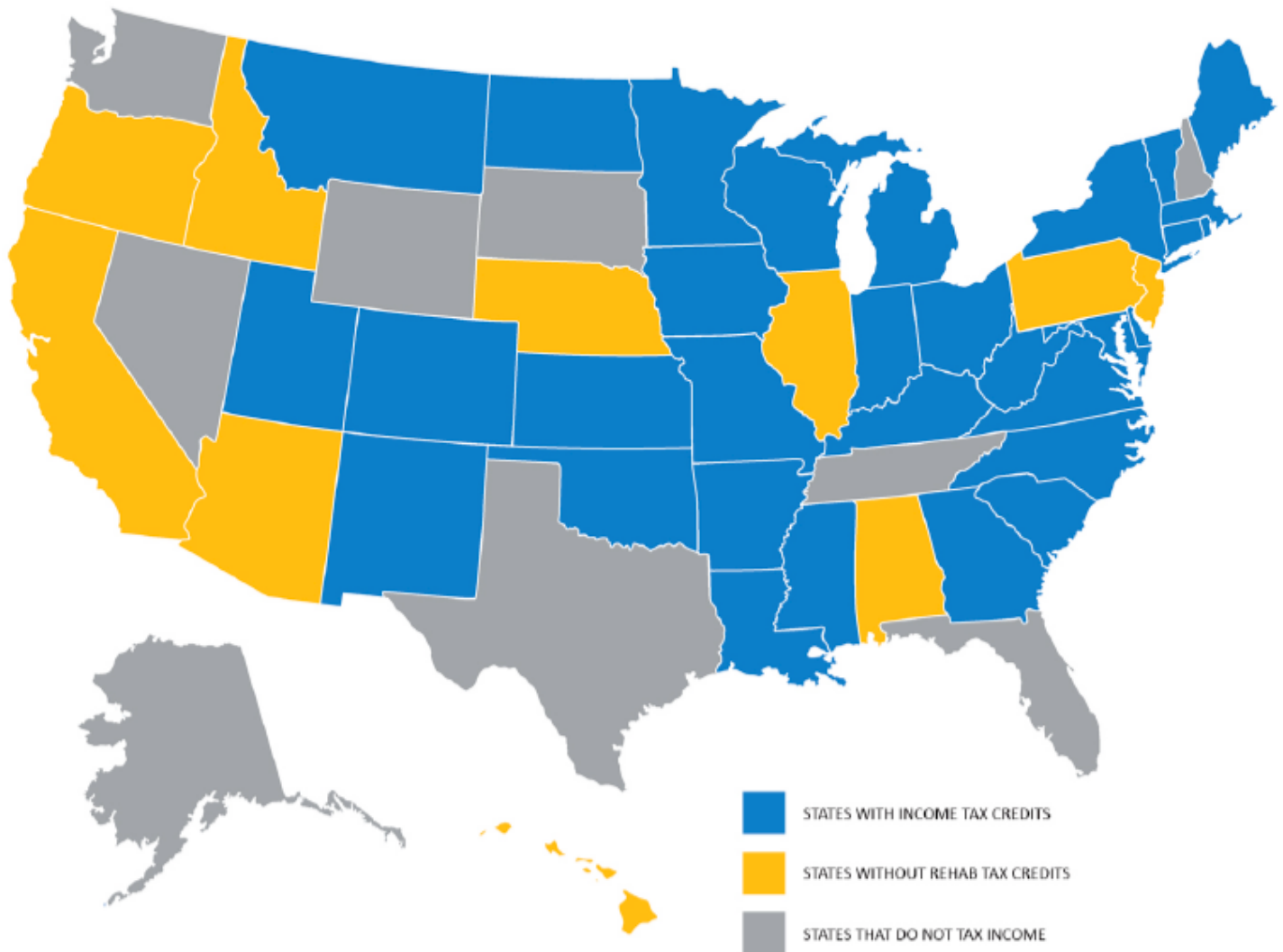


Figure 25: Tax credits available at state levels as of 2010 (National Trust for Historic Preservation)

that qualify. More information and perhaps even assistance provided at local levels could help to make more developers choose to undertake rehabilitation projects. Additional financial incentives at state or local levels could strengthen the chances of preservation projects winning out over new development. As of 2010, 31 states offered tax credits, 9 states didn't have income tax and therefore had no need for state tax credits, and 10 states did not offer credits (see Figure 26).²³¹ Finally, incentives that directly discourage preservation, as those discussed within the city of Portland, should be revoked, particularly within ecocity projects; it has been shown that the demolition process is detrimental to the natural environment and historic buildings have the potential to perform at levels of increased efficiency so it makes sense to preserve and reuse as much of the historic building stock as possible.

²³¹ Schwartz, Harry K. "State Tax Credits for Historic Preservation." *National Trust for Historic Preservation*, 2010. Web. 10 Apr. 2013.

Conclusion

Cities will continue to grow and the need to manage resources and become more sustainable will become more imperative. Therefore, ecocities may be the solution that many cities choose to employ. There is at present no official program with which cities can begin their sustainable transition. This is problematic because any city can technically label itself as an ecocity and the ecocity label could ultimately be appropriated by individuals with agendas that may not be geared towards achieving sustainable goals in conjunction with preservation goals. The IEFS standards, which are currently being created, have the potential to become the standards by which all future ecocities are evaluated. At present, the IEFS group is collaborating with a variety of stakeholders, but preservation is currently absent from all of the IEFS' potential sustainable indicators and strategies. Additionally, many ecocity projects do not consider preservation as a way in which they can reach their sustainable goals.

Naturally each city will be different so different policies and strategies must be tailored to meet a city's individual needs. In order to more easily plan, compare, measure, and ultimately identify ecocities, the IEFS framework should be used by communities hoping to become ecocities in the future. Preservation is clearly able to align with the best practices identified for typical ecocities, and has proven to be directly compatible with several of the ecocity requirements identified during the 2008 Ecocity World Summit. Although not true of all historic buildings, some do have the capability to meet and exceed the efficiency of new green buildings. Even if a new green building uses recycled materials, it still expends more energy use and CO₂ emissions than if an extant building were adaptively reused. Several studies found that if a

historic building is replaced with a comparable, high-efficiency building, it will take many years of efficient building operation to overcome the negative climate change impacts created during the construction process. In addition to any sustainable benefits, historic buildings also have the ability to strengthen community identity and foster heritage tourism, adding to the social and economic sustainability platforms of sustainable development. The exact benefits of each historic building and district differ, so each must be investigated individually; however, enough evidence exists to justify investment on the part of planners and developers to discover those potential benefits.

Preservationists must also become aware of the ways in which preservation and the ecocity movement is compatible and, if conflicts arise, how to properly address them. This will allow them to come to the table at the beginning of the planning stages with evidence to support the preservation of historic districts within ecocities. Preservationists must insert themselves into the conversation and take an active role in the creation of the IEFS standards and strategies that will affect the built environment, including historic resources. It is also important that preservationists keep in mind that being part of the conversation does not simply mean advocating for preservation by making historic buildings immune to changes that are happening among the rest of the built fabric. Stronger preservation legislation will help to avoid issues such as the razing of entire historic areas, as seen in some international examples within this paper. It will allow preservationists a chance to review proposed changes to historic fabric in an effort to increase building efficiency and meet goals outlined under ecocity plans. However, avoiding sustainable changes within historic districts and employing sustainable benchmarks that don't apply to historic buildings is not the way in which historic districts and buildings should be

incorporated into ecocities. Preservationists must look to examples, such as those provided by the case studies here, where preservation was used as a tool to reach sustainable goals.

The idea that preservation and sustainability are at odds is not uncommon; however, preservation has proven to be capable of aligning with many different sustainable goals and strategies. If collaboration between local governments and preservationists is not occurring, it is likely that preservation will not be included as a strategy, or priority, of an ecocity plan. Historic districts have the potential to bolster local identity; meet sustainable target goals, such as reduced energy usage; foster economic benefits, such as heritage tourism; provide increased quality of life through walkable, mixed-use and centralized neighborhoods; and more. Much of the present building usage data focuses on historic buildings on the individual level, but more research must take place at the district-level if preservationists hope to truly become part of the larger-scale ecocity planning conversation. Without making preservation a key component of an ecocity plan, the myriad benefits that they provide will be lost and historic fabric can ultimately be threatened by new “sustainable” development.

Appendix I: Ecocity World Summit 2008

Richard Register and Wang Rusong, Conference Co-Conveners

The International Ecocity Conference Series brings together the key innovators, decision makers, technologists, businesses and organizations shaping the conversation around ecological and sustainable city, town and village design, planning and development. We intend to put these issues on the economic and environmental agenda for 2008 and beyond.

The time to act is now. Life-threatening global environmental problems and limitations on resource consumption demand a restructuring of cities and transportation systems worldwide for long-term energy efficiency and conservation. Concerned citizens in every community - in every city, town and village - must get involved in formulating and implementing new land use and transportation policies and practices, preserving agricultural lands and open space, and reclaiming natural habitat.

The San Francisco Ecocity Declaration

An ecocity is an ecologically healthy city. Into the deep future, the cities in which we live must enable people to thrive in harmony with nature and achieve sustainable development. People oriented, ecocity development requires the comprehensive understanding of complex interactions between environmental, economic, political and socio-cultural factors based on ecological principles. Cities, towns and villages should be designed to enhance the health and quality of life of their inhabitants and maintain the ecosystems on which they depend.

Ecocity development integrates vision, citizen initiative, public administration, ecologically efficient industry, people's needs and aspirations, harmonious culture, and landscapes where nature, agriculture and the built environment are functionally integrated in a healthy way.

Ecocity development requires:

- a. Ecological security - clean air, and safe, reliable water supplies, food, healthy housing and workplaces, municipal services and protection against disasters for all people.
- b. Ecological sanitation - efficient, cost-effective eco-engineering for treating and recycling human excreta, gray water, and all wastes.
- c. Ecological industrial metabolism - resource conservation and environmental protection through industrial transition, emphasizing materials re-use, life-cycle production, renewable energy, efficient transportation, and meeting human needs.
- d. Ecoscape (ecological-landscape) integrity - arrange built structures, open spaces such as parks and plazas, connectors such as streets and bridges, and natural features such as waterways and ridgelines, to maximize biodiversity and maximize accessibility of the city for all citizens while conserving energy and resources and alleviating such problems as automobile accidents, air pollution, hydrological deterioration, heat island effects and global warming.
- e. Ecological awareness - help people understand their place in nature, cultural identity, responsibility for the environment, and help them change their consumption behavior and enhance their ability to contribute to maintaining high quality urban ecosystems.

Source: "Ecocity World Summit 2008." *Ecocities*, 2008. Web. 12 Oct. 2012.

<<http://www.ecocityworldsummit.org>>

Appendix II: The Three Epochs of the Modern Sustainability Movement

Table 1.1: From Environmental Protection to Sustainable Communities			
	Regulating for Environmental Protection 1970 - 1990	Efficiency-Based Regulatory Reform and Flexibility 1980 - 2000s	Toward Sustainable Communities 1990 - present
Problem Identification and Policy Objectives	<ul style="list-style-type: none"> • pollution caused primarily by callus and unthinking business and industry • establish as national priority the curtailment of air, water, and land pollution caused by industry and other human activity 	<ul style="list-style-type: none"> • managing pollution through market-based and collaborative mechanisms • subject environmental regulations to cost-effectiveness test • internalize pollution costs • pursue economically optimal use of resources and energy • introduce pollution prevention • add policies on toxic waste and chemicals as national priorities 	<ul style="list-style-type: none"> • bringing into harmony human and natural systems on a sustainable basis • balance long-term societal and natural system needs through system design and management • rediscovery of/emphasis on resource conservation • halt diminution of biodiversity • embrace an eco-centric ethic
Implementation Philosophy	<ul style="list-style-type: none"> • develop the administrative and regulatory legal infrastructure to ensure compliance with federal and state regulations 	<ul style="list-style-type: none"> • shift to state and local level for initiative in compliance and enforcement • create market mechanisms for protection of the environment 	<ul style="list-style-type: none"> • develop new mechanisms and institutions that balance the needs of human and natural systems, both within the U.S. and around the globe • focus on outcomes and performance

<p>Points of Intervention</p>	<ul style="list-style-type: none"> • end of the production pipeline • end of the waste stream • at the point of local, state, and federal governmental activity 	<ul style="list-style-type: none"> • the market-place, which serves as the arbiter of product viability • provide education and training at several points along the cradle-to-grave path of materials and resource use 	<ul style="list-style-type: none"> • societal level needs assessment and goal prioritization • industry-level attention to product design, materials selection, and environmental strategic planning • individual behavior and life-style choices
<p>Policy Approaches and "Tools"</p>	<ul style="list-style-type: none"> • policy managed by Washington, D.C. • command-and-control regulation • substantial federal technology R&D • generous federal funding of health and pollution prevention projects 	<ul style="list-style-type: none"> • policy managed more by states and affected communities • federal role shifts to facilitation and oversight • introduction of incentive-based approaches (taxes, fees, emissions trading) for business and industry • creation of emissions-trading markets 	<ul style="list-style-type: none"> • comprehensive future visioning • regional planning based on sustainability guidelines, • Total Quality Environmental Management (TEQM) and life-cycle-design practice in industry • various experiments with new approaches
<p>Information and Data Management Needs</p>	<ul style="list-style-type: none"> • firm-level emissions • waste stream contents and tracking • human health effects • environmental compliance accounting in industry 	<ul style="list-style-type: none"> • costing out environmental harms and benefits of reduced pollution • provision of readily accessible emissions data (e.g., through Toxics Release Inventory and right-to-know programs) • professional protocols for environmental accounting in industry • ecosystem mapping 	<ul style="list-style-type: none"> • sustainability criteria and indicators • eco-human support system • region/community/global interaction effects (e.g., regarding CO2 emissions and depletion of ozone layer) • utilization of ecological footprint analysis • use of material and energy "flow-through" inventories and accounting • computer modeling of human-natural systems and interactions

<p>Predominant Political/Institutional Context</p>	<ul style="list-style-type: none"> • rule of law • adversarial relations • zero-sum politics • focus on national regulatory agencies and enforcement mechanisms 	<ul style="list-style-type: none"> • alternative dispute resolution techniques • greater stakeholder and public participation, especially, at the state and local level • reliance on the market place 	<ul style="list-style-type: none"> • public/private partnerships • local/regional collaborations • community capacity building and consensus building • mechanisms created to enforce "collective" decisions
<p>Key Events and Public Actions</p>	<ul style="list-style-type: none"> • Santa Barbara oil spill • Earth Day • passage of the 1970 CAA and 1972 CWA • passage of National Environmental Policy Act • creation of the Environmental Protection Agency 	<ul style="list-style-type: none"> • Carter administration focus on cost of environmental regulation • election of President Ronald Reagan • Love Canal, Bhopal • RCRA and SARA • growth in state and local environmental policy capacity 	<ul style="list-style-type: none"> • Brundtland report, <i>Our Common Future</i> • Earth Summit (UNCED) • Montreal Protocol on CFCs, • Kyoto Protocol adoption • Intergovernmental Panel on Climate Change, series of reports • Hurricane Katrina

Source: Mazmanian, Daniel and Michael Kraft. *Toward Sustainable Communities: Transition and Transformations in Environmental Policy*. Cambridge, Mass.: MIT Press, 1999. Print. 38-40.

Appendix III: The Seven Pillars of the First Environmental Epoch

(1) The Clean Air Act (CAA). The 1970 act required the EPA to set uniform, national ambient air quality standards to “provide an adequate margin of safety” to protect public health “from any known or anticipated adverse effects” associated with six major pollutants.

(2) The clean Water Act (CWA). Formally the Federal Water Pollution Control Act Amendments of 1972, the CWA set a national policy for cleaning up the nation’s surface water. It established national deadlines for eliminating discharge of pollutants into navigable waters and set as a goal “fishable and swimmable” waters nationwide.

(3) The Safe Drinking Water Act (SDWA). The 1974 act was designed to ensure the quality and safety of drinking water by specifying minimum public health standards for public water supplies. It authorized the EPA to set National Primary Drinking Water Standards for chemical and microbiological contaminants in tap water. The act also required regular monitoring of water supplies to ensure that pollutants stayed below safe levels.

(4) The Resource Conservation and Recovery Act (RCRA). In the 1976 act, Congress required EPA to regulate existing hazardous waste disposal practices as well as to promote the conservation and recovery of resources through comprehensive management of solid waste. RCRA required the EPA to develop criteria for safe disposal of solid waste and the Commerce Department to promote waste recovery technologies and waste conservation. The EPA was to develop a “cradle-to-grave” system of regulation that would monitor and control the production, storage, transportation, and disposal of wastes considered hazardous, and it was to determine the appropriate technology for disposal of wastes. The act was strengthened in 1984.

(5) The Toxic Substances Control Act (TSCA). In this 1976 act, the EPA was given comprehensive authority to identify, evaluate, and regulate risks associated with the full life cycle of commercial chemicals, both those already in commerce as well as new ones in preparation. The EPA was to produce an inventory of chemicals in commercial production, and it

was given authority to require testing by industry where data are insufficient and the chemical may present an unacceptable risk.

(6) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Congress created FIFRA in a 1947 act that established a registration and labeling program housed in the Department of Agriculture that was oriented largely to the efficacy of pesticides. In 1970 Congress established the modern regulatory framework that turned jurisdiction over to the EPA. FIFRA requires that pesticides used commercially within the United States be registered by the EPA. It sets a criterion for registration that the pesticide not pose “any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use.” The act was amended significantly in 1996 with the Food Quality Protection Act.

(7) The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund.). Congress enacted CERCLA, better known as Superfund, in 1980 and revised it in 1986 with the Superfund Amendments and Reauthorization Act (SARA). The act is a partner to RCRA. Whereas RCRA deals with current hazardous waste generation and disposal, the Superfund is directed at the thousands of abandoned and uncontrolled hazardous waste sites. The act put responsibility for the cleanup and financial liability on those who disposed of hazardous wastes at the site, a “polluter pays” policy.

Source: Mazmanian, Daniel and Michael Kraft. *Toward Sustainable Communities: Transition and Transformations in Environmental Policy*. Cambridge, Mass.: MIT Press, 1999. Print. 18-19.

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