SUSTAINABLE PLANNING THEORY AND PRACTICE:

A CASE STUDY FOR CINCINNATI

A CREATIVE PROJECTE

SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULLFILLMENT OF THE REQUIRMENTS

FOR THE DEGREE

MASTER OF URBAN AND REGIONAL PLANNING

BY

DEREK WALKER

DR. MICHAEL BURAYIDI – ADVISOR

BALL STATE UNIVERSITY

MUNCIE, INDIANA

JULY, 2015

Table of Contents

Acknowledgments

It is with immense gratitude that I acknowledge the support and help of my Professor and Advisor Michael Burayidi, PhD, who provided direction and support to this creative project. He was crucial in identifying beneficial research, proof reading, and commenting on early drafts. Without his clear guidance this project would not have been possible.

I would like to thank Professor Eric Kelly, PhD who helped me develop my research topic nearly a year ago. With his guidance I was able to narrow down potential topics and discuss resources before finally settling on my chosen subject.

I would like to thank Christine Rhine, Administrative Coordinator to the Department of Urban Planning, who made sure that all forms were sent in to the graduate school and that every small detail was taken care of. Thanks to her I was able to direct my hours to the important aspects of my creative project.

Finally I would like to thank my significant other, Amber Walcott, for reading and commenting on my project. Her eye for grammatical errors was greatly appreciated during the late stages of the project. She provided a non-urban planning perspective, enabling her to identify area for more explanation making my project understandable to a broader range of audience.

Chapter 1
Introduction

Climate change and peak oil collectively pose one of the greatest challenges to humanity. Scientists overwhelmingly agreed that the time to act is now. While national and international entities attempt to compromise on the most equitable solution, cities should anticipate the implications of such talks while providing their own citizens with a resilient means of conducting their lives.

This research will review professional literature on sustainability, understanding both global and local implications. Reviewing such documents will provide a basic criteria for analyzing municipal plans throughout the nation, with an added focus on Midwestern Rustbelt Cities. Multiple plans will then be reviewed in an attempt to grasp what works and what has fallen short. Finally, a critical review of the Green Cincinnati Plan will be conducted.

This creative project not only attempts to provide decision makers of Cincinnati with a means of planning into the future but also cities throughout the Midwest. Ideally from reviewing the work, professional planners will be able to critically analyze their own plans to provide a road to resilience in the face of global climate change.

Statement of the Project

Climate change and peak oil collectively pose one of the greatest challenges to humanity. Scientists overwhelmingly agree that the time to act is now. While national and international entities attempt to compromise on the most equitable solution, cities and other local governments should anticipate the implications of such talks while providing their own citizens with a resilient means of conducting their lives. The theory of sustainability may be the most efficient means of combating these great challenges. This project will provide a framework for planners who are developing sustainable plans.

Defining Sustainability

Many professionals define the term sustainability slightly differently, but the framework for which it is defined is largely the result of the World Commission on Environment and Development (WCED). In 1983 the United Nations created the independent body to "re-examine the critical environment and development problems on the planet and to formulate realistic proposals to solve them, and to ensure that human progress will be sustained through development without bankrupting the resources of future generations" (p. 3). To fulfill this objective the WCED released *Our Common Future* (1987).

The report justifies the call to action explaining the implications of deforestation, poverty, and the alarming increase of environmental degradation. This results because we can get away with this course of action as future generations have no vote or consideration in today's decisions. With this justification the WCED defines sustainable development as, development "that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43).

Additionally in Berke and Conroy's (2000) "Are We Planning for Sustainable Development? An evaluation of 30 Comprehensive Plans" an extended definition of sustainability is provided. Building off of the work completed by WCED they describe sustainability as "a dynamic process in which communities anticipate and accommodate the needs of current and future generations in ways that reproduce and balance local social, economic, and ecological systems, and link local actions to global concerns" (p. 23).

This definition had further implications of promoting sustainability. The WCED (1987) notes that all three systems of sustainability (ecological, economic, and social) are connected and alterations to one will have effects on others within that of the individual system and the other two systems. For example, ecological issues are dependent on or are a result of other issues. In other words, deforestation leads to soil instability which effects the ability to produce agriculture which in turn increases ocean salinity. These independent environmental issues are also linked to both social and economic issues.

Deforestation will decrease farm yield and agriculture dependent populations will witness economic issues that will result in poverty which in turn will force populations to over exploit natural resources for the sake of survival, which furthers environmental degradation.

By understanding the complexity of sustainability it can only conceivably be productive by solving problems at the local level. Only here can one entity possibly understand the unique ecological, economical, and social systems. The regional governments can be better at promoting what the WCED (1987) demands. When responding to each individual unique interconnected system the individual entities view sustainable development as a "global objective" (para. 37-40). The WCED (1987) sums this up nicely in one sentence, "The unity of human needs requires a functioning multilateral system that respects the democratic principle of consent and accepts that not only the Earth but also the world is one" (p. 41). When attempting to solve unsustainable issues, the planners must look at the issues in the context of other interconnected systems and they must be solved simultaneously if we wish to get to the root of the problem.

Political Implications of Sustainability

There are political implications to keep in mind when developing sustainability plans. Phillip Berke and Maria Conroy (2000) evaluate the use of sustainable development principles being integrated into community plans to understand what effects these principles have on plan elements. In their article, "Are We Planning for Sustainable Development?" the authors scored comprehensive plans and compared plans that integrated sustainable development with those that did not.

Surprisingly the study found that the use of sustainability principles had little effect on plan score, which was weighted with whether plans required or considered actions. They suggest that this could be explained by those plans that do not directly use sustainability principles, instead use them with politically sensitive words rather than stating them directly. As the authors believe, this is an effective means of plan making and a great skill for plan makers to have as these planners truly understand what sustainability attempts without directly stating. This integration of sustainability could help take the

political element out of the plan, as sustainability appears to be the obvious ideal when it is simply explained rather than stated. It does not appear as if the authors considered implementation as they only examined plans, which makes me question why they only considered plans 10 to 20 years old. They explain this as a means of standardizing the plans and by doing this they can assume that the planners have not had much practice with sustainability. The authors could have benefited from a more current look on sustainability plans.

Sustainability is a critical component of future planning that all planners must understand thoroughly to have hope in solving 21st century problems. The sooner planners start acting on sustainability initiatives the less severe problems will become in the immediate and distant future. As sustainability initiatives begin to be incorporated throughout everyday lives the numerous positive effects the theory produces will gain recognition and, then the bulk of the population will open up to its ideas and demand this type of development. It appears as if a majority of professionals are well aware of the problems developing from unsustainable development but are too tentative to act, as if it is not within the planners' scope of work. Though it can be dangerous to blindly tackle these problems without full public support, the current situation demands further understanding and planners must embrace sustainability and incorporate it throughout their practice.

Explanation of Project

The goal of this research is to understand sustainability and how the theory can comprehensively provide solutions to the twenty first century problems threatening our common future. After briefly describing the severity of the problems that are already surfacing globally, the context will shift down to a local level in understanding how American cities have attempted sustainability planning. This will be done by discussing sustainability through professional works while attempting to understand how sustainability is achieved. This understanding will be used to create a criteria in assessing the Green Cincinnati Plan. Finally, recommendations will be made on improving the plan, in a manner that is not as

politically vulnerable by integrating sustainability concepts rather than directly using terms as Burke and Conroy suggest.

This creative project will tend to focus on Midwestern Rustbelt Cities with similar problems to that of Cincinnati, but will draw from some of the more aggressive action seen from municipalities throughout the rest of the United States. Ideally this project will provide a framework for planners to develop and update plans in a manner that incorporates sustainability to the degree demanded by the World Commission on Environment and Development (WCED).

This research will review professional literature on sustainability, understanding both global and local implications. Reviewing such documents will provide a basic criteria for analyzing municipal plans throughout the nation, with an added focus on Midwestern Rustbelt Cities. Multiple plans will then be reviewed in an attempt to grasp what works and what has fallen short. Finally, a critical review of the Green Cincinnati Plan will be conducted.

Chapter 2
Planning Background

The definition of sustainability has been set for the remainder of this paper. To quickly revisit, the WCED (1987) states that sustainable development is development "that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43). More broadly put by Berke and Conroy (2000), sustainability is "a dynamic process in which communities anticipate and accommodate the needs of current and future generations in ways that reproduce and balance local social, economic, and ecological systems, and link local actions to global concerns" (p. 23). With this theoretical basis in mind, the project will briefly describe the implications of why such practice is demanded and then examine how sustainability is practiced in the real world.

Setting the Context- the Current Situation

Newman, Beatley, and Boyer (2009) discuss the implications of climate change and peak oil to cities in their book *Resilient Cities – Responding to Peak Oil and Climate Change*. The authors explain six reasons why cities should respond to climate change; that it's a "political necessity" and if cities fail to respond then the citizenry will suffer from inevitable increase in prices; to reduce "impacts on the environment" as oil use is responsible for one third of greenhouse gasses; to reduce "impacts on human health" because of clean air and unhealthy behaviors that follow automobile dependence; response will lead to "greater equity and economic gain" which can be enhanced by improving walkability and transit access; "less economically vulnerable" so business will continue when peak oil passes; and to "result in more peaceful, resilient cities" (p.7).

The world has seemed at times to be approaching peak oil, based on events like the 1973 oil crisis and with gas prices surpassing $4 per gallon in recent years. The introduction of hydraulic fracking, a water intensive means of extracting natural gas and oil, and other technological advances may seem to

extend the threats of peak oil. Newman et al. (2009) state, "estimates from government sources in the United Kingdom and the U.S. are saying that the oil peak will occur sometime between 2010 and 2020" (p.22). Given current technology and lax regulation on fracking this could be slightly prolonged, however the dire predictions of climate change remain the same. According to the Intergovernmental Panel on climate Change (IPCC):

> Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. The period from 1983 to 2012 was likely the warmest 30-year period of the last 1400 years in the Northern hemisphere [additionally]. . . The globally averaged combined land and ocean surface temperature data . . . show a warming of 0.85 ^{o}C over the period 1880 to 2012. (2014, p 2)

Not only is there clear evidence that Earth's climate is changing and at a rapid pace, but it is also clear that human activity is the main driver of the change. The IPCC goes on to explain the causes of this warming:

> Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century (p. 4).

For a city, region, state, or any other entity to respond to climate change and peak oil it is best to understand the situation. Newman et al. (2009) explain that the greatest contributors to global warming in the U.S. are "transportation (28%)", "industry (30%)", "commercial (17%)", "residential (17%)", and "agriculture (8%)" (p.18). The authors draw additional information from the IPCC explaining, "preventing atmospheric average temperature from increasing 2 to 2.5 degrees Celsius will require the

world to reduce greenhouse gas emissions by at least 50 percent by 2050" (p. 18). The authors also note that the transition can be smooth, "to reduce our fossil fuel 50 percent by 2050 requires just a 1.73 percent decline each year" (p. 33).

Though it still seems possible to respond to climate change it will not be easy. Newman et al. (2009) quote James Lovebock, the scientist that first noticed the ozone impacts of CFCs; "[Lovebock] believes that climate change is now irreversible and that by the end of the century human population will be reduced from 7 billion to 500 million. He believes by 2020 we will see the start of extreme weather, and then collapse will begin" (p.37). This would be a catastrophe for not only the three E's of Sustainability (Economy, Environment, and Equity), but also any other system on the planet. A global population of 500 million by 2100 should not be an option, if Lovebock's prediction has any accuracy as such that global population is reduced below 5 billion or so then major injustices would result. To save future generations from great suffering cities, countries, and the entire globe must embrace sustainability. The following section discusses professional literature for developing criteria in evaluating sustainability plans.

Solutions to Unsustainable Practice

To gain a critical perspective on sustainability the project will draw understandings from Benfield's (2014) *People Habitat: 25 Ways to Think about Greener, Healthier Cities*, M. Roseland (2012) "Toward Sustainable Communities: Solutions for Citizens and Their Governments"; and P. Newman, T. Beatley, and H. Boyer (2009) "Resilient Cities: Responding to Peak Oil and Climate Change"

Banfield's (2014) book provides a framework for developing sustainability criteria. Banfield (2014) makes an important consideration when understanding how cities function. He understands that cities are dependent on their region and true sustainability can really only be achieved regionally. Additionally Banfield notes that on a per capita basis cities are significantly more sustainable compared to that of their sprawling suburbs, which tend to be just outside of their jurisdiction. Therefore, cities

should promote compact redevelopment in the urban core and reduce the sprawling nature of suburban development to reduce infringement on vital resources.

Portland began taking this idea of regional sustainability seriously in 1978 when they established "the nation's only directly elected regional government" (Banfield, p. 8, 2014). Banfield discusses the many successes that resulted in planning and policies that enhance quality of life and the environment. Most distinguishable, Portlanders have created a more compact development pattern, witness much lower driving rates compared to the nation, and reduced emissions below 1990 levels as the population grew by 18 percent. Banfield (2014) notes two other successes from attempting to solve problems regionally; California's SB 375 was successful in placing requirements and giving authority to metropolitan governments to reduce greenhouse gas through land use and transportation decisions; and *Ontario's Places to Grow Initiative*, gave a regional government the authority to amend municipal decisions on local planning decisions. (para. 11)

Banfield's (2014) second chapter, *What Seems Green May Be Brown* reiterated his point of the previous chapter that cities need to address problems regionally. In the second essay Banfield explains that even if a project claims to be net zero it could still be unsustainable if it fails to consider proximity. In other words efficient buildings are not efficient if the residents must commute an hour for work and/or recreation.

The following chapter discusses why, when both elements, efficient buildings and compact city revitalization, are achieved the results are praiseworthy. In this chapter Banfield explains the importance of terms like "embodied energy" (p. 24) which is the energy already used to construct old buildings. When considering "embodied energy" it is more efficient to reuse buildings and structures rather than to simply demolish them.

From the first four chapters three main points can be drawn. Problems should be understood and responded to regionally, there is more to sustainability than technology improvements, energy use and carbon emissions are best solved regionally by land use and the availability of transportation.

Banfield's fifth chapter revolves around gentrification, which is the notion that when redevelopment occurs, higher income residents will enter the neighborhood stimulating further economic development and in turn raising property values and displacing current residents. Gentrification often strengthens the tax base and spurs economic activity. Banfield believes that cities should mitigate the negative effects of gentrification by ensuring that these neighborhoods "are also strong and hospitable enough to hold on to existing residents" (p. 43). Banfield ends this essay explaining how cities must do a better job of attracting families with children.

In chapter six Banfield explains how cities need nature. He cites the Trust for Public Land to explain how beneficial pocket parks can be in increasing tax revenue, paying for the park in 15 years. Additionally green infrastructure can significantly reduce public impacts and when combined with street trees can immensely softening the urban density (2014).

Banfield also believed that cities must pay attention to legacy and stated, "a city's chances for lasting success will be enhanced when it recognizes its historic assets; builds upon those assets by courting the kinds of businesses and residents that appreciate their unique character; and preserves those assets for the future, with appropriate law, policy, and practice" (2014, p 70). He provides supplemental data when building upon historic assets for the future. There is a "massive" shift in the housing market. Banfield (2014) notes according to the 2012 Census Bureau:

> People are marrying later, if at all . . . [the] number and portion of people living alone has increased. The portion of children living with two parents has dropped dramatically from 1960, from just under 90 percent of all children to around 70 percent in 2012 . . . [and] average household size has gone down. (p. 81)

With this data Banfield recommends cities "encourage the use of old buildings in new ways to foster intermingled homes, work places, and shops" and a new approach to education ". . . that stresses creativity, instead of orderly" (p. 87).

Smart growth is another important element of sustainability. Banfield (2014) claims that densities must be increased by "retrofitting low density suburbs" and "reinvesting in disinvested parts of central cities and older towns and burbs" (p. 102).

While communities begin to densify and reinvest in themselves they must keep design and quality in mind. Developmental design can be messy, but it must be similar to that of its context, or more specifically as Banfield (2014) claims the design "must be constructed at a pleasing scale, with the materials and building components that welcome people, to get along with its neighbors" (p. 119). This can aid in another component demanded by Banfield, "place making". By making a place livable the demand to live in sprawling neighborhoods that infringe upon natural resources is reduced. Additionally Banfield quotes an article published in 2011 in the *Urban Affairs Review*, "Understanding the Pursuit of Happiness in Ten Major Cities" which states,

> Cities that provide easy access to convenient public transportation and to cultural and leisure amenities promote happiness. Cities that are affordable and serve as good places to raise children also have happier residents. We suggest that such places foster the type of social connections that can improve happiness and ultimately enhance the attractiveness of living in the city (p. 137).

Banfield summarizes the importance of design and place making and what it means to human health when he stated, "If we don't get places right for people it won't matter what they can do for the environment" (p. 140).

Banfield wrote five chapters along the topics of multimodal transportation including: walkable and bikable neighborhoods and the importance of reducing automobile dependence. In comparison to other developing countries including Canada, Britain, Sweden, Germany, and Spain "Americans came in

dead last in transit use, walking, and bicycling" (p. 144). Banfield points out how this is mostly a result of few communities having things to walk to within a safe and easy distance. He suggests,

> The challenge in creating sustainable people habitat is to maximize convenience and livability for the community's residents, workers, and visitors while minimizing the burdens on the environment created by the basic need simply to get around (p. 158)

Banfield's point is reinforced when considering the changes in schools. He notes, "As recently as 1973, some 60 percent of school-age children walked or biked to school . . . today the portion is about 13 percent" (p. 163). He explains that this is because schools are no longer centrally located and pedestrian infrastructure no longer leads to schools.

An essay on food production is also introduced, and though Banfield sees the benefit of community gardens and other means of food production he does not believe it should compromise walkability. Along this discussion Banfield states,

> . . . we still need cities to be cities – walkable, compact places of urbanity – and we still need the countryside to be the countryside in order for both to reach their full potential for sustainability (p. 200) . . . what we need is a compact regional development footprint, with conserved farmland outside that footprint (p. 206).

In addition to keeping the value of cities, Banfield notes that urban life should be made for faith. Along this discussion he poses five points to keep in mind when keeping *the cities as the cities* which include, "many cultural differences among people requiring sensitivity"; "a heightened importance of work and career"; "an increased number of edgy people, who seek change"; "artists, who have their own way of experiencing life"; and "the importance of helping the poor" (p. 215).

Newman et al. (2009) discuss "resiliency", another term that is directly related to sustainability. The authors state that "the ability to experiment and innovate is the tissue of hope and the core of resilience" (p. 5). The authors determine a cities resiliency by assessing its "ability to respond to a natural

resource shortage and response to the recognition of the human impact on climate change" (p. 6). Resilient cities can "adapt to change, . . . [because they have built-in systems] such as a diversity of transportation and land-use systems and multiple sources of renewable power that will allow a city to survive shortages in fuel supplies" (p. 6).

Like Banfield (2014), Newman et al. (2009) see cities as the best response to climate change and state, "they provide the greatest opportunity to lessen emissions due to the high-density development, walkability, and availability of/or potential for mass transit" (p. 18). Newman et al. (2009) see four possible scenarios when responding to peak oil and climate change. The first scenario, which was previously discussed, is "Collapse" as the global population would have difficulty responding to the changing climate and the decreased resources. The second scenario is the "Ruralized City" which ruralizes the suburbs for agriculture, but is likely to turn exclusive. The third scenario discussed is the "Divided City" which pushes the poor outside of the newly efficient urban core. The fourth option is the "Resilient City" which the authors explain as,

> People will have access to jobs and services by transit or walking as well as the use of electric cars for short car journeys. Intercity movement will move toward fast electric rail and will be reduced considerably by the new generation high quality interactive video conferencing. Green building design and renewable fuels will be a part of all neighborhoods . . . Ecovillages will form around transit centers [and] rural regions surrounding will be connected by freight rail. (p. 51)

The resilient city is comprised of 7 elements: "Renewable Energy City", "Carbon Neutral City", "Distributed City", "Photosynthetic City", "Eco-Efficient City", "Place-Based City", and "Sustainable Transport City" (Newman et al, 2009, p. 55). The authors define each element as:

- *The Renewable Energy City*: Urban areas powered by renewable energy technologies from the region to the building level (p. 57).

- *Carbon Neutral City*: Every home, neighborhood, and business is carbon neutral (p. 63), which means the net carbon emitted is zero. Net carbon is calculated by the total emissions released during construction, operation, and maintenance of the building(s), however some emissions could be mitigated with the creation or rehabilitation of natural systems and green spaces that consume carbon.
- *Distributed City*: Cities will shift from large centralized power, water, and waste systems to small-scale and neighborhood-based systems (p. 69).
- *Photosynthetic City*: The potential to harness renewable energy and provide food and fiber locally will become part of urban green infrastructure (p. 74).
- *Eco-Efficient City*: Cities and regions will move from linear to circular or closed-loop systems, where substantial amounts of their energy and material needs are provided from waste streams (p. 79).
- *Place-Based City*: Cities and regions will understand renewable energy more generally as a way to build local economy, nurture a high quality of life, and create a strong commitment to place (p. 81).
- *Sustainable Transport City*: Cities, neighborhoods, and regions will be designed to use energy sparingly by offering walkable, transit-oriented options for all, supplemented by electric vehicles (p. 84).

As discussed earlier, transportation accounts for 28 percent of the U.S. greenhouse gas emissions (Newman et al., 2009, p.18). This is an aspect of the U.S. lifestyle that is in dire need of modification. In response, Newman *et al* (2009) provide seven elements for a more resilient transportation system:

- A transit system that is faster and more efficient than traffic in all major corridors, so that people are encouraged to use the system instead of a highly polluting personal vehicle.

- Viable centers along corridors dense enough to service a good transit system . . . Transit needs densities over [fourteen] people and jobs [per acre] of urban land and for walking/cycling . . . [forty per acre] (p. 95).
- Giving priority to pedestrians and bicyclists in centers (p. 98)
- Services and connectivity that can guarantee frequent day and night access (p. 100)
- Phasing out freeways and phasing in congestion taxes to fund sustainable transport (p. 102)
- Continual improvement of vehicle engines, especially a move to electric vehicles (p. 105)
- Strong regional and local governance and strong citizen support to enable visionary green transport (p. 108)

Newman *et al* (2009) conclude their book with ten steps toward creating a resilient city: "Set the vision, prepare an implementation strategy" (p. 112); "Learn on the job" or be innovative with evaluations and implementations (p. 115); "Target public buildings, parking, and road structures as green icons" (p. 117); "Build TOD [Transit Oriented Development], POD [Pedestrian Oriented Development], and GOD [Green Oriented Development] together" (p. 118); "Transition to resilient infrastructure step by step" (p. 122); "Use prices to drive change where possible" (p. 125); "Rethink rural regions with reduced oil dependence" (p. 128); "Regenerate households and neighborhoods" (p. 132); "Facilitate localism" from food, energy, materials, and even tourism (p. 138); "Use approvals to regulate for the post-oil transition (p.142)" such as reductions in oil, carbon dioxide, and/or water.

Aside from discussing much of the same elements of sustainability as Banfield (2014) and Newman et al (2009), Roseland (2012) expands slightly more on what he considers "Just Sustainability" in his book "Towards Sustainable Communities" (p. 239). Roseland states, "Changing weather patterns, declining agricultural output in developing nations and costs of mitigation and adaption wreak the greatest havoc for those with the least disposable income. Awareness is growing that climate change adaptation strategies must be *just* as well as *sustainable*". Roseland recommends asking and responding to a list of questions which include: "What is a fair per capita share of water? Who are the most vulnerable among us

during extreme weather events, why is this so, and what can we do to address that? How can our planning processes be made more democratic?" (p. 240).

Additionally Roseland (2012) attempts to provide a framework to guide local governments in pursuing sustainability initiatives. Along this topic, Roseland discusses the importance of public participation (p. 263) and consensus-based decision-making (p. 264) and how they can be enhanced with workshops like charrettes (p. 265). An important strategy that should be incorporated into sustainability plans is what Roseland (2012) calls "transition management" (p. 267). Transition management understands that the science, means of achieving goals, and even goals themselves may change over time. This is similar to how Roseland (2012) views sustainability, he states,

> Sustainability is not a destination but a process – one that will evolve in light of new scientific understandings about how ecological and human systems interact. Its conceptually fluid nature means that public participation in defining and planning for sustainability is not just desirable but critical. (p. 272)

Sustainability is not reducing the cost of doing business for global companies to relocate or expand in a community but rather investing in infrastructure and highly skilled labor to improve quality of life (Roseland, 2009, para. 305). Perhaps the best words of advice is Roseland's quote from Hancock's (2001) work "*People, Partnerships and Human Progress: Building Community Capital*" in which is stated,

> There are no quick-fix solutions to the creation of healthier cities and communities, instead a long-term commitment to multiple small steps must be taken. In essence, a healthy community and a healthy city is created one household at a time, one street at a time, one block at a time, one neighborhood at a time and one day at a time. Multiple small strategies provide multiple opportunities to learn and also provide a margin for failure, because failure will occur and is a

learning experience that needs to be accepted, not penalized. The challenge for cities is to learn how to create community capital as a fundamental strategy for creating a healthy city. (p. 308)

The need for sustainability probably began when the U.S. quit solving problems locally and tried to incorporate the profit maximizing effects of the assembly line to everything from manufacturing, to the design and construction of buildings and infrastructure, to the planning process. However, as Roseland and Hancock state, and many others that would surely agree, sustainability needs to be solved one small project at a time while always considering the global implications.

All sustainability plans should above all foster creativity and localism while attempting to create place. These three components will simultaneously create resilience, as local officials and leaders will have the capacity to be innovative and overcome adversity, strengthen the economy by focusing on local materials which will broaden the job base, and create a unique sense of place that will draw people into staying. Along with these overarching themes, sustainability plans should respond to each of the criteria listed in table 1. This criteria and the supplemental implications will be considered when reviewing sustainability plans throughout the US.

Table 1 Sustainability Criteria

Criteria for Evaluating Sustainability Plans

Criteria	How does plan respond to each question
Regional consideration	Does plan consider regional implications and is it intergovernmental in approach?
Community participation	How involved was the community in decision making?
Transition management	Is the plan expected to evolve overtime?

Provide for residents as well as future residents	Adequate affordability, providing all residents with equity and the appropriate economy and environment.
Vulnerable populations	Does the plan answer questions like: What is a fair per capita share of water? Who are the most vulnerable among us during extreme weather events? Why is this so, and what can we do to address that? How can our planning processes be made more democratic?
Land use and transportation	Stressed more than technology improvements, such as compact land use and multimodal transportation (pedestrians, bicycles, and automobiles).
Legacy	Reuse structures and learn from historic aspects of community, ensuring new construction lasts into the future.
Integrated Nature	Conservation of natural systems plus parks and green infrastructure
Urban Culture	Supports diversity, change seekers, and social services.
Resilience	The ability to innovate and overcome adverse effects with creative solutions.
Distributed Utilities	Shift from large centralized power, water, and waste systems to small-scale and neighborhood-based systems.
Renewable Energy	Urban areas powered by renewable energy technologies from the region to the building level.
Carbon Neutral	Every home, neighborhood, and business is moving towards carbon neutral. Where all carbon emitted is mitigated.
Eco-Efficient	Waste Reduction & Recycling. Move from linear to circular or closed-loop systems, where substantial amounts of their energy and material needs are provided from waste streams.
TOD, POD, & GOD	Is Transit Oriented Development, Pedestrian Oriented Development, and Green Oriented Development integrated?

Chapter 3
Sustainability Planning in Practice

The following chapter will analyze nine sustainability plans (ten counting Cincinnati's in the next chapter) to better understand how they match up against the fifteen criteria elements. Each of the plans will be scored zero to three on each criterion for how well they meet each sustainability element, for a maximum score of forty-five. A zero will be given when the plan fails to acknowledge a sustainability element, a one will be equivalent to poorly meeting the criteria, two for average, and three for meeting the aggressive action required. Objectives that outline clear action steps will receive higher ratings, and those that simply encourage, advocate, consider, or other similar non-acting verbs will receive fewer points. This same rating system will be used to measure Cincinnati's plan before making suggestions and recommendations in the final chapter.

First Portland's *Climate Action Plan* (2009) and Los Angeles' *pLAn* (2015) will be used as the model plans. This is because these two cities have been acknowledged as leaders in sustainability. Portland recently won the Sustainable Communities Award, an international award, which recognizes the city that, "shows the pathway to sustainable, resilient, and low carbon communities" (City Climate Leadership Awards, 2014). While Planetizen claims, "Los Angeles is already well positioned to achieve STAR certification due to previous environmental initiatives such as its precedent-setting feed-in tariff from the municipal utility, it's rapidly growing public transportation system, and its new initiatives to reduce water consumption" (Wells, 2015). Then seven city plans located near Cincinnati with similar urban problems including: *Pittsburgh Climate Action Plan Version 2.0* (2012), *The Baltimore Sustainability Plan* (2009), Sustainable *Cleveland Municipal Action Plan* (2013), *Chicago Climate Action Plan* (2008), *ReFresh Milwaukee* (2013), *Sustain Louisville* (2013), and *City of St. Louis Sustainability Plan* (2013). The chapter will end with a brief discussion and table of total scores and what this information means for Cincinnati.

Case Studies and Assessments

Table 2 City of Portland and Multnomah County Climate Action Plan (2009)

Criteria	Assessment	Score (0-3)
Regional consideration	The plan was developed in collaboration with Metro, Portland's regional government and Tri-Met, the provider of public transportation for the region. The two have "guided investment in light-rail, mixed-use development and an integrated multimodal transportation system."	3
Community participation	Eight public meetings were held in which it was estimated over 400 people attended. Additionally over 2,600 comments and suggestions were gathered with the meetings and online forums.	2
Transition management	The plan was expanded on from prior work in 1993 and 2001, an already evolving document. Additionally the plan calls for yearly progress, updated actions every 3 years and re-examining of objectives every 10 years.	3
Provide for residents, today and tomorrow	Portland is already thinking about tomorrow's residents, expecting higher populations as a result of "climate refugees". To support this population the region is focusing on increasing green industry jobs and requiring companies to hire a high proportion of local workers.	1
Vulnerable populations	The plan does not thoroughly address vulnerable populations. However, the plan does require energy performance ratings for all homes to help residents choose appropriate housing.	1
Land use and transportation	The plan addresses transportation and infrastructure well, but slightly less on land use. It states "90% of Portland residents . . . Can easily walk or bike to meet all basic daily, non-work needs and have safe pedestrian or bicycle access to transit." Additionally the plan calls for 20-minute complete neighborhood concepts, and a reduction of VMT by 30%.	2.5
Legacy	A large component of the plan focuses on retrofitting buildings and homes for energy efficiency, but fails to consider the historic and cultural aspects needed for legacy.	1.5
Integrated Nature	Aggressive action is considered to, "Expand the urban forest canopy to cover one-third of Portland, and at least 50% of total stream and river length.	2

Urban Culture	Though quality of life initiatives may be incorporated in other plans, no attention is given in Portland's climate action plan. Without urban culture populations will leave cities, ultimately losing the fight to climate change.	0
Resilience	The action plan shows resiliency by increasing local food, reducing energy use of buildings built before 2010 by 25% through energy efficiency, ensuring that new buildings can adapt to the changing climate, and developing a community wide public engagement campaign.	2
Distributed Utilities	The plan calls for 10% of total energy used to be produced on site, and 15% of energy used for city operations.	3
Renewable Energy	The city will purchase or generate 100% of electricity for city operations from renewables, and produce 10% of total energy used within the county from on-site renewables.	2.5
Carbon Neutral	The plan calls for an 80% reduction in greenhouse gas emissions by 2050. This is achieved by aggressive actions such as "achieve zero net greenhouse gas emissions in all new buildings and homes" and incentivizing those who consider life-cycle emissions in their constructions.	2.5
Eco-Efficient	The plan calls for the popular "reduce, reuse, and recycle." Goals include reduce solid waste by 25% and recover 90% of all waste generated.	2
TOD, POD, & GOD	The plan strategizes for walkable and bikable neighborhoods with access to transit, with established renewable energy goals. It fails to integrate these all in one, in the development of neighborhoods.	2
Score	Portland's plan is articulated well. The goals and objectives are followed by reasonable, specific actions needed to achieve success. The reason Portland is considered a national leader in sustainability is their regional authority and great plan making,	**30**

Table 3 City of Los Angeles, California - pLAn (2015)

Criteria	**Results**	**Score (0-3)**
Regional consideration	Little regional consideration was given in the plan. The plan stated desires to advocate and be a leader for other cities, but does not attempt to solve regional problems.	0.5

Community participation	Little information was given about how the plan involved the community but does state that it consulted "hundreds of individuals and organizations."	1
Transition management	This is the first plan of this type for LA, but calls for annual reports on progress, lessons learned, and innovation while having major updates every 4 years.	3
Provide for residents, today and tomorrow	The plan attempts to meet housing and provide jobs for residents. This is accomplished by increasing cumulative new housing construction to 275,000 by 2035, adding 150,000 green jobs by 2025, and developing a comprehensive green/clean business development plan.	2
Vulnerable populations	Improved air quality and reduced toxicity in most affected neighborhoods, preserving existing affordable housing, providing fresh food within 1/2 mile of all low income residents, increasing the minimum wage to $13.25/hour, expanding affordable housing solar programs to low-income customers, and achieving zero days of unhealthy levels of air by 2025.	3
Land use and transportation	Ensures 65% of new housing units built by 2035 are within 1,500 ft. of transit; improve pedestrian and bicycle infrastructure and other sustainable transportation emphasizing proximity to mass transit; and increase percentage of all trips made by walking, biking, or transit to at least 50% by 2050.	1.5
Legacy	Aside from retrofitting buildings for energy efficiency, no efforts are outlined in the plan to ensure historical assets are carried into the future.	0.5
Integrated Nature	By 2035, 65% of residents will live within 1/2 mile of a park or open space. Cleanup of the San Fernando groundwater basin. Restore at least 11 miles of the LA River.	1.5
Urban Culture	Increase the vibrancy of streets. Increase the city's average walk score to 75 by 2025.	1.5
Resilience	Ensure that the city has extra water storage; provide city wide WIFI; retrofit older buildings for natural disasters, including seismic safety ratings; and increasing street trees and cool roofs to reduce the urban heat island effect.	2.5
Distributed Utilities	Calls for an increase in local renewable energy generation, but does not specify distribution. Sources 50% of water locally by 2035, and captures 150,000 acre-feet per year of stormwater.	1

Renewable Energy	Increase cumulative total megawatts (MW) of solar photovoltaic (PV) power to 900-950 by 2025 and 1,500-1,800 by 2035, while increasing capacity storage to at least 1,654-1,750 MW.	2
Carbon Neutral	Reduce per square foot energy use by 30% for all buildings by 2035, reduce overall greenhouse gas emission by 80% by 2050, and retire all coal power plants.	2
Eco-Efficient	Increase landfill diversion rate to at least 90% by 2025 and 95% by 2035. Develop an anaerobic digester. Increase construction and demolition waste recovery requirements beyond the current 65%. Retrofit city asphalt plant to produce at least 50% recycled concrete asphalt.	2
TOD, POD, & GOD	Focuses on building housing next to transit, improving bicycle and pedestrian infrastructure, and promotes renewable energy; but does not integrate the concepts	1
Score	The plan had many innovative ideas that are appropriate for the area, such as water conservation and responding to seismic activity, but could have used slightly more detail in renewable energy and building reuse.	**25**

Table 4 City of Chicago, Illinois - Climate Action Plan (2008)

Criteria	**Results**	**Score (0-3)**
Regional consideration	Plan states that they considered "impacts on surrounding counties", but provide no evidence to support this claim. However, one initiative is to support intercity passenger rail.	0.5
Community participation	The plan claims that several hundred businesses, civic and environmental leaders were consulted in preparing the plan. However no more details were provided to explain extent.	0.5
Transition management	Acknowledges that plan is a working document, but provides no framework for revisiting goals, objectives, or actions.	0
Provide for residents, today and tomorrow	Aside from mentioning how to reduce costs through efficiency improvements for homes little was discussed on how to improve residents' lives.	0.5
Vulnerable populations	Focus a heat response plan on vulnerable populations.	1
Land use and transportation	Double walking and bicycling trips to one million per year by 2020; and increase transit ridership by 30%, including incentivizing transit use.	1

Legacy	Does not discuss how to preserve historic and cultural assets.	0
Integrated Nature	Increase the number of rooftop gardens from 400 to 6,000 by 2020; new large development must capture first half inch of rain on site; and plant one million trees in parks, parkways, and private yards by 2020.	1.5
Urban Culture	Promote walkability and bikeability.	0.5
Resilience	Improve efficiency of 50% of residential buildings, and retrofit 50% of the commercial and industrial building stock.	1.5
Distributed Utilities	Promote household renewable power, and increase efficient power generated onsite using distributed generation and combined heat and power.	0.5
Renewable Energy	Procure enough renewable energy to reduce electricity emissions 20%; double current household scale renewable electricity generation.	1
Carbon Neutral	Reduce greenhouse gas emissions by 30% through efficient buildings by 2020, and update energy code.	1.5
Eco-Efficient	"Explore" phase out of HFC's by 2020. Reduce, reuse, and recycle 90% of city's waste by 2020.	1
TOD, POD, & GOD	Recommends TOD, and explains the savings.	0.5
Score	Much of Chicago's plan touches on the criteria but provides no course of action for how the city plans to achieve goals and objectives. It often simply states if the city achieved X objectives it would save Y amount of greenhouse gas emission.	**11.5**

Table 5 City of Baltimore, Maryland - The Baltimore Sustainability Plan (2009)

Criteria	**Results**	**Score (0-3)**
Regional consideration	Does not consider the importance of the region and its implications for sustainability.	0
Community participation	Engaged over 1,000 citizens and held over 18 public meetings.	2
Transition management	Office of Sustainability will monitor progress and produce annual reports to "check in, renew commitment, and celebrate success."	2

Provide for residents, today and tomorrow	The plan recommends adopting a policy and/or plan to eliminate pesticide and other toxic chemicals; ensure coordination among weatherization, land remediation, and healthy homes activities; and ensure that local government is purchasing from local businesses if the business produces the product for less than 5% more of market value.	2
Vulnerable populations	Improve the health of indoor air; increase percentage of land under cultivation; expand safe routes to school program; and track the disparity of transportation costs by neighborhood relative to income	1.5
Land use and transportation	"Explore" a more efficient fleet for city vehicles; improve and expand public transit; and implement bicycle master plan.	1
Legacy	Return abandoned properties to productive use; promote the redevelopment of brownfield sites with incentives; "should" consider a resource preservation plan to reuse buildings and their material; and protect ecology and biodiversity.	1.5
Integrated Nature	Ensure that local water bodies are fishable and swimmable; provide public recreation space within 1/4 mile of all residents; restore stream corridors; create and support a land trust to support community managed open space; and reduce impervious surface to 50% on all redevelopments.	2.5
Urban Culture	Educate about litter and improve enforcement of current sanitation code, and strengthen enforcement of dumping and litter laws.	0.5
Resilience	Create watershed-based natural resource management plan; require aggressive energy efficiency standards in all new structures greater than 10,000 square ft.; mandate efficiency upgrades to homes at point of sale; double tree canopy by 2037; support innovative and piolet projects about technology; and improve all school buildings to LEED certification.	1.5
Distributed Utilities	The plan discusses some renewable energy goals that by nature distribute utilities, but little attention is given to the importance of this element.	0.5
Renewable Energy	"Strive" to produce 50 MW of renewable energy by 2020; "plans" to generate 7 MW by methane-capture at city's 2 wastewater treatment facilities.	1.5
Carbon Neutral	Reduce greenhouse gas emissions by 15% by 2015, and create a climate action plan.	1.5

Eco-Efficient	Maximize reuse and recycling of materials; minimize the production of waste; link industrial and commercial users to close waste loops; expand composting program; increase recycling opportunities; and implement sustainable landscape maintenance practice.	2
TOD, POD, & GOD	Failed to consider the relationship between land use, density, transportation, and green design.	0
Score	Baltimore's plan was unique in that it placed emphasis on cleaning up litter and attempting best practices for maintenance (such as vegetation), but failed to provide detailed action steps on sustainable transportation systems and energy generation.	**20**

Table 6 City of Pittsburgh, Pennsylvania - Pittsburgh Climate Action Plan Version 2.0 (2012)

Criteria	**Results**	**Score (0-3)**
Regional consideration	Plan states intentions to "continue to work with Allegheny County and the Greater Pittsburgh region. The plan states that there is significant overlap between Allegheny County government and city wide climate action and sustainability plans. However, they are still separate.	1.5
Community participation	The plan does not discuss if the community was involved in plan development but does provide an initiative to "establish interactive public feedback system regarding sustainability initiatives."	1
Transition management	This is the second version of the original climate action plan, demonstrating progress made with new recommendations. It does not provide a framework for future transitions.	1.5
Provide for residents, today and tomorrow	Incentivize clean energy businesses with tax abatements, reduced fees, and expedited permitting; develop and implement a sustainable food policy/ program; and increase urban farming.	1
Vulnerable populations	Establish a lean fund for residential and small business energy efficiency upgrades who are below a certain income. Create an air quality action plan.	1.5
Land use and transportation	Provide on street bicycle parking spots; support smart growth.	1
Legacy	The action plan failed to recognize the importance legacy has on sustainability.	0

Integrated Nature	Provide green roof incentives for commercial buildings. The plan did little else to capture the benefits associated with integrating nature throughout the community.	0.5
Urban Culture	The action plan fails to improve or support a vibrant urban culture.	0
Resilience	Developed a lot of great partners including City of Pittsburgh Sustainability Committee, Business Climate Coalition, Black and Gold City Goes green Campaign, Higher Education climate Consortium, and Allegheny County. Plan also calls for energy planning to be adopted by city's comprehensive plan, and for passive solar design to be incorporated with zoning.	2
Distributed Utilities	The plan calls for an increase in renewable energy development, but fails to fully provide a framework for a decentralized energy system.	0.5
Renewable Energy	Install 10 MW by 2020; Utilize solar on all municipal buildings that have access by 2020; and "encourage" purchasing of renewable energy credits.	2
Carbon Neutral	Though the city does appear to be on a path to reducing their carbon footprint, they are not aggressive enough to meet world needs.	0.5
Eco-Efficient	Develop an end-of-life plan for all city equipment; establish a tree reuse program; establish a city operated compost facility; advocate for pay as you throw policies; and lobby for a bottle bill.	2
TOD, POD, & GOD	Failed to consider the relationship between land use, density, transportation, and green design.	0
Score	The plan develops many programs and focuses a lot on assigning coordinators to new departments. The document follows with data about what they could do or should promote or enforce, but does not provide meaningful actions. Did successfully organize and create departments along with providing cross industry collaboration.	**15**

Table 7 City of Cleveland, Ohio - Sustainable Cleveland Municipal Action Plan (2013)

Criteria	**Results**	**Score (0-3)**
Regional consideration	The plan does not consider regional impacts, and focuses almost exclusively on improving city owned facilities only.	0

Community participation	The plan does not discuss if the community was involved in plan development.	0
Transition management	The plan states that SC-MAP (Sustainable Cleveland Municipal Action Plan) is the first iteration of what will be a living document, subject to continuous "plan-do-check-act" review and revision process. Nothing else is said about when revisions will be made.	0.5
Provide for residents, today and tomorrow	As mentioned, the plan focuses on making government more efficient and provides little for human capital. However, streetlight upgrades could provide some benefit.	0.5
Vulnerable populations	Nothing in the plan discusses how Cleveland will provide for vulnerable populations.	0
Land use and transportation	Reduce employee commuting VMT through telecommunication; replace city vehicles with more efficient fleet; enforce anti-idling policy; add a sustainability review for all capital improvement projects.	1
Legacy	The sustainability plan failed to recognize the importance of legacy.	0
Integrated Nature	No means of providing nature to the community was addressed.	0
Urban Culture	The action plan fails to improve or support a vibrant urban culture.	0
Resilience	The city mainly focused on improving efficiency and energy conservation. Green building standards for new construction and major renovations of all city facilities; on-site storm water management when feasible; improve water efficiency through upgrades in city facilities.	1
Distributed Utilities	The plan calls for an increase in renewable energy development at some city facilities, but fails to fully provide a framework for a decentralized energy system.	0.5
Renewable Energy	Install a variety of renewable energy systems at city facilities and on city lands.	0.5
Carbon Neutral	Though the city does appear to be on a path to reducing government's carbon footprint, they are not aggressive in their community to meet world needs.	0.5
Eco-Efficient	Reduce waste 20% by 2030; divert 90% of waste by 2030; increase recycling in city buildings; compost program for city buildings; and focus on sustainable purchasing.	1

TOD, POD, & GOD	Failed to consider the relationship between land use, density, transportation, and green design.	0
Score	The plan was specific to Cleveland's Municipal government and provided few actions that would make an impact on the city's sustainability. The document discusses an additional document about community sustainability, but why create two documents when they accomplish the same tasks.	**5.5**

Table 8 City of St. Louis, Missouri - City of St. Louis Sustainable Plan (2013)

Criteria	**Results**	**Score (0-3)**
Regional consideration	Supports regional cooperation on abating climate change. However, regionalism did not show up in the plan.	1
Community participation	Two mayor's summits were held and 1,169 responded to non-randomized survey about perception of sustainability.	1
Transition management	Next steps were not discussed aside from actions in accomplishing current initiatives.	0
Provide for residents, today and tomorrow	Support designated districts that focus on job creation; build a vibrant, community-based urban agriculture industry; assure the employability of the entire labor force; provide waivers of permit and tax abatements for renovation of city-owned vacant properties for studios; and support and strengthen programs to retain the city's diverse population.	2.5
Vulnerable populations	Ensure equal access to amenities, business opportunities, transportation, and safe and healthy neighborhoods; identify sectors which are at risk of not receiving health care and create strategies to provide care; expand safe routes to school; increase affordability and equitable access to a diversity of arts and culture; reduce homelessness, and support low income families and the unemployed; increase access to affordable housing in neighborhoods with transit access; and promote neighborhood stabilization efforts by forfeiting taxes.	2.5
Land use and transportation	Develop incentives for TOD; ensure arts and culture districts are multi-use, walkable, and well served by transit; provide pedestrian conveniences at transit stops; connect cycling infrastructure with transit; and complete city and neighborhood mobility plans.	2

Legacy	Preserve the city's historically and architecturally significant districts, buildings, landmarks, and landscapes through tax credits and incentives; reuse existing buildings for inexpensive incubation of entrepreneurial ideas.	2.5
Integrated Nature	Encourage the installation of green infrastructure; ensure all residents have access to parks, recreation facilities, and open space; provide greenway and trail system within 1/2 mile from every resident; expand urban tree canopy; and ensure building and site development integrates with natural site ecology.	2
Urban Culture	Prioritize infill development to develop thriving compact communities and vibrant mixed-use main streets; complete streets ordinance; expand access to public facilities in off hours; create form based code; encourage public art and design that builds vibrancy and identity.	2
Resilience	Promote and develop arts, cultural and innovation facilities, resources and events; develop smart learning hubs as centers of research and innovation; develop regulations and economic incentives that attract innovative industries; expand accessibility of public meetings; and develop energy efficiency and conservation programs.	1.5
Distributed Utilities	Utilize utility scale options to reduce overall community energy consumption, and develop pilot projects to explore net zero stormwater discharge.	0.5
Renewable Energy	Provide tax incentives to businesses that utilize 50% of their energy need from clean energy sources. Implement a 20% renewables by 2021 energy standard.	1.5
Carbon Neutral	Some of the other initiatives will benefit the city's carbon footprint, however, the only exclusive initiative towards carbon neutral is engaging in climate action planning.	1
Eco-Efficient	Encourage the re-use of historic building materials; divert wastewater treatment sludge from landfills; offer recycling throughout the city; support materials and equipment repurposing programs; pilot composting initiatives in homes and businesses; and tax product manufactures for amount of waste packaging their product generates.	1.5
TOD, POD, & GOD	Failed to consider the relationship between land use, density, transportation, and green design.	0

Score	Focuses highly on people and program development to better utilize human capital. Falls short in responding to global issues, providing little information on reducing greenhouse gas emissions and increasing renewable energy. Suggests broad but reasonable starting points, but not enough actions yet.	**21.5**

Table 9 City of Milwaukee, Wisconsin - ReFresh Milwaukee (2013)

Criteria	**Results**	**Score (0-3)**
Regional consideration	An initiative advocates for sustainable energy future for the entire state, but the plan does not attempt to solve urban problems on a regional scale.	1
Community participation	Held five formal town hall meetings; surveyed 1,011 residents; partnered with area businesses and several trade groups resulting in roughly 85 participating businesses.	2
Transition management	Realign policies and codes of comprehensive plan to match ReFresh Milwaukee goals and targets; Office of Environmental Sustainability produces annual evaluations and is responsible for implementation.	2
Provide for residents, today and tomorrow	Active support of entrepreneurship by city departments; fund residential rehabilitation deconstruction, and demolition with financing options; grow cluster of energy efficient and clean technology companies to create local jobs and exports; create action agenda to ReFresh Milwaukee's food system; and promote inclusion and diversity for a sustainable economy.	3
Vulnerable populations	Partner to save homes from foreclosure; business open house to mentor youth; and increase access to and demand for healthy food in a low-income neighborhood.	1.5
Land use and transportation	New, expanded, and improved access to public transit services; approve streetcar plan and begin implementation by 2016; improve pedestrian and bicycle infrastructure as critical, healthy components of transportation system.	2
Legacy	Sell 200 city tax-foreclosed homes per year; rehabilitate roughly 75 housing units with energy efficiency focuses per year; adaptively reuse 10 buildings by 2016; and redevelop 30 acres of brownfield areas by 2016.	2.5

Integrated Nature	Double tree canopy coverage to 40% of city by 2023; annually increase restoration and/or preserved natural areas by 10%; provide all residents a park or greenspace within a 10 minute walk; increase stormwater runoff capture 10% per year with green infrastructure; restore all waters in the city's watershed to be swimmable and fishable; and revitalize ecology of inner-harbor.	3
Urban Culture	Convert 1,000 vacant lots to benefit neighborhoods by 2016, and recognize and improve the recreational and aesthetic potential of water resources.	1.5
Resilience	Hold all new industrial buildings to "Menomonee valley Sustainable Design Guidelines"; energy code for commercial uses by 2016; incentives for new housing by 2016; require energy disclosure mandates on commercial buildings; evaluate and update zoning and city codes; and reduce energy use by 20% by 2020.	1.5
Distributed Utilities	Remove regulatory and institutional barriers to distribute renewable energy projects, and advocate to utility companies for a smart electric grid and power plant improvements.	1.5
Renewable Energy	Create innovative financing options for energy efficiency and clean energy, and produce 25% renewable energy by 2025.	2
Carbon Neutral	The plan does not directly focus on carbon footprint reduction, but because of attention to sustainability and other actions and initiatives, Milwaukee should be moving towards a carbon neutral future.	1.5
Eco-Efficient	Pay-fee per garbage cart over 1, while recycling carts are free; establish construction and demolition recovery requirements; and achieve 40% waste diversion goal by 2040.	2
TOD, POD, & GOD	The plan does not integrate these elements.	0
Score	This plan is detail oriented, clearly laying out the actions the city plans on taking. Unrelated, but worth noting, the plan was innovative in organization, successfully grouping objectives to achieve multiple tasks with one set of actions.	**27**

Table 10 City of Louisville, Kentucky - Sustain Louisville (2013)

Criteria	**Results**	**Score (0-3)**
Regional consideration	Plan does not consider regional impacts.	0

Community participation	Plan does not discuss how the community was involved, only private stakeholders and businesses.	0.5
Transition management	Updated annually showing progress towards goals and initiatives, but does not discuss updating actions to achieve goals or objectives.	1
Provide for residents, today and tomorrow	Plan to form Green Workforce Advisory Team; evaluate incentive program for businesses that reuse, reduce or make sustainable products; and expand local food system by 20%.	1
Vulnerable populations	Achieve and Exceed national Ambient Air Quality Standards, and establish an urban tree canopy and implement strategies to mitigate the urban heat island effect.	1
Land use and transportation	Traffic light coordination project; green city vehicle fleet with diesel particulate filters; identify sustainability goals for the strategic multimodal transportation plan and metro transportation plan that promote TOD; expand frequent service routes to increase ridership 25% by 2018; and consider implementing a bike share program.	0.5
Legacy	The plan fails to consider the importance of legacy.	0
Integrated Nature	Implement the city parks master plan; increase amount of land managed for habitat, outdoor recreation, and environmental education by 25% by 2018; and acquire 4,000 acres of park land and conservation easements by 2018.	1.5
Urban Culture	The plan does not consider how to improve urban culture.	0
Resilience	Decrease city-wide energy use 25% by 2025; decrease city owned buildings energy use 30% by 2018; launch an incentive program for green infrastructure; launch a community engagement process to develop a signature sustainability project; and offer sustainability based community education programs and workshops.	1.5
Distributed Utilities	The plan does not consider the benefits of decentralized utilities.	0
Renewable Energy	Investigate opportunities and develop a program to increase use of renewable energy technology 50% by 2025.	0.5
Carbon Neutral	Develop a green building incentive program.	0.5

Eco-Efficient	Weekly recycling services in the CBD; solar powered recycling and garbage compactors; 90% participation in recycling and 50% landfill diversion by 2025; and launch pilot programs.	1
TOD, POD, & GOD	The plan does not integrate these elements.	0
Score	This plan falls short in many areas and does not seem to have a sense of direction. The plan states some goals and provides actions that seem to come up short.	**9**

Table 11Sustainability Plans' Score

Sustainability Plan	**Total Score**
City of Portland and Multnomah County Climate Action Plan (2009)	30
City of Los Angeles, California - pLAn (2015)	25
City of Chicago, Illinois - Climate Action Plan (2008)	11.5
City of Baltimore, Maryland - The Baltimore Sustainability Plan (2009)	20
City of Pittsburgh, Pennsylvania - Pittsburgh Climate Action Plan Version 2.0 (2012)	15
City of Cleveland, Ohio - Sustainable Cleveland Municipal Action Plan (2013)	5.5
City of St. Louis, Missouri - City of St. Louis Sustainable Plan (2013)	21.5
City of Milwaukee, Wisconsin - ReFresh Milwaukee (2013)	27
City of Louisville, Kentucky - Sustain Louisville (2013)	9

These plans provide a framework in understanding how sustainability is being practiced/pursued throughout the country, and more specifically in the Midwest. Over half the plans noted that it was the first attempt at such a plan. Growing pains should be expected because of this, but this is a crucial first step that many cities are taking. This list will be crucial in understanding how Cincinnati measures against similar cities making similar first steps. The following chapter will analyze Cincinnati's plan, followed by recommendations and suggestions from sustainability theory and practice, especially looking for ways to build from Milwaukee's success in energy and nature and Baltimore's and St. Louis's success in developing human capital.

Chapter 4
Green Cincinnati Plan

In 2005, Cincinnati was ranked as the third-highest carbon footprint per capita at 3.28 among the 100 largest metropolitan areas, behind only Indianapolis, IN and Lexington, KY (Brookings Institution, 2008). Cincinnati's region is defined as nonattainment by the EPA's NAAQA (National Ambient Air Quality Standard) for both the ozone and fine particulate (PM2.5). According to the Ohio-Kentucky-Indiana Regional Council of Government's (OKI) 2040 Regional Transportation Plan, the region was reclassified in 2011 as a NAAQS standard maintenance area because it attained the ozone and fine particulates standards. Unfortunately this was short lived. By the end of 2012, because of more stringent ozone NAAQS standards, the region was no longer in attainment, as the 2040 plan predicted. In January of 2015 the EPA displayed every county in the OKI region as a nonattainment area for 1 NAAQS Pollutant with the exception of Clermont County having 2 NAAQS Pollutants (EPA, 2015).

Aside from air quality, the Cincinnati Metropolitan Region recognizes congestion as a growing issue, as discussed in OKI's 2040 plan. The 2040 report used data from the Texas Transportation Institute (TTI) with statistics through 2010 for the Cincinnati Urban Area. This report found that the area is the 45th most congested urban area in the U.S. with forty-seven percent of peak travel occurring under congested conditions. On average, peak period travelers were delayed 21 hours a year, congestion wasted six gallons of fuel per person per year, and the annual cost in delays and fuel equate to $486 million (OKI Regional Council of Governments, 2012). Additionally public transit improvements are closely tied to equality, providing a means of transportation for those who do not have access to a personal vehicle. Between the region's carbon footprint, congestion, and poor air quality the need for the *Green Cincinnati Plan* is paramount.

The *Green Cincinnati Plan* was coordinated by the partnership of the Cincinnati Office of Environmental Quality and Green Umbrella, a not for profit organization known as the regional

sustainability alliance for Greater Cincinnati. The plan's goal states to "meet the environmental, social, and economic needs of today while preserving the ability of future generations to do the same" (2013, p. 9).

The plan's intention is to improve Cincinnati's health, economy, and environment. The plan notes that, "Greater Cincinnati's overweight/obesity rate is 64%. . . A sustainable lifestyle includes eating more local fresh vegetables, using human power instead of fossil fuel power to get from place to place, and getting active in our outdoor environment – all three can help reduce obesity" (2013, p. 6). In regards to health, the plan also notes how burning fossil fuels for energy and transportation have increased air pollution, leading to a significant increase in childhood asthma. The plan notes that going green can improve the economy by creating jobs through recycling waste which would otherwise be buried, saving money with efficiency, and attracting the "creative class". Lastly sustainability maintains natural resources, which the plan claims have brought people to Cincinnati for generations.

Nine broad goals provide the plan's framework including: energy efficiency, renewable energy, transportation, reducing waste, land management, land use, food, water, and climate adaptation. Unfortunately no goals were focused around social equity, but were addressed within other groups. Let's now assess the Green Cincinnati Plan in light of the factors on sustainability discussed in the previous chapter.

Regional Consideration

No real regional consideration was given, although the importance of regionalism seemed to be understood. Many actions involved collaboration with regional governments, but unfortunately because Ohio does not have the same authority as Portland's regional government sustainability will be a difficult task. Cincinnati should advocate for regional governments like Ohio-Kentucky-Indiana Regional Governments (OKI) and Hamilton County to support and implement region wide sustainability.

Community Participation

The plan states that more than 200 members of Green Umbrella Action Teams and other interested individuals participated in the new plan. Each action team was led by city staff. The action teams met four times, first to brainstorm, then evaluate and prioritize, then refine, and lastly to review and finalize the plan. Additionally, the plan was reviewed by a steering committee to make final suggestions, made up of public, private and civic sectors, and sustainability experts.

The plan appears to be a great collaboration of leaders throughout the city. However, to truly be sustainable the city should attempt to involve all residents. Sustainability will require everyone to innovate, be dedicated, and accept the challenges facing the planet. This includes hearing the voices from middle class residents and the poor who will require the greatest degree of adaptability and are also the most vulnerable populations. Cincinnati should at a minimum hold public meetings, providing everyone the opportunity to voice opinions. Ideally the city should seek maximum participation, including active online forums.

Transition Management

The *Green Cincinnati Plan* fails to outline a clear path for transition. To ensure implementation and progress Cincinnati should follow a timeline similar to Portland's plan reporting yearly progress, updated actions every 3 years and re-examining of objectives every 10 years. This in itself would hold the city more accountable. Although Cincinnati does not clearly lay its plan's framework, the plan is an updated version of the original action plan adopted in 2008. Additionally the *New Green Cincinnati Plan Detailed Descriptions* (2013), notes that in the five years since adoption of the original plan, more than half of the 82 recommendations have been implemented. This is encouraging news, it proves that Cincinnati is updating its plan and is implementing to some degree.

Provide for People: Today and Tomorrow

Providing for people today and tomorrow is the essential goal of sustainability. To provide for people can be simplified to improving quality of life. This includes access to a reasonable job translating to quality, safe housing and a healthy source of food and water. Additionally people need open space and natural areas to relax, have recreation, and simply to enjoy themselves. Most importantly, providing these elements should not hinder future generations the same opportunity.

Cincinnati's sustainability plan addresses this to some degree. The city plans to expedite the permitting process for green developments and provide tax abatements for LEED certification. These actions show commitment to providing quality housing and reducing greenhouse gas emissions for future prosperity.

The plan also looks to identify ideal land for urban agriculture and continue land banking, updating codes and regulations, and provide programs to support such practices. Programs include training to certify residents and promote best practices for urban farming. Incentives will also be provided for midsize food processors and distributors. In the future the city wishes to assess local food production, to measure how well the city can provide food for residents. This expresses how the city is attempting to provide healthy food for all residents. Increasing urban agriculture also focuses on local production which is crucial for reducing greenhouse gas emissions and pollution associated with transporting food across the country and stopping the degradation of diverse ecosystems.

The city has a lofty but needed goal of improving the city's watershed and finishing local action plans that aim to do just that. Water will become more of an issue as climate change progresses. Fortunately the IPCC does not expect there to be water shortages in the area, but quality of water will be that much more important as the demand for water increases globally as international supplies decrease.

Closed loop systems are important for future generations to ensure that society does not waste valuable resources. The city will incentivize local packaging guidelines to reduce the amount of wasted

materials used for packaging. The sustainability plan also wishes to identify and develop markets for residential recyclables, and will accomplish this by providing incentives to businesses that reuse recyclables.

Incentives are typically not the best approach for developing markets, but at least the city's objective is in the right place. Overall the city does a fair job of meeting people's needs, but should place more focus on developing an equitable economy that provides employment opportunities for all.

Vulnerable populations

The plan identifies two actions that provide for vulnerable populations. Increase access to local foods in all neighborhoods, and link natural areas to the urban population with trails and transit routes. These actions are not nearly enough, the plan should consider initiatives developed in St. Louis, or simply identify who is most vulnerable to climate change. Specifically to Cincinnati, who will be affected by increased flooding and how stable are their homes. The city should also answer what areas are vulnerable during heat waves, how could the heat be mitigated, and how could vulnerable homes be improved. Ideally programs should be investigated to improve employment and economic activity in underserved areas.

Land Use & Transportation

The sustainability plan understands the need to develop and implement a regional transit plan. This is a long political process which was previously completed but not implemented (OKI, 2002). While not losing sight of the broader picture of regional transit, the plan wishes to implement short term transit plans. These include: preserve right-of-ways for transit improvements, continue implementation of city's bike plan, develop a commuter bike plan, improve pedestrian connectivity, adopt complete streets, partner with safe routes to school to identify missing links, optimize traffic signals, expand incentives for electric cars (free parking and installing charging stations), improve fuel efficiency of city vehicles, and interconnect modes of transportation. The city also prioritizes enhancing intercity transit, through

marketing initiatives and revising recommendations to be ready when intercity opportunities are presented.

This is a great list of initiatives to pursue, however the city needs to recognize the important relationship between transportation and land use. One initiative began to show this; implement form-based zoning codes in specified mixed-use districts. The city should attempt to align this initiative and other density considerations with transit.

Legacy

A city's history is important for its future, as was discussed in Banfield's work (2014). Each place has its own unique history, and this uniqueness is what makes people want to be in a place. If communities replace their old historic structures with typical buildings that can be constructed throughout the world, simply because the historic buildings are underutilized, then places will lose what is great about them. People will forget the past and there will be no pride or desire to rebuild great cities. Places must focus on adaptively reusing buildings, which in itself demonstrates resiliency. Cincinnati's plan attempts to revitalize specified vacant structures and brownfields and look for ways to develop them.

This is simply not enough. The city needs policy to protect buildings from destruction. They should identify re-uses for buildings and develop a process which carefully considers all options before ultimately deciding that significant structures should come down.

Integrated Nature

An initiative is to preserve and restore natural corridors through regulations and ordinances, and land banking partners. Additionally the city wishes to increase trees in the city, incorporate green infrastructure in road re-construction, and replace mowed areas with native low maintenance plantings. The city could improve its natural features by ensuring greenspace is within a ¼ mile of all residents as Baltimore's plan states.

Urban Culture

Cincinnati placed little to no emphasis on urban culture. They touched the subject when they developed initiatives around enhancing mixed-use districts and implementing complete streets. However culture is more important than just enhancing mixed-use districts, much like legacy. Without culture there would be little desire to live in a city. Cincinnati has many festivals, museums, and other cultural attractions and should consider how to improve these features in the sustainability plan.

Resilience

Resiliency is the ability to adapt. Cincinnati will need to adapt to a changing climate that is expecting warmer wetter weather. Climate change means much more than this, entire economies could be devastated, fragmented, and essentially relocated. The ability to innovate and overcome these changes is crucial for resilience and future prosperity.

Some of the plan's initiatives that relate to resilience include: reduce impervious surface through incentives and restrictions, adopt policy to use software (similar to sustainability LENS) to assess triple bottom line of approved city funded projects, reduce combined sewer overflows, update emergency plan to include information regarding prolonged heat, update landscape ordinance to include only plants that are adaptable to the expected climate, incorporate landscaping into zoning and subdivision regulations to mitigate UHI effect, partner to implement other strategies such as cool roofs and green roofs, and assess infrastructure in performance for warmer wetter climate.

Again, this is a good list of initiatives, that if implemented would lead to a resilient city. However, improvements could be made to create a more resilient economy, including an equitable economy.

Distributed utilities

Distributed utilities are an integral part of a resilient city. If a power plant fails, power will be lost in great numbers. If a solar panel fails, the effects would only be noticeable at the household level,

but also renewable energy tends to be distributed, because the number of photovoltaic panels and wind turbines needed to power a city cannot be crammed into one plant. Unfortunately Cincinnati's plan was not aggressive with this approach but did show interest in geothermal energy. The plan calls for the city to draft and pass a city ordinance requiring and incentivizing ground sourced heat pump systems. This would be a great policy to distribute heating and cooling abilities. The city could improve this section by identifying numerous locations to generate renewable power, and determining how to implement these plans.

Renewable energy

The plan recognizes the influences state governments have on renewable energy. The plan noted that an amendment to a state policy instantly reduced the number of solar panels being installed. To respond, the plan recommends lobbying to the state of Ohio to strengthen the market for solar projects.

City owned utilities are becoming a rarity, and Cincinnati is no different. This is an obvious road block for municipalities who wish to change their means of energy production. In response the city plans to work on agreements with electric providers to allow virtual net metering for shared solar. This would allow an individual who produces solar power to sell unused energy at market rate, which is currently not the case.

Other initiatives the city identified was to research and promote renewable energy financing tools, expand solar power purchase agreement, and research feasibility of anaerobic digestion. The city's plan was effective at identifying the many roadblocks renewable energy continues to face. However, renewables are crucial to ensure future generations have the same opportunities as present. Cincinnati could potentially reduce the price of such energy for residents with innovative financing tools.

Carbon Neutral

The carbon cycle is crucial to the Planet's health. Historically natural forest fires, animal respiration, and other processes released carbon into the atmosphere, and photosynthesis replaced this

carbon with oxygen. Today carbon is produced in more ways, and the capacity for photosynthesis has been reduced, resulting in exponential increase of carbon year after year. To ensure Earth's health, communities must focus on increasing the capacity for photosynthesis and decreasing carbon emissions.

Cincinnati's plan recommends small steps. The city should support building performance disclosures, and develop energy rating system. This could help consumer awareness, but will not get the city anywhere close to carbon neutral. The city must up its efforts in reducing and offsetting carbon.

Eco-Efficiency

Nature functions in closed loop systems, meaning one product's waste is another's energy and the cycle continuously repeats itself. Humans are the first known species to disrupt this highly efficient cycle. As populations increase cities need to be smart in their use of resources, including reducing raw materials used, re-using products, and recycling them when finished.

Cincinnati's plan discusses how recently an amendment was passed that would not allow the city to increase taxes on trash pick-up for a number of years. The sustainability plan chose an obvious starting point for improving eco-efficiency, attempt to overturn the amendment to allow for the adoption of a pay-as-you-throw tax. This would hold residents accountable for their waste. Additional initiatives included fund "best in class" campaign to educate about recycling, implement biweekly organic collection, increase electronic waste collection drop off opportunities, introduce a commercial recycling program, and begin a city compost program.

TOD, POD, & GOD

The city's plan individually discusses these theories, but does not integrate them enough to achieve great projects. The city has related actions like interconnecting transit, adopting complete streets, implementing bike and pedestrian plans, identifying mixed-use districts, and removing road blocks for renewable energy. However, the city should consider integrating Transit Oriented Development,

Pedestrian Oriented Development, and Green Oriented Development; which is the aspects that Banfield (2014) explains need to be combined to produce true sustainability.

Perhaps if the city sought greater community participation, social equity would have been more evident. Fortunately this is Cincinnati's second sustainability plan and there is room to evolve. The city must ensure that the plan does evolve however. Plan makers could also consider increasing measurements to include progress on objectives and not just goals.

Table 12 City of Cincinnati, Green Cincinnati Plan (2013)

Assessing Cincinnati's Sustainability Plan

Criteria	**Score (0-3)**
Regional consideration	1.5
Community participation	1.5
Transition management	1.5
Provide for residents as well as future residents	2
Vulnerable populations	1
Land use and transportation	2
Legacy	1
Integrated Nature	2
Urban Culture	0.5
Resilience	2
Distributed Utilities	1
Renewable Energy	1.5
Carbon Neutral	1
Eco-Efficient	2
TOD, POD, & GOD	1
Totals	**21.5**

Table 13 Plan Rankings

Plan	**Total Score/Rank**
(1) City of Portland and Multnomah County Climate Action Plan (2009)	30
(3) City of Los Angeles, California - pLAn (2015)	25
(8) City of Chicago, Illinois - Climate Action Plan (2008)	11.5
(6) City of Baltimore, Maryland - The Baltimore Sustainability Plan (2009)	20
(7) City of Pittsburgh, Pennsylvania - Pittsburgh Climate Action Plan Version 2.0 (2012)	15
(10) City of Cleveland, Ohio - Sustainable Cleveland Municipal Action Plan (2013)	5.5
(4) City of St. Louis, Missouri - City of St. Louis Sustainable Plan (2013)	21.5

(2) City of Milwaukee, Wisconsin - ReFresh Milwaukee (2013)	27
(9) City of Louisville, Kentucky - Sustain Louisville (2013)	9
(4) City of Cincinnati, Ohio - Green Cincinnati Plan (2013)	**21.5**

Final Thoughts on Green Cincinnati Plan

Overall Cincinnati's plan is a success, being only there second attempt at such a plan. It is difficult to compare with a city's plan which has been reworked and revised for multiple decades, such as Portland's plan. The Green Cincinnati Plan established great goals and objects and laid clear actions for success.

The city must create a next plan. A revised plan should clearly state transition management, such as yearly progress updates, revised actions every three years to better chances of meetings goals and objectives, and a new plan every ten years to ensure that the goals and objectives align with what is needed at that time.

Sustainability is more than just being green. Smaller footprints are needed for future generations, but equity and application of the plan must be accepted by all. The best way to accomplish this is to give power to the people and give them the opportunity to write and make revisions to the plan. It's no surprise that little consideration was given to equity considering the level of community participation. The city must think of new ways to involve more citizens, by doing this more citizens will be dedicated to sustainability and creative solutions to local problems will increase in prevalence.

By addressing these two problems, transition management and community participation, Cincinnati's plan will improve in all other aspects. Additionally more involvement will improve urban culture, considerations for vulnerable population, and help equity provide for all people. More aggressive goals and objectives should also be pursued, especially in renewable energy and distributed utilities.

Chapter 5
Conclusion

Climate change threatens everyone's way of life, especially vulnerable populations not well positioned to adapt. National and local leaders are starting to accept the implications of climate change and are showing signs of action. Unfortunately political opposition has slowed progress and will be difficult to overcome. Regardless of the opposition, local governments need to act now. The science is becoming more convincing and the consequences of inaction are too dire.

The United Nations is meeting in Paris later this winter for another Climate Change Conference. As international governments work on agreements to address the biggest threat to civilization, legislation may be forced on local governments. Local, state, and federal governments should expect laws demanding reductions in greenhouse gases, and those governments that are most prepared will have the greatest advantage for future prosperity. This report looked at how cities were preparing to respond to climate change and other twenty first century problems to provide a framework for action. The best way communities can prepare is by responding now. This will allow for better organization when international pressure is heightened.

It is impossible to expect any city, organization, or even individual person to master solutions to problems on first attempt. By acting now cities will be better positioned to analyze progress and understand how they can be held to higher standards. Table 14 shows this reports analysis of total scores for how well each city accomplished each criteria element and the average score for each criteria.

Table 14 Total City Plan Scores and Element Averages

	Portland	LA	Chicago	Baltimore	Pitts.	Cleveland	St. Louis	Milwaukee	Louisville	Cinci.	Ave.
Regional cons.	3	0.5	0.5	0	1.5	0	1	1	0	1.5	0.75
Com. Part.	2	1	0.5	2	1	0	1	2	0.5	1.5	1
Transition mgmt.	3	3	0	2	1.5	0.5	0	2	1	1.5	1.3
Provide for residents	1	2	0.5	2	1	0.5	2.5	3	1	2	1.35
Vulnerable populations	1	3	1	1.5	1.5	0	2.5	1.5	1	1	1.3
Land use and trans.	2.5	1.5	1	1	1	1	2	2	0.5	2	1.25
Legacy	1.5	0.5	0	1.5	0	0	2.5	2.5	0	1	0.85
Integrated Nature	2	1.5	1.5	2.5	0.5	0	2	3	1.5	2	1.45
Urban Culture	0	1.5	0.5	0.5	0	0	2	1.5	0	0.5	0.6
Resilience	2	2.5	1.5	1.5	2	1	1.5	1.5	1.5	2	1.5
Distributed Utilities	3	1	0.5	0.5	0.5	0.5	0.5	1.5	0	1	0.8
Renewable Energy	2.5	2	1	1.5	2	0.5	1.5	2	0.5	1.5	1.35
Carbon Neutral	2.5	2	1.5	1.5	0.5	0.5	1	1.5	0.5	1	1.15
Eco-Efficient	2	2	1	2	2	1	1.5	2	1	2	1.45
TOD, POD, & GOD	2	1	0.5	0	0	0	0	0	0	1	0.35
Totals	30	25	11.5	20	15	5.5	21.5	27	9	21.5	16.45

Five criteria averaged scores under one, from lowest to highest includes: TOD, POD, & GOD; Urban Culture, Regional Consideration, Distributed Utilities, and Legacy. Three of these (TOD, POD, & GOD; Regional consideration; and Distributed Utilities) require regional corporation which explains why Portland scored so well in these categories while the other cities lagged. Distributing utilities must be accomplished at a large scale. By focusing on a region local governments can begin to solve energy

dependence, combining energy generation in the countryside with on-site generation. The same goes for TOD, POD, & GOD; the regional population is an important aspect of city sustainability and not considering this population when integrating these three elements will make sustainability nearly impossible. The city will depend on the region for aid in the production of food, water, energy, and other valuable resources provided by healthy ecosystems. The other two elements (Urban Culture and Legacy) are a result of leaders not understanding the full potential of sustainability. Cities seem to understand the "three E's" but overlook the importance of a high quality of life that fosters interrelated relationships. Banfield (2014) discussed the importance of cities in ancient times and how cities' needed people interactions for progress. The same holds true today, if cities fail to provide a high quality of life new and current residents will not stay, and the city will become far from sustainable.

Additionally a majority of the plans that were analyzed had a portion dedicated to improving current building stock energy efficiencies by providing funding and then pursuing renewable energy generation. It would be more effective to simultaneously update building codes to guarantee that new construction meets the same standard while incentivizing onsite energy production.

Cities developing new plans or revising old ones should start addressing the criteria discussed throughout this document including: solve problems with regional consideration; increase community participation; organize and plan for transition management; provide for all residents; improve resilience and quality of lives for vulnerable populations; consider land use and transportation together; build upon the community's established legacy; integrate nature throughout urban areas; foster an urban culture so people want to live in urban areas; become resilient and in a position to adapt to local climate change; develop distributed utilities; increase the proportion of renewable energy; strive to be carbon neutral; become eco-efficient; and develop transit-oriented-development, pedestrian-oriented-development, and green-oriented-development together. Additionally plans should clearly lay out actions to accomplish goals and objectives similar to plans in Portland, Los Angeles, Cincinnati, and Milwaukee.

The biggest challenge that will generate the greatest return is the organization and collaboration of regional governments. Portland is leading by example and proving that by solving problems regionally progress can be made. This will be a huge problem for cities like Cincinnati, whose region overlaps with three separate states each with different legislation.

It may make more sense to just incorporate sustainability throughout cities' comprehensive plans and not just a section at the end of the plan. Sustainable elements should be considered throughout every goal, objective, and action. One plan would help organize and align the entire city's actions. Unfortunately because of the political opposition that stems from sustainability, a separate plan is better than no plan and each piece that gets accomplished will provide opportunity to assess, learn, and improve local sustainability.

Sustainability is an ideal of comprehensive planning, a theory that attempts to consider everything. It is often considered as a theory that simultaneously reflects on the three E's; Economy, Environment, and Equity (WCED, 1987). This can be overwhelming for one individual to organize and accomplish, and it cannot be done in one year's time. That is why it is important that cities, towns, and communities everywhere act. If the world, and especially the developed nations, can act locally while considering impacts globally there is hope that twenty first century problems can be solved.

References

Benfield, F. Kaid. (2014) *People habitat: 25 ways to think about greener, healthier cities*. Print.

Brookings Institute. (2008). *Per capita carbon emissions from transportation and residential energy use.* Retrieved June 2, 2015, from http://www.brookings.edu/~/media/Research/Files/Reports/2008/5/carbon-footprint-sarzynski/tables.PDF

City Climate Leadership Awards 2014. (2014). Retrieved June 3, 2015, from http://cityclimateleadershipawards.com/about-ccla-2014/

City of Baltimore. (2009). *The Baltimore sustainability plan.* Baltimore, MD.

City of Chicago. (2008). *Chicago climate action plan: Our city our future.* Chicago, IL.

City of Cincinnati. (2013). *The New Green Cincinnati Plan Detailed Descriptions.* Cincinnati, OH.

City of Cincinnati. (2013). *Green Cincinnati Plan.* Cincinnati, OH.

City of Cleveland. (2013). *Sustainable Cleveland municipal action plan.* Cleveland, OH.

City of Los Angeles. (2015). *Sustainable city pLAn.* Los Angeles, CA.

City of Milwaukee. (2013). *ReFresh Milwaukee: A vision for community sustainability.* Milwaukee, WI

City of Portland Bureau of Planning and Sustainability. (2009) *City of Portland and Multnomah County climate action plan 2009*. Portland, OR.

City of St. Louis. (2013). *City of St. Louis sustainability plan.* St. Louis, MO.

Green Building Alliance. (2012). *Pittsburgh climate action plan: Version 2.0*. Pittsburgh, PA

IPCC, (2014): *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

Louisville Metro Government. (2013). *Sustain Louisville: Louisville Metro sustainability plan*. Louisville, KY.

Newman, P, Beatley, T, and Boyer, H. (2009) *Resilient cities: Responding to peak oil and climate change*. Washington, DC: Island, Print.

Philip R. Berke, P. R. and Conroy, M. (2000) *Are we planning for sustainable development?.* Journal of the American Planning Association, pp. 66:1, 21-33.

Roseland, Mark. (2012) *Toward sustainable communities: Solutions for citizens and their governments*. Print.

The Southwest Ohio Regional Transit Authority (SORTA), Ohio-Kentucky-Indiana Regional Council of Governments (OKI), The Transit Authority of Northern Kentucky (TANK), & Hamilton County. (2002). *Regional Rail Plan*. Cincinnati, Ohio.

Wells, W. (2015, May 9). Los Angeles pLAn Shoots for STAR. Retrieved June 3, 2015, from http://www.planetizen.com/node/76465/los-angeles-plan-shoots-star

World Commission on Environment and Development. (1987). *Our common future*. Oxford, UK: Oxford University Press.