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BENCHMARKING WORCESTER'S SUSTAINABILITY

An Interactive Qualifying Project Report

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by

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Abstract

In this project, sponsored by the City of Worcester Planning and Regulatory Division, we applied a system of appropriate indicators by which the city can compare its current sustainability policies to those of competing cities with similar demographics. We analyzed Worcester's gaps and produced recommendations in the areas of cluster zoning, sustainability management, environmentally sensitive zoning, land use plans, green building and renewable energy use.

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Executive Summary

Sustainability is defined as the ability to meet present needs without compromising the needs of future generations (Global Development Research Center). It can also be thought of as avoiding depletion of important resources. Most people would agree that sustainability is desirable. However, many current trends are not sustainable such as the rate of worldwide population growth and the rate of fossil fuel use.

What can be done to address these unsustainable trends? There are many possible routes but we focused on the influence of city government. A city government seeking to become more sustainable should ask the following questions. What are the most important types of policies and programs for cities to have? What cities have them? Which policies are most effective and why? These questions provide a basis for the city to evaluate its current policies, identify areas for improvement, evaluate feasibility of programs that have proved effective elsewhere, and implement new programs. We began answering some of these questions for Worcester.

The goal of our project was to apply a system of appropriate indicators by which the City of Worcester can compare some of its current sustainability policies to those of competing cities with similar demographics, such as population and per capita income. The foremost purpose of the indicators was to provide a means of identifying gaps in Worcester's sustainability efforts, especially ones that can be addressed by enacting local policies.

We chose Ken Portney's Taking Sustainability Seriously Index as a suitable system of indicators because it covers all important areas of environmental sustainability and it is policy based. Failure to play a role in policy decisions is a shortcoming of many existing indicators projects. The Taking Sustainability Seriously Index is composed of binary indicators representing whether the city has each policy or program in question. The thirty-four indicators covered are grouped into seven categories: indicator projects, smart growth, land use, transportation, pollution prevention, resource conservation, and management of sustainability.

Portney did not provide any operational definitions of the selected indicators, so we composed our own. We aimed to make definitions as broad as possible while still

being meaningful. We chose to compare Worcester to Hartford, CT; Springfield, MA; Manchester, NH; and Providence, RI. We selected these cities because they are located near Worcester and are similar to Worcester in population and median income.
We attempted to collect data for all 34 indicators for each city by searching online and placing phone calls to appropriate city agencies. Overall, our study showed that Worcester's set of sustainability policies are about as complete as those of Providence. However, all both cities lag behind Hartford significantly. We were not able to compare scores from Manchester and Springfield because a lot of data were missing.

In the second stage of the study, we selected the following six indicators based upon the priorities of the Worcester City Planning Office to research in more depth, and analyze in order to produce recommendations.

- Is zoning used to delineate environmentally sensitive growth areas?
- Does the city have a comprehensive land use plan that includes environmental issues?
- Does the city have a "Green" building program?
- Does the city government use renewable energy?
- Is there a single governmental/nonprofit agency responsible for implementing sustainability?
- Does the city allow cluster development?

Worcester was comparable to its competitors for cluster development single agency for sustainability, and land use plan including sustainability. All cities except Providence allowed cluster zoning, but none of them required it or provided incentives. Providence and Hartford were the only cities with groups to oversee overall sustainability, however, the group was provided by the EPA, not formed of the city's own initiative. Providence has a land use plan including sustainability and Hartford has one in progress. Worcester, Manchester and Springfield do not have land use plans updated within the last five years.

Worcester compares favorably with its competitors for green building, renewable energy use by city government and environmental zoning. The state of Massachusetts requires all municipal buildings over 20,000 sq. feet in size, constructed after September 1, 2006, to be LEED certified as green buildings. Most of the competitor cities outside

Massachusetts do not have any green building policies and those that do are not as strict as those of Massachusetts. Worcester has committed to a goal of using 20% renewable energy sources by 2010. The implementation of this initiative is still in the planning stage; the energy task force has recently completed the first draft of its report and recommendations. The only other competitor that has made a commitment to renewable energy is Providence. All cities have zoning to protect floodplains and wetlands although Worcester, Springfield and Hartford require a 100 foot wetland setback, Providence requires a 50 foot setback, and Manchester only requires a 25 foot setback. Only Worcester has a water resource protection overlay district.

Recommendations:

- Update Worcester's Master Plan (1987)
- Continuing implementing the 20% renewable energy by 2010 initiative
- Manage sustainability with a sustainability task force, sustainability governmental committee, sustainability officer and sustainability web site
- Conduct further study of green building possibilities such as retrofitting municipal buildings and offering a facilitated approval process for green buildings
- Allow cluster developments to have the same number of units as a conventional development on that site would have. Give priority to meeting with developers before they submit applications and take other steps to facilitate the application process.

Introduction

Sustainability is defined as the ability to meet present needs without compromising the needs of future generations (Global Development Research Center). It can also be thought of as avoiding depletion of important resources. There are many resources that are important to human society, from physical ones such as coal and oil, to social ones such as knowledge. Crucial resources can be depleted in a variety of ways. Fossil fuels are non-renewable therefore the amount available is constantly decreasing. Fish in the ocean are theoretically unlimited over the course of time but can still be depleted if they are killed at a rate faster than they can reproduce.

Most people would agree that sustainability is desirable. However, many current trends are not sustainable. If the United States population grows 1.1% per year, then the number of people in this country is projected to double by 2050. Currently there are 1.8 acres of land available in the U.S. to grow food for each citizen. If the current population doubled there would be no more the 0.9 acres of farmland available per person, falling short of the 1.2 acres required to maintain a healthy diet (Pfeiffer). Food is just one example of a resource that humans are using at an unsustainable rate. The major energy sources used in the U.S. and other countries around the world are examples as well. Pollution and contamination are damaging resources such as water and air.

What can be done to address the serious obstacles to sustainability? There are many possible routes but we will focus on the influence of city government. A city government seeking to become more sustainable should ask the following questions. What are the most important types of policies and programs for cities to have? What cities have them? Which measures are most effective and why? These questions provide a basis for the city to evaluate its current policies, identify areas for improvement, evaluate feasibility of programs that have proved effective elsewhere, and implement new programs. It is important to carefully evaluate all policies and programs for any potential negative impacts whether environmental, social or economic.

Some cities have attained a higher level of sustainability using an analysis similar to the one above. The city of Worcester, however, had not undertaken this process. It had some sustainable policies in place such as a commitment to increasing use of renewable

energy, but will benefit from our comprehensive sustainability analysis. We identified gaps in Worcester's sustainability efforts and offered possible solutions.

The goal of our project was to apply a system of appropriate indicators by which the City of Worcester can compare its current sustainability policies to those of competing cities with similar demographics, such as population and per capita income. The foremost purpose of the comparison was to provide a means of identifying gaps in Worcester's sustainability efforts, especially ones that can be addressed by enacting local policies. We chose Ken Portney's Taking Sustainability Seriously Index as a suitable system of indicators because it covers all important areas of environmental sustainability and it is policy based. Failure to play a role in policy decisions is a shortcoming of many existing indicators projects. The Taking Sustainability Seriously Index is composed of binary indicators for whether the city has each policy or program in question. The thirty-four indicators covered: indicator projects, smart growth, land use, transportation, pollution prevention, resource conservation, and management of sustainability.

Background

History of Sustainability

The banning of the chemical DDT in 1967 was one of the first times that sustainability was acknowledged in public policy. DDT was extremely effective in controlling mosquitoes but almost caused the extinction of the bald eagle and some other creatures. Two years later in 1969, the first national environmental protection agency was created, the United States Environmental Protection Agency. Sustainability made a leap into public awareness in 1970 when the first Earth Day was celebrated by 20 million people (International Institute for Sustainable Development [IISD], Sustainable Development Timeline).

The term "sustainable development" did not become popular until 1987 when the World Commission on Environment and Development produced the report *Our Common Future*, commonly referred to as the Brundtland Report after its Chairman, Norwegian Prime Minister Gro Harlem Brundtland. The International Institute for Sustainable Development was created in 1990 and since then it has been promoting change toward sustainable development by conducting research and providing policy recommendations. In 1999 the first global sustainability index was created. People around the world have begun to take a proactive approach to ensure that there will be enough resources for future generations to have a high quality of life. However, the study of sustainability is still new. There remains much to learn and many potential opportunities to apply what the knowledge. (IISD, Sustainable Development Timeline).

Sustainable indicators were not in wide use before the 1990s. Since then they have dramatically proliferated; in December of 2005 there was an extensive database of 669 entries of sustainable development indicators. This database was implemented by the Compendium of Sustainable Indicators Initiatives. It was put together by average citizens, government bureaucrats, and technical experts (IISD, Sustainable Development Timeline).

Types of Indicators

An indicator is an instrument of measurement that provides evidence that a certain condition exists or certain results have or have not been achieved. Environmental indicators reflect the status of living and non-living entities on earth. They also measure factors that have an impact on these entities, such as renewable energy as a percent of total energy use. Nearly all environmental indicators have an impact on humans; however social indicators focus more exclusively on people. Crime rates, literacy rates, and percentage of high school graduates are all social indicators. Economic indicators reflect the system of production and management of material wealth. Gross Domestic Product and median income are economic indicators. Sustainability indicators attempt to evaluate the long term well-being of the community and include environmental, social, and economic indicators to reflect all three interrelated areas of sustainability.

Benchmarking

According to The Benchmarking Exchange, benchmarking is the process of identifying, understanding, and adapting outstanding practices from organizations anywhere in the world to help your organization improve its performance and see where it stands in comparison with its competitors. The same concepts can be applied to the well-being of a city (http://www.benchnet.com/wib.htm).

One example of a successful benchmarking program is the comparison study conducted by the cities of Vancouver, Portland and Seattle. These three leaders in sustainability in North America compared successful policies. Each city was able to determine what it can improve upon, and take action based upon this knowledge. This study focused on sustainable infrastructure within the cities but the same procedure can be applied to any aspect of sustainability (http://www.cityofseattle.net/environment/building.htm).

Reasons for Government Regulation of Sustainability

Individuals make decisions by balancing benefits and costs. This is a powerful rational strategy; however it can be flawed if the decision maker does not fully understand what the benefits and costs are, or if he only considers the impact on himself. A consumer may decide not to buy a hybrid electric car on the belief that hybrids are more expensive. Did she consider the amount she will save on fuel? Did she consider that the cost of fuel may rise quickly? If she did not, then she is an example of someone who did not understand the true costs of her actions. For an example of self-centered analysis, a factory could produce the maximum amount of emissions allowed by law which could reduce costs of pollution controls for the factory while the pollution in the air would increase costs of healthcare for residents with asthma. Costs that are paid by someone other than who caused them are known as externalized costs. The role of government regulation is to limit the amount of externalized costs because residents and organizations will account for internalized costs themselves assuming that they are educated on the subject. The government can also play a role in educating people about the internalized and externalized costs of their activities.

Effects of Pollution on Health

Pollution is a social problem, not just an environmental one. Air pollution is already causing severe health problems, which are likely to become even more severe and widespread as pollution continues. According to the National Resource Defense Council (NRDC) 64,000 people in the USA may be dying prematurely each year from cardiopulmonary causes linked to air pollution. It is estimated that in the most polluted cities, lives are shortened by an average of one to two years.

Diesel smoke is a hazard to the environment and to human health, with 40 toxic air contaminants; it has been linked to cancer, asthma and more than 21,000 premature deaths in the United States every year. Formaldehyde, commonly used as an adhesive in plywood, is another such hazard. It has been linked to lung cancer, and may also cause leukemia and asthma attacks. Benzene, found in gasoline, diesel exhaust and cigarette smokes, is a carcinogen that causes leukemia as well as a number of other illnesses (NRDC). Fine particles less than 2.5 micrometers in diameter are released into the air by

the burning of fossil fuels and pose great health risks because they can penetrate deep into the lungs and sometimes enter the bloodstream and lead to heart attack or stroke. A study in the journal of *Epidemiology* showed that every 10 micrograms of fine particles per cubic meter correlated with and at least 11% increase in risk of death (WebMD).

Lessons Learned

In Lessons Learned from the History of Social Indicators, Cobb and Rixford describe a number of pitfalls that new indicators movements must avoid. Social indicators differ from sustainability indicators in that they focus more on the present than the future; however many of the same principles apply.

1. Do not ignore things that can't be quantitatively measured

A prime example is the focus on standardized testing to assess education. It is controversial whether tests such as SATs are accurate measures of skills such as reasoning, and problem solving. It certainly does not tell you whether students are educated to be curious, ethical, and informed about other cultures.

2. Do not make undue assumptions

Define all key terms. The designers of the 1930 Census measurement of unemployment thought that the definition of unemployed was obvious so they did not address ambiguous situations, such as people who had a job for part of the year. As a result the data obtained were unreliable.

3. Explain the underlying values

Every indicator project involves value judgments. Devising a completely objective set of indicators is impossible because choosing what to measure implies what is important and what is not. The best way to address the situation is to clearly explain the values and methods that underlie all decisions.

4. Do not use too many indicators

An overly complicated project will not clearly represent the community as a whole. The Oregon Benchmark Project recognized this when it decreased the number of

indicators from 272 to 92 and organized them into 3 goal areas to make the benchmarks more meaningful and effective.

5. Consider metaphorical value

A good indicators project considers not only the literal value of an indicator, but also its value as a metaphor, especially for an index composed of a variety of data. The number of spotted owls in a forest has value as a literal measure but it is also a metaphor for biodiversity in the forest. It is a good metaphor if the indicator (number of spotted owls) tends to correlate with the concept it represents (biodiversity).

6. Do not confuse indicators with reality

No indicator can be a complete picture of reality. For that reason it is useful to incorporate multiple indicators for the same phenomenon. Until the 1970s crime statistics were gathered from FBI's Uniform Crime Reports. These statistics were highly unreliable representations of the crimes actually occurring. The jurisdictions did not share the same definitions for crimes and some crimes such as rape were underreported. Any conclusions about reality based upon these statistics would be flawed. The reporting bias could have been mitigated by supplementing the UCR statistics with results of an anonymous survey of city residents.

7. Public participation does not ensure a democratic indicators program

It is more important to include fairness in the indicators. For example, when examining the cities air quality it would be best to take the measurement at various sites in the city to see if pollution has a disproportionate impact on low-income or minority communities, as is often the case.

8. Many indicators do not provide motivation for action

In the 1830s physicians in England and France discovered a statistical relationship between poverty and serious illness. However none of those studies had as much political impact as the writings of Charles Dickens which presented the same concept but with an emotional rather than factual appeal.

9. Use indicators to find causes of problems

Altering a symptom requires a theory about what is causing it. For example the temperance movement that led to prohibition of alcohol in the United States identified correlations between heavy alcohol use and symptoms such as debt and premature death.

10. Resources are a key to getting a good outcome

The groups that develop indicators need to have a connection to those with the power to make changes. For example when the city of Santa Monica's indicator project found that only 15% of the municipal fleet used reduced emissions fuels the city had the ability to act.

Worcester and Sustainability

Worcester has already taken some important steps toward achieving sustainability by way of government policy, organizational decisions, and academic study. The local government has committed to a goal of using 20% clean energy by the year 2010 and runs an effective recycling program. Organizations in Worcester have voluntarily chosen to use green building methods. A team of Worcester Polytechnic Institute students have designed a system of quality of life indicators. Quality of life, present and future, is an important aspect of sustainability.

1. 20% by 2010

Worcester participates in the 20% by 2010 campaign which encourages communities to choose renewable energy. The goal of this campaign is for the city to get 20% of its energy from renewable sources by 2010. This creates a demand for clean energy which allows this industry to develop. The goal of 20% was chosen because it is attainable and still shows a substantial commitment (http://www.smartpower.org/20renewable_energy.htm).

2. Bartlett Center

The Bartlett Center at WPI is an example of the voluntary commitment that some organizations in Worcester have made to green building. It was designed to meet the United States Green Building Council (USGBC) criteria for Leadership in Energy and Environmental Design (LEED) certification. One of the ways that the Bartlett Center scored points toward LEED certification was using certified wood. This wood is harvested by selectively cutting trees in an area instead of clear cutting. This is better for the environment but the wood costs twice as much and is difficult to find. (Neil Benner).

3. Worcester Counts IQP

There was a previous IQP project, titled Worcester Counts, which was a system of quality of life indicators for Worcester. This group worked with a taskforce that included 25 other members of the community ranging from a Rabbi to a professor to a president of a corporation. This taskforce made a giant list of indicators and then narrowed them down based upon certain criteria. These criteria included availability, sustainability, suitability, interpretability, action oriented, communicability, and acceptability. The IQP project team put all of this data into Microsoft Access and on a website. This information is a good start for our work, however it only a few of the indicators are related to environmental sustainability and it does not compare Worcester to any other cities.

Data Sources for the Indicators

Some of the general categories of potential data sources are local government agencies, state government agencies, academic institutions, businesses, non governmental organizations, and large government databases. Local sources of data tend to be more relevant; however they may not be well-suited for comparison to other cities. Sustainability is a wide subject so the information involved may not be found all in one place. One might need to look for data from a number of different sources, depending on the type of data desired. For example, the city clerk's office may be a source of information about local motor vehicle registration and housing. Department of public works is a good place to get information on water use, the generation of solid waste and waste water, and recycling rates (Hart).

An extensive list of sources that have been used for sustainability data appears in Appendix 2. Of particular interest are the data sources used to rate cities against each other; SustainLane seemed to be the most cited of these surveys. Note that we cannot use SustainLane rankings directly because they only rated the 50 largest US cities which do not include Worcester. Their primary method of data collection was sending email and phone surveys to the selected cities. However not all cities responded and they used public data sources in addition.

Public data sources used in the SustainLane study:

- US Census/American Fact Finder for commute-to-work information
- Texas Mobility Study for transportation and congestion
- US EPA for air quality
- Environmental Working Group's December 2005 US city drinking water database for tap water quality
- Urban sprawl data from Smart Growth America's December 2002 study
- Percent of city land area devoted to parks from Trust for Public Land (2002 study)

Topics of primary research for SustainLane study:

- greenhouse gas reduction tracking, goals and inventories
- overall renewable energy use percentage for a city
- alternative fuel fleet data
- Environmentally Preferable Purchasing programs
- commercial and residential green building incentives
- carpooling coordination and car sharing programs (public or private),
- whether cities have a sustainability plan; department to manage environmental/sustainability functions; research partnerships with federal laboratories and/or non-governmental organizations.

Indicator Trends

Some of the trends in choosing indicators are the development of aggregate indicators, interest in core set of "headline indicators", emergence of goal-oriented indicators, and making better use of indicators in performance monitoring (Pinter et al.).

Recently there have been many different groups that give aggregate models to follow in order to create a more sustainable area. A few of these groups are Global Footprint Network, Human Development Index, Environmental Sustainability Index, and

AtKisson. These groups are helpful in creating interest in sustainability but are not very useful in determining indicators of sustainability (Pinter et al.).

The development of a core set of "headline indicators" involves using only a few well known indicators that the average citizen can understand. One example of this is carbon dioxide levels in the air. These are often used in politics and some are constructed for political purposes rather than the purpose of measuring sustainability.

Goal-oriented indicators are exactly what the name implies. There is a specific goal that people want to be completed and then indicators are chosen to measure it. Instead of setting goals based on indicators, the process is reversed, imparting a healthy dose of pragmatism to the process (Pinter et al.).

In the 70s and 80s, performance indicators were management driven and over time more governmental agencies became interested in these indicators. It is difficult for governments to improve these performance indicators but when it is done the results are very positive. These indicators improve accountability for specific sustainability initiatives and the success of the national sustainable development strategy (Pinter et al.).

Methodology

Indicator Selection

We chose to use Ken Portney's Taking Sustainability Seriously (TSS) index for our indicator set. The TSS Index is composed of 34 indicators, organized into 7 categories, designed to measure to what extent cities take sustainability seriously. In other words, does the city have sustainability on its agenda? How much effort is the city committing to striving for greater sustainability? Each indicator is binary (yes or no answers) and policy-based. This means that "Does the city have a green building program?" could be an indicator in the TSS index. "How many green buildings are in the city?" can not be an indicator because it is not binary, nor is it policy-based because organizations could construct green buildings without the city having any policy on the subject.

Our sponsors at the city planning office wanted to use our study primarily to identify gaps in current city sustainability policy, therefore we decided to use indicators based directly on city policy. With policy as the focus of our study, a binary index appears most appropriate. The binary and policy-based natures of the TSS index, therefore, made it an ideal methodology given our objectives. Many other cities such as Santa Monica had indicators that related indirectly to policy such as "air quality index." There are many different causes of a given air quality index including many sources of pollution within and outside the city, as well as the weather. Some of these sources could be reduced by city regulation. This method does work, but we have decided to cut out the intermediate steps for greater efficiency.

Indicator Definitions

Portney does not provide highly detailed definitions or descriptions for the TSS indicators so we composed our own operational definitions. We chose to define our indicators broadly because if the cities used a wide variety of approaches we did not want to exclude any of them from further study at this stage. For example, we defined ecovillage as any community self-defined as an ecovillage because the dictionary definition of ecovillage was very difficult to operationalize. Other examples of our broad

definitions included tax incentives for environmentally friendly development which we defined as "the city uses financial incentives to encourage at least one type of environmentally friendly development." We did not specify a required type of environmentally friendly development.

We anticipated that these definitions might change as we collected data. The largest issue that arose in our definitions was whether state mandated programs could count. For example, the state of Massachusetts has LEED green building requirements for municipal buildings. Worcester does not have any green building policies beyond the state law. Does this count as Worcester having a green building program? We decided to record the answer as yes, marked with an asterisk to indicate the statewide requirement. Even though the green building program was not enacted by the local government it is still the city that must implement the program. Also, if we did not count statewide programs then we would suggest gaps existed where there are none. A minor change in definition occurred in indicator 1, "indicators project active within the last 5 years." We had defined it as "city has completed an organized study of its current sustainability in the last 5 years." We found that Hartford has an indicators project currently in progress and decided to change the definition to, "city has participated in an organized study of its sustainability in the last 5 years."

If our study is updated in the future the definitions used could be stricter in order to set the sustainability bar higher. Our results could be the basis for these definitions. For example, if we find a certain kind of environmental development tax incentive is most effective then that indicator could be redefined to require that specific incentive.

Table 1 is the list of indicators used in Kent Portney's Taking Sustainability Seriously along with our operational definitions for them.

Table 1: Operational Definitions for Indicators

INDICATOR NUMBER	PORTNEY'S INDICATOR	OUR OPERATIONAL DEFINITION
1	Indicators project active in last five years	Does the city have an indicators project active within the last 5 years?
2	Indicators progress report in last five years	Has the city produced an indicators progress report in last five years?
3	Does indicators project include "action plan" of policies/programs?	Does indicators project include "action plan" of policies/programs?
4	Eco-industrial park development	Is there an eco-industrial park within the city limits?
5	Cluster or targeted economic development	Does the city allow cluster development?
6	Eco-village project or program	Is there a self-described ecovillage within city limits?
7	Brownfield redevelopment (project or pilot project)	Has the city worked on brownfield redevelopment in any way?
8	Zoning used to delineate environmentally sensitive growth areas	Is zoning used to delineate environmentally sensitive growth areas?
9	Comprehensive land use plan that includes environmental issues	Does the city have a land use plan that includes sustainability, updated within the last 5 years?
10	Tax incentives for environmentally friendly development	Does the city offer tax incentives for any type of environmentally friendly development?
11	Operation of public transit (buses and/or trains)	Is there intra-city public transit?
12	Limits on downtown parking spaces	Is there any limits on the number of parking spaces in an area?
13	Car pool lanes (diamond lanes)	Are there car pool lanes within city limits?
14	Alternatively fueled city vehicle program	Does the city government own alternatively fueled vehicles?
15	Bicycle ridership program	Does the city have an organized program to promote bicycle ridership?
16	Household solid waste recycling	Does the city offer curbside recycling pickup?
17	Industrial recycling	Does the city government offer industrial recycling?
18	Hazardous waste recycling	Does the city government offer hazardous waste recycling?
19	Air pollution reduction program (i.e. VOC reduction)	Is there an air pollution reduction program (not included within the other indicators)?
20	Recycled product purchasing by city government	Does the city have any policies promoting government purchase of recycled products?
21	Superfund site remediation	Is there a superfund site within the city limits?
22	Asbestos abatement program	Is there an asbestos abatement policy?

INDICATOR NUMBER	PORTNEY'S INDICATOR	OUR OPERATIONAL DEFINITION
23	Lead paint abatement program	Is there a lead paint abatement policy?
24	Green building program	Does the city have any kind of green building polic
25	Renewable energy use by city government	Has the city government officially committed to us renewable energy?
26	Energy conservation effort (other than Green building program)	Does the city have an energy conservation effort (n included within the other indicators)?
27	Alternative energy offered to consumers (solar, wind, biogas, etc.)	Can consumers in the city buy renewable energy?
28	Water conservation program	Is there a water conservation program?
29	Single gov/nonprofit agency responsible for implementing sustainability	Is there a single government/nonprofit agency responsible for implementing sustainability?
30	Part of a citywide comprehensive plan	Is sustainability part of a citywide comprehensive p (plan may include land use but must include other t as well)?
31	Involvement of city/county/metropolitan council	Is city council involved in plans about sustainabilit
32	Involvement of mayor or chief executive officer	Is mayor or chief executive officer involved in plan about sustainability?
33	Involvement of the business community (e.g. Chamber of Commerce)	Is the business community involved in plans about sustainability?
34	General public involvement in sustainable cities initiative (public hearings,	Is the general public involved in plans about sustainability?

We chose to compare Worcester to four cities that are competitors with Worcester for commerce and residents: Providence, RI, Springfield, MA, Hartford, CT, and Manchester, NH. The factors used to select the cities were population, median income and distance from Worcester. We considered population and distance from Worcester because people and organizations choosing a location often consider geographical area and city size as important factors. We considered adjusted per capita income because a city with a high per capita income has more resources to commit to sustainability. The three criteria for choosing a competitor city are shown in table 2.

Table 2: Cities for Comparison

City	Population (people)	Adjusted Per Capita Income ($)	Distance from Worcester (miles)
Worcester, MA	154,398	24,244	0
Providence, RI	160,264	20,333	39
Springfield, MA	146,948	17,023	53
Hartford, CT	111,103	15,947	64
Manchester, NH	109,308	25,491	77

Data Collection

We used a variety of methods for finding research sources. One such method was a Google search where we used a variety of keywords, mostly the name of a city and key term(s) in an indicator. For example, *Hartford "green building"*. Not all web results are credible so we needed a method for finding which ones were. One key to evaluating credibility is to evaluate the authorship including his/her educational background, past writings, knowledge base, skills, or standards. We posed questions such as "Has the content been reviewed, critiqued, or verified?" Is the author a well-regarded name we recognize? Have we seen the author's name cited in other sources or bibliographies? Do authoritative sites link to the page? What are the basic values and goals of the institution or organization? (http://lrs.ed.uiuc.edu/wp/credibility/page3.html)

We also used library databases to search for information. We searched LexisNexus Academic, EBSCO Business Source Premier and Thomson Gale PowerSearch using the same search terms as above. In this case however all the sources were known to have some degree of credibility although some may be less technical than others. Another major way we collected information was by looking at each city's website and placing phone calls to the appropriate departments for data that we could not find online.

We encountered significant difficulties in gathering information. We began with extensive efforts to find information on city websites because we didn't want to waste anyone else's time by making an unnecessary phone call. However, in retrospect our efforts may have been disproportionate to the information we managed to obtain. It might have been better to have limited online searching to about 8 hours per group member and then started placing phone calls. However, phone calls were a problematic method of data

gathering as well. Some departments in some cities never returned our repeated calls. We probably would have benefited from a more organized system for making phone calls, recording who we had called and whether we left a message.

Data Compilation

The data must be collected for the current year, recorded, and made easily accessible for others. It is also imperative to allow for easy modification of the tables. For the reasons previously listed we chose to use Microsoft Excel spreadsheets for our captured data.

We have seven separate sheets labeled as; Worcester, MA, Providence, RI, Springfield, MA, Manchester, NH, Hartford, CT, Indicators, and Checklist. The five cities listed all have the same format, the headings along the top read: Indicator #, Y/N, Contact Name, Contact Number, Job Title, Web Address, and Notes. The indicators one through thirty four are listed along the left side. For example if the city of Providence provides alternative energy for their residents we placed a "YES" in the cell in the Y/N column of the row for indicator 27.

Table 3: Example of City Spreadsheet

CITY OF MANCHESTER NEW HAMPSHIRE						
INDICATOR #	**Y/N**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
1	YES	-	City of Manchester	-	http://www.manchesternh.gov/CityGov/PLN/files/0FB465A67424472588EBA1BD61F32D2E.pdf	from 1993, revision started March 2006

The sheet labeled indicators lists the indicators and provides a general definition and an operational definition. The general definition is a dictionary definition. The operational definition describes the indicator for the purposes of our study.

Table 4: Example Indicator Definitions Spreadsheet

INDICATOR #	INDICATOR DESCRIPTION	OPERATIONAL DEFINITION
6	Eco-village project or program	Is there a self-described ecovillage within city limits?

The second sheet labeled checklist is simply a summary of the data. It lists vertically the indicator number and horizontally the five cities for comparison. Each cell will contain either YES, NO, or 0 if there is no data.

Table 5: Checklist Example

	WORCESTER, MA	HARTFORD, CT	MANCHESTER, NH	SPRINGFIELD, MA	PROVIDENCE, RI
INDICATOR					
1	NO	YES	YES	0	NO

Policy Analysis

After we had compiled all of the results of the binary indicators we further researched a few focus areas. This list is composed of indicators that our sponsor feels are the most important. The indicators that were the subject of in-depth analysis were the following:

- Is zoning used to delineate environmentally sensitive growth areas?
- Does the city have a comprehensive land use plan that includes environmental issues?
- Does the city have a "Green" building program?
- Does the city government use renewable energy?
- Is there a single governmental/nonprofit agency responsible for implementing sustainability?

When we found a city with a policy in one of these key areas we investigated several questions.

- What is the policy?
  What does the policy say? Does it require action or does it provide an incentive?
- What resources does this policy require?
  Does it cost money (i.e. alternatively fueled public transport)? Does it require personnel to manage?

- Is the policy frequently used? If not then why?
  For example, many cities have cluster zoning laws but they may be only used several times within ten years. If this is the case we will investigate why the policy is not frequently used. Are developers aware of the policy? Is cluster zoning impossible or prohibited in some development areas? Are there any disincentives for using the policy?

- Are there any direct or indirect negative impacts?
  For example, a limit on downtown parking spaces could potentially have a negative impact because instead of taking public transit to get downtown many people who own cars may choose not to go downtown at all.

We formulated our overall assessment of this policy based upon how much the policy was used, and if possible the benefits of using it, versus the resources used and any negative impacts. The question of how the policy was developed was helpful later in making suggestions for Worcester. If the policy seems to have significant benefits relative to costs then we considered its feasibility for Worcester. We also considered some policies that we believe could have substantial benefits after some modification.

Once we identified potential policies we analyzed their feasibility for Worcester.

- Are there any potential modifications that might benefit this policy?
  There are numerous questions we could ask, here are just a few examples. Could we eliminate negative impacts that occurred in the other city? Could we operate efficiently with fewer resources?
- Does Worcester have a need for this policy?
  Would this policy benefit the city or is it unnecessary? For example, many businesses are choosing to build to LEED standards voluntarily so it is possible that green building policies may not be necessary.
- Would the policy have any negative impacts in Worcester that were not seen in the original city?
  For example, Providence has an attractive downtown area so maybe they would be able to reduce parking and get people to come downtown by mass transit. Worcester however does not have such an attractive downtown area so that limited parking might have a negative impact on the number of people coming downtown.
- Does Worcester have the resources to implement the program?
  We kept in mind that the city has many other priorities therefore we will only recommend programs or policies that provide an excellent value.

These questions were not answered in a linear order; rather, answers to one question sometimes generated ideas for others. For example, when looking at resources Worcester has available we often came up with ideas to modify the program in order to use fewer resources or more available resources.

Results/Analysis

Binary Indicators

In order to get an overview of sustainability efforts in Worcester, we completed a broad survey of 34 indicators for Worcester and four competing cities (Hartford, Manchester, Providence, and Springfield) which resulted in yes or no answers about whether each city had specified policies or programs. The data were collected though city websites, EPA websites and interviews. Some data were not available due to city officials not returning repeated phone calls. In the second phase of the project we conducted a more detailed analysis on six of these indicators. Our analysis included a comparison of existing policies and programs, concluding with recommendations. For a list of indicators with operational definitions see *Table 1: Operational Definitions for Indicators*

Table 6 shows the complete results of our survey of 34 indicators for all 5 cities. It displays cities along the top and indicators down the left side; the symbol in the intersection (Y/N) represents whether the given policy is present in the specified city.

In analyzing this table it is vital to note that the indicators do not unambiguously suggest operational definitions. Portney does not provide operational definitions in his work so our group composed our own. We made the decision to use broad definitions when in doubt because we did not wish to exclude any potentially relevant data. A full list of operational definitions is available in the *Table 1*.

The single largest instance where we needed to make a choice about operational definition was whether state programs counted toward a city's taking sustainability score. We decided to include state programs but to write "state program" in the exceptions box in our city spreadsheets found in *Appendix 3*. We wanted to show that a program existed in that city regardless of its origin. We made an exceptions column because this was a common issue and we recognized that state initiatives do not necessarily represent how seriously a city is taking sustainability.

Table 6: Full Yes/No Grid

	WORCESTER, MA	HARTFORD, CT	MANCHESTER, NH	SPRINGFIELD, MA	PROVIDENCE, RI
INDICATOR/POLICY					
1) Indicators project	NO	YES	YES	0	NO
2) Indicators progress report	NO	NO	YES	0	NO
3) Indicators action plan	NO	NO	YES	0	NO
4) Eco-industrial park	NO	NO	NO	0	NO
5) Cluster zoning	YES	YES	YES	YES	NO
6) Eco-village	NO	NO	0	0	NO
7) Brownfield redevelopment	YES	YES	NO	YES	YES
8) Zoning/ environmentally sensitive areas	YES	YES	YES	YES	YES
9) Land use plan in last 5 years including sustainability	NO	YES	NO	NO	YES
10) Tax incentives for green development	NO	NO	NO	0	NO
11) Public transit	YES	YES	YES	YES	YES
12) Limits on downtown parking spaces	NO	NO	0	0	NO
13) Car pool lanes	NO	YES	NO	NO	NO
14) Alternatively fueled city vehicles	YES	YES	0	YES	YES
15) Bicycle rider ship program	NO	YES	0	0	YES
16) Curbside recycling program	YES	YES	YES	YES	YES
17) Industrial recycling	NO	NO	NO	NO	NO
18) Hazardous waste recycling	NO	YES	0	NO	YES
19) Air pollution reduction program	NO	YES	NO	0	NO
20) Recycled product purchasing	YES	NO	0	NO	NO
21) Superfund site	NO	NO	NO	NO	YES
22) Asbestos abatement program	YES	YES	0	YES	YES
23)Lead paint abatement program	YES	YES	YES	YES	YES

	WORCESTER, MA	HARTFORD, CT	MANCHESTER, NH	SPRINGFIELD, MA	PROVIDENCE, RI
INDICATOR/POLICY					
24) Green building program	YES	YES	NO	YES	NO
25) City government commitment renewable energy use	YES	NO	NO	0	YES
26) Energy conservation effort	YES	YES	0	YES	0
27) Alternative energy offered to consumers	YES	YES	YES	0	YES
28) Water conservation program	0	YES	YES	0	NO
29) Single government/nonprofit agency responsible	NO	YES	NO	NO	YES
30) Sustainability part of a citywide comprehensive plan	NO	YES	YES	NO	YES
31) Involvement of city council	NO	YES	YES	0	0
32) Involvement of mayor or chief executive officer	NO	YES	YES	0	YES
33) Involvement of the business community	NO	YES	0	0	0
34) Involvement of general public	NO	YES	YES	0	YES

Table 7 gives the total number of Yes, No, and unavailable answers for each city. Worcester scores somewhat lower than its competitors. Hartford has by far the most Yes answers with 24 out of 34. Providence is has 17 Yes answers. Manchester has 14 Yes answers although the true score may be higher since 9 indicators are missing data. Worcester scores 13 with only one indicators missing data. Springfield scored 10, but 16 indicators were missing data.

Table 7: Totals by City

	Worcester	Hartford	Manchester	Springfield	Providence
Number of YES	13	24	14	10	17
Number of NO	20	10	11	8	14
Number of No Data	1	0	9	16	3

As seen in *Table 7* a significant amount of data was unavailable. *Table 8* illustrates how many cities we found data from for each indicator, sorted from most data available to least. Thirteen indicators had data available for all five cities, 26 indicators had data for at least four cities, seven indicators had data available for only three cities and one indicator had data for only two cities.

Table 8: Availability of Data by Indicator

Indicator Number	Total Responses	Yes	No
16) Curbside recycling program	5	5	0
23)Lead paint abatement program	5	5	0
5) Cluster zoning	5	4	1
11) Operation of public transit	5	5	0
21) Superfund site	5	1	4
24) Green building program	5	3	2
30) Is sustainability part of a citywide comprehensive plan	5	3	2
7) Brownfield redevelopment	5	4	1
8) Zoning/environmentally sensitive growth areas	5	5	0
9) Comprehensive land use plan	5	2	3
13) Car pool lanes	5	1	4
17) Industrial recycling	5	0	5
29) Single gov/nonprofit agency responsible	5	2	3
18) Hazardous waste recycling	4	2	2
1) Indicators project	4	2	2
2) Indicators progress report	4	1	3
3) Indicators action plan	4	1	3
20) Recycled product purchasing	4	1	3
22) Asbestos abatement program	4	4	0
34) General public involvement in sustainable cities initiative	4	3	1
4) Eco-industrial park	4	0	4
14) Alternatively fueled city vehicles	4	4	0
19) Air pollution reduction program	4	1	3
25) Renewable energy use	4	2	2
27) Alternative energy offered	4	4	0
10) Tax incentives	4	0	4

Indicator Number	Total Responses	Yes	No
32) Involvement of mayor or chief executive officer	3	2	1
6) Eco-village	3	0	3
12) Limits on downtown parking spaces	3	0	3
26) Energy conservation effort	3	3	0
31) Involvement of city/county/metropolitan council	3	2	1
15) Bicycle ridership program	3	2	1
28) Water conservation program	3	2	1
33) Involvement of the business community	2	1	1

Table 9 lists the six indicators where Worcester's answer is "no" and at least 2 other cities answer "yes". It also gives the number of cities other than Worcester that answered yes. There were no cases where Worcester lacked a program that all four other cities did have.

Table 9: Worcester's Gaps Compared to Other Cities

Indicator Number Where Worcester answered No	Number of Cities That Answered YES
30) Comprehensive plan	3
32) Involvement of mayor	3
34) Involvement of public	3
1) Sustainability indicators	2
9) Land use plan	2
31) Involvement of city council	2
15) Bicycle ridership program	2
18) Hazardous waste recycling	2
29) Single agency	2

Table 10 is a results grid that contains Portney's results along with our results for Worcester.

It is important to note that Portney did not cite operational definitions; therefore he may not have used the same ones we used. Portney's chosen cities are significantly larger than Worcester and were selected for having sustainability plans. His study was completed in 2003 while ours was completed in 2006.

Table 10: Worcester Compared to Portney's Selected Cities

City	Score	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Seattle	30	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Boulder	26	Y	Y	Y	N	Y	N	N	Y	Y	N	Y	N	N	Y	Y	Y	Y
San Jose	26	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y
Scottsdale	26	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y
Portland	25	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	N	Y	N	Y	Y
Santa Monica	25	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y
San Francisco	23	Y	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Tampa	19	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N	Y	Y	Y	Y
Chattanooga	18	Y	N	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	N	Y	Y
Tucson	18	Y	N	Y	N	Y	N	Y	Y	Y	N	Y	N	N	N	Y	Y	Y
Austin	17	Y	Y	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	Y	Y	N
Jacksonville	15	Y	Y	N	N	Y	N	Y	Y	Y	N	Y	N	N	Y	N	Y	Y
Phoenix	15	N	N	N	N	Y	N	Y	Y	Y	N	Y	N	N	Y	Y	Y	N
Boston	14	Y	Y	N	N	Y	N	Y	N	N	N	Y	Y	N	N	N	Y	Y
Brookline	14	Y	N	Y	N	Y	N	N	Y	Y	N	N	Y	N	N	Y	Y	N
Cambridge	14	Y	N	N	N	Y	N	Y	Y	Y	N	N	Y	N	N	Y	Y	N
Cleveland	14	Y	N	N	Y	N	Y	Y	N	N	N	Y	N	N	Y	N	Y	Y
Worcester	13	N	N	N	N	Y	N	Y	Y	N	N	Y	N	N	Y	N	Y	N
Orlando	11	N	N	N	N	Y	N	N	Y	Y	N	Y	N	N	Y	Y	Y	N
Santa Barbara	10	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	Y	Y	Y	N
Indianapolis	9	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	Y	N
New Haven	8	N	N	N	N	Y	N	N	N	Y	N	Y	N	N	N	N	Y	N
Olympia	8	Y	Y	Y	N	Y	N	N	N	N	N	Y	N	N	N	N	Y	N
Brownsville	7	N	N	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N
Milwaukee	6	N	N	N	N	N	N	Y	N	N	N	Y	N	Y	N	N	Y	N

Table 11: Worcester Compared to Portney's Selected Cities (cont)

City	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Seattle	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Boulder	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
San Jose	Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Scottsdale	Y	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Portland	Y	Y	Y	N	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Santa Monica	Y	N	Y	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
San Francisco	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	N	Y
Tampa	N	N	N	N	N	N	N	Y	Y	N	Y	Y	Y	N	N	Y	Y
Chattanooga	Y	Y	N	Y	N	N	N	N	N	Y	Y	N	N	Y	N	Y	Y
Tucson	Y	N	N	N	N	N	N	N	Y	N	Y	N	Y	Y	Y	Y	Y
Austin	N	Y	N	N	N	N	Y	Y	N	Y	Y	Y	Y	N	N	N	N
Jacksonville	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	Y	Y
Phoenix	Y	Y	Y	N	Y	N	N	N	N	N	Y	Y	Y	N	N	N	N
Boston	Y	N	N	Y	N	Y	N	N	N	N	Y	Y	N	N	N	N	Y
Brookline	N	N	Y	N	N	N	N	Y	N	N	Y	Y	Y	N	N	N	Y
Cambridge	N	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	Y
Cleveland	Y	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	Y	Y
Worcester	N	N	Y	N	Y	Y	Y	Y	Y	Y	?	N	N	N	N	N	N
Orlando	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	Y
Santa Barbara	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y
Indianapolis	Y	Y	N	N	Y	N	N	N	N	N	Y	Y	N	N	N	N	Y
New Haven	N	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	Y	Y
Olympia	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y
Brownsville	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	Y	N
Milwaukee	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y

In Depth Analysis

We investigated the following indicators selected by our sponsor agency.

1. Is there a single governmental/nonprofit agency responsible for implementing sustainability?
2. Does the city use zoning to delineate environmentally sensitive areas?
3. Has the city government committed to using renewable energy?
4. Does the city have any green building policies?
5. Does the city allow cluster development?
6. Does the city have a comprehensive land use plan updated within the last five years that includes sustainability?

For each indicator we analyzed Worcester's current position, presented policies from other cities and made recommendations for Worcester.

1. Is there a Single governmental/nonprofit agency responsible for implementing sustainability?

Importance: Having an agency responsible for sustainability makes the effort more organized. If sustainability initiatives were assigned piecemeal to existing agencies then it would be more likely for them to be neglected since the agency already has other priorities. In addition, sustainability efforts often cut across traditional department boundaries. Without central coordination some efforts will prove difficult to implement.

Presence in Worcester: N

Competitive standing: Average

Details: Hartford and Providence each have an agency charged with implementing sustainability; both are part of the US EPA Urban Environmental Program (UEP) in New England. The UEP works with the city government to analyze the city's needs and help organize sustainability initiatives. Worcester does not have an agency charged with implementing sustainability; it only has a few groups charged with implementing specific areas of sustainability. These include an energy task force, a land use subcommittee, and a brown fields roundtable. Neither Springfield nor Manchester has a single agency to implement sustainability.

Innovative practices: We selected three model cities to represent three different methods of managing sustainability.

1. Create a new agency

San Francisco's sustainability initiative resulted in the creation of a Department of the Environment. The older environmental agencies still played a role however, including The City Planning Department, the Bureau of Energy Conservation, the Recreation and Park Department, and the Solid Waste Management Program

http://www.sustainable-city.org/Plan/Intro/intro.htm

2. Merge existing agencies

In Portland, Oregon the Office of Sustainable Development (OSD) was created in September 2000 by merging the Solid Waste & Recycling Division, previously part of the Bureau of Environmental Services, with the Energy Office, which housed the City's energy and green building programs and staffed the Sustainable Development Commission. OSD currently has a staff of about 40. They provide a website that includes listings of the sustainability activities performed by other departments. They have 4 advisory groups: Food Policy Council, Peak Oil Task Force, Solid Waste Advisory Committee, Sustainable Development Commission.

http://www.portlandonline.com/osd/

3. Task force/committee

Santa Monica, CA uses a variety of forums to encourage sustainability. Santa Monica has an Environmental Programs Division (EPD) charged specifically with implementing sustainability; however, Santa Monica's Sustainable City Coordinator, Shannon Parry believes that the city's Sustainable City Task Force and Sustainable City Advisory Committee could potentially operate in a city without an EPD.

The city informs its sustainability efforts with broad input. It has a Sustainable City Task Force, a panel of 11 members appointed by the City Council with specific expertise in one or more of the following areas: Planning, Housing, Recreation and Parks, Social Services, Environmental Policy, Education and Health care. The task force is required to represent stakeholders in Business, Labor, and Neighborhoods. The task force meets once a month for 3 hours.

In addition the city has a Sustainable City Advisory Team which includes at least one representative from each city department, about 30 people total. The advisory team meets once a quarter for 3 hours.
(http://www.smgov.net/epd/scp/governance.htm and interview with Shannon Parry)

2. Does the city use zoning to delineate environmentally sensitive areas?

Importance: Environmentally sensitive growth areas are those which would be more negatively impacted by development than would most other areas. Cities and towns can use zoning to ensure that these areas are either undeveloped, or developed more cautiously than other areas. Environmentally sensitive zoning can reduce risk of flood damage, prevent water contamination and preserve valuable wetland habits.

Presence in Worcester: Y

Competitive Standing: Strong

Details: Springfield (Springfield Zoning Ordinances), Hartford (http://www.cga.ct.gov/2000/rpt/olr/htm/2000-r-0692.htm) and Worcester all require a 100 foot wetland setback. Manchester requires a 25 foot setback from protected wetland areas (Manchester Zoning Ordinances) and Providence follows the Rhode Island required wetlands setback of 50 feet (http://www.crmc.state.ri.us/calendar/agendas/semi112205.html 4.d.8).

Every city had a floodplain district with similar regulations to those of Worcester. Each city defines the boundaries of the floodplain district by using the most recent Flood Insurance Rate Map defined by the Federal Emergency Management Agency (FEMA). This district is the area which is most likely to be affected in a flood. Providence and Manchester have conservation districts and Worcester has open space zoning which limit what activities can take place in the area. Worcester is the only city that has a water resource protection overlay district.

Worcester zoning ordinances protect the following environmentally sensitive areas: Floodplain Overlay District (FOD), Water Resources Protection Overlay District (WRPOD) and wetlands. The FOD designates areas prone to flooding and is protected by Article VI of Worcester's Zoning Ordinance which aims to minimize the environmental impacts of construction in this area. In order for construction to take place it must follow specific regulations and the owners of the proposed building must show that the construction will not increase flood heights, increase flood velocity, be a threat to

public safety, cause public expense or create nuisances. WRPOD protects areas which are potential sources of drinking water for the city by requiring a special application for construction or excavating in this area, limiting the amount of impervious surfaces in the area, and limiting the amount of potentially harmful material that is used or stored in the district. (Article XII Worcester Zoning Ordinance)

Worcester's 100 foot wetlands setback applies to all type of wetlands, including freshwater wetland, bordering vegetated wetland, marsh, wet meadow, bog or swamp, any bank, lake, river, pond, or stream; any land under said waters; any land subject to flooding; or within one hundred feet of any existing or proposed inlet to any storm drain, catch basin, or other storm drain system component discharging to any lake, pond, river, stream, or wetland. (Worcester Wetland Protection Ordinance, Section 2)

3. Has the city government committed to using renewable energy?

Importance: Renewable energy is energy such as windpower, solar energy, or biomass that will not be depleted with use. It is also cleaner than energy from fossil fuels because it does not produce as much air pollution. The air pollution created by fossil fuels causes illness and increases the levels of greenhouse gases in the atmosphere which cause global climate change that could be very harmful in certain areas of the world. A city government that uses renewable energy shows that it is doing its part to slow global climate change. It also sets a good example for its citizens and makes renewable energy more accessible to them by creating a demand for it. The city is prepared for the future when fossil fuels become more scarce and expensive and eventually unobtainable.

Presence in Worcester:

Competitive standing: Strong

Details: The city of Worcester was the first city in Massachusetts to become a member of the 20% by 2010 campaign. This campaign is a pledge for the city as an organization to obtain 20% of its energy from renewable resources. Worcester created an Energy Task Force to write a Climate Action Plan with recommendations on how the city will meet its renewable energy goal. The Climate Action Plan makes a number of recommendations for how the city can conserve energy, use renewable energy, and encourage residents to use renewable energy. One of its recommendations in the area of

renewable energy use by government is to purchase $25,000 of Renewable Energy Certificates (RECs).RECs are receipts from the electric company certifying the purchased energy was from a renewable source. The plan is still in the drafting process and Worcester has not yet implemented any task force recommendations. (Climate Action Plan, 53-59)

4. Does the city have any green building policies?

Importance: Green building is when buildings are designed with environmentally friendly features. This can be done in many different ways such as improving energy efficiency, water efficiency or indoor air quality. In addition to helping the environment, many green building techniques save money and improve the health of the occupants. The most recognized green building certification is LEED (Leadership in Energy and Design) certification, issued by the United States Green Building Council (USBGC). A city can promote green building through requirements, incentives, or education.

Presence in Worcester: Y

Competitive Standing: Strong

Details: Worcester and Springfield follow the green building requirements set by the state of Massachusetts for all new municipal buildings. In Hartford there are no laws requiring municipal buildings to be LEED certified but the Department of Public Works requires it for some projects. Manchester has no green building policy. Providence does not have any requirements but the city is working to pass green building legislation.

In August the state of Massachusetts passed legislation that requires municipal buildings over 20,000 to be LEED certified and attain specific criteria such as energy performance exceeding Massachusetts Energy code requirements by 20%. Smaller buildings are required to exceed energy code by 20% but do not need to be LEED certified. These laws apply to new construction and major renovations of municipal buildings.

This policy increases the initial cost of a new municipal building but reduces long term costs. A report posted by the USGBC analyzed 33 LEED projects in order to determine the cost benefits of building green. The buildings analyzed included 25 office buildings and 8 schools. They estimated the cost of normal building techniques by

comparing each to buildings of similar size and in the same region. They proceeded to determine the additional cost of building green. After an in-depth cost analysis of the building including electricity, water, heat, and maintenance it was determined that over the lifetime of a building the return for building green is ten times the additional cost. This means that if the additional cost is $100,000 then the return over the lifetime of the building is $1 million (http://www.usgbc.org/Docs/News/News477.pdf).

Kats, Greg. (2003). *The Cost and Financial Benefits of Green Buildings.* http://www.usgbc.org/Docs/News/News477.pdf.

Innovative practices: A leader in the Green Building field is Scottsdale, AZ. All municipal buildings of over 5,000 sq. feet in size that are constructed must LEED Silver Certified (http://www.scottsdaleaz.gov/greenbuilding/Reports/0304ProgressRpt.pdf). In addition, Scottsdale offers incentives to designers and builders. One major incentive is fast track plan review. The government agrees to evaluate green building designs in half of the maximum time allowed for buildings that are not green. Scottsdale also provides information brochures to homeowners, and promotional packages for designers/builders (http://www.scottsdaleaz.gov/greenbuilding/Incentives.asp).

Green building design can be applied to renovating older buildings. The first priority is usually improving the lighting and plumbing because this step generates a lot of savings for a relatively small investment. Replacing old inefficient appliances with newer Energy Star approved appliances is also recommended. If a complete renovation is taking place then the windows should be replaced and new insulation should be installed. There are numerous possibilities in this area including installation of solar panels, improved irrigation for outdoor greenery, heat pumps, and motion sensors for lights. The selection of green improvements depends on the site and on the resources available. (http://www.inq7.net/globalnation/sec_prf/2004/dec/15-03.htm).

Global Nation. (2004). *For Green Buildings, New is not Necessarily Better.* http://www.inq7.net/globalnation/sec_prf/2004/dec/15-03.htm.

5. Does the city allow cluster development?

Importance: A cluster development is a parcel of land with buildings concentrated together in specific areas while the remainder of the parcel is preserved as open space. It minimizes infrastructure costs such as roads, preserves continuous open space, and encourages a more close-knit community. Cluster development can benefit developers, city government, and current and future citizens. Developers save money on building private roads and other infrastructure and may be able to make homes more marketable due to the surrounding natural features. The city government saves money on infrastructure such as any public roads and becomes more attractive due to open space. Current citizens may see their property value rise due to proximity of open space. Future citizens of the cluster development will have a more close-knit community and better access to the environmentally valuable areas.

Presence in Worcester: Y

Competitive Standing: Average

Details: Providence does not allow cluster development. Worcester and Springfield allow cluster zoning by special permit, but Springfield is not as flexible about the dimensional requirements. Hartford and Manchester allow cluster zoning but their regulations refer to planned developments. Planned development allows houses to be closer together while requiring that the remaining land is commonly owned by all residents of the development. This land is not required to be open space, it could also be open space but it could be designated for other community use. A cluster development is permitted under planned development regulation.

Cluster development in Worcester requires a site plan approval, as does conventional development; however, cluster development requires a special permit in addition. The number of lots allowed is only 75% of the number that would be allowed in a conventional development. The size and dimensions of the lots are flexible; the only requirement is that the lot be at least 50% of the size of conventional lots.

Innovative practices: The Massachusetts Office of Commonwealth Development (MOCD) is an excellent source of information on cluster development which the MOCD refers to as Open Space Residential Development (OSRD). According to the MOCD one of the most important ways for a city to promote cluster development is by having clearly

written, flexible bylaws. The bylaws should borrow from existing development bylaws in order to minimize additional requirement on developers.

This sentiment is echoed by Jeffrey Rhuda, Business Development Manager at Symes Associates. He prefers to build cluster developments because they cost less to build and appeal to buyers. However, several times he has chosen to build a conventional development because the city's permitting process for cluster development was so difficult that a cluster development would no longer be more profitable than the alternative.

6. Does the city have a land use plan updated within last 5 years that includes sustainability?

Importance: Land use plan provides a written record of a city's vision and provides guiding principles for future land use policy decisions.

Presence in Worcester: N

Competitive Standing: Average

Details: Worcester, Manchester and Springfield do not have updated land use plans. Providence has an extensive land use plan, but it only contains a few sustainability related principles. Hartford's plan is still in progress and it includes a few sustainability issues.

In 2004, Providence Mayor David Cicilline commissioned a study of the greater downtown area to create a vision for Providence in the year 2020. This vision included BIKE Providence, which includes plans to build extensive bike routes that provide direct access to and from downtown Providence, neighborhoods in the city, and state bikeways. Implementation of BIKE Providence was made possible through funding from the Rhode Island Department of Transportation. Hartford's plan is still in progress but a major topic of discussion has been facilitating transportation between the different parks in the city.

Worcester has an outdated comprehensive land use plan from1987 which includes a vision of a "greenway" in Worcester. A greenway is a city street enhanced to provide a pleasant environment for pedestrians and cycling. The intended area of the greenway has since been developed but the greenway concept could be applied in other areas of Worcester. The Worcester plan also includes ideas about cluster or planned unit development which provides more open space and increases property planning. "Green

Belting" the city was another option the city planning looked at, which links the city's open parks to one another with walking trails and bike paths.

Innovative Practices: In 2006, the city of Santa Barbara, California published its first annual Sustainable City Program Report. This report presents the city's current sustainable practices along with plans for further efforts. It covers transportation, green building, energy conservation, waste reduction, urban design, and environmental health.

Santa Barbara already had many sustainable practices in place before the completion of the report. Highlights include:

- ***Urban Design Guidelines*** that encourage development that: is compatible with the existing environment, creates and maintains pedestrian facilities and amenities, locates transit facilities to promote alternative transportation, and encourages the provision of bicycle facilities .
- ***Bicycle Master Plan*** to give guidance to the development of the physical bicycle system as well as biking education, promotion, enforcement, public policy, and information distribution.
- ***Central irrigation management*** allows the city to adjust irrigation schedules for its public parks via computer using real-time weather data

More ideas from Santa Monica can be found at:
http://www.santabarbaraca.gov/Documents/Sustainable_City_Program_Reports/01_Annual_Reports/2006_Sustainable_City_Program_-_1st_Annual_Report_January_2006.pdf

Conclusions/Recommendations

Overall, our study showed that Worcester's set of sustainability policies are about as complete as those of Providence. However, both cities lag behind Hartford significantly. Springfield and Providence were missing too much data for comparison of total scores to be relevant. The second stage of our study was an in depth analysis of six of the original 34 indicators. The six indicators were:

1. Is there a single governmental/nonprofit agency responsible for implementing sustainability?
2. Does the city use zoning to delineate environmentally sensitive areas?
3. Has the city government committed to using renewable energy?
4. Does the city have any green building policies?
5. Does the city allow cluster development?
6. Does the city have a land use plan updated within the last five years that includes sustainability?

For each of these we looked at Worcester's strengths and gaps compared with its competitors and with cities across America that are leaders in sustainability. Finally, in this section of our report we offer recommendations for each of the six indicators.

1. Single Agency

Strengths: Worcester has groups that oversee certain areas of sustainability including an energy task force, a land use subcommittee, and a brownfields roundtable. Worcester used to have a part-time energy officer and is currently looking for someone to fill the position.

Gaps: Worcester does not have any group that oversees sustainability. Hartford and Providence each have a group that oversees sustainability but in both cases this group is part of the EPA; it was not produced by the city's own initiative.

Recommendations:

We recommend that Worcester start a sustainability task force of volunteers from the community and government, form a sustainability committee with members of government agencies, hire a sustainability officer, and make a sustainability section of the

Worcester website. This may not strictly qualify as a "single agency" but it serves the purpose of coordinating Worcester's sustainability effort. We chose this option because it is more cost efficient than creating a new agency and it is appropriate for a medium size city. The committee helps keep sustainability on the agenda for various city departments, the task force involves the community and may take some of the workload off of city employees, the sustainability officer coordinates the groups and the website helps publicize Worcester's sustainability. Any of these suggestions can also be taken piecemeal.

The first task for any sustainability group that Worcester creates is to find out what sustainability means to the community; the next task is to formulate a sustainability plan. This plan should "start small" with a small set of indicators which are easy to find data on. Once the community sees success it will be easier to expand the sustainability plan (phone interview with Shannon Parry).

If the city chooses to form a Task Force it should follow Santa Monica's example of including sustainability subject matter experts as well as stakeholders from business, labor, and neighborhood sectors (http://www.smgov.net/epd/scp/governance.htm). If the city chooses to form an Advisory Committee, it should include members who are in positions of authority in the department as well as those who are environmental champions by nature (phone interview with Shannon Parry).

A sustainability webpage would be beneficial to Worcester as a medium of informing the community and getting citizens involved in sustainability. Creating this webpage is a potential Interactive Qualifying Project (IQP) for a WPI student.

2. Zoning used to delineate environmentally sensitive growth areas

Strengths: Worcester has a floodplain overlay district, a water resources protection overlay district and wetlands protection setbacks. For this indicator, Worcester meets, and in some cases exceeds, the regulations of the competitor cities. Worcester, Springfield and Providence all require a 100 foot wetland setback, Hartford required 50 feet and Manchester required 25 feet. Worcester was the only city in the study with a water resource protection district.

Gaps: The policies do not apply to land uses that began before the policies were enacted. The policies may not always be enforced. The city of Worcester plans to conduct a study on the current uses occurring in the Water Resource Protection Overlay District and compare them with the permitted uses.

Recommendations: We do not recommend any further policy action at this time. Worcester has suitable policies in place. The major challenge is enforcement, upon which Worcester has a study in progress.

3. Renewable energy use by city government

Strengths: Worcester has committed to having its city government run on at least 20% renewable energy by 2010. An energy task force has been created to implement this plan and has produced a climate action plan draft. Providence is also part of the 20% by 2010 campaign. None of the other competitors use renewable energy or have committed to using it in the future.

Gaps: Worcester has not yet approved or implemented any task force recommendations.

Recommendations: We recommend that the city of Worcester follow up on the recommendations by the Energy Task Force.

4. Green building

Strengths: Massachusetts state law requires new municipal buildings to exceed Massachusetts energy code by 20% and buildings over 20,000 sq. feet to be LEED certified. The competitors outside Massachusetts do not have green building policies.

Gaps: Private buildings do not have green building requirements, nor are they given incentives by the city. There is no program for making existing municipal buildings or offices greener.

Recommendations: Worcester can promote green building in a variety of ways. We recommend that Worcester implement retrofitting measures to make existing municipal buildings greener. The specific retrofitting measures employed will depend upon the current state of the building, the funding available and whether a major renovation is occurring. We recommend further study into the possibility of offering expedited permit process for green buildings. This study would have to investigate the current permit

process and the rationale behind it in order to identify feasible methods of facilitating the process for developers of green buildings.

5. Cluster zoning

Strengths: Worcester permits cluster zoning. Manchester and Hartford also permit it; Providence does not but claims that cluster zoning is unnecessary because the city is already compact. One of the features of Worcester's cluster zoning policy that appeals to developers is the flexible lot sizes. A lot can have any dimensions so long as it is at least 50% of the conventional minimum lot size.

Gaps: Cluster zoning is not often used in Worcester. Worcester has had only a few cluster developments in the past years (Lara Bold, Planner for Worcester) while Manchester has had a few has had at least 2 dozen applications for Planned Unit Developments. Planned Unit Developments have the lot size flexibility of cluster development however, the developer is not required to have a minimum amount of open space. (phone interview with Louise Donington, Planner for Manchester). One of the features that makes Worcester's cluster zoning policy less appealing to developers is that the number of houses allowed on a given plot is 75% of what would be allowed under conventional zoning.

Recommendations: In order to encourage cluster development, Worcester's cluster zoning ordinances should be changed to allow the same number of lots in a cluster development than would be allowed in a conventional development. We recommend that Worcester give priority to meeting with developers before application is submitted and facilitating the application process. More detailed recommendations are provided in the Massachusetts Office of Commonwealth Development's smart growth toolkit. The Office of Commonwealth Development has made a study of successful cluster zoning (which they refer to as "open space residential design") ordinances in order to provide sample bylaws and other useful information. The smart growth toolkit can be found at http://www.mass.gov/envir/smart_growth_toolkit/pages/mod-osrd.html.

6. Land use plan including sustainability

Strengths: Worcester has a land use plan, although it was last updated in 1987.

Gaps: Worcester does not have a recent land use plan while Providence and Hartford do.

Recommendations: We recommend that Worcester updates its land use plan. The 1987 plan includes some aspects of sustainability such as greenways and cluster development so we recommend keeping these where relevant and giving sustainability an even larger role in the new plan. There are numerous areas of sustainability that could be covered in the plan; choosing those most suitable for Worcester requires further study and community input. The 1987 plan serves more as a vision than a concrete plan, so we would like to make the updated plan more action oriented where possible.

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Appendix 2: Potential Data Sources

Economy

United States

- Department of Commerce
  - Bureau of the Census
  - Bureau of Economic Analysis
  - Bureau of Labor Statistics
- Department of Labor
- Federal Small Business Administration

State

- Bureau of Labor and Industries
- Department of Consumer and Business Services
- Department of Employment Security
- Department of Revenue
- Employment Department: Childcare Division
- Manufacturers' Guide
- Office of Minority, Women, and Small Businesses
- Office of Tourism

Local

- Local Chamber of Commerce
- Local Economic Development Council
- Local Food Banks
- Local Shelters
- Mayor's or Town Manager's Office
- Town or City Finance Department

Education

United States

- Department of Education
- Department of Labor

State

- Department of Education
- System of Higher Education

Local

- Board of Education
- Colleges and Universities
- School Superintendent's Office

Environment

United States

- Department of Agriculture
- National Resources Inventory
- Soil Conservation Services
- Department of Energy

Environmental Protection Agency
Forest Service
National Forest Health Monitoring Program

State

Department of Agriculture
Department of Environmental Quality
Department of Fish and Wildlife
Department of Forestry
Department of Land Conservation
Department of Natural Resources
Department of Parks and Recreation
Department of Water Resources
Division of State Lands
State Emergency Response Commission

Local

Environmental organizations
Audubon Society - annual species count
Local Emergency Planning Committee

Government

State

Economic Development Department
Election Commission
Secretary of State
Tax Commission

Local

Town or City Registrar
Town or City Annual Reports
Town, City or County Clerk
League of Women Voters

Health

United States

Centers for Disease Control

State

Department of Human Resources

Local

Public Health Department

Housing

United States

Department of Commerce, Bureau of the Census
Department of Housing and Urban Development

State

Department of Housing and Community Service
Planning Commission, Planning Board, Planning Office

Population Surveys
Social and Health Services

Local

Community Development Department
Department of Buildings and Inspections
Health Inspector
Housing Department
Public Health Office

Population

United States

Department of Commerce, Bureau of the Census

State

Data Center
Planning Commission, Planning Board, Planning Office

Local

City Planning Department
Town, City or County Clerk
Community Development Office

Public Safety

State

State Attorney General's Office
State Police Department

Local

Department of Public Health
Local Police and Fire Department

Recreation

State

Department of Parks and Recreation

Local

Department of Parks and Recreation
Parks and Recreation Advisory Board

Resource Use

United States

Department of Energy
Environmental Protection Agency

State

Department of Environmental Protection
Department of Natural Resources
Department of Revenue

Local

Department of Public Utilities

Department of Public Works
Utility Companies

Society

State

Department of Corrections
Department of Justice
Child Support Enforcement Division
Office of Alcohol and Drug Abuse Programs
Senior and Disabled Services Division
State Arts Commission
State Library

Local

Community Service Department
Department of Youth Services
Public library

Transportation

United States

Department of Transportation

State

Department of Motor Vehicles
Department of Transportation
Port Authority
State Police Department

Local

Metropolitan Transit Authority
Police Department

Appendix 3

INDICATOR #	INDICATOR DESCRIPTION	OPERATIONAL DEFINITION
1	Indicators project active in last five years	Does the city have an indicators project active within the last 5 years?
2	Indicators progress report in last five years	Has the city produced an indicators progress report in last five years ?
3	Indicators project includes "action plan" of policies/programs	Does indicators project include "action plan" of policies/programs?
4	Eco- Industrial Park	Is there an eco-industrial park within the city limits?
*5	Cluster zoning	Does the city allow cluster development?
6	Eco-village project or program	Is there a self-described ecovillage within city limits?
7	Brownfield redevelopment (project or pilot project)	Has the city worked on brownfield redevelopment in any way?
*8	Zoning used to delineate environmentally sensitive growth areas	Is zoning used to delineate environmentally sensitive growth areas?
*9	Comprehensive land use plan that includes environmental issues within the last 5 years	Does the city have a land use plan that includes sustainability, updated within the last 5 years?

INDICATOR #	INDICATOR DESCRIPTION	OPERATIONAL DEFINITION
10	Tax incentives for environmentally friendly development	Does the city offer tax incentives for any type of environmentally friendly development?
11	Operation of public transit (buses and/or trains)	Is there intra-city public transit?
12	Limits on downtown parking spaces	Is there any limit on the number of parking spaces in an area?
13	Car pool lanes (diamond lanes)	Are there car pool lanes within city limits?
14	Alternatively fueled city vehicle program	Does the city government own alternatively fueled vehicles?
15	Bicycle rider ship program	Does the city have an organized program to promote bicycle ridership?
16	curbside recycling program	Does the city offer curbside recycling pickup?
17	Industrial recycling	Does the city government offer industrial recycling?
18	Hazardous waste recycling	Does the city government offer hazardous waste recycling?
19	Air pollution reduction program (i.e. VOC reduction)	Is there an air pollution reduction program (not included within the other indicators)?
20	Recycled product purchasing by city government	Does the city have any policies promoting government purchase of recycled products?
21	Superfund site remediation	Is there a superfund site within the city limits?

INDICATOR #	INDICATOR DESCRIPTION	OPERATIONAL DEFINITION
22	Asbestos abatement program	Is there an asbestos abatement policy?
23	Lead paint abatement program	Is there a lead paint abatement policy?
*24	Green building program	Does the city have any kind of green building policy?
*25	Renewable energy use by city government	Has the city government officially committed to using renewable energy?
26	Energy conservation effort (other than Green building program)	Does the city have an energy conservation effort (not included within the other indicators)?
27	Alternative energy offered to consumers (solar, wind, biogas, etc.)	Can consumers in the city buy renewable energy?
28	Water conservation program	Is there a water conservation program?
*29	Single gov/nonprofit agency responsible for implementing sustainability	Is there a single government/nonprofit agency responsible for implementing sustainability?
*30	Is sustainability part of a citywide comprehensive plan	Is sustainability part of a citywide comprehensive plan (plan may include land use but must include other topics as well)?
31	Involvement of city/county/metropolitan council	Is city council involved in plans about sustainability?

INDICATOR #	INDICATOR DESCRIPTION	OPERATIONAL DEFINITION
32	Involvement of mayor or chief executive officer	Is mayor or chief executive officer involved in plans about sustainability?
33	Involvement of the business community (e.g. Chamber of Commerce)	Is the business community involved in plans about sustainability?
34	General public involvement in sustainable cities initiative (public hearings, "visioning" process, neighborhood groups or associations, etc.)	Is the general public involved in plans about sustainability?

	Worcester, MA	Hartford, CT	Manchester, NH	Springfield, MA	Providence, RI		# of YES	# of NO	# No Data
INDICATOR									
1) Indicators project	NO	YES	YES	0	NO		2	2	1
2) Indicators progress report	NO	NO	YES	0	NO		1	3	1
3) Indicators action plan	NO	NO	YES	0	NO		1	3	1
4) Eco-industrial park	NO	NO	NO	0	NO		0	4	1
*5) Cluster zoning	YES	YES	YES	YES	NO		4	1	0
6) Eco-village	NO	NO	0	0	NO		0	3	2
7) Brownfield redevelopment	YES	YES	NO	YES	YES		4	1	0
*8) Zoning/environmentally sensitive growth areas	YES	YES	YES	YES	YES		5	0	0
*9) Comprehensive land use plan last 5 years	NO	YES	NO	NO	YES		2	3	0

	Worcester, MA	Hartford, CT	Manchester, NH	Springfield, MA	Providence, RI		# of YES	# of NO	# No Data
INDICATOR									
10) Tax incentives	NO	NO	NO	0	NO		0	4	1
11) Operation of public transit	YES	YES	YES	YES	YES		5	0	0
12) Limits on downtown parking spaces	NO	NO	0	0	NO		0	3	2
13) Car pool lanes	NO	YES	NO	NO	NO		1	4	0
14) Alternatively fueled city vehicles	YES	YES	0	YES	YES		2	1	1
15) Bicycle rider ship program	NO	YES	0	0	YES		2	1	2
16) curbside recycling program	YES	YES	YES	YES	YES		5	0	0
17) Industrial recycling	NO	NO	NO	NO	NO		0	5	0
18) Hazardous waste recycling	NO	YES	0	NO	YES		2	2	1

	Worcester, MA	Hartford, CT	Manchester, NH	Springfield, MA	Providence, RI		# of YES	# of NO	# No Data
INDICATOR									
19) Air pollution reduction program	NO	YES	NO	0	NO		1	3	1
20) Recycled product purchasing	YES	NO	0	NO	NO		1	3	1
21) Superfund site	NO	NO	NO	NO	YES		1	4	0
22) Asbestos abatement program	YES	YES	0	YES	YES		4	0	1
23)Lead paint abatement program	YES	YES	YES	YES	YES		5	0	0
*24) Green building program	YES	YES	NO	YES	NO		3	2	0
*25) Renewable energy use	YES	NO	NO	0	YES		2	2	1
26) Energy conservation effort	YES	YES	0	YES	0		3	0	2

	Worcester, MA	Hartford, CT	Manchester, NH	Springfield, MA	Providence, RI		# of YES	# of NO	# No Data
INDICATOR									
27) Alternative energy offered to consumers	YES	YES	YES	0	YES		2	0	1
28) Water conservation program	0	YES	YES	0	NO		2	1	2
*29) Single gov/nonprofit agency responsible	NO	YES	NO	NO	YES		2	3	0
*30) Is sustainability part of a citywide comprehensive plan	NO	YES	YES	NO	YES		3	2	0
31) Involvement of city/county/metropolitan council	NO	YES	YES	0	0		2	1	2

	Worcester, MA	Hartford, CT	Manchester, NH	Springfield, MA	Providence, RI		# of YES	# of NO	# No Data
INDICATOR									
32) Involvement of mayor or chief executive officer	NO	YES	YES	0	YES		3	1	1
33) Involvement of the business community	NO	YES	0	0	0		1	1	3
34) General public involvement in sustainable cities initiative	NO	YES	YES	0	YES		3	1	1
Number of YES	13	24	14	10	17				
Number of NO	20	10	11	8	14				
Number of No Data	1	0	9	16	3				

CITY OF WORCESTER MASSACHUSETTS

INDICATOR	Y/N	EXCEPTIONS	CONTACT #	CONTACT NAME	JOB TITLE	WEB ADDRESS	NOTES
1) Indicators project	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
2) Indicators progress report	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
3) Indicators action plan	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
4) Eco-industrial park	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
*5) Cluster zoning	YES	YES statewide plan	(508)-799-1400 x232	Lara Bold	Planning Analyst	http://www.ci.worcester.ma.us/cco/ordinances/zoningord4291.pdf	cluster zoning not used very often
6) Eco-village	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
7) Brownfield redevelopment	YES		(508)-799-1400	Heather Kymex	Planning and Regulatory		Worcester has a specific layer for Brownfields within its GIS map structure which gives parcel size, location, and other information which might be important to developers
*8) Zoning/environmentally sensitive growth areas	YES	YES statewide plan	(508)-799-1400 x232	Lara Bold	Planning Analyst		wetlands setback ordinance, water resource protection overlay district and floodplain overlay district.
*9) Comprehensive land use plan active last 5 years	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
10) Tax incentives	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
11) Operation of public transit	YES		(508)-791-9782	Worcester Regional Transit Authority	Customer service	http://www.therta.com/	buses and trains

INDICATOR	Y/N	EXCEPTIONS	CONTACT #	CONTACT NAME	JOB TITLE	WEB ADDRESS	NOTES
12) Limits on downtown parking spaces	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
13) Car pool lanes	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
14) Alternatively fueled city vehicles	YES		(508)-799-1400 x232	Lara Bold	Planning Analyst		7 hybrid vehicles used/owned by DPW
15) Bicycle rider ship program	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
16) curbside recycling program	YES		(508)-929-1300	Customer Service	DPW	http://www.ci.worcester.ma.us /dpw/trash_recycling/bulk.htm	curbside recycling subcontracted to a waste management company
17) Industrial recycling	NO		(508) 799-1210	Code enforcement building department	Code enforcement building department		
18) Hazardous waste recycling	NO		(508)-929-1300	Customer Service	DPW		
19) Air pollution reduction program	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
20) Recycled product purchasing	YES			John Orrell			John Orrell was contacted through Lara Bold in the planning office
21) Superfund site	NO					http://www.epa.gov/superfund /sites/locate/index.htm	
22) Asbestos abatement program	YES		(508)-977-1198	Jospeh Mikielian	Director- code enforcement	http://www.ci.worcester.ma.us/	

INDICATOR	Y/N	EXCEPTIONS	CONTACT #	CONTACT NAME	JOB TITLE	WEB ADDRESS	NOTES
23)Lead paint abatement program	YES		(508)-977-1198	Jospeh Mikielian	Director- code enforcement	http://www.ci.worcester.ma.us/	
*24) Green building program	YES	YES statewide plan	(617) 727-2040	Thomas Trimarco	Secretary, Administration and Finance State House room 373	http://www.mass.gov/eoaf/docs/administrativebulletin12.doc	municipal buildings must exceed energy code by 20%, large buildings must be LEED certified
*25) Renewable energy use	YES					http://www.recworcester.org/cleanenergy/worcester.html	there is an action plan of 20% renewable energy by 2010, energy task force, climate action plan
26) Energy conservation effort	YES					http://www.ci.worcester.ma.us/ocm/energy/home.htm	
27) Alternative energy offered to consumers	YES	YES statewide plan				http://www.ci.worcester.ma.us/ocm/energy/home.htm	
28) Water conservation program							
*29) Single gov/nonprofit agency responsible	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
*30) Is sustainability part of a citywide comprehensive plan	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
31) Involvement of city/county/metropolitan council	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		

INDICATOR	Y/N	EXCEPTIONS	CONTACT #	CONTACT NAME	JOB TITLE	WEB ADDRESS	NOTES
32) Involvement of mayor or chief executive officer	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
33) Involvement of the business community	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		
34) General public involvement in sustainable cities initiative	NO		(508)-799-1400 x232	Lara Bold	Planning Analyst		

CITY OF PROVIDENCE RHODE ISLAND							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
1) Indicators project	NO		401-351-4300 x520	David Everett	Principal Planner		indicator project planned in the near future
2) Indicators progress report	NO		401-351-4300 x520	David Everett	Principal Planner		indicator project planned in the near future
3) Indicators action plan	NO		401-351-4300 x520	David Everett	Principal Planner		indicator project planned in the near future
4) Eco-industrial park	NO		401-351-4300 x520	David Everett	Principal Planner		
*5) Cluster zoning	NO		401-351-4300 x520	David Everett	Principal Planner		lot sizes are very small, and they already have multi-unit apartment housing
6) Eco-village	NO		401-351-4300 x520	David Everett	Principal Planner		
7) Brownfield redevelopment	YES		(401) 351-6440	Groundwork Providence		http://www.groundworkprovidence.org/brownfields.html	One of Providence's key programs is the Pawtucket/Providence Brownfields Job Training Program, funded through the US Environmental Protection Agency. The program provides a qualified workforce to established companies who are in the business of cleaning up brownfields sites for the purpose of reuse and economic development.
*8) Zoning/environmentally sensitive growth areas	YES					http://www.municode.com/resources/gateway.asp?pid=11458&sid=39	conservation district, wetland setback, flood plan overlay district, no structures allowed closer than 20' from coastal feature.

CITY OF PROVIDENCE RHODE ISLAND							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
*9) Comprehensive land use plan active last 5 years	YES		(401)-351-4300 x 609	Marica Brown	Administrative Assistant	http://www.providenceplanning.org/matriarch/MultiPiecePage.asp_Q_PageID_E_144_A_PageName_E_PlanningProjectsProvidence202	Providence 2020 includes BIKE Providence, future plans include environmental sustainability.
10) Tax incentives	NO		(401)-421-5900	John Gelati	Director, Tax Assessor		
11) Operation of public transit	YES		(401) 421-7740	Providence City Hall		http://www.providenceri.com/transportation/	Trains, buses
12) Limits on downtown parking spaces	NO		(401) 421-7740	Providence City Hall		http://www.providenceri.com/rpp/faq.php	
13) Car pool lanes	NO		(401) 784- 9500 ext 180	RIPTA			but they do have some car pool parking spots.
14) Alternatively fueled city vehicles	YES		(401) 421-7740	Providence City Hall		http://www.ripta.com/ OR http://www.ripta.com/schedules/index.php/section/70	RIPTA trackless trolley's are CNG fueled public transportation trolley's, (CNG = compressed natural gas) these are considered clean fuels. These trolleys have two lines in providence the gold line and the green line.

CITY OF PROVIDENCE RHODE ISLAND							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
15) Bicycle rider ship program	YES		(401) 421-7740	Providence City Hall		http://bikedowntown.org/bike/OnePiecePage.asp?PageID=123&PageName=AboutOverview	city council encourages people to ride their bike to work especially if they live 3-5 miles from their work place. In many cases it is faster, and alleviates downtown traffic. (although not passed yet) Currently a bill in congress says employers are to offer employees a $65 per month tax benefit if they ride their bike to work. Very extensive bike routes all over the city
16) curbside recycling program	YES		(401) 351-6440	Groundwork Providence		http://www.groundworkprovidence.org/recycle.html#Providence	the recycling participation rate is only 10%
17) Industrial recycling	NO		(401) 942-1430	DPW		http://www.providenceri.com/publicworks/	Only provide the number for a service to pick up the waste, service not provided by the city (401) 781-6340
18) Hazardous waste recycling	YES		(401) 942-1430	DPW			The City does have a service to pick up Haz Mat for residential use only, refrigerators, car batteries etc.
19) Air pollution reduction program	NO		401.351.4300 ext 521	Chris Ise	Principal Planner		there is no specific program, though this is a goal of the comprehensive plan specific to downtown auto emissions reduction.
20) Recycled product purchasing	NO		401.351.4300 ext 521	Chris Ise	Principal Planner		Providence uses some purchased recycled materials such as paper, however does not have a plan for sustainable use.

CITY OF PROVIDENCE RHODE ISLAND							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
21) Superfund site	YES			US EPA		http://www.epa.gov/superfund/sites/query/basic.htm	
22) Asbestos abatement program	YES		(401) 490-8880	Maria Alvarado		http://www.pcrn.info/?selected_menu=9920 OR malvarado@provplan.org	searchable resource network for Providence. The city has programs to help rid asbestos in homes and businesses
23)Lead paint abatement program	YES		(401) 490-8880	Maria Alvarado		http://www.pcrn.info/?selected_menu=9920 OR malvarado@provplan.org	searchable resource network for Providence
*24) Green building program	NO		401-351-4300 x520	David Everett	Principal Planner		Plans are in progress to have this policy in the near future
*25) Renewable energy use	YES		(401)-521-7477	City council office		http://www.providenceri.com/CityCouncil/article.php?id=48	member of 20% renewable energy by 2010 campaign. However RI as a state has pledged to do 16% renewable by 2020
26) Energy conservation effort	0		(401)-521-7477	City council office			
27) Alternative energy offered to consumers	YES					http://www.providenceri.com/CityCouncil/article.php?id=48	Based on the comprehensive plan including the 20% by 2010 we have concluded that renewable energy will be available to consumers

CITY OF PROVIDENCE RHODE ISLAND							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
28) Water conservation program	NO		401.351.4300 ext 521	Chris Ise	Principal Planner		There is encouragement and education but not a whole lot more. This may be addressed more directly with the rewrite of the plan
*29) Single gov/nonprofit agency responsible	YES					http://www.epa.gov/NE/eco/uep/provid/index.html	
*30) Is sustainability part of a citywide comprehensive plan	NO		401-351-4300 x520	David Everett	Principal Planner		likely to be a big part in future master plans
31) Involvement of city/county/metropolitan council							
32) Involvement of mayor or chief executive officer	YES					http://www.providenceplanning.org/matriarch/MultiPiecePage.asp_Q_PageID_E_144_A_PageName_E_PlanningProjectsProvidence202	
33) Involvement of the business community							

CITY OF PROVIDENCE RHODE ISLAND							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
34) General public involvement in sustainable cities initiative	YES		(401) 351-6440	Groundwork Providence		http://www.groundworkprovidence.org/eclubs.html OR http://www.providenceplanning.org/matriarch/MultiPiecePage.asp_Q_PageID_E_75_A_PageName_E_ProvidenceTomorrowCNPHOwInvolv	The goals of the E-Team Program are to employ high school youth as environmental educators and positive role models within their communities, and to teach young children about how to protect their environment and make it a clean and safe place to live and play.

CITY OF HARTFORD CONNECTICUT							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
1) Indicators project	YES		(617) 918-1552	Stacey Johnson-Pridgeon Connecticut Urban program Manager		http://www.epa.gov/Region1/eco/uep/hartford/index.html	UEP is currently supporting a data assessment project to identify and prioritize environmental issues in Hartford
2) Indicators progress report	NO					http://www.epa.gov/Region1/eco/uep/hartford/index.html	U.S Environmental Protection Agency
3) Indicators action plan	NO					http://www.epa.gov/Region1/eco/uep/hartford/index.html	U.S Environmental Protection Agency
4) Eco-industrial park	NO		860-757-9200	Dave Shoff	Urban Planner		
*5) Cluster zoning	YES					http://www.hartford.gov/Development/planning/pdf/regulations.pdf	zoning regulations allow planned developments
6) Eco-village	NO		860-757-9200	Dave Shoff	Urban Planner		
7) Brownfield redevelopment	YES					http://www.epa.gov/reg3hwmd/bfs/success/VA-cape_charles.htm OR http://www.planning.org/growingsmart/States/connecticut.htm	
*8) Zoning/environmentally sensitive growth areas	YES	YES state wide program	860-757-9200	Dave Shoff	Urban Planner		State of Connecticut requires protection of wetlands

CITY OF HARTFORD CONNECTICUT							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
*9) Comprehensive land use plan active last 5 years	YES					http://www.hartfordinfo.org/hartford2010/default.asp'	plan to be in progress by 2010
10) Tax incentives	NO			Sanya Ahn	Senior Assessment Technician		
11) Operation of public transit	YES					http://www.cttransit.com/busupdates/busupdates.asp?ID={F012E36D-C525-430C-9693-AE95E7E3A282}	
12) Limits on downtown parking spaces	NO		860-527-7275	Jim Kopencey	Executive Director of Hartford Parking Authority		
13) Car pool lanes	YES					http://www.fhwa.dot.gov/environment/cmaqpgs/amag/03cmaq5.htm	
14) Alternatively fueled city vehicles	YES					http://www.house.gov/larson/pr_060831.htm	in process of getting alternatively fueled hybrid electric "fuel cell bus"
15) Bicycle rider ship program	YES					http://www.crcog.org/bicycle.htm	
16) curbside recycling program	YES					http://ci.hartford.wi.us/Municipal_Depts/Engineering_Pages/recycling_policy.htm	

CITY OF HARTFORD CONNECTICUT							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
17) Industrial recycling	NO					http://www.dep.state.ct.us/wst/hhw/recharge.htm	Hartford recommends private companies for industrial recycling
18) Hazardous waste recycling	YES					http://www.dep.state.ct.us/wst/hhw/recharge.htm	For rechargeable batteries
19) Air pollution reduction program	YES					http://72.14.205.104/search?q=cache:bcA3kdFB_QsJ:www.p2pays.org/ref/17/16744.pdf+eco-industrial+park+hartford&hl=en&gl=us&ct=clnk&cd=6&client=firefox-a	Neighborhood environmental project covers- ethylene glycol and solvent degreaser, ground level ozone house hold hazardous products, lead, pesticides,
20) Recycled product purchasing	NO		860-543-8555	Mark Turcotte	Procurement Manager		
21) Superfund site	NO					http://www.epa.gov/superfund/sites/npl/ct.htm	
22) Asbestos abatement program	YES	YES state wide program					Asbestos Abatement Program (BI-2B-1000)
23)Lead paint abatement program	YES			Hartford Regional Lead Treatment Center		http://www.epa.gov/region1/eco/uep/grants_huc.html#clist	
*24) Green building program	YES	YES state wide program				http://www.ctgbc.org/greenbldgs2.htm	the state DPW requires LEED certification for certain public projects

CITY OF HARTFORD CONNECTICUT							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
*25) Renewable energy use	NO		860-522-4888 ext. 6530	Jane Hess	Employee of Public Works Dept.		
26) Energy conservation effort	YES					http://www.hartford.gov/News/PR103106.htm	educate about energy efficient lighting
27) Alternative energy offered to consumers	YES	YES state wide program				http://www.hartford.gov/Government/council/Minutes/acoteminutes3-30-05.pdf	
28) Water conservation program	YES	YES state wide program				http://www.epa.gov/OW/you/chap4.html	Since October 1, 1990, Connecticut law has required water-efficiency standards for fixtures manufactured and sold in the state. The state has also organized a retrofit program that requires all water distributors to give away free water-efficiency kits.
*29) Single gov/nonprofit agency responsible	YES					http://www.epa.gov/Region1/eco/uep/hartford/index.html	
*30) Is sustainability part of a citywide comprehensive plan	YES					http://www.epa.gov/Region1/eco/uep/hartford/index.html	UEP is currently supporting a data assessment project to identify and prioritize environmental issues in Hartford

CITY OF HARTFORD CONNECTICUT							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
31) Involvement of city/county/metropolitan council	YES					http://www.hartfordinfo.org/citycouncil/docs/08_14_06_Preview.asp	funds were authorized by city council
32) Involvement of mayor or chief executive officer	YES		860-560-0001 / 860-214-9222	Gene Sheehan		http://www.hartfordinfo.org/hartford2010/docs/FundersChart.pdf	
33) Involvement of the business community	YES		860-560-0001 / 860-214-9222	Gene Sheehan		http://www.hartfordinfo.org/hartford2010/docs/FundersChart.pdf	
34) General public involvement in sustainable cities initiative	YES		860-560-0001 / 860-214-9222	Gene Sheehan		http://www.hartfordinfo.org/hartford2010/docs/PressRelease_062106.pdf	community input through website and public meetings

CITY OF MANCHESTER NEW HAMPSHIRE							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
1) Indicators project	YES			City of Manchester		http://www.manchesternh.gov/CityGov/PLN/files/0FB465A67424472588EBA1BD61F32D2E.pdf	from 1993, revision started March 2006
2) Indicators progress report	YES			City of Manchester		http://www.manchesternh.gov/CityGov/PLN/files/0FB465A67424472588EBA1BD61F32D2E.pdf	
3) Indicators action plan	YES			City of Manchester		http://www.manchesternh.gov/CityGov/PLN/files/0FB465A67424472588EBA1BD61F32D2E.pdf	
4) Eco-industrial park	NO		(603) 624-6450	City of manchester	Planner		
*5) Cluster zoning	YES		(603)-624-6450	Louise Donington	Planner		they call it planned development, several made in 2006
6) Eco-village							
7) Brownfield redevelopment	NO			EPA		http://www.epa.gov/region01/brownfields/	no sites found by EPA and nothing mentioned about brownfields in zoning ordinance
*8) Zoning/environmentally sensitive growth areas	YES			City of Manchester		http://www.manchesternh.gov/CityGov/BLD/files/F8881928AB194F2397637E1EB25F46F9.pdf	6.09 require buildings to be 25 feet from any wetlands
*9) Comprehensive land use plan active last 5 years	NO			City of Manchester		http://www.manchesternh.gov/CityGov/PLN/files/0FB465A67424472588EBA1BD61F32D2E.pdf	report over 200 pages describing how Manchester should use its land while maintaining the environment however is not current since it is from 1992

CITY OF MANCHESTER NEW HAMPSHIRE							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
10) Tax incentives	NO		(603) 624-6307	Kate Benway	Marketing specialist for economic development office		
11) Operation of public transit	YES			Manchester Transit Authority		http://www.mtabus.org/	city has public transportation
12) Limits on downtown parking spaces							
13) Car pool lanes	NO		(603)624-6580	city of manchester		http://www.manchesternh.gov/CityGov/TFC/Home.html	
14) Alternatively fueled city vehicles							
15) Bicycle rider ship program							
16) curbside recycling program	YES			City of Manchester, NH		http://www.manchesternh.gov/CityGov/DPW/HWY/Recycling/Home.html	
17) Industrial recycling	NO		(603)-413-6799	Edward Roy	Traffic manager for Corcoran environmental services		regulate industrial waste but do not provide recycling for it
18) Hazardous waste recycling							

CITY OF MANCHESTER NEW HAMPSHIRE							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
19) Air pollution reduction program	NO		(603) 624-6466				
20) Recycled product purchasing							
21) Superfund site	NO			EPA			
22) Asbestos abatement program							
23)Lead paint abatement program	YES			city of manchester, NH		http://www.manchesternh.gov/CityGov/PLN/files/EB6A3BA77DD143E599B89C31CF3BB6D1.pdf	p. 10, 32 government gives grants to remove lead paint from households
*24) Green building program	NO		(603)-624-6475	Carl Frank	Plans examiner for building department		
*25) Renewable energy use	NO		(603) 669-8058	Mike Lopez	Alderman at/large		
26) Energy conservation effort							
27) Alternative energy offered to consumers	YES					www.green-e.org	conduct a search saying "renewable energy for your home"

CITY OF MANCHESTER NEW HAMPSHIRE							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
28) Water conservation program	YES		(603) 624-6482	Kristen Conte	Conservationist at water works department	http://www.manchesternh.gov/CityGov/WTR/ContactUs.html	
*29) Single gov/nonprofit agency responsible	NO			City of Manchester, NH			search of website found 5 documents with word sustainability none with any single agency responsible appeared
*30) Is sustainability part of a citywide comprehensive plan	YES			City of Manchester, NH		http://www.manchesternh.gov/CityGov/PLN/planningsurvey/home.html	
31) Involvement of city/county/metropolitan council	YES			City of Manchester, NH		http://www.manchesternh.gov/CityGov/PLN/landuse/Planningmembers.html	meetings run by planning board
32) Involvement of mayor or chief executive officer	YES			City of Manchester, NH		http://www.manchesternh.gov/CityGov/PLN/landuse/Planningmembers.html	mayor is part of meeting
33) Involvement of the business community							

CITY OF MANCHESTER NEW HAMPSHIRE							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
34) General public involvement in sustainable cities initiative	YES			City of Manchester, NH		http://www.manchesternh.gov/CityGov/PLN/landuse/board.html	meetings run by planning meetings of the planning board are open to the public

CITY OF SPRINGFIELD MASSACHUSETTS							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
1) Indicators project							
2) Indicators progress report							
3) Indicators action plan							
4) Eco-industrial park							
*5) Cluster zoning	YES					http://www.springfieldcityhall.com/COS/planning/zoning_ordinance.pdf	Zoning ordinance, article 16, page 119 in the ordinance
6) Eco-village							
7) Brownfield redevelopment	YES					www.springfieldcityhall.com/COS/Services/CAPER%2006%20DRAFT2.pdf	Memorial Industrial Park II: the city has gotten $2 million grant for infrastructure for this contaminated site and will work with developer on planning cleanup (page 19) Former Gemini Site: city will excavate contaminated soil and affected groundwater (page 23)
*8) Zoning/environmentally sensitive growth areas	YES	YES state wide program				http://www.springfieldcityhall.com/COS/planning/zoning_ordinance.pdf	
*9) Comprehensive land use plan active last 5 years	NO		(413)-787-6020	Director of Planning	Director of Planning		

CITY OF SPRINGFIELD MASSACHUSETTS							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
10) Tax incentives							
11) is public transit used	YES		(413)-787-6260	DPW			
12) Limits on downtown parking spaces							
13) Car pool lanes	NO		(413)-787-6260	DPW			
14) Alternatively fueled city vehicles	YES		(413)-732-2161	Jim Besaw	Superintendent of Maintenance		Springfield has 1 hybrid bus, that is electric over diesel, and at certain speed the diesel kicks in, approx 40 MPH. Springfield also has on order 5 hybrid vehicles for city use
15) Bicycle rider ship program							
16) curbside recycling program	YES		(413)-787-6260	DPW		http://www.springfieldcityhall.com/DPW/solid_waste.html	curbside recycling program
17) Industrial recycling	NO		(413)-787-6260	DPW			no current industrial recycling program, however there is a place you can drop off windows, doors etc, and someone else can buy it a discounted prices
18) Hazardous waste recycling	NO		(413)-787-6260	DPW			HAZ MAT disposal, but no recycling. The city has an area where they will take the material for a small fee

CITY OF SPRINGFIELD MASSACHUSETTS							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
19) Air pollution reduction program							
20) Recycled product purchasing	NO		(413)-787-6260	DPW			
21) Superfund site	NO			EPA		http://www.epa.gov/superfund/sites/npl/ma.htm#PSC_Resources	
22) Asbestos abatement program	YES			City Hall		http://www.springfieldcityhall.com/COS/Services/dept_housing.htm	the city does give grants for income eligible residents
23)Lead paint abatement program	YES			City Hall		http://www.springfieldcityhall.com/COS/Services/dept_housing.htm	the city does give grants for income eligible residents
*24) Green building program	YES	YES state wide program	(617) 727-2040	Thomas Trimarco	Secretary, Administration and Finance State House room 373	http://www.mass.gov/eoaf/docs/administrativebulletin12.doc	municipal buildings must exceed energy code by 20%, large buildings must be LEED certified
*25) Renewable energy use							
26) Energy conservation effort	YES					www.springfieldcityhall.com/COS/Services/CAPER%2006%20DRAFT2.pdf	increased energy efficiency for 749 existing units, doesn't say how (page 13)
27) Alternative energy offered to consumers							

CITY OF SPRINGFIELD MASSACHUSETTS							
INDICATOR	**Y/N**	**EXCEPTIONS**	**CONTACT #**	**CONTACT NAME**	**JOB TITLE**	**WEB ADDRESS**	**NOTES**
28) Water conservation program							
*29) Single gov/nonprofit agency responsible	NO						From resulting search of the website for sustainability, it produced only two results, neither of which contained information about a single agency.
*30) Is sustainability part of a citywide comprehensive plan	NO		(413)-787-6020		Director of planning		
31) Involvement of city/county/metropolitan council							
32) Involvement of mayor or chief executive officer							
33) Involvement of the business community							
34) General public involvement in sustainable cities initiative							