Worcester Counts

An Indicators Project for the City of Worcester, Massachusetts

An Interactive Qualifying Project
Submitted to the faculty of
Worcester Polytechnic Institute
In partial fulfillment of the requirements for the
Degree of Bachelor of Science

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Abstract

This IQP is part of Worcester's Common Pathways Community Indicator Project. Our goal was to research and collect indicator information on the quality of life in Worcester as proposed by a Taskforce of community leaders. We contacted experts to help us locate indicator data, store that data in a relational database and create a prototype website for presenting the data. Our recommendations include ways to utilize the database and website as well as sustain the project.

Authorship Page

The project tasks were divided by splitting the six groups of indicators evenly (see page 11). Each member was responsible for making contacts and gathering information on the two groups assigned to him (see section 2.1). Each member had to explain the indicators assigned to him and enter those indicators into the database. Each member contributed to all the deliverables, including the report, website, and database. However, some tasks were assigned to the member who was the most knowledgeable about the subject.

Aaron McDevitt:

- In charge of the health, and community life and safety indicators.
- Responsible for the creation and design of the website.
- The Website User Manual

Michael Mackey:

- In charge of the environment, and culture and recreation indicators.
- Responsible for the database design and structure.
- The Database User Manual

Patrick O'Malley:

- In charge of the education, and economic indicators
- Responsible for organizing the layout of the report and general content ideas

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1. Introduction: Who and What Is *Worcester Counts*?

1.1 Vision

Worcester Counts is a project to identify and measure significant milestones that provide quantifiable indications of the quality of life in the Greater Worcester area. The data collected will enable organizations interested in maintaining the quality of life in the community to measure the success of their activity and assist them in developing programs to enhance that quality of life. This project currently exists as a database and a website that house collected indicator data and any preliminary analysis of that data. The website and database were created from efforts by members of Common Pathways, The United Way of Central Massachusetts ("United Way") and students from WPI.

This project is a product of the Common Pathways Community Indicators Project. Common Pathways is an organization created to promote shared learning, reflection and broad engagement that will improve community decision-making and quality of life for residents of Greater Worcester. With support from the United Way of Central Massachusetts, this organization is strongly motivated to make progress in Worcester. Like other cities, many complex issues and problems such as poverty, crime, poor education, and health issues deter the progress of the City of Worcester. Citizens are looking for progress in their cities so these problems are no longer prevalent in society. The public often wants to know if their city is progressing in the right direction. They want the answers to questions about the economy, the school system and the health of the citizens. Many of the major cities in the New England area have already tried to answer these questions by starting a sustainable indicator projects. Boston, Providence, and Hartford and other New England cities all have indicator project, why does Worcester, the third largest city in New England, not have one?

An indicators project involves gauging many different specific aspects of the community and trying to encompass all of the aspects important to the city and its improvement. This project focuses on social indicators, which are "sets of statistics that can serve as a proxy or metaphor for phenomena that are not directly measurable", (Cobb 1). Each indicator chosen will be used to determine how well the community is doing in a specific domain of life. The goal of an indicators project is to use the data that is gathered to determine how the city is doing in

different aspects of life. This information is then used to motivate people to have interest in their community and to help work toward change.

A successful indicator project will provide many productive changes for brightening and strengthening the community as a whole. Those who become interested in the quality of life in the City of Worcester can reference our project and understand the areas that are in need of improvement. If there are many obvious places that are in need, and clear ways to come to a solution or improvement, then people who read the published results will be motivated to create change in the community. Furthermore, if the project is sustained by regular updates, then the results will be effective and useful many years from now. All of these aspects contribute to making an indicator project successful and useful.

1.2 First Project Steps

The United Way and Common Pathways first combined efforts on the Common Pathways Community Indicators Project to form a Steering Committee with representatives from both groups and other organizations. Dr. Alan Bernstein, the director of the committee, built upon previous Worcester projects involving indicators (see Appendix 1), and heavily relied on an excellent source of information about indicator projects by Cobb and Rixford (see Appendix 1 section B.1.4) to start a plan to put the project into action. The committee then developed a 5-step process (see next page) for creating a sustainable indicator project.

The committee decided that the best way to gather the initial list of social indicators to analyze was to ask people within their community with much knowledge about a specific domain of indicators. This list of people became the Common Pathways Community Indicators Taskforce ("Taskforce"). These people agreed to attend three meetings to assist with the generation of good indicators to use in the project.

We, a team WPI students working on the project since late August of 2004, researched indicator projects throughout the United States and the projects done in Worcester in the past (Appendix 1). We started working directly on the project during the Taskforce meetings, but most of our work in the 5-step process, as shown below, was the start and completion of stage 2 and their recommendations for stage 3.

Stages in the development of The Common Pathways Community Indicators Project:

Stage 1

- Establish Project Steering Committee
- Establish Indicator Taskforce
- Determine elements for inclusion in community "snapshot"
- Determine communities for review
- Set timeline for projects

Stage 2

- Collect data for "snapshot"
- Summarize data

Stage 3

- Organize data review meetings for target communities
- Get community input – at the neighborhood/community level
- Develop picture of the standards they desire for elements studied
- Present data colleted & review against "ideal" or expected standards established above
- Obtain consensus of quantitative criteria for success
- Evaluate items studied – add or subtract elements

Stage 4

- Develop steps to close gaps and/or celebrate achievements
- Initiate activity to deal with gaps

Stage 5

- Evaluate remedial activity
- Repeat cycle

1.3 Previous Worcester Projects

There have been past attempts at creating such a project, but none have proven to be as successful as those in some other cities. There was a project called Benchmarking Worcester 2000 that took a snapshot of the current situation of the community in Worcester of the year 2000. However, it did very little more than just present that snapshot. There is a key difference between the Benchmarking Worcester 2000 project and an indicator project in the sense that the benchmark project is basically a list of statistics and polls that are described and used to set goals for the future. An indicator project is made up of many key statistics, called indicators, that

when compared to others of their kind produce a clearer picture of major successes or weak points within the community. Those successes or weak points are then stressed to the public for sustaining or improvement. One specific indicator alone is much like a statistic in the sense that it is not useful beyond telling a fact of data. In order to map out the true problems and see how they are caused and how they can be solved, we must have many indicators that work together to show the big picture.

In 2001, there was an attempted indicators project called Pathways to Progress. That group, which is now also involved in this current project as members of Common Pathways, attempted to create a more useful project to benefit the Worcester community. Instead of just presenting a snapshot of one moment in time, Pathways to Progress presented data that was analyzed and compared to neighboring cities. However, while they gave a brief description on why a given indicator was important, they did not take the next step in describing what can be done to fix the problems, to remain a sustainable project, or to motivate community improvement. Because of those faults, Pathways to Progress was unable to create change or improvement in Worcester. However, it can be credited for showing that a comparative analysis is necessary.

In many ways the Benchmarks project was a good starting point and Pathways to Progress was the next step in the evolution of the project. However, they were unable to create change in the community or leave a lasting and sustainable project behind for future use. Therefore, the next step in the evolution of these types of projects in Worcester is the current project. The Worcester Counts project's goal is to motivate change in Worcester by providing a way to pinpoint the places in the city that need change. In doing so, it will have to be taken past simple presenting and comparing of data into actually giving some means to translate data into rational fact. Furthermore, it will need to have some means of giving general suggested solutions as to how to improve those problematic areas. If we want any of these possibilities to come to fruition, then the data will have to be kept current by making the project sustainable for many years.

1.4 This Report

The project team worked with Dr. Alan Bernstein at the United Way office for the seven weeks between October 26 and December 16. Our entire work during that IQP period and preparation period is detailed in this report. This includes our methods for obtaining indicator data and creating the database and website, the results of those methods and our recommendations for furthering each part of the project. The report is organized around four major project objectives and outcomes;

The indicator selection process objective included such tasks as developing, validating and evaluating the indicators. The proper indicators for the Worcester community must be included in this project for the project to be applicable and useful for the community.

The database development and website development objectives were based around creating and developing a process for structuring, utilizing, updating, managing, and presenting the data gathered. Additionally, the two objectives were linked by a desire to create a relationship between the database and website, in order to present, on the web, information dynamically from the database.

The fourth and final objective focused on communication, outreach, and project sustainability. This process was meant to begin and encourage communication to the people of Worcester. Additionally, it was necessary to make recommendations for the project's use of helping the community, as well as how to keep the project sustainable and useful.

Further information regarding the project background and documents used in the project can be found in the appendices. The main sections of the appendix focus on such topics as our background research on indicator projects and the lessons learned from them, user manuals for the database and website, indicator reports which detail the different aspects of the indicators, as well as descriptions of the meetings that we had with people in organizations who helped with collecting data or providing further information.

2. INDICATOR SELECTION

Our first goal was to devise a preliminary list of indicators with the help of the members of the Taskforce, an assembly of people chosen for their expertise in a one or more "domains of life" identified by the Steering Committee (see Appendix 7 for list of Taskforce Participants).

Having good indicators is the first step to building an indicator project. Successfully identifying good indicators from bad ones will ensure that the project will accurately describe the community in question. Further explanations of good indicators are detailed in our Background research (Appendix 1, section B.1.4). The first section of this chapter includes our methods for developing a list of indicators that had value within the community. The next section includes how we evaluated the indicators and describes each indicator in detail. The third section discusses our analysis of the process and how to improve on data collection.

2.1 Indicator Selection Process

We needed to have a list of indicators to work on before we could do any analysis or data collection. However, if the list included indicators that measured unimportant aspects of life, or if it measured those aspects inaccurately, then our analysis would be based on a community that was not Worcester; inaccurate data shows problems that do not exist and leaves out those that do exist. This is why the Taskforce is important. All the members are deeply involved with the Worcester community and know the current problems the city is facing and will provide the best insight towards finding which indicators describe those problems most accurately. We attended the three Indicator Taskforce meetings that took place in September, October, and December.

The Steering Committee planned the agendas for these meetings and gave out materials with starting points. The committee took the idea presented by Pathways to Progress of putting indicators into separate groups that describe a specific quality of life (these groups are called domains). The committee then revamped the list to better suit their view of the community. They decided to organize the indicators under six domains:

1. Economics and Infrastructure
2. Mental and Physical Health and Well-being
3. Environment
4. Education
5. Culture and Recreation
6. Community Life and Safety

During the first Taskforce meeting, our primary task was to observe how the indicator selection process worked and to listen to the wisdom of the members of the Taskforce. During the second meeting, we understood the process well enough to help with the selection of

indicators and give our opinions on whether we could research them or not. The first two Taskforce meetings had similar agendas and the same process for organizing opinions on the list of indicators. Here is a summary of the process:

- Each member was given the choice of which domain of life to participate in and the domains were separated into breakout groups.
- The students sat in on different domains to view how each domain proceeded.
- For each domain, there was a list of indicators to use as a starting point (Appendix 6)
- The members discussed whether each was a suitable indicator for Worcester or not based on an indicator evaluation criteria form each member received (Appendix 5). These criteria are further discussed at the end of this section.
- Members presented additional indicators and their validity was discussed.
- For the first meeting, all indicators that were found to be suitable were written down on a nomination form that described the indicator and its importance.
- For the second meeting, each indicator was given a rank of importance, or was discarded.
- Results and opinions of each domain were shared with the entire Taskforce.

Along with the Steering Committee, we analyzed the indicators selected by the Taskforce. We refined the list of indicators based on further Taskforce input, as well as input from other people within the community not on the Taskforce, in order to create a more useful and feasible list of indicators. We determined which indicators adhered best to the indicator selection criteria and would be most beneficial to the community. This was different than how many indicator projects select their preliminary list of indicators, beginning first with public meetings. The Steering Committee believes that there are basic needs on which everyone agrees. They also feel that public opinion polls on their needs have been done many times before with similar responses, which would make further surveying redundant. We do plan to integrate public support into the project by requesting feedback from the public through the website, as well as through suggestions for various community outreach efforts. Common Pathways has created a new position, beginning January 2005, to lead this outreach effort, which will be described further in section 4.2. Their opinion on which indicators are used and how they are interpreted will be vital to keeping the project within the best interest of the public. In order to ensure that we included all the important issues in Worcester, we suggested that the Taskforce

members contact their peers to compare their thoughts. They brought this knowledge with them to the second meeting to add to the indicator lists and descriptions.

The selection method of indicators was useful for pointing out which indicators were inherently flawed. Some were too broad to be used in the Worcester area, while some were too difficult to gauge. If poor indicators are used, then a wrong idea of the quality of life of the community would be developed and a lot of work could be been done on a problem that did not exist.

After the September meeting of the indicator Taskforce, we gathered all the data collected from that meeting and determined which indicators were most important to the members of the Taskforce. During the second meeting of the Taskforce, the members rated their final proposed indicator list with numbers that told us what they thought were most important. We focused most of our efforts within each domain on the top three ranked indicators with each person working on two domains:

Aaron: Community Life & Safety and Health
Pat: Economics & Infrastructure and Education
Mike: Culture & Recreation and Environment

We attempted to gather all the indicators finally selected by the Taskforce and compiled them into a database. We figured that the first step to making the database was to gather the data to be entered. The availability of an indicator was an important factor that was being considered when selecting the indicators. If an indicator could not be measured or found, then it was useless.

However, we realized that we should first precisely define each indicator so that we could tell people exactly what data to give to us. The indicator descriptions given to us by the Taskforce were unclear in some ways and our first action was to contact those members and get some clarification. Fortunately, many members of the Taskforce also knew where to find most of the indicators. In particular, Cathy O'Conner suggested we look at a database containing many indicators pertaining to the health domain called the MassCHIP Database. This database contains data for all towns and cities for Massachusetts regarding many health issues with data that goes back about ten years.

Understanding what we were exactly looking for was important to make a good first impression on people who can give us indicator data. By telling them exactly what data we are

looking for, it makes it easy for them to get the data prepared for us. The easier it is for them, the more likely it is that they will cooperate with us and cooperate with sustaining the project in the future. We approached each contact professionally and we prepared ourselves to discuss the indicator data with the information given to us by the Taskforce and some research using the Internet. The list of scheduled meetings and a brief description of the meeting can be found in Appendix 4. A guideline for the structure of these meetings is included in the next paragraph.

First, we began by explaining what our project was and how it would benefit the community. We then asked if we could access the data pertaining to a certain indicator, or if the contact knew a way of obtaining the data. Next, we requested that the contact examine our indicator rationale for the indicators he or she was familiar with and make sure it communicated well to the public. Finally, we attempted to ensure the sustainability of the indicator by requesting the contact stay involved with the project and, if not, to suggest any ideas to gather the data in the future.

After we finalized our indicator list, we realized that we needed to explain the validity of each indicator. We analyzed each indicator and gave them a rating for each of the 7 criteria. This analysis can be seen in Appendix 12. The description of each criterion and how it was used to validate each indicator is included here:

1. **Suitability**: To measure suitability we asked ourselves: Is this indicator suitable (valid) for measuring the specific domain of life under investigation? This was primarily a job for the Taskforce because they understand what their domain encompasses. There were some changes to the domain some indicators were listed under for the economic domain, as they pertained to another domain of life. All the indicators are now under the correct domains.

2. **Interpretability**: Can data for this indicator be clearly interpreted to suggest positive or negative growth? Some indicators can be interpreted many different ways; their data does not reflect an explicit representation of the community. The most effective indicators do not have multiple interpretations. If people cannot agree on what is indicated by the data, then the indicator only poses more questions instead of explaining the quality of the community. However, indicators that have low interpretability do pose questions that, if answered, could lead to effective indicators.

3. **Availability**: Is data for this indicator available? Some of the indicators that were suggested by the Taskforce are not currently available. However, another question is: could a

method be developed to make this data available? For many of the indicators that are not available, the answer is "yes". These are called "developmental indicators" and they have been distinguished from the indicators that seem to be impossible to measure.

4. **Action Oriented**: Does this indicator provide evidence that action is needed? One of the major goals of this project is to make people act towards change in the community. We need to use indicators as evidence that would make them want to be active. 'Action Oriented' is based on interpretability, communicability and acceptability, if the indicator has all these qualities, then people can readily recognize the problem it indicates. Also, the problem has to be something that people feel is important and affects them directly. If the indicator can express the importance of a problem, it will lead to actions by the people affected by the problem.

5. **Sustainability**: Does this indicator have the potential to be useful over a span of time? We are focusing on how we can keep the data updated in the future, which will ensure that the indicator data will remain relevant. The usefulness of an indicator is measured by other criteria and it is assumed that the usefulness will be sustained as long as the indicator data is kept up to date.

6. **Communicability**: Can this indicator be communicated to the public? The indicator has to mean something to the people of the community. They have to be able to understand what is being indicated without a long, detailed explanation. People should also be able to relate to the indicator because the indicator is describing their community.

7. **Acceptability**: Is this indicator used in other communities? This measures how well people have received the data provided by the indicator. If many other projects have used a certain indicator successfully, then it would probably be a good idea to include it. However, just looking at other communities does not completely satisfy this criterion. The Taskforce expressed some of their opinions on how the Worcester community would accept the indicators they suggested.

2.2 Indicator Products

The Taskforce proposed 61 indicators. Out of those indicators, we were able to locate information for 24 of them. 33 of the total indicators are labeled as developmental – meaning we do not have data for them, but we have proposed methods to measure them. The remaining few

we feel either cannot be measured accurately enough to be useful, or simply are impossible to be measured.

Included with the numerical data are descriptions of the indicators. The numbers are identified by a short report that describes exactly what it measures and how it is measured. This information is available on the website for people so they can understand the indicator better. The Taskforce created a preliminary list of descriptions and we further refined it with the help of members of the Taskforce. This was accomplished through meetings, phone calls and e-mails; any method that was convenient for the person being contacted. We presented our ideas on how the description should be worded. They gave us feedback regarding our phrasing and corrected some misconceptions, but almost never did our analysis need to be completely reworked.

After working out the description of the indicators, we could then focus on analyzing what the numbers indicate for the city. We started working on writing a paragraph on the relevance of each indicator. Based on our research of other indicator projects and lessons learned (Appendix 1, Background), we each wrote a paragraph on the relevance of the indicators. The work was split-up by the domains we were assigned. We then took our relevance writing through the same screening as we used with the descriptions. Our contacts were helpful with this section as well. They suggested how to smooth out the choice of words and emphasized which parts of the relevance accurately described how the indicator represents the quality of life in the city

Below we show a sample of the indicator reports we wrote for each indicator that was suggested by the Taskforce. Each indicator has a brief paragraph regarding its status, relevance, sustainability and any data collected for it. The information for these reports was entered into the Access database and was updated and reevaluated throughout the project. The report function in Access was used to design the reports and to create them with the information inserted into the design. Reports for all indicators are in Appendix 12, and all indicator data can be found in Appendix 14.

Subdomain

Domain **3** **Economy**
SubdomainName: *Fuel Assistance*

Description: Number of fuel assistance applications
Rationale: Heat is a basic need for the public. Noticing how many people cannot afford it indicates the level of poverty in the city. Since this utility is such a necessity, a high number of fuel assistance applications might be a reason to try to reduce or subsidize the price of fuel, or to increase the amount of assistance.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	2	3	3	3	3

Rank Reasoning:

This easily accessible indicator is measured every month. The actual number it should represent is arguable. Whether to put the number receiving assistance, or those applying for it, or those who are denied it, or showing all of them. People obviously need heat and if the best way to show that people are not receiving assistance is found, this indicator can show people the need to help those who are not receiving assistance.

2.3 Indicator Analysis

The initial criteria that were used to select indicators were developed by the Steering Committee and are described above. The criteria and the 1-4 ranking scheme suggested on the Indicator Ranking Sheet (Appendix 8) are useful in determining the effectiveness of an indicator. The rating system that was used during the Taskforce meetings was used to facilitate the screening of indicators. Having poor scores in many of the categories meant that the indicator either did not measure data accurately or was too imprecise to determine what its value meant. If an indicator fell under this condition, it was discarded.

It is impossible, however, to select the right indicators using this rating system alone. You cannot determine an indicator's usefulness simply based on a mathematical equation. The ranking system suggested that the indicators that have the highest total rank should have been used, but that is an incorrect way to approach an indicator project. The lessons learned section of the background research (Appendix 1, section B.1.4) explains what people experienced in this field believe to be useful in selecting indicators. The section explains how the metaphorical representation of the indicator can be its most important aspect, but that aspect cannot be measured well by this rating system. Our own judgment and intuition as well as availability of the indicators selected were needed to measure that aspect. Additionally, public input is crucial and will be used in the future to evaluate and update the indicators used in the project.

The database has two major parts: the indicator data and the indicator validation. The data is the quantitative information that the indicators measure. The validation includes reasoning for why the indicator was chosen, why it makes a good indicator and how the indicator relates to the quality of life of the community. Both of these aspects are needed to make this project successful. We did not find all of the data for the indicators, but we have a rationale for indicators and suggestions for retrieving the indicators data.

The data collected was entered into the Access database so it could be integrated with the website. The methods for the structure of the data storage, and the way it is displayed are discussed in section 2.1.1.

Some indicators are labeled as developmental. We feel that collecting data for these indicators is feasible, but will take time and resources that are not available to us in the seven weeks we are working on the project. For these indicators, we have developed a method for collecting the information for the people who will work on the project after us. In addition, we feel there are inaccurate indicators and indicators without a feasible data collection method. Those indicators have been identified and the reasoning behind their status as "impossible" is included. Our recommendations for future work on these indicators are listed in Appendix 13.

3. DATABASE & WEBSITE CONTRUCTION

The database and website are the two major products of our project. The need to make the database information publicly available was the cause for the creation of the website. This section explains how we created both and the reasoning behind their underlying structures. Later, we explain the most important features of the database and website and how they can be improved. A more detailed description of how to use these products is included in the user manuals included in the appendices of the report (Appendices 2 & 3).

3.1 Process

At the start of the project, we were unsure how we would store the data we were going to collect. Our two conceivable methods were to use either Microsoft Excel or Microsoft Access to store the information. Both of these programs are used by other indicator projects to store data and both can upload data to a website. There were also uncertainties as to how we would make the data public. The most useful way was to create a website for the project, or to simply publish a report that only suggested making an Internet presence. It was mentioned in our project description that a plan to implement a website to publicize this project would be optional and only if we had the time and resources to create one. We ultimately used an Access database to house the information and, not only did we plan a website, we were successful in actually

creating the website that provided indicator data dynamically from the database. Our methods and decisions that led to this product are described in the next two sections.

3.1.1 Database

We were initially somewhat hesitant to use Microsoft Access to store the data as only Mike had previous experience with using the program. Luckily, our liaison, Alan Bernstein, was proficient in the program and passed on his knowledge of the database system to us. With his help, we were able to create tables of information and organize them to be viewed in the most efficient way. This knowledge was critical to being able to input indicator data and descriptions into the database in a timely manner.

After locating the data, we had to organize it before we entered it into the database. Each indicator had additional information included in the measurement: the dates that the indicator was measured, the area the indicator represented, and how the data was collected. The database was designed with fields to contain the supplementary information. Currently, most of the indicators are measured only for the City of Worcester as a whole and there is little information about the data collection methods of our sources. However, we plan that the project will become more detailed in the future and we have designed the database to support any additional features or data necessary.

One of our main goals for the database was that it be dynamic in order for the project to be truly sustainable. All the indicators within the database will need to be updated regularly in order for the project to continue in the future. To achieve this goal of a dynamic database, we contacted other cities to discuss how their indicator database was structured. Building off the successes of other cities helped us increase our rate of success and ability to make the project stronger. We then had to collect information about where the selected indicators could be found. We created a system of metadata that described where and how the indicator data was gathered and processed. All of this data is housed in the Microsoft Access database, and is easily accessible and interconnected through the infrastructure that we created.

We were not able to complete the database entirely, as some data still must be collected, so we have made suggestions as to how to complete the database. We took into account the indicators that had no collected data, and suggested plans and guidelines for retrieving the data for these incomplete, “developmental indicators”. This categorization of indicators is discussed further in section 2.3.

Since the database must be sustainable, those who handle this project in the future will need to routinely update the data, perhaps on an annual basis. We have gained support from many of our contacts who are willing to give their support in the future, and we set in motion more relationships that can be built. We hope that many of the Taskforce members and other contacts will have an interest in the furthering of the project that they helped to create and will continue to help now and in the future.

3.1.2 Website

People needed to be able to easily access the database and view it in a simplified matter that would not confuse or overwhelm them with a lot of information. We decided that making the database available on the Internet was the best approach. We had a few options that would allow us to make the information contained in the database available on the Internet. Without any professional knowledge of website design or construction, we had to find a person or group to assist us. One option was to talk with Craig Sullivan, the person who created the website for the United Way of Central Massachusetts. He volunteered to give his assistance if necessary. Another option was to contact the WPI Web Development Office regarding what assistance they provided students for student project websites. They suggested that we would have to use our personal WPI provided web space to hold the website until our advisor contacted them directly. We then received permission from the United Way to upload the website onto their web space. This is the website's current location, but the United Way of Central Massachusetts has said that they would try to house the website on a new server in the near future (see section 4.3: Project Sustainability for more information).

We were fortunate enough to have Craig design and create the menu system as well as a template of the website using Microsoft FrontPage. He used a design similar to the website he created for the United Way of Central Massachusetts. The structure included the color scheme on all the blank pages we requested, as well as integrating the menu system into all those pages. The preliminary structure of the website was first created by Mike and Alan. They developed a list of pages they wanted to include in the website along with how they felt the layout of the pages should appear. Mike contacted Craig regarding these requirements. Craig gave his own thoughts on the appearance of the menu system on how to make it look more professional. He then compiled the structure of the website within a few days of our request. We had already

come up with a lot of the content for the website; so much of our work on the website content was importing what we already had into the Microsoft FrontPage document.

Integrating the Access database into the website was a difficult matter. Only Aaron had used FrontPage before, so he took on the responsibility of creating the website. The integration of a database into a webpage is no easy task, but with the help of Microsoft FrontPage, it was not as hard as it could have been. We created six pages for each of the domains of life and made those pages dynamically grab a list of sub domains from the database. Each page then displayed that list. Each item in the list was a link to the same page. This method may seem not very productive; however, the page creates itself every time anyone visits it with new information based on the link they click on each domain page. For more information on how the database is implemented into the website, please consult the Website manual (Appendix 3).

3.2 Product

We are excited about the way our products turned out. We learned much about Access databases and put that knowledge to good use. The website we created was beyond what we expected to accomplish. We implemented features into both products that none of us knew how to create before the project began. The specific tasks each can be used to perform are detailed in the follow sections.

3.2.1 Database

The Microsoft Access database is structured with all the necessary data fields and many features that are essential to those that will be using it in the future. The database is able to keep track of all relevant indicator information, data, contacts, and more. All of this information is easy to find and use, as well as easy to update. The database comes with a user manual (Appendix 2) that details the functionality and features of the database structure, as well as all other relevant information for using and updating the database. This manual will help those who work on the project in the future understand the reasoning behind the structure of the database, as well as understanding the structure itself. Of course, there could still be revisions of the database to better suit online access and better display data.

3.2.2 Website

The website is an excellent tool to use to gather information. The Worcester Counts website contains a lot of information not just about indicator data. There is a menu system at the top of each page, which lists a broad topic for what the site contains. When the mouse is rolled over each menu item, a list is dropped down with links to more specific topics that the website covers. These pages contain content such as an "About Us" page as well as the mission statement for the project. Other pages have information such as links to where we received indicator data, as well as a feedback form where users of the website can provide insight to how they would like to see the site improved. See the website and Appendix 3 for more information on the contents of the website.

3.3 Website and Database Recommendations

Although we are happy with the way our products turned out, there are still many ways to improve them. The database can be updated and utilized by an experienced user, but it could be modified so that anyone can modify it without disrupting the database. Many more features could be added that other indicator projects use. As for the website, there are many ways to make it more effective. For example, comments and suggestions from the Worcester communities and public could be uploaded as well as creating a better query system. The user manuals we included will help to implement systems like these.

In the future, we would like to see the following sections added to and improved in the website;

- Partners and Staff - We need more partners and general staff for this project to remain sustainable.
- Our History - A little history about the project as a whole
- General Community - Including demographic information about Worcester
- Database Files - To be used as a means of getting raw data in the form of spreadsheets and .PDF files.
- Community Profiles – Describes, and links to, other indicator sites that may be helpful in improving our site.

It is possible to create a graphical user interface (GUI) to enter data into the database. We do not have the time to create such an interface, but it would greatly reduce the level of

Access experience required for someone to update the database. The database could be set up in a separate file so that when it is opened, a menu would appear that would guide the user through the database management system. It could be simplified so that it could just ask the user if he or she would like to create a new domain, create a new indicator, or update current indicator information. Then the user would just have to input the basic information in the fields requested by the guide. The database would then update all the tables to reflect the new information and would immediately update the website when requested. This would make the information updates quick and easy for anyone familiar with a computer.

There could be a similar system for the website. This system would not input data, but extract it. An easy to follow GUI would be great if people could use it to organize indicator data into charts and maps. This would take many resources to implement, but would make the data very valuable. It would be best to keep similar systems for both the website and the database, so people do not need to learn both to be able to utilize the data. The most important improvement would be adding the ability to make geographic comparisons and mapping. This possibility is currently limited for Worcester due to the problem discussed later in section 3.4, where we also recommend how to remedy the problem. We have already gained the interest of a project at Clark University as well as others within the community in helping to remedy this problem.

While creating the database and website and writing about the importance of them are important aspects of the project, they are worthless unless people are aware of how it can be useful. Even if they are useful now, there is no guarantee that they will be useful in the future. The website should keep evolving and implementing new ways to view the data that allow it to show localized problems in the community.

3.4 Neighborhood Definition

The City of Worcester is a large community and, like most cities, has areas that are vastly different than other areas in terms of income, race, etc. This is a widely recognized idea; however, there exists no widely recognized division of these areas. There are many systems for dividing Worcester into sections. The Worcester Police Department has the city divided into eight zones, which are further sub-divided into a number of areas. The Worcester Election Commission has the city divided into ten wards, which are further broken up into five precincts

per ward. The Census Tract has the city broken up into six areas that cover thirty-eight total neighborhoods. Looking at the maps of these divisions in Appendix 9 and Appendix 10, one can see they are vastly different. A direct comparison of the mismatch between police department data maps and election commission maps is also shown in Appendix 11.

A problem arises from these geographical discrepancies: it is impossible to compare data geographically. It is difficult to see trends and cause and effect relationships if different data sets are measured inconsistently. The benefit of having data being collected from divided areas is that you can see where problems are localized. However, it is impossible to define these areas if nobody can agree on the definition of the area. There is no consistency in the nomenclature or the boundaries of the areas of Worcester city. It would benefit this project greatly if there exited an initiative to create a division of Worcester that everyone accepted. This would make it easy for the data that is now only being collected for the entire City of Worcester to then be divided into areas.

4. Communication, Outreach and Project Sustainability

This project's success relies heavily on our plan to sustain the project and the database. This plan is based on our analysis of the indicator data that we collected and the possibility of expanding the list of indicators. This section includes the details of our analysis and leads into the suggestions we have made to further the project. We have made recommendations for the utilization of the database and have left clear instructions on how to update the database. Some indicators have not been completed because we did not have time to collect the data or we did not find the indicator to be useful to the community. These developmental indicators and the indicators that are ineffective have been analyzed and their statuses are explained in this section. The rest of the indicators have been acknowledged as providing useful insight for this project and are detailed in full in this section as well.

4.1 Communicating the Project

Before this project, we did not have great presentation or interview skills. Throughout the course of the project, we were constantly trying to express the message delivered by Worcester Counts and extracting information to strengthen the message. We expressed our message by giving a few formal presentations to those who were interested in the project. We used that message to gain the support of experts who held specific information for our indicators. Then, we used that information to bolster the data and to make our project more presentable due to having fewer gaps. Our meetings with people led to better communication skills just from the experience and with some help from Alan Bernstein and our advisors. A summary of the major meetings with contacts is supplied in Appendix 4. Through these contacts, we advertised the *Worcester Counts* project in a favorable light that will hopefully be positively received.

We gave three formal presentations to the Steering Committee with the final meeting including members of the Taskforce and anyone else interested in the project. The first presentation at the beginning of the IQP term, on October 26th, was a description of what we saw as our goals for the project and our plans to fulfill those goals. The feedback from that presentation was favorable and the audience apparently understood our plans well.

We gave an interim project update on November 22nd to inform the committee of what had been accomplished and where we would be by the final presentation on December 14th. Our presentation was centered on what data we had and the places we went to get it. At that point, our goals did not include a website, but did have a good understanding of the database storing the data. The Steering Committee's major concern for the project at that point was making sure the descriptions and rationales for the indicators had the proper wording and would be accepted by people who are knowledgeable about the underlying data. People who were experts in the fields where the data concentrated have now reviewed the writing for these indicator evaluations.

The December 14th meeting was a chance for *Worcester Counts* to gain more support from the community. Alan and we invited the members of the Taskforce and any contacts used to gather data to the meeting. Approximately twenty to thirty people attended. During the meeting, Eric Buch, the president of the United Way of Central Massachusetts, expressed the importance of the project and asked for support from those attending. Alan then introduced us and we gave our presentation of what we accomplished in the last seven weeks. We received many complements on the work we did, especially on the website.

All the indicators selected by the Taskforce represent an important part of the community. However, the public may not immediately recognize their importance. This is the reasoning for giving a rationale and rating for each indicator. These evaluations are accurate, but that does not mean that they should be static. The needs of the community are constantly changing, so the ways the indicators are communicated have to be constantly changing as well. From the feedback we receive from the community, we can edit the rationale and the description of the indicator to fit the community's needs. The way the data is measured for each indicator may have to change to fit these needs

During the course of the project, we were contacting multiple people daily to gain information and support. We found that most people were enthusiastic about the project when we contacted them. We believe that this project is easily communicated to those who are familiar with indicator projects and are facing the actual problems in Worcester. For the general public, understanding the importance of the project will be more difficult. We believe it is important to make sure that the indicator descriptions are constantly being tweaked to make them easily conveyed to the public. We want people to understand its importance so that the community will accept the outreach programs proposed by the project.

4.2 Outreach

We envision a Worcester community that is educated about the problems of the city and voices their opinions of these problems. A community that knows its faults will be ready to accept the changes necessary to fix its problems and improve the overall quality of life for the city. Our project can help make this possible by using the information presented on the website as a learning tool.

Many other indicator projects have already shown examples of ways a project like this can be utilized. Jimmy Royster, a Clark University graduate student, researched the indicator projects of other cities and contacted them to help with our project design by contributing suggestions and guidance. The following is a list of examples of how other cities use their projects to help the community, based on discussions we had with these cities, our background research, and contacts that Jimmy made.

The most frequent topic every indicator project we looked at made clear was that the indicator project had to be more than a written report. A lot of emphasis was put on the fact that simply collecting the data and publishing it in a report or on a website is not enough to help the community. If the people in charge of the project do not push for positive results and do not keep the project evolving, then it will never achieve the effect they desire. The project is meant to be a tool for anyone to use, and to include citizens in the community. The managers of the project have a large desire to see this project used by all types of people in and out of the city, from students to businessmen, and even people interested for personal use.

The information stored in the database will prove useful for grant writers within the city in different organizations and businesses who are looking for varying statistical information on the city to cite in their grant requests. This provides a central location for the data and will thus save them the time and effort of searching the Internet or through hard copies of records for specific data. It will also give them a better way to explain what may be wrong in a given area and why the grant money is needed, and to potentially measure improvements over time.

Two of what we consider to be the best indicator projects, DataHaven in New Haven, CT and the Baltimore Neighborhood Indicator Alliance (BNIA) in Baltimore, MD have already begun these initiatives to involve the community with their project. They use the project to show where underlying problems are and to promote programs to help those areas in need. One program uses the project to help create jobs for kids and others help find volunteer opportunities. The idea is to take the indicator data and present to the community the fact that there are problems and they need to take action. By representing the data geographically, it shows where in the community they need to start these programs and it gives good reason for the people of that area to participate in these programs. This shows how important it is to have data that drills down to the lowest level of the community, which Worcester currently is not well prepared to do, as discussed in section 3.4.

A necessary method to allow programs to affect the most important aspects of life is to monitor what the public believes to be important. The project managers should constantly be wondering, “What is not being asked?” One way many other sites answer this question is by holding regular meetings with residents and community leaders. These meetings are used to gauge community progress, which will help to understand which indicators should be measured and how they should be interpreted. Constant tweaking should be made to the project to keep the

data current with the needs of the community. The project is designed to help the community, thus the community should be involved in how the project evolves. Perhaps focus groups could be used to help get people's opinions and to start discussions. To make the process even more democratic, training programs could be made to help people learn about the website structure and content, or even the Access database structure. These programs would allow people to upload their ideas for the project managers to review and gain insight into the community.

This project can also help the city as a whole. In the future, we hope the project will be incorporated into local planning with the local government and companies. They could use the project as a way to benchmark the city's progress. The data would have to be made more interactive to achieve this goal and those involved would have to be able to easily set up queries and tables to allow them to look at the information they need in a convincing way. The data should be able to be represented by a graph, chart, or even graphical mapping systems, so that any problems in the community can be easily communicated to groups or individuals. The database and website could definitely be used in this manner and suggestions of this type are detailed in the database and website section.

Looking at the bigger picture, this project wants to help not only the City of Worcester, but also the entire Greater Worcester Area. To do this, the project has already contacted other United Way organizations to help reach out to other communities. Perhaps there could also be a partnership with the Boston indicator project to cover a larger portion of the state.

Other projects we may want to include in our suggestions would include schools around Worcester. These projects will range from small high school projects to possibly other WPI Interactive Qualifying Projects similar to this one, but in a different phase of the indicator process. Tying this indicator project to the schools in Worcester is necessary for improving Worcester as a whole. There is no better way to improve the future of Worcester than to involve the future of Worcester, the youth, in projects involving them in their own city.

4.3 Project Sustainability

The most important objective to have when beginning any sustainable project is to have suggestions on how to take the project further once you are done with your part. We now have a

database of sustainable indicators dealing with the most important issues of Worcester. We made suggestions on how to implement it into society in the future after we finished. Researching previous indicators projects gave us insight on how we can benefit from using techniques that worked for other cities regarding the use of an indicator project.

We have proposed various ways on how this indicator information will be sustained over time. Some ways to make this project sustainable include hiring a person to update the database as well as produce annual reports on the status of the community. With a lower budget for continuing the project, the group might suggest something similar to dividing the job of updating the database and producing annual (or more frequent) reports into jobs that already exist. In the case that the project receives little to no funding in continuing these efforts, we have made suggestions to accommodate these conditions.

This project took place in the middle of a five-step indicators process. Our final objective was to suggest ways to continue the project when we were done with our part. As did the members included in the first parts of the project, we must make it possible for the members involved in the last few steps to succeed. Similar to many other indicators projects, there is a possibility of producing an annual report (e.g. those by the Boston Foundation, and the State of Georgia). This will be very helpful in the process of involving the community. We suggest that the people working with the indicator project produce one of these documents at least once or twice per year. This report would be made available to the public and allow the public to readily view the data that they might otherwise not seek out on their own. If the residents of Worcester were to recognize that there were problems in society, they would be more apt to assist in community improvements and thus promote more community involvement on their own.

The United Way requested that we include with our suggestions three different plans for sustaining the project. These three plans suggest what can be done with varying amounts of funding that is provided with for the project. Each plan is for a different budget level: no additional funding, moderate funding (approximately $50,000 more funding), and unlimited funding. We have limited knowledge as to the costs involved with projects like these so we listed ways to develop the project in terms of priority and cost. Our recommendations are based on focusing on the higher priority and lower costing items with lower funding, and then including the lower priority and higher costing items with increased funding.

In the case of no additional funding, the project will have to continue based on many volunteers and their efforts, as well as the efforts of United Way staff members. It would be a possibility for another WPI Interactive Qualifying Project team to continue the work done and further the project for another seven weeks. Additionally, the *Worcester Counts* website can remain housed on the United Way server, or perhaps be moved to a WPI server, for no cost. If the project were to receive additional funding in the range of fifty thousand dollars, there could be much more done with the project. Even with the additional funding, a second WPI team could still participate. Also, the website could remain on the United Way or WPI server for no additional cost, or could be given a devoted server if traffic to the website is too high for the original server. With another WPI team, the additional funding could be spent on developing a means of mapping the project's data, rather than on multiple employees. The project's ongoing relationship with John Rogan and the Human Environment Regional Observatory (HERO) project at Clark University will provide a great understanding from those who work closely with satellite images of Worcester that can be translated into actual data, and vice versa. This relationship is a wonderful asset to the project. To sustain the relationship, some funding may be used for taking responsibility for some of the costs the HERO project accrues in purchasing the different satellite images.

Additional funding could be spent in any number of ways for employing personnel to maintain and update the project data and products, as well as purchasing software for creating our own graphical mapping. With the purchase of the Graphical Information System software, ArcView 8, the project would be able to transform our numerical data into a graphical representation of the data. As the ArcView website explains:

> "ArcView is the world's most popular desktop mapping and GIS software, with more than 500,000 copies in use worldwide. ArcView provides data visualization, query, analysis, and integration capabilities along with the ability to create and edit geographic data." (RockWare, Inc.)

This software would allow the project to present its data more clearly to the public through the images that could be created for any given data. The necessity of this software will have to be judged after the relationship with the HERO project is solidified. That project may be able to meet all of our needs with geographical software. However, if they do not, ArcView 8.0 will need to be considered, along with considering its price of $1,290 for one license

Hired website designers would be able to further the design of the website and create more interactivity and useful functionality of the website, in addition to presenting data. The same can be said for hiring database managers to input the data as well as create more depth to the information provided in the database. Finally, there could be someone hired for a brief time each year to be in charge of contacting data sources for updates, as well as researching the developmental indicators. This task hopefully will not be too complicated once the different organizations get in the habit of having the information ready for the project, as they will be expecting to be contacted. Eventually the goal would be to have them contact the project on their own, thus making the job of the data collector much easier.

It is our hope that in the future this project will not only remain useful and sustainable, but will grow to become easier with each passing year, as our list of partners and their contributions to the project grow over time. We believe that this report has detailed the beginnings of a wonderful project that will be able to provide the City of Worcester with a means to evaluate the quality of life and improve in any way possible.

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Appendix 1: Background

"Over the past two centuries, nations and communities have become increasingly reliant on statistical measures to assess their status and to set policies." (Cobb, 1998, 1) This opening statement in Cobb's introduction to the *Lessons Learned from the History of Social Indicators* explains why indicator projects are a growing phenomenon, and why there is an increasing interest for such a project in Worcester. The world has been gradually realizing that indicators can help society, and if Worcester does not implement an indicator project, then it is likely to fall behind cities that do have one. Indicators give us means to compare our city to other cities that are also researching and keeping track of indicator data. Also, indicators help lead to a diagnosis of problems within the community and can be useful in prescribing a possible solution to the issues. Worcester can keep up with other major cities by using these ideas and perhaps surpass them in some areas.

The concept of indicator projects is nothing new. Methods of trying to use indicator data to help communities improve have been around in New England, Massachusetts, and even specifically in Worcester, for years. There are reports of projects done in all of those locations, which we will discuss, including those past projects from Worcester. We will touch on a report done recently in this city that did not have a large impact on the community. Directly relating our project to the past will allow us to improve on what has been tried, and what has been learned from past attempts. This topic is the subject of section 2.2 of this proposal.

Contrary to the past attempts in Worcester that were not as productive as hoped, successful indicator projects do exist currently in surrounding cities. We will research and learn from these projects in order to find how they can apply to our city. Obviously each city is unique, but there are general principles, lessons, and techniques we can determine from other projects and apply to our own. Their means of approaching the project and methods of implementing it can prove useful to making our efforts easier and more successful, as will be further discussed in section 2.1.3.

In addition, many general indicator reports have been created that detail how indicators should be collected and used. We will review an informative article that addresses the lessons that can be learned by the history of indicators, and describe how those lessons can be applied to this project. By analyzing what other people have done with indicators and by researching how

experts believe indicators should be used, we can become relatively well educated in the field of indicator studies in a short time. Out project requires us to know how indicators should be selected and used, how to organize them and sustain them in a database, and how to ultimately utilize them in community efforts. Many of these points will be further discussed in section 2.1.4.

B.1 Indicator Projects in Action

There has been much research done on indicators and how they can prove beneficial to a community and thus there have been many cities implementing their own indicator projects. Although there are many ways to develop indicator projects, most follow general guidelines that define the project. After understanding what an indicator project entails, it is important to look at examples of indicator projects and learn from their mistakes and successes. This section will define what indicators and indicator projects are, as well as provide an overview of these topics to better understand how to develop our indicator project.

B.1.1 Definition of an Indicator Project

By definition, an indicator is any piece of information that describes a social condition (Cobb, 1998, 1). As mentioned in the introduction, an indicator project uses data from these indicators to make sense of the community, but a successful indicator project goes much deeper than that. A successful project takes into account many factors that affect how the indicator data is collected and analyzed, as well as how the results are recorded. It is important to make all the methods used in these actions as accurate and valid as possible. This means that research must be done to make certain that the data and processes describe the actual social condition. We cannot rely on conditions contrived by theory or general beliefs based on passive involvement in the community. The overall goal of analyzing the data is to grasp a concrete idea of the entire social condition of the community. From that point, making suggestions to improve the conditions is possible. That leads to the ultimate goal of the project, which is to create change by presenting the results that will motivate the citizens to create the change that is suggested. It has been historically proven that indicator projects can work as described. Then next section further

describes the process behind an indicator project, and the final product it can produce if implemented properly.

B.1.2 The Process and Product of an Indicator Project

An indicator project contains two key aspects: process and product. The process is what leads towards the final product, and hopefully a successful project. Essentially the product is the result, or final destination of the project at hand. Consequentially, the process is the steps and route taken to arrive at that final destination. The main hope of the project is that the chosen process will arrive at the desired product.

The process of a successful indicators project is quite detailed. The steps between concept and completion are many and, while they can vary, there are some key aspects that cannot be missing from the overall process. For instance, for a starting point there must be some process for developing a list of important indicators and a means to select them. This process entails choosing the right people from different areas of the community to represent those areas and help formulate ideas for indicators. The next steps involve gathering the data which goes along with those indicators, and then processing, analyzing, and in a sense deciphering and translating the data to some tangible facts. Once the data is translated from numbers and statistics to general problems and successes, more steps can be taken. For example: using the raw data of number of dentist visits per year per person and translating that information so that it may be understood why that particular indicator is important to society in Worcester.

The further steps of the process of the project entail determining what solutions or improvements can be made to the neglected or problematic areas of the community. Creating some means of relating certain common indicator data to specific solutions is an important step in making the solution process all the more simple and easy to find. This creates a sustainable aspect to the project, as it will be useful for the future. When discussing a ‘sustainable’ project, it is referring to a project that will be relevant and effective for many years, not just for when it is completed. In order to make future efforts easier, one goal for the product of the project is a means to input specific forms of data, and be given back a general description of what problems or strength the data implies. Furthermore, along with that description, those involved would provide suggestions for solutions to problems, or simply general community improvement.

Beyond proposing solutions, the project should develop a means towards implementing those solutions, as well as motivating the general community to contribute to the cause for improvements. Perhaps that final step is the most important as the data and suggested solutions cannot alone improve a community. It takes efforts from those people involved in and about the community to truly bring about change.

The final product of the current project will most likely be two-fold. The deliverable part of the project is to create a sustainable indicator system that will work with deciphering the data and suggesting possible solutions. The intangible product of the project is the means to motivate the community towards creating change and improvement. With these two products combined, the result can possibly be a much-improved community for both the short term and long term future. That is after all, the main goal of the project.

B.1.3 Products of Other Indicator Projects

Many indicator projects around New England are very much the same, but they all are unique as well. All of the projects have established domains in which the many indicators are categorized into. While this concept is the same in each of the cities, the domains vary slightly from one another. Also, the number of indicators in a given project varies greatly. Many of the cities have reported success in their efforts. Thus it is not clear that the actual number of has any bearing on whether or not a certain project is successful or not. The difference in the indicator projects can be seen in Table 1:

Cities	Domains	# of Indicators used
New Haven, CT	Demographics, Education, Economic Health, Crime and Safety, Housing, Health, Civic Infrastructure, Transportation, Youth Children and Families	>400
State of Georgia	Demographic, Economic, Fiscal, Education, Health, Social, Environmental, Civic Participation, Public Assistance	35
Burlington, VT	Economy, Neighborhoods, Governance, Youth and life skills, Environment	~60
Boston, MA	Civic Health, Cultural life and arts, Economy, Education, Environment, Housing, Public Health, Public Safety, Technology, Transportation	~180
Reno, NV (Truckee Meadows)	Economic Vitality, Education, Health, Land use and Infrastructure, Natural Environment, Public Safety and Welfare.	30

Table 2.1

Out of all the cities researched, New Haven, Connecticut has the most indicators. This project has reported to have over four hundred indicators in nine domains. The domains described by the New Haven project are as follows: Demographics, Education, Economic Health, Crime and Safety, Housing, Health, Civic Infrastructure, Transportation, Youth, Children and Families. These domains are similar to Worcester's (see Appendix 2) in that they cover all areas of life in the city described, but are also much more specific. Each of the approximately one hundred different indicators in the city of New Haven is reported for four racial groupings: White, Black, Hispanic, and Total. These sub-indicators are one indicator taken and applied to each of the four groups, detailing how it affects them differently. This indicator project is the most comprehensive and has a database that is very well organized, especially considering the amount of indicators it contains. It would be a good standard to compare to our database as it has a search function and expandable sections. It would be ideal to produce a database as accessible and informative as this one, but that might be beyond our time limits. It is more likely that we will create a less sophisticated database and provide suggestions that will allow others to further its progress and make it as comprehensive as the New Haven database.

The state of Georgia has a completely different way of using their indicator project as it is applied to the whole state, not just a city or region. Their project can show how a specific city or town in Georgia can be compared to another, or to Georgia as a whole. Their domains are very

similar to New Haven's and less so to Worcester's (see Table 1). Unlike the New Haven project, the project in Georgia has only approximately thirty-five indicators.

The number of indicators in the Georgia indicator project is very similar to the number of indicators in the Truckee Meadows project. Truckee Meadows has the same number of domains, as well as similar domains, as the Worcester indicator project (see Table 1). The project's domains are as follows: Economic Vitality, Education, Health, Land Use and Infrastructure, Natural Environment, and Public Safety and Welfare. Truckee Meadows uses thirty indicators in their project. The indicators used are spread almost evenly throughout the six domains. This strategy was used in order to get an overall view of the city in each of the domains without resorting to hundreds of indicators to get the same effect. This method proved to be useful in a case where there was possibly not as much time and money available to be as comprehensive as a larger project, yet it was still successful.

Here in Massachusetts, Boston has also had an indicator project for about four years. This project uses a domain system that seems to be a combination of the domains from New Haven and Truckee Meadows. The domain categories have a similar structure to Truckee Meadows but the number of the domains is more that of New Haven. Within each of those domains are approximately eight sub-domains and about two or three indicators per sub-domains. This shows that Boston has the same thoughts as New Haven for the indicators, but chose not to split each of them up into four "sub-indicator" nationality groupings as New Haven did.

There are many lessons that can be learned from each of these various indicator projects. Each has a set of indicators that sets it apart from all the others, yet they all have a similar structure to them. Each project must select the indicators and structure system that fits its own needs and goals.

B.1.4 Lessons Learned from the History of Social Indicators

The many lessons learned from the evolvement and history of indicators are very relevant to our project as we must be able to grasp the idea of why this is being done and what good it can accomplish. Those lessons will help us determine the optimal process to use in order to achieve our high expectations for the product. Much like the mistakes made in the Pathways to Progress

report, we cannot afford to repeat the historical mistakes that are common with indicators, or else we might not be able to create a helpful report at all. Similarly, as we try to learn from specific indicator projects, such as that of New Haven, we must also learn from sophisticated studies that compare many indicator projects to understand systematic lessons. One such study is that of Cobb and Rixford's *Lessons Learned from the History of Social Indicators*.

B.1.4.1 Lessons regarding indicator selection:

- **"Having a number does not necessarily mean that you have a good indicator"** (Cobb, 1998, 14): This is true in the fact that not all statistics are useful as indicators. For example: we cannot use a statistic such as average rainfall during the first week in every July towards bettering the community.
- **"Effective indicators require a clear and conceptual basis"** (Cobb, 1998, 15): If an indicator cannot be clearly understood and described with others, then it may be too complex to be effective. For example: Public opinions on surrounding cities.
- **"The symbolic value of an indicator may outweigh its value as a literal measure"** (Cobb, 1998, 19): While some indicators may not rank high in value, they may have other factors that prove to make them important to the process. This will be discussed further when we reference the indicator rating system in our methods.

One difficulty an indicator project faces is the selection of indicators. The article describes many instances where inappropriate indicators were used and makes several suggestions to avoid these mistakes. First, one must realize that just because you have information does not make it valuable. The validity of the information must be confirmed and it must be proven as useful. Lessons such as "There's no such thing as a value-free indicator" (Cobb, 1998, 17) detail how there will be differing opinions and politics in deciding what value an indicator has, and none can be of a neutral perspective. Some conclusion must be reached to determine the validity and usefulness of an indicator. In addition, just knowing the symptoms does not help alleviate them. Indicators that imply causes to the symptoms are much more useful to the community. Finding indicators that adhere to these rules requires both creativity and research, but the current project's Steering Committee has already comprised a draft of the criteria to validate indicators (see Appendix 1). This list will probably change in the future, but for now it is a good foundation for out project.

A major idea conveyed by this article is that one must make subjective and creative opinions about the indicators one analyzes. One must view the indicator data not just as numbers that sum up to an answer, but as a metaphorical representation of the community. The approach to indicators must be analytical for one to understand how the indicators will help the community. Realizing the big picture will tell you where the problems lie and what causes them. Ultimately, the goal is to incite change in the community. If people are told what needs to be changed and the imperativeness of the change, they are likely to commit to achieving those changes through suggested actions.

B.1.4.2 Lessons regarding processing indicators

Another lesson "Comprehensiveness may be the enemy of effectiveness" (Cobb, 1998, 18) could help us evade a potentially large problem. The lesson states that trying to find too many indicators at once adds too much complexity too soon. If you analyze many data at once, you may lose grasp of the overall picture of the situation. As stated before, sometimes the most important idea to consider is the big picture. However, we will hopefully overcome this problem with the help of the Taskforce and Steering Committee. By allocating separate domains to different groups, they can develop an overall picture and relay that to us. This way, we will not be muddled by the droves of indicators that are presented to us.

The conclusion of this article states a simple yet important lesson: "…there are many blind alleys that can be followed." (Cobb, 1998, 31). This hints to the difficulty of creating an indicator project and what to expect. We should expect to do a lot of trial and error with our selected indicators. An initially good indicator that we invest a lot of time into could prove to be worthless. If there is anything this article teaches us, it is that we must keep a keen perspective on our project and how it proceeds in way of process as well as product. We must also have an analytical approach to the information for history has proven that is the most successful method. If we can grasp a solid idea of how the community around us works, we can see relationships within the community. Only then can we move on to how to make the necessary changes based on those relationships.

B.2 Past Indicator Work in Worcester

The City of Worcester has attempted to use indicators to help the city in the past. These projects were not sustainable indicator projects, but they were useful in addressing where problems were in the city. They also provide a useful starting point for our project, which has a much stronger support than any other project of this kind for this city. The major indicator projects of the past and their significance to this project will be discussed as well as the current efforts for this project.

B.2.1 Benchmarking Worcester

The Benchmarking Worcester project of 2000 was the initial effort for an indicator project in Worcester. However, it was simply a predecessor to any type of indicators project and was only a snapshot of one point in time. This project was only able to provide a description of the data of Worcester for one moment in time. Because of that, it was unable to provide any worthwhile information on what problems existed, let alone possible solutions. It was later succeeded by another project, which tried to take the efforts further in steps to improve the community.

B.2.2 Pathways to Progress

A few years ago, a group called Pathways to Progress attempted a task similar to our own. This group was originally convened by the United Way and was comprised mostly of volunteers. Their goal was creating a better community for Central Massachusetts through indicator data that would engage the community to strive for the betterment of their lives. They created a report regarding the community indicators of 2001, which is the predecessor to this current 2004 indicators project. Their report detailed many different indicators that they believed to be important to the community. However, the project provided no suggested means to improve the problematic areas of the community which it labeled as below satisfactory. While it is a good snapshot of the statistics of the community in 2001, it had no real sustainability as a project. Because of this, it was unable to provoke a real change in the community.

The Pathways to Progress project is relevant to our current project in many ways. Obviously, we have similar goals in data retrieval and in the hopes that it will provoke change in

the community. However, while we can use their report as an example of how to compare and contrast some pieces of data, we can also use it as an example of how we need to take the project a few steps further. Pathways to Progress helps show us that we must provide some suggested means to improving the city and cannot assume that the data will speak volumes on how the communities are hurting and in need of improvement.

The process used in the Pathways project, while not completely helpful, does have useful aspects. We can look to the project for good ways to collect and compare data. We can also view where it was unsuccessful and change our process accordingly to cover key areas that the previous project missed. Similarly, our aim is to result in a much more useful product than our predecessor's.

Currently, the indicator Steering Committee in 2004 is looking to improve upon the methods of Pathways to Progress and create a product that is a sustainable indicators project with possible solutions for given issues. After looking at the goals that Pathways to Progress presented, we can build off the foundation laid by our predecessors. The report presented by Pathways to Progress states eight areas that they believed were fundamental to the livelihood of the community. They are: "Be born, Grow up, Learn, Live, Work, Raise a family, Grow old, and Participate".

As for the exact indicators used in the report, Pathways to Progress selected them based on existing databases of indicators. Due to time and funding constraints, they chose indicators that were not costly to find or evaluate. Some of the indicators chosen were: Percent of births for which there was first trimester prenatal care, percent of child abuse, percent of youth participation in soccer and high school dropout rate. The Steering Committee decided that these indicators were not selected using the right methods. Although they admitted that the indicators were selected out of convenience due to lack of support, not lack of knowledge. Many members of the committee agreed that these indicators do not accurately measure the community as a whole. They only measure a small number of the problems in the community, and fail to address the causes of these problems as well. We can now look at this list of indicators, see where they are lacking, and then proceed to address those weaknesses and build on the strengths to create a list of criteria that will rate the effectiveness of an indicator.

The Pathways to Progress report presents its data by comparing many of the communities of central Massachusetts using indicators, and then compares those to state and region averages.

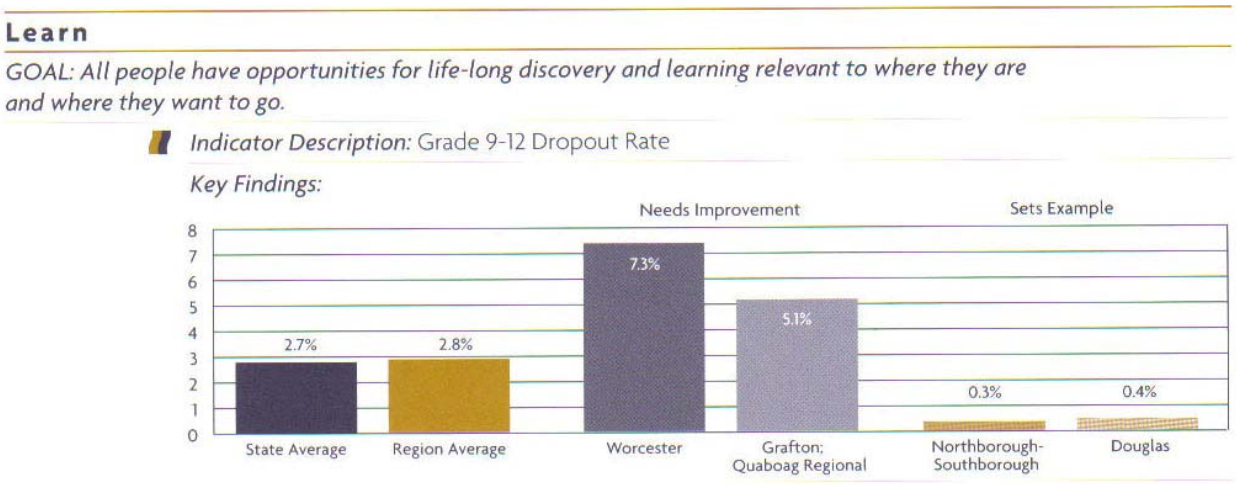


Figure 1: Figure taken from Benchmarks for Progress, 2001: Communities of Central Massachusetts Report

According to those comparisons, the Worcester community falls under the "Needs Improvement" column in many of the indicators selected. Of course, many of the indicators were presented because they showed the areas where Worcester was lacking. However, as the list of indicators is short and not comprehensive, the 'big picture' of the status of Worcester is missing. The report shows there is a higher dropout rate and lower MCAS scores in Worcester than in surrounding communities. There is little else presented to show the nature of Worcester public schools. The only indicator that attempts to justify these numbers is the percent of students eligible for free and reduced price lunch. The project claims that this indicator measures poverty in a community, which thus affects the ability to learn. This reasoning makes sense, but there is better reasoning to be found. It is possible to find a more direct link to poverty and education, as well as the fact that poverty is not the only problem that affects education. Our job will be to work with the members of the Taskforce that are in the fields of education and economics to determine more direct links between poverty and education. We will fix these limitations by inquiring with the domain-specific experts, enlisted by the United Way, for their opinions on certain indicators. Ultimately, we will have a list of indicators that fully describe the areas of Worcester that we are concerned about.

The Pathways to Progress group was well motivated and had good intentions. Their goal of identifying areas of our community were ailing were realistic and we think they achieved that.

However, they did not engage action with their report despite having descriptive indicators and well-established ideas for improving those indicators. We believe we can develop an understanding of where to go from this report. It tells us we need indicators that prove to the public that action is needed. Those indicators are difficult to develop and locate so it will take a large investment of time to accomplish that.

Appendix 2: Database User Manual

Preface for User Manual Version 1, December 2004

This document is a manual for the individuals who will be furthering the database portion of the *Worcester Counts* Indicator Project. The database is used to organize and present the indicator data that has been gathered, as well as presenting the information on the website with ease.

This manual for users will hopefully allow future participants in the project to have the ability to gain a clearer understanding of how and why we created the database the way it is. This manual, much like the actual project, is however still a work in progress. It is our hope that as the project grows to include more data and features, so to will this manual. We thus welcome additions to this manual, and request that new material be accompanied by new prefaces such as this one identifying authors and revision dates. We hope this manual will make the database use and update process easier for you and all of those who come after us.

In addition to this manual on how to use our database, you should also review our full report on the *Worcester Counts* Indicator Project, and the *Worcester Counts* Website Manual, both of which are available through the United Way of Central Massachusetts.

Michael Mackey

Aaron McDevitt

Patrick O'Malley

Introduction

This manual provides quick access to information about navigating, using, and updating the *Worcester Counts* indicator database.[1] First you will learn the details of the individual tables, queries, and reports, and how they interact. Then sections on adding and removing data from the database will be covered. Upon completion of reading this manual, you will be knowledgeable in how the database is structured and operates, and able to use and update it yourself.

The Database

The database is the foundation of the *Worcester Counts* project from which all other functionality is derived. While most users will only see the website end of the database, it should be noted that the project's website dynamically retrieves data from the Microsoft Access database instantly upon request. This allows for easier updating of information, as the information does not need to be input in two locations – the database and the web. Simply uploading the updated database to the website will allow for the updated data to be presented on the site. Because of this dynamic connection between the database and website, some of the functions in the database may not seem useful at first, but are actually used in order to present the data on the web.

[1] Note: This manual does not contain information on installing Microsoft Access (required to view the database) or information on troubleshooting Microsoft Access problems. Please refer to your Microsoft Office installation guide for details on installing the software. Consult Access' "Help" menus for general troubleshooting.

The Relationships

As you may know, Microsoft Access databases have a feature known as "relationships" which allow different tables of information to be linked. To truly understand the layout of the database, you will want to view the Relationships window under the Tools menu. Reference the window within Access, or Figure 1 below, to view the relationships.

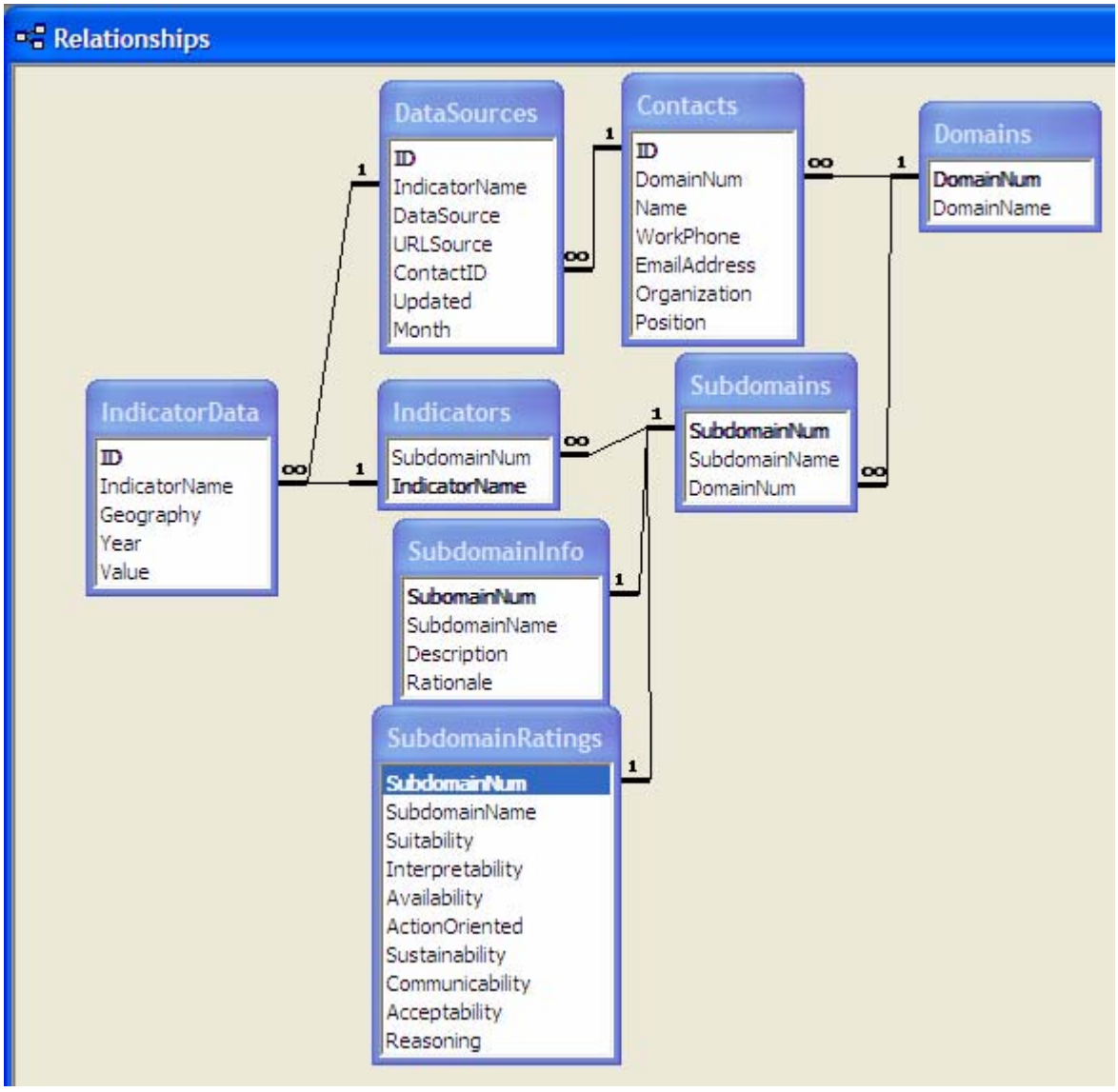


FIGURE 1: RELATIONSHIPS WINDOW

In this window you will find a list of the main tables of the database, with each of their fields listed, as well as their connections to one another. The infinity symbol (∞) denotes that

there is a “one-to-many” relationship. This means, for example, that for every one DomainNum in the Domains table, there are many of that same DomainNum in the Subdomains table. These relationships allow for common data to be presented in multiple tables, but only entered once, among other features. You should examine how the tables interact with one another through these relationships to better understand the functionality of the tables.

The Tables

The primary tables (Figure 2) of the database are those that you saw in the Relationships window (Figure 1). These tables make up the structure of how data is organized, as well as detailing the relevant information associated with the data. Additionally there is a table SubdomainRanks that provides the different rating level choices for the SubdomainRatings table.

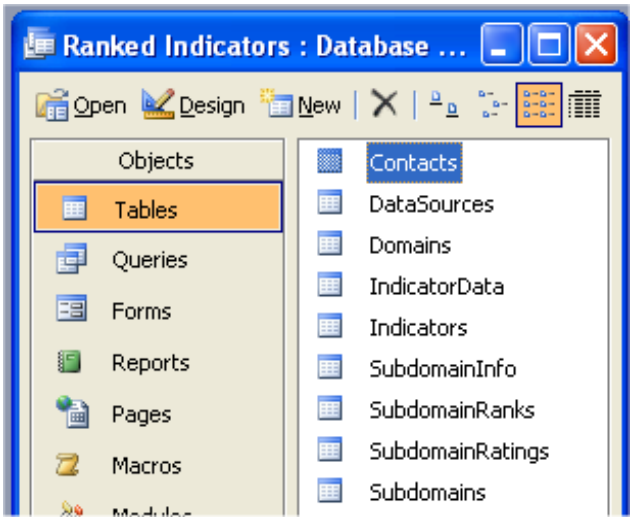


FIGURE 2: PRIMARY TABLES

There are additional tables, which will be referred to as secondary tables, where individual indicator data is stored. The purpose of these tables is to allow for a means to keep indicator-specific tables and fields. These tables are not necessary to the database, and are merely a convention for keeping records of our information. Also as a means of convention, to distinguish these secondary tables from the primary, they are named with a “~” prefix. This convention can be viewed in Figure 3, which shows some of the secondary tables.

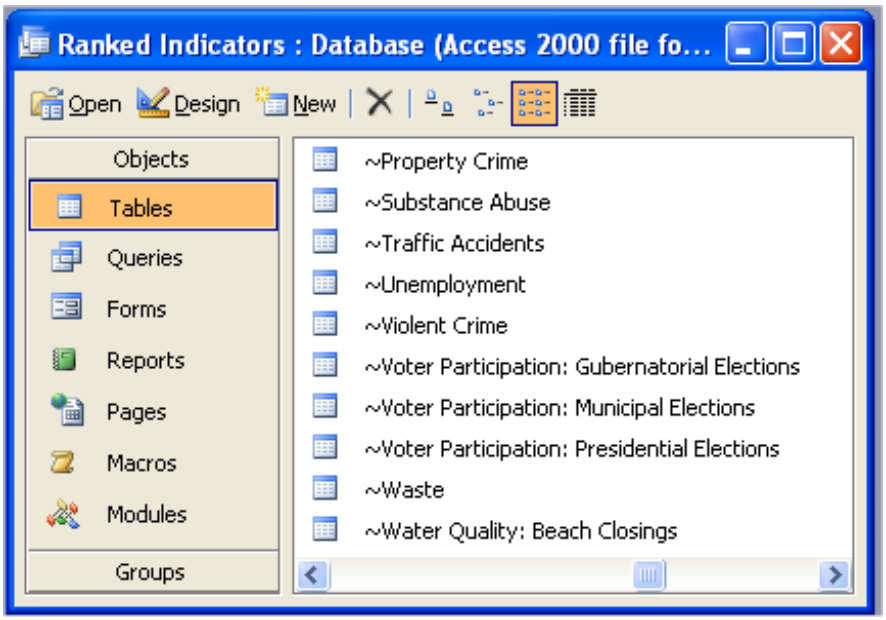


FIGURE 3: SECONDARY TABLES

Family Structure

Excluding the primary tables that describe the sub-domains (SubdomainInfo, SubdomainRatings), the primary tables have a relationship structure similar to that of a family tree (Figure 4). Each domain is "parent" to multiple sub-domains, which are each "parent" to multiple indicators and so on through indicator data. This structure allows for each specific indicator data to be traced all the way back to its domain "great-grandparent"

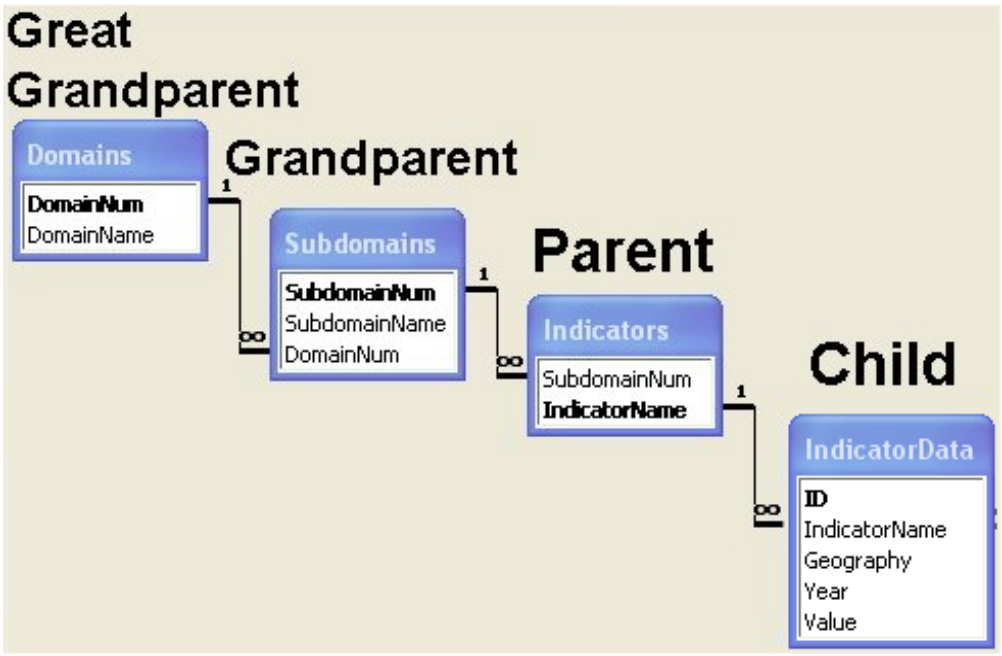


FIGURE 4: THE INDICATOR FAMILY TREE

This manual will now detail the different attributes and purposes of the individual tables. While sometimes tedious and unnecessary, it seems best to describe every field of a table for a complete explanation. It should be noted that table field names must be one word, without spaces, and without symbols in order to work correctly with the website. In such cases where fields had to be renamed for this purpose, they are given a caption in Access to appear as originally desired. You will see examples of this when the individual tables are discussed next.

Indicator Data Table

The Indicator Data table (Figure 5) is where all of the primary indicator data is stored. Its fields include the following:

- ID: A generated number unique to each entry into the table. This unique number allows for each individual entry to be distinguished from others.
- IndicatorName: This field is the specific name of the indicator, or the data that is being collected. This information is available through a drop down menu in the field, which allows you to view a list of the indicators listed in the Indicators table, which will be the table discussed next. The field name is displayed as "Indicator" within the table.
- Geography: In this field is the information pertaining to what area the given data applies to. The data can range from city wide down to individual precincts and up to any given geography even larger than citywide.
- Year: As the project is comparing the past trends of the indicators, it is essential that the database keep track of data by the year it pertains to. This field satisfies that need.
- Value: The actual data of the indicator is stored here. No specific units of measurement can be stored here as the field is left generalized for all forms of data. Because of this, the value units are stored in the indicator's name itself, located in the Indicators table.

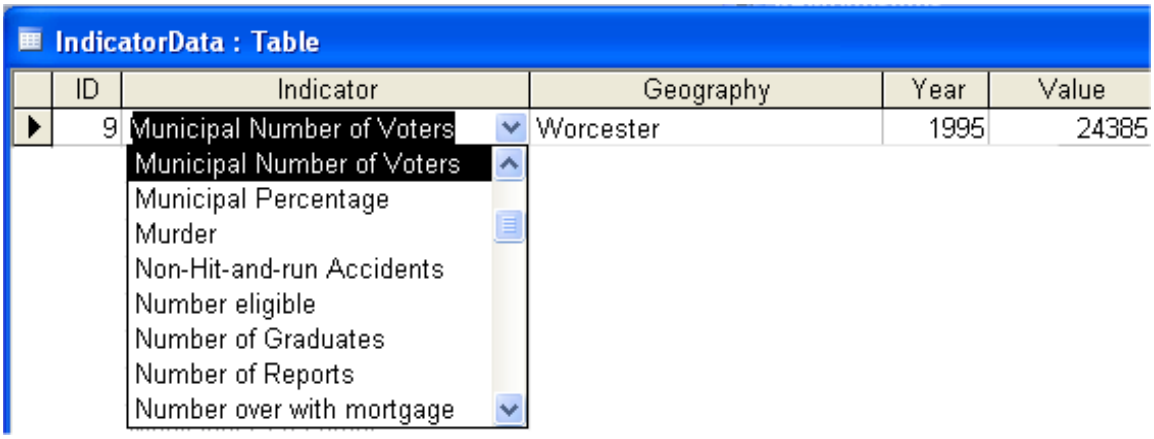


FIGURE 5: INDICATORDATA TABLE EXAMPLE

Indicators Table

This table (Figure 6) provides the list of indicator names used throughout the database, as well as the sub-domain categorization of the given indicator. It allows the database to organize the specific indicators, and their relevant data, into the given "parent" sub-domain. The fields of this table are:

- SubdomainNum: This number comes from the Subdomains table and allows each indicator to be linked to a specific sub-domain. The parent-child relationship between the Subdomains and Indicators tables is important for organizing the data of the given domains. The field is displayed as "Subdomain#" within the table.
- IndicatorName: The name of the indicator is input in this field so that it may then be available in the IndicatorData table, as previously mentioned. The field is displayed as "Indicator" within the table.

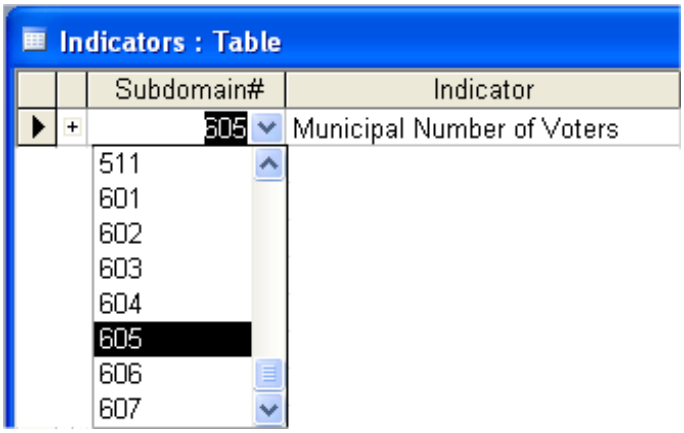


FIGURE 6: INDICATORS TABLE EXAMPLE

Subdomains Table

Each indicator is a "child" of a given sub-domain. As described in the Indicators table section, this relationship is important for organizational purposes. This table (Figure 7) provides even more detail and structure to the database organization by linking sub-domains to their "parent" domain.

- SubDomainNum: This number links with the Indicators table in order to classify each sub-domain with its own ID number. The field is displayed as "Subdomain#" within the table.
- SubDomainName: This field provides the name of the sub-domain. It is then linked to the SubdomainInfo and SubdomainRatings sections for further information. The field is displayed as "Subdomain" within the table.
- DomainNum: This number is what links the different sub-domains to their parent domain. Each domain is a collection of different sub-domains as this number ID is needed to determine which sub-domains belong to a given domain. The field is displayed as "Domain#" within the table.

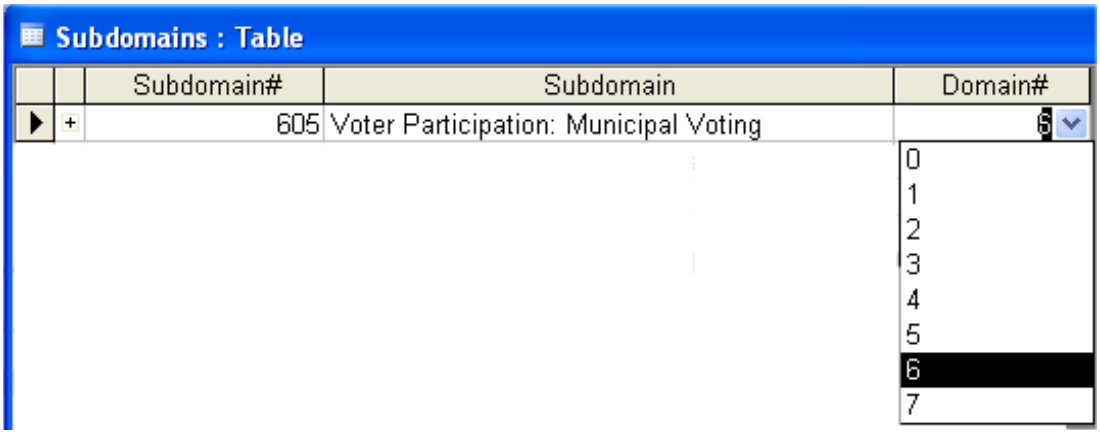


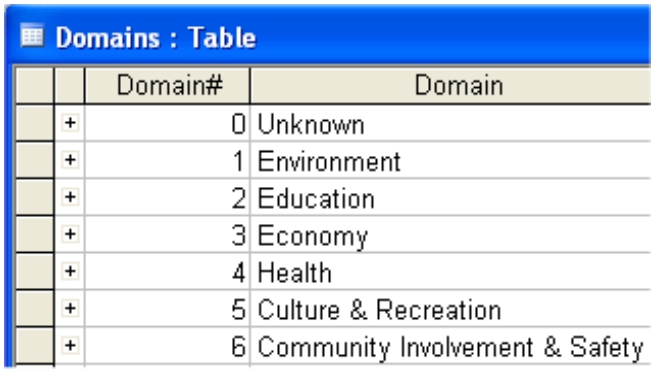
FIGURE 7: SUBDOMAINS TABLE EXAMPLE

Domains Table

The Domains table (Figure 8) is the table from which all other indicator data can be derived. Each domain, relevant to a specific quality of life, is comprised of sub-domains and

their different indicators and indicator data. This structure is integral for organizing the different sub-domains so as to classify them for easier use.

- DomainNum: This number is what links the different sub-domains to their parent domain. Each domain is a collection of different sub-domains as this number ID is needed to determine which sub-domains belong to a given domain. The field is displayed as "Domain#" within the table.
- DomainName: This is the field where the name of the domain is kept. The field is displayed as "Domain" within the table. For the public purposes of the website, the word domain was replaced with the phrase "Quality of Life" on the web.



Domains : Table

Domain#	Domain
0	Unknown
1	Environment
2	Education
3	Economy
4	Health
5	Culture & Recreation
6	Community Involvement & Safety

FIGURE 8: DOMAINS TABLE

SubdomainInfo Table

This table (Figure 9) provides for a location to describe the measurement of the indicator, as well as the rationale for its inclusion in the project.

- SubdomainNum: This field is the unique ID number of the sub-domain. It is what links this table to the Subdomains table in order to associate with all relevant information. The field is displayed as "Subdomain#" within the table.
- SubdomainName: This field provides the name of the sub-domain. The field is displayed as "Subdomain" within the table.
- Description: This is the description of how the indicators of the sub-domain are measured
- Rationale: This rationale provides the logic behind why the sub-domain was included in this project.

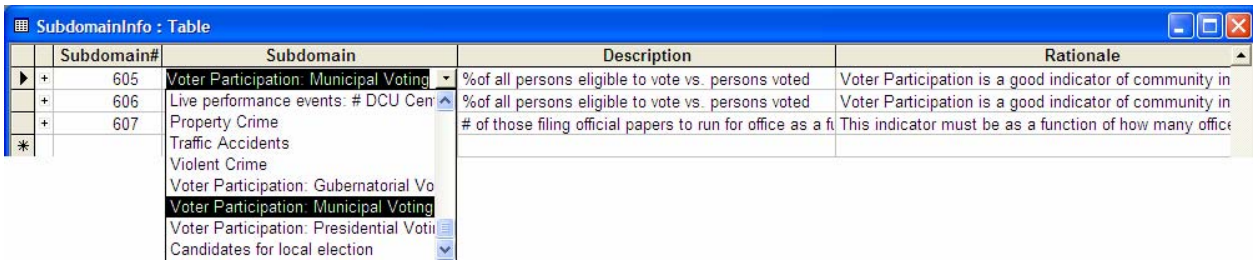


FIGURE 9: SUBDOMAININFO TABLE EXAMPLE

SubdomainRatings Table

The ratings table (Figure 10) allows for each sub-domain to be ranked according to the seven criteria for a good sub-domain. Each of the seven criteria can be ranked on a scale of 1 (poor) to 4 (Excellent) with an additional option for "Unable to Determine." This allows for a record to be kept of how useful a given sub-domain and its indicators are. Low ratings would be a sign to revise the sub-domain choice, or research further into how it could better achieve the criteria that it is lacking.[2]

- SubdomainNum: This field is the unique ID number of the sub-domain. It is what links the table to the Subdomains table in order to associate with all relevant information. The field is displayed as "Subdomain#" within the table.
- SubdomainName: This field provides the name of the sub-domain. The field is displayed as "Subdomain" within the table.
- Reasoning: This field describes the reasoning behind the ranking of the sub-domain. Giving more detail as to why the sub-domain scored well or poorly is essential for those who will be working on the project in the future and will need to know.
- Suitability, Interpretability, Availability, ActionOriented (displayed as Action Oriented), Sustainability, Communicability, and Acceptability: These seven criteria are chosen from possible rankings linked from the SubdomainRanks table. For descriptions of each of the criteria, view Figure 11.[3]

[2] Please reference the *Worcester Counts* full report done by the WPI IQP team in December 2004 for more information on this rating system and criteria, as well as much more about the project.
[3] Note that the figure is geared towards ranking indicators. However, the sub-domains of this project are simply groupings of similar indicators, so the logic behind the criteria still applies.

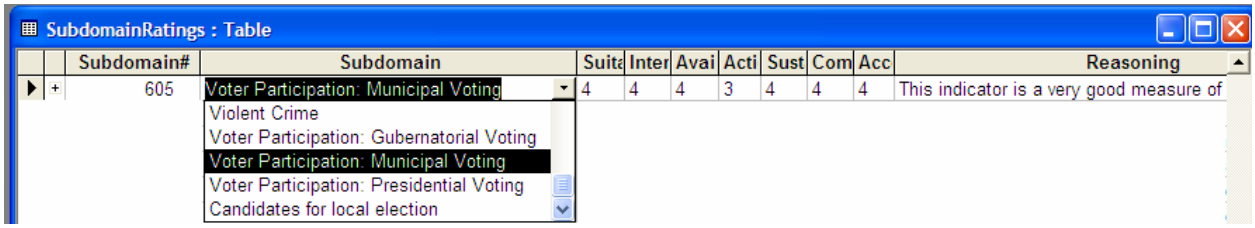


FIGURE 10: SUBDOMAINRATINGS TABLE EXAMPLE

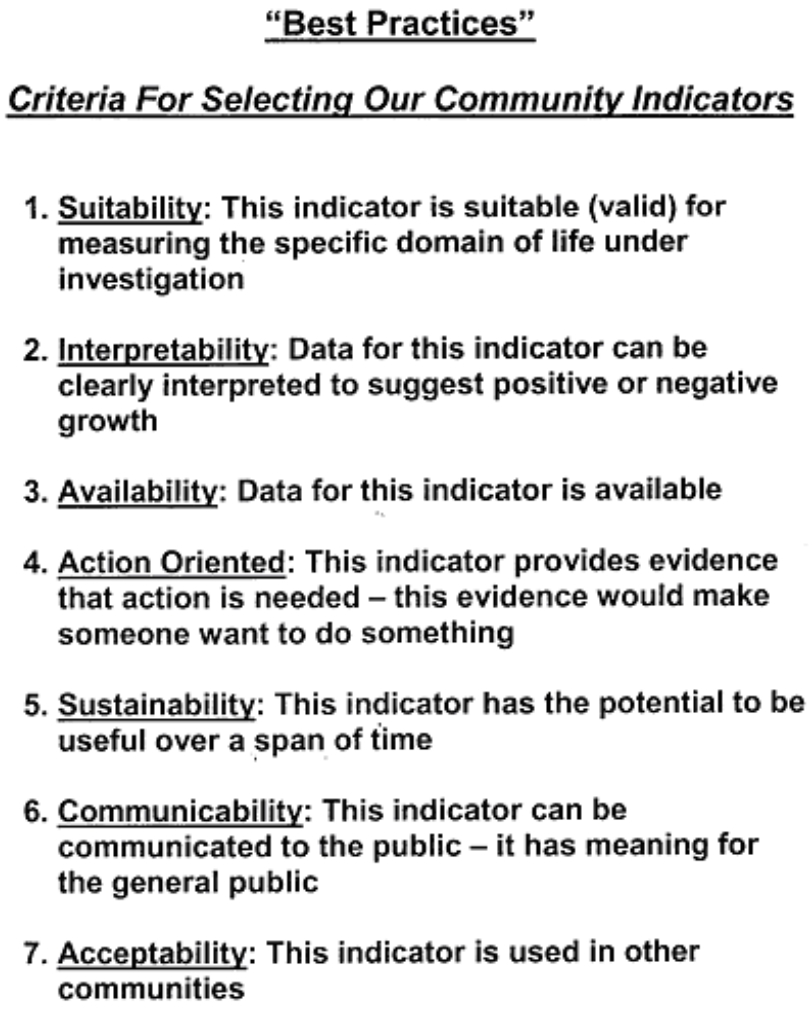


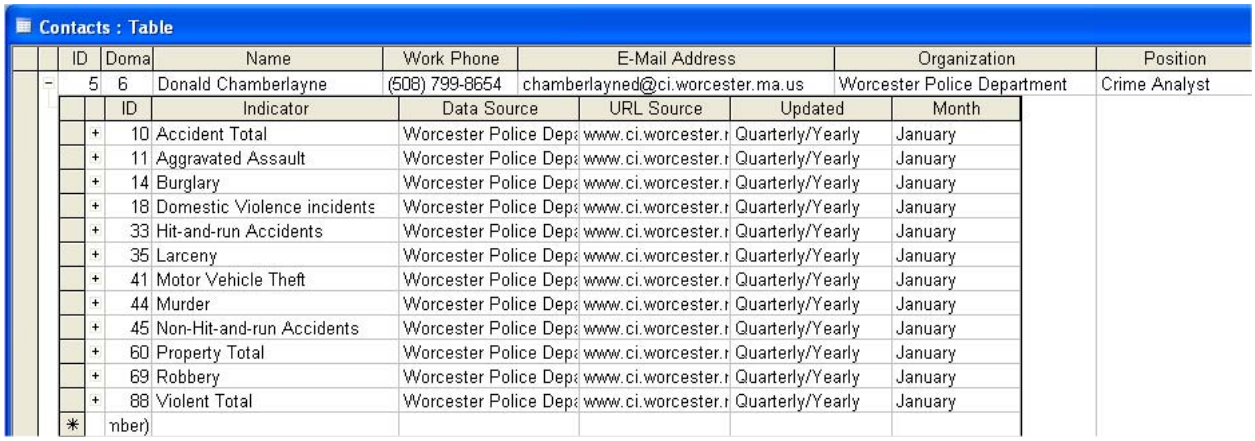
FIGURE 11: "BEST PRACTICES" CRITERIA FOR SELECTING INDICATORS

Contacts Table

The Contacts table (Figure 12) provides a list of people from different organizations in and out of the City of Worcester who have been or could be helpful for gathering indicator data or furthering the project. Through the relationships of the table, the individual contacts are

presented along with all of the indicators which they supplied data for, as you will see in Figure 12.

- ID: A generated number unique to each entry into the table. This unique number allows for each individual entry to be distinguished from others. In case two contacts have the same name, their unique ID number will be used to tell them apart.
- DomainNum: This number is what links the different contacts to the domain relevant to their field of expertise. The field is displayed as "Domain#" within the table.
- Name: This is the first and last name of the given contact.
- WorkPhone: This is the phone number of the contact. It is displayed as "Work Phone" within the table. Also, it automatically formats the number to appear as (###) ###-#### so that you can read the number with ease while using a telephone.
- EmailAddress: This is the e-mail address of the contact. It is displayed as "E-Mail Address" within the table.
- Organization: This is the organization that the contact works for. It is kept on record in case the contact ever leaves the organization and you need to contact them generally.
- Position: This is the position the contact holds within the organization. This will make finding the contact's successor in the future much easier when contacting the organization.



Contacts : Table

ID	Doma	Name	Work Phone	E-Mail Address	Organization	Position
5	6	Donald Chamberlayne	(508) 799-8654	chamberlayned@ci.worcester.ma.us	Worcester Police Department	Crime Analyst

ID	Indicator	Data Source	URL Source	Updated	Month
10	Accident Total	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
11	Aggravated Assault	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
14	Burglary	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
18	Domestic Violence incidents	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
33	Hit-and-run Accidents	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
35	Larceny	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
41	Motor Vehicle Theft	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
44	Murder	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
45	Non-Hit-and-run Accidents	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
60	Property Total	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
69	Robbery	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
88	Violent Total	Worcester Police Depa	www.ci.worcester.r	Quarterly/Yearly	January
nber)					

FIGURE 12: CONTACTS TABLE EXAMPLE

DataSources Table

The DataSources table (Figure 13) provides the information of where the indicator data was gathered. Without this information, it would be very hard for future users of the database to go back to the same sources and retrieve the latest data. This table is related to the Contacts table so that specific contact person information does not have to be repeated.

- ID: A generated number unique to each entry into the table. This unique number allows for each individual entry to be distinguished from others.
- IndicatorName: This is the indicator that the specific source information pertains to and is displayed within the table as "Indicator" and provided in a drop down list from the Indicators table.
- DataSource: This is the organization or department where the data is located
- URLSource: If the data is accessible from the Internet, then the web address for the data source will be kept on record through this field.
- ContactID: This field keeps a dropdown list of the different IDs from the Contacts table. It is a number that represents a person. This also solidifies the connection between the Contacts and DataSources tables.
- Updated: This field keeps track of how often the data is updated
- Month: In this field the month when the new data is presumed to be available is stored.

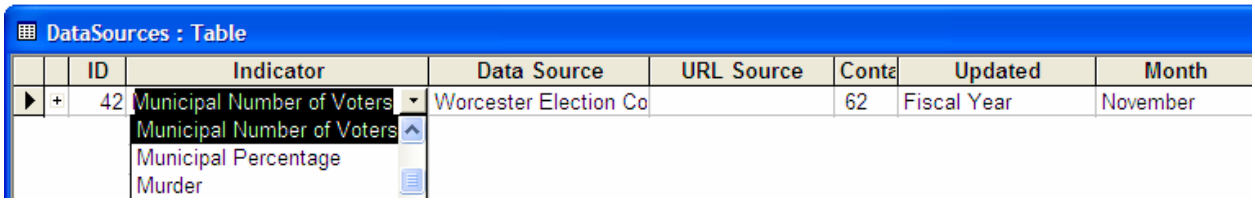


FIGURE 13: DATASOURCES TABLE EXAMPLE

The Queries

The queries (Figure 14) that we have created for the database generally function for one of two purposes:

1. Gathering information so it can be presented easily within another table (e.g. QryDomains)
2. Allowing for information to be better presented on the website (e.g. QryWebData)

- **QryContacts**: Allows for the DataSources table to have a dropdown list that lists all contacts' ID numbers and names, for determining which contact provided the data.
- **QryDomains**: Allows for the domain numbers from the Domains table to be presented in the Subdomains table.
- **QryIndicatorData**: Allows for the presentation of all individual indicators that the database has data for. The query returns the name of the indicator, with no duplicates (as each indicator is listed multiple times, for each year, in the table).
- **QryIndicators**: This query provides the list of all indicators from the Indicators table, so that they can be chosen from the dropdown list in IndicatorData.
- **QrySourceInfo**: This query combines all of the DataSources and Contacts information for it to be easily presented on the web.
- **QrySubdomainName**: Allows for the sub-domain names to be presented in the dropdown lists in SubdomainInfo and SubdomainRatings
- **QrySubdomains**: This query allows for the sub-domain numbers to be presented in the dropdown list in the Indicators table
- **QrySubInfoDomain**: In this query, the SubdomainInfo fields are presented along with the sub-domain and domain numbers, and domain name.
- **QryWebData:** This query combines all the data from the IndicatorData table with the relevant numerical fields from the Domains and Subdomains tables so that it can be better presented on the web.
- **Websubdomain:** This query is for the website and allows for the links on the website to work dynamically. When a link for a domain is clicked, this query recognizes which domain was selected and presents the relevant sub-domains.

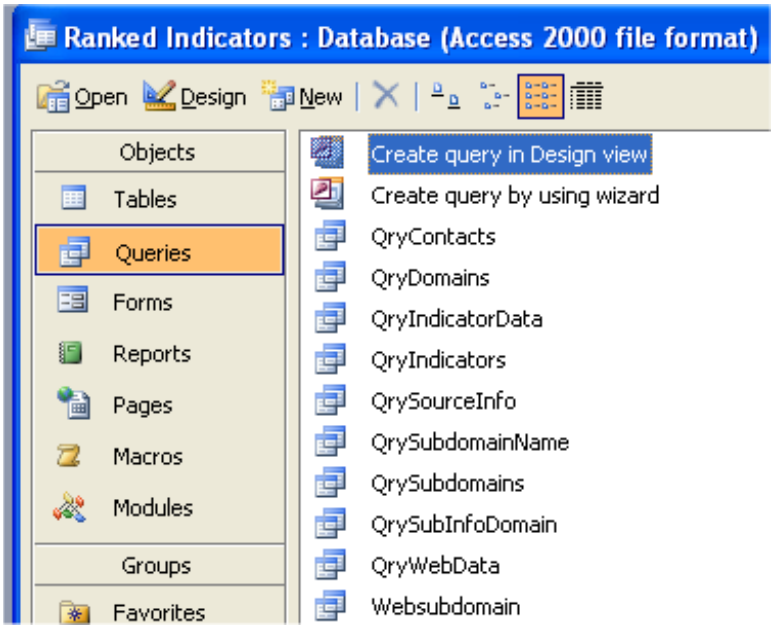


FIGURE 14: QUERIES

The Reports

The reports function in Access allows for a presentable and printable layout of chosen data from the different tables. Essentially the reports currently in the database (Figure 15) are used to present similar information as the website. In the case of needing a hard copy of the information as opposed to viewing it on the website, the reports can be exported to Microsoft Word and printed with ease. At this time you should view the specific reports and see for yourself what information they have to display.

- **All Info**: Displays all relevant domain and sub-domain info, as well as the indicators and indicator data pertaining to the sub-domain.
- **Subdomain Information Report:** Displays all relevant domain and sub-domain info, much like "All Info", yet it does not include indicators or indicator data.
- **Subdomain List:** This report is primarily for the use of explaining the different domains and their sub-domains. It is labeled with more "catchy" titles such as "Quality of Life" in place of the word domain. This way, the public will be easily able to read the report and understand what is being presented.

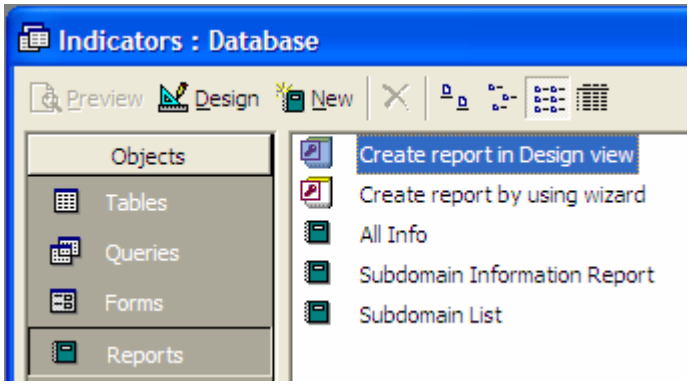


FIGURE 15: REPORTS

Adding Data

In order to add information in the database, you may need to use multiple tables to enter the data. You can add anything from additional indicator data, all the way up to new domains.

- For adding new indicator data:
    - First, use the DataSources table to select your indicator name and input the source from which you got the data. This must be done before you input the data.
    - Use the IndicatorData table, and select the indicator name from the drop down list
    - Fill out all other fields with your new data
- For adding new indicators:
    - Use the Indicators table, and select the sub-domain (number) that the indicator belongs in.
    - Fill in the name of your new indicator
- For adding new sub-domains:
    - Use the Subdomains table, and assign a new sub-domain number to the new sub-domain.
    - Fill in the name of your new sub-domain
    - Select the domain (number) that the sub-domain belongs in.
        - Use the SubdomainInfo and SubdomainRatings tables, and select the new sub-domain number and name from the dropdown lists in each table.
    - Fill out the appropriate information in these two tables
- For adding new domains:
    - Use the Domains table, and assign a new domain number to your new domain
    - Fill out the name of your new domain

Deleting Data

Deleting information from the tables is more difficult than adding information. If you are deleting a field that is not connected to another table (view the Relationships window if you are unsure), the task is simple. However, if you are deleting something that is connected, you must first remove all connected pieces of information that are beneath it. For instance, before you can

delete an indicator from the Indicators table, you must first delete its record in DataSources and IndicatorData. You will be notified by Access if you are trying to delete something before it is ready (Figure 16[4]). This may seem overcomplicated for you as a user, but it helps to guarantee that large amounts of data are not lost by an accidental click of the delete key.

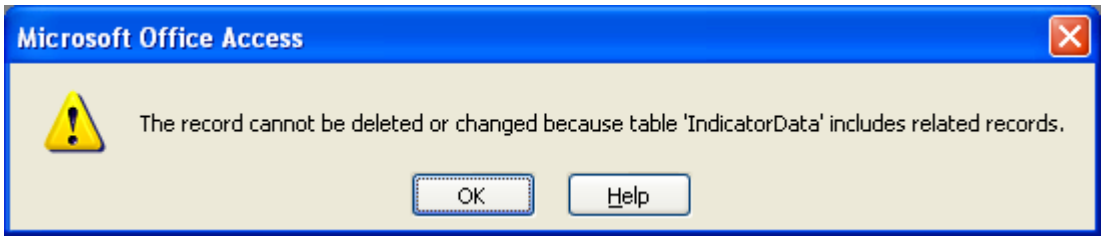


FIGURE 16: DELETION WARNING

[4] This error would come up if you tried deleting an indicator without deleting its information from the IndicatorData table

Additional Information

Authors

Database created for the Common Pathways Community Indicators Project, *Worcester Counts* by Michael Mackey, Aaron McDevitt, and Patrick O'Malley. Database User Manual created by Michael Mackey.

Contact

If you have any questions or comments regarding the project or database, please contact the project coordinator:

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Appendix 3: Website User Manual

Preface for User Manual Version 1, December 2004

This document is a manual for the individuals who will be furthering the website portion of the *Worcester Counts* Indicator Project. The website is used to present the indicator data that has been stored in the database, as well as provide important information about the project.

This manual for users will hopefully allow future participants in the project to have the ability to gain a clearer understanding of how and why we created the website the way it is. This manual, much like the actual project, is however still a work in progress. It is our hope that as the project grows to include more data and features, so to will this manual. We thus welcome additions to this manual, and request that new material is accompanied by new prefaces such as this one identifying authors and revision dates. We hope this manual will make the database use and update process easier for you and all of those who come after us.

In addition to this manual on how to use our website, you should also review our full report on the *Worcester Counts* Indicator Project, and the *Worcester Counts* Database Manual, both of which are available through the United Way of Central Massachusetts.

Aaron McDevitt

Patrick O'Malley

Michael Mackey

Introduction

The website for the *Worcester Counts* Indicators Project was in development during the final stages of the student's involvement with the project. It was developed with the help of Craig Sullivan of Mass Electric. He was responsible for the menu system as well as the template of the site. The WPI students added the content of the site, created the database interaction and created the feedback form. These items will be discussed in greater detail later in this document. The site is currently hosted at the United Way of Central MA at the URL: http://www.unitedwaycm.org/worceter_counts/cpci_home.htm

Navigation

Navigation of the website is very simple. On every page, there are logos at the top. Under the logos, there is a menu system (Figure 1), listing the site's broad topics. When the mouse is rolled over each menu item, a list is dropped down with links to more specific topics that the website covers. The menu items and a brief description of each are as follows:

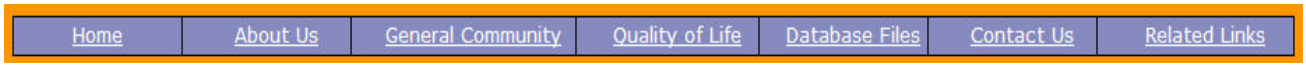


FIGURE 1: MENU SYSTEM ON THE WEBSITE: *WORCESTER COUNTS*

- **Home**- The website homepage
- **About us**- this page describes the Common Pathways contribution to the project as well as goals and what Common Pathways is.
    - **Who are we**- this explains a little about the people involved in creating the site
    - **Vision**- The mission statement of the project is listed here
    - **History**-a little bit of the history of the indicators project will be listed here
    - **FAQ's**- Frequently Asked Questions section. This will have questions that we receive from the feedback section as well as answers to those questions

    - **Staff**- This page is a list of people directly involved with maintaining the project
    - **Partners**- a list of partner organizations in the project
- **General Community**-This page will contain information on demographics of the City of Worcester
    - **About Worcester**- Will describe a little bit about the city of Worcester in general
    - **City Map**- Contains a map of Worcester and a description of the problem of division of neighborhoods.
- **Quality of Life**- These pages list each domain and each sub domain and indicator under them. These menu options are the most important part of the website as they contain the actual information of the indicators. This section will be discussed in depth later in this document.
    - **Community Involvement & Safety**
    - **Culture & Recreation**
    - **Environment**
    - **Education**
    - **Economy**
    - **Health**
- **Database Files**- These pages will contain information and files that can be downloaded and viewed about the data that has been collected.
    - **Spreadsheets**
    - **User Guide**- location where this manual is located
    - **Additional Documentation**
- **Contact us**- this page tells the user how to get in contact with the current person or people updating this site
    - **E-mail**- this will open an email program to send information to the people in charge of the website
    - **Feedback**- this is a page that all users of the website are encouraged to visit (Figure 2). It contains a form that users can fill out to give

information to the people updating the site and database to provide a better site for the user.

- **Related Links**- this page contains related links including web sources of data and links to other indicator sites around the country.
    - **Related Links**
    - **Data Sources**
    - **Community Profiles**

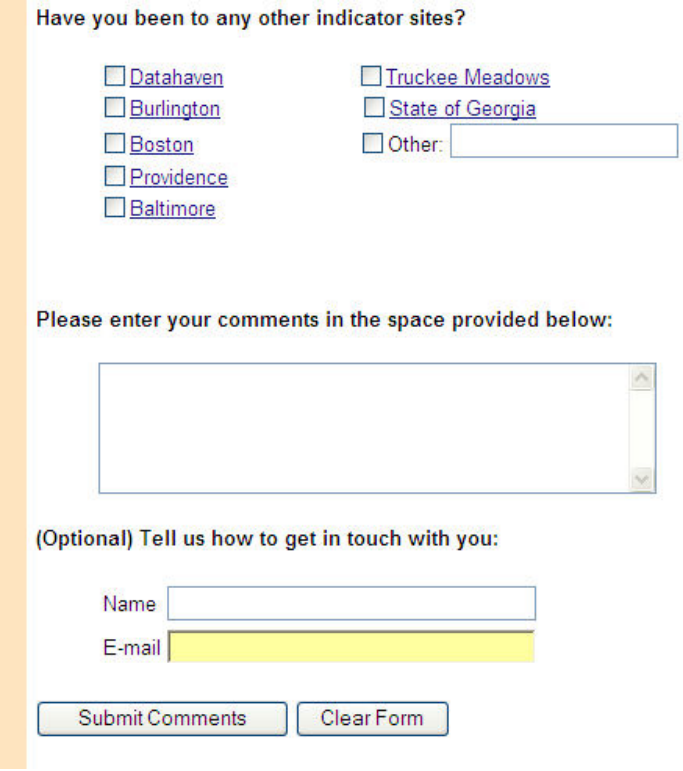
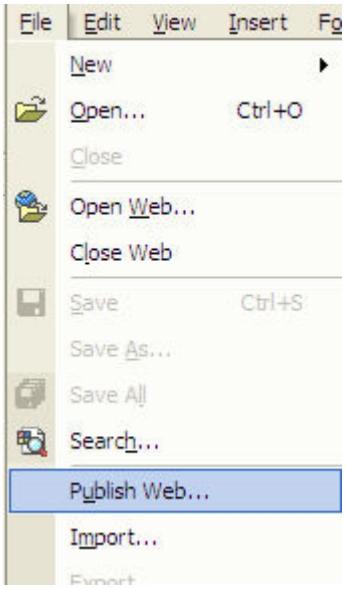


FIGURE 2: FEEDBACK FORM

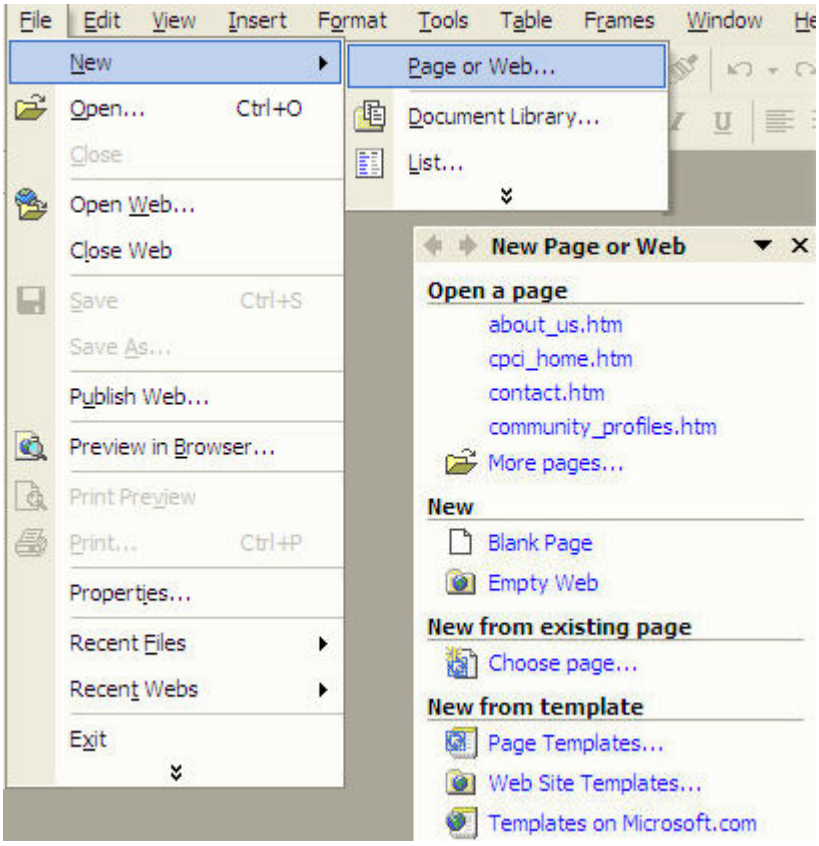
Updating the Website

Updating the website will be an important aspect of continuing this project in the future. To most, the website will be the only way to get the information from this project. Therefore, it is imperative for the website to be updated on a regular basis. The following is a list of the three steps involved in updating the site:

FIGURE 3: FILE MENU FOR FRONTPAGE



1. **Update the database**. The database is where the information is kept for the website. On each quality of life page, a domain of life is listed. The domains of life are the only data that is not created dynamically from the database (see *Adding a Domain of Life* for more information). Each domain of life page displays every sub domain that falls under that domain. These pages are created dynamically.



2. **Open Microsoft FrontPage**- in FrontPage, Select "File>>open web" and select the folder that the website is stored in.
3. **Update web**- Select "File>>Publish Web" (Figure 3) from the menu. Type in the username and password for the server and then Select publish. If the database was updated or changed, it will automatically update it to the website.

FIGURE 4: NEW PAGE OR WEB OPTION MENU

Adding a Domain of Life

The domains of life pages are specific to each domain. These are in the folder quality_of_life. While each domain has its own page, it still grabs the data dynamically from the database to be displayed on it. The following are steps to take to create a new domain page:

1. Create a new web page in the quality_of_life folder. This is done by Selecting on file>>new>>page or web. On the right side of the screen, a menu will open select: "New from Existing Page."

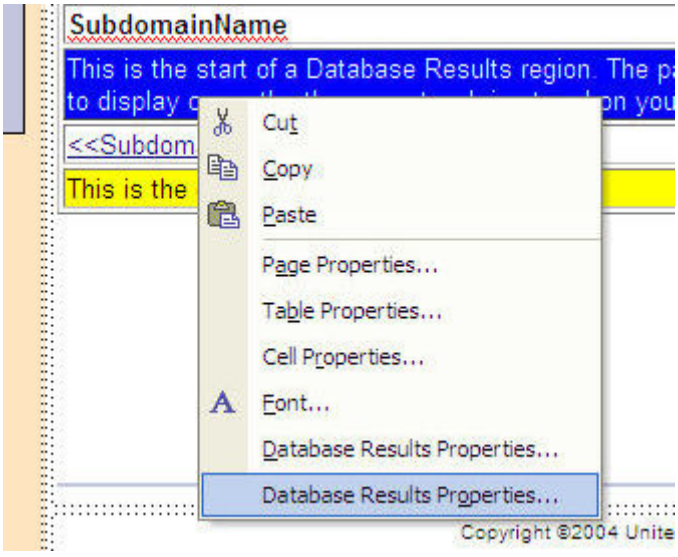
2. Select "choose page…" From the window, open the quality_of_life folder and select one of the domain pages. The domain pages are called: community_involvement_&_safety, culture_&_recreation, economy, education, environment, and health. Select any one of these pages, and FrontPage will create an identical page to the one you selected.

3. Select "File>>Save As…" from the top menu in FrontPage, and save your new page to the quality_of_life folder with the same name as the new domain.

NOTE: when saving a web page file, make sure the name is one word, or separated by underscores or dashes. There should be no spaces in a web page name.

FIGURE 5: HOW TO GET TO DATABASE RESULTS PROPERTIES

4. In the "normal" view of your page in FrontPage, you can edit this page. Change the name at the top of the page to reflect the name of your new domain. Make sure the



title of this page matches the font, style and size of the other pages.

5. On the page, you should see two yellow bars (Figure 5). Right Select on the top yellow bar in the table on the page. Select "Database Results Properties…"
6. If not already selected, select "use an existing database connection" and select the "indicators" connection. Then Select next.
7. Select record source from the radio button, and then select "subdomains" from the drop-down box. Select "Next…"
8. Subdomain should appear in the grey box in the middle of the window. Select "Edit List." In this window, subdomains should appear in the white box on the right side of the window. All other items should appear in the left-hand box. Select ok. Select on more options on the bottom of the window. Select the criteria button on the top of the window. In the box in the new window that opened, Under field: DomainNum,
    - Under comparison: Equals,
    - Under value: [DomainNum] and
    - Under And/Or: And.

    If these fields are correct, Select ok. If they are not, Select "Add…" and fill in the specified criteria from the drop-down boxes. Select "ok"
9. Select "Ordering…" from the more options window. In the right box, SubdomainName should appear with a yellow arrow pointing up next to it. All other fields should appear in the left-hand box. If they do not, use the "Add>>" "<<Remove" and "Change Sort" buttons accordingly. Select "OK"
10. In the more options window, Select "Defaults…" on this new window, Under "Name" should appear "DomainNum" and Under "Default Value" should appear the number of the domain that you are adding. This number should correspond to the domain number added in the database in the domains table. **NOTE: The default value will not default to the desired value like many of the other options have already in this Manual.** This must be changed. To change the default value, Select "Edit…" Input the number of the domain that you are trying to add in the box provided. Select "OK" then Select "OK" again and yet again.

You should be in the “Database Results Wizard” window. Select “Next”

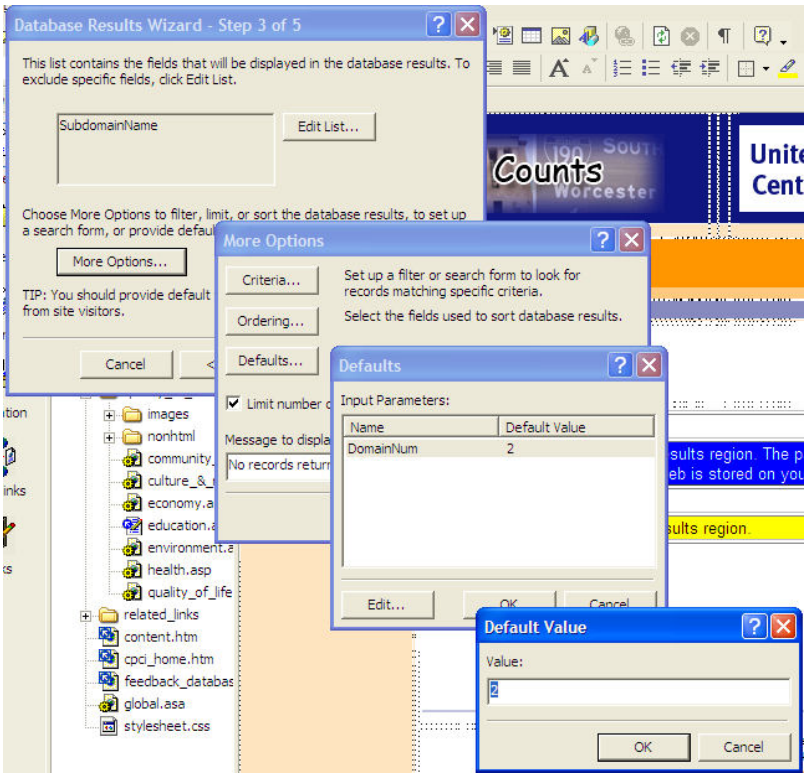
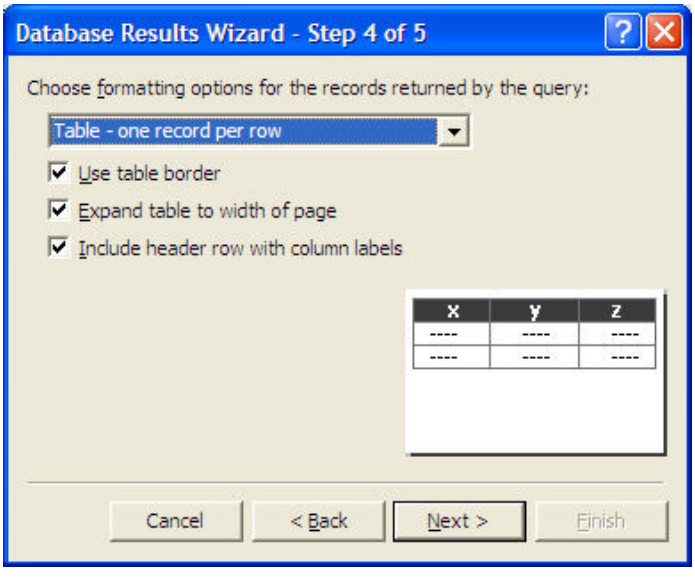


FIGURE 6: DATABASE RESULTS WIZARD MENU OPTIONS

11. In the next window, from the drop-down box select “Table- one record per row” and make sure all the options are checked (Figure 7). Select “Next”

FIGURE 7: END OF DATABASE RESULTS WIZARD



12. Make sure the “Display all records together” is checked. And “Add search form” is unchecked. Select “Finish”
13. One final step in the domain page creation. You must rename the page so the file extension is “.asp” **NOTE: you do not need to rename the name of the file, just change “.htm” to “.asp”** This

can be done by Selecting the name of the web page on the left side of the screen so that it is highlighted, count to 5 and then Select the name again. This will select the name of the file, so you can rename the end of it from ".htm" to ".asp".

Quality of Life

The quality of life page on the web site is one of the most important pages on the site. There is only one page that displays the indicator information on the site. This page is automatically changed each time you visit it. It is set up much like each of the domain pages discussed earlier in this document. To change how the data is displayed, you must go through the same process above by right Selecting on the yellow bars on the site (Figure 8). This page grabs data from the database in two places instead of one like the domain page. At the top of the page, it gathers data from a defined query named: QrySubInfoDomain. This will display the domain name that this specific subdomain is from as well as give a description and a rationale of why this is a good indicator. The bottom half of the quality_of_life page displays each indicator name within the current subdomain as well as its geography, year and value for that year.

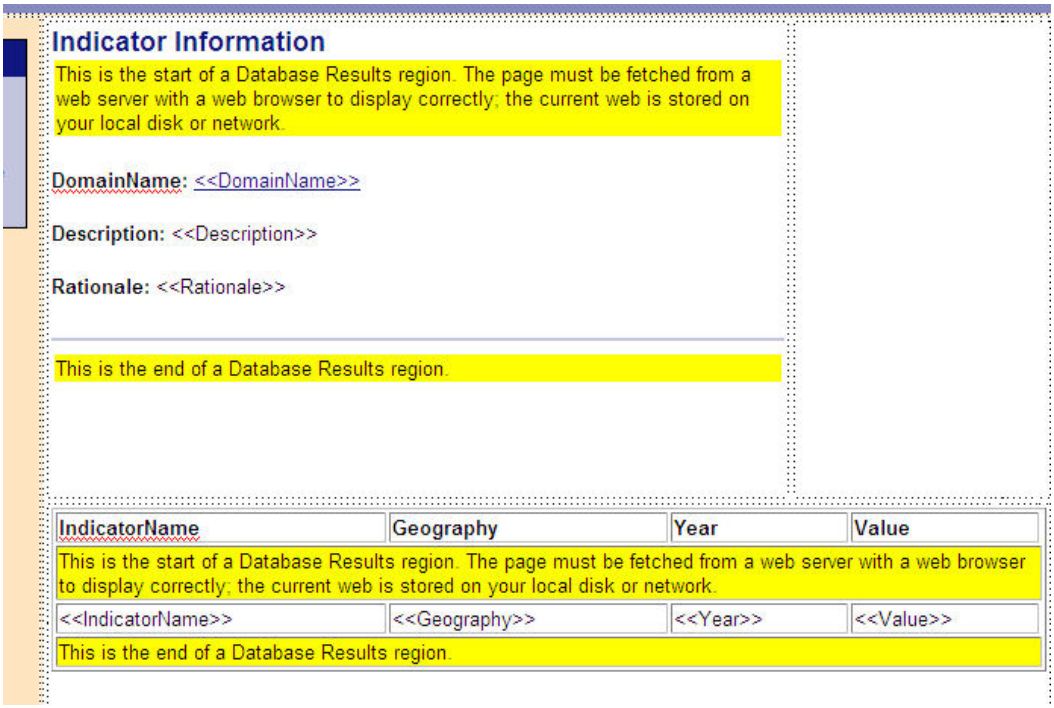


FIGURE 8: QUALITY_OF_LIFE.ASP PAGE

Menu System

The menu system for the website was created using a program called OpenCube. It creates a JavaScript based web menu system through a clear and easy system. To update the links on the menu system, you must use the OpenCube program. More information about using this system can be obtained by contacting Craig Sullivan at Mass Electric.

Hyperlinks

This section is to detail the most important hyperlinks in *Worcester Counts*. This section will not describe how to create hyperlinks in Microsoft FrontPage. For more information on how to create hyperlinks in FrontPage, consult a user manual on that subject.

There are two very important types of hyperlinks defined in the *Worcester Counts* web page. They are from each domain page to the quality_of_life.asp page, and from the quality_of_life.asp page back to the appropriate domain page. There are a few steps to take to create these hyperlinks. There are a few steps to take in order to make these hyperlinks work correctly.

1. On each domain page, as seen above, there are two yellow bars, which define the database results section. In the middle of the bars, there is text that looks like: "<<SubdomainName>>." Highlight the whole text including the << and >> and right-Select it. Select "Hyperlink…" from the bottom of the menu.
2. Navigate to the quality_of_life folder and then to the quality_of_life.asp webpage in the middle box. This should insert the hyperlink directory in the text box at the bottom of the window.
3. On the right hand side of the window, Select "Parameters…" Near the bottom of the parameters window Select "Add…" then select SubdomainName from the top drop-down box. You will see that the value box on the bottom of the window automatically fills itself out with the correct code. Select "OK"
4. Repeat Step 3 again, but instead of SubdomainName, select SubdomainNum from the top drop-down box.

This will describe how to create and edit the hyperlink from the quality_of_life.asp page back to the domain pages. **NOTE: At the time this was written, the hyperlinks going from the quality_of_life.asp page to the community_involvement_&_safety.asp, and the culture_&_recreation.asp pages will not work properly.**

1. Highlight "<<DomainName>>" from the middle of the first two yellow bars. Right-Select and select "hyperlink…" from the menu. Navigate to the quality_of_life folder in the middle box of the window so that the bottom text box of the window says "..\quality_of_life\".
2. Select "Parameters…" In the top box, move the cursor after "..\quality_of_life\" and Select the "Insert Field Value" button under the top text box. From the drop-down box, select "DomainName." This will add code to the top box after "..\quality_of_life\" After the > at the end of the code, type in ".asp" into the box. Select OK, then OK on the hyperlink window (Figure 9).

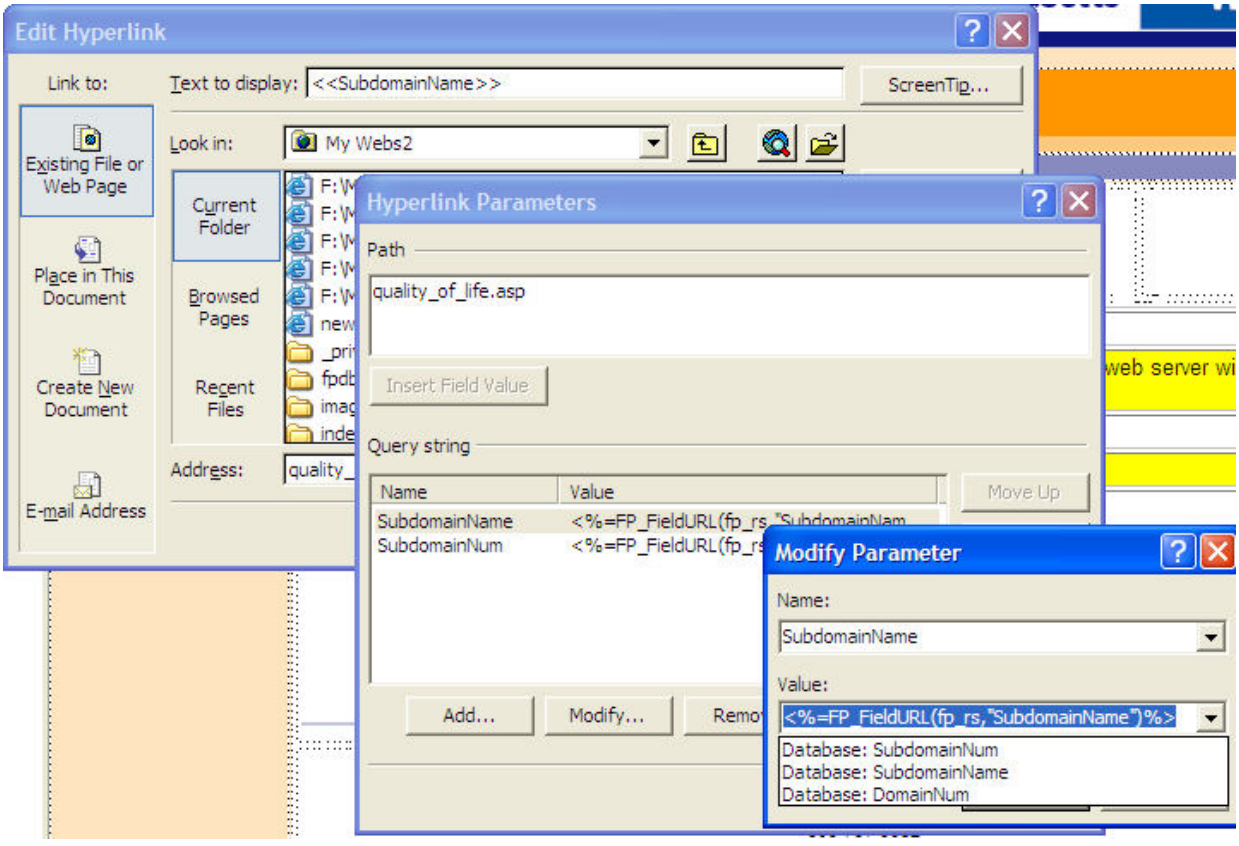


FIGURE 9: HYPERLINK PROPERTIES.

Additional Information

Authors

Website created for the Common Pathways Community Indicators Project, *Worcester Counts* by Aaron McDevitt, Michael Mackey, and Patrick O'Malley. Website User Manual created by Aaron McDevitt.

Contact

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Appendix 4: Scheduled Meetings

- November 3, 2:30pm
- Massachusetts Department of Public Health presented "Public Health in the 21st Century" Central Regional Forum.
- Attended: Pat, Aaron.

Before the presentation, Cathy O'Conner introduced us to the women responsible for the data that was to be presented. One of the women, Isabel Caceres, provided contact information and agreed to give us assistance with any health data we needed. The presentation highlighted many interesting statistical data concerning Massachusetts's health status. It also presented research into these concerns and the evaluation of the research and data. Some examples of the indicators were: Percentage of Adults With no Health Insurance, Adult Health Behaviors and Risks and Infant Mortality Rates. Many of the indicators were compared geographically and highlighted problem areas. Also, some of the indicators were compared to others. Premature Mortality Rates were compared to Median Household Income and it was evident that income is a large factor in how long people live. We were able to see how indicators can be used to stress important problems in society and prove to people that action needs to be taken.

- November 8th, 2:00pm
- Meeting with Donald Chamberlayne, Worcester Police Department Crime Analyst
- Attended: Aaron

This meeting was very productive. Aaron talked with Donald about the indicator Taskforce meeting a few weeks earlier and how we thought it went. Donald was explaining to me how he thought the meeting went well, but he thinks some indicators have flaws in them. He explained why he proposed his indicators and said he has some previous knowledge of indicator projects. His goal in this meeting was to communicate to me why his proposed indicators were relevant to the project, useful to the community, and very easily obtainable.

- November 10th, 11:00am
- Meeting with Mary Parenteau, Department of Elder Services
- Attended: Aaron

This meeting was short. Aaron started out explaining the project to Mary and why it was important to gather the information she would provide. She found the project very interesting and was happy to provide the data. She explained to me that their data was not computerized so

in the future, gathering the data would take a few moments to count. She then brought the information on elder abuse in the past few years, counted and gave me some numbers.

- November 11th, 10:30am
- Meeting with Patsy Lewis, Worcester Community Action Counsel Executive Director
- Attended: Aaron, Pat

We met with Patsy to discuss where we could find data for how many people are serviced by fuel assistance. She had the information stored somewhere and later in the week she delivered to us the data for the number of people seeking and receiving fuel assistance for the past five years. Patsy participated in the education domain during the Taskforce meetings, so Pat brought up the list of indicator rationales that pertained to the education indicators. She glanced through the rationales and evaluated them as fine. Since she showed interest in ESL and Adult Ed programs during the Taskforce meetings, Pat asked if she knew where data for those programs could be found. She mentioned Jane Shea as a better person to ask and, since we had already contacted Jane, we dropped that subject.

- November 11th, 2:00pm
- Meeting with Steven D'Agostino, Worcester Business Journal Writer
- Attended: Pat

Steven D'Agostino is an experienced business journalist who has a lot of knowledge about the Worcester economy. Pat discussed with him all the indicators that were chosen as the final indicators by the economic Taskforce members. When asked if he thought any other indicators should be included, he replied that all other indicators that the Taskforce suggested would overlap the indicators and felt that these indicators covered all the important parts of Worcester's economy. He then proceeded to go through each indicator separately and explain if the description of the indicator was appropriate and if the data was available. The indicator descriptions have since been updated from this meeting according to Steven's suggestions. As for where to get the data, Steven suggested to contact The City Manager's Office, The City Clerk's Office and a few people who held positions in those offices. For some of the indicators, it would be required that individual businesses might have to be contacted. He also suggested an organization called MISER (Massachusetts Institute for Social and Economic Research) that works with census data to provide more detailed information. Then he went over each indicator's rationale and gave suggestions for improving them. These suggestions were accepted

and used to revise the economic indicator rationales. He then suggested a program called J-Lab to contact regarding help creating the website for this project (http://www.pewcenter.org/about/j-lab.html). This resource was not used due to the decision to use other resources to build the website.

- November 15th, 10:00am
- Meeting with Jane Shea, Quinsigamund Community College
- Attended: Aaron, Pat

We met with Jane Shea to discuss information regarding ESL, Adult Ed and Immigrant ED programs. She had prepared for us a copy of a report published in January 2003: Community Assets and Needs Assessment. This report includes all the major programs for ESL, Adult and Immigrant Ed, but does not list exact numbers of participants for all of them, nor does it include those waitlisted for these programs. We discussed how to examine the numbers for those waitlisted because the college and the education department both have waitlists and there may be some overlap. She also looked over the rationales for these indicators and gave some suggestions on the diction. These revisions were later added.

- November 16th, 10:30am
- Meeting with Craig Manseau, Election Commission Executive Director
- Attended: Aaron

This meeting was to gather information on elections in the past few years. The meeting started out with introductions and Craig providing the raw data for Aaron to look at. He decided that he did not need the information broken down by wards and precincts. Later on in the project it was determined, however that the election information was needed broken down by ward and precincts. Aaron went and gathered that information in a short meeting with Craig. The remainder of the meeting on November 16th was mainly Craig explaining why the election statistics were so important as well as giving Aaron insight into how the whole voting process works. It was explained to him that all the information in the city was tied electronically to all other cities in Massachusetts and that the information was very accurate because of that fact. There was much more information that was communicated with Aaron during that meeting, however helpful it was, it was not within the scope of this project to analyze indicator data.

- November 17th, 7:45am

- Worcester Regional Research Bureau, In Partnership with: Worcester Business Development Corporation, present Solving the Housing Crisis: A New Approach
- Attended: Pat

This meeting was a presentation delivered by the Worcester Regional Research Bureau. It did not discuss the fact that there was a housing crisis; rather it focused on a plan to fix the housing crisis. Although not helpful for the purpose of this project, it did provide a positive outlook on the initiative for affordable housing. After the presentation, Pat talked with Roberta Schaffer about the project. She could not provide any information as to where to find indicator data. Instead, she expressed her opinion that many of the economic indicators would be very difficult, if not impossible, to measure.

- November 17th, 10:00am
- Meeting with Jay Gardiner, Department of Public Health Director
- Attended: Aaron, Mike

About

- November 17th, 11:00am
- Meeting with David Gillis, Department of Social Services
- Attended: Aaron

Child abuse

- November 18th, 3:00pm
- Meeting with Penny Johnson, Worcester Public Librarian
- Attended: Mike

Penny Johnson of the Worcester Public Library provided information for the attendance, circulation, and new acquisition statistics of the WPL. She provided online sources for some of the data, however the new acquisition data was not available online and she could not locate it in the office. She later was able to fax the data to the United Way to complete the data.

- November 19th, 10:00am
- Meeting with Craig Sullivan,
- Attended: Mike

Craig Sullivan provided information on what he would need to design a menu system for the *Worcester Counts* website. His requests for information were met and he provided the menu for the project soon after. As he works for Mass Electric, he was also able to provide the information on electricity use in the city as well.

- November 23rd, 10:00am
- Meeting with Peggy Middaugh, Regional Environmental Council Executive Director, and Colin Novick, Greater Worcester Land Trust Project Coordinator
- Attended: Mike

The meeting with Peggy and Colin was to discus the different environmental sub-domains. Specifically, the topic of conversation were the four land related sub-domains: Brownfields, Green Cover, Open Space Designated, and Community Gardens. The main purpose of the meeting was to better define how these indicators or sub-domains were going to be measured, as well as build relationships with the two respective organizations. The meeting contributed a better understanding of how these sub-domains were to be measured, albeit making them more difficult, as well as providing a list of community gardens and open space that will need to be further developed with Peggy and Colin respectively.

- November 23rd, 2:00pm
- Meeting with William Scanlan, title
- Attended: Aaron, Mike, Pat

We approached William about the indicators regarding effective transit and brown fields. For the effective transit indicator, he had come up with information that measured how people get to work. This information was stored in multiple Excel files. In order to fit the effective transit indicator's description, this data would have to be analyzed thoroughly and we simply did not have the time to do that. He provided a binder full of transit information, but only for the year 2000 and none of it fit any descriptions of our current list of indicators. He suggested that we contact the Worcester Regional Transit Authority to help with the data he gave us as well as getting information on what is currently being planned for Worcester transit.

- November 30th, 4:00pm
- Meeting with John Rogan, Assistant Professor of Geography, Clark University
- Attended: Aaron, Mike

This meeting was to discuss the HERO project at Clark University. John helped provide a means of measuring the green cover in Worcester as well as other land related developmental indicators (see Appendix 13). The HERO project will be able to provide satellite images and graphical maps with data pertaining to specific areas of Worcester. This graphical representation of our data is essential to making the project more useful and interesting to the public, as well as to the different city organizations. John expressed a substantial interest in becoming a partner of the project and he should be kept up to date on the project progress in the future. After returning

to Clark University in 2005 after the winter break, John should be able to provide more assistance with the indicators as well as more information on the possibilities of making the indicators presentable in maps.

- December 2nd, 10:00pm
- Meeting with David Gillis
- Attended: Aaron

This was a follow up to the November 17th meeting and to gather better interpretation to the information that was provided to Aaron. David explained how to read the information provided and provided insight into which fields on the packet of information were the best indicators to use for the report.

Appendix 5: "Best Practices" Indicator Criteria

"Best Practices"

Criteria For Selecting Our Community Indicators

1. **Suitability: This indicator is suitable (valid) for measuring the specific domain of life under investigation**
2. **Interpretability: Data for this indicator can be clearly interpreted to suggest positive or negative growth**
3. **Availability: Data for this indicator is available**
4. **Action Oriented: This indicator provides evidence that action is needed – this evidence would make someone want to do something**
5. **Sustainability: This indicator has the potential to be useful over a span of time**
6. **Communicability: This indicator can be communicated to the public – it has meaning for the general public**
7. **Acceptability: This indicator is used in other communities**

Appendix 6: List of Indicator Domains with Suggested Indicators

STARTING POINT: MATRIX OF DOMAINS OF LIFE & INDICATORS

DOMAIN	CATEGORY ("SUB DOMAIN")	INDICATORS
Environment	Air quality	# Asthma & respiratory hospital admissions
	Water quality	# Ecoli cases or other incidents
	Open space	# Acreage loss/expansion per year
	Recycling	% Total waste recycled
Education	Public School Enrollment	# Loss & gain by age/grade per year
	Private School Enrollment	# Loss & gain by age/grade per year
	Early Childhood	# Private Pay, # vouchers, # on waiting lists
	Public High School	# Graduating, # dropouts; MCAS scores; # GED
	Adult education	# Enrolled, % attendance, % completing course
	Trade & Career Education	#Graduating, # licensed
	ESL & Citizenship Prep.	# Completing basic ESL; # Naturalized
	# Post Secondary Academic programs	# Local residents graduating local programs
Economics & & Infrastructure	Local public transit	# Riders, # dependant riders
	Local private transit	# Riders, # voucher riders
	Intercity transit	# Customers, # commuter use
	Manufacturing firms	$ Take home pay, $+/- per year
	Retail outlets, all types	$ Take-home pay, $+/- per year
	Utilities & cable TV	Av. Consumer $, +/- year
	Personal income	#Fixed income, # poverty, #+/-, AV $ earned per household
	Employment	#Unemployed, % workforce employed, +/- per year
	Public roads	$ Change over 3 yr. Period, % budgets
Mental & Physical Health & Well being	Hospitalization	$ 3rd party paid, $ Private pay, $ other, # hospitalizations
	Primary Care Physicians/Facilities	$ 3rd party paid, $ Private pay, $ other, # hospitalizations
	ER use	$ 3rd party paid, $ Private pay, $ other, # hospitalizations
	Communicable disease incidents	# Affected per type
	Infant mortality	# of deaths, socio-eco. status of family affected
	Elder health	$ 3rd party, $ Private pay, $ other, # hospitalizations
	Public School health care	Est. community cost, # of utilizations
	Public School health education	Evaluation data, # of teen smokers
	Health Education & Illness Prevention	Cost/$ spent, source of $, # of SD cases,
Culture & Recreation	Public recreation areas	Tax cost, % total budget
	Public recreation programs	Fees, Tax cost, utilization numbers
	Museums	Av. Fees, budget, $ public support, utilization numbers
	Live theater & music	Av. Fees, budget, $ public support, utilization numbers
	Restaurants, clubs, theaters, etc.	Av. Fees, income gross, payroll, utilization numbers
Community Life & Safety	Home ownership	% of families living in their own homes, AV house costs
	Residential construction	# of new housing starts, unit cost by type, market value of starts
	Police activity	# crimes reported by type
	Fire dept. activity	# of fires, loss of life, loss in $
	Traffic accidents	Insured $ value, number of fatalities
	Social service providers	# Clients served, $ expended by types of services
	Charitable giving	$ value of donations, type of giving
	Elections	# Voting in elections, % potential voters

Appendix 7: Common Pathways Community Indicators Taskforce

Last Name	First Name	Prefix	Comapany Name	Title
Abrau	Wilson	Mr.	Pan American Institute	Executive Director
Beckwith	Mark	Rev.	All Saints Episcopal Church	Rev.
Bernstein	Seth	Rabbi	Temple Sinai	Rabbi
Bernstein	Alan	Dr.	United Way of Central Mass	Research and Evaluation Coord.
Cashman	Suzanne	Dr.	Univ of Mass Medical School	Associate Professor
Chamberlayne	Donald	Mr.	Worcester Police Department	Crime Analyst
D'Agostino	Steven	Mr.	Worcester Business Journal	Writer
Farhoody	Nassrine	Ms.	United Way of Central Mass	Dir. Of community Youth Development
Flynn	Ann	Ms.	United Way of Central Mass	Asst VP, Community Development
Gardiner	Jay	Mr.	Worcester Department of Public Health	Director
Hanson	Susan	Dr.	Clark University	Professor
Jiusto	Scott	Dr.	WPI	Assistant Professor
Johnson	Noreen	Ms.	The Health Foundation of Central Mass	VP for Programs
Krueger	Rob	Dr.	WPI/IGSD	Assistant Professor
Lantz	Josephina	Ms.	Lutheran Social Services of New England	Head of Refugee Services
Lewis	Patsy	Ms.	Worcester Community Action council	Executive Director
Munro	Stuart	Mr.	Assumption College	Dir. of Institutional Research
O'Connor	Cathy	Ms.	Depart of Public Health Comm of Mass	Dir. Office of Healthy Comm.
Ross	Laurie	Dr.	Clark University	Assistant Professor
Scanlan	William	Mr.	Central Mass Regional Planning	Manager, Community Development
Shea	Jane	Ms.	Quinsigamond Community College	Representative for President of College
Thomas	Robert	Mr.	MLKJ Business Empowerment Center	President/CEO
Weiss	Charles	Dr.	Holy Cross College	Dr. Office of Grants & Corp. Giving
Williams	Erin	Ms.	Worcester Office of Cultural Affairs	Director

Appendix 8: Preliminary Indicator Ranking Sheet

Prototype - For Discussion Purposes Only

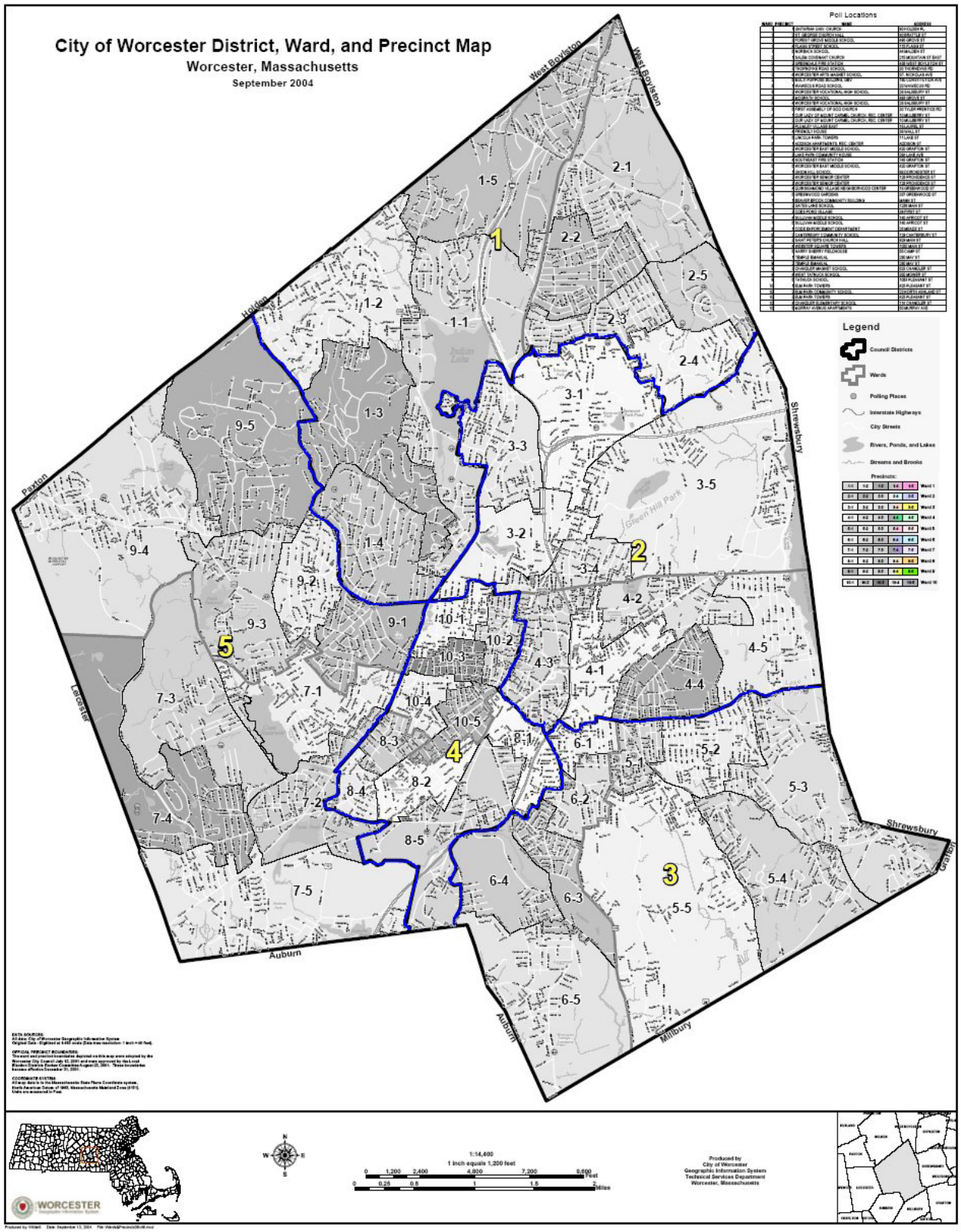
Community Goal/Outcome: All children will be physically, emotionally, socially, and cognitively prepared to succeed in school and in life.

Instructions: Please rate each indicator below in terms of the criteria listed in each column. Please do not leave any rating blank. The rating scale that you should use follows:

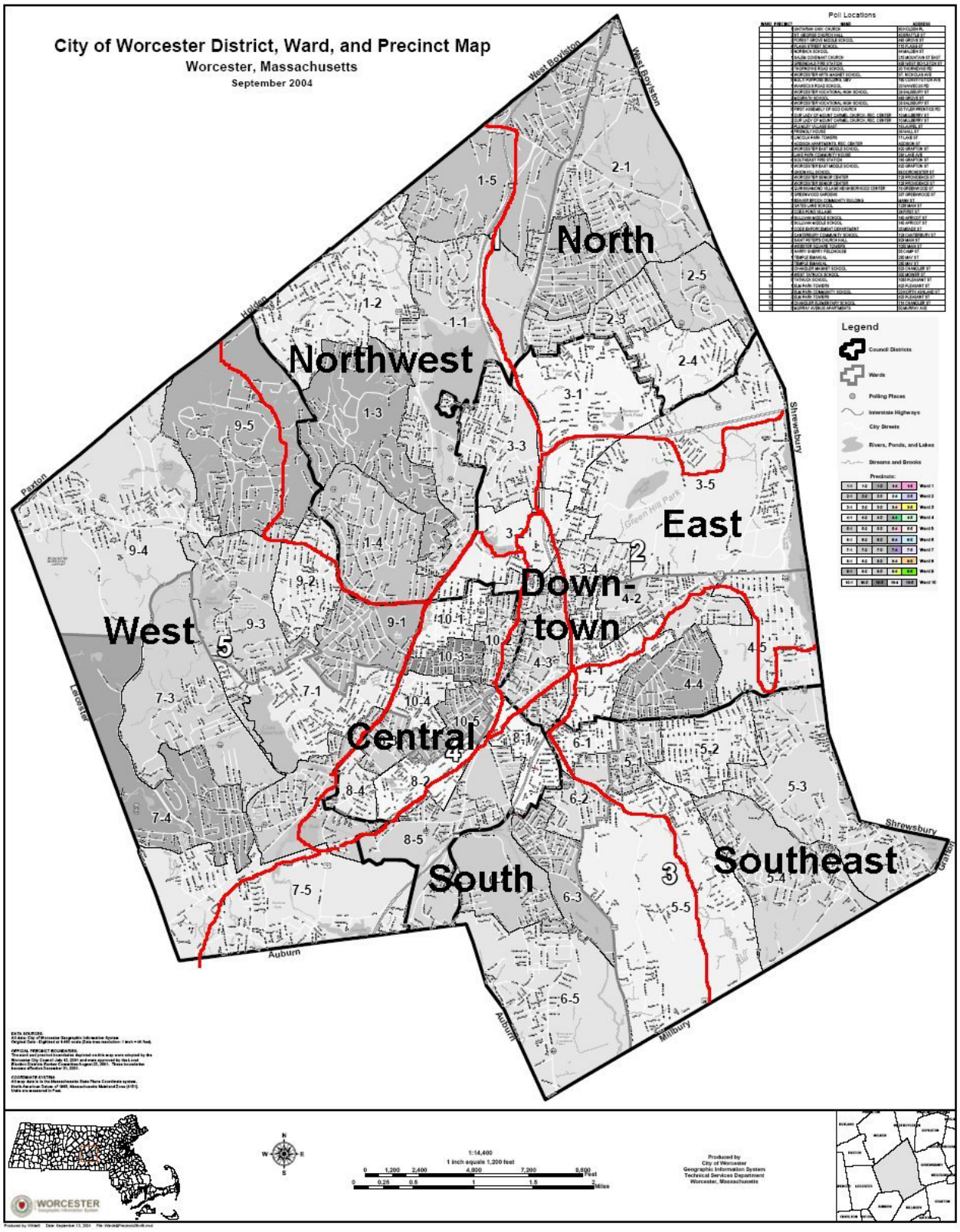
Rating Scale: 4 = Excellent 3 = Good 2 = Fair 1 = Poor U = Unable to determine

Indicator	Suitability of this indicator for measuring the goal/outcome listed above.	Interpretability: Data for this indicator can be clearly interpreted to suggest positive or negative growth	Availability: Data for this indicator is available	Action Oriented: Provides evidence that action is needed/would make someone want to do something	Sustainability: Potential for use over a span of time	Communicability: Can be communicated to the public/has meaning for the general population	Acceptability: This indicator is used in other communities
Percent of total births for which there is first trimester care							
Child abuse rate (alleged) per 1000 children ages 0-9							
Percentage of births to women under 20 years of age							
Youth participation in soccer per 1000 youth (ages 5-19)							

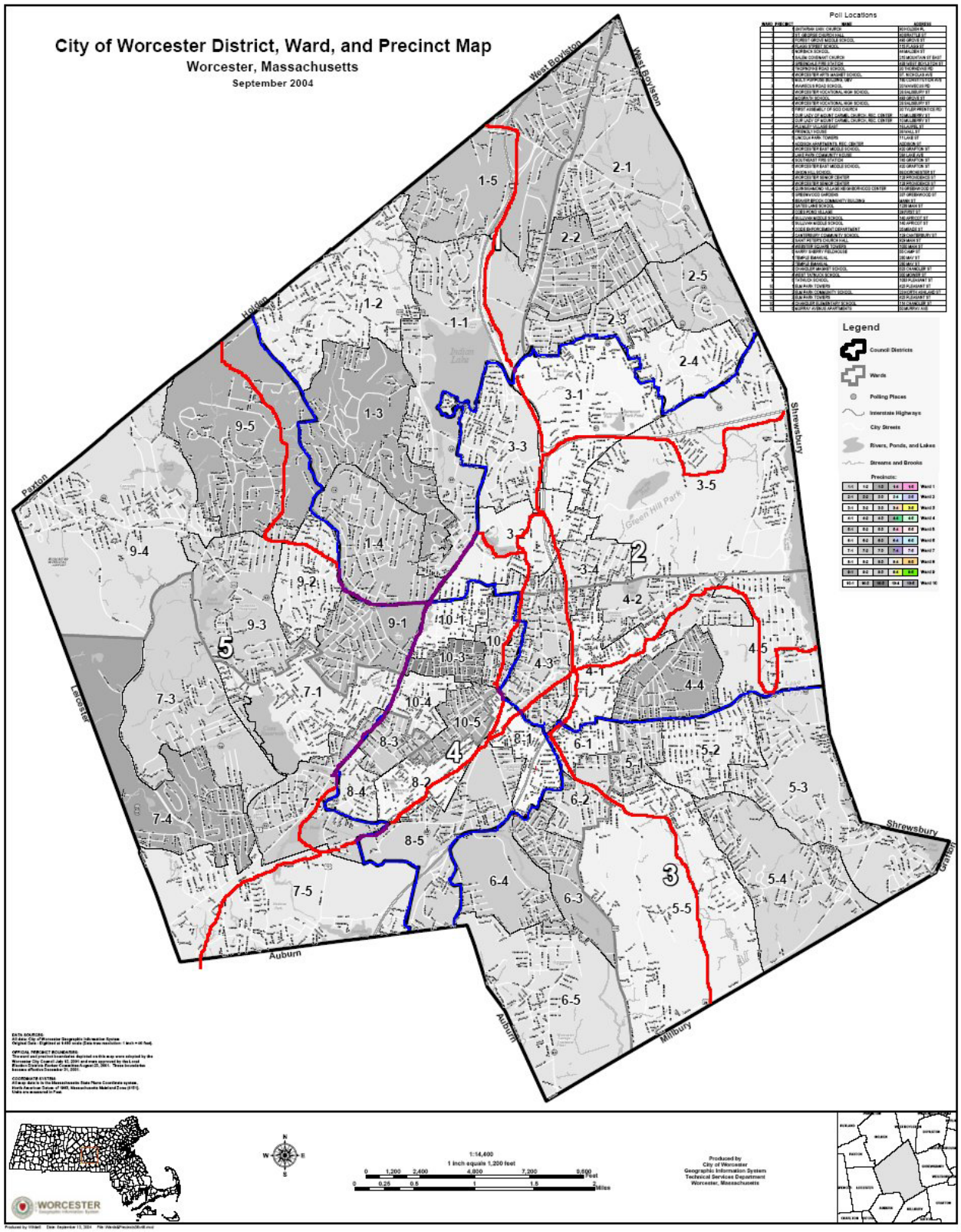
Appendix 9: Election Commission District Map



Appendix 10: Worcester Police Station Zone Map



Appendix 11: Overlapped Election and Police Map



Appendix 12: Indicator Information

SubDomain:

Domain: Environment

SubdomainName: *Energy & Climate Change: Conservation efforts locally*

Description: $ Spent to conserve

Rationale: The amount of money which the city budgets for environmental conservation efforts is key in showing how much the community leaders care about the health of the environment - and thus the health of the people. Perhaps this indicator should be a % of the budget as opposed to simply dollar values so that it can remain a steady measure throughout the course of time with interest rates.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	U	2	2	3	3	2

Rank Reasoning:

The availability of this indicator is poor due to conservation efforts coming from all over the city, from municipal offices as well as private or public independent organizations. It is unknown, because of this fact, whether such data would be sustainable one gathered.

SubdomainName: *Energy & Climate Change: Electricity Use*

Description: Total use per year (along with residential and commercial breakdown)

Rationale: The amount of electricity used in the city would affect the amount of electricity that needs to be generated. The process of generating that electricity requires generators that take up land space and can do harm to the environment.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	3	4	4

Rank Reasoning:

Electricity use is high ranking due to it being available and easily expressed. However, as time progresses and our society turns more and more to technology, it will be a challenge to have this indicator provoke action until alternate power sources are developed further.

SubdomainName: *Energy & Climate Change: GHG or Carbon emissions*

Description: Total emissions per year

Rationale: The amount of emissions per year details how well we are doing at controlling how much we are poisoning the environment. These emissions affect the quality of the water, land, and air. Obviously an increase in the emissions shows bad signs for the environment locally if nothing is done to curb the

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	U	4	4	3	3	3

Rank Reasoning:

The data on emissions would fit perfectly in the environment domain and be easily conveyed to the public's concern.

However the availability of methods to determine the total emissions is questionable and requires further research to determine the best means.

SubdomainName: *Land: Brownfields*

Description: Total amt (or %) of brownfields in city

Rationale: The amount of brownfields in the city is important as they are not healthy for the environment and cannot be used to their full potential because of the problems associated with them. If the amount of brownfields in the community is on the rise, then clearly it is a sign that something has to be done to

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	U	3	1	3	2	3

Rank Reasoning:

The availability, interpretability, and sustainability of this indicator are in question due to the different rankings and sizes of brownfields. Data would have to be kept on each individual brownfield regarding its size and level of contamination. There are also some questions whether the DEP keeps a complete list of brownfields.

SubdomainName: *Land: Community Gardens*

Description: # people involved and/or # gardens

Rationale: The number of community gardens in the city is important for the environment as a place for nature to grow and thrive, but also for the culture to come together and have a pleasant place to work together towards a common goal. The more community gardens in the city, it can be assumed the more produce is being generated by those community members. Also, it shows the people of the city are working together more and more.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	1	4	3	2	3	3

Rank Reasoning:

This indicator will be very good once information can be gathered on a year-by-year basis for comparison. Currently this is not readily available. Also, the greatly varying sizes of the gardens are not kept on record, and negate the value of a number of gardens, when some could be the size of a front lawn, or some could be open lots.

SubdomainName: *Land: Green Cover*

Description: Total amt (or %) of green cover (focus on street trees) (remote sensing by satellites

Rationale: This indicator is a sign of how much space in the city is considered green cover and is providing a source of oxygen for the community

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	4	4	4	3	4	4

Rank Reasoning:

Ranking well all around, this indicator will be further expressed by being accompanied by GIS mapping from the HERO project at Clark

SubdomainName: *Land: Open Space Designated*

Description: Space that is open and is kept as open (preserved)

Rationale: This indicator is a sign of space that is open and not filled with tall buildings and streets that emit toxins and consume energy for their electricity and heat. The more open space in the community, the less harm brought upon the environment in that regard.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	U	3	2	2	2	3

Rank Reasoning:

This indicator will be very good once information can be gathered on a year-by-year basis for comparison. Currently this is not readily available and there are no specific records on what is or is not considered "designated" open space.

SubdomainName: *Waste*

Description: Recycled waste lbs / total waste lbs

Rationale: This indicator will show us the ratio of how many pounds of garbage are being recycled compared to the total pounds generated by the city. In order for the waste issues of the environment to improve, this ratio must be increasing. If the recycle rate is increasing, it shows not only an increase in the health of the planet, but also an increase in the public concern for the environment. If it is decreasing, it could be due to a decrease in concern or general laziness of the people.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	4	4	4

Rank Reasoning:

High all around as it is easy to find, communicate, and interpret - as well as provoke action for recycling

SubdomainName: *Water Quality: Beach Closings*

Description: # beach closings and # days closed per beach per year

Rationale: If the beaches are closed, that means there is something in the water making it unsafe for one type of living creature, which happens to be human beings. Whatever is wrong with the quality of the beach's water is clearly a serious issue to warrant closing it down and not allowing people in the water for the sake of their health.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	4	3	3

Rank Reasoning:

High for its ability to show the cleanliness of the water. Requires some explanation as to how the closings truly effect the environment - in regards to plant life, animal life, and human life.

SubdomainName: *Water Quantity: # Water use restrictions*

Description: Times per year restrictions are in place

Rationale: The number of restrictions placed on water use shows us how often we use too much water given the climate. However, the restrictions are highly dependant on the type of summer we have and are thus hard to prevent. Also there is a vicious cycle of the summers which cause water use restrictions; the heat causes people to require consuming more water, causes more water to evaporate, creates a need for more water to keep lawns and plants healthy, creates a higher chance of bacteria forming in the water, and so on. All of these things raise the water consumption incredibly, and thus lower the quantity to dangerous lows. The bacteria that can thrive in the warm stagnant water will cause people to get sick

and thus require even more fluids, namely, water.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	U	3	3	3	3	3

Rank Reasoning:

Due to unresponsive officials, the availability and sustainability of this indicator are in question. Though it can be assumed the data would be useful in the other areas.

SubdomainName: *Water Quantity: Water Consumption*

Description: # total water consumed per year

Rationale: The consumption of water is probably one of the most important factors in water quantity. It also may be difficult to change. With the amount of water we need to survive, as well as clean ourselves and keep our land healthy, it is no wonder why the water consumption can sometimes be at high levels that could cause problems for the quantity of water in the city.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	U	3	2	U	2	3

Rank Reasoning:

Due to unresponsive officials, the availability and sustainability of this indicator are in question. Though it can be assumed the data would be useful in some other areas, though rarely would people take action to consume a great lesser amount of water due to it being integral to our survival.

Domain: **Education**

SubdomainName: *3rd grade mcas reading*

Description: Percent of children that took 3rd grade MCAS with at or above proficient score

Rationale: Early child development is important for the development of students. This test indicates whether or not the city should develop methods to improve early education.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	3	4	3	2

Rank Reasoning:

MCAS scores are still being debated as being worthy of determining if a student should graduate or not. However, it still indicates how well students in Worcester perform in comparison to other cities and past years. It is easily accessible and directly relates to the education domain. Some people may not approve of the MCAS, but that should not dismiss its value as a social indicator.

SubdomainName: *4th grade mcas*

Description: Percent of children that took 4th grade MCAS with at or above proficient score

Rationale: Early child development is important for the development of students. This test indicates whether or not the city should develop methods to improve early education.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	3	4	2	2

Rank Reasoning:

MCAS scores are still being debated as being worthy of determining if a student should graduate or not. However, it

still indicates how well students in Worcester perform in comparison to other cities and past years. It is easily accessible and directly relates to the education domain. Some people may not approve of the MCAS, but that should not dismiss its value as a social indicator.

SubdomainName: *Adult Ed: Adult Basic Education*

Description: Number enrolled and completed GED

Rationale: This measures Worcester's efforts to educate adults. A higher amount of these programs could improve the unemployment rate by allowing people access to more jobs.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	2	4	3	3	3	3

Rank Reasoning:

The Adult education indicators are good indicators of the need for more programs to educate adults and immigrants. It is difficult to measure due to the many small separate programs that provide education. It is also difficult to quantify the people on the waiting list, because of people on multiple waiting lists, or people declining to be on the waiting list. It would be good to see data for this indicator because it would be useful for those that want to push for a higher adult education budget.

SubdomainName: *Adult Ed: Adult Immigrant Education*

Description: Number enrolled in and completed ESL

Rationale: This measures Worcester's efforts to educate adult immigrants. A higher amount of these programs could improve the unemployment rate by providing immigrants the education necessary to obtain a well

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	2	4	3	3	3	3

Rank Reasoning:

The Adult education indicators are good indicators of the need for more programs to educate adults and immigrants. It is difficult to measure due to the many small separate programs that provide education. It is also difficult to quantify the people on the waiting list, because of people on multiple waiting lists, or people declining to be on the waiting list. It would be good to see data for this indicator because it would be useful for those that want to push for a higher adult education budget.

SubdomainName: *Adult Ed: ESL Waiting list*

Description: Amount of people in a waiting list for ESL

Rationale: This measures the desire for immigrants to learn the English language and how well the system fulfills that desire. A high waiting list indicates that more ESL programs should be implemented.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	2	4	3	3	3	3

Rank Reasoning:

The Adult education indicators are good indicators of the need for more programs to educate adults and immigrants. It is difficult to measure due to the many small separate programs that provide education. It is also difficult to quantify the people on the waiting list, because of people on multiple waiting lists, or people declining to be on the waiting list. It would be good to see data for this indicator because it would be useful for those that want to push for a higher adult education budget.

SubdomainName: *Dropout Rate*

Description: Amount of students who drop out before graduating high school

Rationale: This indicates how many students drop out for various reasons. If the rate is significantly higher than similar communities, then there is a problem that needs to be addressed.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	4	4	4

Rank Reasoning:

This is a major concern for citizens of all cities. It is an often used indicator to show the effectiveness of schools. It is an indicator that people readily relate to and often express their interest in keeping the rate low.

SubdomainName: *New Immigrant education*

Description: Number of new immigrants (5 or less yrs.) enrolled in public schools/graduating/entering college

Rationale: There is a large amount of immigrants coming to Worcester and the city should make efforts to educate them to be productive members of society. This indicates whether or not the city is providing enough education to new immigrants

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	3	3	3	3	3	3

Rank Reasoning:

This is a good indicator of the need for more programs to educate immigrants. It is difficult to measure due to the many small separate programs that provide education. It is also difficult to quantify the people on the waiting list, because of people on multiple waiting lists, or people declining to be on the waiting list. It would be good to see data for this indicator because it would be useful for those that want to push for a higher immigrant education budget.

SubdomainName: *Plans of High School Graduates*

Description: Amount of students who graduate high school and plan to attend college, join the military, join the workforce, or have other plans.

Rationale: This indicator shows the effects of Worcester public schools. This indicates what direction students have after leaving high school. It is important to measure if the students are being as prepared as the community feels they should. The number of students who attend college after high school indicates whether or not public schools should make more of an effort to prepare students for college. Depending on how the community feels about how many students get a job or join the military, they can use this indicator as a reference to back their opinions.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	2	2	3	3

Rank Reasoning:

This indicator does a good job in defining what students attending Worcester schools are geared towards. It is easily updated and expressed to the community what it means. The only problem is identifying what kinds of results the community wants to see from this indicator. Is the only concern that students get into college, or is a 4-year college more important. The public would have to give feedback as to the direction they want the schools to head in.

SubdomainName: *Students Who Stay in Worcester after College*

Description: Amount of Worcester college students who remain in the city after graduating college

Rationale: This measure the attractiveness of Worcester to an important part of the population. College graduates have skills and training needed to fulfill important position. If there is a small number of them staying in Worcester, it would indicate that the city is not suitable for those graduates. In that case, the city should make efforts to appeal to the younger workforce so it can develop a foundation of well trained workers.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	3	3	4	3	3	3

Rank Reasoning:

The colleges around Worcester are great for attracting a new population towards Worcester. This population would be great to remain in Worcester and help it to prosper by lending their knowledge to the community they have already bonded with. It would be time consuming to calculate the rate or number of students who remain in Worcester by cross-referencing tables of alumni addresses from each college. It is plausible though and is a strongly supported indicator to show the need for attracting a younger and education population.

Domain: Economy

SubdomainName: *Airport Use*

Description: Types of services and amount of service

Rationale: Worcester's city airport is a large investment and valuable real estate, so its productivity should be observed. This indicates how useful the airport is to the city by measuring how much different groups use it. Noticing the kinds of people and businesses using it will allow the airport to know which groups it attracts and which groups it should try to promote more usage.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	3	3	4	3	4	3

Rank Reasoning:

This would aptly measure the usefulness of the airport. However, the source of the data may be questionable if its from an airport contact that may exaggerate the numbers. Valid data would be useful to give people information to create opinions of the airport's usefulness.

SubdomainName: *Business Success*

Description: This counts the number of businesses that start in Worcester or move to Worcester, also the number of businesses that leave Worcester and the number of Worcester businesses that go out of business.

Rationale: This is a good indicator of the overall economic health of Worcester. Measuring the success of businesses is important to understand how attractive Worcester is for starting and retaining a business. As more businesses are created, relocated or expanded to Worcester, the economy should become better. If we see a large net increase or decrease in the amount of businesses, payroll or property taxes of those businesses, then we should look at other indicators to find the cause of this change so it can

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	3	4	4	3	4	4

Rank Reasoning:

This indicator is important for the understanding of the relationship of Worcester and businesses. Obviously, more businesses is better for Worcester, but simply the number of businesses is not an accurate account for the success of business in Worcester. The reason for the difficulty of gathering the data is how to display it so it is unequivocal. Showing the commercial taxes or number of jobs provided by Worcester businesses would probably be the best way. If it could be displayed well, it would be a great way to communicate to the public the need for

SubdomainName: *Corporate Philanthropy*

Description: Amount of money given by corporations to the city

Rationale: Worcester wants to attract businesses, but it also wants to keep good relations with businesses. This measures how much those businesses give back to the city. If there is very little given back, then those businesses might be taking advantage of the city. The city might want to try to convince businesses that the city is good for them and, therefore, giving is good for them.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	2	2	3	2	3	2

Rank Reasoning:

This indicator would be measured by going to every business and asking for what they give back to the community. Cooperation is expected because it shows their generous nature, but they may exaggerate numbers, so that data could not be excepted as absolutely accurate. This indicator is difficult to analyze due to the difficulty of comparing it to other cities and past years because of how it depends on the amount of businesses and their success. It is unsure how the public would accept the numbers generated by this indicator.

SubdomainName: *Developer's Contribution*

Description: Amount of labor and supplies used by developers in Worcester that are from Worcester.

Rationale: This indicates how Worcester is treated by businesses and the success Worcester has when dealing with businesses. When we see a small amount of contributions being made, it could indicate that Worcester does not deal well with businesses and should make better demands for businesses to use labor, supplies and services here and not letting developers take advantage of the city by purchasing those items elsewhere..

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	2	2	3	3	3	2

Rank Reasoning:

This indicator would take time to find because of no know centralized location. It does explain very well the relation of developers with the city. Some explanation is needed to clarify its importance.

SubdomainName: *Effective Transit*

Description: Percent of jobs accessible by transit, i.e. be within 0.25 miles of bus stop and travel to location at times

Rationale: shifts are beginning or ending

The ability to physically get to a place of work is an important factor for people looking for work. Even if a person is qualified for a job and is willing to work, that person still needs to get to the job in order to work. If there is a significant lack of jobs accessible to people without a car, it could be a cause for high unemployment and welfare rates.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	2	4	3	4	3	3

Rank Reasoning:

Would take some analysis to compile. Somewhat difficult to sustain as it takes a lasting relationship with the transit planners. Successful quantitative data will be easily read to see the problems in Worcester transit and give a good cause for unemployment.

SubdomainName: *Fuel Assistance*

Description: Number of fuel assistance applications

Rationale: Heat is a basic need for the public. Noticing how many people can not afford it indicates the level of poverty in the city. Since this utility is such a necessity, a high number of fuel assistance applications might be a reason to try to reduce or subsidize the price of fuel, or to increase the amount of assistance.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	2	3	3	3	3

Rank Reasoning:

This is an easily accessible indicator that is measured every month. The actual number it should represent is arguable. Whether to put the number receiving assistance, or those applying for it, or those who are denied it, or showing all of them. People obviously need heat and if the best way to show that people are not receiving assistance is found, this indicator can show people the need to help those who are not receiving assistance.

SubdomainName: *Housing Affordability*

Description: Percent of Households paying more than 40% of disposable income for housing

Rationale: This indicates how affordable housing is in Worcester. This is different than measuring rental rates because it shows housing costs relative to the income of the population. Housing costs have to be affordable for people to stay in Worcester and for people to want to come to Worcester.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	3	4	4	4	4	4

Rank Reasoning:

An indicator that is obviously interpreted as how hard it is to afford housing. However, data available currently for this indicator is only for every ten years.

SubdomainName: *Jobs with Benefits*

Description: Ratio of living wage jobs with benefits require no college degree compared to those that require a college degree

Rationale: This measures how many living wage jobs are available that will be able to sustain basic living needs. A lack of living wage jobs could cause poverty for even skilled workers.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	2	4	3	3	4	3

Rank Reasoning:

This indicator is difficult to define and express its exact definition to the public. It is also difficult to measure because of its exact definition, it would take some research to ensure the data is correct. Accurately measuring this indicator would be a great benefit to understanding the cause for unemployment and poverty and could be well communicated to the public as problem.

SubdomainName: *Living Wage Jobs*

Description: Number of living wage jobs with benefits that do not require a college degree that are available

Rationale: This indicates the success Worcester is having with creating jobs for people who need jobs. These are the kind of jobs that need to be available in order to decrease unemployment and poverty. A lot of people who are unemployed do not have a college degree, but still have the same basic needs as a person who does have a higher education. A low number of these positions could indicate why there are many unemployed. A large number would indicate there are other reasons for unemployment and poverty: inaccessible jobs (poor transit), lack of skills and training for these jobs, ignorance of these jobs

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	2	3	3	3	4	4

Rank Reasoning:

Difficult to measure due to its specificity. It is a good indicator because it is easily interpreted as a cause of unemployment. It is easy to explain how lack of jobs in a community results in people not having jobs that can sustain their living needs.

SubdomainName: *Pad ready brown/greenfields*

Description: Number of pad ready green-brown field sites for commercial or industrial use

Rationale: This measures the space available for businesses to develop and/or expand in Worcester. A large amount of area for greenfields and pad-ready sites would indicate that Worcester has a lot of room for development. A small number would indicate that Worcester should make efforts to make these brownfields available to be developed.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	4	3	4	3	3	4

Rank Reasoning:

Well documented, but brownfields have many levels of contaminations and can support different kinds of buildings. If there is a way to quantify levels of brownfields and their amount, this indicator does well to show the amount of wasted space in Worcester and is easily accepted as both an economic and environmental problem.

SubdomainName: *Rental Rates*

Description: Apartment rental rates

Rationale: This is an indicator of housing affordability. High rental rates might indicate that housing is not affordable, but it also might indicate that Worcester apartments are attractive to people and are a good place to live. Lower rates would indicate that more people could afford to live there, but would also indicate that there may be some underlying problems that cause low rates.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	2	2	3	3

Rank Reasoning:

Somewhat ubiquitous, but does provide a good idea of what direction Worcester is heading in terms of occupants. This data is easily obtained, but can be express in many ways such as: median, average, range, etc. Does not readily express housing affordability problems or economic success unless explained in detail with other indicators.

SubdomainName: *Underemployed Workers*

Description: Workers earning less than their potential over time

Rationale: This measures the amount of people who do not earn as much as their skills, experience, qualifications and backgrounds would suggest. A major contributor to a high number of underemployed workers is a lack of positions available to these people. A large number of underemployed workers would indicate that there needs to be a greater number of higher paying jobs in Worcester.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	2	2	3	3	2	2

Rank Reasoning:

A relatively widely unknown indicator. Hard to define how to actually measure the amount of people who are classified as underemployed. Currently, not accepted as very helpful towards understanding Worcester economics.

SubdomainName: *Unemployment*

Description: Number of 16-64 year olds that are unemployed

Rationale: This is a good indicator of the health of the economy and the satisfaction people have with the city of Worcester. A high unemployment rate would indicate that there are problems in the community that need to be fixed. Other indicators should be analyzed in order to find where the problem could be fixed. A high unemployment rate would also be a good indicator to use to motivate people to help change Worcester for the better. This indicator also may show how much higher the actual unemployment rate is over the official rate.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	2	4	3	3

Rank Reasoning:

The number of working age unemployed is readily accessible via the internet and is updated every month making it easily sustainable. Many people are familiar with what unemployment means and it is accepted by much of the public as a good indicator of economic strength. Also, people respond to unemployment because it indicates the status of the economy. Unfortunately, this only measure people who file for unemployment and does not keep track of everybody who is unemployed so it must be interpreted as being smaller than the actual rate of unemployment.

Domain: Health

SubdomainName: *Access to Healthcare*

Description: # of people with health insurance by type of policy

Rationale: Access to healthcare is important to everyone in a community so that a devastating health problem to a particular family would not harm them financially as well. People with no healthcare are also less likely to have a primary healthcare physician and therefore more likely to contract easily preventable

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	1	4	3	3	4	2

Rank Reasoning:

This would be a great indicator if the data were readily available, but as it stands now the data is in many different places and is difficult to get

SubdomainName: *Engagement in FBC (Faith based communities)*

Description: # individuals who are assisted by their affiliation with a faith based community

Rationale: Engagement in Faith based communities is important to the well being of any community. People are generally happier when they are involved with organizations outside the home, and are less likely to commit crimes against their friends and neighbors if they are known throughout the community. Faith based community involvement is just one of many organizations one could be involved in, but is one of

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	2	2	1	1	3	1

Rank Reasoning:

This indicator is very difficult to gather information from. The information that is readily available is somewhat flawed

in that there is no way to gage involvement. The data is also not readily available.

SubdomainName: *Family Violence: Child Abuse*

Description: # reported cases

Rationale: It is important to know if there is any family violence within a community. It is very difficult to record the actual number of incidences of family violence, and the information provided may not be true in some cases. There may be many more cases of family violence that go unreported, but the most accurate way to measure this indicator is to describe only reported cases.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	4	4	3	3

Rank Reasoning:

The family violence indicators provide a lot of information into how families work together. It clearly shows either positive or negative growth and is easily obtained.

SubdomainName: *Family Violence: Domestic Violence*

Description: # reported cases

Rationale: It is important to know if there is any family violence within a community. It is very difficult to record the actual number of incidences of family violence, and the information provided may not be true in some cases. There may be many more cases of family violence that go unreported, but the most accurate way to measure this indicator is to describe only reported cases.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	4	3	3	3

Rank Reasoning:

The family violence indicators provide a lot of information into how families work together. It clearly shows either positive or negative growth and is easily obtained.

SubdomainName: *Family Violence: Elder abuse*

Description: # reported cases

Rationale: It is important to know if there is any family violence within a community. It is very difficult to record the actual number of incidences of family violence, and the information provided may not be true in some cases. There may be many more cases of family violence that go unreported, but the most accurate way to measure this indicator is to describe only reported cases.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	4	3	3	2

Rank Reasoning:

The family violence indicators provide a lot of information into how families work together. It clearly shows either positive or negative growth and is easily obtained.

SubdomainName: *People living in poverty: Elder medication*

Description: # Elders who need medication, but can't afford it

Rationale: Poverty is related to access to healthcare. If people are living in poverty, chances are that they have limited or no access to healthcare. This indicator is important because it is directly related to family

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	1	4	4	2	2	1

Rank Reasoning:

This indicator data cannot be determined. If it could be measured it would be a good indicator, but there is no way to find a number of how many elders need medication but cannot afford it.

SubdomainName: *People living in poverty: Free/Reduced Lunch*

Description: # students eligible for

Rationale: Poverty is related to access to healthcare. If people are living in poverty, chances are that they have limited or no access to healthcare. This indicator is also directly related to the death rate because of that limited access to healthcare.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	2	2	2	2

Rank Reasoning:

This indicator is suitable for the domain, however if there is an increase in the number it suggests there is more poverty, if there is a decrease, it would show that people are not taking advantage of the program.

SubdomainName: *People living in poverty: Heat Assistance*

Description: # of families seeking

Rationale: Poverty is related to access to healthcare. If people are living in poverty, chances are that they have limited or no access to healthcare. This indicator is important because if there is elder abuse, there is a chance there is a monetary problem within the family.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	2	3	3	3	3

Rank Reasoning:

This is an easily accessible indicator that is measured every month. The actual number it should represent is arguable. Whether to put the number receiving assistance, or those applying for it, or those who are denied it, or showing all of them. People obviously need heat and if the best way to show that people are not receiving assistance is found, this indicator can show people the need to help those who are not receiving assistance.

SubdomainName: *Physical Activity*

Description: Daily exercise/ daily mobility

Rationale: More active people are generally healthier than those who do not engage in physical activity on a regular basis. This indicator is related to the overall health of the community.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	4	4	4	4	4	2

Rank Reasoning:

This would be a very good indicator if the information were collected for it. It is very hard to gage how much physical activity people engage in though.

SubdomainName: *Substance Abuse*

Description: Rates of drug and alcohol use

Rationale: It is important to know if people are abusing drugs. This reflects other problematic areas in the community such as crime and violence. If there is a high substance abuse rate among communities in Worcester, people will be less apt to move to the city as well as stay in Worcester for long periods of

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	2	2	3	4

Rank Reasoning:

This indicator is useful because it shows the rate of people getting help from their abuses. However, it does not and cannot tell whether or not people that have addictions are getting the help they need.

Domain: Culture & Recreation

SubdomainName: *Arts Study*

Description: Append arts study sponsored by city & arts groups as a subsection

Rationale: The Arts Study which another WPI IQP team is working on currently will have pieces of it appended to the indicator project in the future when it is completed, to further describe the state of the art scene in

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
3	U	3	U	3	3	3

Rank Reasoning:

This indicator is based on another project currently being developed by another WPI team on developing an Arts District in Worcester, and due to it being in progress, not much is known about how interpretable and sustainable it will

SubdomainName: *Library activity: attendance*

Description: Total public library attendance / year

Rationale: Total attendance at libraries shows how much they are used and how much the community cares for the knowledge and resources within their walls. The books and other materials provide both a sense of culture and a form of recreation for the community. The more people interested, the better.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	3	2	3	3

Rank Reasoning:

The attendance of the library is easily accessible via the internet. It shows interest from the community. Weaknesses include not detailing changes in hours of operation, web traffic as opposed to physical traffic, and a low idea of it provoking action outside of the library's efforts to promote.

SubdomainName: *Library activity: Circulation statistics*

Description: Total public circulation statistics

Rationale: Much like the importance of the attendance of libraries, the flow of books and materials going in and out

of the library shows how well used the library is, and an even deeper layer of how interested the community is in the culture and recreation which the library's materials provide.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	3	3	2	3	3

Rank Reasoning:

The circulation of the library is easily accessible from online documentation and shows clear signs of increasing or decreasing interest in the materials

SubdomainName: *Library activity: New acquisitions*

Description: Number of acquisitions by total and by books in public library

Rationale: Even further into the importance of the use of the libraries, the upkeep of new materials in the library stock is important to keep the attendance and use of the library up and increasing.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	4	3	3	2	3	3

Rank Reasoning:

This indicator shows the number of books and total acquisitions of the WPL (eventually expanded to more libraries). It ranks low on availability for the time being due to complications in gathering the data from the WPL. Not all data was kept in the same record which complicated the process. Hopefully this will not happen in the future now that the staff was made aware of it.

SubdomainName: *Live performance events: # College sports/cultural events &*

Description: Total attendance / events at college events

Rationale: The events of the many college campuses in Worcester are a further level of culture. Usually priced at a college student's ideal price range, and is geared towards a different audience range; namely that of college students. That age range can be a large portion of the culture in Worcester, thanks to the many universities and colleges here.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	1	2	1	2	2	2

Rank Reasoning:

This indicator is in developmental stages as it would require going to two offices, minimum, at all ten universities in Worcester in order to gather both the athletic data, and the cultural data. Resources and time for gathering such data make this a poor indicator for the current time.

SubdomainName: *Live performance events: # DCU Center events &*

Description: Total attendance / events at the DCU Center

Rationale: The live performances within the city are an extension and more specific aspect of the overall culture of the city. The Centrum is one of the largest, if not the largest, venues in the city and thus the events held there and their attendance rates are a good sign of how interested the city is in the live

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	3	3	3	1	3	3

Rank Reasoning:

Due to unresponsive officials, the availability of this indicator is in question. Though it can be assumed the data would be useful in the other areas and sustainable as it is known that the center keeps the data - just has yet to

SubdomainName: *Live performance events: # Mechanics hall events & attendance*

Description: Total attendance / events at Mechanics Hall

Rationale: As with The Centrum, the events held at Mechanics Hall and their attendance rates are a good sign of how interested the city is in the live performances; in this case classical live performances.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
1	U	2	1	1	1	3

Rank Reasoning:

This indicator is poor due to Mechanics Hall not keeping a record of attendance to the events held there. This is due to the hall being rented out for the majority of events, so therefore the individual organizations who rent the hall keep track of their attendance. Until the hall can keep track of its overall attendance, the data would have to be retrieved individually from each of the organizations / people who rent the hall over the course of the year.

SubdomainName: *Municipal investment: Arts projects budget*

Description: Total $ budgeted for arts projects and/or personnel

Rationale: The amount the city budgets for arts projects is a good indicator of how much interest the city has in its culture. Culture is an important part of society and keeping people involved and happy within the community. If the budgets are lowering in value, then the culture of the city will dwindle and be harmed.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	U	3	3	2	3	2

Rank Reasoning:

Due to unresponsive officials, the availability and sustainability of this indicator are in question. Though it can be assumed the data would be useful in the other areas in order to determine and express the city's interest in the arts.

SubdomainName: *Municipal investment: First Night Attendance Reports*

Description: # people attending First Night / year

Rationale: The attendance reports will show us how involved the citizens of the city are in the municipal cultural events. In an ideal scenario, the city wants to see the attendance rates growing, thus showing a growth in interest. However crowds too big can be unmanageable and must be taken into consideration.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	3	3	3	2	3	2

Rank Reasoning:

Due to unresponsive officials, the availability of this indicator is in question. Though it can be assumed the data would be useful in the other areas and sustainable as it is known that the center keeps the data - just has yet to

SubdomainName: *Municipal investment: Recreation budget and programming*

Description: Total $/programming scheduled for recreation

Rationale: As with the importance of the art budget, the importance of recreation budget and programming is also important for the culture of the city. Recreation is a good part of developing culture and people will easily and quickly flock towards recreational events. The budget increase or decrease will tell us much about the city's interests and future cultural predictions.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	3	3	3	2	3	2

Rank Reasoning:

Due to unresponsive officials, the availability and sustainability of this indicator are in question. Though it can be assumed the data would be useful in the other areas in order to determine and express the city's interest in public

SubdomainName: *Municipal investment: School dept arts & culture budget*

Description: Total $ budgeted for arts & culture within schools

Rationale: Again, similarly to the importance of the city arts budget, the amount the school dept budgets for arts and culture programs is integral to the overall culture of the city. The colleges in Worcester provide a great deal to the cultural aspects, not to mention arts and culture as a part of education is a very important learning tool, as well as a way to get people interested in interacting with the city.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
U	3	3	3	2	3	2

Rank Reasoning:

Due to unresponsive officials, the availability and sustainability of this indicator are in question. Though it can be assumed the data would be useful in the other areas in order to determine and express the city's interest in the arts and culture programs in schools

Domain: Community Life & Safety

SubdomainName: *Candidates for local election*

Description: # of those filing official papers to run for office as a function of the number of offices for which election

Rationale: is being conducted
This indicator must be as a function of how many offices are available. This indicator shows if there is any interest within the community to promote change. There is more than one way to interpret this data. If there are more people running for offices, there must be an increase in community involvement. However, if there is a lack of people running for offices this would show that the community members are happy with the job that the current members are doing.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
2	4	2	1	1	1	1

Rank Reasoning:

This indicator would have erratic data and would not be able to be interpreted very well

SubdomainName: *Property Crime*

Description: This is a list of property crimes by type of property crime. Uniform Crime Reporting "Part 1"

Rationale: With more property crimes comes a feeling from community members that they are not safe where they live. If community members do not feel safe where they live, they are less likely to be involved in local organizations.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	4	4	4

Rank Reasoning:

This is a very good indicator for the safety domain. The data is readily available and shows a clear positive and negative growth. It would be a very good indicator for communicating to the public about problems.

SubdomainName: *Traffic Accidents*

Description: Count of police reportable accidents. Accident numbers/ compared to population

Rationale: Traffic Accidents may show many different things about a community. It may show condition of roads in the area as well as the setup of roads including placement of road signs. If there are more traffic accidents over a long period of time it could show a lack of community involvement to improve these

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	3	2	3	2

Rank Reasoning:

This indicator is suitable for the domain, however it is not very easy to determine whether the indicator clearly shows positive or negative growth. It may be road conditions or just the way that people drive or times that they drive that determines growth in this indicator. There are too many variables.

SubdomainName: *Violent Crime*

Description: Under UCR: four basic crime types: murder, aggravated assault, robbery, rape (divided into categories)

Rationale: must be a rate!
The four types of crimes described as violent crimes are: murder, aggravated assault, robbery, rape. It is not a good indicator to measure only one of these types of violent crime because the numbers are too low and will give data that may be unhelpful. The rate of murders within a community may go up 300% within just one year, but the actual number may only be 3 murders in a given year. This indicator must group these violent crimes so that the numbers are larger and the data is easier to interpret.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	4	4	4

Rank Reasoning:

This is a very good indicator for the safety domain. The data is readily available and shows a clear positive and negative growth. It would be a very good indicator for communicating to the public about problems.

SubdomainName: *Voter Participation: Gubernatorial Voting*

Description: %of all persons eligible to vote vs. persons voted

Rationale: Voter Participation is a good indicator of community involvement. A greater percentage of voter participation shows that people care about their community. Elections are held every year, however there is a greater turnout during presidential elections versus gubernatorial or municipal elections and should be measured independently.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	3	4	4

Rank Reasoning:

This indicator is a very good measure of public involvement in where they live. The data is also readily available and shows that this indicator is important.

SubdomainName: *Voter Participation: Municipal Voting*

Description: %of all persons eligible to vote vs. persons voted

Rationale: Voter Participation is a good indicator of community involvement. A greater percentage of voter participation shows that people care about their community. Elections are held every year, however there is a greater turnout during presidential elections versus gubernatorial or municipal elections and should be measured independently.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	3	4	4

Rank Reasoning:

This indicator is a very good measure of public involvement in where they live. The data is also readily available and shows that this indicator is important.

SubdomainName: *Voter Participation: Presidential Voting*

Description: %of all persons eligible to vote vs. persons voted

Rationale: Voter Participation is a good indicator of community involvement. A greater percentage of voter participation shows that people care about their community. Elections are held every year, however there is a greater turnout during presidential elections versus gubernatorial or municipal elections and should be measured independently.

Ranking: ***Key: U= Unable to determine 1= Poor 2= Fair 3= Good 4= Excellent***

Availability	*Sustainability*	*Suitability*	*Interpretability*	*Action Oriented*	*Communicability*	*Acceptability*
4	4	4	4	3	4	4

Rank Reasoning:

This indicator is a very good measure of public involvement in where they live. The data is also readily available and shows that this indicator is important.

Appendix 13: Developmental Indicators

Domain: Environment

Land: Community Gardens

The community gardens in Worcester at the current time have data pertaining to them, but only for what exists right now. There were no records that the Regional Environmental Council could provide on years past. After meeting with Peggy Middaugh of the REC, and Colin Novick of the Greater Worcester Land Trust, it was understood that there needed to be some more research into the garden data of past years, as well as some refinement as to how to measure the garden indicator.

The gardens cannot be measured by size, as the data is not available. It would be recommended that the garden indicator be measured in number, and by number of volunteers involved. In the future, once a relationship with John Rogan and the HERO project[5] is further developed, then the gardens will be easier to measure as we will have satellite images providing us with exact locations and sizes of the gardens.

It is recommended to work with John Rogan to develop this relationship, as many other indicators will also benefit from the imagery, as well as the project benefiting as a whole from GIS Mapping. Additionally, Peggy Middaugh can provide more assistance on developing a complete list of the community gardens. Colin Novick provided a list of some of the current gardens, but it was not complete. This list must be refined and completed. It is unknown if data on the gardens from the past years will become available, but possible through the satellite images taken over the years.

Land: Open Space Designated

The amount of designated open space in Worcester is another indicator that will benefit from the satellite images that can be provided by the HERO project.[1] Additionally, Colin Novick of the Greater Worcester Land Trust provided a list of different green areas within Worcester. However, he was unable to be reached for follow-up to classify which entries in this list were considered to be open space.

[5] Human Environment Regional Observatory Project at Clark University

Working with Colin Novick will eventually provide a complete list of the space that is designated to be open in the city. The HERO project may also have a list such as this, as well as data and images to go along with it. Further investigation into these two sources will help complete this indicator.

Land: Green Cover

This indicator will be able to be provided by John Rogan and the HERO project[1] in the future. Based on his time commitments at the university, he was unable to provide the data in time for the initial stages of the project's completion. However, he was very interested in the indicators project and expressed a desire to be a close partner to the project.

The amount of green cover in Worcester will be easily determined from the satellite images and will hopefully include even the smallest areas of green space in Worcester.

Land: Brownfields

The brownfields in Worcester are very complicated to measure. The DEP has a list on their website[6] of the brownfields in the city, by their classification. There are different levels of brownfields that determine how contaminated the land is, and what level of cleaning it will require. Some brownfields could be cleaned in a matter of days, while others need full excavations and fresh land to replace the contaminated land.

All of these factors must be considered and used to develop a way to correctly measure this indicator. This indicator simply requires more time in developing a good measurement based on the data that is available, and then assuring that all of the data is presented. Additionally, John Rogan and the HERO project[1] have data on brownfields and images to accompany the data. Once it can be verified that they have a complete list of brownfields and ranking, or it is provided to them, the HERO project data can and should be used for this indicator.

Water Quantity: Water use restrictions and
Water Quantity: Water consumption

[6] DEP Central Mass: http://www.mass.gov/dep/cero/cerohome.htm

Barbara Kickham of the Department of Environmental Protection's Drinking Water Program suggested contacting the department's service center[7] for gathering this information. An appointment would have to be made to review Worcester's Annual Statistical Reports. The data is readily available dating back to 1995. The information will also provide a breakdown on how the water consumed was used. Based on how late this information became available, it could not be achieved during the initial phases of the project.

Energy & Climate change: GHG or Carbon emissions

The Regional Environmental Council has employees who keep track of different emissions within the city, especially greenhouse gasses. It would be a good source for beginning this indicator, however it is unknown if the REC will have all of the emissions data that would be included in this indicator.

Energy & Climate change: Conservation efforts locally

This indicator requires a clearer definition of which organizations are making the "efforts." For instance, it must be determined whether the indicator is looking for city efforts or private/public organizations and their efforts. Craig Sullivan of Mass Electric can be of some assistance in gathering the data once it is clarified what measurement is being used to complete this indicator.

Domain: **Education**

Joan Fitton of the Worcester Public Schools would be an excellent contact for the revision of the rationale of the education indicators. She has been cooperative in retrieving data, but has been unable to meet with any member of the project so far.

Adult Ed: Adult Immigrant Education, ESL Waiting List, and Adult Basic Education and New Immigrant Education

Jane Shea from Quinsigamund Community College was contacted concerning these indicators. She gave a copy of a report that included all the programs that provide education for

[7] DEP Drinking Water Service Center: 508-792-7683

adults and immigrants. The exact numbers for attendance, waitlists and graduates of these programs was not included, but contact information was provided for each program. It was not possible for the project members to contact all the programs in the given time, but it would give all the data needed to fill these indicators. Also, Joan Fitton should have information about these indicators.

Students Who Stay in Worcester after College

This indicator would take too much time to measure for the project team in their available time. A simple method to find the numbers would be to go to each college and ask for alumni data and see how many reside in Worcester.

Domain: Economics

It is recommended that the city manager's office and the city clerk be contacted in regards to these indicators. The project team was not able to schedule a meeting with anyone from either office, but it is likely that they could provide useful data for some of these indicators.

Business Success

A request was made to the David Rushford, the Worcester City Clerk, to find out how many DBA statements were filed each year. He replied with the number of certificates filed for each of the last three years:

```
2002 404
2003 482
2004 474
```

A meeting should be help with David Rushford to discuss these numbers and possibly a better way to indicate business success.

Living Wage Jobs/Jobs with Benefits

There was not enough information to find on this indicator. One suggestion was to look at MISER, which is an organization that deals with census data. They were contacted regarding this indicator and housing affordability. The contact, John Gaviglio was helpful in returning a data source with information regarding housing affordability, but there was not enough time

allowed to discuss the living wage job indicator. It is recommended to contact him in regards to this indicator.

Brownfields

See Environment domain.

Developer's Contribution

This indicator can be separated into indicators that are more detailed. It is likely that one would have to go to the developer directly to get the data for this indicator. An example of how this indicator could be broken-down:

Rental Rates

The data for this indicator can be found from various sources, but the way to display the data has been undecided. It is unknown if it should be displayed as a range, median, or an average. Some analysis should be put into finding the best way to report this indicator

Airport Use

Contacting the airport directly could be a way to find the desired data. Phil Niddrie who is the liaison for the airport would be a good contact, however there were efforts to meet with him, but was never able to be contacted directly.

Corporate Philanthropy

The only difficulty in measuring this indicator is that each business would have to be contacted individually. This would have taken too much time for the time allowed for this project. There should be no difficulty in getting the data from the businesses, as it is expected that they would be glad to publish what they have donated.

Underemployed Workers

This indicator is not well defined in terms of statistics. There were no quantitative guidelines to sort people into this category known to the project members. Steven Willand of the

Worcester Central Workforce deals with underemployment, however he was unable to be contacted.

Domain: Health

People living in poverty: Elder Medication.

The description for this indicator was: The number of elders who need medication, but cannot afford it. That is a very difficult indicator to measure. This indicator was labeled in the database as impossible because the data was not measured. The organizations that would have the information if it did exist stated that it would be impossible for that data to be collected.

Access to Healthcare

This indicator required too much effort in the little time the students had to work on their part of the project. This required that all local healthcare providers be contacted and for them to provide a list of how many people are covered in their plans. The definition could have been changed as well. This indicator could have had the definition of people unable to afford healthcare that seek help. It could have also changed to people who seem to use the emergency room as their primary care provider. In the future, this definition should change to accurately gather data.

Physical Activity

This would be a very good indicator if the data were to be collected on it. The reason this indicator is labeled developmental was that we could not gather the data because it did not exist. In the future, a survey would be the best way to gather this data from people in the community. The definition could also be changed to properly reflect the physical activity progress in the citizens of Worcester.

Engagement in Faith Based Communities

This indicator is labeled developmental. This indicator is very difficult to gather information from. The information that is readily available is somewhat flawed because there is no way to gage involvement. The students' proposal for this indicator is that the definition be

changed to accurately fit the current data available for such an indicator, or to leave this indicator out of the project permanently.

Domain: Culture & Recreation

Municipal investment: First Night attendance report

The First Night office of Worcester will most likely have this data. However, the office was unavailable for contact. They have been made aware of our project and offered to present the data to us. It can be presumed that the offer still stands and simply requires calling again and attempting to speak with someone who would have the data.

Municipal investment: Arts projects budget
Municipal investment: School dept arts & culture budget and
Municipal investment: Recreation budget and programming

The City Budget Office was contacted and offered to gather the data for the project. Those in the Budget Office claimed that the data may require some research but they would let those involved with this project know where the data could be found, if the Budget Office did not have it. However, no contact was ever returned from the office before the initial phases of the project were completed.

Live performance events: # DCU Centre events & Attendance

DCU Marketing Director, John Lahair was contacted and he offered to gather the number of events per year, attendance per year and attendance per event, for the last five years. However due to a large workload of changing over the name of the Centre from the "Centrum Centre" to the "DCU Centre" in time for the new year, he was unable to return the data. Follow-up contacts in 2005 should provide useful.

Live performance events: # Mechanics Hall events & attendance

Due to the fact that Mechanics Hall rents out its space for the majority of events, it does not keep an accurate attendance count for the events. The hall can only provide an "average" number of events and attendance per year, however when asked for the same information for the

past few years, the answer was the same for every year. This indicator should be reevaluated and determined if it is useful to the project or can be measured in a more meaningful way.

Live performance events: # college sports / cultural events & attendance

This indicator was not collected simply because of the time it would take to collect. There is no central location for this information, and not all colleges even have a local central location for "cultural events." This means that it would require traveling to at least two offices, athletic and cultural, at each of the ten colleges and universities in Worcester. Future research should be put towards making contacts with all of the necessary offices at the colleges, and attempting to develop an easier means of gathering the data in the future through expected yearly data requests.

Library activity: New acquisitions
Library activity: Circulation statistics and
Library activity: attendance

The Library activity sub-domains currently in the database apply only to the Worcester Public Library. Eventually, when time permits, the data should also be gathered for the private libraries in Worcester, as well as the different college and university libraries. These efforts simply require more time provided to concentrate on this topic.

Domain: **Community Life & Safety**

Candidates for Local Elections

This indicator would have erratic data and would not be able to be interpreted very well. If there were many people running one year, it may show that more people want to get involved. However, if there was a lack of people running for office it may show that people in the community of Worcester feel as though the current office holders are doing a good job. This indicator should be left out of the project because of the erratic data and if the data were to be interpreted, it could not be easily defined as positive or negative growth as a community.

Appendix 14: Indicator Data

Domain: Environment

Energy & Climate Change: Electricity Use

Indicator **Commercial kWh**

Geography	Year	Value
Worcester	1996	988495853
Worcester	1997	990320542
Worcester	1998	1020203729
Worcester	1999	1023699226
Worcester	2000	1050381596
Worcester	2001	1054656502
Worcester	2002	1061263316
Worcester	2003	1058601007

Indicator **Residential kWh**

Geography	Year	Value
Worcester	1996	361169783
Worcester	1997	358420086
Worcester	1998	357622709
Worcester	1999	376239943
Worcester	2000	379419070
Worcester	2001	391233652
Worcester	2002	403821151
Worcester	2003	421863933

Indicator **Total kWh**

Geography	Year	Value
Worcester	1996	1358037754
Worcester	1997	1356747761
Worcester	1998	1386028664
Worcester	1999	1408202283
Worcester	2000	1438052132
Worcester	2001	1456734196
Worcester	2002	1475927721
Worcester	2003	1491347750

Waste

Indicator **Recycling Rate**

Geography	Year	Value
Worcester	1996	0.54
Worcester	1997	0.52
Worcester	1998	0.54
Worcester	1999	0.57
Worcester	2000	0.51
Worcester	2001	0.51
Worcester	2002	0.47
Worcester	2003	0.49

Indicator **Total Disposed (Tons)**

Geography	Year	Value
Worcester	1996	24436
Worcester	1997	24142
Worcester	1998	24804
Worcester	1999	25551.09
Worcester	2000	26309
Worcester	2001	28121
Worcester	2002	28846
Worcester	2003	34553.27

Indicator **Total Recycled (Tons)**

Geography	Year	Value
Worcester	1996	28854.42
Worcester	1997	26374.83
Worcester	1998	29180.86
Worcester	1999	33256.92
Worcester	2000	27729.23
Worcester	2001	29346.94
Worcester	2002	25300.24
Worcester	2003	32983.55

Water Quality: Beach Closings

Indicator **Bell Pond**

Geography	Year	Value
Worcester	2001	0
Worcester	2002	0
Worcester	2003	0
Worcester	2004	0

Indicator **Coes Hillside Pond**

Geography	Year	Value
Worcester	2001	0
Worcester	2002	1
Worcester	2003	14
Worcester	2004	0

Indicator **Coes Mill St Pond**

Geography	Year	Value
Worcester	2001	13
Worcester	2002	14
Worcester	2003	22
Worcester	2004	0

Indicator **Indian Lake**

Geography	Year	Value
Worcester	2001	1
Worcester	2002	0
Worcester	2003	1
Worcester	2004	0

Indicator **Shore Park**

Geography	Year	Value
Worcester	2001	0
Worcester	2002	0
Worcester	2003	0
Worcester	2004	0

Indicator **Total Days closed**

Geography	Year	Value
Worcester	2001	14
Worcester	2002	15
Worcester	2003	37
Worcester	2004	0

Domain: **Education**

3rd grade MCAS reading

Indicator **3rd grade Advanced**

Geography	Year	Value
Worcester	2001	0
Worcester	2002	0
Worcester	2003	0
Worcester	2004	0

Indicator **3rd grade Needs Improvement**

Geography	Year	Value
Worcester	2001	42
Worcester	2002	41
Worcester	2003	42
Worcester	2004	48

Indicator **3rd grade Proficient**

Geography	Year	Value
Worcester	2001	43
Worcester	2002	50
Worcester	2003	48
Worcester	2004	39

Indicator **3rd grade Warning**

Geography	Year	Value
Worcester	2001	14
Worcester	2002	9
Worcester	2003	10
Worcester	2004	13

4th grade MCAS

Indicator **English Advanced**

Geography	Year	Value
Worcester	1998	0
Worcester	1999	0
Worcester	2000	0
Worcester	2001	4
Worcester	2002	4
Worcester	2003	5
Worcester	2004	4

Indicator **English Needs Improvement**

Geography	Year	Value
Worcester	1998	66
Worcester	1999	66
Worcester	2000	68
Worcester	2001	44
Worcester	2002	45
Worcester	2003	42
Worcester	2004	48

Indicator **English Proficient**

Geography	Year	Value
Worcester	1998	11
Worcester	1999	16
Worcester	2000	11
Worcester	2001	33
Worcester	2002	36
Worcester	2003	38
Worcester	2004	29

Indicator **English Warning**

Geography	Year	Value
Worcester	1998	22
Worcester	1999	18
Worcester	2000	21
Worcester	2001	19
Worcester	2002	15
Worcester	2003	14
Worcester	2004	20

Indicator **Math Advanced**

Geography	Year	Value

Worcester	1998	7
Worcester	1999	9
Worcester	2000	6
Worcester	2001	5
Worcester	2002	8
Worcester	2003	5
Worcester	2004	4

Indicator **Math Needs Improvement**

Geography	Year	Value
Worcester	1998	49
Worcester	1999	46
Worcester	2000	44
Worcester	2001	49
Worcester	2002	46
Worcester	2003	51
Worcester	2004	49

Indicator **Math Proficient**

Geography	Year	Value
Worcester	1998	19
Worcester	1999	19
Worcester	2000	24
Worcester	2001	17
Worcester	2002	21
Worcester	2003	22
Worcester	2004	17

Indicator **Math Warning**

Geography	Year	Value
Worcester	1998	25
Worcester	1999	26
Worcester	2000	25
Worcester	2001	28
Worcester	2002	25
Worcester	2003	22

Worcester	2004	30

Dropout Rate

Indicator **Dropout Rate (%)**

Geography	Year	Value
Worcester	1995	7.9
Worcester	1996	7.4
Worcester	1997	6.8
Worcester	1998	5.9
Worcester	1999	7.28
Worcester	2000	6.2
Worcester	2001	6.37
Worcester	2002	5.55
Worcester	2003	5.98

Plans of High School Graduates

Indicator **2-year private college (%)**

Geography	Year	Value
Worcester	1995	6
Worcester	1996	6
Worcester	1997	6
Worcester	1998	6
Worcester	1999	4
Worcester	2000	2
Worcester	2001	2
Worcester	2002	2
Worcester	2003	2

Indicator **2-year public college (%)**

Geography	Year	Value
Worcester	1995	22
Worcester	1996	23
Worcester	1997	23
Worcester	1998	23
Worcester	1999	24
Worcester	2000	23

Worcester	2001	31
Worcester	2002	40
Worcester	2003	29

Indicator **4-year private college (%)**

Geography	Year	Value
Worcester	1995	25
Worcester	1996	26
Worcester	1997	28
Worcester	1998	22
Worcester	1999	22
Worcester	2000	19
Worcester	2001	18
Worcester	2002	20
Worcester	2003	21

Indicator **4-year public college (%)**

Geography	Year	Value
Worcester	1995	23
Worcester	1996	23
Worcester	1997	25
Worcester	1998	26
Worcester	1999	19
Worcester	2000	24
Worcester	2001	20
Worcester	2002	17
Worcester	2003	26

Indicator **Military (%)**

Geography	Year	Value
Worcester	1995	4
Worcester	1996	4
Worcester	1997	1
Worcester	1998	3
Worcester	1999	3
Worcester	2000	4

Worcester	2001	2
Worcester	2002	2
Worcester	2003	3

Indicator **Number of Graduates**

Geography	Year	Value
Worcester	1995	741
Worcester	1996	808
Worcester	1997	809
Worcester	1998	793
Worcester	1999	934
Worcester	2000	1047
Worcester	2001	1123
Worcester	2002	1141
Worcester	2003	1120
Worcester	2004	1127

Indicator **Other Plans (%)**

Geography	Year	Value
Worcester	1995	3
Worcester	1996	3
Worcester	1997	3
Worcester	1998	4
Worcester	1999	7
Worcester	2000	2
Worcester	2001	3
Worcester	2002	2
Worcester	2003	2

Indicator **Other secondary (%)**

Geography	Year	Value
Worcester	1995	2
Worcester	1996	5
Worcester	1997	3
Worcester	1998	4
Worcester	1999	2

Worcester	2000	3
Worcester	2001	2
Worcester	2002	2
Worcester	2003	3

Indicator **Plans Data not available (%)**

Geography	Year	Value
Worcester	1995	0
Worcester	1996	0
Worcester	1997	0
Worcester	1998	1
Worcester	1999	0
Worcester	2000	2
Worcester	2001	3
Worcester	2002	7
Worcester	2003	7

Indicator **Work (%)**

Geography	Year	Value
Worcester	1995	11
Worcester	1996	20
Worcester	1997	10
Worcester	1998	22
Worcester	1999	19
Worcester	2000	20
Worcester	2001	19
Worcester	2002	9
Worcester	2003	9

Domain: **Economy**

Fuel Assistance

Indicator **Number eligible**

Geography	Year	Value
Worcester	1999	7471
Worcester	2000	7858
Worcester	2001	9782
Worcester	2002	9245
Worcester	2003	9576

Indicator **Number served**

Geography	Year	Value
Worcester	1999	7300
Worcester	2000	7748
Worcester	2001	9649
Worcester	2002	9078
Worcester	2003	9486

Indicator **Percent served**

Geography	Year	Value
Worcester	1999	97.7
Worcester	2000	98.6
Worcester	2001	98.6
Worcester	2002	98.2
Worcester	2003	99.1

Indicator **Total applications**

Geography	Year	Value
Worcester	1999	8620
Worcester	2000	8489
Worcester	2001	10925
Worcester	2002	10270
Worcester	2003	10327

Housing Affordability

Indicator Number over with mortgage

Geography	Year	Value
Worcester	1990	1940
Worcester	2000	1945

Indicator Number over without mortgage

Geography	Year	Value
Worcester	1990	976
Worcester	2000	509

Indicator Percent over with mortgage

Geography	Year	Value
Worcester	1990	16.3
Worcester	2000	13.4

Indicator Percent over without mortgage

Geography	Year	Value
Worcester	1990	12.8
Worcester	2000	7.2

Indicator Total housing units

Geography	Year	Value
Worcester	1990	11877
Worcester	2000	14542

Indicator Total number over

Geography	Year	Value
Worcester	1990	2916
Worcester	2000	2454

Indicator Total percent over

Geography	Year	Value
Worcester	1990	14.9
Worcester	2000	11.4

Indicator Total units with mortgage

Geography	Year	Value
Worcester	1990	7644

Worcester	2000	7049

Indicator **Total units without mortgage**

Geography	Year	Value
Worcester	1990	29521
Worcester	2000	21591

Unemployment

Indicator **Employment Number**

Geography	Year	Value
Worcester	1994	235518
Worcester	1995	232843
Worcester	1996	236818
Worcester	1997	245661
Worcester	1998	250289
Worcester	1999	249028
Worcester	2000	244850
Worcester	2001	249795
Worcester	2002	252668
Worcester	2003	249841
Worcester	2004	250926

Indicator **Unemployment Number**

Geography	Year	Value
Worcester	1994	235518
Worcester	1995	12124
Worcester	1996	9897
Worcester	1997	9403
Worcester	1998	8347
Worcester	1999	8231
Worcester	2000	6915
Worcester	2001	10167
Worcester	2002	14876
Worcester	2003	15538
Worcester	2004	13362

Indicator **Unemployment Rate**

Geography	Year	Value
Worcester	1994	5.2
Worcester	1995	4.9
Worcester	1996	4
Worcester	1997	3.7
Worcester	1998	3.2
Worcester	1999	3.2
Worcester	2000	2.7
Worcester	2001	3.9
Worcester	2002	5.8
Worcester	2003	6.4
Worcester	2004	5.1

Domain: Health

Family Violence: Child Abuse

Indicator **Support Rate**

Geography	Year	Value
Worcester	2002	56
Worcester	2003	55

Indicator **Supported Investigations**

Geography	Year	Value
Worcester	2002	764
Worcester	2003	770

Family Violence: Domestic Violence

Indicator **Domestic Violence incidents**

Geography	Year	Value
Worcester	1999	2930
Worcester	2000	2896
Worcester	2001	2887
Worcester	2002	3193
Worcester	2003	3046

Family Violence: Elder abuse

Indicator **Number of Reports**

Geography	Year	Value
Worcester and Surrounding	2003	580
Worcester and Surrounding	2004	656

People living in poverty: Free/Reduced Lunch

Indicator **Reduced/Free percentage**

Geography	Year	Value
Worcester	2000	52.5
Worcester	2000	52.5
Worcester	2001	53.2
Worcester	2001	53.2
Worcester	2002	56.2

Worcester	2002	56.2
Worcester	2003	60.5
Worcester	2003	60.5
Worcester	2004	61.1
Worcester	2004	61.1

Substance Abuse

Indicator **Abuse Count**

Geography	Year	Value
Worcester	1992	2783
Worcester	1993	3630
Worcester	1994	4626
Worcester	1995	5531
Worcester	1996	5709
Worcester	1997	5678
Worcester	1998	6560
Worcester	1999	7067
Worcester	2000	7422
Worcester	2001	7248
Worcester	2002	6805
Worcester	2003	5682

Indicator **Drug Usage Percentage**

Geography	Year	Value
Worcester	1992	3.4
Worcester	1993	4.15
Worcester	1994	4.89
Worcester	1995	5.47
Worcester	1996	5.72
Worcester	1997	5.41
Worcester	1998	5.7
Worcester	1999	6.1
Worcester	2000	6.23
Worcester	2001	6.01
Worcester	2002	5.51

Worcester	2003	4.92

Domain: **Culture & Recreation**

Library activity: attendance

Indicator **Total Attendance**

Geography	Year	Value
WPL	1999	526079
WPL	2000	364273
WPL	2001	365017
WPL	2002	744814
WPL	2003	851994
WPL	2004	701632

Library activity: Circulation statistics

Indicator **Total Circulation**

Geography	Year	Value
WPL	1999	562147
WPL	2000	465343
WPL	2001	545877
WPL	2002	624790
WPL	2003	681229
WPL	2004	618071

Library activity: New acquisitions

Indicator **Book Acquisitions**

Geography	Year	Value
WPL	1999	22016
WPL	2000	24957
WPL	2001	25057
WPL	2002	25057
WPL	2003	28106
WPL	2004	28608

Indicator **Total Acquisitions**

Geography	Year	Value
WPL	1999	27004
WPL	2000	30243

WPL	2001	35157
WPL	2002	35601
WPL	2003	37596
WPL	2004	38098

Domain: **Community Life & Safety**

Property Crime

Indicator **Burglary**

Geography	Year	Value
Worcester	1992	4333
Worcester	1993	3404
Worcester	1994	3234
Worcester	1995	2523
Worcester	1996	2231
Worcester	1997	2146
Worcester	1998	1691
Worcester	1999	1557
Worcester	2000	1229
Worcester	2001	1152
Worcester	2002	1421

Indicator **Larceny**

Geography	Year	Value
Worcester	1992	4774
Worcester	1993	5221
Worcester	1994	5108
Worcester	1995	5790
Worcester	1996	5139
Worcester	1997	5416
Worcester	1998	5390
Worcester	1999	5274
Worcester	2000	4959
Worcester	2001	4421
Worcester	2002	4346

Indicator **Motor Vehicle Theft**

Geography	Year	Value
Worcester	1992	1393
Worcester	1993	1692
Worcester	1994	1387

Worcester	1995	1291
Worcester	1996	1113
Worcester	1997	1291
Worcester	1998	1162
Worcester	1999	1163
Worcester	2000	1151
Worcester	2001	1217
Worcester	2002	1054

Indicator **Property Total**

Geography	Year	Value
Central1	2004	16
Central2	2004	51
Central3	2004	72
Central4	2004	53
Central5	2004	35
Central6	2004	25
Central7	2004	32
Central8	2004	17
Central9	2004	37
Downtown1	2004	66
Downtown2	2004	19
Downtown3	2004	38
Downtown4	2004	27
Downtown5	2004	10
Downtown6	2004	11
East1	2004	57
East2	2004	31
East3	2004	45
East4	2004	39
East5	2004	4
East6	2004	16
North1	2004	17
North2	2004	18
North3	2004	30

North4	2004	56
North5	2004	7
North6	2004	21
North7	2004	36
North8	2004	31
Northwest1	2004	83
Northwest2	2004	5
Northwest3	2004	29
Northwest4	2004	11
Northwest5	2004	10
Northwest6	2004	10
South1	2004	52
South2	2004	94
South3	2004	43
South4	2004	10
South5	2004	13
South6	2004	7
South7	2004	38
Southeast1	2004	74
Southeast2	2004	9
Southeast3	2004	18
Southeast4	2004	10
Southeast5	2004	23
Southeast6	2004	13
Southeast7	2004	7
Southeast8	2004	37
Southeast9	2004	27
West1	2004	31
West2	2004	4
West3	2004	20
West4	2004	31
West5	2004	59
West6	2004	13
West7	2004	28

Worcester	1992	10500
Worcester	1993	10317
Worcester	1994	9729
Worcester	1995	9604
Worcester	1996	8483
Worcester	1997	8853
Worcester	1998	8243
Worcester	1999	7994
Worcester	2000	7339
Worcester	2001	6790
Worcester	2002	6821

Traffic Accidents

Indicator **Accident Total**

Geography	Year	Value
Worcester	1999	7430
Worcester	2000	7482
Worcester	2001	7438
Worcester	2002	8144
Worcester	2003	8201

Indicator **Hit-and-run Accidents**

Geography	Year	Value
Worcester	1999	1271
Worcester	2000	1347
Worcester	2001	1470
Worcester	2002	1358
Worcester	2003	1497

Indicator **Non-Hit-and-run Accidents**

Geography	Year	Value
Worcester	1999	6159
Worcester	2000	6135
Worcester	2001	5968
Worcester	2002	6786
Worcester	2003	6704

Indicator **Aggravated Assault**

Geography	Year	Value
Worcester	1994	948
Worcester	1995	1264
Worcester	1996	1038
Worcester	1997	1200
Worcester	1998	1278
Worcester	1999	1248
Worcester	2000	995
Worcester	2001	935
Worcester	2002	996

Indicator **Murder**

Geography	Year	Value
Worcester	1992	13
Worcester	1993	12
Worcester	1994	13
Worcester	1995	5
Worcester	1996	7
Worcester	1997	6
Worcester	1998	4
Worcester	1999	10
Worcester	2000	5
Worcester	2001	7
Worcester	2002	9

Indicator **Robbery**

Geography	Year	Value
Worcester	1992	448
Worcester	1993	628
Worcester	1994	668
Worcester	1995	431
Worcester	1996	412
Worcester	1997	387

Worcester	1998	388
Worcester	1999	341
Worcester	2000	317
Worcester	2001	363
Worcester	2002	359

Indicator **Violent Total**

Geography	Year	Value
Worcester	1994	1629
Worcester	1995	1700
Worcester	1996	1457
Worcester	1997	1593
Worcester	1998	1670
Worcester	1999	1599
Worcester	2000	1317
Worcester	2001	1305
Worcester	2002	1364

Voter Participation: Gubernatorial Voting

Indicator **Gubernatorial Number of Voters**

Geography	Year	Value
Worcester	1998	41912
Worcester	2002	44386

Indicator **Gubernatorial Percentage**

Geography	Year	Value
w10p1	1998	42.39
w10p1	2002	35.58
w10p2	1998	28.58
w10p2	2002	28.42
w10p3	1998	34.66
w10p3	2002	28.05
w10p4	1998	24.28
w10p4	2002	21.92
w10p5	1998	19.5
w10p5	2002	24.42

w1p1	1998	60.29
w1p1	2002	61.58
w1p2	1998	62.82
w1p2	2002	64.78
w1p3	1998	63.57
w1p3	2002	63.89
w1p4	1998	61.9
w1p4	2002	62.94
w1p5	1998	55.85
w1p5	2002	58.42
w2p1	1998	59.41
w2p1	2002	61.21
w2p2	1998	62.32
w2p2	2002	59.9
w2p3	1998	55.66
w2p3	2002	58.89
w2p4	1998	52.43
w2p4	2002	50.1
w2p5	1998	30.2
w2p5	2002	25.79
w3p1	1998	56.6
w3p1	2002	56.73
w3p2	1998	33.71
w3p2	2002	31.4
w3p3	1998	41.94
w3p3	2002	46.71
w3p4	1998	32.99
w3p4	2002	27.45
w3p5	1998	46.05
w3p5	2002	42.78
w4p1	1998	44.11
w4p1	2002	35.76
w4p2	1998	49.51
w4p2	2002	44.22

w4p3	1998	24.1
w4p3	2002	15.49
w4p4	1998	57.39
w4p4	2002	48.8
w4p5	1998	59.65
w4p5	2002	56.03
w5p1	1998	47.8
w5p1	2002	42.08
w5p2	1998	56.5
w5p2	2002	51.95
w5p3	1998	59.74
w5p3	2002	56.82
w5p4	1998	55.44
w5p4	2002	51.9
w5p5	1998	57.1
w5p5	2002	53.44
w6p1	1998	34.47
w6p1	2002	31.89
w6p2	1998	46.64
w6p2	2002	37.89
w6p3	1998	45
w6p3	2002	40.94
w6p4	1998	42.11
w6p4	2002	27.12
w6p5	1998	55.54
w6p5	2002	51.18
w7p1	1998	55.53
w7p1	2002	59.53
w7p2	1998	32.77
w7p2	2002	43.61
w7p3	1998	52
w7p3	2002	50.59
w7p4	1998	53.96
w7p4	2002	51.86

w7p5	1998	53.47
w7p5	2002	52.3
w8p1	1998	41.01
w8p1	2002	31.15
w8p2	1998	30.61
w8p2	2002	26.12
w8p3	1998	24.88
w8p3	2002	23.91
w8p4	1998	37.94
w8p4	2002	34.66
w8p5	1998	50.55
w8p5	2002	35.27
w9p1	1998	54.38
w9p1	2002	57.87
w9p2	1998	60.45
w9p2	2002	59.27
w9p3	1998	59.97
w9p3	2002	64.25
w9p4	1998	63.22
w9p4	2002	62.98
w9p5	1998	60.81
w9p5	2002	61.87
Worcester	1998	50
Worcester	2002	47

Voter Participation: Municipal Voting

Indicator **Municipal Number of Voters**

Geography	Year	Value
Worcester	1995	24385
Worcester	1997	25293
Worcester	1999	24897
Worcester	2001	25262
Worcester	2003	15707

Indicator **Municipal Percentage**

Geography	Year	Value
w10p1	1997	29.74
w10p1	1999	23.58
w10p1	2001	23.01
w10p1	2003	15.86
w10p2	1997	21.51
w10p2	1999	14.27
w10p2	2001	14.19
w10p2	2003	8.81
w10p3	1997	32.4
w10p3	1999	24.34
w10p3	2001	22.49
w10p3	2003	12.02
w10p4	1997	25.64
w10p4	1999	12.06
w10p4	2001	12.44
w10p4	2003	6.43
w10p5	1997	27.27
w10p5	1999	11.93
w10p5	2001	17.26
w10p5	2003	15.27
w1p1	1997	34.08
w1p1	1999	37.23
w1p1	2001	36.4
w1p1	2003	22.75
w1p2	1997	40.08
w1p2	1999	40.79
w1p2	2001	41.63
w1p2	2003	24.45
w1p3	1997	38.27
w1p3	1999	40.8
w1p3	2001	41.78
w1p3	2003	26.93

w1p4	1997	42.6
w1p4	1999	41.87
w1p4	2001	43.65
w1p4	2003	28.81
w1p5	1997	29.46
w1p5	1999	29.76
w1p5	2001	31.37
w1p5	2003	15.88
w2p1	1997	32.62
w2p1	1999	32.18
w2p1	2001	35.31
w2p1	2003	20.28
w2p2	1997	34.83
w2p2	1999	37.41
w2p2	2001	38.71
w2p2	2003	20.01
w2p3	1997	34.16
w2p3	1999	32.54
w2p3	2001	34.65
w2p3	2003	18.26
w2p4	1997	30.03
w2p4	1999	27.46
w2p4	2001	25.41
w2p4	2003	12.46
w2p5	1997	14.19
w2p5	1999	19.97
w2p5	2001	14.05
w2p5	2003	7.58
w3p1	1997	32.05
w3p1	1999	27.45
w3p1	2001	34.5
w3p1	2003	22.7
w3p2	1997	16.71
w3p2	1999	15.37

w3p2	2001	14.57
w3p2	2003	9.73
w3p3	1997	21.81
w3p3	1999	18.81
w3p3	2001	19.47
w3p3	2003	11.96
w3p4	1997	16.12
w3p4	1999	12.63
w3p4	2001	12.68
w3p4	2003	7.37
w3p5	1997	23.88
w3p5	1999	20.34
w3p5	2001	21.26
w3p5	2003	13.95
w4p1	1997	30.03
w4p1	1999	28.48
w4p1	2001	23.62
w4p1	2003	15.85
w4p2	1997	30.1
w4p2	1999	26.32
w4p2	2001	26.74
w4p2	2003	17.46
w4p3	1997	16.54
w4p3	1999	19.45
w4p3	2001	15.74
w4p3	2003	6.69
w4p4	1997	34.94
w4p4	1999	31.69
w4p4	2001	31.65
w4p4	2003	19.43
w4p5	1997	34.68
w4p5	1999	31.36
w4p5	2001	37.03
w4p5	2003	23.62

w5p1	1997	29.49
w5p1	1999	25.8
w5p1	2001	20.8
w5p1	2003	14.23
w5p2	1997	29.56
w5p2	1999	26.03
w5p2	2001	29.49
w5p2	2003	13.46
w5p3	1997	31.65
w5p3	1999	30.76
w5p3	2001	29.95
w5p3	2003	16.25
w5p4	1997	28.21
w5p4	1999	24.01
w5p4	2001	24.35
w5p4	2003	13.86
w5p5	1997	28.09
w5p5	1999	25.78
w5p5	2001	25.59
w5p5	2003	16.31
w6p1	1997	18.25
w6p1	1999	16.75
w6p1	2001	15.97
w6p1	2003	9.12
w6p2	1997	23.8
w6p2	1999	20.78
w6p2	2001	19.84
w6p2	2003	10.63
w6p3	1997	22.47
w6p3	1999	18.69
w6p3	2001	17.24
w6p3	2003	10.7
w6p4	1997	20.89
w6p4	1999	31.11

w6p4	2001	13.73
w6p4	2003	7.17
w6p5	1997	26.33
w6p5	1999	24.4
w6p5	2001	24.59
w6p5	2003	15.58
w7p1	1997	38.51
w7p1	1999	38.1
w7p1	2001	36.25
w7p1	2003	26.44
w7p2	1997	22.66
w7p2	1999	18.9
w7p2	2001	15.95
w7p2	2003	12.26
w7p3	1997	40.21
w7p3	1999	33.52
w7p3	2001	26.47
w7p3	2003	18.24
w7p4	1997	32.02
w7p4	1999	33.77
w7p4	2001	28.89
w7p4	2003	15.25
w7p5	1997	35.11
w7p5	1999	33.55
w7p5	2001	27.19
w7p5	2003	14.72
w8p1	1997	31.59
w8p1	1999	26.53
w8p1	2001	22.11
w8p1	2003	11.52
w8p2	1997	29.19
w8p2	1999	17.23
w8p2	2001	14.82
w8p2	2003	8.14

w8p3	1997	20.52
w8p3	1999	11.35
w8p3	2001	10.99
w8p3	2003	5.6
w8p4	1997	33.41
w8p4	1999	26.02
w8p4	2001	23.01
w8p4	2003	18.44
w8p5	1997	31.73
w8p5	1999	32.32
w8p5	2001	26.19
w8p5	2003	12.06
w9p1	1997	44.57
w9p1	1999	37.5
w9p1	2001	32.61
w9p1	2003	23.9
w9p2	1997	45.41
w9p2	1999	42.98
w9p2	2001	40.37
w9p2	2003	25.16
w9p3	1997	45.67
w9p3	1999	43.33
w9p3	2001	39.31
w9p3	2003	26.92
w9p4	1997	46.27
w9p4	1999	44.21
w9p4	2001	39.06
w9p4	2003	28.94
w9p5	1997	40.12
w9p5	1999	40.79
w9p5	2001	37.62
w9p5	2003	24.26
Worcester	1995	36
Worcester	1997	32

Worcester	1999	29
Worcester	2001	28
Worcester	2003	17

Voter Participation: Presidential Voting

Indicator **Presidential Number of Voters**

Geography	Year	Value
Worcester	1996	54800
Worcester	2000	54267
Worcester	2004	56951

Indicator **Presidential Percentage**

Geography	Year	Value
w10p1	1996	67.8
w10p1	2000	51.92
w10p1	2004	45.92
w10p2	1996	57.66
w10p2	2000	36.98
w10p2	2004	37.96
w10p3	1996	59.27
w10p3	2000	42.24
w10p3	2004	37.5
w10p4	1996	51.81
w10p4	2000	30.72
w10p4	2004	37.11
w10p5	1996	45.4
w10p5	2000	32.31
w10p5	2004	33.24
w1p1	1996	76.31
w1p1	2000	70.32
w1p1	2004	71.21
w1p2	1996	79.42
w1p2	2000	75.18
w1p2	2004	74.02
w1p3	1996	80.45

w1p3	2000	72.69
w1p3	2004	70.72
w1p4	1996	79.33
w1p4	2000	74.06
w1p4	2004	69.54
w1p5	1996	77.79
w1p5	2000	69.01
w1p5	2004	68.85
w2p1	1996	76.08
w2p1	2000	70.89
w2p1	2004	69.71
w2p2	1996	78.2
w2p2	2000	71.82
w2p2	2004	70.02
w2p3	1996	71.72
w2p3	2000	67.93
w2p3	2004	69.16
w2p4	1996	71.83
w2p4	2000	65.75
w2p4	2004	60.81
w2p5	1996	54.91
w2p5	2000	40.73
w2p5	2004	33.08
w3p1	1996	76.77
w3p1	2000	66.79
w3p1	2004	66.94
w3p2	1996	58.92
w3p2	2000	44.22
w3p2	2004	43.83
w3p3	1996	68.5
w3p3	2000	52.39
w3p3	2004	53.24
w3p4	1996	56.75
w3p4	2000	41.77

w3p4	2004	37.9
w3p5	1996	65.69
w3p5	2000	52.16
w3p5	2004	57.44
w4p1	1996	65.2
w4p1	2000	48.08
w4p1	2004	46.7
w4p2	1996	67.38
w4p2	2000	57.01
w4p2	2004	55.92
w4p3	1996	50.63
w4p3	2000	26.84
w4p3	2004	22.09
w4p4	1996	72.64
w4p4	2000	61.68
w4p4	2004	63.09
w4p5	1996	75.75
w4p5	2000	66.86
w4p5	2004	66.42
w5p1	1996	70.19
w5p1	2000	54.36
w5p1	2004	52.97
w5p2	1996	73.68
w5p2	2000	65.49
w5p2	2004	63.45
w5p3	1996	76.03
w5p3	2000	68.96
w5p3	2004	69.55
w5p4	1996	75.35
w5p4	2000	64.22
w5p4	2004	66.38
w5p5	1996	71.91
w5p5	2000	60.69
w5p5	2004	66.42

w6p1	1996	57.67
w6p1	2000	42.62
w6p1	2004	44.09
w6p2	1996	69.95
w6p2	2000	53.47
w6p2	2004	50.44
w6p3	1996	70.16
w6p3	2000	51.4
w6p3	2004	51.62
w6p4	1996	67.46
w6p4	2000	50.99
w6p4	2004	35.9
w6p5	1996	73.47
w6p5	2000	60.1
w6p5	2004	61.84
w7p1	1996	74.66
w7p1	2000	61.25
w7p1	2004	66.96
w7p2	1996	63.38
w7p2	2000	43.41
w7p2	2004	52.28
w7p3	1996	72.38
w7p3	2000	60.5
w7p3	2004	61.77
w7p4	1996	71.69
w7p4	2000	62.8
w7p4	2004	63.62
w7p5	1996	72.48
w7p5	2000	61.62
w7p5	2004	63.84
w8p1	1996	62.94
w8p1	2000	45.69
w8p1	2004	40.44
w8p2	1996	56.08

w8p2	2000	37.82
w8p2	2004	36.59
w8p3	1996	51.3
w8p3	2000	36.83
w8p3	2004	37.04
w8p4	1996	60.18
w8p4	2000	44.65
w8p4	2004	46.76
w8p5	1996	70.66
w8p5	2000	55.3
w8p5	2004	46.02
w9p1	1996	76.83
w9p1	2000	64.02
w9p1	2004	65.65
w9p2	1996	81.79
w9p2	2000	71.14
w9p2	2004	68.19
w9p3	1996	77.52
w9p3	2000	72.22
w9p3	2004	72.54
w9p4	1996	78.79
w9p4	2000	72.76
w9p4	2004	73.64
w9p5	1996	80.29
w9p5	2000	73.58
w9p5	2004	72.61
Worcester	1996	71
Worcester	2000	59
Worcester	2004	57