Sustainability Progress Report 2012



SUSTAINABLE DUBUQUE
viable • livable • equitable

The University of Iowa School of Urban & Regional Planning

University of Iowa School of Urban and Regional Planning

Iowa Initiative for Sustainable Communities

Naana Amonoo-Neizer ● Tim Christensen ● Emily House ● Medora Kealy ● Emma Papworth ● Lindsay Salvatore ● Lindsay Whitson

Acknowledgments

The authors of this report—seven graduate students from the University of Iowa School of Urban and Regional Planning—thank everyone who has contributed their time, effort, and insights; your help has been invaluable. We especially acknowledge:

Project Partners

Cori Burbach, City of Dubuque Sustainable Community Coordinator
Randy Rodgers, Sustainable City Network

City of Dubuque Staff

Robert Boge, City of Dubuque Housing Department
Laura Carstens, City of Dubuque Health Services
Mary Bridget Corken, City of Dubuque Leisure Services
Mary Rose Corrigan, City of Dubuque Health Services
Lisa Demmer, City of Dubuque Utility Billing
Tami Ernster, City of Dubuque Housing Department
Randy Gehl, City of Dubuque Public information Office
Kim Glaeser, City of Dubuque Housing and Community Development
Bob Green, City of Dubuque Water Department
Davis Harris, City of Dubuque Housing Department
Rose Hoerner, City of Dubuque Utility Billing Department
John Klostermann, City of Dubuque Public Works Department
Chris Kohlman, City of Dubuque Information Services
Kelly Larson, City of Dubuque Human Rights Department
Kathy Masterpool, City of Dubuque Public Works Department
Dean Mattoon, City of Dubuque Engineering Department
Kris Neyen, City of Dubuque Housing and Community Development
Jerelyn O'Conor, City of Dubuque City Manager's Office
Randy Peck, City of Dubuque Personnel Office
Patrick Prevenas, City of Dubuque Leisure Services Department
Jacqueline Rodriguez, City of Dubuque Water Department
Rich Russell, City of Dubuque Building Services
Paul Schultz, City of Dubuque Public Works
Aggie Tauke, City of Dubuque Housing and Community Development
Ken Tekippe, City of Dubuque Finance Department
Marie Ware, City of Dubuque Leisure Services Department

Dubuque Non-Profits, Universities, and Regional Governments

Jayne Eslinger, Loras College
Mark Henning, 7th Power Sustainable
Raki Giannakouros, Green Dubuque
Chuck Goddard, DMASWA
Kelsey McElroy-Anderson, ECIA
Jim O'Toole, Operation New View
Chandra Ravada, ECIA
Bev Wagner, Loras College & DMASWA

Other Resources

Chad Fields, Iowa Geological and Water Survey
City of Napa, California
Robin Leslie, City of Oshkosh Planning
Bob Libra, Iowa DNR
Elizabeth Schultz, University of Wisconsin
Brad Boesdorfer, City of Decatur
Ben McConville, City of Ames Public Works

University of Iowa School of Urban and Regional Planning

Professor Charles Connerly, University of Iowa
Professor Paul Hanley, University of Iowa
Professor Lucie Laurian, University of Iowa
Professor Phuong Nguyen, University of Iowa
Professor Scott Spak, University of Iowa
Professor Aaron Strong, University of Iowa

Table of Contents

Introduction

Dubuque is a viable, livable, and equitable community. We embrace economic prosperity, environmental integrity, and social/cultural vibrancy to create a sustainable legacy for generations to come.

Sustainable Dubuque Vision Statement—December 2008

Dubuque has come a long way since the City Council made sustainability a priority in 2006. Over the course of two years, a grassroots community initiative developed Sustainable Dubuque's Vision Statement and 11 supporting sustainability principles, which were adopted by the City Council in 2008. The 11 principles fall under the three pillars of sustainability: economic prosperity, social/cultural vibrancy, and environmental/ecological equity—each the foundation for ensuring the long-term viability of Dubuque and the well-being of its residents. The goal of Dubuque's sustainability mission is to create a model community with a strong economy and a clean, safe environment where everyone in the community has an opportunity to prosper. This report provides the first objective, statistical analysis of Dubuque's progress toward becoming that community.

In recent years, Dubuque has taken many steps toward becoming a sustainable city. The City has expanded its transportation network to make for a more livable community by offering free rides on the Jule to school-age students and by approving a bike plan that will add over 45 miles of trails to the city. The City has also worked to improve the environment by partnering with Iowa DNR to measure its contribution to climate change, resulting in the Dubuque Greenhouse Gas (GHG) Inventory, and a forthcoming GHG plan will guide Dubuque toward cleaner, more affordable ways to power city operations. Dubuque has also worked extensively to revitalize its Historic Millwork District, including the construction of Complete Streets, which support a vibrant, walkable neighborhood conducive to economic growth.

Further, the City has partnered with various local businesses and non-profits to achieve its goal—a partnership that is admired and emulated across the nation. For example, the Buyer Supplier Network links local businesses in trade for goods and services, keeping money within the local economy. Regional governments have also become involved, including the East Central Intergovernmental Association (ECIA) partnering with private businesses in the Petal Project—a partnership in which the ECIA certifies local businesses that increase energy efficiency, reduce waste, and conserve water, each of which improve the environment and local businesses' bottom lines.

In recognition of Dubuque's progress, the City has received multiple awards. In 2010, the National Resource Defense Council (NRDC) named Dubuque as a "Smarter City" for its initiatives in alternative-energy development, energy-efficiency projects, and emphasis on individual volunteer action—Dubuque was one of only 22 cities in the nation to receive this distinction. In addition, Dubuque was named a gold-standard community by the International Awards for Livable Communities, which recognized Dubuque's enhancement of the landscape, heritage management, environmentally sensitive practices, community sustainability, healthy lifestyles, and planning for the future.

To measure Dubuque's progress toward sustainability more reliably, the City partnered with the University of Iowa School of Urban & Regional Planning (UI). Since August 2011, students from the UI have worked with city staff and community members to develop measurements—or indicators—of sustainability. The result of this collaboration is the Sustainability Progress Report, which includes a total of 60 indicators. Each indicator pertains specifically to at least one of Dubuque's 11 sustainability principles.

Introduction

Dubuque's 11 sustainability principles include Regional Economy; Smart Energy Use; Smart Resource Use; Community Design; Green Buildings; Healthy Local Food; Community Knowledge; Reasonable Mobility; Healthy Air; Native Plants & Animals; and Clean Water. Within each principle, (for example, *Regional Economy*), there are between four and eight indicators that provide individual quantitative measurements of Dubuque's progress, such as *Net Job Growth*. The indicators are organized by themes developed by UI students that unify indicators addressing similar topics, which in this case is *Economic Growth*.

Indicators are important tools for cities to develop an understanding of their past and current performance, and to track their progress toward sustainability into the future. Sustainability as a concept can be abstract, and without ways to measure progress it is difficult for cities to truly understand how they are doing. By measuring and evaluating Dubuque's progress, the City, its residents, and its businesses can build off Dubuque's strengths and improve its weaknesses. Furthermore, by comparing Dubuque's progress to other similar communities—Ames, Iowa; Decatur, Illinois; Oshkosh, Wisconsin; and St. Cloud, Minnesota—Dubuque can gain a better understanding of what works and what doesn't, allowing the City to identify best practices and make strategic improvements.

Methodology

Defining Sustainability

According to the City of Dubuque, "Sustainability is defined by a community's ability to meet the environmental, economic, and social equity needs of today without reducing the ability of future generations to meet their needs." To achieve sustainability, the three pillars must work together, but sometimes they can conflict. For example, there may be a conflict between a business's bottom line (economy) and pollution standards (environment). To develop a comprehensive list of indicators, it is important to approach sustainability from each pillar so that one aspect of sustainability is not sacrificed at the expense of another. This three-prong approach guided the UI students, city staff, and community members in developing the indicators.

Selecting the Indicators

In developing Dubuque's Sustainability Indicators, the UI students studied 44 different indicator systems from across the world and identified over 1200 potential indicators. In collaboration with city staff and community members, UI students identified the final set of indicators, specifically consisting of indicators that are meaningful, measurable, comparable to other cities, and those that advance Dubuque's sustainability goals. Many of the indicators were derived from the existing indicator systems, however, several indicators were developed specifically for Dubuque, including Building Material Reuse & Recycling and the Educational Disparity indicator.

Public Engagement

The UI students held several focus groups with city staff and individuals from other agencies and non-profits in Dubuque in order to develop the indicators for this report. The first two focus groups were held with the Dubuque Performance Metrics Committee and the last focus group was held with the Sustainable Dubuque Collaboration Committee. The information and feedback provided by the focus groups were integral to the development of the indicators and the interpretation of the data. In addition, the UI students held a community open house to allow the public to provide feedback on the indicators and learn about the process.

Selecting Comparison Cities

Four comparison cities were selected to provide insight into how Dubuque compares to its peer cities. To ensure the comparison cities were similar to Dubuque, the UI students, in collaboration with the City of Dubuque, developed five criteria for selection: population size of 40,000 to 100,000, interest in sustainability, strength in manufacturing, a non-suburb city located in the Midwest, and a low college-student population. The selected cities were Ames, IA; Decatur, IL; Oshkosh, WI; and St. Cloud, MN. The comparison cities meet all of the specified criteria except for Ames, which was chosen due to its interest in collaborating with Dubuque.

Data Sources and Reliability

The progress report provides baseline data for Dubuque for nearly all of the 60 sustainability indicators. The baseline data comes from the most recent year available, which is either 2010 or 2011. Many of the indicators also have historical data and comparison city data to provide context for the baseline data.

The data for approximately 40% of the indicators come from federal or statewide online resources. The data for the remaining 60% of indicators were collected from City Departments or other local agencies. Most of the data are based either off of one-year averages or point-in-time results. Some of the data, such as the data from the U.S. Census Bureau's American Community Survey, is based off multi-year averages, and thus reflects a multi-year time period.

Some of the indicators are based on samples or estimates and therefore have margins of error. Most of these margins of error are noted within the report, however, in a few instances the margins of error were not reported by the agency collecting the data, and thus are not available for this report.

Most of the indicators are based on city-level data, but in some cases city-level data was not available. In these cases county level or metropolitan statistical area (MSA) level data was utilized instead. Unless otherwise noted, the data reflect city-level statistics.

Methodology

Sustainability Scorecard

Each indicator is scored as a "Strength," "Neutral," or "Weakness," or "Unknown" depending on the performance of the indicator in Dubuque in recent years and its performance relative to similar cities. The results of this scoring system are located in the "Sustainability Scorecard," on pages 76—78. The scores are based on a system (outlined in Figure 1) that utilizes the trends and comparisons to determine whether or not Dubuque is headed in the right direction.

The data in this report provide an important baseline for further analysis of sustainability in Dubuque. Specifically, the report provides an accurate depiction of Dubuque's past and current performance under these indicators and provides insight into how Dubuque compares to its peer cities. However, this report does not determine why Dubuque may be trending in a particular direction or why it differs from the comparison cities. The reasons behind the trends are best examined through additional analysis. In this respect, the Progress Report serves as a launching pad for investigation into other, more specific data sets and observations to gain a holistic view of the determinants of sustainability. The Progress Report, combined with subsequent investigation, will enable the city to most effectively improve sustainability for future generations.

Figure 1: **Indicator Scoring System**

Trend	Comparison	Score
Improving	Better	Strength
	Mid-range	Strength
	Worse	Neutral
	Unknown	Strength
Stagnant	Better	Strength
	Mid-range	Neutral
	Worse	Weakness
	Unknown	Neutral
Worsening	Better	Neutral
	Mid-range	Weakness
	Worse	Weakness
	Unknown	Weakness
Unknown	Better	Strength
	Mid-range	Neutral
	Worse	Weakness
	Unknown	Unknown

Principle: Regional Economy

Sustainable Dubuque is a community that values a diversified regional economy with opportunities for new and green markets, jobs, products and services.

A sustainable regional economy depends on strong, equitable, economic growth. It depends on having a diverse economy resilient to downturns and market shifts outside of the local economy's control. It also depends on having a financially sound municipal government that can take advantage of opportunities and provide an environment conducive to new jobs and economic growth without imposing an undue burden on current or future taxpayers.

Eight indicators have been developed to measure Dubuque's Regional Economy. Overall, Dubuque is doing quite well under this principle, with strengths in GDP growth per capita, the diversity of the economy, and improving interest rates on municipal bonds. Although Dubuque has a growing debt burden, strong performance in other indicators should mitigate concerns about the debt burden.

Principle: Regional Economy
Theme: Economic Growth

INDICATOR

Growth in Gross Domestic Product (GDP) per Capita - Growth in per capita GDP from previous year

WHY IS THIS IMPORTANT?

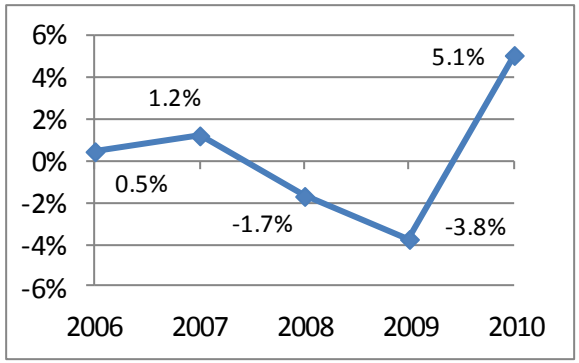
When the GDP of a metropolitan statistical area (MSA) rises, it indicates that businesses are performing well and residents have more money to spend, increasing the overall standard of living. This higher standard of living allows citizens to spend money on necessary items such as education and healthcare. Generally a higher GDP is correlated with higher tax revenues without increasing tax rates, which increases a city's ability to fund important programs.

This indicator measures the growth in GDP per capita in the MSA (in Dubuque the MSA is the same as Dubuque County) as measured by the Bureau of Economic Analysis (BEA). GDP is defined as the total market value of all final goods and services produced in an area in a given year, equal to total consumption, investment, and government spending, plus the value of exports, minus the value of imports.

HOW ARE WE DOING?

The Dubuque MSA GDP per capita rose by 5.06% in 2010, but this high growth rate was preceded by two years of economic contraction. The economic contraction in those years is expected; this was the peak of the sub-prime market real estate crash of 2008 and subsequent recession.

Figure 2: **GDP/Capita Growth in Dubuque**



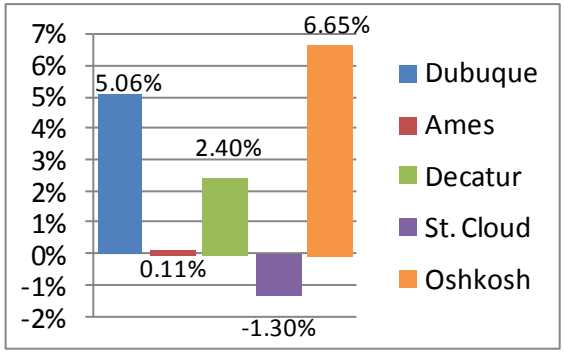
Source: Bureau of Economic Analysis

One reason why Dubuque has seen its economic growth rise in recent years, aside from the general upturn of the national economy, is that it attracted IBM and several hundred jobs to the area. If Dubuque wants to continue to grow its economy and attract jobs to the region, it needs to adopt policies conducive to business, while at the same time ensuring that persons of all abilities have access to job opportunities.

HOW DOES DUBUQUE COMPARE?

In 2010, Dubuque did quite well in comparison to its peer communities. Only the MSA in which Oshkosh, WI is located grew at a faster rate.

Figure 3: **GDP/Capita Growth in 2010**



Source: Bureau of Labor Statistics

Not only did Dubuque's MSA do well in comparison to its peer cities' MSAs, it also did well in Iowa, the region, and the nation. Dubuque's MSA had the highest rate of all MSAs in Iowa, and of the more than 40 MSAs in the surrounding six states, only three had higher growth rates. Furthermore, the Dubuque MSA growth rate surpassed the national average of 3% in 2010.

SUMMARY

Although Dubuque's economy struggled in 2008 and 2009, it did quite well in 2010 relative to its peer cities, Iowa, the region, and the nation.

Principle: Regional Economy
Theme: Economic Growth

INDICATOR

Net Job Growth - Percent change in total employees

WHY IS THIS IMPORTANT?

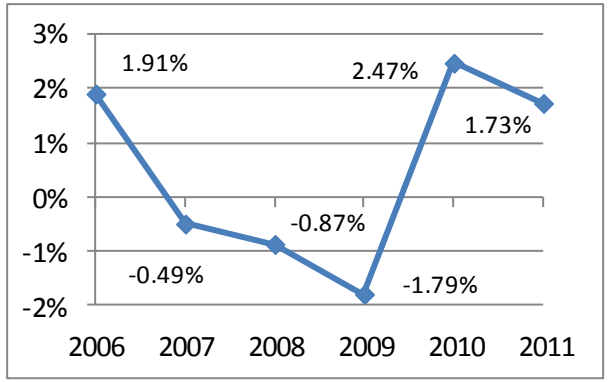
When more people are employed in the community, it signifies that the community is conducive to economic growth and that more people have wages, which increases their quality of life.

This indicator should be read in conjunction with the unemployment rate indicator. An increase in the amount of employees is not all that significant if the unemployment rate also increases; it may simply reflect an increase in population.

HOW ARE WE DOING?

There was a 1.73% increase in the amount of employees in Dubuque from 2010 to 2011. There was also an increase in employees in 2010, but there was a decrease from 2007 to 2009. Overall, approximately 300 employees have been added (approximately 1% growth) since the end of 2006, which is impressive given the overall slowdown of the national economy. However, the unemployment rate has also increased during this time period, which signifies that there is still a need for more jobs. Notably, the jump in employees from 2009 to 2010 is partially due to IBM coming to Dubuque.

Figure 4: **Net Job Growth in Dubuque**



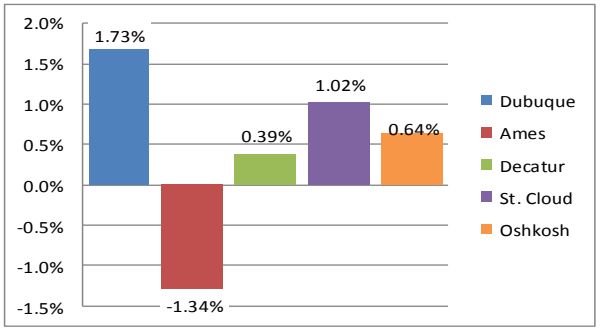
Source: Bureau of Labor Statistics

HOW DOES DUBUQUE COMPARE?

Dubuque had the highest increase in net job growth in 2011 and it also had the highest net job growth since 2006. Only Oshkosh, WI, has also seen an increase in jobs during this period. Of the comparison cities, St. Cloud, MN, came in second in net job growth in 2011, Oshkosh third, Decatur, IL fourth, and Ames, IA lost jobs.

Relative to Iowa, Dubuque is also doing well. Iowa net job growth only grew by 0.04% in 2011, and overall the state has lost 1.85% of its jobs since 2006. Dubuque, having gained 1% since 2006, also did well relative to the nation. Jobs nationwide grew by 1.14% in 2011 and declined by 3.47% since 2006.

Figure 5: **Net Job Growth in 2011**



Source: Bureau of Labor Statistics

SUMMARY

Dubuque has experienced net job growth during the last two years and is doing better relative to its peer cities, the state of Iowa, and the nation.

Principle: Regional Economy
Theme: Economic Growth

INDICATOR

Unemployment Rate - Percent of residents who are unemployed

WHY IS THIS IMPORTANT?

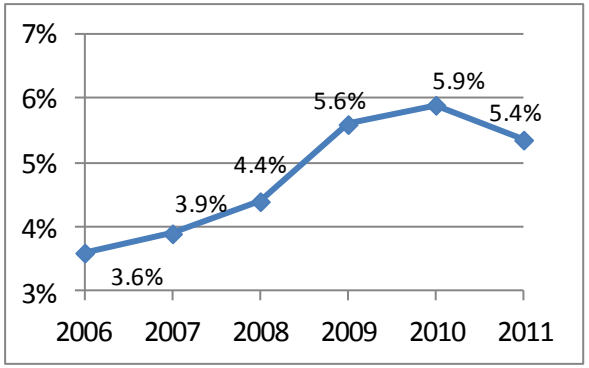
People who are steadily employed have more income to spend on education, healthcare, and other items that help the long-term viability of themselves and their community. When people can afford these items themselves, it eases pressure on the community to provide for its residents, which allows the community to focus on initiatives that foster other forms of community development. Furthermore, with higher levels of employment, wages increase due to increased demand for local workers. This increases the amount of money circulating throughout the community, benefiting local businesses and creating a more vibrant, stable local economy. A lower unemployment rate is indicative of a well-functioning, local economy, where employers are providing jobs suitable for the skills of the available labor force.

This indicator measures the unemployment rate in Dubuque. According to the Bureau of Labor Statistics (BLS), a person is unemployed "if they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work." Therefore, this indicator only includes individuals looking for work. The data describe a monthly average of unemployment in Dubuque.

HOW ARE WE DOING?

Unemployment in Dubuque rose from 3.6% in 2006 to 5.9% in 2010. This trend follows the overall national economic downturn. In 2011, the unemployment rate fell to 5.3%, a signal of a rebounding economy.

Figure 6: **Unemployment Rate in Dubuque**



Source: Bureau of Labor Statistics

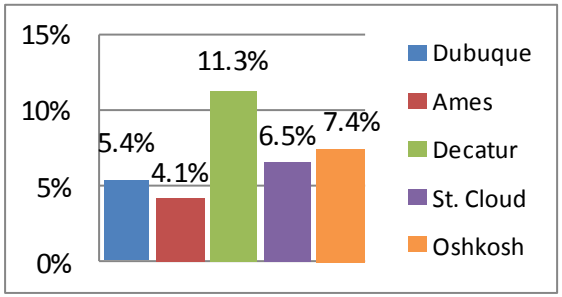
Overall, males have a higher unemployment rate than females in Dubuque. Between 2005 and 2007, males had an average unemployment rate of 5.6% compared to only 3% for females. Similarly, between 2008 and 2010, males had an unemployment rate of 7.1%, compared to 4% for females.

It is important that Dubuque continue to reach out to members of the community in efforts to decrease unemployment of minority groups. Between 2006 and 2010, white residents had an unemployment rate of 5.1%, whereas African-American residents had a 17.8% unemployment rate and Hispanic residents were at 13.6% unemployment.

HOW DOES DUBUQUE COMPARE?

Dubuque is doing well in comparison to the nation, the state, and peer cities. From 2009 through 2011, Dubuque's unemployment rate has consistently been a half point lower than the state average and Dubuque's 5.3% unemployment rate in 2011 was far below the national average of 8.9%. Compared with its peer cities, Dubuque trailed only Ames, IA, which had an unemployment rate of 4.1%. The reason for Dubuque's relatively low unemployment rate may be due to its highly diversified economy (see Sector Diversity).

Figure 7: **Unemployment Rate in 2011**



Source: Bureau of Labor Statistics

SUMMARY

Dubuque's unemployment rate has risen in recent years, but fell in 2011. Dubuque is outperforming the national unemployment rate and performs well compared to its peers. A decrease in the unemployment rate will benefit the community, with the largest room for improvement existing amongst males and minority groups.

Principle: Regional Economy
Theme: Economic Resiliency

INDICATOR

Economic Sector Diversity - Index measuring diversity of the MSA economy through employment by sector.

WHY IS THIS IMPORTANT?

When an economy has a diverse employment base, it is less susceptible to widespread economic downturns resulting from a shock to one particular industry, and can more easily withstand an economic recession. A diverse economy also offers opportunities to people of all skill and educational levels, which helps keep people employed. Furthermore, a diverse economy is more likely to be able to form regional connections with other industries, thereby improving the viability of local businesses and keeping money within the regional economy.

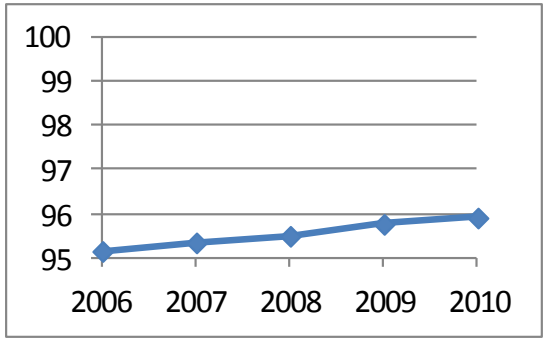
This indicator measures the diversity of the economy in Dubuque's MSA by measuring the percent of employees in the major sectors of the economy, according to figures from the Bureau of Labor Statistics (BLS).

This index ranges from 1 to 100, with a score of 100 meaning that there are an equal number of employees in each two-digit BLS employment industry (e.g., Manufacturing or Educational Services). On the other hand, a score of 1 means the economy lacks diversity and is concentrated in only one industry.

HOW ARE WE DOING?

Dubuque's economy has become more resilient over the last five years with sector diversity now having a score of 95.91.

Figure 8: **Sector Diversity in Dubuque**



Source: Bureau of Labor Statistics

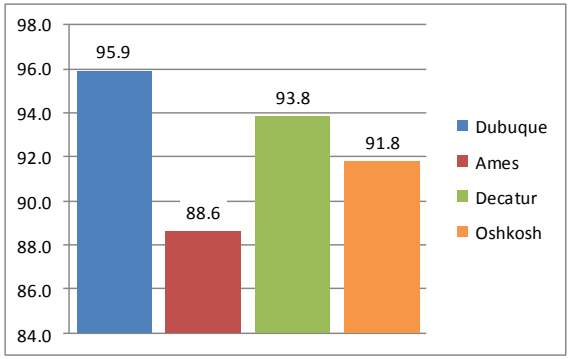
Dubuque's economy is becoming more diverse primarily because it is losing manufacturing jobs but gaining high-tech, less-polluting jobs in professional and technical services, such as jobs at IBM.

While the loss of manufacturing jobs is certainly unfortunate because these industries often provide employment opportunities to less educated workers, the transition to higher-end jobs is encouraging because it demonstrates that Dubuque is keeping up with the overall trend in the national economy in shifting towards a more service-based economy.

HOW DOES DUBUQUE COMPARE?

Dubuque's MSA has more sector diversity than any of the MSAs. Since Dubuque has such a high sector diversity, it should be better able to withstand economic downturns as has been proven by the recent overall unemployment rates and the fact that Dubuque has maintained a lower unemployment rate than most of its peer cities, the state of Iowa, and the nation.

Figure 9: **Sector Diversity in 2010**



Source: Bureau of Labor Statistics

SUMMARY

Dubuque has a highly diversified economy that is developing in the more advanced sectors, including professional and technical services. This development will make Dubuque's MSA a less-polluting and more sustainable economy in the future. Of Dubuque's comparison cities, Dubuque is the most diverse overall, making it more resilient to downturns in the economy.

Principle: Regional Economy
Theme: Economic Resiliency

INDICATOR

Poverty - Percent of city residents living in poverty

WHY IS THIS IMPORTANT?

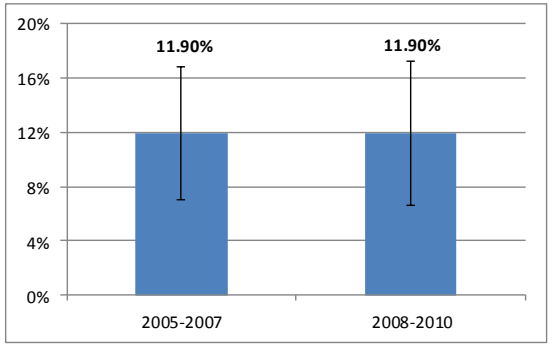
Poverty has major adverse social and economic effects on a community. Poor people are more vulnerable to natural disasters and other economic shocks (Lusigi, 2008). People living in poverty often do not have access to healthcare, healthy food, or adequate shelter, which lowers the quality of life for these individuals.

Furthermore, a higher poverty rate incurs costs for the community as a whole in the form of city services and private contributions needed to support people in poverty. Poverty can also result in a lack of social cohesion, weakening bonds between people and a community's sense of place.

HOW ARE WE DOING?

From the 2005 to 2007 time frame to the 2008 to 2010 time frame, poverty rates in Dubuque have held constant. For both time frames, the poverty rate in Dubuque was 11.90%.

Figure 10: **Poverty Rate in Dubuque**

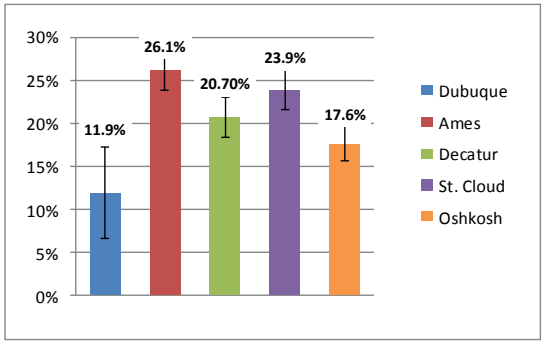


Source: American Community Survey

HOW DOES DUBUQUE COMPARE?

As shown in Figure 11, from 2008-2010, Dubuque had the lowest poverty rate in comparison to its peer cities. Ames had the highest poverty rate of 26.1%. The high number may be due to the larger student population in the city. However, Dubuque was still markedly lower than St. Cloud (23.9%), Decatur (20.70%), and Oshkosh (17.6%). Within both time frames, the poverty rate in Dubuque was similar to the state average (11% and 11.9%, respectively). However, Dubuque's poverty rate was lower than the national average of 13.3% and 14.4%, respectively.

Figure 11: **Poverty Rates, 2008-2010**



Source: American Community Survey

SUMMARY

Dubuque's poverty rate did not change between the time frames of 2005-2007 and 2008-2010. In comparison to Ames, Decatur, St. Cloud, Oshkosh, and the national average, Dubuque had the lowest poverty rate between 2008 and 2010. Although Dubuque's poverty rate has been similar to the state average in both time periods, further efforts to reduce poverty would improve the well-being of its residents.

Principle: Regional Economy
Theme: Economic Resiliency

INDICATOR

Gender Wage Gap - Female earnings as a percentage of male earnings for full-time, year-round workers

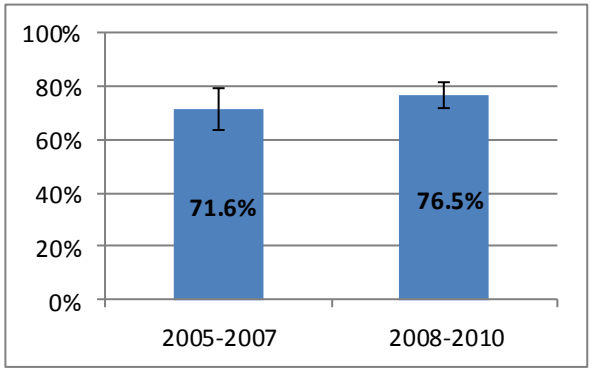
WHY IS THIS IMPORTANT?

In a sustainable city, income level does not depend upon gender. Across the U.S., however, the median female earnings were only 78.3% of the median male earnings in 2010. Although this statistic does not account for skills or job position, it reflects a variety of societal influences that contribute to pay disparity. These societal influences include cultural preconceptions on aptitudes based on gender, the cultural value of work traditionally performed by women, and unconscious bias about the capabilities of women. The lower median wage for females reduces equality and increases the vulnerability of single mothers and their families.

HOW ARE WE DOING?

The gender wage gap in Dubuque held constant from the 2005 – 2007 time span to the 2008 – 2010 time span. In 2005 – 2007, female earnings were 71.6% of male earnings, and in 2008 – 2010 female earnings rose to 76.5% of male earnings. However, this change is within the margin of error, and thus there has been no improvement in the gender wage gap.

Figure 12: **Female earnings as a percentage of male earnings for full-time, year-round workers in Dubuque**

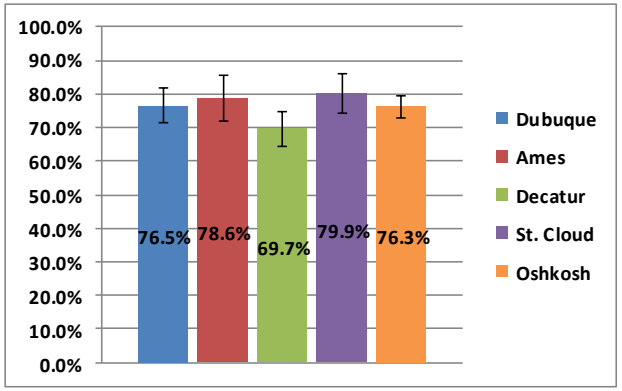


Source: American Community Survey

HOW DOES DUBUQUE COMPARE?

The gender wage gap in Dubuque is similar to its peer cities. The confidence interval for each of the cities overlap with one another, and thus the data does not indicate whether Dubuque's performance is better or worse than its peers.

Figure 13: **Comparison of Gender Wage Gap (2008-2010)**



Source: American Community Survey

SUMMARY

Due to large margins of error, it is unknown whether Dubuque's gender wage gap is changing and how it compares to other cities. It is important for Dubuque to promote educational opportunities for both males and females and to encourage non-discriminatory pay scales.

Principle: Regional Economy
Theme: Municipal Finance

INDICATOR

Debt Burden per Capita - Outstanding municipal debt per capita

WHY IS THIS IMPORTANT?

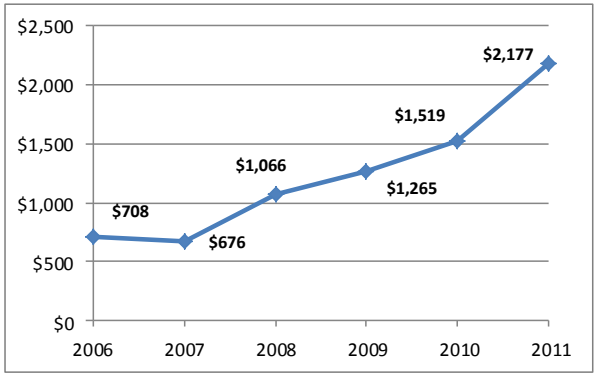
A community that is viable for both the present and the future does not incur excessive debt. Although debt financing is not inherently bad for the city if used for prudent, sustainable projects, if the money generated from issuing debt (e.g., from the issue of general obligation bonds, tax-increment financing bonds, etc.) are not used productively, future debt can burden the city for decades to come. Moreover, a city with a lot of debt may have trouble borrowing in the future as creditors may question whether the city has the revenue-generating capacity to pay back its loans. It is important to read this indicator in conjunction with the interest rate, as a high debt is not as concerning if borrowing costs are low.

This indicator measures the total direct (specific to city), outstanding municipal debt per resident in the City of Dubuque, according to the Comprehensive Annual Financial Report. This indicator is measured on a per capita basis to gain a better understanding of how much each citizen is paying to finance the city's debt. Cities in Iowa have a legal debt limit of 5% of their total taxable property base, signaling the state legislature's view that too much debt is unsustainable.

HOW ARE WE DOING?

In the fiscal year ending in June 2011, the outstanding debt per capita in Dubuque was $2,177, and it has been generally rising over the last five years.

Figure 14: **Debt per Capita in Dubuque**



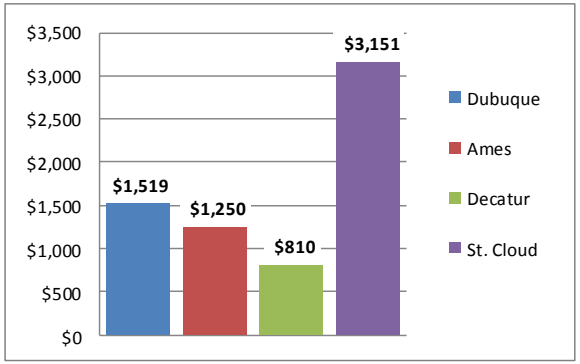
Source: City CAFR Reports, U.S. Census

Moreover, the city has a reduced capacity to borrow in the future as it is issuing a greater percentage of debt applicable to its debt limit. In 2011, Dubuque had outstanding debt of 53% of its limit, which is down from 60.5% in the 2010. However, its outstanding debt as a percentage of its debt limit is expected to rise in 2012. Despite this, Dubuque's revenues exceeded its liabilities in 2011, and if this trend continues the potential barriers that come with high debt may be less concerning as the city will have the financial capacity to pay off the debt. Moreover, this is only a snapshot, and beyond 2012 Dubuque's situation looks better.

HOW DOES DUBUQUE COMPARE?

Dubuque falls in the middle in relation to its peer cities in terms of its debt per capita.

Figure 15: **Debt per Capita in 2010**



Source: City CAFR reports; U.S. Census

Dubuque had a lower debt per capita than St. Cloud, but had a higher debt per capita than Decatur and Ames. One must be careful using these comparisons as each city's fiscal year varies, and because each city has a different income level. Therefore, a wealthier city (e.g., Dubuque compared to Ames) may have a higher debt per capita, but that does not necessarily mean Dubuque residents are worse off.

SUMMARY

Dubuque's debt per capita is rising and in comparison to its peer cities, its debt per capita is in the middle of the pack.

Principle: Regional Economy
Theme: Municipal Finance

INDICATOR

Interest Rate on Municipal Bonds - True Interest Cost (TIC) on general obligation (GO) bonds issued by the City of Dubuque in a fiscal year

WHY IS THIS IMPORTANT?

When cities can issue bonds at a low interest rate, it allows them to borrow money more affordably. This allows a city to invest in capital projects such as street repairs or renovations of buildings at a minimal cost to current and future taxpayers.

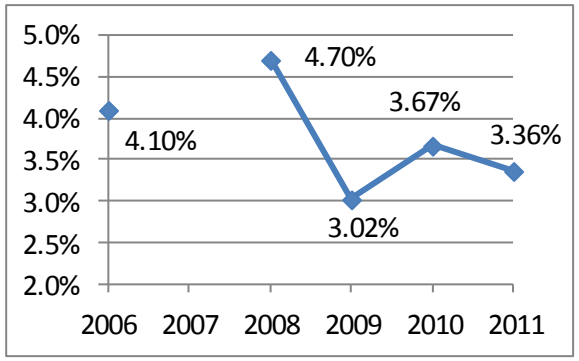
Furthermore, lower interest rates allow cities to take on projects with high upfront costs that ultimately turn out to benefit the city's bottom line. For example, if the city was interested in investing in an alternative energy technology that had a return on investment of 5%, it may be wise to issue bonds to pay for this technology if the interest rate is less than 5%.

This indicator measures the interest rate Dubuque pays on its GO bonds (bonds backed by the taxing power of Dubuque) by calculating what is referred to as the TIC. More specifically, TIC represents the interest rate on principal and interest payments, accounting for the time value of money. Figure 16 represents the average TICs of all bond issues in a given fiscal year. In Dubuque, fiscal year 2011, for example, begins in July 2010 and ends in June 2011.

HOW ARE WE DOING?

Generally, the City of Dubuque's average TIC on GO bonds has decreased over the last five fiscal years, and it stood at 3.36% in the fiscal year ending in June 2011.

Figure 16: **TIC on GO Bonds in Dubuque**



Source: City of Dubuque

Although the 2012 fiscal year is not complete until June 2012, the City has participated in two bond issues so far, and the average TIC of these bond issues was 2.64%. This is further evidence that the City is heading in the right direction.

The fact that Dubuque is paying a lower interest rate on its bond issuances is interesting because the City has issued a higher percent of its debt limit in recent years (see previous page), but investors still believe that the City is in a better financial shape as evidenced by the lower interest rate Dubuque must pay.

HOW DOES DUBUQUE COMPARE?

Dubuque's TIC on GO bonds has not yet been compared to its peer cities. One potential problem is that other cities measure their interest rate in another way, potentially by Net Interest Cost, which is similar but does not account for the time value of money.

Dubuque's interest rates are outperforming national standards: compared with 30-year U.S. Treasury bonds, Dubuque is issuing its bonds at a lower interest rate. For Treasury bonds issued on the same day in 2011, the interest rate was 4.07%, which is higher than Dubuque's 3.36% interest rate for bonds issued on the same day. Overall, the yield on Dubuque's bonds has decreased by 18% since 2006 which outperforms the decrease of 16.9% for Treasury bonds.

SUMMARY

Dubuque's interest rates are generally improving since 2006, which will allow the City to borrow money more affordably, and therefore lower taxes from residents to pay for this borrowing. Furthermore, Dubuque's interest rates were better than the U.S. Government in 2011 and have improved more than the U.S. government since 2006.

Principle: Smart Energy

Sustainable Dubuque is a community that values energy conservation and expanded use of renewable energy as a means to save money and protect the environment.

A city has sustainable energy if energy is affordable, renewable, and low polluting. It is often difficult and time-consuming to measure how efficient a city and its residents utilize energy, and this difficulty can be compounded by the proprietary nature of utility data. Therefore, perhaps the first step a city should make to determine whether it is using energy sustainably is to gather and analyze its current performance. This requires cooperation with utility companies, and perhaps residents and local businesses as well.

Principle: Smart Energy
Theme: Energy Affordability

INDICATOR

Energy Assistance — Percentage of households applying for energy assistance in the form of LIHEAP

WHY IS THIS IMPORTANT?

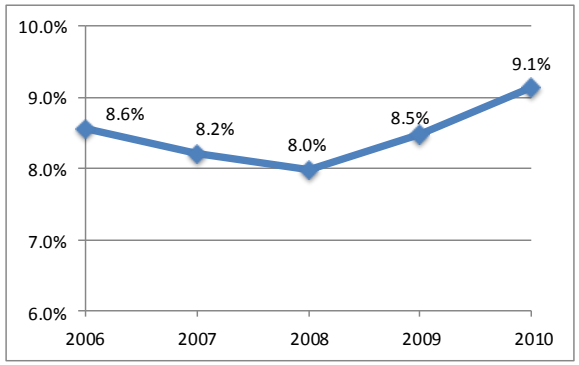
Energy is a basic need and should be affordable to all citizens of Dubuque. If energy is too expensive, people will sacrifice other needs like healthcare and education. Affordable energy will also reduce people's dependence on Dubuque's local energy assistance programs. This will save the city resources, which can be used for other worthy projects.

This indicator measures energy affordability by measuring the percent of households who apply for Low Income Home Energy Assistance Program (LIHEAP) in Dubuque County. Approximately 62% of population in Dubuque County live in Dubuque City. LIHEAP is a federally funded program that provides support to needy low-income households for utility bill payments. The assumption here is that only people who need assistance apply for LIHEAP. If less people apply for LIHEAP, it implies that energy has become more affordable either because of higher income, lower energy cost, or decreased use of energy.

HOW ARE WE DOING?

As shown in Figure 17, the percent of households that applied for LIHEAP in Dubuque County has been increasing since 2008. In 2007, 8.3% of households applied. This dropped to 8.0% in 2008. The percentage then rose to 8.5% in 2009 and 9.1% in 2010.

Figure 17: **Percent of Households that Applied for LIHEAP (2007-2010)**



Source: Operation New View -Community Action Agency, American Community Survey, US Census

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Overall, more people are applying for energy assistance in the form of LIHEAP in Dubuque County. It is important for the City to provide support for its residents by expanding energy efficiency programs so that residents do not sacrifice other needs and decrease their quality of life.

Principle: Smart Energy
Theme: Energy Utilization

INDICATOR
Household Energy Use — Residential energy use per household per year

WHY IS THIS IMPORTANT?
The efficient use of energy by households is important to sustainability because inefficient use of energy increases demand for energy, which increases the production of energy and associated pollution. Residents can improve their energy efficiency in a variety of ways, such as repairing insulation, sealing cracks, and reducing use.

When energy is produced, fossil fuels are often burned that release chemicals like sulfur oxides, nitrogen oxides, and carbon monoxide into the air. These pollutants can have health implications, especially affecting the respiratory and cardiovascular systems. Fossil fuels also affect the environment by contributing to acid rain or ground-level ozone. Furthermore, fossil fuels release carbon dioxide and other greenhouse gases into the air, which contributes to climate change.

This indicator measures how efficiently households are using energy. It reflects how households in Dubuque are contributing to sustainability through efficient energy use.

HOW ARE WE DOING?
The city has put in a request for residential electricity and natural gas use for 2010 and 2011, but the data is not yet available.

In 2009, residential households used an average of 786 therms of natural gas and a total of 193,783,248 kilowatt hours of electricity. However, because the number of customers using this electricity is not available, an average cannot be calculated at this time.

HOW DOES DUBUQUE COMPARE?
Data is only available for Oshkosh, WI. In 2009, Oshkosh residential customers used a total of 16,620,085 therms of natural gas. In Dubuque residents used 17,908,224 therms. However, since customer-level data is not available at this time in Oshkosh, the average residential usage cannot be compared.

In Oshkosh, residents used 172,438,549 kilowatt hours of electricity. Dubuque residential customers used 193,783,248 kilowatt hours. As with natural gas, due to data unavailability, the average usage cannot be compared.

SUMMARY
Due to unavailability of data, it is unclear how Dubuque is doing with regard to residential use of energy. However, when data becomes available this indicator will be useful to promoting Dubuque's sustainability efforts.

Principle: Smart Energy
Theme: Municipal Energy

INDICATOR

Renewable Energy Use — Percent of municipal energy use derived from renewable sources

WHY IS THIS IMPORTANT?

Renewable energy is important to sustainability because it emits less pollution than nonrenewable energy, and because it slows the pace of depletion of natural resources, which will benefit future generations.

This indicator is a direct measure of the City's dedication to renewable energy. It measures the percentage of the City's energy use derived from renewable sources in all phases of City operations aside from fleet vehicles.

HOW ARE WE DOING?

Currently, there is only an estimate for the city's renewable energy use. The only building using a significant amount of renewable energy is the Municipal Service Center, which, among other energy sources, is powered by an estimated 300,000 kilowatt hours of solar energy annually. Overall, the solar energy represents approximately 1% of the City's electricity use.

Data will soon be available describing the City's potential for increased renewable use through a University of Iowa renewable energy asset study.

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Only 1% of Dubuque's municipal electricity use comes from renewable sources, but this may increase in the future as the City realizes the potential of its municipal sites to generate wind, solar, and geothermal energy.

Principle: Smart Energy
Theme: Municipal Energy

INDICATOR

Energy Savings — Energy savings, measured in dollars, from demand reduction and energy efficiency projects in municipal buildings

WHY IS THIS IMPORTANT?

Energy savings advances sustainability both in terms of a city's long-term financial health and in terms of benefiting the environment through less energy consumption and pollution. Energy savings through energy efficiency initiatives and demand reduction in municipal buildings has the added benefit of saving taxpayers' money and providing an example to residents and business leaders of the gains that can be made through demand reduction (energy conservation) and energy efficiency efforts—both financially and environmentally.

This indicator measures the City of Dubuque's energy savings in dollars from energy efficiency projects and demand reduction in sixteen municipal buildings.

HOW ARE WE DOING?

Data analysis is not complete at this time and while the results of this indicator would be important, calculating an accurate value (taking into account energy costs and temperature changes) may require the expertise of an energy consultant.

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Energy savings from demand reduction and energy efficiency projects benefits the city both economically and environmentally. The City should undertake efforts to measure its current energy costs so it can evaluate energy savings in the future, taking into account the price of energy and variations in temperature.

Principle: Smart Resource Use

Sustainable Dubuque is a community that values the benefits of reducing, reusing and recycling resources.

Sustainable resource use involves citizen access to recycling facilities and programs, utilization of these services, and practicing smart resource use behaviors at home. Smart resource use guidelines includes the diversion of materials from the local landfill, appropriate disposal of hazardous materials, water conservation, and reusing existing materials effectively. These elements promote a sustainable community where resources are conserved to help reduce future resource extraction and reduce impacts on landfills and climate.

Six indicators have been developed to measure Dubuque's resource use. These indicators reveal that Dubuque is performing well in the areas of household water consumption, trash/refuse generation, sustainable materials management, and in the recycling and reuse of construction materials. Dubuque may wish to improve its groundwater conservation efforts and increase participation of households and small businesses in proper hazardous waste disposal.

Principle: Smart Resource Use
Theme: Water Use

INDICATOR

Total Water Consumption - Residential water consumption per household

WHY IS THIS IMPORTANT?

Water consumption plays a key role in a community's sustainability profile. Per capita water use in the United States is currently estimated at 70 gallons per day, or 280 gallons per day per 4-person household. High numbers such as these suggest that water consumption should be monitored and managed for conservation (American Water Works Association, 2010).

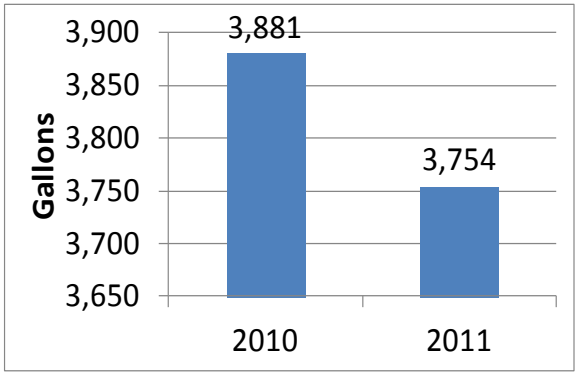
Geographic regions that experience water shortages must be diligent in their water use. The underlying issue of water scarcity is not the only reason why water consumption should be monitored; infrastructure age, function, and capacity of water systems are other important considerations. By understanding water consumption patterns and trends, the infrastructure can be managed optimally.

Measuring the total residential water consumption is essential for Dubuque so that it can gauge the impact it is having on city infrastructure, expenses, and the environment.

HOW ARE WE DOING?

In 2010, Dubuque households used an average of 3,881 gallons of water per month, with an average household size of 2.28 people. This amount decreased to 3,754 gallons per month in 2011. For both years Dubuque is considerably lower than the national average of approximately 9,000 gallons per month, which is based on a 4-person household.

Figure 18: **Average Monthly Water Consumption per Household in Dubuque**



Source: City of Dubuque

HOW DOES DUBUQUE COMPARE?

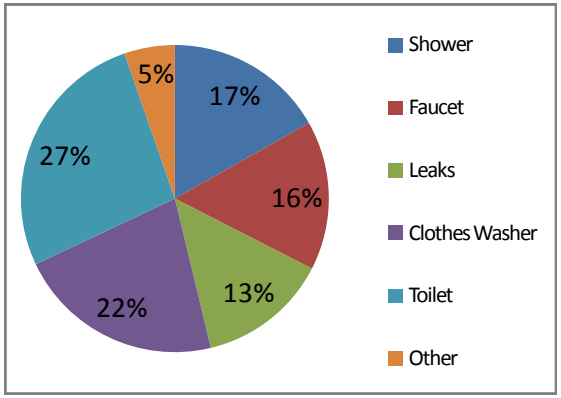
Comparison data is not available at this time.

SUMMARY

Although it is difficult to determine a trend due to minimal data, the recent year decline in household water use shows Dubuque residents moving in a more sustainable direction.

Smart water use techniques have been shown to reduce water consumption and cost by 30 percent in the U.S. Therefore, it is important for Dubuque to continue to educate and engage its residents on ways to improve their water conservation, and to measure the outcome (American Water Works Association, 2010).

Figure 19: **National Average Distribution of Water Use**



Source: U.S. EPA

Principle: Smart Resource Use
Theme: Water Use

INDICATOR

Groundwater Conservation - Net water withdrawal from local groundwater sources

WHY IS THIS IMPORTANT?

Efficient groundwater use is a vital for the long-term viability of a community, particularly for agricultural economies of the Midwest.

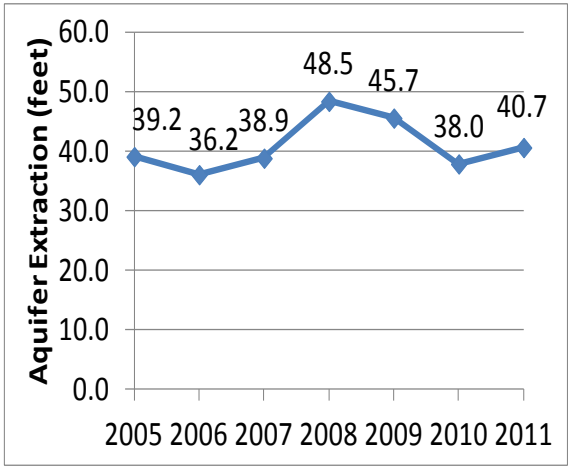
Water withdrawal from freshwater sources is expected to increase 50 percent within the next 13 years globally, which will undoubtedly create large-scale problems for many urban communities (UN Water, 2011).

For Dubuque, an increasing population and expanding economy are likely to put additional stress on local groundwater supplies (the Jordan Aquifer), contributing to an increase in water withdrawal. Net water withdrawal is measured by the drawdown in the aquifer caused by pumping. In accordance with Iowa law, drawdown may not be more than 200 feet. There are two ways to reduce groundwater depletion: reducing water usage and improving ground-water infiltration through sustainable water management practices and low impact design.

HOW ARE WE DOING?

Data from 1935 provides a baseline water level for the Jordan Aquifer. Since 1935, Dubuque's local aquifer has shown significant signs of depletion, as the aquifer net water drawdown has been 40 feet. Measures taken in 2008 revealed nearly 50 feet of drawdown, which could be attributed to the record flooding that occurred over a short time frame in 2008. This flooding quickly saturated the soil, so subsequent precipitation was unable to percolate into the aquifer and recharge the groundwater supply.

Figure 20: **Net Groundwater Withdrawal of the Jordan Aquifer Near Dubuque Since 1935**



Source: City of Dubuque

HOW DOES DUBUQUE COMPARE?

Comparison data is not currently available.

SUMMARY

Although local groundwater depletion does not occur on a short time-scale, it is still vitally important to monitor and track overall aquifer levels and progress over time.

It is critical that Dubuque cautiously and efficiently manages its local aquifers to ensure that water sources remain sustainable for future use. If Dubuque depletes its aquifer, there will be negative impacts on freshwater ecosystems, fisheries, wildlife habitats, recreational opportunities, and natural flood control.

INDICATOR

Trash/Refuse Generation - Average weekly total pounds of solid discards produced per household

WHY IS THIS IMPORTANT?

Generation of trash is an important measure of household contribution to community sustainability. This is a measure of all trash/refuse collected by city curbside collection. This measure will help gauge general household consumption and the impact on the local landfill.

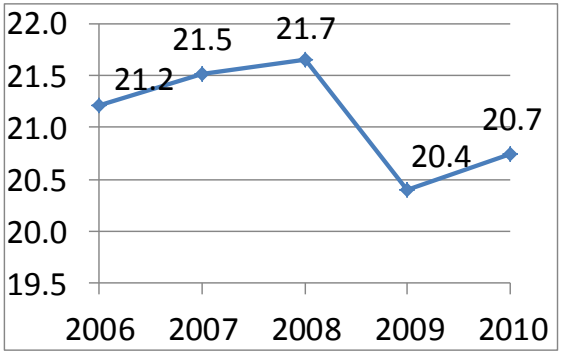
In general, generation of trash/refuse has increased dramatically in the United States. The 88.1 million tons of trash/refuse produced in 1960 pale in comparison to the nearly 245.7 million tons produced in 2005 (U.S. Environmental Protection Agency, 2006). Much like the rest of the United States, total generation of trash/refuse poses the potential to create some significant problems to Dubuque's sustainability, should the total generation continue to rise. Measuring the generation of trash/refuse provides Dubuque with valuable information on potential economic, environmental, and local landfill implications as a result of trash/refuse generation, which can be used to help minimize negative impacts on future generations.

HOW ARE WE DOING?

Generally, Dubuque households are generating less trash/refuse, with the lowest generation occurring in 2009.

In 2006, Dubuque households averaged just over 21.1 pounds of trash/refuse weekly. By 2010, this rate decreased slightly to 20.7 pounds.

Figure 21: **Average Weekly Household Generation of Trash/Refuse in Dubuque**

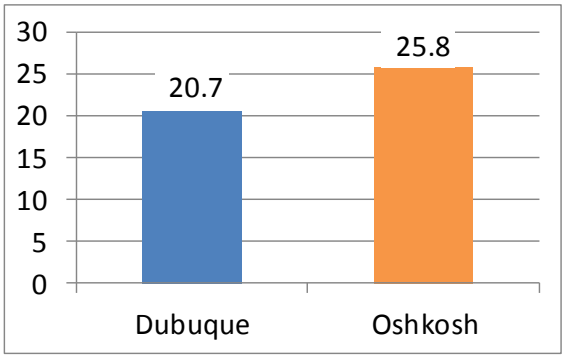


Source: City of Dubuque

HOW DOES DUBUQUE COMPARE?

Generation of trash/refuse seems to be decreasing among Dubuque households, and the city and its residents are doing relatively well compared to the City of Oshkosh, Wisconsin. In 2010, Dubuque households produced 20.7 pounds of solid discards, while households in Oshkosh produced just over 25.8 pounds of solid discards, nearly 20% more than Dubuque households.

Figure 22: **Comparison Trash/Refuse Generation 2010**



Source: City of Dubuque; City of Oshkosh

SUMMARY

Promoting more sustainable lifestyles, in terms of minimizing over-consumption of materials, is a priority that will not only benefit Dubuque residents by reducing pressure on resources and landfill capacity, but also financially by reducing wasteful per capital consumption.

Principle: Smart Resource Use
Theme: Wasting & Recycling

INDICATOR

Sustainable Materials Management -

Percent of city curbside discards diverted to beneficial use instead of landfilling*

WHY IS THIS IMPORTANT?

The optimal use of Dubuque's landfill space is an important issue for the resiliency of the City. Measuring the percent of solid materials diverted from local landfills can provide insight into the degree to which the community is recycling, reusing, or composting materials.

It is vital that Dubuque continue to promote alternative methods to manage solid discards and measure the effectiveness of those methods, as economic and population growth put pressure on landfill capacity.

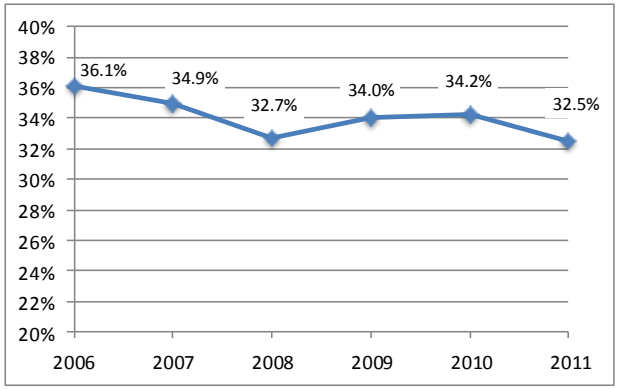
Sustainable resource management and natural resource conservation, and resultant energy conservation are significantly important to Dubuque's overall sustainability. These diversions from landfilling also reduce fugitive landfill gas emissions which have been the city's most significant component of its carbon footprint. Therefore this indicator helps mitigate climate change impacts.

HOW ARE WE DOING?

Overall, the last five years have shown to be fairly steady in the proportion of solid discards diverted from the local landfill.

In 2006, diversion from the local landfill was at 36.1%. Although there is a slight decline in 2011 to 32.5%, it is important to note that the decline is partially due glass materials no longer accepted as recyclable material, an initiative that promotes greater benefits and long-term sustainability for Dubuque.

Figure 23: **Percent of Curbside Discards Diverted from Landfill**



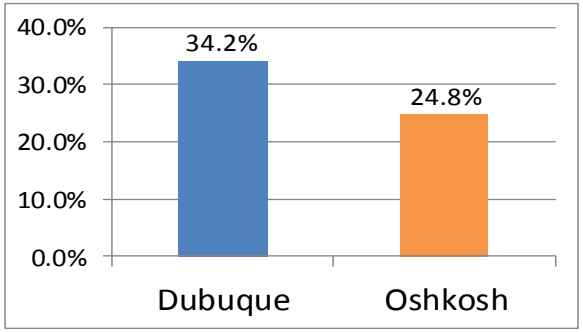
Source: City of Dubuque

*This indicator only tracks city municipal residential collection, which is about 15% of the discards generated in the city. Other collection by private haulers: residential, commercial, institutional and industrial discards are not included. It also does not track source reduction drop off recycling, Bottle Bill container returns for 5 cent deposits, biomass heating, back-yard composting, grass-cycling and reuse.

HOW DOES DUBUQUE COMPARE?

Although Dubuque's proportion of diversion seems to be declining, the city is doing significantly well in comparison to Oshkosh, WI. In 2010, while Dubuque was averaging 34 percent diversion, Oshkosh's diversion was slightly over 24.8%. Similarly, national trends are declining on collected recyclables largely due to less use of paper products and the general impacts of the national recession (U.S. EPA 2009).

Figure 24: **Comparison of Diversion of Curbside Discards 2010**



Source: City of Dubuque; City of Oshkosh

SUMMARY

Despite Dubuque's slight decrease in diverting discards over the past few years, the city is doing better in comparison to Oshkosh. Diversion of solid discards from landfilling is important to minimize climate change impacts, resource extraction, and conserve local landfill capacity in the future.

Principle: Smart Resource Use
Theme: Wasting & Recycling

INDICATOR

Building Material Reuse & Recycling - Percent of building and construction material reused or recycled from local deconstruction projects

WHY IS THIS IMPORTANT?

Dubuque's building and construction material reuse is already a unique strength to the city. Continued efforts have the potential to provide multiple benefits to Dubuque, such as minimizing the amount of mass that enters the local landfills, thereby reducing overall stress on landfills and maintaining landfill capacity for the future.

Ongoing support of building material reuse and recycling within Dubuque provides an opportunity for Dubuque to focus on its unique area of strength and to evaluate the overall impacts its program has on the community and surrounding areas.

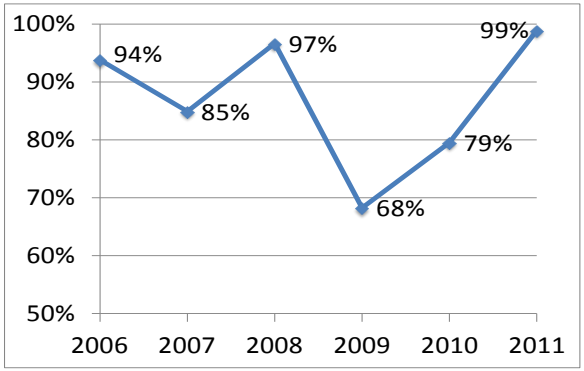
HOW ARE WE DOING?

Over the last five years, the percent of building materials that are reused and recycled as a result of deconstruction projects within Dubuque fluctuated significantly.

In 2009, only 68% of materials from deconstruction projects were recycled or reused, compared to 99% of materials from deconstruction projects in 2011.

In 2008 and 2010, reusing and recycling of building materials peaked at over 10,000 tons, but in other years, such as 2009, this amount was significantly less. Much of this fluctuation is due to scale and availability of projects and data reporting.

Figure 25: **Percent of Building Materials Recycled or Reused from Local Deconstruction Projects**



Source: Dubuque Metropolitan Area Solid Waste Agency

Figure 26: **Tons of Building Materials Reused & Recycled in Dubuque, 2006-2011**

2006	2007	2008	2009	2010	2011
1,400	3,385	13,387	357	10,769	6,857

Source: Dubuque Metropolitan Area Solid Waste Agency

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

There exists some inconsistencies within the data both in terms of completeness of data and the variation in the number of deconstruction projects. However the limited data available shows Dubuque is committed to building material recycling and reuse.

Principle: Smart Resource Use
Theme: Wasting & Recycling

INDICATOR

Hazardous Materials - Percent of residents participating in small business & household hazardous waste disposal

WHY IS THIS IMPORTANT?

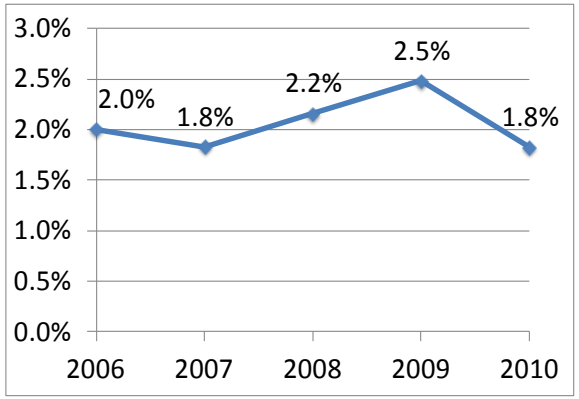
Proper disposal of household hazardous materials prevents ground contamination and protects the health and integrity of the local environment.

Currently, 95% of local household hazardous materials are disposed of improperly and enter local landfills. Improper disposal can result in hazardous material seepage into surface and groundwater systems, resulting in avoidable health dangers for nearby communities and ecosystems. Similarly, residential participation in household hazardous materials disposal signifies the extent of residential effort and understanding of proper disposal procedures.

HOW ARE WE DOING?

Participation in local hazardous waste disposal is approximately 2% of the metropolitan population. Although recent data from 2010 shows a decline in participation to 1.8%, trending from previous years showed a steady increase in participation. Participation reached a high of nearly 2.5% in 2009.

Figure 27: **Percent of Dubuque Metro Area Household Participating in Household Hazardous Waste Disposal, 2006-2010**



Source: Dubuque Metropolitan Area Solid Waste Agency; American Community Survey

HOW DOES DUBUQUE COMPARE?

Comparison data is not available.

SUMMARY

Participation in household and small business hazardous waste disposal is an important factor in maintaining healthy and safe communities and neighborhoods. Increasing local participation is important to Dubuque and the surrounding region because it would mitigate local health concerns surrounding improper disposal of hazardous materials, in addition to regional environmental and ecological concerns.

Principle: Community Design

Sustainable Dubuque is a community that values the built environment of the past, present and future which contributes to its identity, heritage and sense of place.

Sustainable community design depends on having accessibility to common destinations, conserving open space, preserving cultural heritage, and minimizing the negative effects of development. Combined, these elements promote a sustainable community where natural and cultural resources are preserved, and all residents have access to common destinations and open space.

Six indicators have been developed to measure Dubuque's Community Design. These indicators reveal that Dubuque is performing well in regards to quantity of open space and urban density. Dubuque could improve historic preservation, access to open space, and level of mixed use. Dubuque's weakest area is the amount of sidewalks and bike paths.

Principle: Community Design
Theme: Accessibility

INDICATOR

Complete Streets – Ratio of miles of sidewalks and bike paths to miles of roads

WHY IS THIS IMPORTANT?

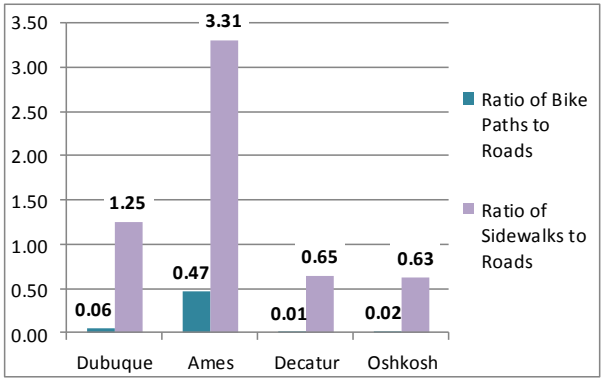
In a sustainable city, residents have access to destinations by non-polluting transportation options such as walking or biking. To provide these options, a sustainable city will ensure that it has enough bike paths and sidewalks. Although there is no official standard for this measure, accessibility can be measured by comparing the ratio of miles of sidewalks and bike paths to miles of roads. In addition to reducing pollution, bike paths and sidewalks improve mobility for all residents, regardless of socioeconomic status, and therefore accessibility is important for social equity.

The term "complete streets" refers to streets that are designed to allow access for all users, including pedestrians, bicyclists, and vehicles. This indicator expands upon the definition slightly to measure all of the sidewalks and bike paths in the city, whether or not they are along a street or constitute a complete street. Transit was not analyzed, but it is an important component of complete streets and accessible transportation.

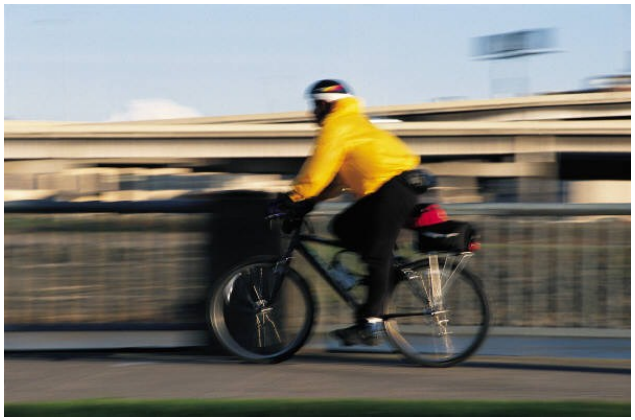
HOW ARE WE DOING?

For every 100 miles of road, Dubuque has 6 miles of bike paths and 125 miles of sidewalks. No trend data is available at this time.

Figure 28: **Ratio of Miles of Bike Paths and Sidewalks to Miles of Roads**



Source: City of Dubuque, City of Ames, City of Decatur, and the City of Oshkosh



HOW DOES DUBUQUE COMPARE?

Dubuque has a smaller ratio of bike paths and sidewalks to roads than Ames, IA, but it has more than both Decatur, IL and Oshkosh, WI.

In Ames, for every 100 miles of road there are 47 miles of bike paths and 331 miles of sidewalks. Compared to Dubuque, the amount of bike paths is about 7 times higher in Ames, and the amount of sidewalks is about 2.5 times higher. Dubuque has a slightly higher ratio of bike paths than Decatur and Oshkosh; there are 6 miles of bike paths in Dubuque compared to 1 mile in Decatur and 2 miles in Decatur. The sidewalk ratio in Dubuque (1.25) is almost twice as large as the ratio in Decatur (.65) and Oshkosh (.63).

SUMMARY

Dubuque has less mileage of bike paths and sidewalks than Ames but more than Decatur and Oshkosh. Accessibility by bike paths and sidewalks is important for reducing pollution and providing equality of access.

The City of Dubuque adopted a Complete Streets Policy in April 2011, and recently completed a pilot Complete Streets project in the Historic Millwork District. It is important for Dubuque to expand the number of compete streets and also to increase the amount of bike paths and sidewalks, whether or not they are part of an official complete street.

INDICATOR

Mixed Use – Average land-use mix factor

WHY IS THIS IMPORTANT?

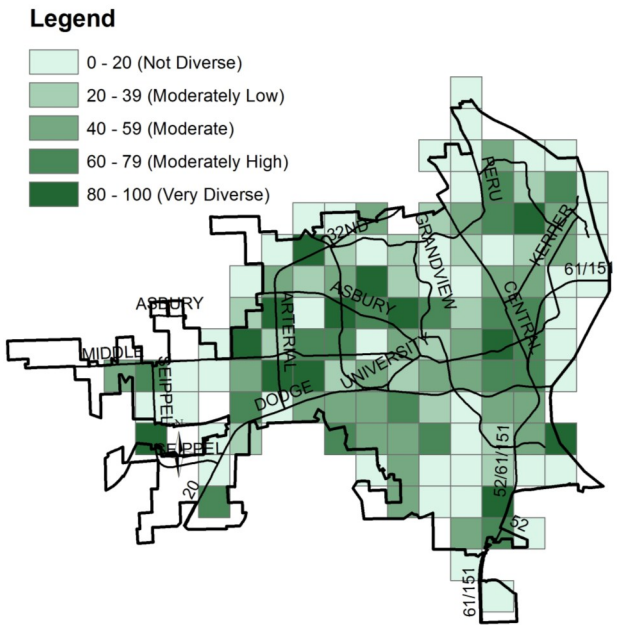
A sustainable city has a mixture of land uses throughout the city. Instead of separating land uses such as housing, schools, offices, and retail into distinct areas, such land uses are located closer together, and residents can easily access common destinations such as work, shopping, or school. A higher level of access benefits all residents by increasing the opportunities for walking. Additionally, by reducing the distances between different types of land uses, the total Vehicle Miles Traveled (VMT) will also be reduced, thereby improving air quality. Despite all of the benefits of mixed use, it is usually underprovided due to antiquated zoning regulations and suburban development patterns.

This indicator measures the level of mixture of six types of land uses on a 0 to 100 scale. The six land uses are single-family residential, multi-family residential, offices, retail, education, and entertainment. The city was randomly divided into ½ mile by ½ mile study areas. A score of 100 indicates that all six land uses are present in equal amounts in each of the study areas. A score of 0 indicates that in each ½ mile by ½ mile study area, only one land use is present. Thus, higher scores indicate higher levels of land-use mixture.

HOW ARE WE DOING?

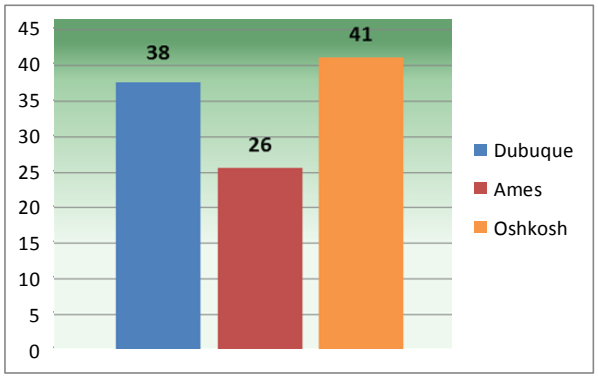
Dubuque's level of land-use mixture is 38. This is a moderately low level of mixture. Downtown Dubuque has a moderate level of mixture. The study areas with the highest levels of mixed use were generally located to the west, and usually reflect a mixture of housing, shopping, and schools. No trend data is available at this time.

Figure 29: **Land Use Mix Factor in Dubuque**



Source: City of Dubuque

Figure 30: **Mixed Use in Comparison Cities**



Source: City of Dubuque, City of Ames, City of Oshkosh

HOW DOES DUBUQUE COMPARE?

Dubuque's mixed-use score is between Ames's and Oshkosh's score. Ames, IA has the lowest level of mixed use, with a score of 26—a moderately low level of mixed use. Oshkosh, WI has the highest level of mixed use with a score of 41—a moderate level of mixed use. However, each city categorizes land use slightly differently, so the results are not wholly comparable.

SUMMARY

Dubuque's level of mixed use is moderately low to moderate, and it is less mixed than Oshkosh. Mixed land use is important for increasing accessibility and reducing pollution. Dubuque could improve its level of mixed use by focusing on strategic areas where increased land-use mix would be most appropriate.

Principle: Community Design
Theme: Open Space

INDICATOR

Quantity of Open Space – Percent of city that is open space (including parks, schoolyards, and woodlands)

WHY IS THIS IMPORTANT?

Open space is a critical resource for a sustainable city. Undeveloped land in open space absorbs surface water runoff, which helps prevent stormwater overflows and localized flooding. The land in open space also filters pollutants from surface water runoff, thereby improving water quality in streams and rivers. Vegetation in open space absorbs greenhouse gasses and mitigates the urban heat island effect. Open space also provides wildlife habitat and recreation areas.

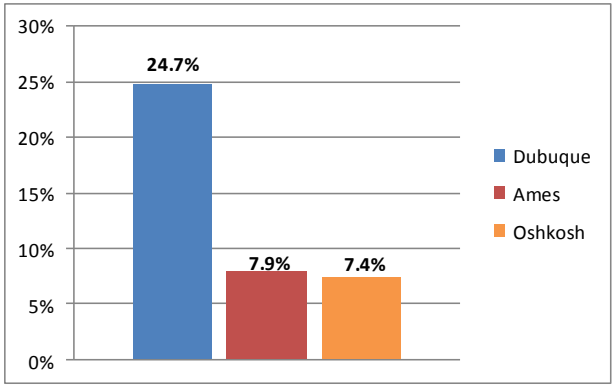
This indicator measures the percent of the city that is open space, which includes public parks, schoolyards, and all other public or private open space.

Parks filter and store stormwater

HOW ARE WE DOING?

Almost a quarter of the City of Dubuque is open space. No trend data is available.

Figure 31: **Percentage of Open Space in Comparison Cities**



Source: City of Dubuque, City of Ames, City of Oshkosh

HOW DOES DUBUQUE COMPARE?

Dubuque has a much higher percentage of open space than Ames , IA or Oshkosh, WI. In Ames, 7.9% of the city is open space, and 7.4% of Oshkosh is open space. Dubuque's percentage of open space is about three times as high as Ames and Oshkosh.

SUMMARY

Dubuque has a very high percentage of open space compared to other similar communities. Open space provides numerous environmental benefits, including reducing air and water pollution, reducing flooding, and supporting biodiversity. It is important for Dubuque to preserve its high level of open space.

INDICATOR

Access to Open Space – Percent of households within walking distance (¼ mile) of public open space (including parks and public schoolyards)

WHY IS THIS IMPORTANT?

In a sustainable city, residents can easily access open space, because it is located throughout the city. Open space should be equitably distributed so that all residents can enjoy the recreational opportunities of open space as well as the environmental benefits of open space, such as reducing localized flooding and filtering air and water pollution.

Since ¼ mile is commonly recognized as a walkable distance, this indicator measures the percent of households within ¼ mile of public open space. Only public open space is counted since private open space does not always provide recreational opportunities. The data for this indicator was calculated based on digital maps of each city.

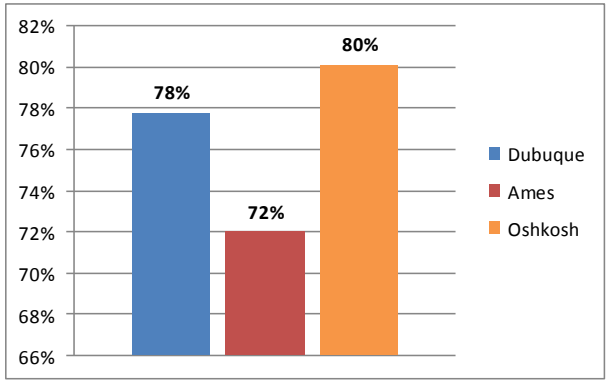
HOW ARE WE DOING?

In Dubuque, 78% of households are within ¼ mile of public open space. In addition, 97.8% of residents are within ½ mile of public open space. Dubuque also has 68 acres of open space per 1000 residents, which far exceeds the benchmark of 10 acres per 1000 residents set by the National Recreation and Park Association. No trend data is available.

HOW DOES DUBUQUE COMPARE?

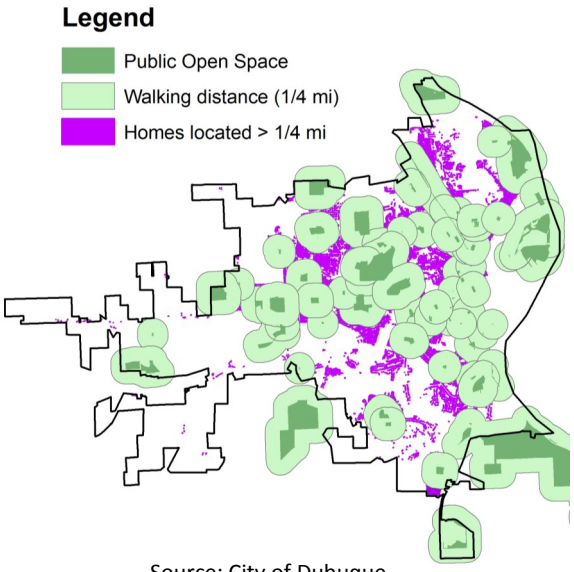
Dubuque has fewer residents within ¼ mile of public open space than Oshkosh, WI, but more than Ames, IA. In Oshkosh, WI, 80% of residents are within ¼ of public open space. In Ames, 72% of residents are within ¼ mile of open space.

Figure 32: **Percent of Households within 1/4 mile of Public Open Space**



Source: City of Dubuque, City of Ames, City of Oshkosh

Figure 33: **Households not within Walking Distance of Public Open Space**



Source: City of Dubuque

SUMMARY

Almost 100% of Dubuque residents are within ½ mile of public open space, however, only 78% are within walking distance (¼ mile). Dubuque has greater open space access than Oshkosh, and slightly less open space access than Ames. It is important for residents to be able to easily access open space, so that all residents have opportunities for recreation. To increase the percentage of residents within walking distance of public open space Dubuque could purchase private open space, or encourage private spaces to allow public access.

INDICATOR

Historic Preservation – Number of buildings and structures on the National Register of Historic Places

WHY IS THIS IMPORTANT?

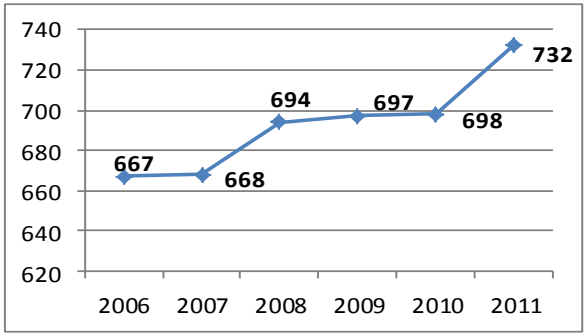
In a sustainable city, the cultural resources of the community are preserved for the future. Dubuque, as a historic river town, has many historic buildings and structures that are valuable to Dubuque's identity and culture. Preserving these buildings will not only promote cultural vibrancy, but will reflect efficient reuse of existing infrastructure and support tourism to Dubuque, thereby boosting the local economy.

Although Dubuque has made great efforts with local preservation efforts, this indicator only measures historic designations through the National Register of Historic Places (NRHP). By using the NRHP, this indicator is directly comparable to other cities. Both buildings and structures (e.g., bridges and grain elevators) are measured for this indicator. To qualify for NRHP designation, the building or structure must be old enough to qualify as historic (usually at least 50 years old) and must be significant to events, activities, or developments that were important in the past.

HOW ARE WE DOING?

The number of buildings and structures that are designated as historic places in Dubuque has increased since 2006, from 667 to 732.

Figure 34: **Dubuque Buildings and Structures on the National Register of Historic Places**



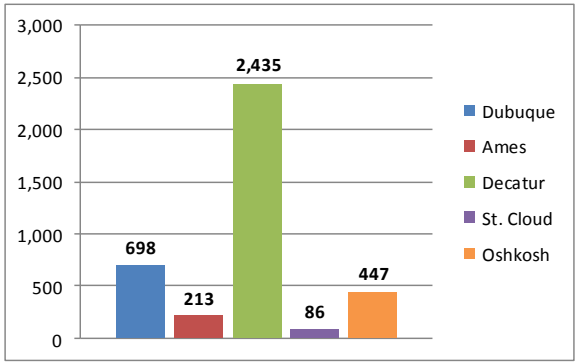
Source: National Register of Historic Places

Star Brewery in Dubuque has been listed on the NRHP since 2007

HOW DOES DUBUQUE COMPARE?

Dubuque has more buildings and structures on the NRHP than Ames, IA, St. Cloud, MN, or Oshkosh, WI. However, Dubuque has much fewer buildings and structures listed than Decatur, IL, which has several large historic districts on the NRHP.

Figure 35: **Buildings and Structures on the National Register of Historic Places in 2011**



Source: National Register of Historic Places

SUMMARY

Dubuque's preservation efforts are substantial, and the number of buildings and structures on the NRHP continues to increase. Dubuque has more buildings on the NRHP than most of the comparison cities, though it trails Decatur. It is important to continue preserving historic buildings and structures in Dubuque to support cultural ties to the past, promote building reuse, and encourage tourism.

INDICATOR

Urban Density – Residents per acre of developed land

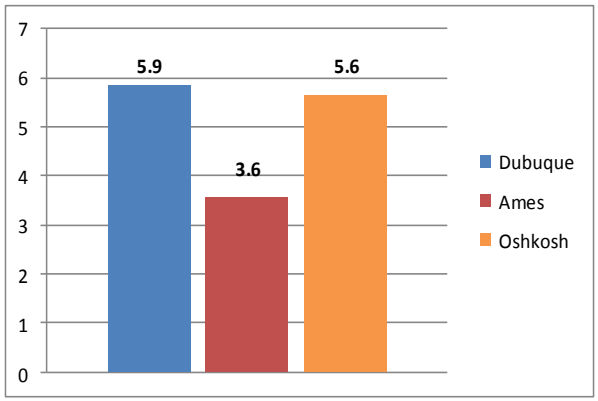
WHY IS THIS IMPORTANT?

A sustainable city has higher urban densities so that the impact from development is minimized. Sprawling, less dense development reduces wildlife habitat, removes native plants, reduces stormwater infiltration, and tends to increase Vehicle Miles Traveled (VMT) and pollution. Higher urban densities mitigate these development impacts. Additionally, compact development utilizes existing infrastructure, such as roads and water mains, and is thus more cost-effective and fiscally sustainable.

HOW ARE WE DOING?

In 2011 Dubuque had 5.9 residents per acre of developed land. No trend data is available.

Figure 36: **Residents per Acre of Developed Land in 2011**



Source: City of Dubuque, City of Ames, City of Oshkosh

HOW DOES DUBUQUE COMPARE?

The urban density in Dubuque is higher than the other comparison cities. Dubuque's density of 5.9 narrowly beats Oshkosh's density of 5.6, and is much higher than Ames's density of 3.6.

SUMMARY

Dubuque has the highest urban density of the comparison cities. It is important for Dubuque to continue to promote infill development and higher density development, so that the negative impacts of development can be minimized.

Higher urban density development in Downtown Dubuque

Principle: Green Buildings

Sustainable Dubuque is a community that values a productive and healthy built environment.

Green buildings promote sustainability through their economic, social and environmental benefits. By reducing energy usage and utilizing environmentally-friendly building materials, they improve air and water quality and protect ecosystems. They reduce operating costs of buildings and enhance the comfort and health of occupants (EPA, 2010). For housing to be sustainable, the homes must be safe, healthy, affordable and efficient in terms of energy and resource use.

The Roshek Building was awarded LEED Platinum Certification

Interior of the historic Roshek Building in downtown Dubuque

Indicators that measure sustainability under the green buildings principle include: Percent of non-residential buildings that meet Energy Star or LEED standards; Percent of households living in affordable housing; Percent of rental housing inspections that result in housing code violations; Percent of children under age 6 tested for lead poisoning within the last year; and incidence of lead poisoning.

Principle: Green Buildings
Theme: Efficient Buildings

INDICATOR

Green Standards - Percent of non-residential buildings that meet Energy Star or LEED standards

WHY IS THIS IMPORTANT?

Green buildings support sustainability because they reduce pollution and have lower energy and resource costs. The two most prevalent green building certification programs include the EPA's Energy Star program and the Leadership in Energy and Efficiency Design (LEED) program run by the non-profit U.S. Green Building Council. Both programs provide certification to new and existing buildings for achieving energy efficiency. The average LEED building energy use is 25-30% more efficient than the national average (Turner, 2008).

Efficient homes are more affordable in the long-run than most traditional buildings. Studies have shown that energy efficient buildings have higher occupancies, sales price and rental rates than non-green buildings due to their high demand (Burr, 2008). Businesses in Dubuque can take advantage of this market by adding sustainability features to their structures

This indicator measures the percent of non-residential buildings in Dubuque that are officially certified as green and efficient. The indicator does not count buildings that meet Energy Star or LEED standards that are not yet certified.

HOW ARE WE DOING?

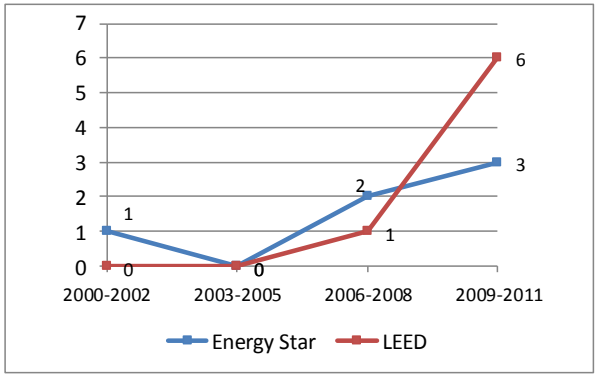
Dubuque had a total of 2,690 nonresidential buildings in 2011. Only 14 nonresidential buildings (0.5% of total) were Energy Star or LEED certified as of 2011. The majority of these green buildings are LEED certified buildings. The City had a major increase of both LEED and Energy Star buildings certified per year from 2009 to 2011.

Table 1: **Percent of Non-Residential Green Building in Dubuque (2011)**

Total non-residential Buildings in Dubuque	Number of Green Buildings	Percent
2690	14	0.5%

Source: US Green Building Council, EPA

Figure 37: **Number of Energy Star and LEED Buildings Certified Each Year (2000-2011)**

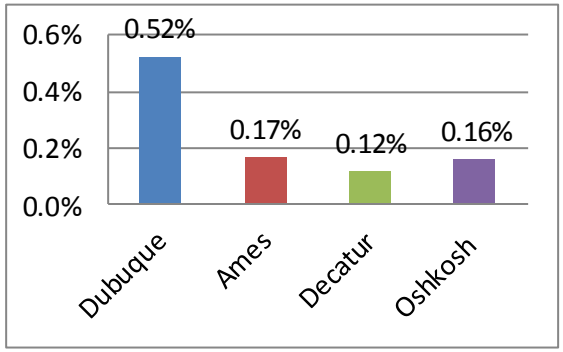


Source: US Green Building Council, EPA

HOW DOES DUBUQUE COMPARE?

All four cities have less than 1% of their non-residential buildings certified by either Energy Star or LEED. Figure 38 below shows that Dubuque has the highest percent of green buildings as compared to its peer cities. Ames has the second highest percentage (0.17%) and Decatur has the lowest percentage (0.12%) of green non-residential buildings.

Figure 38: **Percent of Non-Residential Green Buildings (2011)**



Source: US Green Building Council, EPA

SUMMARY

Though Dubuque has a low percentage (0.5%) of officially certified green buildings, it is doing better than its peer cities. Green buildings promote sustainability because they are efficient, have lower energy costs, improve affordability in the long run, and have higher sales rates.

Principle: Green Buildings
Theme: Housing Affordability

INDICATOR

Affordable Housing - Percent of households living in affordable housing

WHY IS THIS IMPORTANT?

Affordable housing is important to sustainability because when people do not have affordable housing, they tend to sacrifice other necessities like healthcare, healthy foods and education. Sacrificing these necessities has a negative impact on individuals, their neighborhoods, businesses and the city as a whole. Housing for staff is one factor that businesses consider when locating to a city. Businesses want to ensure that their workers have affordable homes that are in proximity to their offices. If Dubuque has unaffordable housing, businesses may be dissuaded from locating in the city.

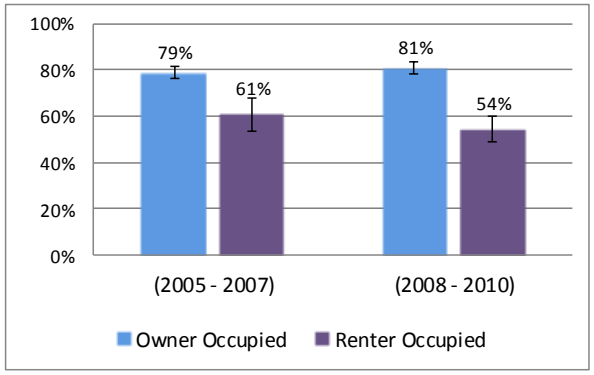
The US department of Housing and Urban Development defines a house as affordable when households spend less than 30% of their income on housing.

Most of the costs of homeownership are included in this measurement, such as mortgage payments, real estate taxes, fire, hazard and flood insurance, and utilities. Renter costs include gross rent plus estimated average monthly costs of utilities and fuels if they are paid by the renter (US Census Bureau).

HOW ARE WE DOING?

In general, 73% of households lived in affordable homes between 2005 to 2007 while 72% lived in affordable homes between 2008 to 2010. The percent of renter households (renters) who live in affordable housing is lower than that of households who own their homes. (owners). From 2005 to 2007, 79% of owners lived in affordable housing while 61% of renters lived in affordable housing. The percentage of owners and renters living in affordable housing held steady from the 2005-2007 time frame to 2008-2010, as indicated by the overlapping margin of error bars displayed in the graph. However, the data gives a clear reflection of the affordability gap between owners and renters.

Figure 39: **Housing Affordability in Dubuque**

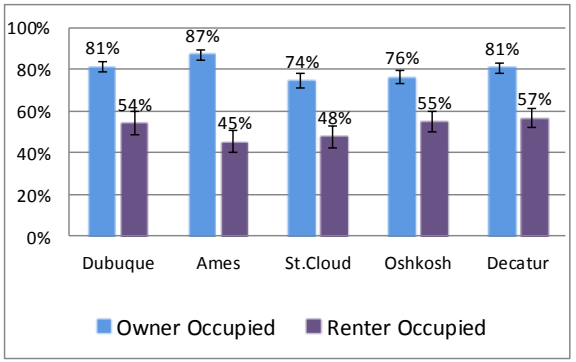


Source: American Community Survey

HOW DOES DUBUQUE COMPARE?

In comparison to its peer cities, Dubuque had the highest total percent (73%) of affordable housing between 2008-2010. Dubuque had the second highest percent of affordable housing for owners and the third highest for renters. However, the overlapping margins of error prevent an accurate comparison between Dubuque and its peers, because the differences may be due to sampling errors. In all five cities, a higher percentage of owners live in affordable homes compared to renters.

Figure 40: **Comparison of Housing Affordability**



Source: American Community Survey

SUMMARY

Housing affordability in Dubuque most likely held from 2005 to 2010. Compared to other cities and to the state, Dubuque is doing well, however, affordability remains an issue in Dubuque, especially for renter households.

INDICATOR

Safe Housing - Percent of rental housing inspections that result in housing code violations

WHY IS THIS IMPORTANT?

In addition to ensuring that homes are affordable, it is important to ensure that homes are also safe. Unsafe buildings have direct, negative effects on human health as well as the economic and social well-being of communities. Housing codes are meant to promote the health, safety and welfare of community members. Code violations like high lead exposure or unsanitary conditions put human life at risk.

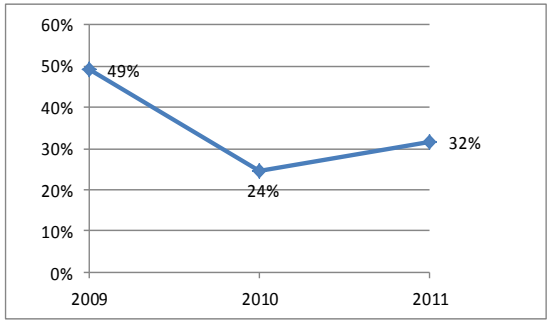
This indicator measures the level of safe and healthy housing in Dubuque by measuring the housing inspections that result in code violations. Not all residential buildings are inspected regularly. Rental units, especially low income rental units, are more regularly inspected than owner occupied units. Rental units are required to be inspected and licensed annually by Dubuque's housing and Community Development Department.

Even with this data limitation, this indicator, in addition to other indicators such as lead exposure rates and radon detection will provide an approximate measure of the degree of housing safety in Dubuque.

HOW ARE WE DOING?

This indicator includes all housing violations since they all have an effect on the health and safety of community members. All re-inspections that resulted in violations are also included. Figure 41 below shows that percent of violations dropped from 49% in 2009 to 24% in 2010. The percent of violation rose again to 32% in 2011.

Figure 41: **Percent of Rental Housing Inspections In Dubuque that Resulted in Housing Code Violations (2009-2011)**



Source: City of Dubuque Permit Plus

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Percent of housing code violations in Dubuque dropped in 2010 but increased again in 2011. Unsafe buildings have negative effects on the economic and social well-being of communities. Code violations may put human life at risk. Dubuque should therefore increase efforts to reduce the number of housing code violations.

INDICATOR

Lead Exposure Testing – Percent of children tested for Lead poisoning at least once before age 6

WHY IS THIS IMPORTANT?

It is important to consider lead poisoning when looking at sustainability because it is an element of unsafe housing and has several long -term health implications, especially for children under the age of six.

If lead is ingested, it can damage the brain, nervous system, red blood cells, and kidneys in children. It can also lead to hearing impairments, attention deficit disorders, and poor classroom performance.

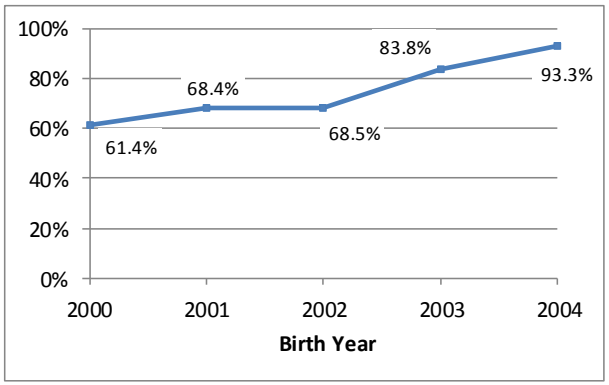
Lead exposure is a major housing safety issue that has raised concerns around the USA because of its known detrimental effects. In cities like Dubuque, the concern is even higher because of the large number of older residential buildings.

Lead was used in house paint until 1978 when the Consumer Product Safety Commission (CPSC) restricted its use in household paint. Many buildings built before 1978 have lead-based paint both inside and outside. Dubuque has already put in efforts to control lead hazards through its lead hazard control programs.

HOW ARE WE DOING?

This indicator measures the percent of children in Dubuque County that were tested for lead poisoning before age six. The data is organized according to the year that the children were born. Thus, the percentage of lead testing for children born in 2004 is the most recent data for this indicator. Ideally, children under age 6 will be tested annually, however, this indicator measures the percent of children tested at least once before age six. In the last ten years there has been a general upward trend of children tested for lead poisoning before age 6.There was not much difference in percentage points between children born in 2001 and children born in 2002.The highest percent of children tested were those born in 2004. 93.3% of children born in 2004 were tested at least once by age 6 (2010).

Figure 42: **Percent of Children Tested Before Age 6 (Children born from 2000-2004)**



Source: City of Dubuque Housing and Community Development Department

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Percent of children tested for lead poisoning has a general upward trend with children born in more recent years having higher percentages of testing. This is likely a result of City efforts to reducing lead poisoning. It is important to increase testing for lead poisoning to ensure that children have save environments, and a healthy start.

INDICATOR

Lead Poisoning Rate – Incidence of lead poisoning (of those children tested)

WHY IS THIS IMPORTANT?

Lead poisoning occurs when people absorb large amounts of lead by breathing or swallowing a substance containing lead. An exposure level of 10 micrograms per deciliter (µg/dL) or higher is considered by the CDC to be "lead poisoning".

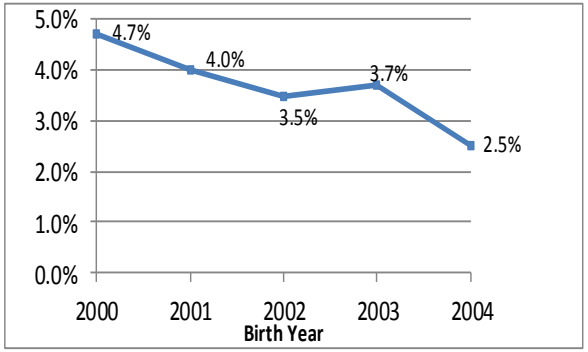
Apart from house paints, lead-based paint may also be found on older toys, furniture and playground equipment. Children who are six years and younger have higher risks of lead poisoning because they usually put their hands in their mouths and sometimes swallow non-food objects. Their bodies also absorb lead at a higher rate.

This indicator measures safety of homes, specifically in relation to children. This indicator complements the lead exposure testing indicator by providing the results of the lead exposure test—the actual percentage of tested children who were diagnosed with lead poisoning.

HOW ARE WE DOING?

This indicator reflects the number of children born from 2000 to 2004 in Dubuque County who were tested by age 6 and identified as lead poisoned. Just like the preceding indicator, the data is organized according to the year that children were born. There has been a general downward trend of children who were diagnosed with a lead exposure level of 10 micrograms per deciliter (µg/dL) or higher (lead poisoning). Children born in 2000 had the highest incidence of lead poisoning while children born in 2004 had the lowest incidence of lead poisoning. The results of this indicator are dependent upon the percentage of lead testing among children. As a greater percentage of children are tested for lead, the percentage of children diagnosed with lead poisoning will most likely decrease.

Figure 43**: Percent of Children Diagnosed with Lead Poisoning (Children born from 2000-2004)**



Source: City of Dubuque Housing and Community Development Department

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

In general, there is a downward trend of the percent of children identified as lead poisoned. The reduction in lead poisoning indicates an improvement in the safety and well-being of children.

Principle: Healthy Local Food

Sustainable Dubuque is a community that values the benefits of wholesome food from local producers, distributors, farms, gardens and hunters.

Consumption of healthy foods such as fruits and vegetables, accessibility to healthy food options, and community gardens can help decrease negative health impacts and improve the well-being of residents. Farmers markets and purchasing locally help strengthen the local economy. The above elements allow for a sustainable community that has access to healthy food options, utilizes open space for household food production, and encourages the purchase of locally grown foods.

Six indicators have been developed to measure Dubuque's Healthy Local Food Principle. These indicators conclude that Dubuque is performing well in regards to the elimination of food deserts. Dubuque would benefit from improvements in reducing obesity rates, increasing community gardens, increasing adult fruit and vegetable consumption, and an increase in farmers markets attendance. A thorough analysis of local food purchases by local institutions was not completed, and therefore the status for the relevant indicator is unknown.

Principle: Healthy Local Food
Theme: Accessibility

INDICATOR

Proximity to Healthy Foods – Percent of residents with low access to a supermarket or a large grocery store in a food desert

WHY IS THIS IMPORTANT?

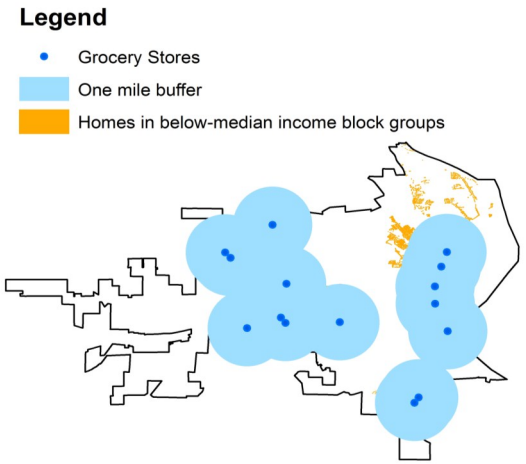
The Healthy Food Initiative (HFFI) and United States Department of Agriculture (USDA) define a food desert as a low-income census tract where a substantial number of residents have low or no access to a supermarket or a large grocery store. To be considered low-income, the census tract must have either a poverty rate of at least 20%, or a median family income at or below 80% of the city's median family income (USDA Food Desert Locator). To be considered a low-access area, there must either be at least 500 residents in the census tract or 33 percent of the census tract's population who live over one mile away from a supermarket or large grocery store. For this indicator, a healthy food location is defined as a store that sells fresh fruits, vegetables, and at least one baking item such as flour.

This indicator is a measure of sustainability because access to healthy foods is a matter of social equity. Not all members of a community have reliable means of transportation; therefore it is necessary for a community to have places that provide healthy foods that are easily accessible to the entire community.

HOW ARE WE DOING?

According to the USDA, there are no census tracts in Dubuque which qualify as food deserts. However, further analysis shows there are still residents in Dubuque who have limited access to healthy foods.

Figure 44: **Low Access Areas in Dubuque**



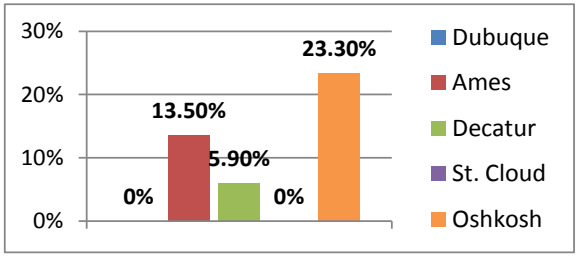
Source: City of Dubuque

Figure 44 shows healthy food locations in Dubuque relative to low-income block groups. The smaller blue dots represent grocery store locations, and the larger blue circles represent a 1-mile access area. Homes located in low-income block groups that are also more than one mile away from a grocery store are represented in orange. Approximately 7.8% of residents live in low-income block groups that are more than one mile from a healthy food location. These residents largely reside in Northeast Dubuque.

HOW DOES DUBUQUE COMPARE?

Neither Dubuque nor St. Cloud, MN have any food deserts as identified by the USDA. Decatur, IL has the next lowest percentage of residents living in a food desert at 5.9%. Ames, IA is next at 13.5% and Oshkosh, WI has the highest at 23.3%.

Figure 45: **Percent of Residents with low access in 2009 in Comparison Cities**



Source: USDA's Food Desert Locator

SUMMARY

Dubuque has no census tracts that are considered food deserts, indicating that the community has high access to healthy food. It is important for Dubuque to have adequate access to healthy food locations for all members of the community because it may help to reduce the risk of negative long-term health impacts and provides equal accessibility to healthy food options.

Principle: Healthy Local Food
Theme: Local Food

INDICATOR

Community Gardens - Square footage of community and school gardens

WHY IS THIS IMPORTANT?

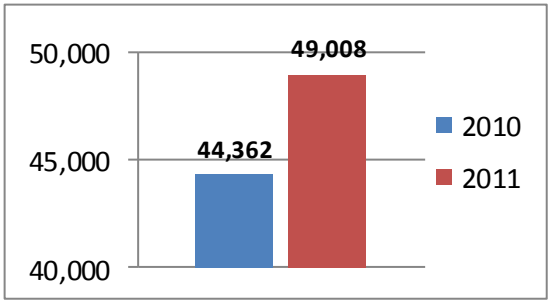
Community gardens are spaces within a community that are allotted for the public for gardening activities. They are open to some or all members of a community and can affect the community in a positive manner.

Community gardens can serve as a social gathering function for members of the community and may allow members to feel more connected to the community. Community gardens promote sustainability by increasing food availability, improving environmental issues such as reducing storm water runoff, and minimizing negative externalities, such as increased carbon dioxide emissions, that come with transporting foods longer distances. Incorporating gardens into school settings is also advantageous because they can serve as an educational tool. Children may learn life-long lessons that can be practiced on a daily basis, such as the importance of consuming fresh fruits and vegetables.

HOW ARE WE DOING?

Currently, Dubuque has six community garden projects throughout the city. The square footage of the community gardens has increased from 2010 to 2011 from approximately 44,400 square feet to 49,000 square feet. Figure 46 illustrates the increase of the square footage of community gardens. As more community garden projects begin in Dubuque, the square footage will continue to grow. However, due to the planting and development stages, an increase in the square footage of community gardens may result in a longer outcome period than other indicators.

Figure 46: **Square Footage of Community Gardens in Dubuque**

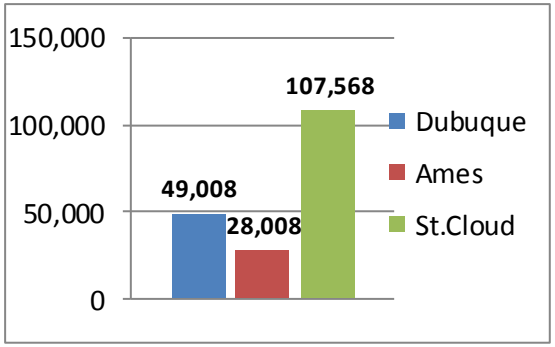


Source: Community Garden Project Coordinators

HOW DOES DUBUQUE COMPARE?

Figure 47 below compares the estimated square footage of community gardens in Dubuque, Ames, IA, and St. Cloud, MN in 2011. Dubuque's square footage of community gardens is nearly double the square footage of Ames. However, St. Cloud's square footage is much higher than the other two cities.

Figure 47: **Square Footage of Community Gardens in 2011 in Comparison Cities**



Source: Community Garden Project Coordinators

SUMMARY

Dubuque's square footage of community gardens increased from 2010 to 2011 and is significantly higher than Ames' community gardens. It is important that Dubuque continues to increase its square footage of community gardens since they may allow members to feel more connected to the community, improve accessibility to food, and improve the environmental issues that come with transporting food.

Principle: Healthy Local Food
Theme: Local Food

INDICATOR

Farmers Market Attendance - Annual estimated attendees at Dubuque's farmers markets

WHY IS THIS IMPORTANT?

An increase in the number of attendees at local farmer markets is an indication that more people may be benefitting from healthy local food options, or are at least interested in purchasing healthy local foods.

Generally, farmers markets are a venue for healthy fruits and vegetables. Often, this produce is sourced from local growers. Farmers markets promote sustainability by providing a venue for people to access, and consume, healthy foods. Eating healthy foods is shown to have a positive impact on diet, which can help to mitigate negative health impacts. Purchasing food and other items locally can also help circulate money back into the local economy. Finally, farmers markets can serve as a social gathering function for a community, which promotes social capital and community cohesiveness.

HOW ARE WE DOING?

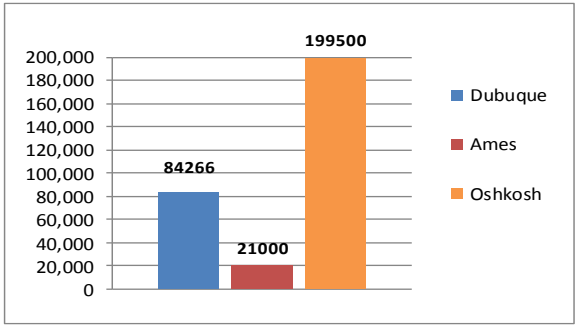
Dubuque has two farmers markets. Dubuque Main Street Farmers' Market, Iowa's oldest active farmers market, is located on 13th St. and Iowa St., and was open 26 Saturdays in 2011 from May through October. This year was the first time an attendance estimate was conducted, but the Market anticipates collecting future attendance estimates four times a year. In 2011, the Dubuque Main Street Farmers' Market had an average of 3,241 attendees per week for a total of approximately 84,300 attendees throughout the year.

The winter farmers market is managed by the Four Mounds Foundation and a committed group of volunteers. The market runs from early November to late April. In 2011, there were approximately 400 attendees per week for a total of approximately 9,600 attendees throughout the entire year (the 2011 season consists of each farmers market in January to April and November to December).

HOW DOES DUBUQUE COMPARE?

Although there is no national average from which to compare Dubuque, peer city data provides some context. Figure 48 displays the number of attendees from Oshkosh's Saturday Farmer's Market (21 weeks), Ames's Main Street Farmer's Market (14 weeks), and the Dubuque Main Street Farmer's Market (26 weeks) in 2011.

Figure 48: **Farmers Market Attendees in 2011**



Source: Farmers Market Coordinators

SUMMARY

Dubuque's farmers market attendance in 2011 was less than that of its peer city Oshkosh, but approximately four times that of Ames. Dubuque's plan to count the number of farmers markets attendees on an annual basis will provide a better gauge of the level of interest of the Dubuque community for this venue. Dubuque will be in a better position to analyze the effect of marketing, and effectively respond to ensure access to this positive community gathering.

Principle: Healthy Local Food
Theme: Healthy Food

INDICATOR

Healthy Diets - Percent of adults in the county who eat an adequate amount of fruits and vegetables

WHY IS THIS IMPORTANT?

Many people do not eat the daily recommended amounts of fruits and vegetables, although they are essential to a healthy lifestyle. Eating fruits and vegetables promotes sustainability because an improvement in diets can result in an overall improvement of health within the community. This includes reducing the risk of negative long-term health impacts that may be prevalent with the consumption of unhealthy eating habits such as Type II Diabetes and obesity. An increase in the intake of fruits and vegetables in children is also imperative to their growing habits and education of healthy eating habits. Furthermore, a larger percentage of residents eating fruits and vegetables could potentially indicate that more residents are living within easily accessible distances of healthy food options.

HOW ARE WE DOING?

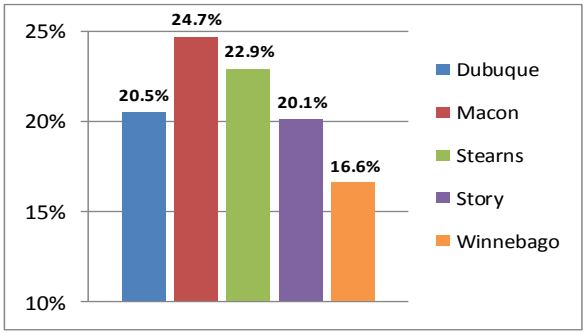
The data for this indicator was obtained from the Community Health Status Indicators (CHSI) website from the U.S. Department of Health and Human Services. The website provides county-level data from surveys conducted in 2008 and 2009 of adults 18 years or older. The survey defined the daily consumption of five or more servings of fruits and vegetables as an 'adequate' amount.

In 2008 and 2009, 20.5% of Dubuque County adults ate adequate amounts of fruits and vegetable. Nationally, an estimated 23.4% of residents consumed an adequate amount of fruits and vegetables during the same period. Hence, the percentage of Dubuque County residents consuming an adequate amount of fruits and vegetables is substantially lower than the national average. The national average was obtained from the Behavioral Risk Factor Surveillance System (BRFSS) from the Centers for Disease Control and Prevention (CDC).

HOW DOES DUBUQUE COMPARE?

Dubuque and its peer cities are all within a seven percent range for the number of adults who eat an adequate amount of fruits and vegetables in 2008 and 2009. Winnebago County, WI had the lowest percentage at 16.6%. Dubuque County was ranked in the middle at 20.5%, while Macon County, MN had the highest percentage at 24.7%.

Figure 49: **Percent of Adults Who Ate an Adequate Amount of Fruits and Vegetables in 2009**



Source: Community Health Status Indicators website

SUMMARY

In Dubuque County, 20.5% of adults consume an adequate amount of fruits and vegetables, ranking in the middle of its peer cities. An increase in the daily consumption of fruits and vegetables in Dubuque County can help to reduce health risks, which can help to decrease medical costs and increase the overall quality of life in Dubuque.

Principle: Healthy Local Food
Theme: Local Food

INDICATOR

Local Purchases - Dollar value of local foods purchased by local institutions

WHY IS THIS IMPORTANT?

When institutions purchase local foods, it returns funds into local businesses and boosts the economy. Purchasing local foods promotes sustainability because it minimizes the amount of miles food must travel, and therefore, the subsequent environmental effects associated with automobile transport. Sourcing food purchases locally promotes transparency between the producer and consumer, which promotes community cohesiveness.

Local institutions included in the data collection process for the City of Dubuque include the Dubuque Community Public School System, the city's nursing homes, and two of the three collegiate institutions located in Dubuque, specifically Clarke University and Loras College. Overall, there were seven local institutions contacted during the data collection stage. In the future, it will be beneficial to extend this data set to include other local institutions such as daycares, local restaurants, and grocery stores.

HOW ARE WE DOING?

Many institutions require great quantities of food to provide for a large number of individuals. Therefore, it is not always easy, or feasible, to connect with local distributors able to provide for such a large quantity in a cost-effective manner.

Currently, there are two nursing homes in Dubuque that annually purchase $200–300 worth of locally grown food including sweet corn, tomatoes, among other fresh produce. Both locations cited this number is less than 1% of the facility's total food purchases.

HOW DOES DUBUQUE COMPARE?

No comparison data was collected for this indicator.

SUMMARY

Although many of Dubuque's local institutions have purchased little or no locally grown foods, there are some that have expressed interest in doing so in the future. As the trend toward eating locally grown foods continues, it is important that Dubuque's local institutions provide local foods to minimize negative health impacts and increase social capital.

Principle: Healthy Local Food
Theme: Healthy Food

INDICATOR

Obesity - Percent of adults in the county who are obese

WHY IS THIS IMPORTANT?

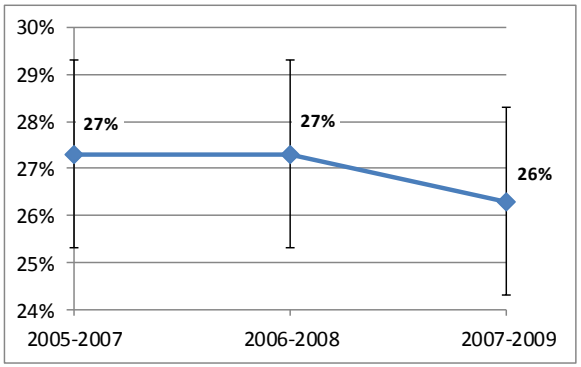
Obesity is an epidemic in the United States due to poor diets, overeating, and lack of exercise. Obesity is defined as having a body mass index (BMI) of greater than 30. There are many adverse health effects caused by obesity, such as heart disease and Type II Diabetes. In extreme cases, it may lead to a premature death. Overall, obesity rates are increasing in the U.S., affecting an increasing number of children and adults each year. The source data used for this analysis only measures adult obesity; therefore, the percentage does not reflect obese children in Dubuque County .

A reduction in obesity can increase the overall health of a community and help to decrease the likelihood of developing other obesity-related diseases. Furthermore, reducing obesity may save individuals money on medical costs and improve their overall quality of life. Studies have shown an association between community design and obesity. As such, this is an indicator the City of Dubuque, as well as residents, can impact.

HOW ARE WE DOING?

Dubuque County's data comes from a three-year sample, which is then compared using a rolling average. For example, 2006 data is derived from the years 2005-2007. This method is used to ensure a more accurate measure of the percentage of obesity on the county level. As seen in Figure 50, obesity rate was essentially stagnant from 2005-2007 to 2007-2009.

Figure 50: **Obesity Rate in Dubuque County**



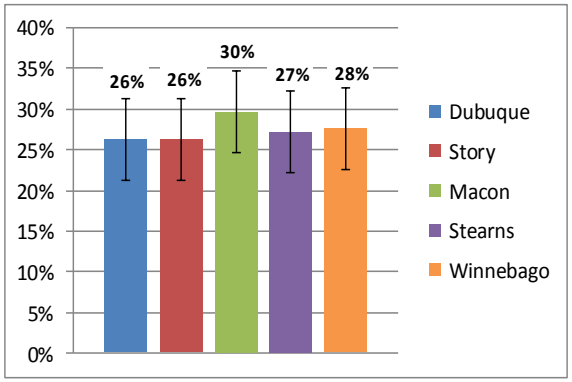
Source: Centers for Disease Control and Prevention

The data for this indicator is derived from a survey from the Department of Health and Human Services and the Centers for Disease Control and Prevention (CDC). The estimates include adults who are age 20 and above. Participants were considered obese if they had a BMI greater than 30, a direct calculation of respondents' measured height and weight.

HOW DOES DUBUQUE COMPARE?

Although the percentages reveal that Macon County contains the highest percentage of obese adults, the overlapping margins of error prevent an accurate comparison of Dubuque and its comparison city's obesity rates. The margins of error can be seen in Figure 51.

Figure 51: **Obesity Rates in 2008**



Source: Centers for Disease Control and Prevention

SUMMARY

Dubuque County's obesity rate was stagnant from 2007 to 2009, and along with Ames, was generally lower than the other peer cities. Although residents are in primary control of their weight, the City of Dubuque can attempt to improve the obesity rate by providing healthy food options and increasing access to parks and trails.

Principle: Community Knowledge

Sustainable Dubuque is a community that values education, empowerment and engagement to achieve economic prosperity, environmental integrity and social/cultural vibrancy.

Sustainable community knowledge depends upon having a strong sense of place, public awareness of sustainability, and an emphasis on education. Through these three elements, the community will achieve a more educated population, and a stronger, more active public life.

The indicators for this principle reveal that Dubuque's weakest area is voter participation and its strongest area is educational disparity. Third grade reading proficiency is neither a strength nor a weakness, but more improvements are necessary. Not enough data is available for the eco-literacy, volunteerism, and arts & culture indicators to determine strengths or weaknesses at this time.

Principle: Community Knowledge
Theme: Sense of Place

INDICATOR

Volunteerism – Volunteer hours per capita for city initiatives and national service programs

WHY IS THIS IMPORTANT?

A sustainable city has a sense of place, where residents are engaged with their community and feel like they belong. Volunteerism is a manifestation of civic engagement and is an important resource for the community. Volunteerism is also a reflection of social capital, which consists of the network of relationships and the level of trust in the community. Social capital enables collective action and a more sustainable society.

This indicator measures volunteer hours for city initiatives, such as the Martin Luther King Day and Make a Difference Day. It also tracks national service program hours, which includes programs such as Foster Grandparents, AmeriCorps, the Retired and Senior Volunteer Program (R.S.V.P.), and the Iowa Campus Compact at Loras College. In the future, more volunteer programs will be monitored and included in this indicator.

HOW ARE WE DOING?

In 2011 Dubuque residents volunteered a total of 3.96 hours per capita for city initiatives and national service programs. No trend data is available.

Figure 52: **Volunteer Hours per Capita for City Initiatives and National Service Programs in Dubuque in 2011**

Source: City of Dubuque

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Insufficient data is available on this indicator to provide a comprehensive analysis at this time. The City of Dubuque recently began tracking volunteer hours and plans to expand the volunteer database to include more programs. As the volunteer database expands, data for this indicator will become even more accurate and meaningful.

Ameri-Corps Volunteer in Dubuque

Principle: Community Knowledge
Theme: Sense of Place

INDICATOR

Voter Participation – Voter participation in general elections

WHY IS THIS IMPORTANT?

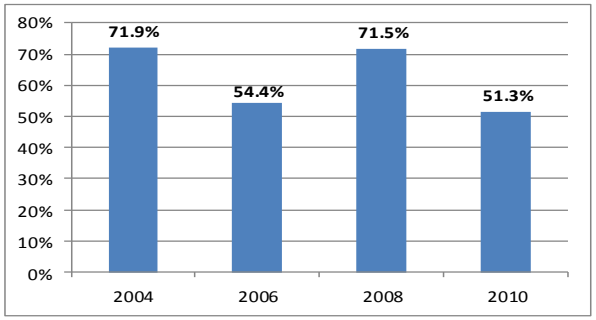
Voter participation is a key component of civic engagement. Civic engagement is an important resource for the community, as it shows that residents care about each other and the community. Voter participation also reflects the extent of a city's sense of place. A strong sense of place occurs when the community has a strong identity or character and residents feel deeply connected to the community. When residents feel connected to their community, they are more likely to vote in elections, especially local elections.

It is important to monitor voter participation for both mid-term general elections and for presidential elections. The difference between participation rates for the two types of elections is also relevant, because it demonstrates a lack of engagement in the local community.

HOW ARE WE DOING?

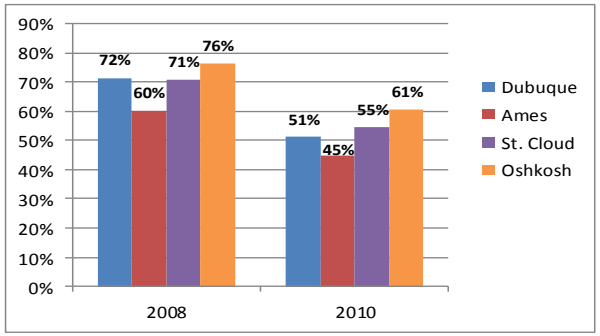
Voter participation rates in Dubuque have held steady for presidential and mid-term general elections since 2004. About 71% of eligible voters participated in the presidential general elections of 2004 and 2008. The voter participation rates for mid-term general elections dropped slightly from 2006 to 2010, from 54.4% to 51.3%.

Figure 53: **Voter Participation in Dubuque**



Source: Dubuque County Commissioner of Elections

Figure 54: **Voter Participation in Comparison Cities**



Source: Dubuque County Commissioner of Elections, City of Oshkosh City Clerk, City of St. Cloud City Clerk, Story County Auditor's Office

HOW DOES DUBUQUE COMPARE?

Dubuque's voter participation rates are higher than in Ames, IA, but lower than in Oshkosh, WI. Dubuque had a slightly higher voter participation rate than St. Cloud in 2008, but a lower rate in 2010. Of all the cities, Dubuque had the largest drop in voter participation rates between presidential and mid-term general elections. Dubuque's difference was 21 percentage points, whereas Ames and Oshkosh had a difference of 15 percentage points and St. Cloud had a difference of 16 percentage points.

SUMMARY

Voter participation for mid-term elections in Dubuque declined from 2006 to 2010 and is not as high as in some comparison cities. Dubuque also had the largest drop in voter participation rates between presidential and mid-term elections. Voter participation is an important indicator for civic engagement and sense of place. To strengthen civic engagement, it will be important for Dubuque to be responsive to citizens and enable other forms of civic participation.

Principle: Community Knowledge
Theme: Education

INDICATOR

Educational Disparity – Percentage point difference in high school education attainment between the two racial groups with the greatest disparity

WHY IS THIS IMPORTANT?

In a sustainable city, all residents, regardless of race, have the opportunity to attain a high school education. A high school education is required for military service, advanced education, and for most jobs. Disparities in high school educational attainment by race exist throughout the country and perpetuate inequality among races. It is important to monitor disparities in educational attainment so that high schools, GED centers, and other institutions are aware of disparities and can mobilize efforts to reduce them.

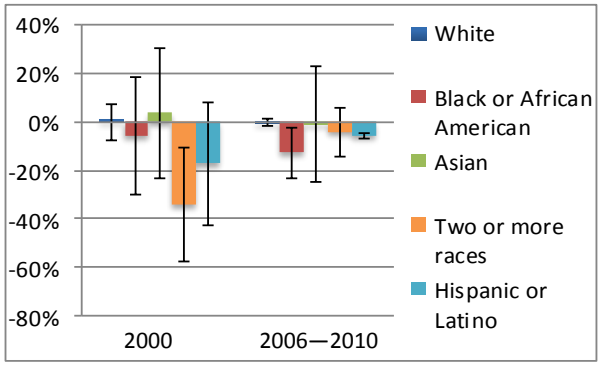
This indicator examines the percent of the population above age 25 that has graduated from high school or completed their GED. Specifically, the indicator measures the educational attainment for each race and calculates the difference in percentage points between the racial group with the highest rate of high school educational attainment and the racial group with the lowest. The two racial groups that are compared will depend on the most recent data, and may differ from year to year.

HOW ARE WE DOING?

According to the most recent data, which comes from a 5-year span between 2006 and 2010, 88.6% of Dubuque residents over age 25 had a high school education. The largest disparity by race was 12.4 percentage points: non-Hispanic whites had an educational attainment of 88.9%, while African Americans had an educational attainment of 76.7%. The educational disparity by race was 34.1 percentage points in 2000.

The data for this indicator is less accurate due to smaller sample sizes. The U.S. Census Bureau provides margins of error for these estimates. Due to the large margins of error, there is no statistical difference between the two data points, and thus there has been no change in educational disparity in Dubuque from 2000 to the 2006—2010 time span.

Figure 55: **Educational Disparity in Dubuque**

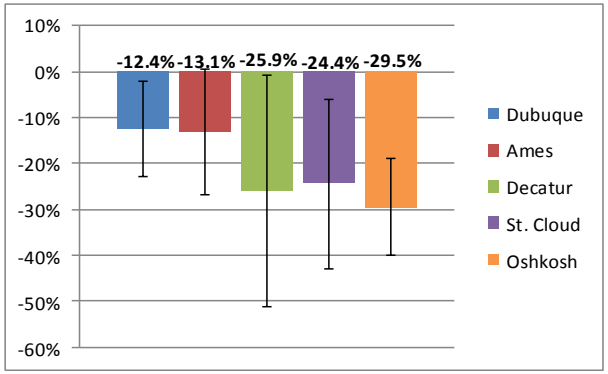


Source: American Community Survey

HOW DOES DUBUQUE COMPARE?

Dubuque's educational disparity appears to be the lowest of the comparison cities, however, the margins of error overlap for each of the cities. For the 2006 – 2010 time span, Oshkosh, WI appeared to have the highest level of disparity, with a gap of 29.5 percentage points.

Figure 56: **Educational Disparity in 2006-2010**



Source: American Community Survey

SUMMARY

Educational disparity in Dubuque declined from 2000 to the 2006 – 2010 time span, and is lower than in comparison cities. However, the disparity between non-Hispanic whites and African Americans increased in Dubuque in the last decade. It is important to minimize the disparity in educational attainment by race to ensure that all residents have the opportunity to participate fully in civic life.

Principle: Community Knowledge
Theme: Education

INDICATOR

3rd Grade Reading Proficiency – Percent of 3rd grade students who meet or exceed proficiency standards

WHY IS THIS IMPORTANT?

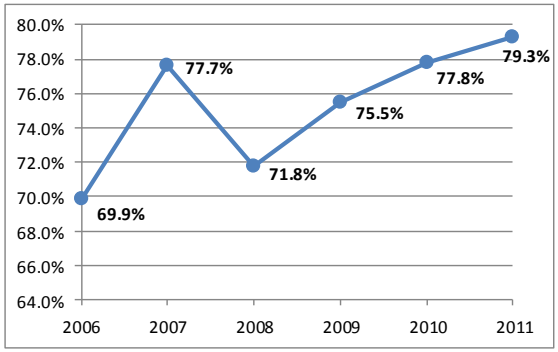
The ability to read proficiently by third grade is critical. According to research released last year from the Annie E. Casey Foundation and the City University of New York, students who cannot read proficiently by third grade are four times less likely to graduate from high school. If they are also living in poverty, students are six times less likely to graduate. Third grade is a critical point in a child's life because it is when students transition from "learning to read" to "reading to learn" (2011 Hernandez). It is important to improve the percentage of students who can read proficiently so that every child, regardless of income, can be prepared to learn and succeed.

This indicator examines third-grade reading in the public school districts of each city. Under the No Child Left Behind Act (NCLB), each state is allowed to design their own test to comply with NCLB requirements. Therefore, Dubuque's data will be most comparable with Ames, since the school districts use the same test. Despite the differences in testing, each state follows a consistent grading scheme of minimum performance, basic, proficient, and advanced. A proficient score indicates mastery of reading, whereas a basic score indicates partial mastery.

HOW ARE WE DOING?

The percentage of third graders who are proficient in reading has generally increased over the last five years in Dubuque. In 2011, 79.3% of third graders were proficient in reading, which was almost ten percentage points higher than the proficiency level in 2006 (69.9%). The percentage of proficient readers continually increased from 2008 (71.8%) to 2011 (79.3%).

Figure 57: **Percent of Third Graders Proficient in Reading in Dubuque**

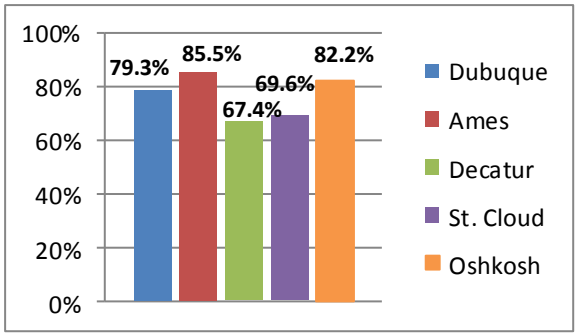


Source: Iowa Department of Education

HOW DOES DUBUQUE COMPARE?

In 2011, proficiency in Dubuque was over ten percentage points higher than Decatur, IL (67.4%) and St. Cloud, MN (69.6%). However, proficiency in Dubuque was several percentage points lower than Oshkosh, WI (82.2%). The most compelling comparison is between Dubuque and Ames, since they utilize the same standardized test. The percentage of proficiency in reading in Dubuque was 6 percentage points lower than in Ames (85.5%) in 2011.

Figure 58: **Percent of Third Graders Proficient in Reading in 2011**



Source: Iowa Department of Education, Illinois State Board of Education, Minnesota Department of Education, Wisconsin Department of Public Instruction

SUMMARY

Dubuque 3rd grade reading proficiency is improving, but it still trails other cities, including Ames. Third-grade reading is important for enabling students to succeed, and ensuring an educated and prosperous Dubuque. To increase reading proficiency, it is important for parents, teachers, and the greater community to support reading and learning efforts among children.

Principle: Community Knowledge
Theme: Eco-Literacy

INDICATOR

Sustainability Knowledge, Attitude, and Behavior - Percent of residents who are aware of sustainability and have made specific behavioral changes to contribute to sustainability

WHY IS THIS IMPORTANT?

Sustainability is a community goal, requiring broad-based participation. Therefore, it is important for residents to be aware of sustainability and the extent their behavior impacts their community. The more aware residents are of the importance of sustainability, the more likely it is that the community-inspired sustainability goals will be achieved.

This residential survey will indicate the community's knowledge and views of aspects of sustainability. It will measure both the effectiveness of Dubuque's educational efforts, as well as outcomes of those efforts based on specific behavioral changes from year to year. Moreover, this survey will give community leaders a better idea of the community's goals and values, and thus will allow the community to better allocate its resources.

HOW ARE WE DOING?

The city may be administering this 20-question survey and eliciting community feedback in 2012.

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

Principle: Community Knowledge
Theme: Sense of Community

INDICATOR

Arts & Culture - Annual number of arts and cultural festivals or events

WHY IS THIS IMPORTANT?

A strong arts community is imperative for sustainability because it contributes to social and cultural capital by providing opportunities for social gatherings and events, and makes a community more well-rounded. This indicator focuses on the cultural dimension of equity and social sustainability.

This is a direct measure of the vitality of the arts, an important aspect of any culturally vibrant community.

Taste of the World, Multicultural Family Center

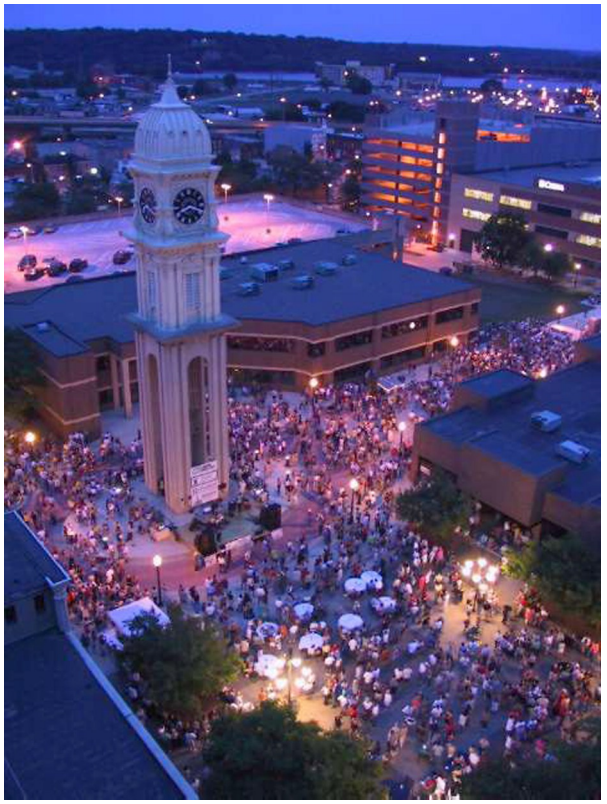
HOW ARE WE DOING?

There were a total of 26 cultural events in 2010, the only year for which this data is available. These events include crafts, food, performing arts, and heritage festivals.

The source for this indicator is an element of the Local Arts Index (LAI). The LAI is a pilot research initiative to complement the Americans for the Arts National Arts Index, funded by the Kresge Foundation. Dubuque was one of only 100 communities nationwide selected for this pilot index in May 2010. The City fulfilled the primary data requirements from surveys and economic data, and submitted it to Americans for the Arts in November 2011. A final report, with an arts community measure in the form of the LAI, will be released in late spring 2011. This single index will enable Dubuque to compare itself to other communities across all measures, as well as discover its deficiencies, thus enabling Dubuque to plan for targeted improvements to its local arts.

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.



Jazz Festival

SUMMARY

This single measure is an opportunity for Dubuque to develop its community character, discover opportunities for future community engagement, and evolve as a vibrant, community-centered city.

Principle: Reasonable Mobility

Sustainable Dubuque is a community that values safe, reasonable and equitable choices to access live, work and play opportunities.

Sustainable reasonable mobility depends on ensuring housing and transportation affordability, community design to reduce the need for vehicle travel, a safe travel network, and modal diversity. Combined, these elements promote a sustainable community where the built environment promotes accessibility for all residents.

Five indicators have been developed to measure Dubuque's Reasonable Mobility. These indicators reveal that Dubuque is performing well relative to its peers in walkability and true housing affordability. Dubuque has room to improve its vehicle miles traveled and public transit ridership.

Principle: Reasonable Mobility
Theme: Affordability

INDICATOR

True Housing Affordability - Percent of residents paying over 45% of their income on housing and transportation costs

WHY IS THIS IMPORTANT?

Traditionally, housing is defined as affordable if it costs less than 30% of a household's annual income. However, this definition ignores transportation costs, which can be a significant expenditure for a household. Transportation costs often depend on the location of a home within a community, and households located in areas that require automobiles for their daily trips tend to have higher transportation costs than residents located in compact, mixed-use neighborhoods with convenient access to jobs and amenities. Higher levels of affordability correspond with reduced driving, reduced pollution, and more compact, mixed-use, and vibrant neighborhoods (CNT, 2011).

This measure takes into account the effect of housing location on transportation costs, and defines "true affordability" as housing and transportation costs that constitute less than 45% of a household's income (CNT, 2011). This measure comes from the Center for Neighborhood Technology Housing and Transportation Index (H+T), a tool developed in collaboration with the Center for Transit Oriented Development.

HOW ARE WE DOING?

In 2010, the single year in which this data was available on a regional scale for Dubuque, 70.9% of Dubuque households spent 45% or more of their income on housing and transportation costs (Table 2). Conversely, only 29.1% of Dubuque households spent less than 45% of their income on housing and transportation costs.

Table 2: **Dubuque Regional Housing and Transportation Costs as a Percent of Income 2010**

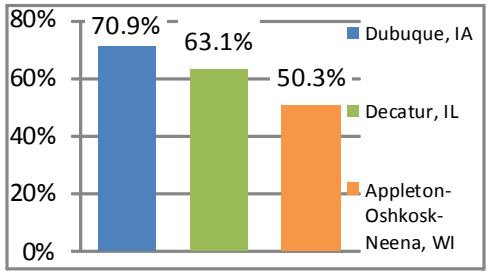
Percent of Income spent on Housing and Transportation Costs	Percent of Population
Less than 45%	29.1%
45% and Greater	70.9%

Source: The Center for Neighborhood Technology's Housing and Transportation (H+T®) Affordability Index

HOW DOES DUBUQUE COMPARE?

In Dubuque, a higher percentage of households paid over 45% of their income on housing and transportation than in Decatur, IL and Oshkosh, WI. In Decatur, 63.1% of households spent over 45% on housing and transportation, and in the Appleton-Oshkosh-Neena region, 50.3% of households spent more than 45% of their income on these costs.

Figure 59: **Percentage of Population Paying Over 45% of Income on H+T Costs**



Source: The Center for Neighborhood Technology's Housing and Transportation (H+T®) Affordability Index

SUMMARY

Dubuque has a higher percentage of residents paying 45% or more on housing and transportation than both Decatur and Oshkosh, but no data is available aside from 2010. The impact of transportation costs on household expenditures should not be understated, and Dubuque should consider potential transportation costs when planning new development.

Principle: Reasonable Mobility
Theme: Decreasing Net Pollution

INDICATOR

Vehicle Miles Traveled - Average annual Vehicle Miles Traveled (VMT) per capita

WHY IS THIS IMPORTANT?

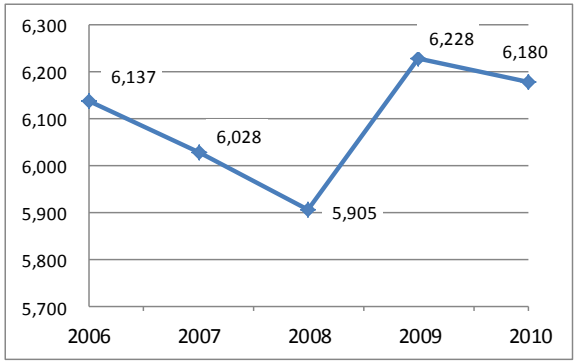
Gasoline consumption for personal automobile travel is a major contributor of carbon dioxide emissions, which has been linked to climate change (Academies, 2009). Furthermore, vehicle emissions contribute to poor air quality, which can have acute negative health effects. Approximately 80% of Dubuque workers drive alone to work, contributing these environmental impacts as well as congestion. Developing more compact, mixed-use residential and employment locations has a direct effect in reducing VMT, and the development of transit and trails can also contribute to reducing VMT.

Reducing VMT is one of the goals of the Smarter Sustainable Dubuque project. According to East Central Intergovernmental Association, even "modest decreases in vehicle miles traveled in the community will result in millions of dollars of savings to the community, and thousands of tons of avoided carbon emissions."

HOW ARE WE DOING?

Dubuque averaged 6,180 vehicle miles traveled per capita in 2010. Although this number represents a 42 mile per capita (.7%) increase from 2006, it is a 48 mile per capita (0.8%) decrease from 2009.

Figure 60: **Dubuque VMT Per Capita**

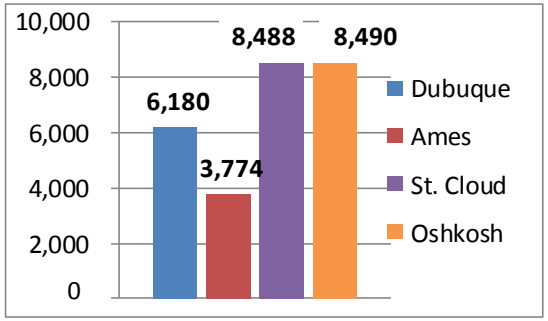


Source: Iowa Department of Transportation; U.S. Census Bureau

HOW DOES DUBUQUE COMPARE?

Dubuque's 6,180 VMT per capita in 2010 was lower than the VMT in St. Cloud, MN and Oshkosh, WI, but higher than the VMT in Ames, IA. Figure 61 below shows that the VMT per capita in Ames in 2010 was 39% lower than in Dubuque. Both St. Cloud and Oshkosh had VMT measures 37% higher than in Dubuque.

Figure 61: **VMT per Capita in 2010**



Source: Iowa DOT; Minnesota DOT; Wisconsin DOT

SUMMARY

VMT per capita in Dubuque is trending upwards, and although 2010 values were higher than Ames, they were still lower than St. Cloud and Oshkosh. Dubuque can work towards improving community design to reduce the need for vehicle travel, which will decrease pollution and congestion.

Principle: Reasonable Mobility
Theme: Modal Diversity

INDICATOR

Walkable Neighborhoods - "Walk Score" derived from the Street Smart Walk Score index

WHY IS THIS IMPORTANT?

Walkable neighborhoods provide residents the opportunity to shift mode from automobiles and other greenhouse gas-emitting modes, to walking, which is a zero-emissions mode of transportation. In addition, infrastructure that promotes pedestrian activity has the potential to strengthen social capital by enabling residents, regardless of socioeconomic status, to more fully participate in civic life.

Walk Score is a measure of land-use mix and road connectivity. Data from this indicator is derived from WalkScore.com, a tool that measures the walkability of communities. This tool is based on a "Street Smart" algorithm, which measures amenities within walking distance and pedestrian accessibility metrics for the city as a whole (Score, 2011). Walkability at the city level is measured on a scale of 0-100 and descriptions of the Walk Score are in Figure 62. WalkScore.com uses data sources such as Google and Open Street Map, as well as localeze.com for local business listings, and education.com for school information. Due to this open-source format, residents can log in using their Facebook credentials and add amenities close to their homes to impact ensure all amenities are accounted for.

HOW ARE WE DOING?

Dubuque's 2011 WalkScore is 52. The target is towards a Walk Score of 100, a "Walker's Paradise." Dubuque falls within the range of 50 -69, or 'Somewhat Walkable.'

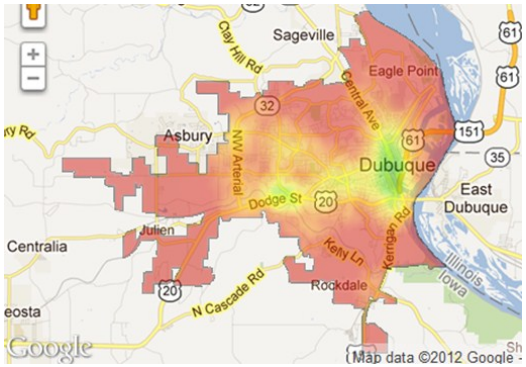
Figure 62: **Walk Score Classifications**

Walk Score®	Description
90–100	**Walker's Paradise** Daily errands do not require a car.
70–89	**Very Walkable** Most errands can be accomplished on foot.
50–69	**Somewhat Walkable** Some amenities within walking distance.
25–49	**Car-Dependent** A few amenities within walking distance.
0–24	**Car-Dependent** Almost all errands require a car.

Source: Walkscore.com

Figure 63 shows a walkability map for the city. Green represents walkable areas and red represents the least walkable, or most car-dependent, areas.

Figure 63: **Dubuque 2011 Walkability Map**

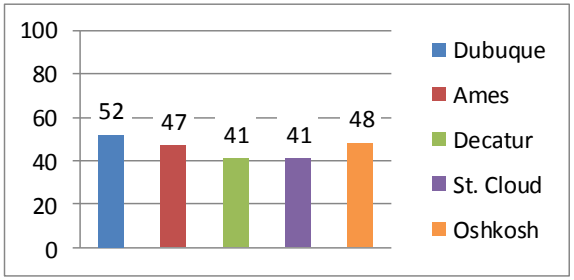


Source: Walkscore.com, Map by Google 2012

HOW DOES DUBUQUE COMPARE?

Dubuque is more walkable than Ames, Decatur, St. Cloud, and Oshkosh. Figure 64 shows that the four other cities have a Walk Score ranging from 41 to 48, all of which are below the threshold for 'Somewhat Walkable' designation, and place them in the category of 'Car-Dependent' cities with "a few amenities within walking distance."

Figure 64: **2011 Walk Score Comparison**



Source: Walkscore.com

SUMMARY

Although Dubuque has a higher Walk Score than any of its peers, it is low in the range of a 'Somewhat Walkable' neighborhood. The City of Dubuque can impact this Walk Score through improvements to intersection density and block length, and promoting mixed-use neighborhoods.

Principle: Reasonable Mobility
Theme: Modal Diversity

INDICATOR

Public Transit Ridership - Number of public transit passenger trips per 1,000 residents

WHY IS THIS IMPORTANT?

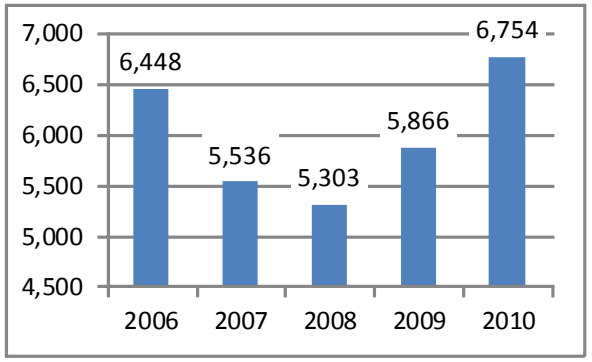
Public transit is a transportation option with less overall emissions per person than individual automobiles. A reduction of vehicle emissions, in turn, improves air quality and the environment. Furthermore, increased transit ridership reduces congestion. Ridership is influenced by service quality, service levels, fares, marketing, and street design, among other factors (Taylor & Fink). Moreover, if ridership increases, public transit becomes more affordable for the city. It is important that transit stops are accessible to residents, but also distributed in areas to enable residents to get to and from work, daily tasks, and fulfill everyday shopping needs.

The Jule Public Transit

HOW ARE WE DOING?

As seen in Figure 65, Dubuque has experienced significant fluctuations in ridership over the past five years and is currently trending at its highest ridership since 2006—6,754 rides per 1,000 residents. These annual numbers reflect both the fixed route rides serving Dubuque citizens each day, as well as mini-bus rides, which generally serve elderly and disabled residents in accordance with ADA requirements.

Figure 65: **Dubuque Public Transit Ridership**



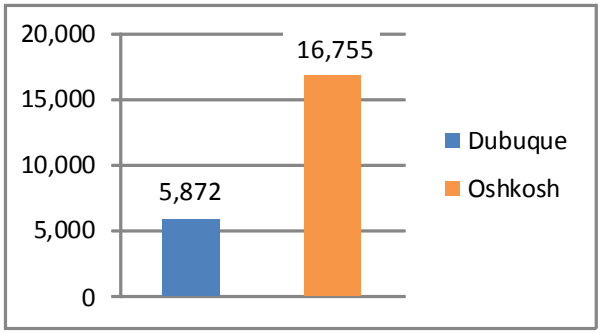
Source: City of Dubuque, U.S. Census Bureau

Transit accessibility is an important factor in considering ridership. An analysis of fixed-route transit stops reveals that 83% of residents reside within 1/4 mile, a 5-minute walk, of a transit stop. Dubuque is currently undergoing a study in collaboration with IBM to provide residents the information they need to reduce costs, save resources, and decrease their environmental impact.

HOW DOES DUBUQUE COMPARE?

The only ridership data that could be obtained for comparison purposes was that for Oshkosh, WI in 2009. A comparison ridership in 2009 shows Oshkosh with 16,755 rides per 1,000 residents, almost three times that of Dubuque for the same year.

Figure 66: **Public Transit Ridership 2009**



Source: Oshkosh Transit Development Plan July 2011, East Central Wisconsin Regional Planning Commission

SUMMARY

Public transit ridership is trending up in the last three years, but ridership fall far short of Oshkosh. Since increased ridership has the potential to reduce costs, save resources, and reduce emissions, it is important for Dubuque to maintain this transportation option. Dubuque should focus on ensuring quality of service, service levels, and fares meet the needs of the local community.

Principle: Reasonable Mobility
Theme: Safety

INDICATOR

Safe Travel Network - Number of collisions on the transportation network per 1,000 residents

WHY IS THIS IMPORTANT?

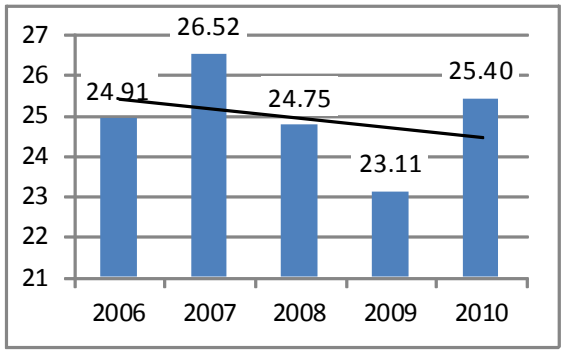
Livability, the subset of Dubuque's Environmental/Ecological Integrity and Social/ Cultural Vibrancy sustainability goals, is largely dependent on safe travel network for both drivers and non-drivers. One element of a sustainable transport system is that it does not endanger public health. Safe streets reduce damage to automobiles, injuries to pedestrians and drivers, and even deaths. The transportation network provides access and mobility, but these positive impacts are diminished when safety declines. A safe travel network will be result in fewer traffic collisions for passenger vehicles, bicycles, motorcycles, pedestrians, school buses, and large trucks.

HOW ARE WE DOING?

Figure 67 shows the number of traffic collisions in Dubuque per 1,000 residents from 2006-2010. In 2007, there were 1,517 total collisions. This was the highest number of collisions per 1,000 residents in the last 5 years.

The number of collisions per 1,000 residents decreased in 2008 and 2009, but jumped up to 25.4 in 2010.

Figure 67: **Traffic Collisions in Dubuque**



Source: Iowa Department of Transportation Safety, Analysis, Visualization, and Exploration Resource (SAVER) directory

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Even with the high collision rates in 2007 and 2010, the overall trend is downward. Modal diversity is less valuable if people refuse to use it because it is not safe. Therefore, it is important Dubuque to improve the safety of its transportation network across all modes.

Principle: Healthy Air

Sustainable Dubuque is a community that values fresh air, reduced greenhouse gas emissions and minimized health risks.

The Healthy Air Principle is comprised of five themes: Outdoor and Indoor Air Quality, Air-to-Human Health Connections, Local Contribution to Climate Change, and Decreasing Net Pollution. The indicators measure pollutants in the Dubuque region.

In terms of outdoor air quality, the City has experienced more days in the Air Quality Index (AQI) 'Good' category. In the long run, however, Dubuque will need to improve particulate matter (PM 2.5) levels. With regard to carbon dioxide emissions, Dubuque continues to face challenges. One way the City has addressed the challenge of climate change is by increasing the amount of fuel-efficient vehicles in its fleet.

This principle also analyzes safety-related indicators such as asthma rates and household radon, though neither of these indicators can yet be viewed as a strength or weakness.

INDICATOR

EPA Air Quality Index - Percent of monitored days with "Good" air quality

WHY IS THIS IMPORTANT?

The Air Quality Index (AQI) is an indicator of overall air quality, taking into account all air pollutants measured within a geographic area. The AQI measures ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide and nitrogen dioxide. This indicator measures the number of days that are above the Green category, and includes days in the *Moderate* (50 – 100), *Unhealthy for Sensitive Groups* (101 – 150), *Unhealthy* (151 – 200), *Very Unhealthy* (201 – 300), and *Hazardous* (301 – 500) categories.

Figure 68: **EPA Air Quality Index**

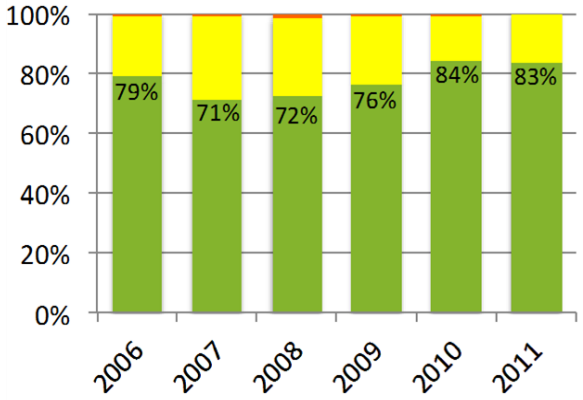
AQI values	Levels of health concern	Color
0-50	Good	Green
51-100	Moderate	Yellow
101-150	Unhealthy for Sensitive Groups	Orange
151-200	Unhealthy	Red
201-300	Very Unhealthy	Purple
301-500	Hazardous	Maroon

Source: EPA Air Quality Index

HOW ARE WE DOING?

Over the last six years, the air quality in Dubuque has mostly been within the *Good* category. However, all monitored days showed high levels of particulate matter level of 2.5 micrometers (PM 2.5). Over six years (2006 – 2011), the average percentage of days with air quality below *Good* quality was 23%. Conversely, the average number of days over the six years, within the *Good* category was 77%. In 2011, Dubuque experienced 83% of monitored days as good (80 days out of 96 total). In 2010, Dubuque experienced 84% of monitored days as good (101 days out of 120), where 18 days were in the Moderate category and 1 day in the USG category. Although Dubuque has good air quality, the PM 2.5 measurement is high and should be improved.

Figure 69: **Percent of Monitored Days with "Good" Air Quality in Dubuque**

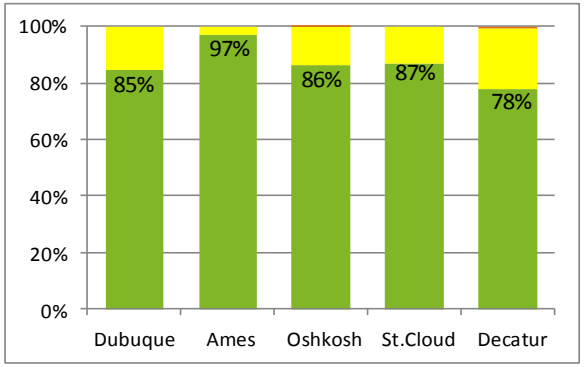


Source: EPA AQS Data Mart

HOW DOES DUBUQUE COMPARE?

Dubuque and Decatur, IL have similar air quality levels, with both cities measuring an average of 17-22% days within the *Moderate* and *Unhealthy for Sensitive Groups* categories. Compared to the other peer cities, Dubuque air quality is poorer; it has a higher percentage of days within the yellow and orange categories. Ames, IA has the best air quality with only 3% of days monitored in 2011 outside of the Good range.

Figure 70: **Percent of Monitored Days with "Good" Air Quality in 2011 in Comparison Cities**



Source: EPA AQS Data Mart

SUMMARY

It is important to note the AQI monitoring station for the city is approximately 26 miles away in Potosi, WI. According to the EPA Air Quality field officer for the area, the monitoring station is still an accurate description of Dubuque's air quality.

INDICATOR

Household Radon – Percent of homes tested for radon above 4 picocuries per liter (pCi/L)

WHY IS THIS IMPORTANT?

Radon is a carcinogen recognized as the leading cause of lung cancer in the United States amongst nonsmokers. The National Academy of Sciences (NAS) and the Surgeon General estimate that as many as 21,000 lung cancer deaths that occur in the U.S. annually are a result of radon exposure. Radon is a naturally occurring, odorless and colorless gas that is released from the ground and soils. The greatest exposure to radon is in the home (basement) and enters via cracks in floors, walls, drains, sump pumps, and joints. It is important to monitor radon levels in homes to prevent its negative effects on human health.

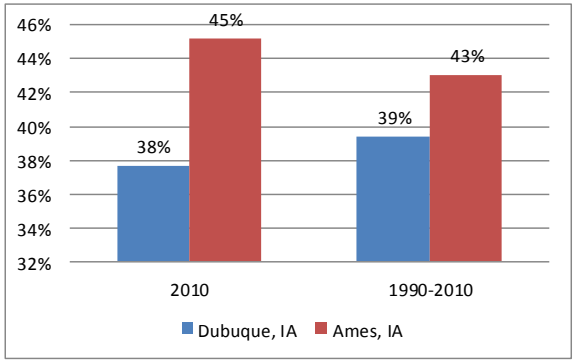
The EPA recommends that homes take action to fix the problem if the radon levels is 4 pCi/L or higher. Radon levels less than 4 pCi/L still pose a risk, and in many cases may be fixed by improving household ventilation.

Based on data collected from radon home tests, the Iowa Department of Public Health estimates that as many as 5 in 7 homes (or greater than 50—70%) across Iowa have elevated radon levels.

HOW ARE WE DOING?

Data from the Iowa Department of Public Health provides radon-level data for households by zip code. The most recent data available is from 2010. Out of a total of 671 homes tested in Dubuque, approximately 62% are below the 4piC/L radon level and 38% of homes have radon levels greater than or equal to 4 piC/L. The rate is consistent with historical data from 1990 – 2010, when an average of 39% of homes had radon levels of at least 4 piC/L. This indicates that the percentage of households overexposed to radon over a ten year period has remained relatively constant.

Figure 71: **Percent of tested households above (>) 4piC/L**



Source: Iowa Department of Public Health

For more information on radon visit:
http://www.idph.state.ia.us/eh/radon.asp

HOW DOES DUBUQUE COMPARE?

Extensive comparison data is currently unavailable except for Ames, IA. In 2010, out of a total of 325 homes tested, approximately 55% of homes in Ames fell below 4piC/L and 45% of homes had levels of at least 4piC/L. The rate is consistent with historical data from 1990 – 2010 inclusive, which showed that 43% had radon levels of at least 4 piC/L. Radon levels in Ames are similarly comparable to Dubuque.

The national average of radon levels indoors is 1.3 pCi/L, while 0.4 pCi/L of radon is normally found in outdoor air. Iowa, Wisconsin and Illinois are all in Zone 1, where estimated average indoor radon levels are greater than 4 pCi/L.

SUMMARY

Sample data from Dubuque indicates that almost half of all households tested are at risk to radon levels higher than 4pCi/L. To lower radon levels within buildings, mitigative actions such as improved ventilation must be taken. Substantial information is provided to the public by the Iowa Department of Public Health and the EPA on radon risks, testing, and mitigation. Testing for radon is simple and inexpensive; a kit costs approximately $10. A city ordinance should be considered to encourage and require relatively inexpensive basement modifications in new home construction to vent radon containing air.

INDICATOR

Asthma – Annual emergency department (ED) visits for asthma

WHY IS THIS IMPORTANT?

Asthma is a chronic disease that affects the airways that carry oxygen in and out of the lungs. Asthma can affect a person's enjoyment of activities and therefore their quality of life.

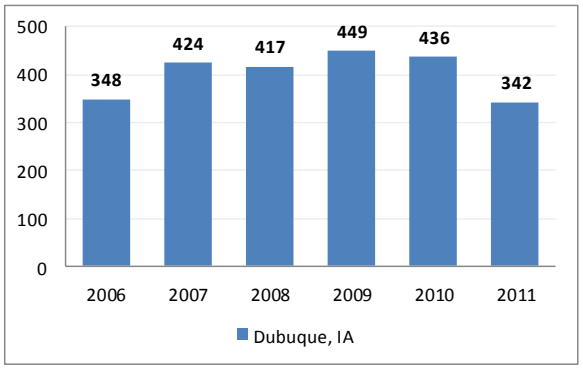
A number of studies have reported associations between air-pollution exposure (such as particulate matter) and asthma. Tracking ED visits on account of asthma may yield an association between the poor air quality days (from the EPA Air Quality Index) and ED visits for asthma. This association can be used to identify trends and patterns in the occurrence of asthma hospitalizations across time.

Furthermore, this indicator is aligned with the Iowa Department of Public Health's *Plan to Improve the Health of Iowans with Asthma 2010 – 2015*. One of the objectives of this plan is to monitor trends in asthma-related health care utilization among residents. This includes analyzing asthma-related hospitalization and ED data.

HOW ARE WE DOING?

Data from the Iowa Hospital Association provides historical and current (up to 2010) data on ED visits for acute asthma. In 2011, 342 cases of asthma presented to Finley and Mercy Hospitals of Dubuque. This was one of the lowest years since 2006. Between 2006 and 2011 the highest count was in 2009, with 449 reported cases.

Figure 72: **Number of ED Visits for Asthma**



Source: Dubuque County Department of Public Health

HOW DOES DUBUQUE COMPARE?

Data for comparison cities was unavailable. To provide context, the rate of Iowa asthma-related ED visits was much lower than the Midwest and the nation. Iowa hospital data reveals that children under age 15 had the highest ED visit rates due to asthma, especially for boys under age 5, while elderly had the lowest rate. Overall, females had 1.3 times higher rate than that of males. Age groups showed wide differences between genders. For example, females aged 35-44, 45-54 and 55-64 had rates more than two times higher than that of males in the same age categories.

In 2008, out of the 17 Iowa counties defined as metropolitan areas (a population greater than 50,000), 3 counties had lower rates than the state average: Story County at 18.7% (Ames), Johnson (Iowa City) and Washington County at 24.1. Des Moines County had the highest ED visit rate at 2.5 times higher than that of state average (36.5 per 10,000), (Source: Iowa Department of Public Health).

SUMMARY

Overall, visits to the emergency department for asthma accounts for approximately 350 – 450 visits per year. As trends are established with both the AQI and asthma, the relationship between the two in Dubuque may become clear. Dubuque is at a greater risk of ED visits due in part to the high particulate matter (PM 2.5) pollutants in the region.

Principle: Healthy Air
Theme: Local Contribution to Climate Change

INDICATOR

Carbon Dioxide Emissions – Annual carbon dioxide-equivalent emissions in tons

WHY IS THIS IMPORTANT?

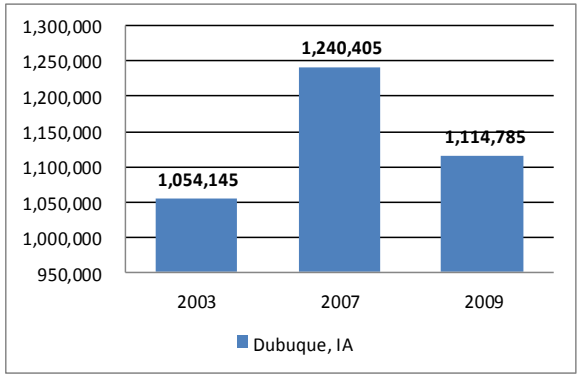
It has now been firmly established in the scientific community that greenhouse gases such as carbon dioxide and methane contribute to climate change. Monitoring an area's emission profile can provide insightful information to our overall contribution (or 'footprint') to climate change. Greenhouse gas emission sources include the transportation sector (e.g., combustion-engine vehicles), manufacturing sector, water treatment plants, heavy and light industry, waste and landfills, and households.

Any building or process that requires a lot of power (e.g., wastewater treatment plant, or a large non-insulated building), will in turn demand energy from the local power plant. This indicator measures the overall community carbon dioxide-equivalent footprint for the City of Dubuque and was compiled by GreenDubuque.

HOW ARE WE DOING?

The most recent data available for the overall carbon-dioxide equivalent emissions in tons for the City is from 2009. Approximately 1.11 million tons of carbon dioxide-equivalent was emitted. This is down from 2007 when the City emitted 1.24 million tons, yet the 2009 figure was higher than the 2003 level of 1.01 million tons (Dubuque GHG Reduction Plan 2011). The City has committed itself to reducing carbon dioxide-equivalent emissions to 50% below 2003 levels by 2050.

Figure 73: **Total tons of CO_2e , Dubuque**

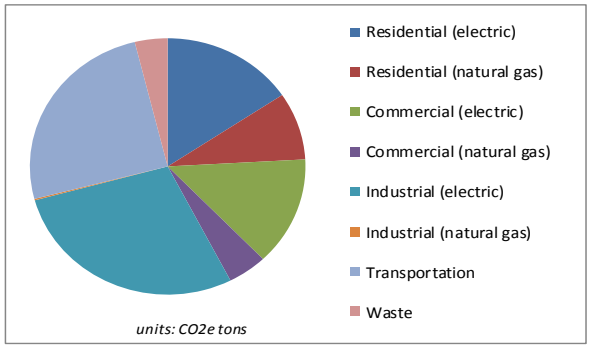


Source: GHG Reduction Plan 2011, GreenDubuque

HOW DOES DUBUQUE COMPARE?

Data for the carbon footprint of each comparison city is currently unavailable. As part of a GHG reduction program, Mayor of Dubuque signed the U.S. Conference of Mayors Climate Protection Agreement in 2007. All other comparison cities except Decatur, IL are participants and signatories to the same agreement. As part of this agreement, all mayors commit to striving toward a 7% reduction in emissions of 1990 levels by 2012.

Figure 74: **GHG Inventory 2009**



Source: GHG Reduction Plan 2011, GreenDubuque

SUMMARY

Dubuque is striving forward with its carbon dioxide-equivalent reduction program with various initiatives and is developing a working database. The 2050 target is ambitious but perhaps attainable with policy and behavioral changes.

INDICATOR

Clean Fleet - Percent of municipal vehicles meeting efficiency standards

WHY IS THIS IMPORTANT?

A fuel-efficient fleet is important to Dubuque because it saves money in fuel expenses for the City, reduces greenhouse gas emissions, and increases energy sustainability.

Fuel efficiency is largely determined by national and international trends in vehicle fuel efficiency. However, there are several opportunities for fuel efficiency improvements in Dubuque. The following chart shows potential savings with the implementation of various transportation projects (Dubuque GHG Reduction Plan, 2011). All initiatives are in progress except for the southwest arterial and intermodal facility programs.

Table 3: **Transportation related GHG reductions (tons CO_2e/year by 2030)**

Transportation Initiative	2030 Reduction
Complete Streets	18,909
Bus system transformation	376
Fuel efficient buses	1,008
Southwest Arterial	7,762
Smarter City ITS	4,591
Intermodal Transportation Facility	2,255
Total CO_2e tons	34,901

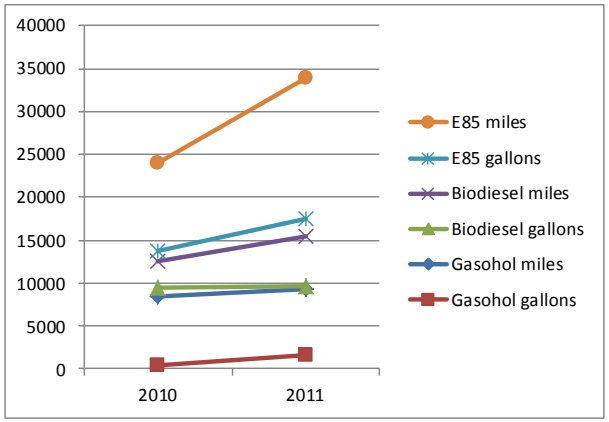
Source: GHG Reduction Plan 2011, GreenDubuque

HOW ARE WE DOING?

Currently the percent of municipal vehicles as clean fleet is unavailable. Data on the number of vehicles, fuel type used, and total gallons consumed is available. This indicator has provided a baseline year for the vehicle type, gallons consumed and miles travelled. The City of Dubuque has 297 clean fleet vehicles. Of these, 145 vehicles run on biodiesel, 104 vehicles are gasohol, 43 vehicles are E85, 4 vehicles are gasohol-electric, and 1 vehicle is gasohol-CNG.

All above vehicles fill-up from one location, which is useful for tracking purposes. Historical data shows a clean fleet from 2006 to 2010, although these dates do not have gallons and miles per vehicle.

Figure 75: **City of Dubuque Vehicle Fuel Types by Miles Driven and Gallons Used**



Source: City of Dubuque, Public Works Department

HOW DOES DUBUQUE COMPARE?

No comparison data is available at this time.

SUMMARY

Dubuque has used fuel efficient vehicles for many years. The main vehicle types include ethanol-run vehicles and biodiesel. As technology develops, so too will the clean fleet.

Principle: Clean Water

Sustainable Dubuque is a community that values water as a source of life and seeks to preserve and manage it in all forms.

Sustainable water sources are vital requirements for the health and vitality of a community and the surrounding ecosystem. Contaminants from various sources need to be continuously monitored in order to ensure a safe drinking water supply that can be used by future generations. Wastewater discharge also needs to be minimized in order help create and maintain surface water quality that is safe for all types of uses, from human recreation to biological preservation.

Five indicators have been developed to measure Dubuque's local water sources. These indicators reveal that Dubuque is performing well in the following: providing the public with clean drinking water supplies and minimizing sanitary sewer discharges. Improvements can be made with minimizing chloride and E. coli concentrations, and stream impairments.

Principle: Clean Water
Theme: River, Stream, & Watershed Quality

INDICATOR

Bacterial Concentration - Highest assessed average Escherichia coli (E. coli) concentration within Dubuque (colonies per 100 mL of water)

WHY IS THIS IMPORTANT?

It is important for sustainable cities to maintain the quality of rivers and streams for community enjoyment and ecosystem functionality. Although E. coli is a naturally-occurring organism in humans and animals necessary for proper digestive function, the presence in local rivers and streams can signal sanitary sewer leaks or other potential contamination hotspots that feed into the surface water system.

Although usually harmless, E. coli can produce toxins and lead to serious illness for both human and animal populations in contact with contaminated water supplies.

E. coli bacteria can pose health concerns for populations in contact with contaminated water sources during recreational activities such as swimming or fishing, and in the drinking water. Often, drinking water supplies are derived from local groundwater or surface water sources, therefore making proper treatment of water sources critical for the health and safety of the community.

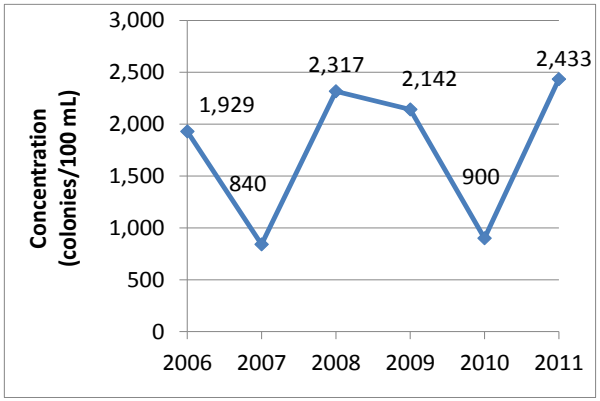
HOW ARE WE DOING?

In general, E. coli concentrations in Dubuque's rivers and streams seem to fluctuate quite frequently. The annual average concentration in 2011 is higher than 2006, with fluctuating concentration levels between these years.

In 2007 and 2010, E. coli concentrations were fairly low in comparison to surrounding years, with concentrations of 840 and 900 colonies/100 mL of water respectively. These levels exceed the recommended EPA standards of 394 colonies/100 mL. E. coli levels peaked in 2008 and again in 2011 with concentrations just under 2,500 colonies/100 mL.

Higher levels of E. coli in 2008 and 2011 may be the result of greater rainfall and flooding, contributing to washing contaminates into local surface water.

Figure 76: **Highest Average E. coli Concentration in Dubuque Surface Waters 2006-2011**

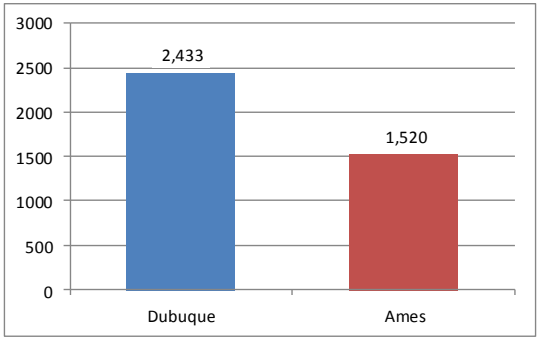


Source: U.S. EPA; Iowa DNR; City of Dubuque

HOW DOES DUBUQUE COMPARE?

The highest average annual E. coli level in Dubuque exceeded that in Ames, Iowa in 2011 by nearly 60%. Measures in both cities were significantly higher than recommended EPA standards.

Figure 77: **Highest Average E. coli Concentration in Surface Waters of Dubuque, IA and Ames, IA in 2011**



Source: U.S. EPA; Iowa DNR

SUMMARY

Although there is no current established trend, every year measured E. coli concentrations exceed the EPA quality standard, with an overall increase in concentrations from 2006 to that of 2011. It is important that the City of Dubuque frequently monitors surface waters throughout the city. Maintaining healthy rivers and streams is an important goal necessary to ensure the health and safety of local residents, preserve the aesthetic nature of the area, and protect valuable ecosystems for future residents of Dubuque to enjoy.

Principle: Clean Water
Theme: River, Stream, & Watershed Quality

INDICATOR

Impaired Stream Segments - Miles of impaired streams as a percent of EPA-assessed miles within the county

WHY IS THIS IMPORTANT?

The condition of local waterways is important for the health and safety of human and wildlife populations. The aesthetic amenities that waterways and landscapes deliver are often related to their quality and condition.

The indicator accounts for any contamination exceeding the total maximum daily load (TMDL) of the water body, which varies by stream segment. Contaminants include chemical, biological, or high levels of naturally occurring substances. By monitoring these levels, the quality and condition of waterways can be assessed. This indicator does not take into account impaired lakes due to the inability to effectively quantify measures of both lakes and streams.

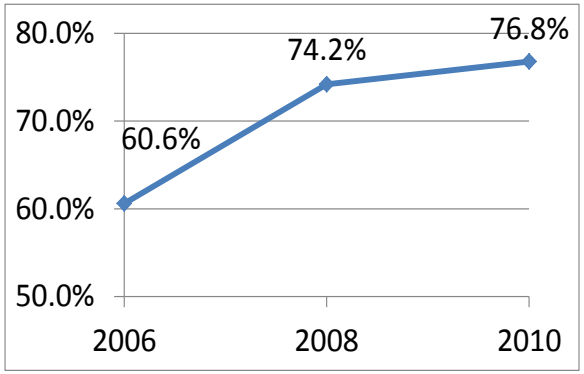
Dubuque is located near multiple bodies of water including the Mississippi River, streams and rivers, and in close proximity to farming and industrial activities. These activities have the potential to negatively impact local water bodies through runoff of herbicides, pesticides, and hazardous natural materials or chemical use.

HOW ARE WE DOING?

Stream segment impairments within Dubuque County have increased over past few years.

In 2006, just over 60% of the county's assessed stream miles were listed as impaired by the U.S. EPA. By 2008, 74.2% of the assessed stream miles were impaired, an increase of 15%. There was a slight increase in the percent of stream miles impaired in 2010, as nearly 77% were classified as impaired.

Figure 78: **Percent of Assessed Stream Miles Impaired in Dubuque County, Iowa 2006-2010**

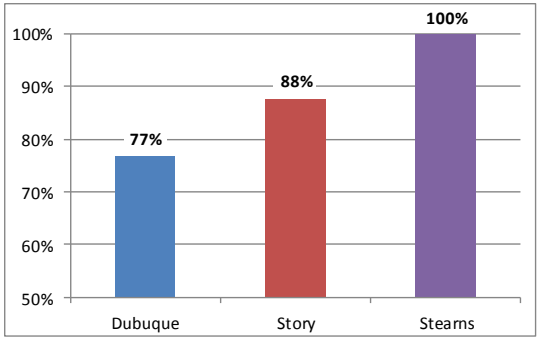


Source: U.S. EPA

HOW DOES DUBUQUE COMPARE?

Although the proportion of impaired miles in Dubuque County has increased over the past few years, the county's streams are still less impaired than the comparable locations of Story and Stearns Counties, which have 88% and 100% of their assessed streams impaired, respectively.

Figure 79: **Percent of Assessed Stream Miles Impaired in Dubuque (IA), Story (IA), and Stearns (MN) Counties in 2010**



Source: U.S. EPA

SUMMARY

Although Dubuque County has fewer impaired streams than comparable counties, the county's proportion of impaired streams miles has steadily increased over the past few years. There is a significant need to increase stream monitoring, and to address contamination and mitigate stream degradation early. Healthy streams provide aesthetic, recreational, and functional benefits necessary for thriving communities.

INDICATOR

Chloride Concentration - Highest average chloride concentration in city surface waters (mg/L)

WHY IS THIS IMPORTANT?

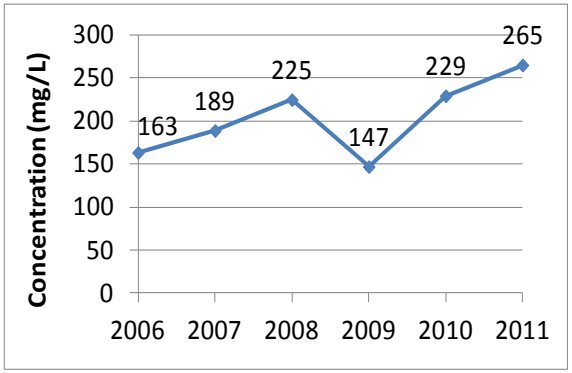
Chloride is typically used as a disinfectant agent to protect drinking water from disease-causing organisms or pathogens that if left untreated, can cause health problems. The treated waste water is eventually discharged into the local rivers and streams. As a result, chloride concentration can occur. It is the concentrated chloride that can impact human health and aquatic organisms. An additional main source that contributes to chloride concentration is the runoff from salt products used during winter months on icy parking lots and roadways.

The national recommended water quality standard set by the EPA for long-term chloride concentration is 230 mg/L. Nearly 40 percent of urban streams were found to have exceeded recommended federal criteria set to protect aquatic life (USGS, 2009). Levels exceeding the recommended standard begin to degrade waters and put strain on future stream quality and long-term species viability. According to the USGS, high chloride levels have been found to inhibit plant growth, impair reproduction, and reduce organism diversity in local streams.

HOW ARE WE DOING?

Chloride concentrations in Dubuque have risen over the last few years. The highest average chloride level assessed for 2006 was 163 mg/L. This level increased to 265 mg/L in 2011. This is a fairly significant increase over a five year span, as even though concentrations fell from 2008 to 2009, they quickly rose again in 2010.

Figure 80: **Highest Annual Average Chloride Concentration in Dubuque Surface Waters 2006-2011**

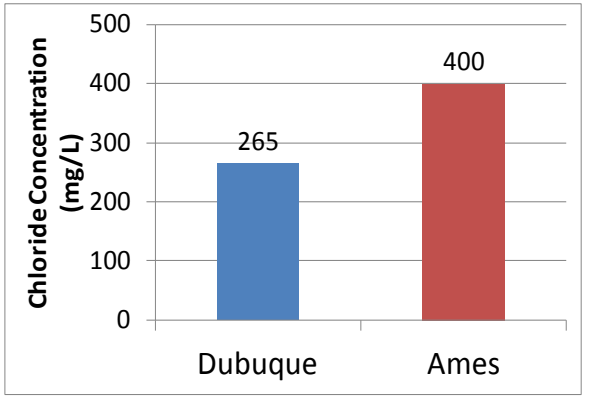


Source: U.S. EPA; Iowa DNR

HOW DOES DUBUQUE COMPARE?

Although chloride concentrations in Dubuque seem to be steadily increasing, Dubuque is still performing fairly well in comparison to similar cities such as Ames, IA. Levels in Ames were as high as 400 mg/L in 2011 compared to 260 mg/L in Dubuque that same year.

Figure 81: **Highest Average Chloride Concentration in Surface Waters of Dubuque and Ames in 2011**



Source: U.S. EPA; Iowa DNR

SUMMARY

Rising chloride levels will have an effect on the future health and viability of Dubuque's streams, and have associated impacts on the community and wildlife. Addressing potential sources and mitigating chloride discharge into waterways can significantly help preserve the integrity and value of Dubuque's waters for current and future enjoyment.

Principle: Clean Water
Theme: Groundwater & Drinking Water Quality

INDICATOR

Drinking Water Contamination - Number of EPA health-based, public drinking water violations from local ground or surface water sources

WHY IS THIS IMPORTANT?

Contaminated drinking water can lead to harmful health consequences; clean drinking water is an important asset in any community. Drinking water typically undergoes an extensive treatment process that aims to protect the community by minimizing and eliminating the presence of harmful chemicals, pathogens, and sediments. However, contaminated drinking water can, on occasion, get past treatment processes and pose threats to the local population.

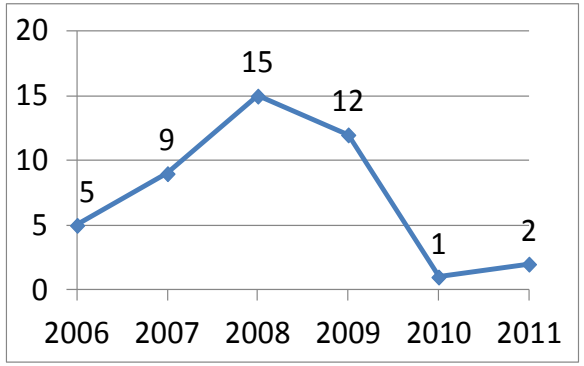
The EPA currently monitors all public drinking water systems for compliance regarding maximum contaminant levels, treatment techniques, and accuracy of monitoring and reporting information. Awareness of EPA health-based drinking water violations can help the community identify where concerns regarding drinking water quality exist and how best to address those concerns to better protect the health and safety of the community.

HOW ARE WE DOING?

The City of Dubuque is performing better at minimizing EPA drinking water violations than in recent years.

Data from the past 5 years has shown Dubuque has a history of acquiring multiple violations within a given year, receiving 15 violations at its peak in 2008. Although violations increased in the years of 2006 and 2007 from 5 violations to 15, an extensive decrease from 15 violations in 2008 to 1 violation in 2010 reveals an extreme improvement.

Figure 82: **EPA Drinking Water Violations for the City of Dubuque 2006-2011**



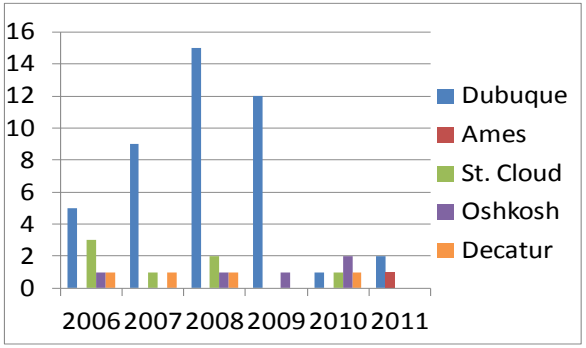
Source: U.S. EPA

Minimizing drinking water violations is an essential component needed to ensure proper health and safety of the community as well as sustainable water supplies that can continue to serve future populations.

HOW DOES DUBUQUE COMPARE?

Overall, although Dubuque has made significant progress in reducing EPA drinking water violations from prior years, it has historically been well above similar cities by as much as a factor of 10, such as in 2008. Even though violations have decreased since 2006 and Dubuque only received two in 2011, Dubuque continues to have the greatest number of violations out of any of the comparable cities.

Figure 83: **EPA Drinking Water Violations**



Source: U.S. EPA

SUMMARY

Dubuque's progress in reducing EPA drinking water violations has been significant, as violations went from as high as 15 in 2008 to 2 in 2011. It is essential that the city continue to strive for safe and healthy drinking water quality in order to protect the community, and maintain good quality drinking water supplies for the future. Current Clean drinking water does not guarantee good supplies in the future.

INDICATOR

Wastewater Discharged - Gallons of wastewater discharged from sanitary sewer overflows

WHY IS THIS IMPORTANT?

This indicator is a direct measure of the annual amount of wastewater contamination as a result of local sanitary sewer spills. Sewer overflows can be the result of undersized sewer systems, pipe failures, and deteriorating systems.

Overflows can also follow a recent storm event, in which the excess water enters the sanitary sewer system through both inflow and infiltration. Inflow involves water flowing into the system through direct channels, and infiltration is through cracks or leaks in the infrastructure. Both result in a rapid increase in water volume.

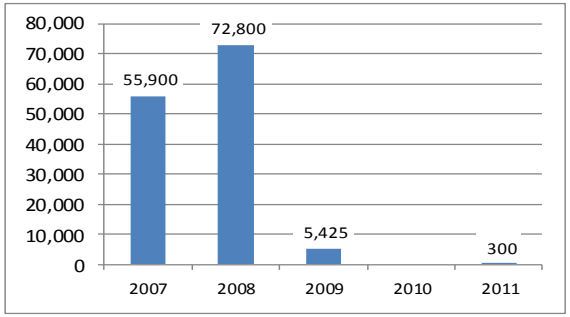
Overflows occur when storm water combines with sanitary waste water and exceeds system capacity. Sanitary sewer overflows endanger human and ecosystem health, as sewer overflows release large amounts of contaminants/fecal coliform, concentrations into public and aquatic areas, which are also where people may frequently swim.

HOW ARE WE DOING?

Sanitary sewer discharge in Dubuque has decreased significantly from previous years. Discharge amounts were greater than 50,000 gallons in 2007 and 2008, largely due to heavy rain events and limited sewer capacity. In 2009, discharge was nearly 93% less than 2008 due to upgrades in city-wide sewer systems.

Data for 2010 and 2011 is mostly unavailable due to significant rain events which caused rapid, immeasurable discharges.

Figure 84: **Gallons of Sanitary Sewer Discharge in Dubuque 2007-2011**



Source: City of Dubuque

**Data does not include bypasses that occurred due to a break in the force main system, a bypass at a lift station or at the wastewater treatment plant, or basement backups*

HOW DOES DUBUQUE COMPARE?

Comparison data is unavailable at this time.

SUMMARY

Sanitary sewer discharge in Dubuque has decreased from previous years, largely due to upgrades in sewer infrastructure. Continuing to assess and monitor the amount of sanitary sewer discharge on an annual basis is important in Dubuque. Proper monitoring is necessary to adequately determine whether the current infrastructure can continue to sustain the population and whether upgrades are needed, or other management practice must be taken, in order to ensure that the health and safety of the community is preserved.

Smoke testing is part of Dubuque's Inflow & Infiltration Program

Principle: Native Plants & Animals

Sustainable Dubuque is a community that values biodiversity through the preservation, restoration and connection of nature and people.

The Native Plants & Animals Principle is comprised of two main themes: Ecological System Health and Native Habitat. The indicators that measure overall ecosystem health focus on urban trees, the use of fertilizers and chemicals on municipal lands, and the diversity of local birds.

Overall, Dubuque has taken an active approach in planting more diverse trees within the city to improve resiliency and habitat. Planting native trees is an important approach within this project. Monitoring and using less chemicals on municipal lands can reduce the environmental problems related to chemical use.

It is necessary for the City to improve environmental land use to be a sustainable city. Some improvements the City can make include monitoring and planning for invasive species and pests, improving local plantings for pollinators, and encouraging prairie restorations.

Principle: Native Plants & Animals
Theme: Ecological System Health

INDICATOR

Urban Forest – Diversity of tree species

WHY IS THIS IMPORTANT?

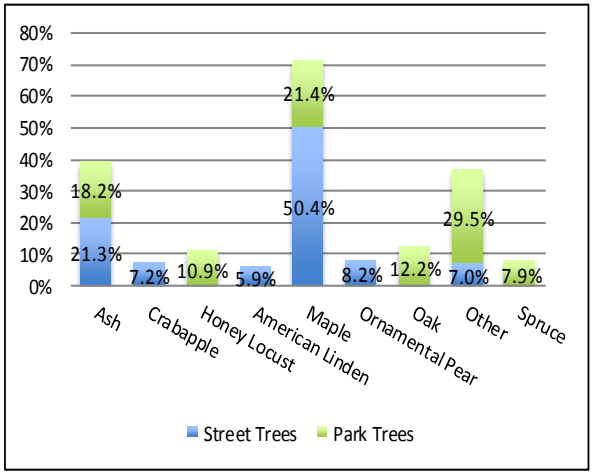
With limited diversity of tree species, the tree stock is at greater risk to disease and pests. Trees provide environmental benefits such as erosion control, storm water management, and improved air quality. Maintaining a healthy tree stock is important to a community's sense of place and quality of life. Furthermore, trees increase property values. Monitoring and encouraging a more diverse tree population within the urban setting yields benefits, both in the short-term and long-term.

Online access to the 2011 Dubuque Urban Forest Evaluation is found at:
http://www.cityofdubuque.org/DocumentCenter/Home/View/3142

HOW ARE WE DOING?

The Parks & Leisure Department of Dubuque has recommended a species diversity policy requiring that no more than 10% of the stock be one species, in any future plantings. Overall, the results from the 2011 study show that out of a total 844 trees and 30 species planted along city streets; Norway Maple represents 28.2% (238 trees), and Green Ash as 18.5% (156 trees). All other species individually comprise less than 10% of the total. Within city parks, a total of 864 trees are planted; Norway Maple represents 21.4% (185 trees), Green Ash represents 18.2% (157 trees), and Oak represents 12.2% (105) trees.

Figure 85: **Tree Species Diversity in Dubuque**



Source: 2011 Dubuque Urban Forest Evaluation

HOW DOES DUBUQUE COMPARE?

Extensive comparison data is unavailable at this time. Dubuque's 10% guideline is consistent with other North American cities' urban forestry programs.

SUMMARY

Dubuque has established a 10% single-species target, and this indicator will measure the City's progress annually. Currently two species are overrepresented in park and tree plantings.

Furthermore many of the tree species are not native to Iowa. Planting native trees such as Black Maple, Bur Oak, Chinkapin Oak, Red Oak, White Oak, Nothern Pin Oak, Shingle Oak, Cockspur Hawthorn, Downy Serviceberry, Hackberry, Nannyberry, Kentucky Coffeetree, Ohio Buckeye, Pagoda Dogwood, is more beneficial to the local ecosystem (Iowa DNR).

Principle: Native Plants & Animals
Theme: Ecological System Health

INDICATOR

Municipal Chemical Use – Municipal use of fertilizers, pesticide, herbicide and fungicide in lbs

WHY IS THIS IMPORTANT?

Monitoring the use and amount of chemical fertilizers in the urban setting is important from an environmental health perspective. Misuse of fertilizers can impact human health by acute (immediate) or chronic (delayed) problems.

Use of fertilizers can also cause environmental problems such as eutrophication, soil acidification, persistent organic pollutants, heavy metal accumulation, and increased pest resiliency. Inorganic fertilizers are unsustainable because they are manufactured with limited resources and have serious environmental consequences with their use. Organic fertilizers are more sustainable yet are more expensive to produce and are more variable in nutrient content release. This indicator measures the City's use of fertilizers on municipal soils.

Bunker Hill Golf Course

HOW ARE WE DOING?

The Bunker Hill golf course uses the most fertilizer and chemicals than any other managed municipal land in the city. Data acquisition is incomplete but efforts are ongoing within the city to establish historical chemical and pesticide use, and in developing a database for monitoring future purchases.

The Bunker Hill golf course uses granular fertilizer primarily on fairways and tees; where it is 100% slow release containing no phosphorous compounds. Nitrogen use is low, at less than 2.3 lbs of nitrogen per 1000 square feet per year.

The granular fertilizer used on golf course greens is 65% MUTech slow release which is released over an 8 week period, and applied three times per year; this totals less than 2.7lbs of nitrogen per 1000 square feet.

While a number of best management practices are used on some City-owned lands to limit chemical use, the application of fertilizers, pesticides, herbicides and fungicides are used on other properties; the amount depending on the degree to which the property needs to appear manicured. The newly-created Natural Resources & Sustainable Practices Specialist will be responsible for establishing and implementing best practices and developing systems to track this data.

HOW DOES DUBUQUE COMPARE?

There is no comparison data at this time.

SUMMARY

Currently no central database exists for the gathering of municipal chemical use. Historical records for the Bunker Hill Golf Course show low rates of nitrogen-based fertilizer per 1000 sq. ft. The total land area of the golf course is 3.2 acres. In the future data should be available on a city-wide scale.

Principle: Native Plants & Animals
Theme: Ecological System Health

INDICATOR

Bird Count – Annual local bird counts

WHY IS THIS IMPORTANT?

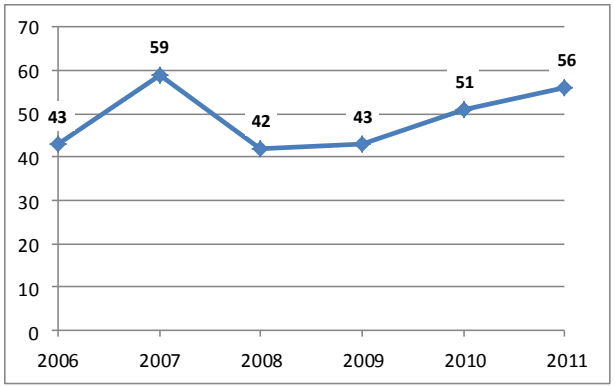
Birds are an indicator species of environmental health, and are also important for human connection to nature. By monitoring the abundance of species in annual bird counts, this indicator provides a measure of the overall environmental health of the area. As bio-indicators, bird diversity serves as a leading indicator to habitat loss, pollution, and disease.

Birds serve many purposes in the environment, including insect and rodent control, the dispersal of seeds, and as a source of food for predators. Furthermore, humans find enjoyment in observing and listening to birds.

HOW ARE WE DOING?

Dubuque has a relatively consistent local bird count. The Audubon Society Christmas bird count provides the number of bird species reported annually, including total birds, species type, and other variables such as weather, date, and number of participants in the bird count. Between 2006 and 2011 the average count was 49 species. The highest count was in 2007, with 59 reported species. Between 2006 and 2011, there have been high numbers of American robins, mallards, European starlings and dark-eyed juncos. A sharp drop-off in house finch and house sparrows was observed in 2011.

Figure 86: **Total Reported Bird Species, Dubuque**

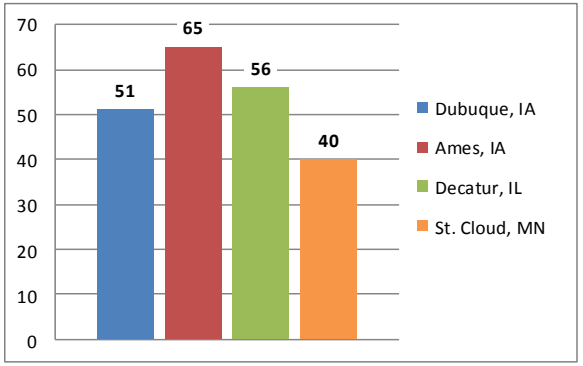


Source: Audubon Society

HOW DOES DUBUQUE COMPARE?

The Audubon Society Christmas 2010 Bird Count was conducted in Ames, IA; St. Cloud, MN; and Decatur, IL, but not in Oshkosh, WI. Results show Dubuque had a similar profile in terms of overall numbers. The difference between the year with the most observed birds, and the year with the least observed birds in Dubuque was 16; while it was 19 in Decatur; 13 in Ames; and 5 in St. Cloud.

Figure 87: **Total Reported Bird Species in Comparison Cities**



Source: Audubon Society

SUMMARY

Although there has been some variability in Dubuque between 2006 and 2011, Dubuque's results were similar to the comparison cities. It is important for Dubuque to monitor long-term trends of this indicator species. Changes and timing in migratory patterns will occur as greater effects of climate change are observed.

Principle: Native Plants & Animals

Theme: Native Lands

INDICATOR

Prairie and Wetlands – Acres of established and restored prairies and wetlands

WHY IS THIS IMPORTANT?

Prairies are an important part of any ecosystem as they provide key habitat for many species and are breeding and nesting grounds. The extensive and deep-root system of prairie plants also yields many environmental benefits such as promoting water infiltration into the soil after heavy rains, preventing erosion and topsoil loss, and returning nutrients into the soil after a plant decomposes. Prairie soils are rich soils, which is why Iowa land is agriculturally productive. However because of the demand for these rich soils, less than 1% of natural prairie remains in Iowa. Prairie protection and restoration is therefore necessary to conserve the remaining habitat, and to retain the environmental cultural heritage of the prairie regions.

HOW ARE WE DOING?

The current prairie acreage in Dubuque is approximately 42 acres. More data is needed to distinguish between the established, restored and conserved prairie spots. Wetland data is also unavailable at this time.

HOW DOES DUBUQUE COMPARE?

Data on prairie and wetlands in the comparison cities is currently limited. St. Cloud has reported approximately 3,511 acres of wetlands (Greenstep, 2011), but other secondary data sources are currently unavailable. The Iowa Department of Natural Resources holds GIS wetlands files for the State.

SUMMARY

Dubuque would benefit from having an established sensitive lands database that includes marked prairie and wetland areas. In the future Dubuque will need to promote the conservation and quality of these lands to be deemed sustainable in land management.

Although the urban setting is not conducive to establishing wetlands, some small ponds and wetland areas can be established with managed care. Prairie grasses should be promoted for landscaping uses, both in the private and public sector.

Sustainability Scorecard

Interpreting the Sustainability Scorecard

The Dubuque Sustainability Progress Report found 23 indicators to be strengths, 18 neutrals, 6 weaknesses, and 13 unknowns.

The Sustainability Scorecard provides an assessment of each indicator based on its trend over the last five years and/or its comparison to peer cities. Thus, the score does not represent the level of sustainability, but instead represents Dubuque's recent performance and how it has performed relative to its peers in the most recent year.

This system weighs trends and comparisons equally to maintain objectivity. For example, even if Dubuque's performance were significantly better than its peer cities, if Dubuque's performance declined slightly in recent years the indicator would be scored as neutral.

It is important to interpret the indicator scores in relation to one another and alongside any relevant information on the causes of the trends and comparisons. In some cases indicators that appear to be a weakness in isolation may be less concerning when interpreted alongside another indicator.

Many of these scores are based off comparisons to the four selected peer cities, which have similar economic and demographic structures as Dubuque. It is possible that alternative peer cities could be selected that would produce different results.

REGIONAL ECONOMY	GDP Growth Per Capita	Strength
	Net Job Growth	Strength
	Unemployment Rate	Strength
	Economic Sector Diversity	Strength
	Poverty	Strength
	Gender Wage Gap	Neutral
	Debt Burden	Weakness
	Interest Rate on Municipal Bonds	Strength
SMART ENERGY USE	Energy Assistance	Weakness
	Household Energy Use	Unknown
	Renewable Energy Use	Unknown
	Energy Savings	Unknown
SMART RESOURCE USE	Total Water Consumption	Unknown
	Groundwater Conservation	Neutral
	Trash/Refuse Generation	Strength
	Sustainable Materials Management	Strength
	Building Material Reuse & Recycling	Strength
	Hazardous Materials	Neutral
COMMUNITY DESIGN	Complete Streets	Neutral
	Mixed Use	Neutral
	Quantity of Open Space	Strength
	Access to Open Space	Neutral
	Historic Preservation	Strength
	Urban Density	Strength

Sustainability Scorecard

GREEN BUILDINGS	Green standards	Strength
	Affordable Housing	Neutral
	Safe Housing	Strength
	Lead Exposure Testing	Strength
	Lead Poisoning Rate	Strength
HEALTHY LOCAL FOOD	Proximity to Healthy Foods	Strength
	Community Garden	Neutral
	Farmers Market Attendance	Neutral
	Healthy Diets	Neutral
	Local Purchases	Unknown
	Obesity	Neutral
COMMUNITY KNOWLEDGE	Volunteerism	Unknown
	Voter Participation	Neutral
	Educational Disparity	Strength
	3rd Grade Reading Proficiency	Strength
	Sustainability Knowledge, Attitude, and Behavior	Unknown
	Local Arts	Unknown
REASONABLE MOBILITY	True Housing Affordability	Weakness
	Vehicle Miles Traveled	Weakness
	Walkable Neighborhoods	Strength
	Public Transit Ridership	Neutral
	Safe Travel Network	Neutral

HEALTHY AIR	EPA Air Quality Index	Strength
	Household Radon	Unknown
	Asthma	Neutral
	Carbon Dioxide Emissions	Weakness
	Clean Fleet	Unknown
CLEAN WATER	Bacterial Concentration	Weakness
	Impaired Stream Segments	Neutral
	Chloride Concentration	Neutral
	Drinking Water Contamination	Neutral
	Wastewater Discharged	Strength
NATIVE PLANTS & ANIMALS	Urban Forest	Unknown
	Municipal Chemical Use	Unknown
	Bird Count	Strength
	Prairie and Wetlands	Unknown

23 Strengths **18 Neutrals** **6 Weaknesses** **13 Unknown**


Regional Economy


Smart Energy Use


Smart Resource Use


Community Design


Green Buildings


Healthy Local Food


Community Knowledge


Reasonable Mobility


Healthy Air


Clean Water


Native Plants & Animals

Conclusion

IS DUBUQUE A SUSTAINABLE CITY?

Sustainability is an important vision and goal for the City of Dubuque; one that will ensure the long-term viability of the city. Achieving sustainability requires strong performance among a multitude of interrelated factors. The Progress Report analyzed 60 of those important factors, and found that for 23 of them, Dubuque is headed in the right direction. These 23 indicators, identified as strengths in the Sustainability Scorecard, are areas where Dubuque is either improving, performing better than its peers, or both. Eighteen indicators are identified as neutral areas, due to either a stagnant performance in recent years or a similar performance as compared with peer cities. Six of the indicators are identified as weaknesses, indicating areas where Dubuque's performance has declined or areas where Dubuque is performing worse than its peers. An additional 13 indicators are identified as unknown, due to lack of data on trends, comparisons, or baseline data. These results indicate that in many respects Dubuque is performing well and sustainability is advancing. The indicator scores also reveal areas where Dubuque may target efforts to enhance sustainability.

However, it is important to restate several of the limitations of this scoring system. First, it is based entirely on the direction of the trends and comparisons for each indicator, and not on the degree of the trend or comparison. Although this system is objective, in some cases it may not accurately describe Dubuque's performance. Second, many of these scores are based off comparisons to the four selected peer cities, and it is possible that alternative peer cities could be selected that would produce different results. Third, this scoring system does not necessarily indicate the level of sustainability for each indicator—if Dubuque is considered a strength in two indicators, it does not necessarily mean that Dubuque is performing equally well under these indicators. If the City of Dubuque identifies targets for each indicator, future reports can utilize a scoring system that accounts for the level of progress for specific sustainability goals. Finally, the indicators ought to be interpreted in relation to one another, and not in isolation. An indicator may not be as concerning when the indicators are viewed holistically.

WHAT ARE DUBUQUE'S MAIN STRENGTHS?

A total of 23 indicators were found to be strengths for the City. The principles with the greatest number of strengths include Green Buildings, Regional Economy, and Community Design. All of the sustainability principles contained at least one strength except Smart Energy Use. The best performing principles reflect that there has been improvement in the safety of Dubuque's buildings, that Dubuque's economy is strong, and that Dubuque has strong open space and historic preservation.

Conclusion

WHAT ARE DUBUQUE'S MAIN WEAKNESSES?

A total of 6 indicators were found to be weaknesses for the City. The principles with weaknesses included Vehicle Miles Travelled, True Housing Affordability, Debt Burden, Energy Assistance, and Bacterial Concentration, and Carbon Dioxide Emissions. These weak areas merit additional attention to improve sustainability in Dubuque.

ADDRESSING HEALTH & SAFETY

Health and safety is a critical component of sustainability. Several of the indicators in the Progress Report address health and safety, including safe housing, lead exposure testing, lead poisoning rate, healthy diets, obesity, household radon, and asthma. However, there are other aspects of health and safety that are not currently incorporated into the Progress Report due to the fact that none of the Sustainability Principles directly address the concept of health and safety. A Health and Safety principle could be added to Dubuque's sustainability principles to enhance awareness of health and well-being in Dubuque. Such a principle would promote a safe city with minimal crime, access to healthcare and health services, and strong physical and mental health of its residents. Suggested indicators include the following: health insurance coverage, child abuse, crime rates, low birth weight, mental health, dental care, and youth substance abuse.

Table 4. **Suggested Indicators for a Health & Safety principle**

Themes	Indicators
Resiliency	*Health Insurance Coverage* – Percent of adults under 65 without health insurance
Safety	*Child Abuse* – Confirmed child abuse cases per 1,000 children
	Crime Rates – Violent crime rates per 1,000 residents
Health	*Low Birth Weight* – Percent of infants born at low birth weights (less than 5 lbs 3 ozs)
	Mental Health – Number of mental health care visits per 1,000
	Physical Health – Average years of potential life lost (YPLL) due to premature deaths
	Dental Health – Percent of children with access to dental care
	Youth Substance Abuse – Percent of children abusing substances, including alcohol, marijuana, and tobacco

Conclusion

IMPROVING SUSTAINABILITY

Sustainability planning is an ongoing activity that requires monitoring results, investigating the explanations behind trends and comparisons, and adjusting City programs and policies in response. With the results of this progress report, Dubuque will be better equipped to improve sustainability in the long-term.

As mentioned in the Introduction, this report does not attempt to determine *why* Dubuque may be trending in a particular direction or why it differs from the comparison cities. There are many reasons behind the trends and comparisons, and these reasons should be examined through additional analysis. Therefore, it is recommended that the City engage in further analysis of the indicators to fully understand Dubuque's progress toward becoming a leader in sustainability. This analysis includes supplementing indicator data with alternative data sets, determining the interaction between the indicators, and examining the interaction between indicator performance and institutional policies. Once the additional information is gathered, Dubuque can determine how to most effectively improve sustainability.

Additionally, it is important that the City engage residents in discussion about the indicators and sustainability in Dubuque. The Progress Report ought to be made available online, ideally in an interactive format, so that residents can easily learn about sustainability. Educational webinars, public meetings, and additional resources on how individuals can improve sustainability in their own lives will help increase public engagement. In addition, links to the online Eco-Literacy survey should be provided at public meetings, posted at the local library, and distributed at cultural events. Fourteen of the sixty indicators are directly linked to individual behaviors and decisions, including healthy diets, vehicle miles traveled and voter participation. Through concerted efforts by residents, combined with efforts by the business community and the City, sustainability will be substantially improved in Dubuque.

Dubuque also should establish targets for each of the indicators so that the City can set goals and strategize its sustainability efforts. It is imperative that the community is actively engaged in the process of setting targets. Once targets are set, future updates to the Progress Report can assess the level of improvements in relation to the city's agreed-upon targets. Additionally, setting targets will eliminate some of the limitations of the current scoring system. Ideally, the Progress Report should be updated regularly, perhaps once every two years, to ensure assessments of sustainability are up to date. If the City creates an online, interactive version of the report, newly available data could be incorporated so that the data remains current.

Dubuque has made sustainability a priority, and this Progress Report shows that Dubuque continues to make improvements to sustainability. However, this report should not be considered the last step in measuring Dubuque's performance—it should be a living document. To best advance sustainability in Dubuque, the City should investigate *why* Dubuque is performing as it is; engage citizens to determine appropriate action; and establish targets so the City can strategically improve its sustainability. Dubuque is well on its way toward becoming a sustainable city and with continued efforts, it will cement its status as a leader in the sustainability movement. More importantly, sustainability will increase the well-being of Dubuque's residents through improving the economy, environment, and the cultural vibrancy and equity of the community; certainly a laudable and worthy goal.

References

Academies, N. R. (2009). *Driving the Built Environment; The Effects of Compact Development on Motorized Travel, Energy Use, and CO2 Emissions.* Washington, D.C.: Transportation Research Board.

Burr. C.A, 2008. CoStar Study Finds Energy Star, LEED Bldgs. Outperform Peers, Retrieved on 04/12/2012 from http://www.costar.com/News/Article/CoStar-Study-Finds-Energy-Star-LEED-Bldgs-Outperform-Peers/99818

Center for Neighborhood Technology. (2011). H+T Index Methodology. Retrieved 2011, from H+T Affordability Index: http://htaindex.cnt.org/downloads/Methods.3.3.11.pdf

Commission, E. C. (2011). Oshkosh Transit Development Plan. Retrieved from City of Oshkosh: http://www.ci.oshkosh.wi.us/Transit/pdf/Final_2010_TDP.pdf

Environmental Protection Agency (2012). Air Quality Index [Online]. Retrieved from http://www.epa.gov/airdata/ad_rep_aqi.html.

Environmental Protection Agency.2010, Why Build Green? Retrieved on 4/18/2012 from http://www.epa.gov/greenbuilding/pubs/whybuild.htm

GreenDubuque (2011). Dubuque GHG Plan [Online]. Retrieved from http://greendubuque.org/wp-content/uploads/2012/02/DubuqueGHGplan-full_V1.pdf

Hernandez, Donald. (2011). "Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation". (Special Report). Baltimore, MD: Annie E. Casey Foundation.

Iowa Department of Public Health (2012). Radon in Iowa [Online]. Retrieved from [http://www.idph.state.ia.us/eh/radon.asp].

Lusigi A, 2008 Linking Poverty to Environmental Sustainability, UNDP-UNEP Poverty - Environment Initiative. Retrieved on 4/19/2012 from http://povertyandconservation.info/docs/20080524-UNDP-UNEP_Poverty_Environment_Initiative.pdf

Minnesota GreenStep Cities (2012). City of St. Cloud [Online]. Retrieved from http://greenstep.pca.state.mn.us/viewFile.cfm?id=435.

National Audubon Society (2012). The Christmas Bird Count Historical Results [Online]. Retrieved from http://www.christmasbirdcount.org.

Score, W. (2011, July 15). *Walk Score Methodology.* Retrieved October 2011, from walkscore.com: www2.walkscore.com/pdf/WalkScoreMethodology.pdf

Taylor, B. D., & Fink, C. N. (n.d.). *The Factors Influencing Transit Ridership: A Review and Analysis of the Ridership Literature.* Los Angeles: UCLA Institute of Transportation Studies.

Technology, C. f. (2012). *H+T Affordability Index Methods.* Chicago: CNT. Minnesota GreenStep Cities (2012). City of St. Cloud [Online]. Retrieved from http://greenstep.pca.state.mn.us/viewFile.cfm?id=435.

Turner, C. Frankel M. 2008 Energy performance of LEED for New Construction Buildings, Final Report, March 2008. Prepared by New buildings institute, 1331 Washington Street Vancouver, WA. Prepared for U.S Green Building Council. Retrieved on 04/12/2012 from www.usgbc.org/ShowFile.aspx?DocumentID=3930

University of Iowa School of Urban and Regional

Appendix A: Indicator & Data Limitations

This appendix contains the limitations not mentioned in the indicator pages for all the indicators and data sources in the Dubuque Sustainability Progress Report 2012. Limitations include concerns and potential areas of improvement among the indicators and data sources, which may include the availability or lack of data, inaccurate or inconsistent data, and the variability of standards set to define the indicators from one city to another.

Table of Contents

Regional Economy

Indicator: GDP Growth Rate per Capita

The limitation of this indicator is that it uses county, rather than city data. Cities were chosen with similar ratios of city to county population, so this indicator should be roughly comparable between cities, but it will not be perfect. One benefit for choosing this measure of affluence is that data is available every year.

Indicators: Net Job Growth and Unemployment

Both of these indicators are based on sample data from the Local Area Unemployment Survey, and therefore they contain margins of error. The BLS does not release particular margins of error for this data, so it could not be determined.

Indicator: Economic Sector Diversity

The limitation of this indicator is that data in not available for all industries for all cities. Because of this, one needs to make estimations for each industry in order to have an equal number of industries influencing the sector diversity index. If a different amount of industries are used, the numbers will not be comparable between cities. This study aimed for simplicity in estimating the employees in particular industries by distributing the remaining, unaccounted, employees evenly throughout all the remaining industries, despite knowing this would be inaccurate. Generally, the distribution of the remaining employees will not make a huge difference, and it particularly will not make a huge difference when looking at the same city over time.

This indicator also measures employment sectors at the county level, which is the only feasible way to measure sector diversity.

Indicator: Debt Burden per Capita

The limitation of this indicator is that one must be particularly careful in making sure that each city is measuring the same thing in terms of debt burden. There are categories for direct city debt, city debt from general obligation bonds, overlapping city debt (usually with public schools), and non-overlapping city debt. Each city reports these differently in their CAFRs, so care must be taken to ensure the same number is used. Moreover, it is important to use population estimates from the U.S. Census rather than rely on per capita numbers in individual CAFR reports as cities often assume the same population each year (usually based on beginning-of-decade Census).

Another important thing to consider is that a higher per capita debt burden does not necessarily mean the debt is more burdensome to a city's residence. Some cities use an indicator adjusting for median or mean income, but when they do this they often make assumptions of income that are not necessarily accurate.

Smart Energy

Indicator: Energy Assistance

Since this indicator only measures the percent of household applying for energy assistance, in some ways it is just another measure of income. If incomes go down more people are likely to apply for LIHEAP, so this may not accurately reflect energy costs.

The group wished to provide the average amount paid by household, but this data was not available.

Indicator: Household Energy Use

The limitation of this indicator is that it does not take into account different annual temperatures, which can have a significant impact on energy use. When comparing between other cities, this is also a concern.

To best account for differences in temperature, the concept of "degree days" should be incorporated into this report. Degree days take into account days below or above given temperatures (i.e., the temperature at which buildings typically use heating or cooling systems).

Indicator: Energy Savings

Like "Household Energy Use," it would be best to account for degree days in this indicator. It is also important to adjust for energy costs, but because of the structure of the energy bills, the group was not able to do this.

Smart Resource Use

Indicator: Sustainable Materials Management

This indicator is somewhat incomplete as it measures only solid materials that were captured by municipal/city services, which consists primarily of residential collection. Any collection provided by commercial haulers that service industrial or commercial businesses are not included, as well as any collection from larger living facilities or complexes within the city. The data is also somewhat incomplete as it is difficult to determine the total degree of diversion as some materials being reused or recycled may go unreported. The indicator includes solid recyclables and yard waste as the materials which were diverted from the landfill as a percent of the total recyclables, yard waste, and refuse collected by city services. Not included in this measure is the total building/construction materials reused or recycled as a result of demolition projects within Dubuque. The omission of this data is due to the overall incomplete data availability among all Dubuque consumers; therefore it seemed more relatable and community-friendly to limit data to only residential landfill diversion.

Indicator: Trash/Refuse Generation

This indicator is somewhat incomplete as it measures only solid materials that were captured by municipal/city services, which consists primarily of residential collection. Any collection provided by commercial haulers that service industrial or commercial businesses are not included, as well as any collection from larger living facilities or complexes within the city. This indicator relies on only refuse and recyclables collected by city services; measuring primarily residential, consumer-based, solid discards generation only.

Indicator: Household Hazardous Materials

Data for this indicator was acquired through the Dubuque Metro Area Solid Waste Agency (DMASWA), which collects hazardous materials from Dubuque and the surrounding area. Therefore, analyzing the data for the City of Dubuque alone is not currently possible. The DMASWA does not distinguish the addresses or zip codes of the participating households, and therefore the data was analyzed at the metropolitan area-level. Although it is assumed by the DMASWA that most participating households are from Dubuque, it is difficult to justify using the number of Dubuque households to determine a percentage of participating households for a metro-area organization. Therefore, the data is limited and may be slightly skewed depending on the actual proportion of Dubuque households participating. A component requiring the zip codes or some form of address of participating households would significantly increase the clarity and accuracy of data, and it would allow city-level analysis for the City of Dubuque.

Indicator: Building Material Reuse & Recycling

Data for this indicator is based solely on companies and contractors successfully reporting the amount of building materials reused or recycled and a total of all building materials resulting in the deconstruction. This data is largely limited by inconsistent reporting of all deconstruction projects, as well as inconsistencies in overall

data reporting. Promoting greater reporting and accuracy of all deconstruction projects would provide a significantly better indication of building material reuse and recycling occurring within the city.

Indicator: Groundwater Conservation

The limitations of this indicator primarily include a general lack of available data, primarily historical data. Although some historical data of the aquifer's standing water level was able to be used from the Iowa DNR's GEOSAM database, a comprehensive database spanning the timeframe from the earliest data value until present was unavailable. The availability of this data would provide a better, more detailed, understanding of the overall trend of the net groundwater use near Dubuque over time.

Community Design

Many of the indicators for the Community Design principle rely on GIS shapefiles maintained by each of the cities' GIS departments. Each city has its own standards that affect comparability of the data, such as the frequency of updating these files, and criteria for designating land use categories. The variation in land use categorization, however, reduced the comparability of the mixed use indicator and the open space indicator. The land use designations in Ames were applied over much larger geographic areas, and were thus less specific than the land use designations in Dubuque. The differences between Dubuque, Ames, and Oshkosh may be partly attributable to difference in land use categorization. Decatur does not have a current land use shapefile, so instead they submitted a zoning shapefile for the analysis. However, the zoning designations did not have any land zoned for open space or vacant land, and so the quantity of open space and access to open space were not calculated for Decatur.

Another limitation was the insufficient GIS data, which was needed for a complete analysis. None of the cities had information on the number of dwelling units in multifamily parcels (within the GIS shapefiles), number of stories in each building, or number of lanes on each road. For example, because of the lack of information on floors in buildings, the mixed use indicator is based on the building footprint, and not on the total square feet of each building. Therefore, buildings with multiple stories are not counted as providing additional square feet of a particular land use. This limitation affected all of the comparison cities, and thus impacted accuracy more than comparability.

Indicators measuring access were limited by the lack of information on the number of dwelling units for each multifamily parcel. Currently, Dubuque does not have a shapefile with the number of dwelling units. To fill that gap, data from the assessor's office was utilized that provided the number of dwellings per parcel. While this information was useful, it did not appear to be complete since many buildings located in multifamily land uses were not included in the dataset. The indicators that assess access, including Access to Open Space and Proximity to Healthy Foods are not completely accurate assessments of access.

Finally, the complete streets indicator is limited due to both GIS data limitations and the design of the indicators. As explained within the report, Complete Streets refer to streets that are accessible to all users, including pedestrians, bicyclists, transit users, and vehicles. This indicator does not examine the number of officially designated complete streets, but instead analyzes the ratio of sidewalks and bike paths to miles of road, to get a more complete picture of how access varies between three basic types of transportation. It does not address transit accessibility, since that analysis would be much more complex. Another limitation of this indicator is that it was originally designed to compare lane miles of roads to miles of sidewalks and miles of bike paths. Unfortunately, the number of lanes for each road was not available in any of the comparison cities, so the indicator was changed to overall miles of road, and not lane miles. While this indicator still provides important information on the different levels of access, it would be improved if lane miles were available in the GIS shapefiles.

Community Knowledge

Indicator: Volunteerism

The volunteerism indicator was originally designed to measure the percent of city residents volunteering within the last year. Unfortunately, the data is not currently available for such an indicator. However, the City of Dubuque recently began a volunteer database that collects information on volunteer hours for city initiatives. There is also information available on number of volunteer hours for national service programs. The indicator was changed to number of hours per capita for city initiatives and national service programs. It is expected that the volunteer database will be expanded to include more programs in the future. While this will reduce the integrity of the trend information (in the short-term), in the long-term, this additional information will strengthen the accuracy of this indicator.

Indicator: Educational Disparity

The educational disparity indicator measures the disparity in high school educational attainment by race. One question we have come across is why the indicator does not compare attainment by economic class. It is very likely that class is an important variable for attainment, but unfortunately there is no comprehensive source of information for adults' educational attainment that also includes their childhood economic class. In a sustainable city children of all economic classes and races would have a chance to succeed.

Indicator: 3rd Grade Reading

The comparability of the 3rd Grade Reading Proficiency indicator is limited due to the differences in testing between states. Each state has developed its own test, and therefore it is unknown how much of the differences in proficiency are due to testing differences and how much is due to actual differences in proficiency. Despite this limitation, it is still important to compare across states because the tests are designed to meet the federal No Child Left Behind Act, and theoretically should be comparable.

Indicator: Eco-Literacy

The survey was administered using electronic voting clickers at the Public Forum on March 20, 2012, as well as via SurveyMonkey. However, less than fifteen responses were gathered, too minimal for a measure of this indicator. The survey is included in the appendix for future administration.

A Dubuque community sustainability survey was conducted by AltaVista Research for Dubuque 2.0 and Staff in January 2011. Beyond general demographic questions, the content related more to residents' beliefs more so than sustainability knowledge and practice. The attached Eco-Literacy more effectively measures respondents' sustainability knowledge, practice, and views pertaining to Dubuque's sustainability initiatives.

A City of Dubuque Employee Sustainability Survey was administered to ascertain employee sustainability practices in the workplace. This survey was developed independently of the attached Eco-Literacy survey. Results from this survey are not used for this indicator because of selection and content bias as it only obtained results from city staff and about city-related sustainability functions.

Green Buildings

Indicator: Efficient Buildings

The limitation of this indicator is that some companies that are LEED certified prefer that their company information remains confidential. As a result, there is a possibility that some green buildings are not included in this analysis. Moreover, there are other energy-efficiency-certifying organizations, but these numbers are not included in this indicator.

Indicator: Safe Housing

The limitation of this indicator as a measure of housing safety is that not all residential buildings are inspected regularly. Rental units are required to be inspected and licensed annually by Dubuque's housing and Community Development Department. As a result, they are regularly inspection. In contrast, owner-occupied units are not inspected regularly. It is therefore likely that some unsafe homes will not be recorded. However, this indicator, in addition to other indicators such as lead exposure rates, will provide an approximate measure of the degree of housing safety in Dubuque.

Healthy Local Food

Indicator: Accesibility

According to the USDA's Food Desert Locator, there are no food deserts located in Dubuque. Therefore, just because people do not live in food deserts as the USDA defines them, there still may be people residing in locations that have low access to a supermarket or a grocery store. This is discussed in the Report.

Indicator: Local Purchases

The primary limitation for this indicator was including all local insitutions within Dubuque. As a result, only a select group was incorporated into the study including nursing homes, the Dubuque Community Public School System, and the two of the three collegiate programs located in Dubuque. Due to time constraints, it was not possible to collect data from all local institutions.

Indicator: Farmers' Markets

Many farmers' markets in the comparison cities do not take estimated heads counts of the annual attendees. Therefore, it was not possible to incorporate the number of attendees at each farmers' market in each city into the study.

Indicators: Healthy Diets and Obesity

For both of these indicators, the limitation is the ability to collect data for each year. Currently, accurate data was unavailable beyond 2008 for the Obesity indicator and unavailable beyond 2009 for the Healthy Diets indicator

Reasonable Mobility

Indicator: Vehicle Miles Traveled (VMT)

Generally, VMT sampling and monitoring is inconsistent. In addition, although all data was sourced from samples, no standard error of the mean was provided for the data set and the sample information provided was insufficient to attempt to determine the standard error of the mean.

Indicator: Walk Score

Walk Score sources data from various sites, including user input. Residents can log in to Walk Score using their Facebook account and log local amenities. Walk Score employs wiki-style editing prior to accepting new amenitites on the map. Walk Score is not a comprehensive evaluation of walkability, it is merely an approximation. The company notes additional limitations as follows:

- **"Street design:** Sidewalks and safe crossings are essential to walkability. Appropriate automobile speeds, trees, and other features also help.
- **Safety from crime and crashes:** How much crime is in the neighborhood? How many traffic accidents are there? Are streets well-lit?
- **Pedestrian-friendly community design:** Are there narrow streets with buildings close to the sidewalk and parking relegated to the back? Are destinations clustered together?
- **Topography:** Hills can make walking difficult, especially if you're carrying groceries.
- **Weather:** In some places it's just too hot or cold to walk regularly." Walkscore.com

Indicator: True Housing Affordability

Current (2012) data is based off of the 2009 American Community Survey 5-year estimates, therefore, in order to prevent overlap, the next period measured should be the 2014 ACS. This Index is an estimate based off a "Representative Household" and is not adaptable for different types of households. It is also on a metropolitan or city scale, and not available at the neighborhood or household-level.

Healthy Air

Indicator: Outdoor Air Quality

The closest air quality monitoring station for the City of Dubuque is in Potosi, WI approximately 13 miles away. The results may therefore have a margin of error. However, after discussion with several local experts, this was considered the best option.

Indicator: CO2 Emissions Profile

This indicator is based on estimates from a primary report commissioned to GreenDubuque by the City that has analyzed Dubuque's greenhouse gas emissions over the last ten years. The commissioned report is called the "5*0% by 2030*," or, the Dubuque GHG 2011 Report. The limitations with the emission calculations for this indicator are similar to those found in "50% by 2030 report." There will be a margin of error with all estimates and calculations which can be found in the primary report.

This indicator can only be relevant if updated regularly; therefore the primary report must also be updated regularly. As such, there may be a timing issue with the indicator data.

Clean Water

Indicator: Impaired Stream Segments

The EPA does not assess many waters within the City of Dubuque itself, which is why a county-wide measure was determined for this indicator. It is also likely that many of the waters are selected based on their impairment and not randomly or by some other method, making the number of miles impaired high for most regions. Although it would have been a better measure solely at the city-level, the data from local monitoring stations was not quite thorough enough to make judgments regarding impairment lengths. The team also considered assessing impaired stream segments by watershed; however, the City of Dubuque is located at the heart of multiple watersheds which makes it difficult to assess as a single measure. Therefore, assessing impaired waters at the county-level provided the best option for a comprehensive analysis that follows a specific standard.

Several of the comparison city data for 2010 was still unavailable from the EPA, making our comparison to others cities incomplete. Also, a caveat to this measure is that many comparison cities also contained several lakes which were designated as impaired. However, there is not a reasonable way to compare number of stream miles impaired to the acres or area of an impaired lake; therefore, this measure only includes rivers and streams and omits lakes. For areas such as St. Cloud, this somewhat skews the perception of surface water quality, as St. Cloud had very few rivers and streams and many lakes with water quality concerns. It is also important to note that total maximum daily load (TMDL) criteria are set by each state, and therefore determining whether or not a stream segment is impaired may vary slightly by state.

Indicator: Wastewater Discharged

The data regarding the amount of sanitary wastewater discharged within the City of Dubuque is somewhat incomplete as it assesses only discharged resulting from untreated wastewater from the gravity flow sanitary sewer systems only. Estimates from wastewater bypasses due to a break in the main system, bypasses at a lift station or at the wastewater treatment plant are not included. Also, severe rain events in 2010 and 2011 resulted in city-wide wastewater releases from overflowing manholes, which could not be estimated.

Indicator: Ground/Drinking Water Contamination

This indicator is based on drinking water violations reported to the EPA by states. The EPA acknowledges that there may be some inaccuracies and underreporting of data in the Safe Drinking Water Information System (SDWIS) and they are continuously working to improve the overall quality of the data

Native Plants & Animals

Indicator: Prairies and Wetlands

The data for this indicator was unavailable at time of publication. Compilation of this data requires human resources, time and access to various databases. It is anticipated this data will be available for the next iteration of the progress report.

Indicator: Bird Count

One limitation of this indicator is the misidentification of birds due to human error.
The Audubon Society reduces the discrepancies in the Christmas Bird Count as much as possible by: (1) using the same (day) each year for the bird count; (2) marking weather patterns; (3) identifying the volunteers and number of volunteers each year; (4) marking the number of hours spent on the bird count; and (5) using the same transects (area of land) for observation. Furthermore it provides training and Christmas bird count guidelines for volunteers to make sure they are performing a scientific study as best as possible. Nevertheless, there is likely human error variances is the identification and counting of bird species each year.

Indicator: Diversity of Tree Species

This indicator measures the biodiversity of trees on streets and parks in Dubuque. Although the adoption of a tree species diversification policy is important, the limitation is that it does not account for native trees, which often provide more habitat for native species. In the long-run this indicator should incorporate native plantings as a measure.

Indicator: Invasive Species

The group wished to include anindicator monitoring invasive species (insects, animals, and/or plants). Invasive species threaten ecological systems, biodiversity health, and environmental resiliency. Invasive species can cause substantial economic losses in agricultural systems, wreak havoc on local landscaping, and cause long-term environmental problems. The most threatening species to Iowa include: Asian carp, zebra mussel, emerald ash borer, garlic mustard, reed canary grass, sericea lespedeza, leafy spurge, purple loosestrife, common buckthorn, Eurasian watermilfoil, and the Japanese beetle.
With the establishment of a city-wide Integrated Pest Management (IPM) program it may be feasible for an invasive species to be added to the Native Plants & Animals principle. For long-term sustainability it is essential to monitor and respond to invasive species at the municipal, regional, and state level.

Appendix B: Data and Methodology

This appendix provides data methodology for all the indicators in the Sustainability Progress Report and includes directions for acquiring the data in future years. Most data can be collected in less than an hour, but some data may take as long as 10 hours. Data-gathering time will depend on proficiency with Excel, ArcGIS, and Access.

Some data were derived from the American Community Survey (ACS) 3-Year Estimates. For example, 2010 ACS 3-year data for poverty measures the average estimated poverty rate based on data sampling from 2008 through 2010. When comparing ACS 3-Year estimates, it is important to compare the data in 3-year intervals. In this case, 2010 (average estimated value 2008-2010) could be compared to 2007 (average estimated value 2005-2007). If 2010 data were compared with 2008 3-Year data, for example, data from 2008 would be included in both estimates, which the U.S. Census considers inaccurate. Therefore, in order to compare the results of this report (which uses 2010 ACS 3-Year estimates) with future years, 2013 ACS data should be utilized.

If this report is updated more frequently than every three years it is still possible to use ACS 3-year estimates. For example, 2011 ACS 3-Year data could be compared to 2008 ACS 3-Year data. However, the data from consecutive reports would not be directly comparable due to the overlap in the samples used to derive the data.

Data collected for this report are provided in Excel spreadsheets, and ArcGIS and Access files. Please contact Cori Burbach at the City of Dubuque to access these spreadsheets.

Cori Burbach, City of Dubuque Sustainable Community Coordinator
(563) 589-4110
cburbach@cityofdubuque.org

Table of Contents

Regional Economy

Indicator: GDP Growth Rate per Capita
Time: 15 minutes

Data was derived from the Bureau of Economic Analysis at bea.gov. The data reflect GDP growth rate per capita at the metropolitan statistical area (MSA) level (for Dubuque, same as Dubuque County) because data were not available at the city level.

To acquire this data, follow these steps:

1. http://www.bea.gov/iTable/iTable.cfm?ReqID=99&step=1
2. Gross Domestic Product By Metro Area
3. Per capita real GDP
4. Select year and "percent change from preceding period."
5. Locate Dubuque's MSA.
6. Repeat steps 1-5 for other comparable cities.

Indicator: Net Job Growth and Unemployment Rate
Time: 15 minutes

Data for these indicators were derived from the Bureau of Labor Statistics at bls.gov. The data are part of the "Local Area Unemployment Statistics" (LAUS) and are calculated monthly. These indicators are an estimate, but the BLS does not provide the standard error, so the margin of error is not known.

To acquire this data, follow these steps:

1. http://data.bls.gov/cgi-bin/dsrv?la
2. Select "Iowa," then "Cities and towns above 25,000 population," then "Dubuque city, IA," then select "unemployment" and "employment," then "Not seasonally adjusted," then "Retrieve data."
3. Repeat steps 1 & 2 for comparison cities, choosing the appropriate state.

Indicator: Sector Diversity
Time: 3 hours

This indicator is derived from the BLS, at bls.gov. The data are at the county level, because city level data was not available. Specifically, these figures come from BLS's "State and County Employment and Wages."

To acquire the data, follow these steps:

1. http://data.bls.gov/cgi-bin/dsrv?en
2. Select the following industries (on PCs, hold "Ctrl" to select additional industries), then select "Next form":
   - 10, Total, all industries
   - 11, NAICS 11, Agriculture, forestry, fishing and hunting
   - 21, NAICS 21, Mining, quarrying, and oil and gas extraction
   - 22, NAICS 22, Utilities
   - 23, NAICS 23, Construction
   - 31-33, NAICS 31-33, Manufacturing
   - 42, NAICS 42, Wholesale trade
   - 44-45, NAICS 44-45, Retail trade
   - 48-49, NAICS 48-49, Transportation and Warehousing
   - 51, NAICS 51, Information
   - 52, NAICS 52, Finance and insurance
   - 53, NAICS 53, Real estate and rental and leasing
   - 54, NAICS 54, Professional and technical services
   - 55, NAICS 55, Management of companies and enterprises
   - 56, NAICS 56, Administrative and waste services
   - 61, NAICS 61, Educational services
   - 62, NAICS 62, Health care and social assistance
   - 71, NAICS 71, Arts, entertainment, and recreation
   - 72, NAICS 72, Accommodation and food services
   - 81, NAICS 81, Other services, except public administration
   - 92, NAICS 92, Public administration
3. Select "Dubuque County, Iowa."

4. Select all “Total Covered” and “Private,” then “All Employees,” then “All establishment sizes,” then “Retrieve data.”
5. Near the top of the screen, choose the year.
    a. From: 2012 To: 2012
    b. Select “Go.”
6. Input the retrieved data into an Excel sheet as indicated below and in the Excel spreadsheet files. The “Annual Total Employees” will be the first number listed on the BLS website and “Private” employees will be the second number listed. “Public Employees” is simply the difference. Then input the rest of the data from the BLS webpage.

Year	Annual Total Employees	Private Employees	Public Employees	Annual Total Employees of Known Industries	Remainder	Agricultural, Forestry, Fishing and Hunting	Mining, Quarrying, and Oil and Gas	Utilities	Construction
2010	53727	49131	4596	53535	192	96	96	230	2383

After inputting all the industry totals, use the “SUM” function to add all the private industries with known quantities (some values will be ND (nondisclosed)). This number belongs in the column for “Annual Total Employees of Known Industries.”

Subtract “Annual Total Employees from Known Industries” from “Annual Total Employees” to get the number for the “Remainder” column. Then, evenly distribute the “Remainder” column to the industries with “ND” employees. Although this will not be accurate, each city has different nondisclosed data and this is the most consistent way to fill the gaps.

When all the numbers are inputted (including those industries with nondisclosed data), it is time to calculate the sector diversity index. To do this, divide each industry total (e.g., Agriculture, Foresty, Fishing and Hunting) by the “Annual Total Employees” and square the result. Be sure to also include “Public Employees” as an industry, but leave out “Private Employees,” “Annual Total Employees of Known Industries,” and “Remainder” (these are accounted for elsewhere).

The following is the beginning of the calculation in the above screenshot:

(96/53727)^2+(96/53727)^2+(230/53727)^2+…

This will give you a number, say “X”, likely between .01 and .20. In order to normalize this number to take into account the number of industries and to make the scale from 0 to 1, perform the following calculation:

(X-(1/20))/(1-(1/20), where 20 represents the total number of industries. In order to make this indicator more intuitive, subtract this normalized number from “1” and multiple by 100. The final result should be a number between 80 and 100, and the desired indicator.

Once you gather data for one city, it is efficient to gather data for the next cities as you will not have to choose the industries once again. Click “back” in the browser on the screen displaying the data until you have the option of choosing another county. Then, repeat steps 4-6.

Indicator: Poverty
Time: 25 minutes

This indicator is derived from American Community Survey (ACS), and therefore it is only an estimate. The ACS surveys households on a yearly basis and provides estimates for a city of Dubuque’s size on a three-year and five-year basis. Therefore, a 2008—2010 figure represents the survey average in those three years.

To acquire the data, follow these steps:

1. Go to the Census FactFinder page. The web address (which is subject to change) is http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
2. Select “Topics” tab
3. Select “People” menu
    a. select “Poverty” menu
    b. select “Poverty”
    c. close pop-up
4. Select “Geographies” tab

a. In “Select geography type” drop-down menu, select “Place within State,” then “Iowa,” then “Dubuque city, Iowa,” then “Add to your selections,” then close pop-up.
b. Select “Poverty Status in the Past 12 Months” for the desired three-year time period (e.g. “2010 ACS 3-year estimates,” which reflects the average estimated poverty rate from 2008 to 2010).

5. Record the poverty rate and margin of error and any other demographic information regarding poverty, keeping in mind that some of the data has a high margin of error.

6. Press “Back” on browser, click the “x” in the left-hand chart next to “Dubuque city, Iowa,” and repeat steps 4-5 for the other cities.

Indicator: Gender Wage Gap
Time: 1.5 hours

1. Go to the Census FactFinder page. The web address (which is subject to change) is http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
2. In the “search for” box, type: median earnings sex full-time, and press Go.
3. On the left side of the screen, click on the “Geographies” box. In “Select geography type” drop-down menu, select “Place within State,” then “Iowa,” then “Dubuque city, Iowa,” then “Add to your selections,” then close pop-up.
4. You may also add the comparison cities at this time, and then you will be able to download all of the data simultaneously. Repeat Step 3 for the other cities to do this.
5. Select the S2404 dataset, “Industry by sex and median earnings in the past 12 months (in 2010 inflation-adjusted dollars) for the full-time, year-round civilian employed population 16 years and older,” for the desired three-year time period (e.g., “2010 ACS 3-year estimates,” which reflects the average estimated earnings from 2008 to 2010).
6. You may download the dataset by clicking the blue download button; select “excel” as the file type (under “presentation-ready formats”. I recommend renaming the file. I added “gender earnings Dubuque” to the file I downloaded.
7. Next, you may want to download historical data for Dubuque. To do so, remove the other cities from the “your selections” panel. Search for the S2404 data and locate the table for previous years. This inaugural report utilized data from the 2007 and 2010 ACS 3-year datasets.
8. When you open the downloaded file(s), it will be difficult to tell where the male and female median earnings are located – you will need to expand the height of row 8, or whichever row the column headings are in, to see the full title (how to: on the left side of the excel window, put your cursor over the line between row 8 and 9 until you see a double pointed arrow. Click and drag the line down to expand row 8 until you can see the column titles in full).
9. The data for this indicator is located in the first row of the table: “full-time, year-round civilian employed population 16 years and over”. In the columns on the right will be the estimate of Median earnings (dollars) for male and the estimate for Median earnings (dollars) for female.
10. Formatting the data: I recommend creating a new excel spreadsheet where you can combine and analyze all of the data for this indicator. Copy and paste the median earnings for males and females, and also the margins of error for both males and females for each city to a new spreadsheet. (One way to arrange the data is to have cities along the top from left to right, and on the left label the rows as “male median” “female median”, “ratio”, “male ME”, and “female ME” (ME stands for margin of error).
11. Divide the Median earnings (dollars) for female by the Median earnings (dollars) for male to get the ratio. You do not need to account for inflation, since the indicator is a ratio. (To display the ratio as a percent, click on the cell, then click on the % symbol in the Home ribbon, and then click to add a decimal point.)

12. Margin of error: To calculate the margin of error for the ratio, you will need to apply a formula to the margins of error for female and male median earnings.

    a. The first step is to erase the "+/-" found in front of the margin of error (you won't be able to calculate with the cell if it contains non-numeric characters). Also, check to see if the median earnings numbers have a green triangle in the upper left-hand corner of each cell. If they do, it means the data is stored as text, not numbers. Highlight all of the cells that have green triangles. Click on the yellow exclamation point sign, and click on "convert to number"

    b. Next, write (or copy and paste, and remove any spaces) the following formula into a cell (if you arranged the data as suggested in step 9, then you may place this cell below the female ME.)

    =ROUND((SQRT(J9^2+(J6^2*J8^2)))/J4,4)

    where the blue cell is referencing the female ME, the green cell references the ratio, the purple cell references the male ME, and the red cell references the male median earnings. Hit enter, and you will get the margin of error for the ratio. Drag this formula to the cells for the other cities (or time period) by hovering the mouse over the lower left corner until the mouse becomes a black crosshair. Then click and drag to the right to calculate the ME for the remaining data.

13. Formatting the charts:

    a. An easy way to create the chart for comparison cities is to highlight the row in excel with the five comparison cities' earnings ratios. Click on the Charts ribbon, choose column, and then clustered column, as the chart type. To add the name of the cities to the chart, right click on the chart, and then click on "select data". Click on the chart icon located next to the "Category (X) axis labels", and then highlight the cities' names. Hit the enter key, then click OK. Delete the legend entry. Follow the same steps for the historical data for Dubuque.

    b. To add the margins of error that you calculated, click on the chart (so that it's highlighted), then click on the "chart layout" ribbon. Click on "error bars" located on the right side of the ribbon, and click on "Error bars options". On the screen that pops up, under "error amount", select "custom". Click on "specify value". Click on the chart icon for "positive values", then highlight the cells that contain the calculated margin of error. Click on the chart icon again to return to the previous screen. Click on the chart icon next to "negative values", and highlight the calculated margins of error again. Click on the chart icon, then click OK. Click OK again, and now you will see the margins of error on the graph.

Indicator: Debt burden per capita
Time: 1 hour

This indicator measures the outstanding primary government debt per capita in a given fiscal year (ending in June of each year) for the City of Dubuque. This measure includes direct city debt (but not overlapping city debt with school districts, for example). It can be acquired on Dubuque's and other cities' websites:

1. The city, and other cities, issue a Comprehensive Annual Financial Report (CAFR) each year. The CAFRs can be found at the following websites: http://www.cityofdubuque.org/index.aspx?NID=1235, http://www.cityofames.org/index.aspx?page=118, http://www.ci.stcloud.mn.us/index.aspx?nid=275 (part 2), and http://ci.decatur.il.us/citygovernment/finance/finance.html.
2. Once the primary government debt is determined (nonoverlapping), divide by city population as estimated by the U.S. Census at the following website (some city reports provide their own per capita

primary government debt, but often these cities do not use updated population estimates. Rather, they use the most recent census data. The following website is more appropriate): http://www.census.gov/popest/estimates.html (select "Current Estimates Data," then "Latest Available Complete Vintage" for "Cities and Towns").

   a. Select "All Incorporated Places," then download State excel files (XLS) to find population estimates.

3. Data for 2010 (and every 10 years) should be gathered from the U.S. Census at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
   a. Select "Topics" tab
   b. "People," "Basic Count/Estimate," "Population Total," exit popup.
   c. Select "Geography" tab
   d. In "Select geography type" drop-down menu, select "County," then "Iowa," then "Dubuque County, Iowa," then "Add to your selections," then close pop-up.
   e. Select file DP-01 and record population.
4. Divide debt in (1) by population total.

Indicator: Interest Cost on Municipal General Obligation Bonds
Time: 15 minutes

1. This indicator measures True Interest Cost (TIC) of general obligation municipal bonds issued by the city. TIC was provided by Dubuque's finance director. Efforts were not made to get these numbers from comparable cities.

2. Ken Tekippe, Finance Director, City of Dubuque
   a. Phone: 563.589.4133
      E-mail: Ktekippe@cityofdubuque.org

Smart Energy Use

Indicator: Energy Assistance
Time: 15 minutes

1. LIHEAP application data is county data, and was collected from Jim O'Toole, Director of Low Income Home Energy Assistance Program, 1473 Central Ave., Dubuque, IA 52001, (563) 556-5130 Ext 11 (jotoole@operationnewview.org)
2. In order to determine total number of households, first determine household size: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
3. Select "Topics" tab
   a. Select "Housing" menu
   b. select "Occupancy Characteristics" menu
   c. select "Household Size"
   d. close pop-up
4. Select "Geographies" tab
5. In "Select geography type" drop-down menu, select "County," then "Iowa," then "Dubuque County, Iowa," then "Add to your selections," then close pop-up.
6. In "Narrow your search" type B25010.
7. Select 1-Year Estimate for desired year, and record the estimated household size.
8. For total number of people in county, go to http://www.census.gov/popest/estimates.html (select "Current Estimates Data," then "Latest Available Complete Vintage" for "Cities and Towns"). Select "All Incorporated Places," then download State excel files (XLS) to find population estimates.
9. Data for 2010 (and every 10 years) should be gathered from the U.S. Census at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
10. Select "Topics" tab
11. "People," "Basic Count/Estimate," "Population Total," exit popup.
12. Select "Geography" tab
13. In "Select geography type" drop-down menu, select "County," then "Iowa," then "Dubuque County, Iowa," then "Add to your selections," then close pop-up.
14. Select file DP-01 and record population.
15. Divide number in (7) by number in (8) or (13) to get total households.
16. Divide application total in (1) with quotient in (15) to get indicator.

Indicator: Household Energy Use
Time: 15 minutes

1. The household energy use data for 2009 was acquired from Raki Giannakouros from Green Dubuque, at raki@greendubuque.org.
   a. At this time, the number of customers for electricity is not available, so only average natural gas usage could be calculated.
2. The City of Dubuque has put in a request with the utility companies for data on residential use of energy for 2010 and 2011. Contact Cori Burbach, Sustainability Coordinator of Dubuque, at Cburbach@cityofdubuque.org to receive more recent data.

Indicator: Renewable Energy Use
Time: 15 minutes

1. This data is also from Raki Giannakourous from Green Dubuque, at raki@greendubuque.org.
2. This data is merely an estimate from the only known source (Municipal Service Center) of renewable energy in municipal operations, aside from city fleet.

Indicator: Energy Savings
Time: Unknown

1. This data has not been fully collected and analyzed at this point. The City of Dubuque finance department has utility bills dating back 18 months, and these can be acquired from:
   Ken Tekippe, Finance Director, City of Dubuque
   Phone: 563.589.4133
   E-mail: Ktekippe@cityofdubuque.org
2. The goal of this indicator is to measure annual energy savings, in dollars, from Dubuque's most important buildings.
3. To compare this number to other cities, it would be beneficial to determine energy cost per square foot.
4. However, in order to measure energy savings on a yearly basis, it would be best to adjust for temperature (if possible) and the cost of energy (the rate charged by utility companies). In order to adjust for temperature, however, it is necessary to isolate energy usage due to heating/cooling apart from general energy use (e.g., for appliances) and the utility bills do not isolate these charges. Also, the utility bills as provided by the utility companies often contain multiple rates, so it is difficult to distinguish rate changes.
5. UI students attempted to determine total energy costs for city buildings in a given year from utility bills to form some sort of basis of energy savings, but were unable to do so due to time restraints.

Reasonable Mobility

Indicator: True Housing Affordability
Time: 15 minutes

Data for the 'Housing and Transportation (H+T®) Affordability Index' results for 2010 was derived from the Center for Neighborhood and Technology H+T Index website http://htaindex.cnt.org on February 14, 2012. The H+T Index is based on a multidimensional regression analysis of housing costs, transportation costs, and neighborhood characteristics using the 2009 ACS 5-year estimates at the Census block group level for the primary dataset. Data for this indicator was available for Dubuque, IA and Decatur, IL at the county level, and for Oshkosh at the three-county MSA level.

As described in the H+T Index Methodology, the basic structure is as follows:

> "The household transportation model is based on a multidimensional regression analysis, in which formulas describe the relationships between three dependent variables (auto ownership, auto use, and transit use) and independent household and local environment variables. Neighborhood level (Census block group) data on household income (both median and per capita), household size, commuters per household, household density (both residential and gross), street connectivity (as measured using average block size and intersection density), transit access, and employment access were utilized as the independent or predictor variables.
>
> To construct the regression equations, each predictor variable was tested separately; first to determine the distribution of the sample and second to test the strength of the relationship to the criterion variables. For this research, the regression analysis was conducted in a comprehensive way, thus ignoring the distinction between the local environment variables and the household variables in order to obtain the best fit possible from all of the independent variables. The predicted result from each model was multiplied by the appropriate price for each unit—autos, miles, and transit trips—to obtain the cost of that aspect of transportation. Total transportation costs were calculated as the sum of the three cost components as follows:
>
> Total Transportation costs were calculated as follows:
> Household T Costs = $[C_{AO}*F_{AO}(X)] + [C_{AU}*F_{AU}(X)] + [C_{TU}*F_{TU}(X)]$
> Where
> C = cost factor (i.e. dollars per mile)
> F = function of the independent variables (F_{AO} bis auto ownership, F_{AU} is auto use, and F_{TU} is transit use)
> (Technology, 2012)."

Full methodology can be found at http://htaindex.cnt.org/downloads/HTMethods.2011.pdf (Technology, 2012)

Indicator: Vehicle Miles Traveled (VMT)
Time: 1 hour

Iowa:
Data for this indicator for the cities of Dubuque, IA and Ames, IA was derived directly from state Department of Transportation contact, Ronald Bunting. Annual VMT counts for the City of Dubuque were provided for 2006-2010. This data were then divided by city population derived from the U.S. Census Bureau American Community Survey. VMT counts for the City of Ames, IA in 2010 were provided by the same contact. These counts were divided by ACS 3-Year population estimates for per capita VMT.

Ronald Bunting
Office of Transportation Data
System Monitoring Section
Ph: 515-239-1323 Fax: 515-817-6645
www.iowadot.gov/maps/

Wisconsin:
An electronic request via email was logged for 2010 VMT data for Oshkosh with Jennifer Murray, WisDOT Traffic Forecasting Section Chief. 2010 daily and annual VMT totals for the city of Oshkosh, WI was provided by Harold Schumacher on 4.2.12, per the request of Jen Murray. This data was divided by ACS 3-Year population estimates derived from the U.S. Census Bureau, American Community Survey.

Jen Murray
Harold Schumacher
Traffic Forecasting Section Chief, WisDOT
Wisconsin Department of Transportation
Jennifer.Murray@dot.wi.gov
Harold.Schumacher@dot.wi.gov
608.264.8722

St. Cloud, Minnesota:
Data was derived from the Minnesota Department of Transportation.
http://www.dot.state.mn.us/roadway/data/reports/vmt.html

1. Select 'VMT by County/City/Route System
2. Select 2010 for 'Year'
3. 'View Report in Excel Format'
4. St. Cloud is located in more than one county. Obtain the annual city VMT by aggregating the following:

County	Route System
O5 Benton County:	02, 03, 04, 05, 07, 10
71 Sherburne:	02, 03, 04, 05, 07, 10
73 Stearns:	01, 03, 04, 05, 07, 10

5. Divide aggregated 2010 Annual (Total) Vehicle Miles by 2010 population derived from U.S. Census Bureau American Community Survey 3-Year Estimate.

Indicator: Walkable Neighborhoods
Time: 15 minutes

Walk Score Data for Dubuque, Ames, Decatur, Oshkosh, and St. Cloud was obtained from the Walk Score site on Tuesday, February 14, 2012.

1. Go to www.walkscore.com
2. Enter in city name in "Get A Walk Score"

Walk Score Data Sources: Walk Score uses data from a number of sources:

- Business listing data from Google and Localeze
- Road network data and park data from Open Street Map
- School data from Education.com
- Public transit data from over 200 transit agencies

The Walk Score is on a scale from 0 to 100 derived from a "Street Smart Walk Score Algorithm," which assesses count, depth of choice, and walking distance of amenities, as well as pedestrian friendliness metrics. Amenities are assessed as a weighted value per their relative importance based on recent walkability research. Amenity categories include grocery, restaurants, shopping, coffee, banks, parks, schools, books, and entertainment. The algorithm uses a polynomial distance function, assessing full value for amenities that are within .25 miles of the origin, and decreasing value as distance increases such that the amenity is devalued to 12% of its original at a distance of 1 mile from the origin. (Score, 2011). Pedestrian friendliness metrics include intersection density (intersections per square mile) and average block length. Penalties for low intersection density and long average block length can decrease a walk score by up to 10% of the total score.

The score can be impacted by residents:

> "In addition to changes to the algorithm, "Street Smart" Walk Score allows visitors to the Walk Score website to add amenities that may be missing or to remove amenities that are closed or miscategorized. For example, if a retail location was missing, a user could add a new business to Walk Score. If a place had gone out of business or was closed, a user could remove this from Walk Score. Walk Score requires users to login to curate amenities and employs wiki-style editing, to prevent people from "gaming" the score by adding additional amenities. (Score, 2011)"

Indicator: Public Transit Ridership
Time: 15 minutes

Dubuque, Iowa: A direct request for data was placed into the city and provided by Barbara Morck, Director of Transit Operations, The Jule/ECIA on February 17, 2012. A spreadsheet of annual ridership statistics on both Fixed Route and Mini-Bus Service for FY 2004-2011 was provided.

Barbara J. Morck
Director of Transit Operations
The Jule / ECIA
2401 Central Avenue

Dubuque, IA 52001
(563) 589-4196

Oshkosh, WI: Annual Oshkosh ridership statistics were published in the Oshkosh Transit Development Plan (Commission, 2011, p. 56). The 2010 figure was taken directly from this source document.

Indicator: Safe Travel Network
Time: 15 minutes

A direct request for data was placed from the contact page at http://www.iowadot.gov/crashanalysis. Reportable Crash history data for crashes within the corporate limits of the City of Dubuque for the years 2006-2010 was provided by Michael Pawlovich of the Iowa DOT on February 28, 2012.

Michael D. Pawlovich, Ph.D., P.E.
Iowa DOT Office of Traffic and Safety
Michael.Pawlovich@dot.iowa.gov
P: (515) 239-1428

These annual figures were divided per 1,000 residents from population data gathered from the U.S. Census American Community Survey.

Green Buildings

Indicator—Affordable Housing
Time: 45 minutes

Data for percent of households living in affordable housing was collected from the American Community Survey and is estimated every three years.

1. http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
2. Select "Topics" tab
   a. "Housing," "Financial Characteristics."
   b. Click on "Owner Costs," then "Renter Housing Costs," then close pop-up.
3. Select "Geography" tab
   a. In "Select geography type" drop-down menu, select "Places Within State," then "Iowa," then "Dubuque city, Iowa," then "Add to your selections," then close pop-up.
4. From Results table, select "B25106," which is described as "Tenure by Housing Cost as a Percentage of Household Income in the past 12 months," for your desired time frame (in this case 2010 ACS 3-year estimates).
5. You may download the dataset by clicking the blue download button; select "excel" as the file type (under "presentation-ready formats". I recommend renaming the file.
6. In excel file add up total number "owner occupied housing units" households under each income that pays "30% or more" of income on housing cost.
   a. Divide this figure by total Owner-occupied housing units households and multiply by 100 to get the percentage of owner-occupied households that live in unaffordable homes.
   b. Subtract this number by 100 to get the percent that live in affordable housing.
7. Add total number "Renter occupied housing units" households under each income that pays "30% or more" of income on housing cost.
   a. Divide this figure by total "Renter-occupied housing units" and multiply by 100 to get the percentage of rental households that live in unaffordable homes.
   b. Subtract this number by 100 to get the percent that live in affordable housing
8. To get the total of both owner- and renter-occupied households living in affordable housing add the number of households under each income that pays "30% or more" for both renters and owners in steps 6 & 7 and divide by the total number of households in Dubuque (renter-occupied + owner-occupied housing).
9. Repeat steps 3 through 8 for other comparison cities.

Indicator—Green Standards
Program Needed: ArcGIS
Time: 45 minutes

Data for this indicator was from the EPA Energy Star website, US Green Building Council website, and from ArcGIS files provided by the City of Dubuque and other comparison cities.

Number of Energy Star non- residential buildings in Dubuque

1. Go to http://www.energystar.gov/
2. Under "Buildings and Plants" heading, click on "Find Certified Buildings and Plants."
3. In "City" box, type Dubuque, Iowa and click find to get the total number of Energy Star non-residential buildings
   a. Do same for other cities

Number of LEED Certified Buildings

1. Go to http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx
2. To filter down to Dubuque (or other cities), type in Dubuque and IA in the "City" and "State" boxes, respectively

Total Number of Buildings

ArcGIS was used for this data

1. Utilize the following shapefile created for each of the cities for the Mixed Use indicator: the "BuildingFootprint and LandUse Intersect; dissolved by building FID" shapefile.
2. Open the attribute table of one of the city's shapefiles. Under the selection menu, click on "select by attributes".
3. Select all non-residential land uses from the specified shapefile. For Dubuque, the formula will be "LandUse" = 'C' OR "LandUse" = 'HI' OR "LandUse" = 'LI' OR "LandUse" = 'RCR' OR "LandUse" = 'OF' "LandUse" = 'IS'. Click apply.
4. In the attribute table, view the number of buildings that are selected. This is the number of commercial, municipal, and industrial buildings located within the city.
5. To get percentage divide the total number of both LEED and Energy Star buildings by the total number of non-residential buildings derived from the ArcGIS.

Indicator—Safe Housing
Time: 1.5 hours

Number of inspections that resulted in violations

1. Excel file is from Permit Plus, Contact Chris Kohlman at City of Dubuque Information Services (Ckohlman@cityofdubuque.org)
2. Filter the action/description column and select "inspection where violation was observed" (it will be easier if this selection is copied into a new spreadsheet).
3. Go through comments by inspectors and delete all those which show that inspectors were not able to access home.
4. Divide the total number left with by the total housing inspections in the original spreadsheet to get the percentage of housing inspections that resulted in housing code violations.

Indicator—Lead Exposure Testing
Time: 15 minutes

Data for this indicator was from Mary Rose Corrigan (563-589-4181) at the City of Dubuque Health Services Department.

Indicator—Lead Poisoning Rate
Time: 15 minutes

Data for this indicator was from Mary Rose Corrigan at the City of Dubuque Health Services Department. (563-589-4181)

Community Knowledge

Indicator: Eco-Literacy
Time: TBD

A new Eco-Literacy survey was created for Dubuque, with questions based largely off of the City of Napa Sustainability Survey. The Napa Sustainability Survey was developed by the City of Napa, California, and the consulting firm Sustainametrics.

Andrea Fox
City of Napa, Sustainability Coordinator
Phone: (707) 258-7864
afox@cityofnapa.org
Sustainametrics
www.sustainametrics.com

The survey was administered using electronic voting clickers at the Public Forum on March 20, 2012, as well as via SurveyMonkey. However, less than fifteen responses were gathered, too minimal for a measure of this indicator. The survey is attached for future administration.

Indicator: Arts & Culture
Time: 15 minutes

A direct request for information was placed with the city, and a response was provided by Jan Stoffel, City of Dubuque Arts and Cultural Affairs Coordinator, on December 7th, 2011. Jan provided the 2011 Local Arts Index Final Submission Excel file, with data for this report derived from the 'Number of annual arts and culture festivals / events, e.g., crafts, food, performing arts, heritage' under item number thirteen, 'Ethnic Groups'.

Jan Stoffel
City of Dubuque Manager's Office
Arts and Cultural Affairs Coordinator
jkanstoff@cityofdubuque.org

Indicator: Volunteerism
Time: 30 minutes

1. Mary Bridget Corken, the volunteer service coordinator for the City of Dubuque, has the data for the number of volunteer hours for city initiatives. She also has contacts for the national service program volunteer hoursIndicator: Voter Participation

Indicator: Voter Participation
Time: 1.5 hours

1. For voter participation data specific to the City of Dubuque, the data must be retrieved from the office of the Deputy Commissioner of Elections for Dubuque County. Tom O'Neill is the Deputy Commissioner for Dubuque. (There is voter participation data on the Iowa Secretary of State website, however only county-wide data is available). Request voter participation rates for general elections, including absentee voters.
2. For Ames, voter participation information is available at the city level from the Story County website: http://www.storycountyiowa.gov/
    a. Hover the mouse over the "Departments" icon.
    b. Click on "Departments A-E". Click on "Auditor and Elections". Click on "elections", then "previous election results".
    c. Select the election year from the panel on the left.
    d. Under the "general election" section, click on "by precinct".

e. The first 19 or so stations will be in Ames. Record the number of registered voters and the number of cards cast into an excel spreadsheet.
f. Sum up the number of registered voters and number of cards cast to get an overall percentage of voter turnout for the city.

3. For St. Cloud, go to http://ci.stcloud.mn.us/index.aspx?NID=447. If the link is no longer functional, go to the City of St. Cloud website, and navigate from the home page to "departments", "Finance", "City Clerk", "Elections", and "Election Results".
    a. Find the appropriate election year, and click on "Turnout". Examine the column headings; the percentage listed on the right is the voter turnout. Voter turnout is listed by polling location, but at the bottom of the page the total voter turnout is listed for the city. Record this percentage.
4. For Oshkosh, go to http://www.ci.oshkosh.wi.us/City_Clerk/elections.asp
    a. Scroll to the bottom of the page and look for the "Election Results" section.
    b. Click on the appropriate election year.
    c. Click on the first bullet point: "election statistics:
    d. Scroll to the bottom of the page to view the voter turnout.

Indicator: Educational Disparity
Time: 4 hours

1. Go to the Census FactFinder page. The web address (which is subject to change) is http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t
2. On the left side of the screen, click on the "Geographies" box. In "Select geography type" drop-down menu, select "Place within State," then "Iowa," then "Dubuque city, Iowa," then "Add to your selections," then close pop-up.
3. You may also add the comparison cities at this time, and then you will be able to download all of the data simultaneously. Repeat Step 3 for the other cities to do this.
4. Search for "educational attainment" in the main search box.
5. Select the current 5-year estimates for each race for data table ID B15002. To view only the data from the 5-year ACS data, an easy way to narrow the results is to click on "Topics" (found on the left side of the window), then click on "dataset" and __(most recent year)__ ACS 5-year estimates. Each race has its own table denoted with a letter (A – I) at the end (i.e. from B15002**A** to B15002**I**). Select each table by clicking in the checkbox next to the 9 tables. Then click "view" at the bottom. (You may also check the 3-year ACS data. However, in the 3-year 2010 dataset the only city that had data available for a race other than white was Decatur, which had 3-year data available for African Americans).
6. Now that the tables are check marked you have two download options. Option 1 is to click download; this will download a zip file of the datasets in csv format (which you can open in excel), along with a text file that describes the dataset. Option 2 (my preference) is to click View, and then download each of the 9 datasets separately, which will then download the datasets as individual excel files.
    a. If you opt to view the data and download individually, then each dataset will be shown on a separate webpage. To view the next dataset window, click on the gray arrow near the top of the screen located to the right of "Result 1 of 9".

7. Once you download the data, add on to the file name which races the letters A – I denote. Alternatively, write down what each letter denotes somewhere else (it will not say it in the excel spreadsheet. Also, pay attention to this, particularly when comparing data from various years, since the letter designation has changed over time).
8. Open up each of the 9 spreadsheets and copy the relevant cells (all the cells with data and their labels – but not the wordy text above and below the data table) into a new excel worksheet. One way to do this, if you have data from each of the cities in the spreadsheets, is to copy and paste the data for one race into a new spreadsheet. Leave two rows empty rows below it, and then paste data from another race directly below. In the first empty row you will be calculating the percentage of high school graduates. The second row will serve as a visual break.
9. Calculating high school attainment: the data I downloaded for 5-year estimates in 2010 had four types of educational attainment: "less than high school diploma", "high school graduate, GED, or alternative", "some college or associate's degree", and "bachelor's degree or higher". (The 3-year ACs data separates educational attainment into more than 4 categories.) The harder way is to add up the males and females who are in the later three categories (high school, some college, and bachelor's degree), then divide by the total population. A simpler way is to divide the "less than high school diploma" by the total population, and subtract that percentage from 1.
10. Drag the formula over for the adjacent columns by placing your cursor over the lower right hand corner of the cell until the crosshair turns black; then click and drag over to the right to calculate the high school attainment rate for each city.
11. After calculating the attainment for each race in each city, I recommend copying and pasting the educational attainment rates into a new section or tab of the excel spreadsheet. The new section/tab will have a table you set up with the races along the left (in separate rows) and the cities along the top (in separate columns). An easy way to do this is to copy a row of your calculations, right click where you want to paste them, select "paste special", then select "values" and click OK. There will likely be gaps for the margin of error (and for any merged cells). When I copied and pasted, I left the gaps until I had pasted a row for each of the races, and then I deleted the gaps by highlighting them, right clicking, selecting "delete" and keeping the setting at "shift cells left".
12. Next you can determine the percent of population by race for each city, which will show you which data points will be most important to highlight. For the 2010 report, I used a cutoff value of 1% population: any racial group less than 1% of the population was not analyzed due to the lack of a significant presence and the likelihood of insignificant data. Create a "Sum Population" row below the last data table in your combined excel spreadsheet. Use the sum function (=sum(cell,cell, etc.)) and click on the cell for each race in that city to sum up the populations. Do not include "white, not Hispanic" or "Hispanic or Latino" in the summed population, since those populations are already counted in the other 7 categories.
13. Create another table in your spreadsheet (it can be on the same tab. I recommend placing it next to the new educational attainment table). Along the top (in the columns), write the names of each city (or, if looking at historical data, each time-span). Along the side (in the rows), write each of the races. Fill in the table by typing in an equal sign: =. Then click on the total population of the specified race in the specified city, type a slash: /, click on the total population for the city, then hit

enter. Do this for each cell in the table, until you have the population percentage for each race in each city.

14. Of the racial groups that constitute at least 1% of the population, find the group with the lowest and the group with the highest attainment for Dubuque. In the 2010 5-year estimates for Dubuque, the racial group with the highest educational attainment that also constituted over 1% of the population was white, not Hispanic. ("Some other race" had 100% high school educational attainment, but only constituted 0.1% of the population). The racial group with the lowest educational attainment that also constituted over 1% of the population was African Americans (Native Hawaiian and American Indian had lower educational attainments, but constituted 0.1% and 0.2% of the population respectively). Thus, for the inaugural report, the disparities will be between white, not Hispanics and African Americans. This is subject to change, depending on which racial groups have the highest disparity in Dubuque.
15. Next, determine what the greatest disparity is for each city (based on which racial groups constitute over 1%), and also calculate the disparity for the two racial groups in Dubuque's disparity calculation. These may be the same two racial groups, but will depend on current data. Subtract the lowest from the highest, so that you get the resulting disparity in negative percentage points.

Indicator: 3rd Grade Reading Proficiency
Time: 1 hour

Iowa

1. Go to educateiowa.gov, the website for the Iowa Department of Education
2. Under the "Data & Statistics" tab, click on "District & AEA Reports".
3. Click on "APR State Student Achievement Data"
4. On the left, under indicators, click on "Reading", and then click on "grade 3". Go to the district drop down menu click on the appropriate district (Dubuque Comm School District and Ames Comm School District), and then click the select button.
5. Look for the % Proficient in the table at the bottom of the webpage.

Minnesota

1. Go to education.state.mn.us/, the website for the Minnesota Department of Education.
2. Hover your mouse over the "Data Center" tab, and click on "Data for Parents and Educators"
3. Keep # 1 selected as "How are students performing academically?"
4. For #2, change the district to "St. Cloud Public School District". Keep the next setting to all schools. Click on "Data for educators".
5. Change "All accountability tests" to "MCAII".
6. Change "math" to "reading"
7. Change "all grades" to "grade 3".
8. Keep the setting at "proficiency". Hover the mouse over the data point for the St. Cloud public school district in the appropriate year, and record the percentage of students.

Wisconsin

1. Go to http://dpi.state.wi.us/, the website for the Wisconsin Department of Public Instruction.
2. Under the "Data" tab, click on "Academic Achievement"
3. Click on "Knowledge and Concepts Examinations (WKCE)"
4. Click on the first link: "WINSS – Wisconsin's Information Network for Successful Schools"
5. Click on data analysis.

6. Under “by district”, type in “Oshkosh”. This website is located at http://data.dpi.state.wi.us/data/ (REWRITE TO SHOW HOW TO SKIP 1 -5).
7. Under “district”, click on “Oshkosh area”
8. Click on “how are students performing academically?”
9. Click on the first link: “how did students perform on state tests at grades 3-8 and 10?”
10. Make sure the subject is set to “Reading”. Find the appropriate school year (WI seems to provide the current year’s data earlier than other states).
11. Look at the table at the bottom of the webpage. To determine the percentage of proficient 3rd graders, add up the percentages for Proficient and advanced (the percentages provided for each category are not cumulative). To account for the percentage of students not tested (No WSAS total), add up the other percentages and then divide by 100 – the percentage not tested. For example, 82.0% had either a proficient or advanced level of reading. I divided this number by 99.8, which was 100 – the 0.2 percent who did not test, and the statistic changed to 82.16%.

Illinois

1. Go to http://www.isbe.state.il.us/assessment/report_card.htm (If the link doesn’t work, go to:
2.
3. Click on the “state, school, and district report cards” for the appropriate year.
4. Change the “search by” to “District”, type in “Decatur” in the Keyword box.
5. Click on “Decatur SD 61”
6. A webpage with all of the schools will appear. If you scroll to the bottom, the “Decatur SD 61” will be listed under “District Reports”. Click on the link for the district.
7. A PDF of the districts report card will load.
8. Look for the section on “ISAT Performance”. The first chart under this section should be third grade reading. The relevant statistic is the percent of students in the district who meet or exceed standards.

Community Design

Indicator: Complete Streets
Program Needed: ArcGIS
Time: 30 minutes

1. Gather the necessary shapefiles: road centerlines, bike paths (or rec trails), sidewalks, and the city boundary (polygon).
2. Clip each of the road centerline, sidewalk, shapefiles to the city boundary.
3. Open the attribute table of each clipped shapefile. Right click on the shape_length attribute, select "statistics". Record the "sum" statistic. Ensure that the shape_length attributes do not include the length of segments outside the city boundary by comparing the clipped shapefiles to the unclipped shapefiles. If there is no change, and there ought to be (if the original shapefile had segments outside of the city), then create a new shape_length attribute for the clipped shapefile. Add the attribute by clicking on "option" and selecting "add field". Right click on the new column and select "calculate geometry". Make sure "length" is selected, and click OK. Find the summary statistic for the column by right clicking on the column title and selecting "statistics". Record the "sum" statistic for each shapefile.
4. Divide the length of the sidewalk by the length of the road; and the length of the bike path by the length of the road for each city. These numbers are the ratios of sidewalks or bike paths to roads.

Indicator: Mixed Use
Programs Needed: ArcGIS, Access, Excel
Time: 12 hours

Part A: GIS

1. Gather the necessary shapefiles: building footprint, land use designations, parcels, road centerlines, and the City of Dubuque outline.
2. Use the Intersect tool (located under the geoprocessing menu) to attach the land use designations to the building footprints. Input the two shapefiles. Save in a convenient location, and name the output BuildingFootprintsLandUseIntersect. Click OK.
3. Create a fishnet: Search for the fishnet tool in the Geoprocessing search box (or go to Data Mangement → Feature Class → Create Fishnet). In the Output Feature Class box, click on the folder to save the shapefile in a convenient location. Decide on a name for the new shapefile, such as "Fishnet". For "Template Extent", choose the Land Use Shapefile (click on the down arrow and select it from the shapefiles in your mxd). The coordinates for the fishnet will automatically populate. The width and height will each be 2640 (feet, but there will be no place to choose the unit. You must make sure the map units are in feet. If they aren't, you'll need to make a new mxd and have the first shapefile you add use a coordinate system with feet as the units. You want 2640 feet since there are 2640 feet per ½ mile. Each fishnet box will be ½ mi by ½ mile.) For number of rows and number of columns, enter 20 for both. Uncheck "create label points". Under geometry type, select "polygon". Click OK.
4. The fishnet shapefile will be added to the map.

5. Open the intersect tool (located under the geoprocessing menu). Input the Fishnet shapefile and the BuildingFootprintLandUseIntersect shapefile. Save to a convenient location, with a name such as BuildingFootprintLandUseIntersectFishnetIntersect.

6. Open the attribute table for the newly created shapefile. Make sure there is a column with shape area that shows the shape area for each polygon (Dubuque's shapefiles had a shape_area column that automatically tabulated the area of the dissected building footrpints). If there isn't a column, add one by clicking on Table Options, then "add field". Select long interger, and name it "Shape_Area". Right click on the column title and click on "calculate geometry". If ArcMap warns you that you are outside of an edit session, just click "OK" and proceed. Keep the property type as "area", keep the projected coordinate system it displays, and keep the units as square feet. Click OK.

7. In the Table Options menu, select "export". Click on the folder icon to choose where you want to save the export. Give the file a name such as "BFLUintersectFintersect" and save as a text file. (If this doesn't work, you may need to first save as a dBASE file, add it to the map, and then export the dBASE file as a TXT file).

Part B: Excel and Access

8. Open access. Open the txt file (in the open window, make sure "all files" is selected, not just Microsoft Access files, otherwise the txt file won't be visible). An import dialogue box will appear. Check the box next to "first row contains headers". Click next, finish, then OK.

9. The table will be listed in the left-most pane of the Access window. Double click on the excel table's title, and the database will open in the main screen.

10. In the "Create" ribbon, click on Query Design. The add table window will pop up – add the table listed in there, then click the red x to remove the "show table" box. The categories of the table will appear in a list in the top half of the screen. Double click on FID_Fishne, LandUse, and Shape_Area.

11. Those three categories will now appear in the lower half of the screen. In the lower half, under Shape_Area, click in the box that says "group by", click on the down arrow that will appear, and change to "sum". (Note: if there is no "Group by" column, click on the ∑ "totals" symbol in the Query Tools ribbon.)

12. In the top left corner of the screen click on the View button. You will now see the results of your Access Query. Make sure it looks right: you should see three columns, and the third column will be the sum of building area according to the fishnet ID and the land use.

13. The next step is to reorganize the data into a more convenient table. In the top left corner of the screen click on the down arrow below the "view" button. Then click on "Pivot table". Drag the "FID_Fishne" to the left side of the screen where it says "Drop Row Fields Here". Drag the "LandUse" to the top of the screen where it says "Drop Column Fields Here". Drag the "SumOfShape_Area" to the center where it says "Drop Totals or Detail Fields Here". You should now see a table with the Fishnet ID on the left, the land uses along the top, and some of the cells filled in with shape_area numbers.

14. Under the PivotTableTools ribbon, click on "export to excel". An excel spreadsheet will pop up with the data from the pivot table (if the shape_area sums are not listed in the table, check the right pane of the excel window and make sure the SumOfShape_Area field has a checkmark).

15. Save the excel table as an excel workbook (not as a website).

16. Hide the columns for AG (agriculture), HI (heavy industrial), LI (light industrial), POS (open space), and PRK (park).

17. Create a SUM column to the right of the table to add up the building areas for only the remaining columns. Title this column "SUM shape area". For the first calculation, type =sum(c5,e5,g5,h5,i5,l5,m5)

    (Note: You cannot just click on the cells you are adding up, you must type in the letter and number for each cell. If you click on the cells, $ signs will be automatically entered (since it's a pivot table) and you won't be able to drag the formula down for the rest of the data. Another note: The cell reference may change depending on where the pivot table is located. The c5 refers to the commercial shape_area for the first listed fishnet box, even if that cell is blank. Then type in the rest of the reference cells.) Once you've entered the sum for the first row of data, drag the formula down for the rest of the data (click on the cell, hover the mouse over the lower right corner until it turns into a black cross hair, pull the corner down until you reach the end of the data).

18. Create a column called "Fishnet ID" to the right of the SUM Shape area column. Copy the numbers in the FID_Fishne column from the pivot table into this new column (you will need to have the column copied over so that you can have the FID reference when you open a new worksheet).

19. Create a Percentage Land Use Table: In a space to the right of the Fishnet ID cp;l,m you created and in the same row as the column headers for the land use in the pivot table, type up the 7 land uses again, each in their own column, except for MF and MR, which will be combined (C, IS, MF+MR, OF, RCR, SF).This new table will be used to create the percentage of land uses for each fishnet box. In the first cell below the new table you created, type a formula that references c5, and divide by the sum for the fishnet square. You will also add 0.00000001 to each percentage (this will facilitate the diversity calculation, which does not accept any zeroes). In my spreadsheet, this formula was: =c5/p5+0.00000001

20. Continue to type a formula for each of the land uses for the first row of data: for each one type in the reference cell for the numerator from the pivot table. So, for example, the next cell to the right will have =e5/p5+0.00000001. The next cell, which is for multifamily and mixed residential, will refer to two cells in the numerator =(g5+h5)/p5+0.00000001

21. Highlight the six cells in the first row with the percentage of land uses. Hover the mouse over the lower right corner until a black cross hair appears. Click and drag down until the percentages are calculated for all of the rows of data.

22. Create a new column with the heading "# of land uses". For the first row of data, type in the following formula, using references to all six of the land use percentages for that row:

    =6-COUNTIF(R5:W5, +0.00000001)

    - Drag the formula down to all the rows of data by clicking on the black cross hair in the lower right hand corner of the cell. This column will now show you how many land uses are in each fishnet box.
    - Note: Some comparison cities may not have 6 types of land uses that can go into the land use mix formula. For Oshkosh, the relevant land uses were commercial, Government + institutional + school, Infill non-residential + mixed use, Multi-family, and Single + Two family. In this case, there were 5 categories, so this formula was =5-COUNTIF(R5:WF,0.00000001)

23. Create two final columns to the right called “A statistic” and “Diversity Score”. Your table should look similar to this:

	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1															
2															
3															
4	SF	Grand Total		SUM Shape Area	Fishnet ID	C	IS	MF+MR	OF	RCR	SF	# of Land Uses	A statistic	Diversity Score	
5		111660.4845		91908.92772	66	0.00000001	0.00000001	0.00000001	1	0.00000001	0.00000001	1			
6	122983.8823	122983.8823		122983.8823	77	0.00000001	0.00000001	0.00000001	1E-08	0.00000001	1.00000001	1			
7		4682.40739		0	166	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
8		15634.24831		0	255	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
9	337702.143	406374.1416		406374.1416	193	0.00000001	0.13788725	0.0310999	1E-08	0.00000001	0.83101288	3			
10	60329.98807	288561.9368		288561.9368	128	0.59595034	0.10453384	0.00000001	0.090445	0.00000001	0.2090712	4			
11		13441.23624		13441.23624	133	1.00000001	0.00000001	0.00000001	1E-08	0.00000001	0.00000001	1			
12		994.465097		0	233	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
13	13188.06163	63082.13999		63082.13999	105	0.79093827	0.00000001	0.00000001	1E-08	0.00000001	0.20906175	2			
14	27985.9524	32351.19561		32351.19561	232	0.00000001	0.00000001	0.13493299	1E-08	0.00000001	0.86506703	2			
15	112412.5261	132605.7088		112412.5261	315	0.00000001	0.00000001	0.00000001	1E-08	0.00000001	1.00000001	1			
16	221549.3029	226305.672		221549.3029	195	0.00000001	0.00000001	0.00000001	1E-08	0.00000001	1.00000001	1			
17	64680.06186	94448.03869		85585.23314	217	0.24426144	0.00000001	0.00000001	1E-08	0.00000001	0.75573858	2			
18		37993.7385		0	253	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
19		1543.748831		0	174	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
20		12592.71525		0	296	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
21		16143.81043		0	238	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6			
22	9900.673614	9900.673614		9900.673614	190	0.00000001	0.00000001	0.00000001	1E-08	0.00000001	1.00000001	1			

24. Highlight the rows “SUM Shape Area” to “Diversity score”, and all of the rows of data below. Right click and then click on “copy”. Open a new excel workbook and paste the data values (to paste the values, right click in cell A1 and select **“paste values”** under paste options. (Note: this data needs to be in a new workbook separate from the pivot table so that the data can be reordered using “Sort & Filter”).

25. Highlight all of the cells again, from “SUM Shape Area” to “# of Land Uses”, and all of the rows of data below. Click on the “Data” ribbon. Click on the Sort button, which will open up a custom sort box. In the top right of the sort box, select “My data has headers” (If it is not already selected). Sort by the # of Land uses, and select the order of “largest to smallest”. Click OK.

26. Near the top will be the rows of data with 6 Land Uses. Some of these rows will actually have 0s in the SUM shape area, and #DIV/0! In the land use percentage columns. All of the rows with 0s in the SUM shape area need to be deleted (they don’t count towards the land use mix, and must be deleted to calculate the average diversity). Highlight the rows (using shift and control to select all of them, or using shift and selecting one bunch at a time), right click in the highlighted area, and select delete.

27. Next fill in the formula for column “A statistic”. This column contains the first portion of the Diversity calculation. The formula references each land use percentage twice. In my spreadsheet, the formula was

    =(C2*LN(C2))+(D2*LN(D2))+(E2*LN(E2))+(F2*LN(F2))+(G2*LN(G2))+(H2*LN(H2))

    Copy the above formula into your spreadsheet, and make sure each cell reference correctly refers to each of the six land use percentages.
    - Drag the formula down by clicking on the black crosshair in the lower right-hand corner until all the rows of data have a calculation for “A statistic”

28. Now, fill in the Diversity Score formula. This formula will refer to the formula in the “A statistic” column, and the number of land uses. In my spreadsheet, I used the following formula

    =-K2/(LN(J2))

    Where K2 referenced the A statistic and J2 referenced the # of land uses. Make sure that there is a negative sign in the formula, so that the resulting number is positive. A score of 1 is highly diverse, while a score of 0 is not diverse at all. Drag the formula down by clicking on the black crosshair in the lower right-hand corner until all the rows of data have a calculation for “Diversity Score”.

29. Find the first row of data that has 1 has the number of land uses. The Diversity Score will be #DIV/0! For this row, and all other rows with only 1 land use. These rows should actually have a diversity score of 0, but the formula instead produces an error message because it is dividing by zero. Replace the error message by clicking in the box and typing a zero: 0, then clicking enter. Then drag the zero down to the other rows with only 1 land use.

30. Find the land use diversity score average. At the bottom of the table, type in a formula that finds the average of all of the diversity scores. In my spreadsheet, this formula was

    =AVERAGE(L2:L124)

    Save the excel workbook with a name such as LandUseDiversityIndex.

Part C: Access and GIS-based (This step is only needed for Dubuque’s data in order to create a map showing the land use diversity.)

31. Open Access. Click on File, then click Open. In the Open window that appears, click on the black arrow in the lower right hand corner where it says “Microsoft access” and instead choose “all files”. Navigate to the LandUseDiversityIndex excel spreadsheet, and click open.

32. The link spreadsheet wizard will appear. In the first window, click next. In the second window, the “first row contains column headings” should be checkmarked (If it is not, then click in the box so that there is a checkmark). Click next. In the last window, you can click Finish. Then click OK.

33. The left-hand pane titled “Tables” will have the spreadsheet title listed. Double click on the title to open the table. If the cells contain the # sign shown repeatedly, that is no cause for concern. It simply means that there are too many numbers to display in the cell.

34. In the left-hand pane, right click on the spreadsheet title. Hover over “export” and select “dBASE File”. Save the dBASE in a convenient location, with a name such as Diversity.

35. Open ArcMap and the MXD file with the fishnet from Part A. Add the DBF table "Diversity" to the map.
36. Right click on the fishnet layer, hover over "joins and relates" and select "Join". Keep the first selection as "join attributes from a table". For #1, choose OID. For #2, choose DIVERSIT. For #3, choose FISHNET_ID. Keep "Join Options" as "Keep all records". Click OK.
37. Clip the fishnet layer to the shapefile of the outline of the City.
38. Open the properties for the clipped fishnet shapefile. Click on the Symbology tab, then click on Quantities. For Value, select Diversity_. Click on Classify to change the classification to equal breaks. Change the color scheme to shades of dark green. Right click in the symbols and label box, and select "Format labels…". Under "rounding", change the number of decimal places to 2. Click OK.
39. Add the Road Centerlines shapefile to the map. Use Select by Attributes to select the roads with road levels of Arterial (62), Major Road (64), or State Highway (71). Export these to a new shapefile called MajorRoads and add it to the map.
40. Open the editor toolbar to edit the MajorRoads shapefile. Select the roads that fall within the Dubuque outline shapefile (use the select by location feature). Switch the selection so the roads outside Dubuque are selected (in the attribute table, click on the "switch selection button" which has two arrows on it.) View the selected roads and then delete them.

Indicator: Quantity of Open Space
Program Needed: ArcGIS
Time: 1 hour

1. Gather the necessary shapefiles: land use, parcels, schools (via Interest Points), impervious surfaces (including building footprints community parking area, miscellaneous pavement, and roadways), and the city boundary
2. Create a shapfile of public school parcels:
    a. Export all public schools from the Interest Points shapefile (by using a "select by attributes").
    b. Select by location for the parcel layer. The source layer is schools and the method is target layer feature(s) intersect the source layer feature(s). Some schools have open space located on adjacent parcels, especially high schools. Examine these schools and add any additional open space parcels.
    c. Once all the school parcels have been selected, export to a new shapefile.
3. Merge the impervious surfaces shapefiles together, including building footprints, community parking area, miscellaneous pavement, and roadways.
4. Use the "erase" function to remove impervious surfaces from the school parcel shapefile: Input features of the school parcels shapefile, and erase features from impervious surfaces. Save as a new shapefile, called PublicSchoolOpenSpace.
5. Export all the PRK and POS areas from the land use shapefile using a "select by attributes". Name the new shapefile "PRKandPOS".

6. Merge the PublicSchoolOpenSpace shapefile and PRKandPOS shapefiles into a new shapefile called "OpenSpace".
7. Open the attribute table for "OpenSpace". Right click on "shape_area", click on statistics, and record the sum. This is the sq ft of open space.
8. Open the attribute table for the city boundary. Right click on the "shape_area", click on statistics, and record the sum.
9. The final statistic, the percentage of open space, is the sum of open space divided by the sum of the city area.

Indicator: Access to Open Space
Program Needed: ArcGIS, Excel
Time: 4 hours

1. Gather the necessary shapefiles: land use, parcels, PublicSchoolOpenSpace (from the Quantity of Open Space indicator), an excel spreadsheet or database with the number of dwelling units for multifamily parcels, city boundary, and building footprint.
2. If the multifamily information is in a spreadsheet, save it as a DBF. Add the DBF to ArcMap and join it to the parcel shapefile based on the parcel number. The parcel shapefile lists the parcel number under the category of PIN, which is a string. The parcel numbers in the DBF are most likely "double". To ensure that the two shapefiles can be joined, add a new field to the DBF's attribute table. Input the parcel number for the new column, but change the type to "string". Join to the parcel shapefile based on the new parcel field.
3. Intersect the parcel shapefile with the building footprint shapefile, and name it IntersectParcelBuilding.
4. Intersect the new shapefile with the land use shapefile. Name the new shapefile IntersectPBL
5. Dissolve the IntersectPBL shapefile according to the building footprint FID. Name this shapefile IntersectPBLdissolved
6. Select by attributes from IntersectPBLdissolved to select only those buildings that are residential or have dwelling unit information. Export as a new shapefile called ResidentialBuildings. (Note: It may be easiest to divide the residential buildings shapefile into one for buildings with dwelling unit information and one for buildings without. That way, it will be easier to distinguish when the dwelling units need to be added in the subsequent steps).
7. Export the PRK land uses from the land use shapefile by selecting them and then exporting as a new shapefile.
8. Merge the PublicSchoolOpenSpace shapefile with the PRK shapefile to create a new shapefile called PublicOpenSpace.
9. Create a buffer around the PublicOpenSpace shapefile: Enter a buffer distance of 0.25 miles. Name this shapefile PublicOpenSpaceBuffer.
10. Select by location from the ResidentialBuildings shapefile. The selection criteria is intersecting with the PublicOpenSpaceBuffer shapefile.
11. Open the attribute table for the ResidentialBuildings shapefile. Record the number of buildings that are selected (and thus within the buffer), and the total number of buildings.
12. Divide the number of buildings within the buffer area by the total number of buildings. This is the final statistic for this indicator: the percentage of residences within ¼ mile of public open space.

Indicator: Historic Preservation
Programs Needed: Microsoft Access
Time: 2 hours

1. Go to http://nrhp.focus.nps.gov/natreg/docs/Download.html
2. Under “all data”, click on “download entire database”
3. Open Microsoft Access, and open the .exe file that you just downloaded (Note: only PCs can open .exe files).
4. Under the ribbon of “Database Tools”, click on “Relationships”
5. Click on the tables “County” and “Propmain”
6. Create a relationship between “Refnum” in each table
7. Save the relationship
8. Under the ribbon of “Create”, click on “Query Design”
9. Add the County and Propmain tables, then click close.
10. Click on “”City” in the County table to add it to the spreadsheet below. Then click on “County”, and then “refnum” in the county table. In the propmain table, click on “numcbldg”, “numnbldg”, “numcsite”, “Numnsite”, “resource” and “certdate” (these stand for number of contributing buildings, number of non-contributing buildings, number of contributing sites, and number of noncontributing sites, the type of site (building, structure, or district), and the date if was added to the NRHP). (If you click on them out of order, I believe it won’t mess up the query. However, it is possible to move the columns around: Click on the gray bar above the column in the spreadsheet, which will make the column black. Then click again and drag the column to where you want it.)
11. In the spreadsheet below, in the first column (where the field says “city”), click in the box for “criteria”. Type in Dubuque. You have just designed a query that will show you all of the records for the city of Dubuque.
12. To view the records, click on the “view” button in the top left of the screen (it is under the “Query tools: design” ribbon). You will now be viewing the “datasheet” view. In this view, you can see all the results of the query. Click on the arrow in the top left of the spreadsheet; this will highlight all of the cells in blue. Copy the cells. Open excel, and paste the cells in a spreadsheet.
13. The cells in excel may have little green triangles in the corner. This indicates that the data is stored in text format, not numeric format, which means you will be unable to perform calculations on the data cells. Highlight all the cells that have green triangles, and a yellow box with an exclamation mark will appear. Click on the exclamation mark, and then click on “convert to number”. (Design note: if the cells become taller than necessary, thus creating more white spaces and making the spreadsheet less easy to view, then look for any columns that are not wide enough. Make them wider, by dragging the right edge of the gray column letter to the right. Then select all cells by clicking on the gray arrow near the top left. Then, double click on any of the edges of a row box (for example, in-between 5 and 6). This should reduce all of the cells in the sheet to the minimum size needed to view the data.)
14. Make sure your records are only for Dubuque in Dubuque County. If there are other cities of Dubuque, then you can delete those rows of data.
15. Sum the numbers of buildings and structures. (Tip - type in the formula: sum(d2:dX) where x is the last cell of data.

Drag the formula to the other columns by holding your cursor over the bottom right of the cell until the cursor becomes a black crosshair. Then click and drag.)

16. To gather data for the comparison cities, go back to access. Click on the "data view" near the top left of the screen (click on the image; or if you click on the black arrow below, then select "design view"). (If a screen pops up telling you that you've saved a lot of data to your clipboard, you can click on "no", to not save the data on the clipboard.) Once you're in design view, you can change the "criteria" under the County and City columns to the new cities. Delete what's there, and type the new city (no need for quotation marks – access will add them). For Decatur, I recommend also typing in "macon"; Decatur is completely located within Macon, and there are several other Decatur's, so by specifying the county you'll save the step of reordering the data.
17. Notes: Oshkosh is completely located within Winnebago county (the Oshkosh in Garden County is in Nebraska). St. Cloud is in multiple counties: mostly Stearns, but also Benton and Sherburne (the St. Cloud in Osceola county is in Florida). Ames is completely located within Story County (the Ames in Montgomery county is in NY).
18. Add up the sums for each row into three different statistics – a sum for all buildings, a sum for all contributing buildings or structures, and a sum for all four (all building and structures, whether they are contributing or not) (THIS MAY CHANGE)
19. To analyze the data, create a new tab, then copy and paste the three calculated sums for each city into the new spreadsheet. Make sure to use paste special so that the numbers don't turn into "#REF!" (to use paste special, right click where you want the cells to go, then under "paste options", select the square with numbers in it, which stands for "values".

Urban Density
Program Needed: ArcGIS
Estimated Time: 1 hour

1. Gather the necessary shapefiles: land use and city boundary.
2. Select all land uses that are not AG, POS, or PRK.
3. Export to a new shapefile called "DevelopedLandExport".
4. Open the attribute table for the new shapefile. Right click on the shape_area field and click on "statistics". Record the shape area.
5. Look up the most recent population for each city on the Census website: http://www.census.gov/popest/estimates.html
    a. Select "Current Estimates Data," then "Latest Available Complete Vintage" for "Cities and Towns").
    b. Select "All Incorporated Places," then download State excel files (XLS) to find population estimates.
6. Data for 2010 (and every 10 years) should be gathered from the U.S. Census at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

b. Select “Topics” tab
c. “People,” “Basic Count/Estimate,” “Population Total,” exit popup.
d. Select “Geography” tab
e. In “Select geography type” drop-down menu, select “County,” then “Iowa,” then “Dubuque County, Iowa,” then “Add to your selections,” then close pop-up.
f. Select file DP-01 and record population.

Divide each city’s population by its developed area; this is the final urban density statistic.

Healthy Local Foods

Indicator: Community Gardens
Time: 5 hours

Iowa:
Data for the cities of Dubuque, IA and Ames, IA was derived by contacting each community garden project coordinator via e-mail and telephone. Project coordinators contacted for the City of Dubuque include:

Mary Purdy: mary_purdy@hotmail.com
Kathy Eldridge-Hutton: keldridgehutton@aol.com
Mary Lou Baal: 563-583-1709
Christine Happ Olson: 563-557-7292
Jeanna Schiltz: 563-588-9229
Megan Horstman: 1160Dietitian1@hy-vee.com

Project coordinators contacted for the City of Ames include:

Stephanie Corbett: Stephanie.corbett@vcstory.org
Susan Lammers: slammers@iastate.edu
Laura Logsdon: 515-268-5323
Todd Jorgensen: 515-233-1872

Wisconsin:

Data for Oshkosh, WI was derived from contacting each community garden project coordinator via e-mail and telephone.

Project coordinators contacted for the City of Oshkosh include:

Nick Schneider: NSchneider@co.winnebago.wi.us
Jeff Decker: 715-321-0905
Paul Van Auken: vanaukep@uwosh.edu

Minnesota:
Data for St. Cloud, MN was derived from the St. Cloud Area Community Garden Directory. The website can be reached from the following link; http://www.co.benton.mn.us/Human_Services/ship/St.%20Cloud%20Area%20Community%20Garden%20Directory_Spring%202011.pdf.

Indicator: Farmers Markets
Time: 2 hours

Iowa:
Data for Dubuque was retrieved from a 2011 Farmers' Market Study. The resource was provided by Cori Burbach. Data for this indicator for Ames was derived from contacting each farmers' market project coordinator individually via e-mail and/or telephone. In the provided study, information derived from Tom Drenthe (director@amesdowntown.org) of the Ames Main Street Farmers Market was included.

Wisconsin:

Data was derived from contacting the project coordinators of each farmers market via e-mail and/or telephone. Information from Dennis Leatherman (920-426-1821) of the Oshkosh Saturday's Farmers Market was included in the report.

Indicator: Healthy Diets
Time: 30 minutes

Data for this indicator for Dubuque and each city's county was derived from the U.S. Health and Human Services website. The page is titled, Community Health Status Indicators (CHSI).

1. Once on the website, use the dropdown boxes on the left of the screen to select a year, state, and county(Information for this indicator is unavailable on the city level).
2. Click on "Display Data," then on the left side of the website select "Risks for Premature Death."
3. There is a bar graph located in the center of the page illustrating the percentage of residents in the chosen county who consume, "Few Fruits and Vegetables." The data specifies individuals who do not eat a daily amount of adequate fruits and vegetables, but the chosen indicator identifies the percentage of adults who do consume an adequate daily amount of fruits and vegetables.
4. To find the final percentage of adults in a county who consume an adequate daily amount of fruits and vegetables, subtract the listed number on the bar graph from 100%.

An adequate amount of fruits and vegetables is defined as 5 or more servings of fruit and vegetable servings per day. The link to the website's homepage is provided below:

http://communityhealth.hhs.gov/chsi2008/homepage.aspx?j=1

Indicator: Obesity
Time: 15 minutes

Data for this indicator for Dubuque and each city's county was derived from the Department of Human Health and Services Centers for Disease Control and Prevention website. The link provided below will take the user directly to a page that displays County Level Estimates of Obesity for each state.

1. Under the "indicator" drop down menu select "obesity" and under the state drop down menu select the desired state.
2. Select the desired year and under "Data Type" select the "% of adults" option.
3. Slide the cursor over the desired county and the percentage of obese adults in the chosen county will be provided in the box below.
4. Since the data is derived from a sample, the lower and upper 95% confidence intervals and the standard deviation are also included.

The link to the website's homepage is provided below:

http://apps.nccd.cdc.gov/DDT_STRS2/CountyPrevalenceData.aspx?mode=OBS

Indicator: Local Institutions
Time: 2 hours

Data for this indicator for Dubuque was derived from contacting a representative from each of the chosen local institutions. Local institutions included are nursing homes, hospitals, Dubuque Community School District, and the three collegiate programs in Dubuque. The following institutions were contacted:

Manor Care Health Service, Sunset Park Place Retirement Community, Heritage Manor Rehabilitation and Independent Living, Stonehill Franciscan Services, Dubuque Community School District, Clarke College, Dubuque University, and Loras College.

Indicator: Accessibility
Time: 2 hours

Data for this indicator for Dubuque and for all of the comparison cities was derived from the USDA Food Desert Locator. The link provided below will take the user directly to a page that displays the census tracts defined as a food desert and their populations.

1. Select "Enter Locator" at the top of the page.
2. Zoom into the preferred location (the census tracts that are highlighted in pink are considered food deserts).

Dubuque and St. Cloud do not have any food deserts; therefore do not have any census tracts colored pink. However, for Ames, Decatur, and Oshkosh, the number of residents living over one mile away from a supermarket or a large grocery store was found within each food desert.

3. Click on the census tract of choice and scroll down and find the number of people within each desired tract with access.
4. Total the number of people within each tract.
5. This total was divided by the total population of the county to determine the final percentage of residents living in a food desert who live over a mile away from a supermarket or a large grocery store.

The population totals can be found here:

1. http://www.census.gov/popest/estimates.html (select "Current Estimates Data," then "Latest Available Complete Vintage" for "Cities and Towns").
    a. Select "All Incorporated Places," then download State excel files (XLS) to find population estimates.

2. Data for 2010 (and every 10 years) should be gathered from the U.S. Census at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml
    a. Select "Topics" tab
    b. "People," "Basic Count/Estimate," "Population Total," exit popup.
    c. Select "Geography" tab
    d. In "Select geography type" drop-down menu, select "County," then "Iowa," then "Dubuque County, Iowa," then "Add to your selections," then close pop-up. Select file DP-01 and record population.

The link to the USDA Food Desert Locator is provided below:

http://www.ers.usda.gov/Data/FoodDesert/fooddesert.html

Smart Resource Use

Indicator: Total Water Consumption
Time: 15 minutes

Data collection to measure the total water consumption of Dubuque residents was based on measures acquired from Rose Hoerner, the Utility Billing Supervisor, at the City of Dubuque Utility Department based on prior years water use and billing data. The data was acquired as metered gallons per household, which was then averaged for each available year.

Rose Hoerner
Utility Billing Supervisor
563.589.4143
rhoerner@cityofdubuque.org

Indicator: Groundwater Conservation
Time: 1 hour

The net water withdrawal of the Jordan Aquifer near Dubuque was determined by acquiring standing water level data from Jacqueline Rodriguez, the Water Plant Manager, at the City of Dubuque Water Department and the Iowa DNR Geological Department's GEOSAM database of the four primary deep water wells utilized by the City of Dubuque. Deep water sources are less resilient to changing climate and human impact and provided a better measure of overall water supply sustainability, and therefore the alluvial well measures were not incorporated. Data from the Iowa DNR's GEOSAM database provides historical information on water levels of local Dubuque water supplies, of which the static water levels of the four deep water wells were obtained for the earliest years available. The earliest static water level available was for Well 6 in 1935; therefore Well 6 was used as the baseline measure as it provided the most comprehensive measure to determine long-term groundwater withdrawal trending.

1. More recent, monthly measures of local static water levels of the Jordan Aquifer, at Well 6, below Dubuque were acquired from Dubuque's Water Department.
2. These monthly static water levels were averaged for each year from 2005-2011.
3. The change in the static water level from 1935 was determined for each year as a net change.
4. The data for this indicator was displayed as the net water extracted, in feet, since the 1935 static water level of Well 6.

Jacqueline Rodriguez
Water Plant Manager
563.589.4291
jrodrigu@cityofdubuque.org

Indicator: Sustainable Materials Management
Time: 1 hour

Landfill diversion was determined based on the percent of solid materials that were recycled, reused, or composted through municipal collection services only. This data was acquired from Paul Schultz, the Resource Management Coordinator of the City of Dubuque's Public Works Department. The data consisted primarily of household solid materials collected per month, which includes refuse, recyclables, and yard waste.

1. The monthly amount, in tons, of recyclables and yard waste diverted to the local recycling center and composting facility were classified as 'solids diverted' as they did not go to the landfill, which was averaged for each year available.
2. The amount of solids diverted is then taken as a percent of the total tons of all residential refuse, recyclables, and yard waste collected for each year from 2006 to 2011.
3. The same process was completed for the City of Oshkosh, where the city data was received from John Rabe at the Winnebago County Landfill.

Paul Schultz
Resource Management Coordinator
563.589.4250
pschultz@cityofdubuque.org

Indicator: Trash/Refuse Generation
Time: 30 minutes

Trash/refuse generation was measured based on the amount of solid discards produced per household, which is based on municipal collection services only. The measure of solid discards generated includes routinely produced discards, or refuse, that enters the landfill.

1. The solid discards data was collected from the City of Dubuque Public Works Department as the tonnage collected within Dubuque by city services.
2. The total tons of material were then converted to pounds of solid discards by multiplying the amount in tons by 2,000 (1 ton = 2,000 pounds).
3. Data regarding the annual number of households within Dubuque was acquired through the City of Dubuque as the number of households who are customers of the city curbside collection service. The number of customers estimated on an annual basis is calculated from the total base monthly fee revenues divided by the monthly base fee and adjusted slightly for customers subscribing to tipper carts and not paying a monthly base fee.
4. The annual number of household customers from 2006 to 2010 was used to normalize the poundage of solid discards generated by household in the City of Dubuque.
5. Data was processed the same for the City of Oshkosh, which was received from John Rabe at the Winnebago County Landfill.

Indicator: Building Material Reuse & Recycling
Time: 30 minutes

The data acquired for building material reuse and recycling was provided by Chuck Goddard the Dubuque Metro Area Solid Waste Agency's Administrator (DMASWA), which included a breakdown of the tons of building and construction material that was diverted from the landfill and either, recycled or reused in other ways. The data was the result of local deconstruction projects only within the City of Dubuque that successfully reported the breakdown of the deconstructed materials produced and their end destination. The data was displayed as a percent of the total materials produced as a result of deconstruction projects from 2006 to 2011.

Chuck Goddard
DMASWA Administrator
563.589.4250
cgoddard@cityofdubuque.org

Indicator: Household/Small Business Hazardous Waste
Time: 1 hour

Participation in proper hazardous waste disposal was determined by the percentage of residents making efforts to dispose of their household or small business hazardous waste.

1. This data was acquired from Chuck Goddard, Administrator, at the Dubuque Metro Area Solid Waste Agency (DMASWA) as the number of households participating in either facility drop-off or mobile drop-off of hazardous materials.
2. The number of households that the Dubuque Metro Area Solid Waste Agency has the potential to serve was determined using the number of households within the Dubuque metropolitan-area. This number was provided by the State Data Center of Iowa using 1-year population estimates from the American Community Survey.
3. The total number of households participating in hazardous waste disposal was divided by the total number of households within the metropolitan area, and multiplied by 100 to determine a percentage.
4. This data is not currently tracked at the city or zip code level by the DMASWA, and there the measure was conducted at the metropolitan level until data at the city level becomes available.

http://www.iowadatacenter.org/

Chuck Goddard
DMASWA Administrator
563.589.4250
cgoddard@cityofdubuque.org

Clean Water

Indicator: Impaired Stream Segments
Program Needed: ArcGIS
Time: 5 hours

The number of miles of impaired stream segments was determined using the U.S. EPA's 305(b) Assessed Waters document, which provided a detailed list of assessed and impaired stream segments by coordinate location, the length of the segment, and cause of impairment. The assessed and impaired stream segments were digitized using ArcGIS software for the years 2006, 2008, and 2010 in order to calculate the total length of the assessed waterway as well as the length of the impaired segment. EPA only provides data for even years. Although the EPA provides shapefiles of the impaired waterways, they do not always seem to be comprehensive and they do not provide the total assessed waters. However, first compare the 305(b) Assessed Waters list with the shapefile to see if the shapefile is comprehensive, this will save time digitizing, or minimize digitizing if only a few stream segments need to be added to the shapefile.

1. Go to EPA's: WATERS→AskWATERS→Main Menu→Expert Query→Assessed 305(b) Waters
2. Select 'Region 7', 'Iowa', and the desired cycle year to display all assessed and impaired waters.
3. Select the 'Actions' button and 'download' to download all data to an excel spreadsheet for easy manipulation.
4. Once opened in excel, select all data and under 'sort & filter' select 'custom sort'.
5. Sort the data first by 'cycle status'.
6. Then select 'find' and type the desired county which is being assessed.
7. Color all the rows including the desired county with a single color.
8. Select all data again and choose 'sort & filter' and 'custom sort'.
9. Select 'add level', choose 'cycle status' for the column, and sort on 'cell color', and choose the designated color that was used for the county.
10. From here, only the data that is colored and has a cycle status of 'impaired' or 'good' should be considered.
11. Using ArcGIS, compile county and stream files from ESRI and the Iowa DNR for the county of interest, as well as the surrounding counties and turn on labels of the streams.
12. Using the data in the excel spreadsheet, identify the starting location of the assessed waterway; if the start and end points of the waterway lie within the county, the total miles listed in the 305(b) list can be included, otherwise the portion of the waterway outside the county must be digitized by creating a new feature class or traced using the 'measure' tool in ArcGIS.
13. If digitizing, the total length can be calculated by selecting the 'measure' tool and selecting 'feature' and clicking on the feature.
14. Once the miles of the waterways outside the county are calculated, they can be subtracted from the total of that segment listed in the 305(b) list.
15. Add the total stream miles assessed together; add the total impaired miles together and divide by the total assessed to get the percentage of assessed miles which are impaired in the chosen county.
16. This same process was conducted for both Story County, IA and Stearns County, MN, as 2010 data for both Winnebago County, WI and Macon County, IL was still unavailable.

Indicator: Bacterial Concentration
Time: 3 hours

Bacterial concentration, more specifically E. coli concentration (colonies/100 mL), was acquired by utilizing the U.S. EPA's MY Waters Mapper, as well as the Iowa DNR's IOWATER database.

1. Go to EPA→water→WATERS→Tools→MyWATERS Mapper
2. Type the address of interest into the 'Go to' box and under 'Other EPA Water Data' check 'STORET Water Monitoring Stations' box.
3. The water monitoring stations will appear as blue water drops; identify EPA water monitoring stations within the city's boundary by clicking on the station.
4. Make an excel spreadsheet of all the water monitoring stations within the city's boundary.
5. Go to: http://www.iowater.net/ and click on: database→online database→view data
6. Enter the each station ID into the 'site no.' box and select 'get site'.
7. E. coli concentrations will be found under 'chemical/physical log', click on the yellow bar to open up all the result for that particular station, which can be copied into an excel spreadsheet.
8. Once all data has been collected from the IOWATER site and copied into excel, organize the excel spreadsheet by highlighting all the data, selecting 'sort & filter' and 'custom sort', select the 'site_no' column to sort by and sort lowest to highest.
9. Then select 'add level' and select 'DateMonitored' and sort highest to lowest.
10. Average the values for each year from 2006 to 2011 for each monitoring station, and select the highest value from all stations for a given year to display the highest average E. coli concentration found within the city for each year from 2006 to 2011.

Indicator: Chloride Concentration
Time: 3 hours

Chloride concentration (mg/L) was acquired using EPA's MyWater's Mapper and Iowa's STORET database.

1. See steps 1-4 under the Bacterial Concentration indicator to find all EPA water monitoring stations within Dubuque and each comparison city.
2. Go to Iowa DNR's STORET database by going to: https://programs.iowadnr.gov/iastoret/
3. Select 'search by county' or 'search by station' and select a search date range.
4. Match the station number with the stations identified using EPA's MyWATER'S Mapper and select 'submit'.
5. Under 'select analyte' select 'chloride' as the element being assessed.
6. In the drop-down menu at the top-right of the page, select 'excel' and export to transfer the data into an excel spreadsheet, one station per excel page.
7. Select all the data and choose 'sort & filter' then 'custom sort' and sort the data by 'date/time'.
8. Average the chloride concentration for each monitoring station for each year, using the highest average measure per year as the indicator measure.

Indicator: Ground/Drinking Water Contamination
Time: 2 hours

Groundwater/drinking water contamination data was acquired using the EPA's Safe Drinking Water Information System (SDWIS). This analysis includes all public water systems within the city, which includes those that are community systems that serve the same population all year long, as well as those that serve the same population but not year round (Non-Transient Non-Community) and that do not serve the same population (Transient Non-Community). All of these systems have the potential to serve the city's population and those visiting the city and are therefore important to the sustainability of local drinking water supplies.

1. Access the EPA's SDWIS by going to: EPA→Envirofacts→SDWIS→Search
2. Select the state of interest, select the county, and select 'search'
3. Select each of the public water systems included in 'Community Water Systems', 'Non-Transient Non-Community Water Systems', and 'Transient Non-Community Water Systems' to determine whether the water system exists within the city of interest.
4. If the water supply exists within the city, distinguish between the 'health-based' water violations and the 'monitoring, reporting, or other' violations.
5. Assess only the health-based violations, and create an excel spreadsheet for each year from 2006 to 2011 to record the number of health-based violations per year.
6. Add all health-based violation for all of the public drinking water supplies within the city for the necessary years determined.
7. Repeat this process for: Story County, IA and identifying systems within Ames, IA; Stearns County, MN and identifying systems within St. Cloud, MN; Winnebago County, WI and identifying systems within Oshkosh, WI; and for Macon County, IL and identifying systems within Decatur, IL.

Indicator: Wastewater Discharged
Time: 15 minutes

The amount of wastewater discharged, in gallons, as a result of sanitary sewer overflows was provided by John Klostermann, the Street and Sewer Maintenance Supervisor, for the City of Dubuque Public Works Department. The data was reported as the total gallons of sanitary sewer wastewater that was discharged from 2006 to 2011 and graphed for each year using Excel.

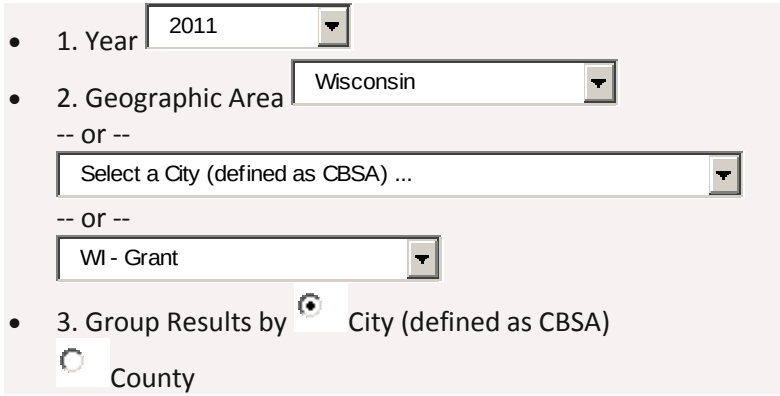
John Klostermann
Street & Sewer Maintenance Supervisor
563.589.4250
jkloster@cityofdubuque.org

Healthy Air

Indicator: Outdoor Air Quality
Time: 1 hour

The EPA Air Quality Index is found online at http://www.epa.gov/airdata/ad_rep_aqi.html. This searchable database displays an annual summary of AQI values for counties or core based statistical areas (CBSA). Although AQI includes all available pollutant measurements, you should be aware that many areas have monitoring stations for some, but not all, of the pollutants. Each row of the AQI Report lists summary values for one year for one county or CBSA. The summary values include both qualitative measures (days of the year having "good" air quality, for example) and descriptive statistics (median AQI value, for example).

To access data for the City of Dubuque, the Potosi, WI monitoring station is used as the closest measure. To display this information you must search by county; Grant County, WI is used. The Potosi station is the only monitoring station in Grant County, WI is approximately 13 miles from Dubuque.



Geographic Area: Grant County, WI
Summary: by County
Year: 2011

The following data links are active for the next 10 minutes, after which you must resubmit your query.
Download PDF (printable page)
Download CSV (spreadsheet)

Comparison city data are accessible using this method. Tabulating the results can be done manually in Excel. Data interpretation for this indicator involves assessing the number of days monitored in the "Good" category and finding the percent (total days in "good" category / total days monitored * 100%). It should be noted that monitoring days per year vary by station; e.g., 185 days of the year and 365 days of the year were monitored in Decatur, IL, therefore the numbers must be converted to percent in order to make an accurate comparison.

For a complete profile of the air quality, the number of days in the Moderate and Unhealthy for Sensitive Groups should also be calculated.

Indicator: Indoor Air Quality
Time: 1 hour

Indoor air quality measures household radon levels. This data is available on the Iowa Department of Public Health at http://www.idph.state.ia.us/eh/radon.asp and http://www.idph.state.ia.us/eh/common/pdf/radon/radon_zipcode_data_2010.pdf. Data is available by zip code only. Therefore, to determine the household radon levels for Dubuque you must search for the following 3 zip codes: 52001, 52002, and 52003. Two datasets are available: a spreadsheet totaling radon levels from 1990 – 2010 and data for 2010 only.

Ames, IA: the same spreadsheet and methodology applies from Dubuque. The zip codes for Ames include 50010 and 50012 (for 2010 only); and 50010, 50011, 50012 (for 1990 – 2010).

Data for subsequent years may be listed on the website; if not, the Iowa Department of Public Health is the main contact organization for this information.

Indicator: Asthma
Time: N/A

Data for the number of emergency department visits for asthma is collected by the Iowa Department of Public Health and the Iowa Hospital Association. This information is available only through the public health specialist for Dubuque, Mary Rose Corrigan. The database is found at http://www.ihaonline.org/infoservices/databank/databank.shtml; only authorized users can access this information.

The IHA DATABANK Program is a web-based database of hospital utilization, financial performance, and balance sheet indicators. The database is the source of comparable information on inpatient utilization, outpatient statistics, charges and expenses per day and per stay, uncollected charges, number of days in accounts receivable gross, profitability, financial ratios and a number of personnel statistics.

Indicator: CO2 Emissions
Time: 30 minutes

This indicator is compiled with data found in the Dubuque GHG Plan of 2011, accessible online at http://greendubuque.org/wp-content/uploads/2012/02/DubuqueGHGplan-full_V1.pdf. The local emissions profile of Dubuque will be monitored annually; the main contact person to update the annual CO2e emissions of the City is Raki Giannakouros, who is associated with Green Dubuque, a nonprofit. You may also contact Cori Burbach for this information.

In April 2010, the GreenDubuque organization, in collaboration with the city of Dubuque developed the above assessment report. The inventory cataloged emissions for Dubuque's municipal government operations and for the community as a whole. The inventory included Scope 1 emissions (direct GHG emissions, except for biogenic CO2) and Scope 2 emissions (indirect GHG emissions from consumption of purchased o acquired electricity, steam, heating, or cooling). Data for 2011 is to be released within May.

Raki Giannakouros
raki@greendubuque.org
(563) 542-6680

Indicator: Clean Fleet
Time: N/A

Data for this indicator requires personal communication with Kathy Masterpol at the City of Dubuque. Data provided includes the

current fleet; number of vehicles by type (E85, biodiesel, E10). The data provided also contains information of miles driven and gallons used, per year, per vehicle.

Kathy Masterpool
Kmaster@cityofdubuque.org

This indicator also includes monitoring transportation initiatives that reduce greenhouse gas emissions. The data for the transportation initiatives is found in the Dubuque GHG Plan of 2011, accessible online at http://greendubuque.org/wp-content/uploads/2012/02/DubuqueGHGplan-full_V1.pdf.

Native Plants and Animals

Indicator: Wildlife Abundance
Time: 2 hours

The annual Audubon Society Christmas Bird Count is accessible online. The bird count data is used for an assessment tool of wildlife diversity. All comparison cities except Oshkosh, WI have historical and current year Christmas Bird Count data.

For current year data: http://netapp.audubon.org/cbcobservation/ObservationCircle.aspx

For historical results: http://netapp.audubon.org/cbcobservation/Historical/CircleData.aspx

The online tool is searchable by bird county survey code, or by county. The count for Dubuque is IADU. The table results are downloadable by PDF, Excel, CVS or Word. In order to compile all the data however, a chart was used in Excel. For example:

Dubuque, IA (IADU)	2011	2010	2009	2008	2007	2006
Survey Details	**2011 (112)**	**2010 (111)**	**2009 (110)**	**2008 (109)**	**2007 (108)**	**2006 (107)**
Count Date	17-Dec-11	18-Dec-10	2-Jan-10	3-Jan-09	29-Dec-07	30-Dec-06
Number of Participants	13	15	16	11	15	17
Number of Party Hours	45.75	39.5	45.75	27.5	43	47
Species Reported	**56**	**51**	**43**	**42**	**59**	**43**
Low Temperature	31	5	-9	17	18	37
High Temperature	34	15	4	31	28	47
Species	**2011 (112)**	**2010 (111)**	**2009 (110)**	**2008 (109)**	**2007 (108)**	**2006 (107)**
Greater White-fronted goose						
Cackling Goose						
Canada Goose	239	39	205	412	298	25
Trumpeter Swan	15	1				
Wood Duck	1					

(all species listed…)

The contact person for Audubon Society:

Geoffrey S. LeBaron
Christmas Bird Count Director

cbcadmin@audubon.org
Christmas Bird Count
National Audubon Society
545 Almshouse Road
Ivyland PA 18974

Alternatively the Dubuque Audubon Society can be contacted at:

Dubuque Audubon Society
P.O. Box 3174 Dubuque, IA 52004-3174
563-582-7215
www.audubonduque.org

Indicator: Prairies and Wetlands
Time: N/A

Data for the number of acres for prairies and wetlands is found with the Department of Leisure Services. Data is available on number of established, restored and new prairie plantings, and wetlands. Although not accessible at time of print, this indicator data should be available for future years.

Marie Ware
Leisure Services Manager
Leisure Services
Phone: 563.589.4264

Indicator: Urban Forest
Time: 1 hour

Data for the diversity of tree species is found in the 2011 Urban Forest Evaluation report. This report does not provide historical information, nor does historical data exist for tree species. This indicator therefore is a baseline for future assessment reports or urban forest evaluations.

The report is available at http://www.cityofdubuque.org/DocumentView.aspx?DID=3142. The main contact person for the evaluation study is

Marie Ware
Leisure Services Manager
Leisure Services
Phone: 563.589.4264

Indicator: Toxic Chemical Use
Time: N/A

Data for this indicator is difficult to find and also relies upon personal contact with City staff. Pat Prevenas is the main contact person that provides the fertilizer, pesticide and herbicides used on the Bunker Hill golf course and other municipal lands.

Patrick Prevenas
Recreation Division Manager
City of Dubuque, Iowa Leisure Services Dept
2200 Bunker Hill Road, 52001
563-589-4263
563-589-4391(fax)
pprevana@cityofdubuque.org

Margins of Error (for the Gender Wage Gap, Affordable Housing, and Educational Disparity indicators)

The margins of error must be calculated for these three indicators. The data for these indicators comes from the U.S. Census Bureau's American Community Survey (ACS). The ACS provides margins of error for each of its estimates, however, the data for these indicators are based on multiple estimates, and thus the margins of error for each estimate must be combined to determine the overall margin of error for the indicator.

According to the American Community Survey General Handbook (available at http://www.census.gov/acs/www/Downloads/handbooks/ACSGeneralHandbook.pdf), there are three basic formulas for determining margins of error.

For **derived ratios**, where $\hat{R}$ = the ratio, and $\hat{X}_{den}$ = the estimate for the denominator, the Margin of Error for the ratio (MOE_R) is calculated as follows:

$$MOE_R = \frac{\pm\sqrt{MOE_{num}^2 + (\hat{R}^2 * MOE_{den}^2)}}{\hat{X}_{den}}$$

For **derived proportions**, where $\hat{P}$ = the proportion and $\hat{X}_{den}$ = the estimate for the denominator, the margin of error for the proportion (MOE_P) is calculated as follows:

$$MOE_p = \frac{\pm\sqrt{MOE_{num}^2 - (\hat{p}^2 * MOE_{den}^2)}}{\hat{X}_{den}}$$

For **aggregated counts**, use the following formula:

$$MOE_{agg} = \pm\sqrt{\sum_c MOE_c^2}$$

where MOE_c is the MOE of the c^{th} component estimate.

Worksheets for calculating the margin of error for the three indicators are included with the 2012 Progress Report's data spreadsheets. The instructions below provide supplementary information for these calculations. (Note: these MOE formulas only apply to data derived from the American Community Survey. If estimates are derived from estimates from the U.S. Census's decennial census (also known as the long-form census, which is available in Summary File 3 or Summary File 4), different formulas must be used to calculate the total margin of error. The long-form

census was discontinued in 2010, and thus these formulas are not described below, since they will not be required for future updates to the report).

Gender Wage Gap

This indicator requires calculation of a **ratio**, and thus the **"derived ratio"** formula is used to determine the margin of error.

1. The ratio for this indicator is the median female earnings divided by the median male earnings. Take the margin of error for the male earnings (the denominator), and square it. Multiply this by the square of the ratio. Add this to the square of the margin of error for the median female earnings (the numerator). Take the square root of this number. Finally, divide by the median earnings for males. The resulting statistic is the margin of error for the ratio of female earnings to male earnings.

Affordable Housing

This indicator requires **adding** up several sub-populations to determine how many households are housing cost-burdened. Next, the **proportion** of housing cost burdened households is calculated.

1. The census reports housing cost burden by income category. There are four income categories reported, from "less than $20,000" to "$75,000 or more". Each of these income categories will have an estimate for the number of households paying over 30% for housing. The margins of error for each of these estimates must be added using the **"aggregate counts"** formula. Add the squares of each margin of error for owner-occupied households. Take the square root. Do the same for renter-occupied households, to determine its own (separate) margin of error.
2. Next, use the **"derived proportion"** formula to determine the margin of error for the percentage of housing-burdened renter households, and the percentage of housing-burdened owner households. The numerator's MOE was calculated in step 1. The denominator's MOE is the MOE for the total number of owner-occupied households or the total number of renter-occupied households. The estimate for the denominator is the number of owner-occupied households or number of renter-occupied households. The following instructions are written for the owner-occupied estimate. Follow the same steps with the renter-occupied households. Square the proportion of housing cost burdened owners and multiply it by the square of the margin of error for the total number of owner households. Subtract that number from the squared margin of error for the number of cost burdened owners. Take the square root, and then divide by the total number of owner households. The resulting number is the margin of error for the indicator.

Educational Disparity

There are three steps to calculating the margin of error for this indicator. First, a margin of error for a **sum** must be calculated, then for a **proportion,** and then for another **sum**. In each case, the margin of error from the previous calculation is utilized for the next

step; with the final step producing the overall margin of error for the indicator.

1. The easiest method of calculating the **number** of residents who have a high school education is to calculate the reverse: the number of residents without a high school education (which is easier than adding up every other education category and trying to calculate the associated margin of error). Add together the number of males and number of females who have an education level of "less than high school diploma". The margin of error for the estimate of this number is calculated by using the **"aggregated counts"** formula. For each race, the margin of error for the males and females must be added using this formula (square the margin of error for males, add it to the square margin of error for females, then take the square root).
2. Next, a margin of error must be calculated for the **proportion** of each race that have less than a high school education. The numerator for this calculation is the number of residents with less than a high school education. The denominator is the total population of the race. To calculate this margin of error, you need the margin of error for the numerator (which you calculated in step 1), the margin of error for the denominator (which is provided in the census data), and the proportion (or percentage) of residents that have less than a high school education. Use the **"derived proportions"** formula. Multiply the square of the proportion by the square of the denominator's MOE. Subtract that from the squared margin of error for the numerator. Take the square root, and then divide by the total population of the race.
3. The final step in calculating the indicator is subtracting the percentage of attainment for the racial group with the lowest percentage from the percentage of attainment from the racial group with the highest percentage. This resulting number if the percentage point disparity (or "disparity"). To calculate the margin of error for the disparity, use the **"aggregate counts"** formula. Add the squared margins of error for each proportion (calculated in step 2), and take the square root. The resulting number is the overall margin of error for the disparity (it is therefore the only margin of error that needs to be reported. The margins of error calculated in steps 1 and 2 both contribute to this final MOE).