



“Giving residents and businesses the information they need to do what they want.”

What is Smarter Sustainable Dubuque?

Smarter Sustainable Dubuque is the research function of the Sustainable Dubuque initiative, which began in 2006 when Dubuque, Iowa Mayor Roy D. Buol and the City Council made it a top priority for the City.



Sustainable Dubuque seeks to make Dubuque a community that meets the environmental, economic, and social equity needs of its residents today without reducing the ability of future generations to meet their needs. This approach is unique in Dubuque in that it is a citizen-driven process guided by a vision and principles developed by the community.

Smarter Sustainable Dubuque is a public/private partnership between the City of Dubuque and a diverse group of partners, including IBM Watson Research Center, the division of IBM responsible for its “Smarter Planet” initiative. The project was initiated in September 2009 when the City of Dubuque and IBM Watson Research Center announced their intentions to make Dubuque one of the first “smarter” sustainable cities in the U.S. The first \$30,000 in “seed” money was provided by the Greater Dubuque Development Corporation. It has grown into a collaboration that includes over two dozen industries and eight state and

federal agencies.

In a nutshell, it is the development of new “smarter” technologies coupled with community outreach and implementation strategies to create a replicable, international model of sustainability for communities of 200,000 and under, where over 40 percent of the U.S. population resides. The model will integrate community engagement and education, more energy-efficient ways of operating municipal services and buildings, decreased carbon emissions, new job creation, increased financial savings, resource conservation, and a higher quality of life for the entire community. It will also document the improvement to competitive opportunities that comes through “smarter” resource utilization.

Smarter Sustainable Dubuque is providing Dubuque residents and businesses what they need (information and tools specific to their circumstances) to do what they want (save money, conserve resources, improve the local economy and environment, and improve their health). The initiative is engaging Dubuque residents and businesses who, through advanced technology, are better managing their use of resources like water, electricity, and oil. The program is expanding to improve the health and wellness of the community through collaboration with efforts such as the Green and Healthy Homes Initiative.

HOW IS DUBUQUE GETTING SMARTER?

With the support of public and private partners, Dubuque is exploring and using new “smarter” technologies and strategies to deliver or better utilize vital services such as water, energy, and transportation to its citizens while reducing the community’s impact on the environment. These new technologies digitize and connect city systems, sense, analyze and integrate data, and allow Dubuque to respond intelligently to the needs of citizens. It also provides consumers and businesses the information specific to their households or businesses that they need to make informed decisions about how they can reduce consumption and improve their economic bottom lines. Collecting and analyzing this information is giving consumers and city policymakers new insights on how to conserve Dubuque’s resources, become more sustainable, and improve their opportunities in an increasingly competitive world economy.

PARTNERSHIPS

SUSTAINABLE INNOVATION CONSORTIUM

Facilitated by Greater Dubuque Development Corporation, this regional cluster initiative is designed to research, analyze, and implement regional efforts to grow the “sustainability and innovation industry” in the region. From traditional manufacturing to internet technologies, these companies are documenting hundreds of jobs created or retained through expansion of the sustainability industry in Dubuque.

STARTUP DUBUQUE

StartUp Dubuque is a one-stop-shop that brings together key partners in one centralized location. From entrepreneurial counseling to business plan development, from a co-working environment to access to resources an entrepreneur or small business owner may need, StartUp Dubuque has all of the resources to help aspiring entrepreneurs.

PETAL PROJECT

Sponsored by the East Central Intergovernmental Association, this green business certification program recognizes organizations dedicated to reducing their energy, water, and natural resource use to benefit the environment and their bottom line.

DUBUQUEWORKS

This seven-organization partnership was formed to analyze and revitalize existing workforce strategies, identify and address workforce gaps, and seamlessly provide workforce solutions for local companies. DubuqueWorks also addresses workforce issues through Project HOPE, the Bridges Initiative, and other programs to develop the whole person to meet employers’ workforce needs.



SMARTER WATER

Dubuque's Smarter Water pilot study was conducted in conjunction with the City's community-wide water meter replacement project in 2011. It was a unique partnership of local, state, and federal funding partners and private sector vendors to implement innovative technologies and empower citizens and businesses with the information and tools needed to reduce water costs and use.

IBM Watson Research Center technology interfaced with the City's system to process water consumption data and provide near real-time visibility into the overall city water consumption. More than 300 households participated in this 12-month study which helped reduce water utilization by 6.6 percent and increased leak detection and response eight-fold among participants.

The Smarter Water Portal provided a customer-specific, integrated view of water usage. The data was collected hourly and transmitted daily. Usage data was displayed in gallons, cost, or by carbon footprint. The portal also provided leak detection and notification, historical usage data, and comparative data.

SMARTER TRAVEL

The Smarter Travel Study used systems, algorithms, and analytics developed by IBM Watson Research Center to collect data through smartphone technology on how, when, and where study participants traveled in and around Dubuque.

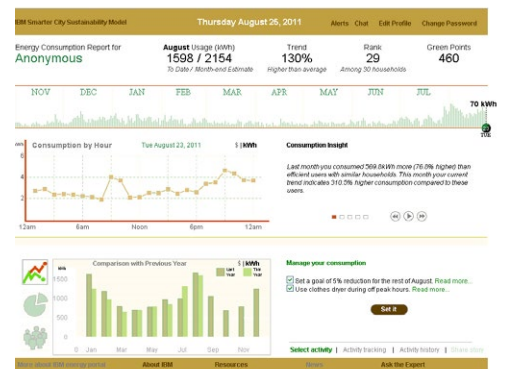
The Smarter Travel Study recruited participants who were traveling in the Dubuque area on a daily basis through various modes; who were interested in improving transit and the travel patterns in Dubuque; and who met diverse demographic and socioeconomic parameters.

The data has been used to generate optimized public transit routes for the The Jule, Dubuque's public transit system. The optimization algorithm minimizes average travel time for bus routes while keeping the operating costs constant and providing routes based on demand during peak and off peak times. This project was selected for a presentation at the 2017 Transportation Research Board (TRB) Annual Meeting.

The City of Dubuque and its partners are using the information generated by this project to build dynamic and adaptive signal coordination system models, evaluate infrastructure project alternatives, and develop technology-based solutions to address local transportation issues. This project was designed to be replicated in metro areas with populations of less than 200,000.

SMARTER ELECTRICITY

Working in partnership with IBM Watson Research Center, Alliant Energy, and the Iowa Office of Energy Independence, the community conducted a multi-million dollar Smarter Electricity pilot study. Involving nearly 1,000 volunteer households, Alliant Energy installed new Advanced Metering Infrastructure (AMI) meters and provided anonymous customer electricity usage data to the City and IBM Watson Research Center for analysis. IBM Watson Research Center used the data to develop a consumer interface system, or portal, enabling study participants to better understand their electricity use in real-time so they could consider changes to save energy, reduce costs, and reduce carbon emissions.



By reviewing historical and real-time current data and analyzing the opportunity for energy savings through the Smarter Electricity pilot, IBM Watson Research Center has determined that roughly 26 percent of average household usage in Dubuque is presently "phantom power" (electricity which is being consumed by appliances when not in use). The savings opportunity is significant.

How do these Smarter Pilot Studies become a Smarter System?

Dubuque is integrating all the individual resources or "silos" of energy into an Integrated Sustainability System. Giving citizens the power to use real-time water information to help reduce their electricity consumption is new. Giving citizens the ability to use their travel and data to improve their health and wellness outcomes is new. This ability to view all personal energy interactions within the community is unique.

SMARTER DISCARDS

The City and IBM Watson Research Center ran the Smarter Discard Pilot Study from June 2013-April 2014, to analyze and improve waste diversion through curbside trash and recycling collection service. The study involved two groups of curbside collection customers, an aggregate group and a volunteer group. The City identified two residential collection areas to participate in this project as the aggregate group establish baseline measurements as well as understand the return-on-investment (ROI) of on-board computing RFID technology. The City also recruited 300 households for the volunteer group to have their discard (refuse, recycling, and food scraps in separate containers) data recorded anonymously by the city solid waste collection crews. IBM Watson Research Center developed a website portal available to the volunteers to provide functionalities that included diversion tips for beneficial use, household goal challenges, available incentives, visualization of data over a period of time, insights into household discard patterns, and analytics that compare discard generation with other households with similar profiles. The volunteers received "green points" based on their performance compared with their peer group's performance and the volunteer's previous performance.

SMARTER HEALTH & WELLNESS

The Smarter Health & Wellness study piloted citizen engagement around physical activity tracking and meeting physical activity goals. During the study, an app used mobile sensing technology to automatically record a user's physical activities. Within the app, users set goals, reviewed physical activity progress, received reminders of goals achieved/not achieved, and logged the physical activities (such as swimming) that could not easily be recorded on the mobile app. An Intelligent Operations Center (IOC) analyzed results for both activity and engagement at an aggregate level. Messaging and engagement could be tailored for the community, showing promise for more targeted programs and communications around health and wellness.



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