WISCONSIN
UNIVERSITY OF WISCONSIN–MADISON

INSIGHTS INTO MUNICIPAL AND COOPERATIVE INTERNET

AGRICULTURAL AND APPLIED ECONOMICS 323: COOPERATIVES

FALL 2016

UNIVERCITY BETTER PLACES TOGETHER

MONONA

June 9, 2017

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ACKNOWLEDGMENTS

Thank you to the following contributors for their guidance and resources in completing this report:

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This report was produced in collaboration with the Agricultural and Applied Economics Department in the College of Agricultural and Life Sciences and the UniverCity Year at UW-Madison.

EXECUTIVE SUMMARY

Municipalities that support broadband infrastructure can offer a vital service for their residents, businesses, and local institutions. Some municipalities, especially in rural areas, do not have a strong presence of for-profit telecommunications companies to meet the Internet needs of the community. Where access from private companies does exist, municipalities cite the high cost of for-profit Internet as a key reason for developing an affordable alternative that all residents can access. Still other local governments have heard their constituents' dismay with low quality and bad customer service as the impetus to provide a more reliable, fast and friendly option. While there are multiple reasons why municipalities have explored providing Internet service, the common understanding is that Internet is critical to socially and economically participating in today's society, just as electricity was a century ago. Providing Internet as a public good, therefore, benefits the whole community and helps drive economic development forward.

This report shares research and recommendations from UW-Madison's AAE323: Cooperatives class on how municipalities and cooperatives provide consumers with alternatives to private Internet service, both nationally and here in Wisconsin. In collaboration with City of Monona's Community Media Director, Will Nimmow, the class also ran two focus groups and an online survey for Monona businesses to share their Internet needs and level of interest in developing a cooperatively-run service. This report includes a summary of feedback from these forums to help guide the City of Monona in taking their next steps in consideration to municipal broadband.

As the City of Madison currently considers expanding their fiber optic cable to a Fiber-to-the-Premises system, it may be opportune to explore the possibilities of working with them to bring this infrastructure to the City of Monona as well. Because Madison will be working with a much larger geographic area to implement their project, the economy of scale may make it more cost effective for Monona to invest in building more fiber optic channels at this juncture. However, it would still likely cost significantly more than administering Wi-Fi to businesses or residents through radio tower alone, as considered in the city's initial direction for the project. Chippewa Valley Internetworking Consortium's model, detailed in Section 4 of the report, may serve as an alternative model for Monona's interests. Leveraging the power of partnership and cooperation, the area between Eau Claire and Chippewa Falls provides fiber optic Internet service to anchor institutions while servicing residents and small businesses with Wi-Fi via radio tower.

> ***"Though there are less expensive options, fiber optic cable provides optimum reliability, quality and customer satisfaction."***
>
> ***-AAE 323 students***

Ultimately, with further research on community interest, providing a municipally-supported Internet option for Monona's residents may prove to be a worthy investment for the city. Creating more Internet service choices may help to not just raise the quality of life for current community members, but also attract new families and businesses to the municipality. The students of AAE323 hope the following information helps to inform the City of Monona's ultimate direction with providing municipally-supported broadband to their community.

INTRODUCTION

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Since the early 2000s, municipal broadband projects have received significant attention from many cities throughout the United States seeking to better meet the Internet needs of their communities. As of January 2015, approximately 500 municipal entities served residents and businesses with broadband access through publicly-owned fiber optic or cable channels (Community Broadband Networks 2015).

The term broadband is used to speak of high-speed Internet that connects users to websites and other material online faster than a telephone dial-up connection. Most users access the Internet through a wireless network, abbreviated in this report as Wi-Fi. Wi-Fi is transmitted through radio waves from a tower that is connected to coaxial, fiber optic, or copper (DSL) channels (Broadband Reference Guide 2014). Depending on the connection line used in the system, broadband may differ in how long it takes for websites to process or for data to download or upload. Glass fiber optic cables are considered the "gold standard" in the context of current technology options, as their carrying capacity for information is almost unlimited and they are more durable than other cable materials (Broadband 101 2013).

Cities that consider using a municipal broadband system have different reasons for wanting to introduce the new system, rather than relying on for-profit commercial service providers. One important factor that drives certain communities to consider adopting a municipal broadband service is inadequate service, or, in some cases, complete lack of service from the existing Internet Service Providers (ISPs). Lack of service tends to especially be a problem in rural areas, such as farming communities, where it would not be worthwhile for profit driven companies to put up expensive infrastructure to provide Wi-Fi for a small population.

Beyond necessity, there are a number of social and economic reasons that cause communities to consider investing in municipal broadband systems. Some examples of social and economic reasons for adopting a municipal broadband system are the city's desire for increased digital inclusion in the community, reduced price for broadband,

Photo by Bryce Richter/UW-Madison, © Board of Regents of the University of Wisconsin System

increased economic development, and improved public safety or internal governmental communications. The reasons that cities have for considering municipal broadband, as well as the goals that the cities wants to accomplish with municipal Wi-Fi, affect the layout and structure of their municipal system. Reliability, speed, security, and coverage range are examples of just some of the characteristics that cities must consider when determining what they want from their municipal broadband system. As a result, cases of municipal broadband services can differ greatly both in terms of goals and infrastructure.

The following report reviews major municipal broadband policies and projects, both nationally and here in Wisconsin. The results of two focus groups and an online survey geared to local Monona businesses are also shared to help guide the city with taking their next steps toward a municipally supported broadband project. The report additionally provides insights into future trends and key takeaways from the research.

"Some examples of social and economic reasons for adopting a municipal broadband system are the city's desire for increased digital inclusion in the community, reduced price for broadband, increased economic development, and improved public safety or internal governmental communications."

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SECTION ONE: A NATIONAL REVIEW OF MUNICIPAL INTERNET POLICIES

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This section briefly highlights significant federal legislation and oversight that relate to municipal Internet projects. In addition, an overview of state legislation regarding municipal Internet is also included to share further insights on what the policy environment looks like in different states around the country.

Federal Regulations and Agencies

The City of Monona should be aware of how relevant federal regulations impact the administration of Internet service, especially with regard to the Federal Communications Commission (FCC), which is the U.S. agency in charge of regulating interstate and international communications by radio, television, wire, satellite and cable (Kohlhaas & Kluz 2014). Filing for municipal broadband with the FCC requires public hearings as well as an evaluation of the costs and benefits (O'Rielly 2015). Per the FCC's comments on this policy, the public hearings should not be an excessive issue--public hearings are required for most instances where taxpayer funding is used to compete with private providers.

The National Telecommunications and Information Administration (NTIA), a body of the U.S. Chamber of Commerce, is also a critical group at the federal level that is supporting broadband Internet access around the country (Kohlhaas & Kluz 2014). NTIA provides technical and financial support to community broadband projects and works closely with the Broadband Opportunities Council (BOC), an interagency group instituted by President Obama in 2015 to remove barriers to Internet access expansion (Kohlhaas & Kluz 2014).

Federal Influence on the Broadband Industry

A series of U.S. Supreme Court decisions in the early 2000s concerning language in the 1996 Telecommunication Act have led to a significant deregulation of the broadband industry. These federal rulings have allowed existing broadband providers to more

heavily monopolize the market for broadband and prevent competition from smaller service-providers, including municipally owned projects (Travis 2006). This has become a major obstacle to the expansion of municipally owned Wi-Fi networks across the nation.

While these rulings have supported the monopolization of the broadband industry, there are no current federal laws that inhibit municipalities from providing these services. In 2005, however, U.S. Rep. Pete Sessions (R-TX) sponsored a bill in the House of Representatives, H.R. 2726, that would have prohibited municipal governments from providing telecommunications, information, or cable services in areas where private companies had already established services (Library of Congress 2005b; Shaffer 2007). Though this legislation did not ultimately leave the Subcommittee on Telecommunications and the Internet, it is possible that similar proposals make make it to a vote in the future.

National Trends in State Policies

Policy makers at the state level have been proposing legislation to prevent local municipalities from developing any kind of broadband Internet infrastructure since the early 2000s (Tapia 2006). As of June 2006, 35 states had addressed the municipal broadband issue in some way. At least 14 states have structurally and legally limiting infrastructure that prevent municipalities from implementing universal broadband access (Travis 2006). Many U.S. states have legislation that is meant to block municipal broadband, including Florida, Indiana, Louisiana, Michigan, Nebraska, Tennessee, and Colorado (Travis 2006). Nevada bars cities with populations of more than 25,000, and counties of more than 50,000, from implementing municipally-owned Wi-Fi. Washington State prohibits public utility districts from providing access to municipally owned Wi-Fi (Travis 2006).

Some states outlaw certain subsidies for municipally-operated broadband and have adopted provisions meant to increase costs of city-supported telecommunications services. These states include Alabama, Florida, Iowa, South Carolina, Tennessee, Utah, and Wisconsin (Travis 2006). In states like Iowa, municipalities cannot spend any general fund moneys to continuously subsidize or support telecommunication systems, which prohibits competition with private companies (Travis 2006). Iowa's cities cannot redirect revenue from municipal electric, gas, water, sewage, or garbage services for "ongoing support" of a telecommunications system, either (Travis 2006).

Dillon's Rule

Another hurdle for several states in offering Internet service is "Dillon's Rule," which states that municipalities only have powers directly assigned to them by the state (Travis 2006). This rule has been used to challenge municipal networks across the nation (Travis 2006). Private telecommunications companies have used this rule to block municipal networks from forming because their formation surpasses local governmental authority (Travis 2006). One court case that demonstrates this use of Dillon's Rule is the Warner Cable Commc'ns, Inc. v. Schuylkill Haven case in Pennsylvania. The court held that boroughs should be prohibited from providing a cable television system since the state legislature had not explicitly sanctioned such development (Travis 2006). However, in Bellsouth Telecomms., Inc. v. City of Laurinburg, the Supreme Court of North Carolina resolved that a city could provide Internet through its fiber optic network according to a statute allowing cities to provide services that included any wire/cable system transmitting electronic signals (Travis 2006).

"Filing for municipal broadband with the FCC requires public hearings as well as an evaluation of the costs and benefits (O'Rielly 2015)."

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SECTION TWO: CASE STUDIES FROM MINNESOTA

The following case studies highlight municipal Wifi systems in neighboring Minnesota. By examining how both Minneapolis and rural Minnesota have approached municipally-supported broadband, the City of Monona may gain insight into the best ways to plan a municipal Wi-Fi service for their residents.

Case Study 1: Minneapolis, MN

On April 13, 2005, the City of Minneapolis requested proposals from the private sector to build, own, and operate an open wireless broadband network using the city's existing fiber optics network. 90 vendors expressed interest, 20 vendors registered for prime contractor status, and nine vendors submitted proposals. Through that process, two vendors were identified as finalists and US Internet was ultimately selected as the final vendor after an initial testing and evaluation period. The network was completed in December 2009 and covers all 59 square miles of Minneapolis providing residents, businesses, and visitors with wireless broadband access throughout the city (City of Minneapolis 2006).

The major target market segments for the Minneapolis broadband network are institutional (government), residential, and businesses. The broadband network also provides the city's public safety employees and first responders with a reliable mobile communications system. The wireless network offers city-wide Wi-Fi, which increases visitor, business, and citizen interest in Minneapolis. The city-wide broadband eliminates "dead zones" or areas that receive limited coverage from current internet providers.

Minneapolis signed a 10-year contract with US Internet of Minnetonka, MN, to provide the city with broadband technology. US Internet funded, built, and currently manages the wireless network. Minneapolis decided to implement the municipal broadband network to meet local broadband needs that were not being met by private sector providers (City of Minneapolis 2006). In addition, Minneapolis implemented municipal Internet to support the internal communication system of the local government, which has been shown to contribute to lower crime rates, public safety, and improved service (City of Minneapolis 2006).

Minneapolis assessed a variety of business models and eventually decided on a public-private partnership. The private contractor financed the design, construction, and operation of the network and owns parts of the infrastructure. The city's fiber network that US Internet uses to operate the service, however, is ultimately owned by the City of Minneapolis. The city chose this partnership

US Internet's Fiber Spreads Across South Minneapolis, Star Tribune-http://www.startribune.com

model because of city budget constraints, exposure to risk, potential legal challenges, and the complexity of network setup and management (City of Minneapolis 2006). The private partner had access to publicly owned building rooftops, towers, street lights, and other assets, which they pay the city a rental fee for using.

The network provides wireless Internet access ubiquitously outdoors around the city, in addition to indoors in 90% of Minneapolis's high rise and multi-family units. Those who wish to use the service, at 1-3 megabits per second, subscribe for the rate of $19.95/mo for residents, or $29.99/mo for business users (City of Minneapolis 2006). The City of Minneapolis's broadband network has remained sustainable over the past seven years and offers beneficial insight into how a public-private partnership structure can successfully function.

Case Study 2: Rural Minnesota

RS Fiber Cooperative is building a telecommunications network in the southern central region of Minnesota to meet the needs of farmers and other rural citizens. This fiber-to-the-home (FTTH) network was created with the support of ten local municipalities and seventeen townships due to the lack of access to high speed Internet in rural South Central Minnesota. When completed, RS Fiber Co-op will serve 6,000+ households across 700+ sq. miles. Hiawatha Broadband Communications, Inc. (HBC), a private company, is contracted to manage the telephone, television, and Internet access via the fiber infrastructure (Carlson and Mitchell 2016).

Users of RS Fiber Cooperative services are members-government, businesses, and households--and each has a vote in company decision-making. Incorporated as a 308B cooperative under Minnesota law, non-patron equity investors also have a vote, but patron members still have a controlling voice over economic issues (Carlson and Mitchell 2016).

The ten cities used 20-year tax abatement bonds to loan the cooperative $13.7 million, with the agreement that the cities would be the last to be paid back if the cooperative fell through. The co-op would repay government loans with network revenues, but local taxes will makeup shortfalls if necessary (Carlson and Mitchell 2016). The cities issued taxable bonds instead of tax-exempt ones since developing a cooperative falls outside of tax-exempt rules.

It took seven years of research, planning, and community outreach to reach the completion of Phase I of the project in 2016, where all ten cities have FTTH Internet access. Phase II of the project, which will cost an additional $30 million, will extend the fiber network to farms in the seventeen townships. This "fiber-to-the-farm" network is not projected to be complete until 2021 (Carlson and Mitchell 2016).

While it costs more to provide services to farmers than people in the small towns, the cooperative agreed early on to average costs for the greatest societal benefit. RS Fiber Cooperative provides Internet, phone, and cable bundles for $49.95/mo for 50 mbps, $69.95/mo for 100 mbps, and $129.95/mo for 1 gbps. Having fast and reliable Internet service available in the area has already attracted economic development, including the relocation of the Minnesota College of Osteopathic Medicine to Gaylord, MN--one of the ten cities involved in the project (Carlson and Mitchell 2016).

Comparative Analysis of Case Studies, and Recommendations

These two case studies were selected to examine what cooperative and municipal Wi-Fi systems can look in their start-up and sustainability stages. A review of the

steps, successes, and challenges in establishing and maintaining municipal Wi-Fi systems offers lessons for a city like Monona engaging in this process. This section compares the motivation for these endeavors, the endeavor's structures, partnerships, and the successes and challenges faced along the way. Retaining such lessons can ensure the affordability, productivity, and longevity of Monona's municipal Wi-Fi enterprise.

Relevance of Comparisons: Place

These two case studies from Minnesota provide a range of valuable insights for the City of Monona's consideration of municipal broadband. Minneapolis provides long-term indications about what works, while the Rural Minnesota project shares a comparative view from the ground of a project navigating potential assets and issues. The comparison does exclude an example of a "failed" municipal endeavor, limiting the insights of our chosen cases.

Each case study's municipal character matches with an aspect of Monona. Minneapolis is a dense Northern-Midwest city, like Monona, which is tucked into an even larger urban area of Madison, WI. Like Minneapolis, Monona offers a cross-section of residential and commercial areas and interests. On the other hand, the Rural Minnesota case more closely matches Monona's population base, working with about 6,000 households. This region is presumably less dense than Monona, although the analysis of this project references variety in the layout of this region, leading to higher cost of maintaining Wi-Fi service in more remote areas.

Common Purpose

Both Minnesota cases explicitly cite maximizing economic development as a goal of their projects. Rural Minnesota mentions regional businesses that would benefit from this work, while Minneapolis points to municipal programs and departments that could streamline or cut costs. Minneapolis also seeks to eliminate "dead zones," areas without Wi-Fi, for the benefit of residents and city workers that rely on telecommunication, such as first responders. Rural Minnesota's social goals included improving educational opportunities for its children and students. Each Minnesota case also related that the private sector had left Wi-Fi customers underserved or unsatisfied.

Both case studies seek to provide a reliable and high quality service to residents and businesses, though they approached the endeavor with a different business model. Rural Minnesota structured their project as a cooperative where every user is a member, with a vote at an annual meeting. Meanwhile, Minneapolis leaders explain that although their project met their goals of cutting costs for municipal services, the City is not using this to necessarily generate profit (City of Minneapolis 2006). Yet Minneapolis's project is considered a success because it met the goal of providing a valued service to residents. Monona staff should move forward intentionally. If their goal is to make Internet access a public good, they should prepare for a long-term investment with returns in quality of life and economic productivity, rather than returns of short-term profit.

Partnership and Marketing

These projects were not only costly, but complex. Rural Minnesota's project has taken seven years, and is not projected to be completed until 2021. Because the process can be long and costly, Monona should consider how the process of establishing this service can be a benefit to both commercial interests, residents, and the local government's functioning.

Though they look different in the two business models reviewed above, partnerships are critical to establishing, managing, and maintaining municipal Wi-Fi service. If Monona seeks a cooperative approach, partners must have an avenue for involvement from the beginning, one that ensures that voices while be heard, while flexible to accommodate the time and energy that different partners wish to contribute.

"Minneapolis provides long-term indications about what works, while the Rural Minnesota project shares a comparative view from the ground of a project navigating potential assets and issues."

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SECTION THREE: WISCONSIN'S MUNICIPAL INTERNET POLICIES

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Municipality owned Wi-Fi is a fairly new concept in the state of Wisconsin, with most of the state's early adopters only starting projects in the past 12 years. The state legislature regulates telecommunications and develops funding opportunities for expanding broadband infrastructure (Kohlhaas & Kluz 2014).

In 2009, the Wisconsin Governor appointed the Public Service Commission of Wisconsin (PSCW) as the organization in charge of receiving federal mapping grants (Kohlhass & Kluz 2014). The Public Service Commission of Wisconsin serves two objectives. First and foremost, the PSCW is meant to assist in building partnerships with providers and consumers to promote the implementation of a strong broadband system across the state of Wisconsin. The second goal of the PSCW is to help handle the improvement funds received from the annual Broadband Expansion Grant Program. As the City of Monona proceeds with this project, it is helpful to note that the PSCW is in place in order to answer any questions that may arise regarding clarity of policies. Also, it may be beneficial to see if the City of Monona would qualify for any of the grants available from PSCW (Kohlhaas & Kluz 2014).

In Wisconsin, there are policies that prevent cross-subsidization and/or impose accounting, funding or advertising limitations (O'Rielly, 2015). If zoning codes, ordinances, or permits are to be used to increase broadband access, the City of Monona must be consistent with their comprehensive plan as addressed in Wisconsin State Statute 66.1001(3).

Tower Agreements

One of the most common type of public-private partnerships in municipal Wi-Fi is a "tower agreement." According to UW-Extension, local governments can develop agreements with private Internet service providers so that these companies can construct wireless telecommunications infrastructure on public land (Kohlhaas & Kluz, 2014). So, as the City of Monona continues to move

forward with this project, tower agreements may be something to consider.

When constructing tower agreements, there are five topics that are commonly addressed. The first topic is exclusivity, which refers to who can use that tower. In the agreement, it should discuss which companies' equipment can be used on the tower as well as the option of co-locating with another service provider. The second topic is height. This is important because the higher the tower, the more expensive the cost. Also, certain cities have ordinances regarding height requirements. The third topic area deals with the responsibilities involved. This addresses who installs the towers, who removes equipment from the towers, and who is responsible for maintenance of the towers. The last topic area is fees, referring to the cost of the towers since different costs vary based on the different demographics of the area. These four topic areas should be accounted for when considering tower agreements, and it is always important to address a legal team when creating any type of contract or agreement of this type (Kohlhaas & Kluz, 2014).

Anti-Competition

One of the most notable policies instituted in the state of Wisconsin regarding municipal Wi-Fi and broadband is Wisconsin State Statute 66.0422. This statute is an anti-competitive law passed in 2003 that is meant to prohibit municipal governments from competing in the telecommunications marketplace by offering broadband services. Essentially, the statute does not allow local governments to construct, own, or operate video, telecommunications, or broadband services either directly or indirectly to the public without first satisfying certain provisions. The local government is required to hold public hearings on the proposed resolution, and a specific notice must be given about the hearing. In addition, materials regarding the cost benefit analysis and potential costs and revenues estimated must be made available to the public at least 30 days prior to the public hearing for close inspection. In order for the local government to implement public Wi-Fi and broadband services, a majority of the voters must vote in support of such an operation in a referendum. Another requirement is that the local government must ask, in writing, each broadband provider in the area if they currently provide broadband to that area, or if they intend to provide broadband to that area within nine months. If no one responds to this within 60 days, the local government may proceed with their attempt to implement their intended Wi-Fi system. Further constraints contained within this statute articulate that municipalities may not compete with more than one current private provider in the area, that the municipality offers service non discriminatorily to those who provide broadband service to end users, and that the municipality itself cannot use the facility to provide direct service to end users (Wisconsin Legislature: 66.0422).

Framed as an anti-competitive law by proponents, Wisconsin State Statute 66.0422 largely discourages local governments from proceeding with municipally-owned Wi-Fi initiatives (Wisconsin Farmers Union 2016). This law poses a major hurdle for municipalities like the City of Monona that want to improve Internet services for their residents.

Photo by Jeff Miller/UW-Madison,
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SECTION FOUR: WISCONSIN CASE STUDIES

Despite legal challenges from industry-backed groups, there have been several successful attempts by municipalities in offering Internet access to communities across Wisconsin. Three prominent examples include the Reedsburg Utility Commission, Sun Prairie Utilities, and the Chippewa Valley Internetworking Consortium. While they vary in Internet delivery strategy and financial support, the three following cases still may provide substantial guidance to the Connected Monona project.

Reedsburg Utility Commission

Reedsburg, WI is located approximately 65 miles northwest of the City of Monona, with a population of about 9,000 residents (U.S. Census Bureau 2010). The City started operating its own public utility, Reedsburg Utility Commission (RUC), when it began providing electric and water services in the late nineteenth century (About Us 2011). The Utility currently services more than 4,400 customers in the Reedsburg Area, governed by a City Council-elected, five-person advisory board (Local Ownership 2011).

The Reedsburg Utility Commission was one of the first municipalities in the country to develop a fiber-to-the-home (FTTH) Internet service for city residents (Gonzalez 2016). The project's origins date back to 1998, when the City of Reedsburg first installed fiber-optic cable to connect its own electric substations, well-water facilities, and Reedsburg's public school buildings (Isenberg 2010). The Utility Commission initially approached the incumbent telecommunications companies operating in the area, Verizon and Charter, to see if they were interested in developing and operating the project. When neither company voiced interest, RUC preceded with the initiative and built the 7-mile ring of cable themselves (Isenberg 2010).

With the success of their initial project, the Reedsburg Utility Commission decided to expand its fiber-optic Internet, cable, and telephone ("triple-play") services to all residents of Reedsburg. In 2003, RUC began a pilot project that involved running subterranean fiber to 20 homes in the area (Chaffee & Shapiro 2008). By 2006, the Utility had completed laying fiber to all homes within the city limits. RUC was able to finance the project through two "bond anticipation notes" from a local bank, for $5 million and $8.5 million each (Isenberg 2010).

Even though residents could purchase triple-play services from private companies like Charter, over 60% of Reedsburg homes (approximately 2600) opted for service from RUC (Chaffee & Shapiro 2008). Due to this high take rate of residents, RUC was able to become cashflow positive just five years after their initial FTTH investments (Isenberg 2011). In 2010, RUC received a broadband stimulus award to expand their fiber-optic infrastructure

and service to the rural areas outside of Reedsburg (Mitchell 2011). Further expansion is planned to cover more of Sauk County in 2016 (Gonzalez 2016). Currently, RUC offers Internet for $44.95 (100 mbps) and $79.99 (1,000 mbps) (Our Internet Packages 2016).

Unlike the City of Monona, Reedsburg already had its own public utility company to offer the service, which has helped them in navigating Wisconsin's current policy environment for municipal broadband. The City of Reedsburg also opted to invest in the infrastructure for fiber-optic cable to service every home, unlike Monona's investigation into the lower upfront investment of radio-transmitted wireless service. In addition, Reedsburg started offering their triple-play services prior to a 2003 state law, lobbied by industry groups, that makes it much more difficult for municipalities to become competitive local exchange companies (CLECs) (Chaffee & Shapiro 2008). This authorization is necessary for a municipality to be able to offer any kind of communication service to their residents (Jahn n.d.).

"The Reedsburg Utility Commission was one of the first municipalities in the country to develop a fiber-to-the-home (FTTH) Internet service for city residents (Gonzalez 2016)."

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Photo from http://reedsburgutility.com/about-us

Sun Prairie Utilities

The City of Sun Prairie is another example of a municipally owned utility in the process of providing fiber-to-the-home Internet services to residents. Like the City of Monona, Sun Prairie is also situated in the Madison Metropolitan Statistical Area; the suburb is Madison's largest, with approximately 30,000 residents (Demographic & Economic Data 2016). Sun Prairie has had its own public utility, Sun Prairie Utilities, since 1910. Governed by a seven-person commission, the company reaches 13,500 customer accounts with its water and electrical services (Who We Are 2013).

Sun Prairie's recent FTTH project has been largely inspired by the City of Reedsburg's efforts (Trostle 2016). Like Reedsburg, it initially invested in fiber optic cable to equip its public school buildings with high-speed Internet at an affordable price (Fetterly 2015). Since their initial investment of fiber optic cable in 1999, they have made fiber-based Internet service available for 28 businesses and over 30 apartment complexes within the city limits (Fetterly 2015). In 2015, Sun Prairie's City Council approved $624,000 for a pilot fiber-to-the-home project that is providing single family homes in the Smith's Crossing subdivision with Internet service (Residential Internet n.d.; Fetterly 2015). Neither Frontier nor Charter, the private Internet providers in Sun Prairie, offer fiber-based Internet in the city, although both companies fought hard against the pilot project's proposal (Trostle 2016).

While Sun Prairie Utilities expected a 30% take rate from residents, 54% of homes in the pilot area were interested (Trostle 2016). As of 2016, Sun Prairie Utilities offers their fiber service for $49.98/mo (100 mbps) and $69.98/mo (250 mbps) to single family homes in the pilot area (Residential Internet n.d.). Unlike Reedsburg, Sun Prairie does not offer telephone or cable service for residents to complement their Internet service.

Chippewa Valley Internetworking Consortium (CINC)

A collaboration between anchor institutions in Eau Claire and Chippewa Falls, the Chippewa Valley Internetworking Consortium (CINC) takes a different approach than Reedsburg and Sun Prairie's fiber-to-the-home model.

Rather, CINC operates as a Community Area Network (CAN) that services both public and private institutions like schools, hospitals, colleges, nonprofits and government buildings instead of individual homes (Happel 2012). While the collaboration began in 1999, CINC has since become an Unincorporated Association (2011) and continues to coordinate regional communication infrastructure-sharing through fiber optic cable across the region (Blodgett 2012). The members of CINC are able to afford the expenses of laying down high-speed broadband infrastructure because they share the cost amongst each other, rather than the entire cost falling on one municipality or another kind of entity to finance (Blodgett 2012).

In 2010, due to the success of CINC's model, UW-Extension applied for $37.4 million in funding through a federal Building Community Capacity through Broadband (BCCB) grant to expand the CAN service in Chippewa Valley and replicate it in Platteville, Wausau, and Superior (Gonzalez 2012). The fiber connects over 180 anchor institutions, but radio towers allow wireless Internet access to be delivered to private homes and other businesses (Happel 2012).

The CAN model also differs from Reedsburg and Sun Prairie in that the infrastructure is now being serviced by a private broadband company, CCI Systems. A Michigan-based, employee-owned firm, CCI Systems partnered with UW-Extension on the 630-mile fiber installation and has since taken over maintenance and services (Happel 2012). So, while a public utility does not directly provide the Internet access, the public-private partnership between UW-Extension and CCI Systems has greatly improved the quality and speed of Internet services offered in these communities (Gonzalez 2012).

Although CINC and UW-Extension's approach is quite different from the City of Monona's vision for municipally supported Internet, Monona might consider the Community Area Network (CAN) as a viable model for operationalizing their plan to provide Internet. Entering a similar partnership with anchor institutions or other government entities (neighboring cities, local hospitals, etc.) may help the City of Monona better afford the costs of building communications infrastructure, whether that consists of subterranean fiber optic cable or a series of wireless Internet radio transmission towers.

(CINC Strategy Briefing, 2013 - https://cincua.org/)

There may especially be potential for Monona to partner with the City of Madison in expanding their Madison Unified Fiber Network (MUFN) to reach further than its initial funding, which—like UW-Extension's effort—was also provided by a federal Building Community Capacity through Broadband grant (Svitavsky 2016).

It is worth noting that UW-Extension's public-private partnership with CCI Systems became the subject of a 2011 lawsuit from Access Wisconsin, an AT&T lobbying organization (Ziff 2011). The group charged UW-Extension and its partners with a claim of unfair competition against the existing broadband service providers (Ziff 2011). A Dane County judge dismissed the charge, but as the Institute for Local Self-Reliance commented, lawsuits such as this one are steering municipalities away from investing in their community, that the private internet providers are able to maintain their customer base while avoiding investing in modern connections (Mitchell 2011).

Telecommunications Cooperatives and Internet Service

Wisconsin's cooperatively-run telecommunications companies may also be instructive for the City of Monona's efforts to provide Internet services. Wisconsin hosts a number of telecommunications cooperatives, including 11 that belong to the Wisconsin State Telephone Cooperative Association (Wisconsin State Telephone Cooperative Association 2016). Examples of telecommunications companies that offer Internet service include Tri-County

Communications Cooperative, Cochrane Cooperative Telephone, and Vernon Communications Cooperative. In these three cooperatives, users or subscribers are eligible for membership after filling out an application to join. These cooperatives typically formed because of a lack of service to rural areas. While Monona is not rural, the difficulty in accessing fair Wi-Fi service may prove to be a strong parallel for the city.

Electric Cooperatives and Internet Service

In addition to telecommunications cooperatives, a number of Wisconsin's 24 rural electric cooperatives have also expanded their services in order to provide Internet access to their members (FAQ 2016). The Richland Electric Cooperative is one such electric cooperative currently providing Internet in Wisconsin. The cooperative primarily serves Richland county, with an estimated population of 18,000 residents (U.S. Census 2010). The Richland Electric Co-op also serves parts of Crawford, Sauk and Vernon counties. It provides satellite, Internet service, dial-up Internet service and First Call emergency response telephone service. The Richland Electric Cooperative is a member-consumer co-op, providing service for over 3,500 members in and around Richland County, Wisconsin (Richland Energy Cooperatives n.d). As a member of the cooperative, one both receives service and has a democratic vote in how the cooperative operates.

Comparative Analysis of Case Studies, and Recommendations

Several best practices emerge from the overview, including the partnership between multiple institutional players to achieve an economy of scale that would help keep costs lower for all participants involved. Wisconsin's case studies also point to the importance of conducting a thorough feasibility study to ensure that there is enough interest and need from the public for the service. With cooperative Internet models, making sure to follow cooperative principles, especially with regard to member economic participation and democratic ownership, allow for a strong structure and business stability.

If the City of Monona decides to organize a cooperative structure for Internet provision, it might want to look into joining a larger, second-order cooperative like Touchstone Energy Cooperative. Joining the Touchstone Energy Cooperative helps smaller cooperatives gain access to a wealth of advertising and communications campaigns, education and training tools, member benefit programs and web development tools to use in their local community.

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SECTION FIVE: MONONA SURVEY AND FOCUS GROUP

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The authors of this paper developed a series of focus group questions, administered in November 2016 to a total of three business leaders in Monona, and an online survey, administered to eight business leaders.

After conducting two focus groups with three different employees of Farmers Insurance Agency, we were able to discern their interest in a city-wide broadband network. All three currently contract with Charter Communications for their internet needs. They all found issues with Charter's reliability, citing frequent blackouts and an inability to remain connected during important conference calls. One focus group participant also mentioned having issues with Charter's customer service, stating they were difficult to get in contact with and not forthcoming with information when problems occurred with his internet service.

All participants used the internet to send important insurance related documents and to conduct conference calls with corporate offices. As such, all three said they would be willing to pay more to gain more speed and reliability, but that they would not be willing to take a reduction in reliability or speed even if it came with a reduction in cost. Increasing speed and reliability, they felt, would make their business seem more professional when contacting clients and corporate leaders. Unbundled service appealed to all members more so than bundled options as landline and cable were not used at their business.

> ***"As such, all three said they would be willing to pay more to gain more speed and reliability, but that they would not be willing to take a reduction in reliability or speed even if it came with a reduction in cost."***
>
> ***-AAE323 students***

Interest in having a municipally or cooperatively owned Wi-Fi network was appealing to all as long as it would be reliable and secure. All participants cited that they felt it would be beneficial to the community at large as well as their business. However, one mentioned that, although he would pay more at his business, an increase in his city taxes would not be an acceptable way to fund this project. In the future, they would like to move towards being completely wireless as they viewed being wired up as a hassle. Unfortunately, they were not allowed to send certain documents over Wi-Fi for security purposes. Overall, it seems that there is interest by the business owners in the city of Monona for a municipally or cooperatively owned Wi-Fi both for businesses and for their community at large.

Focus Group

After conducting two focus groups with three different employees of Farmers Insurance Agency, we were able to discern their interest in a city-wide broadband network.

Reliability

All three currently contract with Charter Communications for their internet needs. They all found issues with Charter's reliability, citing frequent blackouts and an inability to remain connected during important conference calls.

Customer Service

One focus group participant also mentioned having issues with Charter's customer service, stating they were difficult to get in contact with and not forthcoming with information when problems occurred with his internet service.

Willingness to Pay

They all used the internet to send important insurance related documents and to conduct conference calls with corporate offices. As such, all three said they would be willing to pay more to gain more speed and reliability, but that they would not be willing to take a reduction in reliability or speed even if it came with a reduction in cost. Increasing speed and reliability would make their business seem more professional when contacting clients and corporate leaders.

Bundled Service

Unbundled service appealed to all members, more so than bundled options in fact as landline and cable were not used at their business.

Cooperation

Interest in having a municipally or cooperatively owned WiFi network was appealing to all as long as it would be reliable and secure. All participants cited that they felt it would be beneficial to the community at large as well as their business, however one mentioned that although he would pay more at his business, an increase in his city taxes would not be an acceptable way to fund this project.

Takeaways

In the future, they would like to move towards being completely wireless as they viewed being wired up as a hassle. Unfortunately, they were not allowed to send certain documents over WiFi for security purposes. Overall, it seems that there is interests by the business owners in the city of Monona for a municipally or cooperatively owned WiFi both for business and their community at large.

Survey

Eight representatives from different Monona businesses responded to an online survey shared through the East Side Business Alliance. The point of this survey was to determine potential interest or questions regarding municipal Internet service.

All of the businesses who participated currently use Internet regularly. Of those, half provide Internet to their customers. A majority of respondents confirmed that they face issues with their current Internet providers, including reliability of connectivity, speed, and high cost.

When asked about what service improvements the respondents would seek, four businesses said they wanted cheaper Internet and three businesses said they wanted faster Internet. The majority of businesses claimed they prioritized reliability and price equally, while a small

group chose reliability. The survey also inquired into the respondent's interest in a community or cooperatively owned Wi-Fi service. Seven out of eight businesses indicated that they were either somewhat or very interested in such a service.

Internet is crucial to these businesses - five out of eight predict that the magnitude of their internet needs will increase into the future, even as most of these businesses currently face service issues. This growing need and current dissatisfaction demonstrates room for potential interest in a community/cooperative Wi-Fi endeavor.

Q2 - What type of business do you operate?

#	Answer	%	Count
1	Food	0.00%	0
2	Services	25.00%	2
3	Retail	0.00%	0
4	Manufacturing	0.00%	0
5	Construction	0.00%	0
6	Other (specify)	75.00%	6
	Total	100%	8

Other (specify)

self employed
Non profit
None
Communications
consulting
Work for a nonprofit

Q3 - Do you use internet services regularly?

#	Answer	%	Count
1	Yes	100.00%	8
2	No	0.00%	0
	Total	100%	8

Q4 - Do you provide internet services to your customers?

#	Answer	%	Count
1	Yes	50.00%	4
2	No	50.00%	4
	Total	100%	8

Q5 -How could your internet service better support your business or community goals?

#	Answer	%	Count
1	Faster	37.50%	3
2	More reliable	0.00%	0
3	Cheaper	50.00%	4
4	Other (specify)	12.50%	1
	Total	100%	8

Q6 - What is more important to you: reliability or price?

#	Answer	%	Count
1	Reliability	37.50%	3
2	Price	0.00%	0
3	Both	62.50%	5
4	Other (specify)	0.00%	0
	Total	100%	8

Q7 - Do you face any kind of issues with your current internet provider?

#	Answer	%	Count
1	Yes	25.00%	2
2	No	37.50%	3
3	Sometimes	37.50%	3
	Total	100%	8

Q8 - If yes, what kind of issues are you facing with your current internet provider

connectivity
n/a
Inconsistent speeds
The cost!
Expensive

Q9 - How interested are you in a cooperative or community owned internet service?

#	Answer	%	Count
1	Very interested	50.00%	4
2	Interested	25.00%	2
3	Somewhat interested	12.50%	1
4	Not really interested	12.50%	1
5	Not interested at all	0.00%	0
	Total	100%	8

Q10 - Would you be interested in an unbundled service, with no cable or phone included?

#	Answer	%	Count
1	Yes	87.50%	7
2	No	12.50%	1
3	I don't know	0.00%	0
	Total	100%	8

Q11 - Will your internet needs increase in the future?

#	Answer	%	Count
1	Yes, a lot	12.50%	1
2	Somewhat	50.00%	4
3	No	37.50%	3
	Total	100%	8

Q12 - Please provide any other relevant comments

Please provide any other relevant comments:

- Would like to see more options, more competition.
- Quite pleased with this whole UniverCity endeavor.

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SECTION SIX: CURRENT ISSUES AND FUTURE TRENDS IN MUNICIPAL INTERNET PROVISION

Looking to the future, there is potential for some hold backs and competition from the industry that could prevent municipal broadband from taking off. Currently, Internet service providers are looking into newer technologies to provide Internet through existing infrastructure. This is particularly the case in rural and poor areas where Internet service has been considerably lacking. AT&T has been discussing the potential use of power lines to run Internet services in order to reach these more rural areas (Barrett 2012). While this is a technology that is still in the development stage, it provides an example of a new technology that could compete with local municipal groups if successful.

Changing legal contexts

In an efforts to support more municipal and community Internet services, laws have been introduced to federal legislation in the last year. The Community Broadband Act of 2016 was introduced to help communities across the country develop locally-controlled communication networks (Gustin 2016). Unfortunately, Internet service providers are showing a huge resistance to passing this law. Many of them do not want more competition in the market that would require them to lower their prices. Internet Service Providers have been able to successfully lobby congress to push back against legislation like The Community Broadband Act. For example, Republicans for ISPs have argued that using public funds as a way to compete against private sector is a form of socialism. They have also argued that municipalities will struggle with keeping up with the newer technologies.

The Federal Communications Commission (FCC) has been a huge supporter in the efforts of allowing municipalities to compete in the market. With their support, laws against limiting municipalities' ability to create broadband fiber Internet were struck down in North Carolina and Tennessee. The FCC continues to show support for more competition in the marketplace and should be a

huge advocate for the Community Broadband Act in the months to come (Watza 2015).

Public-Private Partnerships

Since there has been failure of projects due to laws and resistance from other companies, there will likely be a shift towards a public-private partnerships in areas where municipal broadband services are of interest.

If the Community Broadband Act does not pass, these kinds of partnerships are the best way to create a municipal network while getting past the laws many states currently have against Internet municipalities.

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SECTION SEVEN: FINAL TAKEAWAYS FOR MONONA PROJECT

Studies of municipal Internet provision's political landscape and case studies of such endeavors in Minnesota and Wisconsin provide a revealing backdrop for preliminary feedback gathered from Monona's business leaders on their interest in municipally supported cooperative Wi-Fi. Such a synthesis generates insights for Monona as they move forward in considering and shaping municipal broadband service.

The Case for Municipal Broadband

Municipal broadband services support governance both fiscally and programmatically, while enhancing public safety. Across the country, municipalities have seen tangible benefits to instituting this enhance communication system. In New Orleans, their citywide public safety video surveillance system uses a metro-scale Wi-Fi network, and contributed to a reduced murder rate by 57%, and auto theft by 25%, over the course of just six months (Sege 2005). Meanwhile, the network makes first-responders more efficient with access to driver's license information and gang and Amber alert databases.

Municipal broadband networks also lower costs and improve service with public works departments. In Corpus Christi, Texas, a Wi-Fi network automated utility meter reading to cut costs and improve service. The city can read 73 water meters per second, many times faster than the manual reading system in place before its installation (Sege 2005).

This "lay of the land" regarding municipal Internet would be incomplete without acknowledging success in Wisconsin, where municipalities, as well as cooperative businesses, have provided affordable and reliable Internet services.

Challenges and Limitations

For Monona to move forward with the greatest efficacy possible, the city must be versed in obstacles and limitations, which stem from prohibitive state policy and a distinct set of steps required by a city like Monona. State Statute 66.0422 will not allow Monona to construct, own, or operate broadband services without holding public hearings, introduced to the public by a prior notice. This requirement gives private companies a chance to interfere with the development of municipal broadband services. Monona must also provide a careful evaluation of the costs and benefits of their proposed service.

As Monona proceeds with this project, the city must keep in mind federal and state mandates, such as complying with the Federal Communications Commission regulations and ensuring that their broadband system falls within the auspices of their local comprehensive plan.

Key Recommendations

The city may find sufficient interest among their businesses and residents for municipal Wi-Fi. However, the city should study whether insourcing Wi-Fi is the most efficient use of their funding and governance capacity. Increased capacity may come from partnerships, like public-private partnerships. Any partnership must be tended to ensure input and feedback from all parties, including municipalities, private companies, or citizen-volunteers. The Tri-County Communications Cooperative provides a model of an equipment ownership plan, as well as user/subscriber roles. Partnership could also take the form of the city joining a larger, second-order cooperative to access marketing and outreach resources. These types of partnerships could be key for moving this project forward.

Again, Monona may find a critical mass of interested parties willing and eager to move forward into developing municipal or cooperatively run Wi-Fi. Though there are less expensive options, fiber optic cable provides optimum reliability, quality, and customer satisfaction. We recommend that Monona consider leveraging support to invest in such a system. A feasibility study would provide feedback on community interest and fiscal possibilities of pursuing fiber optic cable.

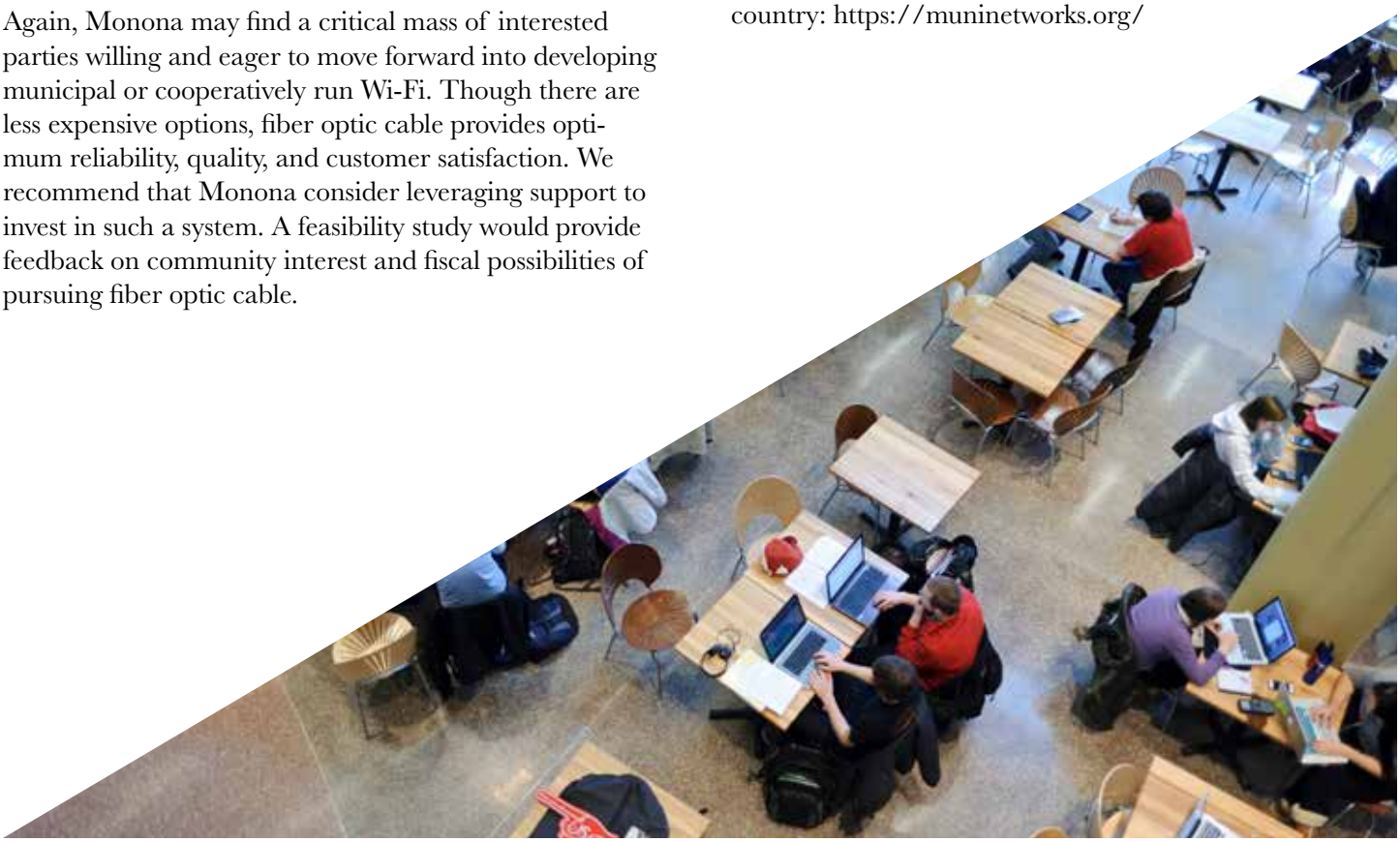
Resources to Consider

Monona is not the first municipality to pursue this kind of project. Nearby and communities nationwide represent a wealth of advice and caution on seeking to provide improved Internet services through public or cooperative means. The following resources may be especially helpful to the City as they explore next steps:

The Public Service Commission of Wisconsin provides expansion grants and other resources for broadband projects: http://psc.wi.gov/utilityinfo/tele/broadband/bbAboutUs.htm

The University of Wisconsin-Extension's Broadband and E-Commerce Education Center is a knowledgeable resource on state and local policy, funding, and municipal broadband business models: http://broadband.uwex.edu/

The Institute for Local Self-Reliance's Community Broadband Networks Initiative provides a wealth of information about municipal broadband from around the country: https://muninetworks.org/



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ABOUT THE UNIVERCITY YEAR

UniverCity Year is a year-long partnership between UW-Madison and one community in Wisconsin. The community partner identifies sustainability and livability projects that would benefit from UW-Madison expertise. Faculty from across the university incorporate these projects into their courses with graduate students and upper-level undergraduate students. UniverCity Year staff provide administrative support to faculty, students and the partner community to ensure the collaboration's success. The result is on-the-ground impact and momentum for a community working toward a more sustainable and livable future.

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UNIVERCITY BETTER PLACES TOGETHER