2018 White Papers

PATHWAYS to SUCCESS

Four Strategies for Wisconsin

Improve access to capital

Make it easier to be an entrepreneur

Improve the tech infrastructure

Expand the supply of human capital

Produced by:
Wisconsin Technology Council

August 2018

WARF
Wisconsin Alumni Research Foundation

Innovation and the Wisconsin Idea

A digital series co-authored by leaders from **across Wisconsin**, hosted by **WARF**

ARTICLES

INNOVATION, JOBS AND THE WISCONSIN IDEA
Erik Iverson, Managing Director of WARF

RENEWING THE WISCONSIN IDEA
Governor Tommy G. Thompson and Professor Mike Sussman

ON THE SHOULDERS OF GIANTS: INNOVATION AND THE WISCONSIN IDEA THE OLD-FASHIONED WAY
Professor Dan Ludois and Cecil Edirisinghe, CEO of Velicon

UW/INDUSTRY PARTNERSHIPS YIELD BETTER SOLUTIONS
Chris Salm, CEO of Ab E Discovery, and Dean Kate VandenBosch

FROM LAB TO BEDSIDE, THE WISCONSIN IDEA IS ALL FOR THE GOOD OF THE PATIENTS
Dr. Alan Kaplan, CEO of UW Health, and Dr. Susan Turney, CEO of Marshfield Clinic

NOTHING VENTURED, NOTHING GAINED: INVESTING IN WISCONSIN INNOVATION
John Neis, Executive Managing Director of Venture Investors, and Cory Nettles, Founder and Managing Director of Generation Growth Capital Inc.

HOW UNIVERSITY INNOVATIONS CHANGE THE WORLD
Dean Ian Robertson and Greg Piefer, CEO of SHINE Medical Technologies

TAPPING INTO THE CREATIVITY OF OUR STUDENTS FOR THE GOOD OF WISCONSIN: CONTRIBUTIONS TO THE WISCONSIN IDEA ACROSS GENERATIONS
Arjun Sanga, President of WiSys, and Zach Halmstad, Co-Founder of Jamf

INNOVATION FOR THE PUBLIC GOOD: HOW THE WISCONSIN IDEA MAKES PEOPLE HEALTHIER
State Senator Luther Olsen and Dean Robert Golden

THE WISCONSIN IDEA AND REGIONAL ECONOMIES: APPLES FALLING FROM MANY TREES
Chancellor Dean Van Galen and Tom Still, President of the Wisconsin Technology Council

PROPER POLICY AND STRATEGY HONORS THE WISCONSIN IDEA – INVESTING IN INNOVATION
State Senator Alberta Darling and Rock Mackie, Professor and Entrepreneur

SEEKING BEGINS WITH AN IDEA
Zach Brandon, President of the Greater Madison Chamber of Commerce, and Tim Sheehy, President of the Metropolitan Milwaukee Association of Commerce

HOW ALUMNI CAN CARRY THE WISCONSIN IDEA FORWARD
Mike Knetter, President of the University of Wisconsin Foundation

Visit **warf.org/WisconsinInnovates** or share feedback at **WisconsinIdea@warf.org.**

Follow us

#WisconsinInnovates

PATHWAYS to SUCCESS

The Role of the Tech Council

The Wisconsin Technology Council is the bipartisan, nonprofit science and technology policy adviser to the governor and the Legislature, as reaffirmed through Executive Order 51. The Tech Council periodically issues "white papers" and special reports to assist those policymakers.

Tom Still
President

Greg Lynch
Chairman

The ideas offered in the Tech Council's 2018 white papers are intended to set the table for a renewed public discussion about improving the state's tech-based economy.

They include emerging priorities as well as restatements and updates from previous white papers, legislative proposals or executive branch proposals. Some are based on our knowledge of innovative ideas in other states.

Most ideas are brought forward by our board members, members of our Tech Council Innovation Network and others – entrepreneurs, investors, service experts and researchers – who attend our events and seminars.

Our ideas often draw upon our understanding of Wisconsin's tech-based economy strengths and weaknesses as compared to other states.

We advocate a comprehensive look, not a focus on any single metric. The "Tech Metrics" section in this report quantifies how Wisconsin ranks among those states according to nearly two-dozen measures that deserve the attention of all policymakers.

Some might suggest bold ideas won't fly in Wisconsin for political or budgetary reasons. Our own history suggests otherwise. State policymakers have carefully considered ideas recommended in past white paper reports and embraced many, including the recent expansion of the state's successful tax credits law and the abolition of an outdated fee on capital raised by certain young companies.

We recognize some proposals come with a cost, but we also expect those policies, if implemented, would generate more economic activity and tax revenue over time.

We are pleased to offer our 2018 white papers report to you, and invite you to read on to learn more about the depth and breadth of Wisconsin's tech-based economy.

Contents

Executive Summary 2
Section 1 / Expanding Human Capital 6
Section 2 / Improve Access to Investment Capital 10
Section 3 / Improve Tech Infrastructure 14
Section 4 / Make it Easier to be an Entrepreneur 18
Legislative update 20
Tech Metrics 26
Interdisciplinary Technology Clusters 32

Executive Summary

Recommendations in the Wisconsin Technology Council's 2018 white papers report fall into four major categories:

1. *Enhance workforce development and training, K-Gray, while re-investing in higher education (human capital)*
2. *Support capital formation through improvements in existing law as well as innovative strategies that expand participation in the asset class (investment capital)*
3. *Focus on tech development as an economic driver, with an emphasis on how platform technologies can propel targeted sectors (tech infrastructure)*
4. *Make it easier to be an entrepreneur in Wisconsin, from start-up to scale-up (entrepreneurism)*

Within those four broad categories, here are our leading recommendations to the governor and Legislature:

Human Capital

1. **Develop talent through means-tested student aid.** To make Wisconsin competitive, annual appropriations for state student grant aid must be raised to bring us to Minnesota's level for grant aid spending per undergraduate. This needed increase in the annual appropriation for Wisconsin Grants should be apportioned among students in the three sectors, as is currently the case. In other words, 55 percent for UW students, 20 percent for technical college students and 25 percent for Wisconsin citizens attending a private, nonprofit college in this state. This would cost about $140 million spread over multiple budget cycles; it could pay for itself over time through rising per capita incomes and tax collections associated with that revenue growth.
2. **Attract talent through employer incentives.** Wisconsin employers, with the incentive of a state "Future Workers Tax Credit" could attract well qualified workers to Wisconsin. A "Future Workers Tax Credit" would provide incentives to employers to invest in education and training of individuals (future workers), empowering employers, rather than government, to determine the skills and abilities they most need.
3. **Bolster apprenticeships, internships and training opportunities.** Strategies include (1) supporting the federal CHANCE in Tech Act, an acronym for Championing Apprenticeships for New Careers and Employees in Technology, which would award contracts to industry intermediaries to develop apprenticeships; (2) support tech internship programs that expose college students to Wisconsin companies; (3) encourage establishment of industry "centers of excellence" that function as training centers, and; (4) support funding of computer science courses in K-12 schools.
4. **Recognize the economic value of higher education.** Building upon the Tech Council's May 2016 report, the governor and Legislature should continue to (1) recognize the critical importance of talent development and attraction for all sectors of the Wisconsin economy; (2) help to attract and retain the best faculty and researchers; (3) keep our universities affordable and accessible; (4) improve the transfer of knowledge and ideas into a prosperous Wisconsin economy, and; (5) be aware of the competitive world around us, especially in terms of capital projects to support research and development.

Investment capital

1. **Establish a fund-of-funds based on a public/private partnership model.** Wisconsin should seek to establish a $150-million fund of funds that involves public and private investment.
2. **Persuade the State of Wisconsin Investment Board to invest more Wisconsin-based venture capital.** The State of Wisconsin Investment Board is Wisconsin's largest investor in the venture capital asset class but, in other states, state pension funds have committed a higher percentage of assets to funds located in their state. A doubling of SWIB's current commitment is achievable without diminishing its underwriting standards.
3. **Support the formation of additional seed stage capital in Wisconsin.** Create matching funds of 20 percent for seed funds, angel groups or venture debt programs targeting the first $250,000 invested could enable more entrepreneurs to launch their businesses. This could be financed with a portion of the return on the state "rainy day" fund, if re-invested through the State of Wisconsin Investment Board versus current low-yield options.

Tech infrastructure

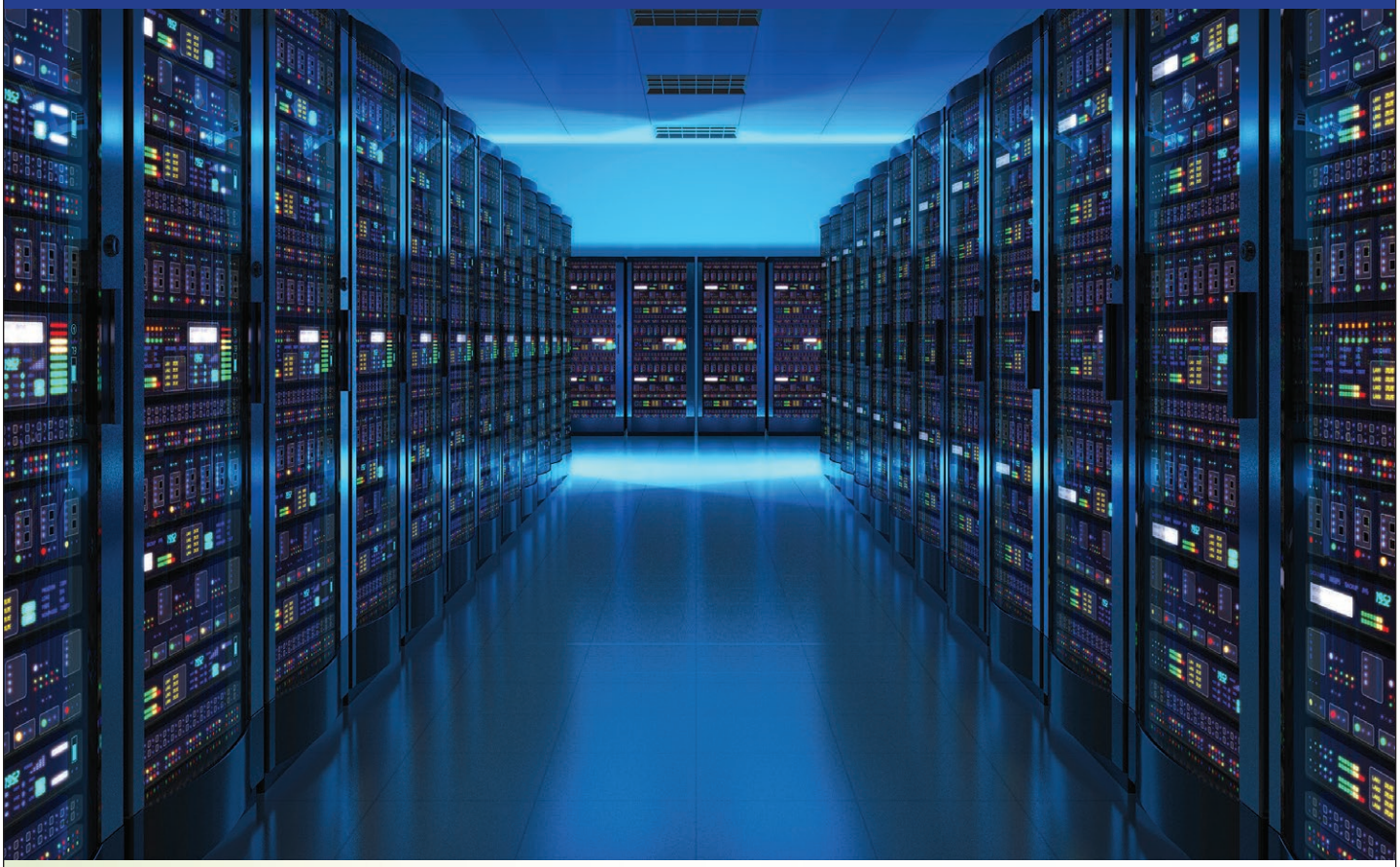
1. **Accelerate investments and welcome emerging platforms in broadband development.** These include dedicated use of broadcast "white space," small-cell technologies and more. This is a two-part recommendation, with an emphasis on continuing public-private investment in rural broadband and private investment – with proper regulatory reform – to encourage small-cell and 5G development.
2. **Enhance access to clean, out-of-state power.** This will make Wisconsin's power grid more stable, promote "green" energy use such as wind power and reduce reliance on coal-based generation.
3. **Continue to assist the state's airport professionals in attracting non-stop or direct flights** to cities such as San Francisco, Boston, Denver and Seattle, per past Tech Council efforts. This is an important bridge to attract coastal researchers, technologists and investors to Wisconsin. This has been a part of Tech Council recommendations since 2005.
4. **Embrace innovation in transportation,** such as autonomous and connected vehicles for people, electric vehicles, other "people-moving" strategies, freight moving and raising transportation maintenance revenues through new strategies.
5. **Support efforts to enhance Wisconsin's computing capacity.** These include the formation of a data science institute in Milwaukee and the evolution of the UW-Madison Computer Science Department, as well as support for K-12 computer sciences courses.

Entrepreneurism

1. **First, do no harm:** Avoid state-based research restrictions. Validate our level of regulation relative to other states to ensure we maintain an open and competitive innovation environment for entrepreneurs already in our state – as well as attracting entrepreneurs to Wisconsin.
2. **Compare "fence-me-in" regulations in Wisconsin with those in other states.** Ensure that professional and occupational licensing isn't a "fence-me-in" strategy to exclude new entrants to the marketplace.
3. **Carefully follow the employment non-compete debate** with an eye on enhancing mobility while keeping appropriate, existing protections for confidentiality, intellectual property, trade secrets and non-solicitation. The Tech Council went on record in 2015 as opposing legislation that would have made existing non-compete law easier to enforce.
4. **Use our existing "Tech Metrics"** and other studies to validate the importance of startups and scale-ups to the Wisconsin economy.
5. **Create a clear path for a Startup Visa (federal)** and establish Global EIR programs in the state's universities leveraging existing immigration law. Also, create new visas for U.S.-educated students and entrepreneurs through legislation such as the "Immigration and Innovation" act at the federal level.

To read past white papers and other policy reports, visit our web site at *www.wisconsintechnologycouncil.com*.

Reliable. Affordable. Environmentally Responsible.



Electricity is more than a convenience; it's essential to the way we live our lives. When you flip the switch, boot up a laptop or just kick back and watch a movie, you depend on safe, reliable electricity.

Moving energy forward, from the source to where it's used, is what American Transmission Co. is all about. That's why as we plan for the electric grid of the future, we're also keeping close watch on the grid of today to make sure you don't miss a beat.

atcllc.com/PowerForward

AMERICAN TRANSMISSION COMPANY®


Wisconsin Economic Development Corporation
in


Wisconsin
Technology
Council


TECH COUNCIL
INVESTOR
NETWORKS
IGNITING EARLY
STAGE INVESTMENT


TECH COUNCIL
INNOVATION
NETWORK


WISCONSIN
ENTREPRENEURS'
CONFERENCE


Wisconsin
Early Stage
Symposium


WISCONSIN
Tech Summit


WISCONSIN GOVERNOR'S
BPC
BUSINESS PLAN CONTEST


Wisconsin
YES!
www.WisconsinYES.com

Expand Human Capital

Wisconsin's workforce challenge

The Wisconsin economy is doing well, but to sustain and expand our economy, Wisconsin needs to address talent development and talent attraction. All sectors of the economy are challenged by an aging workforce, historically low birth rates and net out-migration.

By 2040, almost one-quarter of Wisconsin's population will be age 65 or older. The growth in that age category will be more than 95 percent. Those in the cohort of ages 18 to 64 are projected to grow by only .1 percent. [1] The state needs to provide opportunities for Wisconsinites of all ages to increase their skills and encourage in-migration of educated workers. Without concrete, scalable actions, Wisconsin will increasingly fall behind in the race to attract a qualified workforce.

As the Wisconsin Taxpayer Alliance noted: "… Wisconsin is also losing young adults. (Tax) filers 26 or younger comprised about 8 percent of all Wisconsin filers during 2013-16. However, they accounted for almost 30 percent of the state's net loss of residents." [2]

The Wisconsin Technology Council has affirmed: "Wisconsin's economy is at a crossroads. The state is poised to fully participate in the Information Economy of the 21st century…provided it can produce, attract and retain enough people with training. That opportunity is reflected in the transition of the state's advanced manufacturing sector; the continued rise of its financial services sector; and the evolution of agriculture, three staples of the Wisconsin economy for generations." [3]

Retention is an issue, not just for those relocating to the state, but for all 5,795,483 residents of Wisconsin. [4] Increasing retention is dependent on numerous factors: quality K-12 education, reasonable taxation, efficient transportation, affordable housing, a wide panoply of civic, cultural and recreational opportunities – and, above all, jobs. Initiative to address talent development and attraction – if done right – will also affect retention.

There is a clear link between educational attainment and measures of economic success. College graduates are much more likely than high school graduates to be employed, to own a home and to be contributing to a retirement plan. [5] Increased educational attainment also tangibly and markedly determines earnings. According to the Georgetown Center on Education and the Workforce, 55 percent of the "good" jobs of the future will require a bachelor's degree. [6] A "good" job is defined as a "well-paying" job. For 2015, average annual earnings in the United States were as follow: [7]

All workers 18 years and over	$49,994
Not high school graduates	$25,315
High school graduates	$35,615
Some college or associate's degree	$38,943
Bachelor's degree	$65,482
Advanced degree	$92,525

The same relationships hold over the 1975-2015 period. On some parameters, Wisconsin does even better. For instance, an Associate's degree holder in Wisconsin earns $41,000. [8] All these comparisons underscore the benefits – to students and to the economy – of increasing access to post-secondary education and attainment levels for the work force.

We must do more. Recently, the University of Wisconsin System, the Wisconsin Technical College System and the Wisconsin Association of Independent Colleges and Universities came together under the auspices of the Lumina Foundation to address educational attainment. In that effort, called 60Forward, they jointly set a goal of having 60 percent of all working-age adults receiving a college degree or high-quality credential by 2027. This is a big lift from current attainment levels, and further underscores the need for more substantive efforts to support student access to educational opportunity.

Attracting talent through means-tested student aid

Some strategies are proven to ensure that larger percentages of under-represented populations have access to postsecondary education. Means-tested student grant aid provides access to higher education for academically qualified citizens who, without a financial boost, could not move up the ladder of success that higher education provides. Our primary "means-tested" state student aid program is called Wisconsin Grants.

"State spending on need-based aid helps ensure that low-income students who enter four-year colleges actually emerge with a degree."[9]

Wisconsin has room to improve upon its national ranking on student aid, as evidenced by its neighboring state of Minnesota.

Minnesota stands in 18th place among the 50 states in student grant aid, per undergraduate, while Wisconsin lags in 28th place.[10] Average income in Minnesota puts it in 10th place while Wisconsin lags in 22nd place.[11]

The same kind of relationship appears to exist between education attainment and per capita incomes. Minnesota is 10th in the nation in the percentage of adults 25 and older who hold a bachelor's degree or higher and first in the region. Wisconsin is 27th nationally and third in the region. Minnesota was 14th in per capita income in 2016 at $53,043 and led the Great Lakes region, including Illinois. The Minnesota income figure compared favorably with the U.S. per capita average of $50,322 and the Wisconsin average of $47,850, which was 23rd in the nation and third in the region.

Direct correlations are difficult to draw, yet it should be noted that most of the top 15 states in college degree achievement are also found in the top 15 per capita income states. That suggests an increase in the number of people with college degrees would lead to more income – and more tax revenue for the state to help pay for Wisconsin Grants over time.

To make Wisconsin competitive, annual appropriations for state student grant aid must be raised to bring us to Minnesota's level for grant aid spending per undergraduate.

This needed increase in the annual appropriation for Wisconsin Grants should be apportioned among students in the three sectors as is currently the case. In other words, 55 percent for UW students, 20 percent for technical college students and 25 percent for Wisconsin citizens attending a private, nonprofit college in this state. Adjusting grant aid to a competitive level is an on-going challenge, not a one-time fix. Students need to have consistent stability in their support through their college careers. Starting and stopping, growing or cutting aid is a leading cause of dropouts – i.e., of investments being wasted. We recommend the Legislature establish a link between the percentage increase in public-sector tuition increases and the percentage increase in the Wisconsin Grant appropriation, and that the appropriation be made "sum sufficient" – i.e., that funds be available for all qualified Wisconsin students.

Increasing grant aid to students is the best approach to boosting attainment. Grants need not be paid back, and therefore reduce the dependence on loans before a problem develops.[12] Evidence shows that need-based grants reduce the likelihood that low- and moderate-income students will drop out of college, and a recent study indicates that increases in grant aid increase receipt of a bachelor's degree.[13] It has been noted that a grant "…reduces college dropout rates and strengthens student persistence and academic success."[14] One study suggests that "need-based grants from all sources increase chances to complete a degree…whereas unsubsidized (federal) loans are found to drastically lower chances to obtain a degree."[15]

Increased grants to qualified students with financial need will result in more students enrolling in and graduating from college, a reduction in their expenses and an increase in their income – during their college years and after – and in an expansion of Wisconsin's economy powered by a trained and educated workforce.

Wisconsin Grants are a vehicle for expanding opportunity. By expanding state grant aid targeted to those who, without help, will not attend a college or university, Wisconsin will expand its qualified workforce. Students in all sectors – UW, WTCS, and WAICU – received an increase in their Wisconsin Grants appropriation in the 2017-19 biennial budget, an important step forward.

Expand Human Capital *cont.*

However, prior to this most recent budget, the state's principal student aid program had been flat funded for UW and WAICU members for a decade, but student need (families who can afford nothing for their own education) has grown. About 82,000 students who applied to Wisconsin colleges and universities came from families who could not contribute anything to their higher education – 37 percent of all applicants.

Wisconsin Grants are for Wisconsin students attending Wisconsin colleges and universities. Currently, if funds run out, students are wait-listed and may have to delay or forgo postsecondary education. Because of the crisis in our current and future workforce, we cannot afford to leave anyone behind. Each year we do not fully fund student aid is not just opportunity delayed, it is opportunity denied. In 2013-14, there were more than 68,000 Wisconsin Grant recipients from all sectors – UW, WTCS, and WAICU – but more than 43,000 students were turned away because of inadequate funding. [16]

In sum, means-tested grants to students are the most effective way to increase educational attainment for Wisconsinites; getting them to college, keeping them on track and graduating them on time, with manageable debt.

In addition, there is pending federal legislation, the CHANCE in Tech Act, an acronym for Championing Apprenticeships for New Careers and Employees in Technology [17], recognizes that tech apprenticeships in the United States are largely a patchwork of programs that do not always result in certificates that are "portable" from one workplace to another. The legislation would instruct the U.S. Department of Labor to award contracts to industry intermediaries to develop apprenticeships in tech; define how those intermediaries – such as colleges and industry groups – would work with business; and make apprenticeships available to high school students, early college science and tech students, and post-secondary students.

Talent attraction through employer incentives

The Governor and Legislature have taken a bold step on workforce attraction through the "Think/Make/Happen" campaign, with targets such as reaching out to millennials in Chicago. Campaigns like this tell our story, but Wisconsin must also drill down to matching specific career interests of specific individuals with specific talents and industries with specific workforce needs.

Even if "right-sizing" the Wisconsin Grants program expands education and training for current Wisconsin residents and succeeds beyond expectation, our state still will not have enough qualified, home-grown workers for high-end jobs. The demographic reality simply causes us to fall short.

As is the case with talent development, the pathway to talent attraction runs through the campuses of our colleges and universities. Most college graduates end up living and working within 100 miles of their alma mater. Everyone knows of individuals who have come to study in this wonderful state and ended up remaining here. Employers, more than the state government, can make a difference in bringing the best and the brightest to Wisconsin. This is not an issue of current residents versus future residents. We need both.

State student aid for out-of-state students has been a "nonstarter" politically. However, the Tech Council believes Wisconsin employers, with the incentive of a state "Future Workers Tax Credit" could attract well qualified workers to put Wisconsin on their list. A "Future Workers Tax Credit" would provide incentives to employers to invest in education and training of individuals (future workers), empowering employers, rather than government, to determine the skills and abilities they most need.

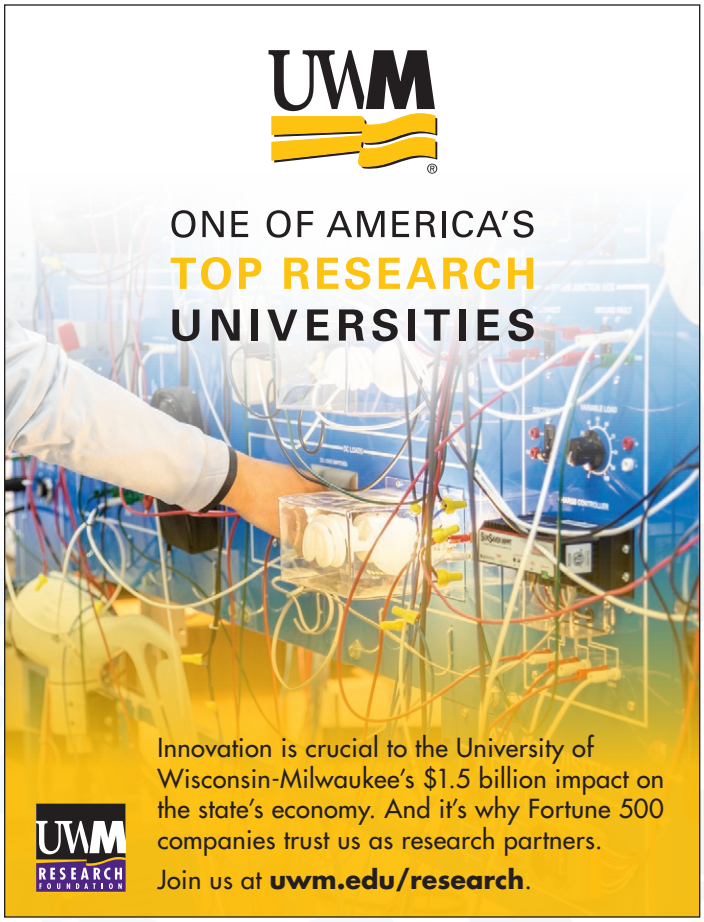
Here's how it would work: The "Future Workers Tax Credit" would provide Wisconsin employers with a tax credit equal to 50 percent of the tuition they pay for any individual to attend a Wisconsin public or private, nonprofit college, university or technical college. The credit would rise to 75 percent for individuals in fields identified by the Department of Workforce Development as being of critical importance to the state or for students eligible for federal Pell Grants (i.e., students with high financial need).

The "Future Workers Tax Credit" provides an incentive for the private sector to invest in a way that will expand the talent pool for Wisconsin, and, more specifically, for their own companies. Equally important, the credit would give employers the ability to increase the supply of skills they need, rather than having the government pick winners and losers. In addition, employers would have the entire span of college years to build relationships with participating students (e.g., with internships). About 73 percent of students with internships while in college end up getting a job offer where they interned. [18]

It would be up to the colleges and universities to recruit in-state and out–of-state students meeting the employer's criteria (major, income strata, critical occupations). The employer would then pay the tuition and claim the credit on their next return.

Footnotes:

1. Wisconsin's Future Populations, UW-Madison Applied Population Laboratory, December 2013.
2. Wisconsin Taxpayer, February 2018.
3. Tom Still, "The value of computer science to the Wisconsin economy," March 2018.
4. United States' Census Bureau, Population estimates, July 1, 2017, www.census.gove/quickfacts/WI .
5. Economic Policy Institute as cited by The Associated Press, January 12, 2017.
6. Georgetown Center on Education and the Workforce, 2017.
7. Post-secondary Education Opportunity, 2018-1.
8. Wisconsin Technical College System Board, 2015-17 Biennial Report, October 2017
9. The Chronicle of Higher Education, April 14, 2016.
10. NAASGAP Surveys on Student Financial Aid.
11. U.S. Census, 2010-2014 American Community Survey.
12. "The research suggests that need-based grants are more effective than loans and tax credits (to students) in promoting access and success for underserved students." Institute for Higher Education Policy, January 2013. Used by permission.
13. Institute for Higher Education Policy, January 2013. (Specifically refers to Pell Grants.)
14. Center on Budget and Policy Priorities, July 27, 2017.
15. Ray Frank, PhD, Toward the Education Nation?, Prepared for the American Educational Research Association, March 2014.
16. Wisconsin Higher Education Aid Board reports.
17. S.1518 and H.R. 3174
18. Internship and Co-op Survey, NACE, May 2016



Follow the Tech Council!

/WiscTechCouncil

/WiscTechCouncil

/Wisconsin-Technology-Council

/WiTechCouncil

Improve Access to Capital

Wisconsin has an acute shortage of risk capital.

We have 1.78 percent of the nation's population, conduct 1.89 percent of the nation's academic research and generate 1.64 percent of the nation's patents. However, we have 0.21 percent of the nation's venture capital under management and our state's companies raised 0.35 percent of our nation's venture capital.

Over the last three years, the average first round of funding has been $2.5 million and the average follow-on round is $10.5 million nationally, with an average of 1.95 follow-on rounds per company, which means the average venture capital backed company needs $23 million through several rounds. Many need substantially more and the long-term requirement varies by sector. The average first round in pharma and biotech is $10 million with an average of three follow-on rounds of $16 million and a total financing need of $58 million over time.

In California, Massachusetts and New York, where 83 percent of the nation's venture capital is managed, the median sized fund is $84 million. In the other 47 states, the median sized fund is $28 million. In Wisconsin, the median sized fund is less than $20 million. Wisconsin's funds generally have the capacity to lead a first round, but lack the capacity to lead a follow-on round with a meaningful commitment.

Comparing Wisconsin deal size to other Upper Midwest states on a per-capita basis shows Wisconsin does comparatively well in deals less than $5 million and starts to lag peer states in larger deals. Wisconsin has also had historical strengths in angel capital, with Wisconsin Investment Partners listed as one of the most active angel groups nationally and Golden Angels, Wisconsin Super Angel Fund, Silicon Pastures and others showing consistent investment activity.

Venture capital is a social network, relying on proximity and relationships to find opportunities and be actively engaged in their portfolio companies. Even with Wisconsin's strengths in innovation and early-stage capital, more than 80 percent of the nation's venture capital is managed by firms with headquarters in three states (California, Massachusetts, and New York) and they invest more than 80 percent of the money they manage in the same three states.

If Wisconsin wants a thriving entrepreneurial economy with companies facing national and international competition, our entrepreneurs need access to more capital.

To achieve that aim, we need tools to help grow our local venture capital community in number and size of funds, and help build the networks and relationships that produce syndicates capable of financing our companies competitively.

Objectives of a program: To have a transformational impact on venture capital availability in the state, a program would have to select from a handful of alternative ways to increase the number of funds operating in the Wisconsin and the size of those funds:

- Make a commitment of public dollars to venture capital investments. It is widely acknowledged that the best programs are a form of public/private partnership. Gaining private sector participation only works if the inducements for investment are not offset by requirements and constraints that are perceived to diminish returns.
- Encourage those in the private sector investing in the venture capital asset class to invest more in Wisconsin. This is increasing the reliance on the existing participants rather than broadening the base. They are most likely to invest more if more experienced fund managers are operating in the state.
- Attract new investors to the venture capital asset class in Wisconsin. Many smaller institutional investors may not be investing because they cannot deploy enough to justify hiring the specialists who manage the investments in this sector. A fund-of-funds structure is intended to fill that void.

Create a "fund-of-funds" based on public-private partnership model

At one extreme there is the state-sponsored fund-of-funds like those that were effective in building Michigan's venture capital community. The Badger Fund-of-Funds is built on that model, but it is smaller than many single rounds of financing in companies and it had substantially greater constraints than other state sponsored fund-of-fund efforts, limiting the private sector's willingness to participate. It is not clear whether Wisconsin has the appetite for an effort at the appropriate scale.

At the other extreme, there are completely private efforts like Renaissance in Michigan or Cintrifuse in Cincinnati. These fund-of-funds required the collaboration, vision and commitment of a few major corporate leaders to catalyze and launch. There are some encouraging signs that Wisconsin corporate leaders are prepared to initiate this effort, but there have been no such announcements.

If a private fund does not materialize, an alternative would be a $150-million fund of funds under a public/private partnership:

- Up to a $50 million State of Wisconsin commitment (one-third).
- Up to a $100 million private sector match (two-thirds).
- State capital is drawn to fund commitments first, then the private sector match. First returns go to private investors until they are whole, then the state until it is whole, pro rata thereafter. The net effect is to reduce private sector risk and holding period and make it a more attractive investment relative to other alternatives.
- Privately managed, making investments of $5-25 million in venture capital funds that agree to:
    - Establish and maintain a Wisconsin office with a full-time professional.
    - Not to exceed 25 percent of total fund commitments: will result in funds with a total of at least $600 million under management.
    - Invest an amount in qualified businesses in Wisconsin at least equal to the commitment from the fund-of-funds (at least $150 million).
    - A multiple of that number is achieved through syndication.

This approach could potentially achieve all objectives above. The State of Wisconsin would experience a lower rate of return than the private sector investors because of the timing to induce the commitments, but unlike those other investors, the State of Wisconsin generates tax income from the activity. Factoring in new tax revenue, the State of Wisconsin would likely generate a superior return in the long run.

A core component of this strategy is the State of Wisconsin would be a participant in the larger fund, not only the Wisconsin portion. The participation in the larger fund with other limited partners reduces the financial risk to the state, creates the incentive for the fund manager to make strong investment choices in Wisconsin, and reduces the need for "red tape" by adopting a market-based mechanism for compliance.

State Role: Lead Investor and catalyst with commitment to invest $50 million.

Other Participants: Need private sector participation.

Form of Commitment: Investment expected to generate a return.

Risk/Reward: Highly likely to generate desired impact
Key Considerations: Avoid constraints beyond the investment commitment because they will be a deterrent to the desired matching investment.

Support the formation of additional seed stage capital in Wisconsin.

While Wisconsin has shown strength in early stage investments, many believe there is room for improvement in our start-up activity. The first outside dollars invested, the dollars that often allow a founder to commit to the enterprise full-time, can be the most difficult to raise for first-time entrepreneurs or untested technologies.

Matching state funds of 20 percent for seed funds, angel groups or venture debt programs targeting the first $250,000 invested could enable more entrepreneurs to launch their businesses. These funds could support high-growth companies that will need downstream capital or local job producing firms with high startup capital requirements.

State Role: Creative investing of the state of Wisconsin's "rainy day" fund, currently about $300 million, would produce an evergreen funding source for a matching fund program.

The state currently earns about 1 percent per year on the fund, which is used as a cushion should state revenues drop below certain levels.

If invested through the State of Wisconsin Investment Fund, returns could be expected in the 7 percent range. A portion of that increment (6 percentage points) could be used to finance matching funds through WEDC while still building the size of the "rainy day" fund principal.

Other Participants: Requires private sector investors to source and fund investments.

Form of Commitment: Cash for 20 percent match of participating investor commitment.

Risk/Reward: WEDC funding would be made at risk alongside private investments and would provide a commensurate return minus necessary inducements and compliance overhead. The goal would be to substantially increase the number of companies receiving investment for the first time.

Key Considerations: Would follow established models and could be run as a pilot to prove success. WEDC would be allowed to work with private investors to develop program parameters likely to achieve desired results. Matching fund program would address additional support for early capital need while providing an investment return to the state without additional pressures on the established QNBV program limits or inducing unintended consequences associated with higher credit amounts.

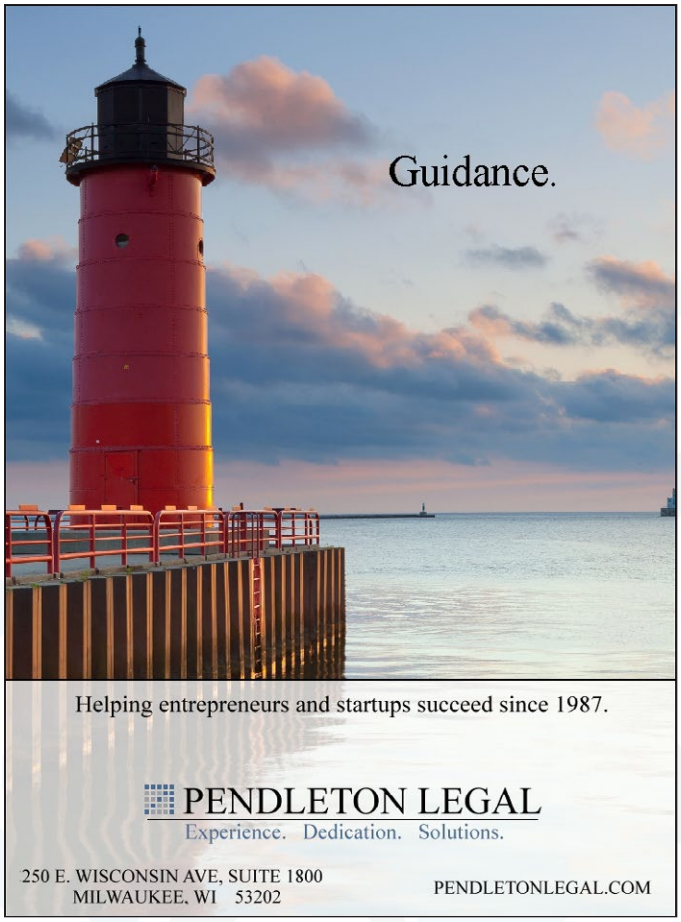
Improve Access to Capital *cont.*

Discuss with the State of Wisconsin Investment Board opportunities to further develop the Wisconsin startup ecosystem

The State of Wisconsin Investment Board is Wisconsin's largest investor in the venture capital asset class and has close and important relationships with venture capital funds in Wisconsin, the Midwest and on the coasts.

SWIB has thoughtfully constructed its venture capital portfolio over the years to generate strong returns and maintain the fiduciary duty it owes to the 622,000 participants in the Wisconsin Retirement System.

We ask that SWIB continue to find ways in which it can affect the Wisconsin start-up community. Such opportunities could include coordinating events to raise awareness of Wisconsin's technology successes; inviting East and West coast venture managers to meet with Wisconsin's most promising startups to raise capital;



providing guidance and broadening professional networks; and finding innovative ways to invest capital, such as creating 4490 Ventures with the Wisconsin Alumni Research Foundation.

Three specific ways in which SWIB could play an increased role:

- Advise on future fund-of-funds models similar to what it did with the Badger Fund. Additionally, there may be venture capital funds within the Badger Fund or other Wisconsin fund-of-funds models that over time could be of interest to SWIB, and we would welcome SWIB's investigation and due diligence of those funds. Additional commitments to these funds would increase the amount of early stage capital in the state to invest in the most promising startup opportunities.
- Consider advising on emerging manager programs that may develop in the state to assist first- or second-time managers who have promise. This type of a program could lead to increased early stage capital to Wisconsin and bring experienced and networked investors to the state to potentially invest in the most promising startup companies.
- Continue to invite the non-Wisconsin venture capital funds to Wisconsin to meet with start-up companies and other participants in the state's start-up community to make investments, share experiences, mentor, collaborate and broaden our local companies contacts and connections.

Action step: Collaborate and engage in dialogue with SWIB regarding its involvement with the Wisconsin early state ecosystem consistent with its fiduciary responsibility to the WRS and other legal requirements.

Other participants: Optional.

Form of commitment: Any investments would need to generate a return that meets SWIB's duties as a fiduciary to the participants of the Wisconsin Retirement System.

"At the end of the day, they know where we're coming from."

People who know Startups, know BDO.

The Technology Practice at BDO

With advisors all over the world, BDO's Technology practice, along with seasoned private equity professionals, encompass more than traditional audit, tax, and advisory. Combining industry knowledge with experienced, service-driven professionals, we can help you address the diverse business issues affecting the industry.

BDO Wisconsin Offices:
One Erdman Place, Suite 404, Madison, WI 53717, 608-831-8500
8383 Greenway Boulevard, Suite 500, Middleton, WI 53562, 608-836-7500
330 E. Kilbourn Avenue, Suite 750 Two Plaza East, Milwaukee, WI 53202-3143, 414-272-5900

Accountants and Advisors **www.bdo.com/technology**

© 2018 BDO USA, LLP. All rights reserved.

BDO

Improve Tech Infrastructure

The right infrastructure contributes to economic and social health.

One of the components of a healthy economy and society is its infrastructure. Broadly defined, infrastructure is the basic physical and organizational structures and facilities – such as buildings, roads, airports, ports, rail lines and power supplies – needed for the operation of a society or enterprise.

In Wisconsin, a strong technology infrastructure touches many of those items and more.

A healthy tech infrastructure means telecommunications systems that will allow a greater number of Wisconsin citizens and businesses to benefit from the power of the internet.

It includes continued efforts to ensure that Wisconsin is well-connected to major airports in the United States and the world.

It means maintaining a vigorous trade and foreign direct investment structure that recognizes Wisconsin's wide array of products, goods and services cannot be consumed entirely within our borders.

It includes embracing innovative transportation systems for commerce and movement of people.

It means embracing competitive alternative energy sources. Platforms such as intrastate transmission, wind, solar, natural gas and "next-generation" nuclear power must be part of the long-term diversification strategy.

Here are core recommendations for building a long-term tech infrastructure for Wisconsin.

1. Accelerate public and private investments and welcome emerging platforms in broadband development. These include dedicated use of broadcast "white space," small-cell technologies and more.
2. Enhance access to out-of-state power, per past Tech Council efforts and recommendations.
3. Continue to assist the state's airport professionals in attracting non-stop or direct flights to cities such as San Francisco, Boston and Seattle, per past Tech Council efforts. This is an important bridge to attract coastal researchers, technologists and investors to Wisconsin. This has been a part of Tech Council recommendations since 2005.
4. Embrace innovation in transportation, such as autonomous and connected vehicles for people, electric vehicles, freight moving and raising transportation maintenance revenues through new strategies.
5. Ensure that Wisconsin's interests in trade and foreign direct investment are protected, with or without bilateral trade agreements.
6. Support efforts to enhance Wisconsin's computing capacity. These include the formation of a data science institute in Milwaukee and the evolution of the UW-Madison Computer Science Department, as well as tangible support for K-12 computer science courses. Wisconsin has statewide standards for computer science education in high school, but no funding for course development, based on reports by Code.org.

Support broadband development, rural and urban

The story of broadband development in Wisconsin is split into two stories – the first relating to mostly rural parts of the state that lack adequate connections, as defined by the Federal Communications Commission, and the second involving largely urban parts of the state that need fifth-generation telecommunications platforms (5G) to support commerce, transportation and more.

In rural Wisconsin, the story is largely one of access. In a 2018 report, the FCC found that broadband deployment in Wisconsin was below the national average. The FCC found that 13.7 percent of the people in Wisconsin (783,000) lack access to at least one broadband service with a speed of 25/3 Mbps or better, compared to the national average of 7.7 percent. It also concluded 43.1 percent of Wisconsin residents living in rural census blocks (748,000 people) lack access to at least one broadband service, compared to the national average of 30.7 percent.

This is a challenge for Wisconsin: There is a disparity between the quality of broadband service available in urban areas and that available in many rural areas.

Those findings also help to explain why Wisconsin ranks No. 2 in the nation, behind only California and its far-flung geography, in receiving grant dollars from the federal Connect America 2 Fund. That fund is aimed at helping underserved areas.

It also explains why Wisconsin has invested in a Broadband Expansion Grant Program through the state Public Service Commission. Through early 2018, that program had awarded 55 grants that will connect 600 businesses and about 20,000 people to the internet at competitive speeds and rates.

While there is continued dispute over what constitutes "competitive" download and upload speeds, the FCC in 2015 declared that 25 megabits per second (25 Mbps) was the reasonable minimum standard for uploads in 2018 and 3 Mbps for uploads. As recently as 1996, the FCC's recommended download speeds were 200 kilobits per second – a fraction of today's speeds. That summarizes the dramatic growth of the internet over the past two decades, especially the explosion in video data.

The solution is tied to money. To offer a decent broadband service, the service provider must often either upgrade or bypass existing older telephone facilities. Both of those options are expensive. In urban and suburban areas, there is usually a sufficient concentration of customers to pay for improvements.

However, in many rural areas, it's often not possible to build an upgraded broadband service financed through monthly rates for service. That's where CAF2 and the state Broadband Expansion Grant Program can help, providing public dollars to get broadband to customers who are literally at the end of the line.

In 2015, the FCC estimated that it would take about $80 billion to extend fiber-to-the-premise and bring broadband penetration (25/3 Mbps) from 86 percent to 100 percent of American homes. The cost for 98 percent penetration was about $40 billion. www.fcc.gov/general/connect-america-fund-phase-ii-models

For Wisconsin to achieve 98 percent coverage using the FTTP standard, the extrapolated cost is roughly $800 million. Clearly, that cannot be accomplished overnight. The Tech Council recommends a tiered approach that would set goals of 92 percent by 2022 ($200 million in public and private investment), 94 percent by 2024 (cumulative $380 million), 96 percent by 2026 ($540 million) and 98 percent by 2028. Other broadband technologies, such as greater use of television "white space" and "fixed wireless," may help to significantly lower the cost.

The urban part of the story is different and potentially far less expensive because it involves more private investment than public. The most important contribution government can make to the development of new broadband and wireless technologies is to ease the deployment of those technologies across various municipalities and localities.

A prime example is Indianapolis, Ind., where the Legislature acted to craft rules that identified how providers could quickly install the technology required for 5G wireless ("small cells"), which are installed on utility, light and street poles, typically requiring interaction with the various municipalities that own that infrastructure. With uniform rules across localities, providers were quick to deploy this technology in Indianapolis, since the regulatory process was de-risked. Wisconsin is virtually alone in the Upper Midwest in not removing such barriers and should do so within the next biennium.

Enhance supply of out-of-state power; support diversification

Because Wisconsin has invested heavily over time in coal plants for electricity generation, those plants cannot be economically "retired" tomorrow or next year. However, the state's utility companies understand the need to diversify power sources and have done so in recent years.

One strategy is to avoid capital-intensive investments in generation plants that are located inside Wisconsin in favor of transmission of power, especially wind power, from locations outside Wisconsin. Wisconsin has limited wind generation power on its own; much of the available wind power is west of Wisconsin in Iowa, Minnesota and the Dakotas. A longstanding Tech Council recommendation has been to tap into that power, subject to state and local decisions related to siting of power lines.

Solar power is one of the fastest-growing generation sources in Wisconsin, and it is diffused in its sources. Natural gas has moved from a "peaking source" of electricity generation to a baseload source, but concerns about price remain. Nuclear power should remain on the list of available sources, especially as next-generation plants are planned and tested.

Enhancing flight connections to destinations outside Wisconsin

Wisconsin has enjoyed success of late in making air connections that move the state from "two-flight" to "one-flight" status. That may seem trivial to some, but not to venture capitalists and tech company executives who have choices about where they can do business.

As Wisconsin matures as a place where technology and talent are available, the state's airports should continue to foster connections to major domestic tech hubs: San Francisco, Boston, New York, Denver, the Research Triangle of North Carolina, Austin, Tex., Denver and other destinations.

Madison's success in securing non-stop flights to San Francisco is a prime example of involving the public and private sectors in generating the data needed by airlines to justify such an investment, and building community support for a revenue-generating, sustainable route.

Improve Tech Infrastructure *cont.*

Embrace innovation in transportation

Wisconsin has the expertise and capacity to position itself as a key contributor to the development of autonomous and interconnected vehicles. Wisconsin contains mapping and computing expertise necessary for the development and deployment of this technology, as well as corporate participants (such as Foxconn Technology Group) that have exhibited a willingness to deploy early instances of this technology.

This need not necessitate massive public investment, although the development of a 5G network in urban corridors is necessary. Instead, it will be critical to develop a uniform regulatory framework for the deployment of autonomous and interconnected vehicles, bringing together regulatory stakeholders at the state, county and local levels, and harmonizing the regulatory approach to this technology.

The Tech Council recommends building upon the work of the Special Committee on Autonomous and Connected Vehicles. This committee was formed with input from the Tech Council and key lawmakers. It has focused on innovation in Wisconsin, safety considerations, pedestrian and bicycle interaction, existing research and testing assets, and industry perspective. We urge that committee to submit its recommendations in a timely manner.

Ensure an open trade and foreign direct investment environment

Wisconsin must maintain a vigorous level of exports across a mix of sectors to prosper. It is a manufacturing state, an agricultural state, a raw materials state and a technology state – diversity that helps when trade relations are strong and makes Wisconsin vulnerable when tit-for-tat tariffs disrupt the global economy.

Wisconsin businesses exported $22.3 billion in goods and services to 202 countries in 2017, an amount that grew by 6.1 percent over 2016. The three biggest destinations were countries President Trump has singled out in his trade criticisms – Canada, Mexico and China.

The core Wisconsin product list is extensive: Industrial machinery, electrical machinery, medical and scientific instruments, vehicles and vehicle parts, plastic products, aircraft and parts, paper products, wood and wood products and a long list of agricultural goods. In short, Wisconsin is a target-rich environment for a trade war.

Wisconsin's congressional delegation represents a mix of Democrats and Republicans, with varying degrees of sentiment on what constitutes "free trade" and what represents "fair trade" or a "Buy American" approach. There are fans in both parties of bilateral pacts such as the North American Free Trade Agreement and the Trans-Pacific Partnership Agreement, as well as skeptics.

Members of the Wisconsin delegation have their differences on what trade policies work best, but it would be helpful if they agreed unilateral tariffs are a dangerous course.

Support efforts to enhance Wisconsin's computing capacity

These include the formation of a data science institute in Milwaukee and the evolution of the UW-Madison Computer Science Department.

Northwestern Mutual Life Insurance, Marquette University and the UW-Milwaukee are launching a Northwestern Mutual Data Science Institute. Over the next five years, Northwestern Mutual and its foundation will contribute $15 million to support an endowed professorship at each university, expand the universities' curricula around data science, fund research projects and develop learning opportunities for K-12 students. At the request of its chancellor, the UW-Madison Department of Computer Science is undergoing a review of its goals and mission, with the intent of boosting its faculty, reach to non-Cop Sci students and improving its national rankings.

These and other initiatives will help Wisconsin expand its supply of computer-savvy talent, serve existing and new businesses, and provide cutting-edge research for the state, the nation and the world.

Wisconsin Connected.

At AT&T, we know businesses help communities thrive. In Wisconsin and across the nation, we empower connections that help to build a better tomorrow.

Keeping communities connected. At AT&T, it's how we do business.

AT&T is proud to support the Wisconsin Technology Council.

AT&T

© 2018 AT&T Intellectual Property. AT&T, Globe logo, Mobilizing Your World and DIRECTV are registered trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks are the property of their respective owners.

Make it Easier to be an Entrepreneur

Entrepreneurism matters

For an economy to flourish and constantly refresh itself, new ideas, products and companies must rise to take the place of the old. It's a phenomenon called "creative destruction" by economists and it has driven the American and Wisconsin economies for generations.

Startups and scale-ups push up from below in the economy, creating most net new jobs in the United States as older companies mature, sometimes shedding jobs or shutting down.

Over the past 20 years in the United States, the rate of entrepreneurism declined overall, according to the Ewing Marion Kauffman Foundation, which charts the rise of falls of startups, Main Street business and growth companies. It started to rise again in 2014 and has increased each year since.

In Wisconsin, as measured by Kauffman, the rate of startups ranks last among the 25th largest states. Conversely, Wisconsin ranks 2nd among all states in Main Street entrepreneurism. Other indexes, such as the Milken Foundation's studies, rank Wisconsin higher.

Whatever the state's ranking, it can do more to establish itself as a state that values entrepreneurs, startups and scale-ups. Here are some recommendations.

Avoid state-based research restrictions

The entrepreneurial spirit of any state revolves around the level of innovation that is fueled with public and private support. One way to ensure this spirit remains alive in Wisconsin is to ensure a reasonable regulatory environment around research activities. With a strong research foundation embodied in many public and private institutions and companies, it is imperative that Wisconsin maintain a hands-off policy as it relates to state-based research restrictions. This is a reiteration of policy statements made by the Wisconsin Technology Council since 2001.

On a regular cycle, state government and other partners should validate Wisconsin's level of regulation relative to other states to ensure it maintains an open and competitive innovation environment for entrepreneurs already in our state – as well as attracting entrepreneurs to Wisconsin.

Compare "fence-me-in" regulations in Wisconsin with those in other states.

Ensure that professional and occupational licensing isn't a "fence-me-in" strategy to exclude new entrants to the marketplace. It may be advisable to compare Wisconsin's licensing and certifications requirements to those of other Midwestern states.

This issue seems to have arisen from a Kauffman Task Force on Entrepreneurial Growth Study entitled "License to Grow: Ending State, Local, and Some Federal Barriers to Innovation and Growth in Key Sectors of the U.S. Economy," January 2012. A follow up report was issued on December 2, 2014 called "Occupational Licensing: A Barrier to Entrepreneurship." These materials imply that overly burdensome and expensive licensing requirements inhibit entrepreneurial growth.

Examples cited include restrictions related to lawyers and the practice of law, health care providers and the delivery of health services, drug manufacturers, educators and other occupations (such as tour guides, pet groomers, etc.).

Our recommendation is to review Wisconsin's professional and occupational licensing and certification requirements to ensure that they are not overly burdensome or expensive. Consider providing (1) additional exceptions or exemptions to people who are already licensed in other states (provided that the public interest in the health and safety of residents is protected) and (2) lower annual fees for new professionals.

Carefully follow the employment non-compete debate

It is sound policy to keep an eye on enhancing mobility while keeping appropriate, existing protections for confidentiality, intellectual property, trade secrets and non-solicitation. The Tech Council went on record in 2015 as opposing legislation that would have made existing non-compete law easier to enforce.

Non-competes are an oft-debated topic when it comes to comparing Wisconsin to other states on various areas of competitiveness in the technology sector. States such as California do not uphold or enforce non-competes within the confines of labor law. In fact, it is argued that this "lack" of constraint on employee mobility enhances the quality, and competitiveness, of the technology labor force that chooses to work in California.

This is particularly true in software businesses, which are constantly competing for technical talent.

While California is not the national norm for non-competes, the broader question of the applicability of non-competes given their effect on employee mobility, IP protections, and the war for talent keeps this topic on the front-burner for continued evaluation.

It would be worth studying the changes made at the state level (perhaps starting with Midwestern states) to see if our protections are disabling talent mobility compared to elsewhere in the region. The key to this discussion in determining how much the topics of (1) confidentiality, (2) IP protections, (3) trade secrets and (4) non-solicitation need to be coupled within non-compete agreements.

Use data to determine Wisconsin's true status in startups and scale-ups

Wisconsin is the No. 2 state for scaling up business, according to the America Express Power Index Survey. It has more than $1.4 billion in university research and development expenditures, as noted by the National Science Foundation. It produced more than 17,000 patents over the past 10 years, according to national academic licensing surveys. It is ranked 14th in the world for venture-backed entrepreneur production. Madison has been ranked as the nation's top city for STEM graduates and the nation's 7th best for entrepreneurs. The state has a host of organizations, accelerators, investors and more to help connect, inform and inspire young companies. Yet, other sources, such as the Kauffman Index, rank Wisconsin as 23rd in growth entrepreneurship and 25th in startup activity.

This data and associated rankings suggest that Wisconsin has tremendous potential for startup activity based on the R&D output of the state. This emphasizes the need to develop a set of key metrics that reliably reflect the startup activity in Wisconsin. To improve the creation of startups and aid the startup community in Wisconsin, the Tech Council has created its own "Tech Metrics" index. Other academic studies are underway.

Create clear paths for talent creation for foreign-born talent

Wisconsin members of Congress should create a clear path for a federal Startup Visa and establish Global EIR programs in the state's universities leveraging existing immigration law. Also, Congress should be encouraged to create new visas for U.S.-educated students and entrepreneurs through legislation such as the "Immigration and Innovation" act at the federal level.

Many foreign entrepreneurs are interested in starting businesses in the United States and are unable to do so because of immigration regulations. The U.S. does not currently have a visa program that supports business creation by foreign entrepreneurs. Attempts to pass this type of legislation have failed in the past.

Our neighbors to the north in Canada have a startup Visa Program. Under the Canadian program, a foreign entrepreneur can apply for a visa if they meet the following requirements:

1. Have a letter of support from a designated organization within Canada. A designated organization is from an approved list of venture firms, banks, angel investors or business incubators who commit to investing in the entrepreneur's venture.
2. Show proficiency in English or French.
3. The applicant must own at least 10 percent of the proposed venture and the applicant and the designated organization must own more than 50 percent of the proposed venture.
4. The applicant must demonstrate enough financial resources to support themselves and their families while the venture gets underway.

The Canadian model was a success during its trial run. It is now a permanent program. The United States should enact legislation akin to the Canadian program. It will support business and job creation as well as very low-risk immigration of successful, well-educated people.

Many highly talented students come from around the world to Wisconsin to attend our universities and graduate schools. Many of these students are engaged in highly scientific and technical fields. Upon completion of their courses of study many of them have no opportunity to utilize their skills through employment or by starting a business because of their inability to obtain a U.S visa. The economy that these people would create through innovation and expertise leaves with them when they leave the country. The Wisconsin Technology Council recommends that state leaders foster and specifically target retention of highly qualified foreign students and graduates and allow them to remain in Wisconsin.

Immigration is obviously a matter of federal purview. The Senate is considering a bill titled Senate bill 2344 "Immigration and Innovation Act of 2018." The bill eliminates current caps on workers holding a master's degree or above, eases employer sponsorship burdens and allows students to seek permanent residence status while in school. Under the bill, security remains an exclusionary criterion in the interests of public safety. The bill is endorsed by many corporate and industry leaders.

Legislative update: How past white papers have helped

A core mission of the Wisconsin Technology Council is to serve as a policy advisor and resource for Wisconsin's governor, its Legislature and other state agencies that touch the state's tech-based economy.

It is a role the Tech Council has played since its inception as a non-profit, bipartisan corporation in 2001, with results that have proven to be helpful to Wisconsin's emergence as a state that welcomes tech-based businesses, research and related activity.

Here is a summary of how the Tech Council's ideas influenced policy decisions in the most recent session of the Legislature; how it helped in the past; and other ways the Tech Council works to improve federal policy through its national partnerships.

What passed in the 2017-2018 session of the Wisconsin Legislature?

Assembly Bill 489 – A bill to raise the lifetime ceiling on angel and venture capital investments in young companies eligible for Wisconsin's successful early stage tax credit program was signed into law April 3, 2018 by Gov. Scott Walker. It is retroactive to Jan. 1, 2018.

Assembly Bill 489 had previously passed the state Assembly and Senate unanimously.

Since 2005, Wisconsin has made 25 percent tax credits available to investors who put money into "Qualified New Business Ventures." In short, a private investment of $4 in a QNBV company can yield a $1 state tax credit.

State-vetted QNBVs are young, technology based and typically pre-revenue. It's a rigorous vetting process that, once completed, earns the angel and venture capital equivalent of a "Good Housekeeping Seal of Approval" for young companies.

As time passed, however, some parts of the law aged. The update made by the Legislature, and signed into law by Walker, raised the lifetime cap on credit-eligible investments in any single company from $8 million to $12 million.

The $8 million cap had been in place since the early years of the law. The cap posed a problem for many tech-based companies, especially those in health care or manufacturing, two capital-intensive sectors.

Primary sponsors for AB-489 were Rep. Mike Kuglitsch, R-New Berlin, and Sen. Tom Tiffany, R-Hazelhurst. This bill passed appropriate Assembly and Senate committees on unanimous votes before passing on a voice vote in the Assembly and 32-0 in the Senate.

Assembly Bill 897 – A bill to eliminate a longstanding and unique fee on angel and venture capital raised by qualifying C Corporations organized in states outside Wisconsin, mainly Delaware, was signed into law March 28, 2018 by Gov. Walker.

Assembly Bill 897 and its Senate companion had previously passed the state Assembly and Senate unanimously.

For decades, Wisconsin has charged a state fee on "paid-in" capital – essentially, venture and angel capital – raised by a certain class of companies. Called foreign C Corporations, these companies are domestic firms organized in another state but headquartered and producing goods and services in Wisconsin.

The law, which took effect June 1, 2018, exempts capital (beyond $60,000) raised by C Corps that are Wisconsin Qualified New Business Venture companies. State-vetted QNBVs are young and typically pre-revenue. The fee is three-tenths of 1 percent, or $24,000 on a venture capital investment of $8 million.

Wisconsin stood virtually alone in charging the fee, which out-of-state investors viewed as at least an annoyance in putting money into young Wisconsin companies. The companies paying the fee saw it as a detriment to their growth, because it was money not put to work on business basics, such as hiring people or buying equipment.

The Tech Council had long advocated for removing the fee to encourage more startups and scale-ups in Wisconsin. Lead sponsors were Rep. Shannon Zimmerman, R-River Falls, and Sen. Howard Marklein, R-Spring Green.

Senate Bill 148 – This bill authorizes the operation of personal delivery vehicles on sidewalks and crosswalks in Wisconsin. This bill, signed into law by Gov. Walker, will allow delivery companies in the state to expand their business operations. The devices must weigh less than 80 pounds, excluding cargo, can move no faster than 10 miles per hour, and are capable of operating with and without active control or monitoring by an individual.

Assembly Joint Resolution 100/Senate Joint Resolution 96 – This resolution, which was sent to the Federal Communications Commission, put Wisconsin on record as strongly encouraging the use of currently vacant television spectrum – called "white space" – to increase access to the Internet.

The resolution specifically called for the FCC to set aside dedicated "white space" in Wisconsin, which is one of 12 test states for the technology. Primarily intended for hard-to-serve rural areas, the white space option is attractive because it can operate at speeds four times faster than Wi-Fi and reach up to 16 times farther. Wireless signals can travel over hills, through foliage and buildings, the same qualities that have long allowed rural communities to get strong television signals.

The resolutions were consistent with the Tech Council's long-standing efforts to improve broadband penetration in Wisconsin.

What bills may resurface in the 2018-19 session of the Legislature?

In addition to ideas contained in this "white papers" report, the Tech Council will consider again supporting two bills that failed to pass in 2017-2018, assuming they are reintroduced in the next session of the Legislature.

Assembly Bill 758 and its companion, Senate Bill 651, were written to change rules that make it hard for the University of Wisconsin to contract with companies in which UW faculty have a financial/founding interest. Dubbed the "Mark Cook" bill in honor of the late researcher and entrepreneur, it was passed by the Assembly but did not make final Senate cut.

Assembly Bill 348 was written to provide for administrative and regulatory changes that will speed deployment of a network of 'small cell' antennas for 5G internet use. The bill passed the Assembly and was OK'd by Senate committee, but did not make it to the Senate floor for consideration.

Coming to Madison:
July 23-25, 2019
Tech Councils of North America
Annual Summer Conference

How has the Tech Council helped in the past?

Since 2001, the Tech Council's policy reports, recommendations and general advocacy have laid the foundation for more than a dozen initiatives, including:

1. Passage of the Badger "Fund-of-Funds" in 2013. This $25 million investment by the state will be matched by private dollars on a 2-to-1 basis as the venture capital fund creates more recipient funds;
2. Passage of the Act 255 investor tax credits (2004) and revisions to the nationally recognized program (2009 and 2013);
3. Creation of the Tech Council Investor Networks, which has expanded from five networks and angel groups in early 2005 to about 30 early stage groups today;
4. Expansion of the scope of allowable bonding projects for the Wisconsin Health and Educational Facilities Authority;
5. Repeal of the shareholder wage lien law, which discouraged investment in Wisconsin startup companies;
6. Improvements in laws governing entrepreneurial activity by University of Wisconsin faculty;
7. Improvements in processes and regulations vital to expanding broadband availability, especially in rural Wisconsin;
8. Extension of the "single-sales factor" sales apportionment for corporate income to technology and service firms in Wisconsin;
9. Enactment of an Education Tax Credit to assist employers in hiring and training workers;
10. Support for the "Emerging Technology Centers" concept within the UW System, which was first envisioned as Centers of Excellence in the Tech Council's Vision 2020 report;
11. Support for an Interdisciplinary Research Center, also through Vision 2020, which was consistent with the Wisconsin Institutes for Discovery and Morgridge Institute for Research, which opened in December 2010;
12. Broader recognition of the economic value of academic research and development in Wisconsin, which attract nearly $1.3 billion in sponsored research each year;
13. Creation of the I-Q Corridor branding concept and support for multi-state relationships;
14. Passage of AB-729 in 2014, which allows the UW System to pursue classified research projects through a mechanism that allows for faculty governance with regular reporting to the Legislature;
15. Extension of funding for the WiSys Technology Foundation, which assists UW System campuses in transferring technology to the marketplace.

Legislative update: *cont.*
How past white papers have helped

What are the Tech Council's national affiliations and priorities?

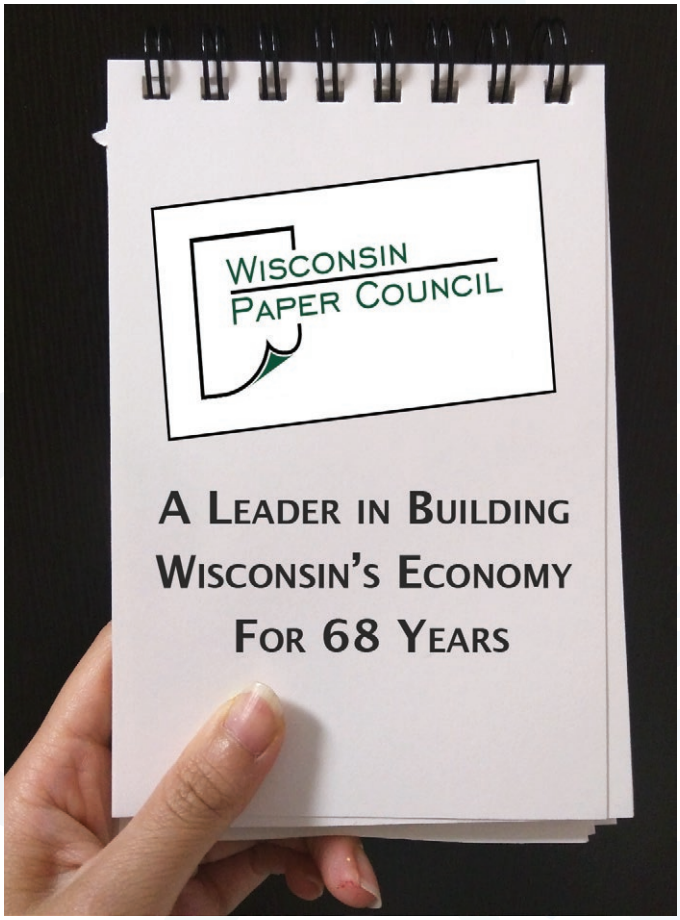
The Tech Council is a member of the Tech Councils of North America and its partner, CompTIA, which is the nation's largest tech trade association.

TECNA includes organizations much like the Wisconsin Technology Council in many of the 50 states and all Canadian provinces. It regularly engages on issues that come before Congress and federal agencies, providing a valuable industry perspective.

One of TECNA's current priorities is the "CHANCE in Tech Act," S.1518/H.R. 3174, which aims to streamline the tech apprenticeship process for companies by allowing for state "intermediaries" that can work with the U.S. Department of Labor, businesses, schools and others.

The Tech Council takes part in Washington, D.C., "fly-ins" organized by TECNA to stay in touch with Wisconsin's members of Congress and other policymakers. The group also helps to produce the annual "Cyberstates" report, which tracks tech employment and businesses in each state.

A resource that will be used by the Tech Council in coming months with be "CQ Engage," an online advocacy management software that will allow members of the Tech Council and the Tech Council Investor Networks to voice their ideas on state and national issues.



How do I know Enbridge's pipelines are operating safely?

Enbridge's pipelines are monitored 24/7, 365 days a year to protect what matters most.

Nothing is more important than the safety of the environment and the people who live and work along our pipelines in Wisconsin. That's why we continuously monitor our pipeline system, using advanced leak-detection technology, internal inspections, plus regular aerial and ground surveillance.

> **Learn more about safe delivery of energy in Wisconsin at Enbridge.com/Wisconsin**

ENBRIDGE®
Life Takes Energy™

Advancing Innovation

Husch Blackwell, an industry-focused law firm, collaborates with emerging companies on legal, business and financial strategies. We provide the right mix of services at the right time, ensuring that Husch Blackwell is a partner your early-stage company won't outgrow.

HUSCH BLACKWELL

huschblackwell.com

33 East Main Street
Madison, WI 53701
608.255.4440

555 East Wells Street
Milwaukee, WI 53202
414.273.2100

20800 Swenson Drive
Waukesha, WI 53186
262.956.6200

Arizona | California | Colorado | Illinois | Missouri | Nebraska | Tennessee | Texas | Washington, D.C. | Wisconsin

The choice of a lawyer is an important decision and should not be based solely upon advertisements.

UNIVERSITY RESEARCH PARK
UNIVERSITY OF WISCONSIN–MADISON

universityresearchpark.org • info@urp.wisc.edu • (608) 441-8000

Where Wisconsin IDEAS Flourish

University Research Park is a neighborhood of ideas, entrepreneurship, and opportunity, positively impacting Wisconsin and beyond.

@1403

Talented, innovative community actively engaged in Wisconsin's entrepreneurial movement.
urpat1403.com

Contact us today to learn how URP can help start up YOUR Wisconsin IDEA!

merlin MENTORS

A network of highly qualified mentors, working to guide emerging entrepreneurs to business success.
merlinmentors.org

madworks coworking

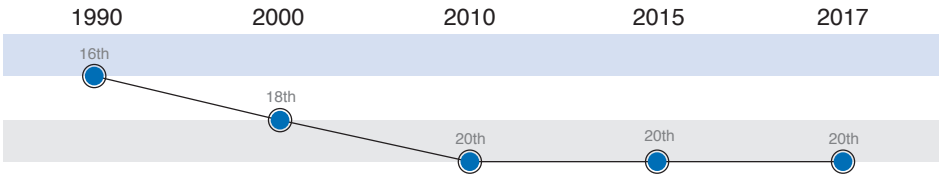
Professional work environment that fosters a vibrant community of innovative thinkers.
madworkscoworking.org

Tech metrics

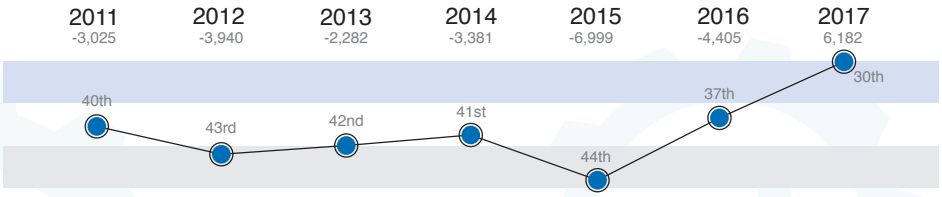
The Tech Council gathers or has access to a wide range of data regarding various indicators that measure the progress of the economy.

Driving off our past research and metrics, as established by "Vision 2020: A Model Wisconsin Economy" and other sources, we have created a credible source of data in the following areas: investment capital, intellectual property, educational attainment and test scores, population and migration, real domestic product and gross state tech product, tech employment and average tech salaries, research and development spending, Small Business Innovation Research grants, exports and more. This publication provides a periodically updated platform for measuring Wisconsin by indicators that truly propel the high-growth economy.
Lead researcher: Bram Daelemans

TOTAL POPULATION
5,795,483
(Estimated July 1, 2017)
Source: Census.gov

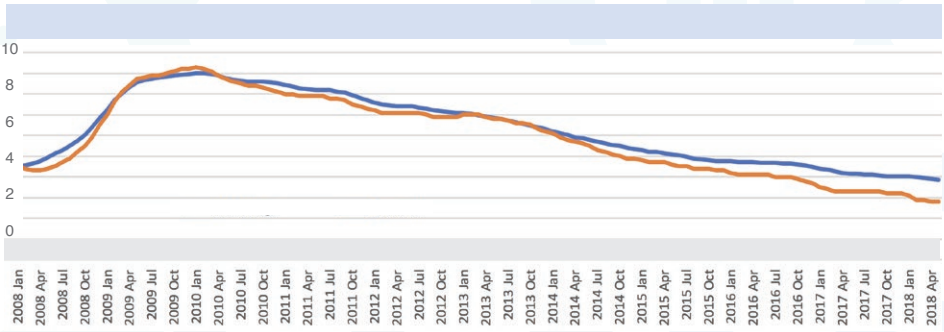


NET MIGRATION
Source: Census.gov Factfinder

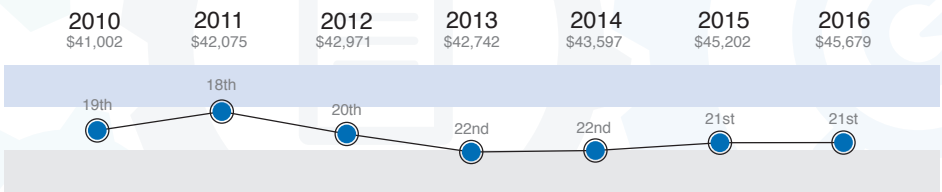


UNEMPLOYMENT RATE
(Seasonally Adjusted)
Source: US Bureau of Labor Statistics

US Average
Wisconsin

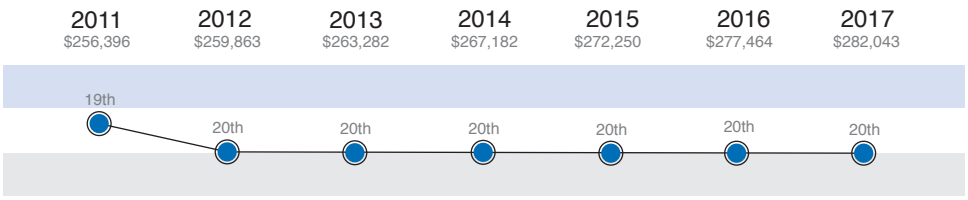


REAL PERSONAL INCOME PER CAPITA
(In 2009 Chained Dollars)
Source: US Bureau of Economic Analysis



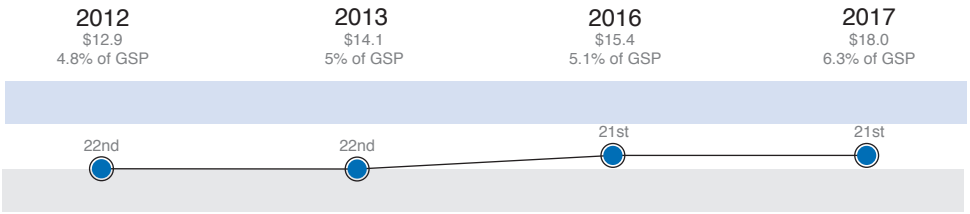
REAL GROSS DOMESTIC PRODUCT (In 2009 Chained Dollars)

Source: US Bureau of Economic Analysis



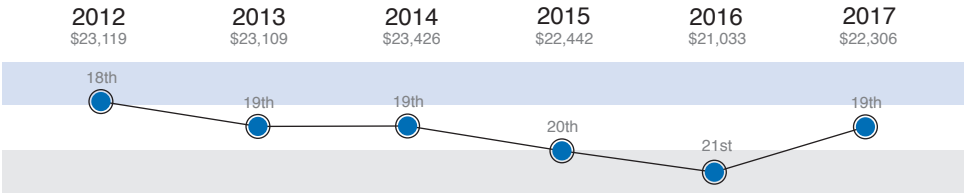
GROSS STATE TECH PRODUCTS (In Billions)

Source: Cyberstates Report
GSP: Gross State Product



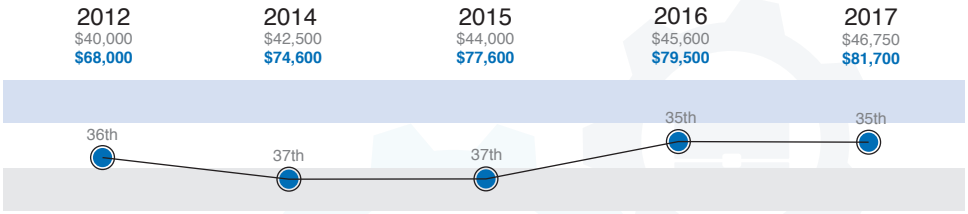
TOTAL EXPORTS (In Millions)

Source: Census.gov



TECH WORKER AVERAGE SALARY

Source: Cyberstates Report

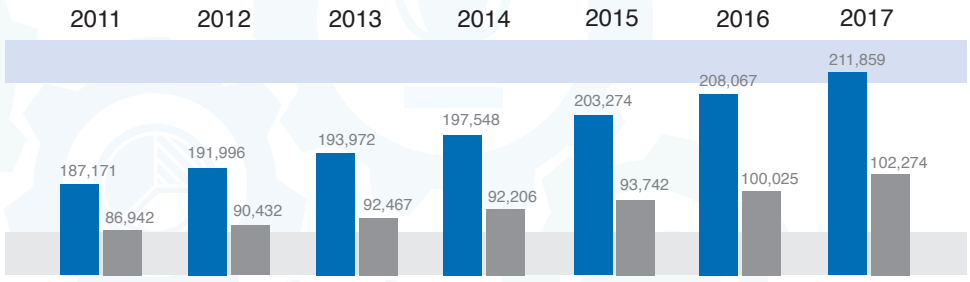


Private Industry Wages

Tech Industry Wages

TECHNOLOGY EMPLOYMENT

Source: Cyberstates Report



Net Tech Employment*

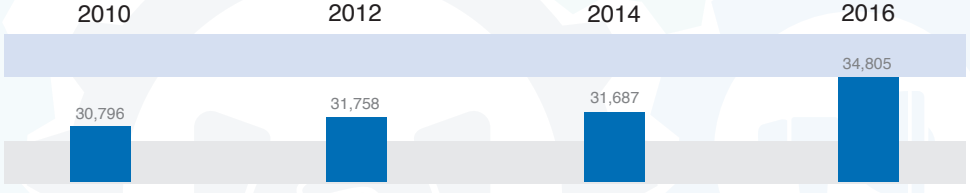
Tech Industry Employment**

*Net Tech Employment includes all (self-)employed tech professionals as well as all (self-)employed support/ business professionals working for companies in the tech industry.

**Tech Industry Employment is limited to all (self-) employed tech professionals across the economy

BIOSCIENCE INDUSTRY EMPLOYMENT

Source: TEConomy/BIO

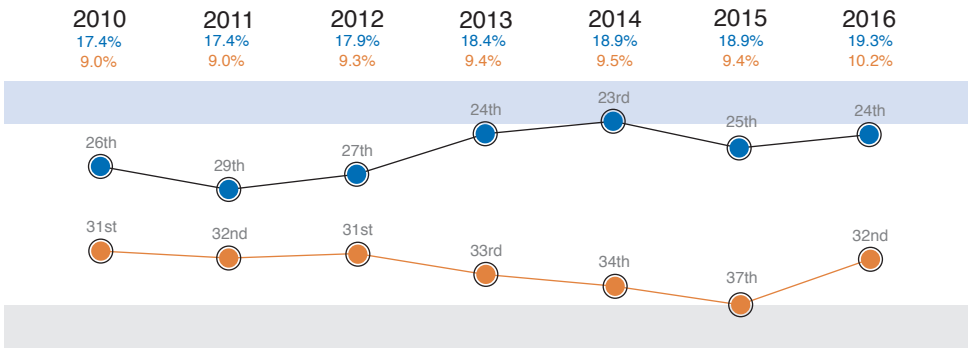


Tech metrics

EDUCATIONAL ATTAINMENT AS A PERCENTAGE OF POULATION 25+

Source: Census.gov Factfinder

- Bachelor's Degree or Higher
- Advanced Degrees



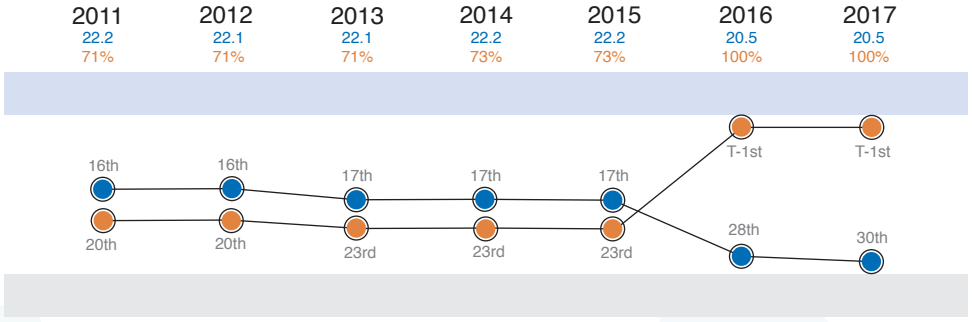
ACT SCORES

Source: ACT.org

- Average ACT Score*
- % of Graduates Tested for ACT**

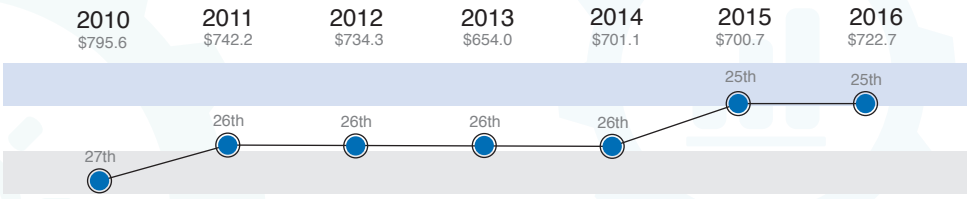
*Average ACT scores have dropped since 2016 - the first year during which 100% of graduates in Wisconsin were tested.

**Among states with 100% of graduates tested, Wisconsin has the second highest average score.



FEDERAL R&D DOLLARS (In Millions)

Source: National Science Foundation

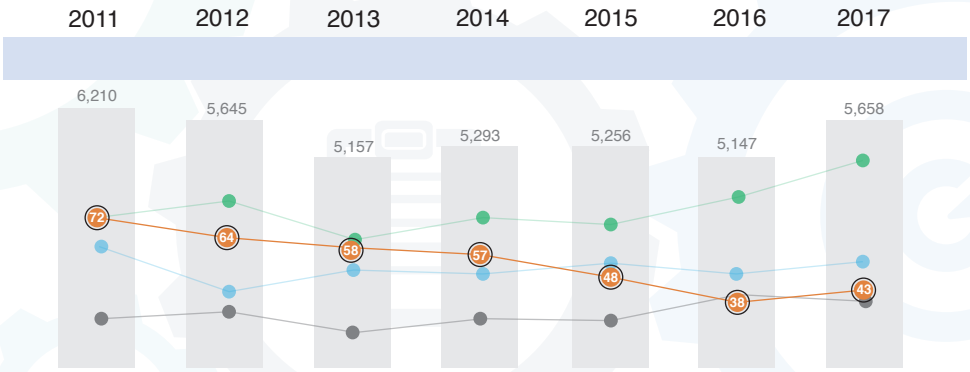


SBIR AWARDS (Number of Awards)

Source: SBIR.gov

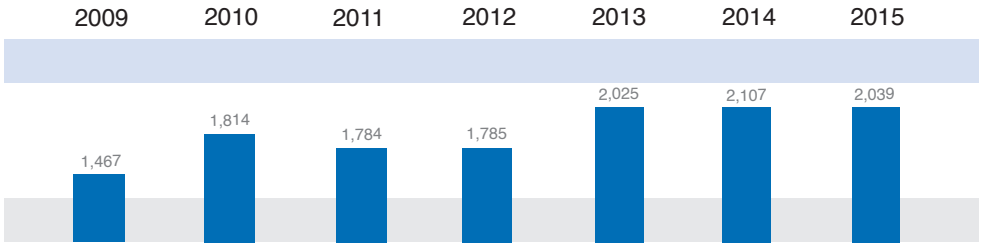
- Minnesota
- Wisconsin
- Indiana
- Missouri
- U.S. Awards

IA, IL, and MI have been omitted from the graph - their SBIR awards are either too low (IA), or too high (IL and MI)



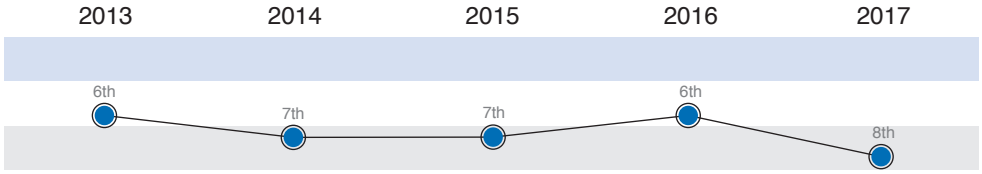
TOTAL PATENTS ISSUED

Source: US Patent & Trademark Office



WARF RANKING OF WORLDWIDE UNIVERSITIES GRANTED U.S. UTILITY PATENTS

Source: National Academy of Investors



WI UNIVERSITY RANKING BY TOTAL R&D EXPENDITURES

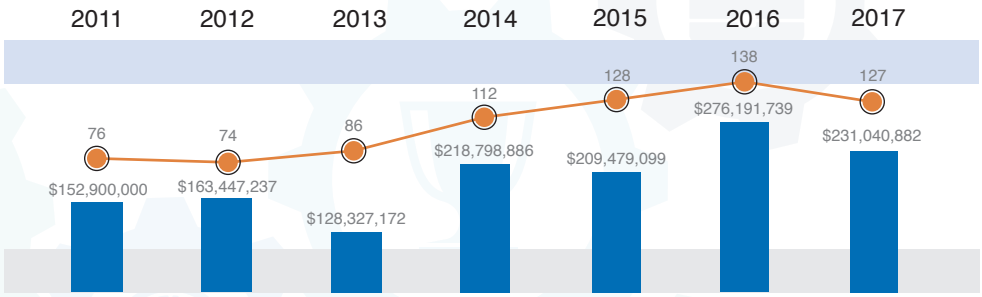
Source: National Science Foundation

	2010	2011	2012	2013	2014	2015	2016
UW-Madison	3	4	3	4	4	6	6
Medical College of WI	102	94	96	100	104	104	105
UW-Milwaukee	167	176	180	189	179	171	183
Marquette University	292	272	278	262	246	245	236
UW-La Crosse	403	421	436	419	435	432	449

ANGEL/VENTURE CAPITAL INVESTMENT

Source: 2018 Wisconsin Portfolio

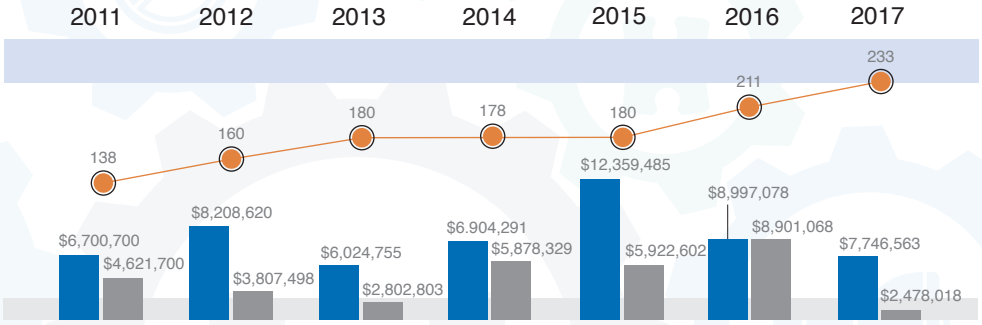
- Number of Deals
- Total Investment



VERIFIED ACT 255 TAX CREDITS AND CERTIFIED QNBV COMPANIES

Source: WEDC

- Total QNBV Companies
- Angel Tax Credits
- Early Stage Seed Tax Credits



Tech Council Investor Networks

WISCONSIN TECHNOLOGY COUNCIL

The Tech Council is the science and technology advisor to Wisconsin's governor and Legislature. It is an independent, non-profit and non-partisan board with members from tech companies, venture capital firms, public and private education, research institutions, government and law. The Tech Council Investor Networks (see below) is among its programs.

CONTACT: Tom Still, president
(608) 442-7557 | Tstill@wisconsintechnologycouncil.com
ww.wisconsintechnologycouncil.com

TECH COUNCIL INVESTOR NETWORKS (TCIN)

A program of the Wisconsin Technology Council, the mission of the TCIN is to fuel the growth of entrepreneurial, early stage financing throughout Wisconsin. TCIN produces and provides resources to the early stage investing community.

CONTACT: Bram Daelemans, director
(608) 442-7557 | Bram@wisconsintechnologycouncil.com

STATE OF WISCONSIN INVESTMENT BOARD (SWIB)

SWIB is the state agency that invests the assets of the Wisconsin Retirement System, the State Investment Fund and other state trust funds. As of December 31, 2016, SWIB managed about $104.5 billion in assets.

CONTACT: Chris Prestigiacomo, portfolio manager, private markets group
(608) 266-6723 | Chris.Prestigiacomo@swib.state.wi.us
www.swib.state.wi.us

WISCONSIN ALUMNI RESEARCH FOUNDATION (WARF)

WARF is a non-profit organization that supports research, transfers technology and ensures that the inventions and discoveries of UW-Madison benefit humankind. The UW-Madison is a premier research institution with world-class faculty and staff who attract more than $1 billion in sponsored research each year. WARF receives about 350 disclosures per year and has taken an equity share in 38 active companies.

CONTACT: Erik Iverson, managing director
(608) 263-9396 | eiverson@warf.org | www.warf.org

WISCONSIN SYSTEM TECHNOLOGY FOUNDATION (WISYS)

WiSys is a non-profit WARF subsidiary established to identify innovative technologies developed beyond the UW-Madison campus, primarily within 11 other UW System campuses and the UW Extension. It helps to bring those technologies to the marketplace for the benefit of the inventors, their universities, Wisconsin's economy and society.

CONTACT: Arjun Sanga, executive director
(608) 316-4015 | ASanga@wisys.org | www.wisys.org

UWM RESEARCH FOUNDATION

UW-Milwaukee has annual research expenditures of about $60 million. UWM Research Foundation's mission is to foster research, innovation and entrepreneurship at the UW-Milwaukee. The Foundation manages a growing portfolio of patents, with more than 100 issued or applied-for patents. The UWMRF Catalyst grant program has provided about $4 million to seed projects with strong commercial potential.

CONTACT: Brian Thompson, president
(414) 906-4653 | briant@uwmfdn.org | www.uwmfdn.org

WISCONSIN ECONOMIC DEVELOPMENT CORP.

This agency offers technology loans and grants to qualified companies, assists in site and location matters, and manages the Qualified New Business Venture (QNVB) program for investor tax credits, among other programs.

CONTACT: Mark Hogan, chief executive officer and secretary
(608) 210-6701 | Kathie Colbert | kathie.colbert@wedc.org
FOR SPECIFIC QNVB INFORMATION CONTACT: Chris Schiffner
(608) 210-6826 | chris.schiffner@wedc.org | www.inwisconsin.com

WISCONSIN DEPARTMENT OF FINANCIAL INSTITUTIONS (DFI)

DFI's mission is to ensure the safety and soundness of Wisconsin's financial institutions, to protect the consumers of financial services and to facilitate economic growth. The agency regulates and licenses financial service providers who do business in Wisconsin.

CONTACT: Jay Risch, secretary
(608) 264-7800 | askthesecretary@dfi.state.wi.us | www.wdfi.org

MEDICAL COLLEGE OF WISCONSIN OFFICE OF TECHNOLOGY DEVELOPMENT

The MCW Office of Technology Development is responsible for managing the discoveries, inventions and other intellectual property assets of the Medical College of Wisconsin and advancing these discoveries. The MCW conducts about $140 million in sponsored research each year.

CONTACT: James Antczak, office of technology development
(414) 955-4894 | jantczak@mcw.edu | www.mcw.edu/OTD.htm

MARSHFIELD CLINIC INFORMATION SERVICES

Marshfield Clinic Information Services (MCIS) is an information technology company dedicated to delivering and managing cutting edge products and services for healthcare providers. MCIS is the product of Marshfield Clinic's 50 year commitment to the use of IT to benefit patients and physicians in the pursuit of excellent care.

CONTACT: Denise Webb,
chief executive officer, MCIS/chief information officer;
(715) 221-8388 | denise.webb@mcis.com | www.mcis.com

GENER8TOR

gener8tor is a Wisconsin-based accelerator that invests its community, capital, expertise, mentorship and network in capable, early-stage entrepreneurs with innovative business models. gener8tor works with the startups in its portfolio to create successful, scalable companies. Sponsored by American Family Insurance, gener8tor seeks to invest in technology-enabled businesses. Accepted companies receive $70,000 and 12-weeks of mentorship-driven programming.

CONTACT: Troy Vosseller, co-founder; Joe Kirgues, co-founder
(414) 502-8880 | troy@gener8tor.co | joe@gener8tor.com
www.gener8tor.com

ANGEL CAPITAL ASSOCIATION

ACA is a collective of accredited investors that supports the success of angel and private investors in high-growth, early-stage ventures. The organization is the source for critical information and data that aligns the needs of angels, entrepreneurs, and the startup support community. Among its members are more than 240 angel groups and platforms and more than 13,000 individual accredited investors.

CONTACT: Sarah Dickey, ACA membership director
(913) 894-4700 | sdickey@angelcapitalassociation.org
www.angelcapitalassociation.org

COMPUTING TECHNOLOGY INDUSTRY ASSOCIATION

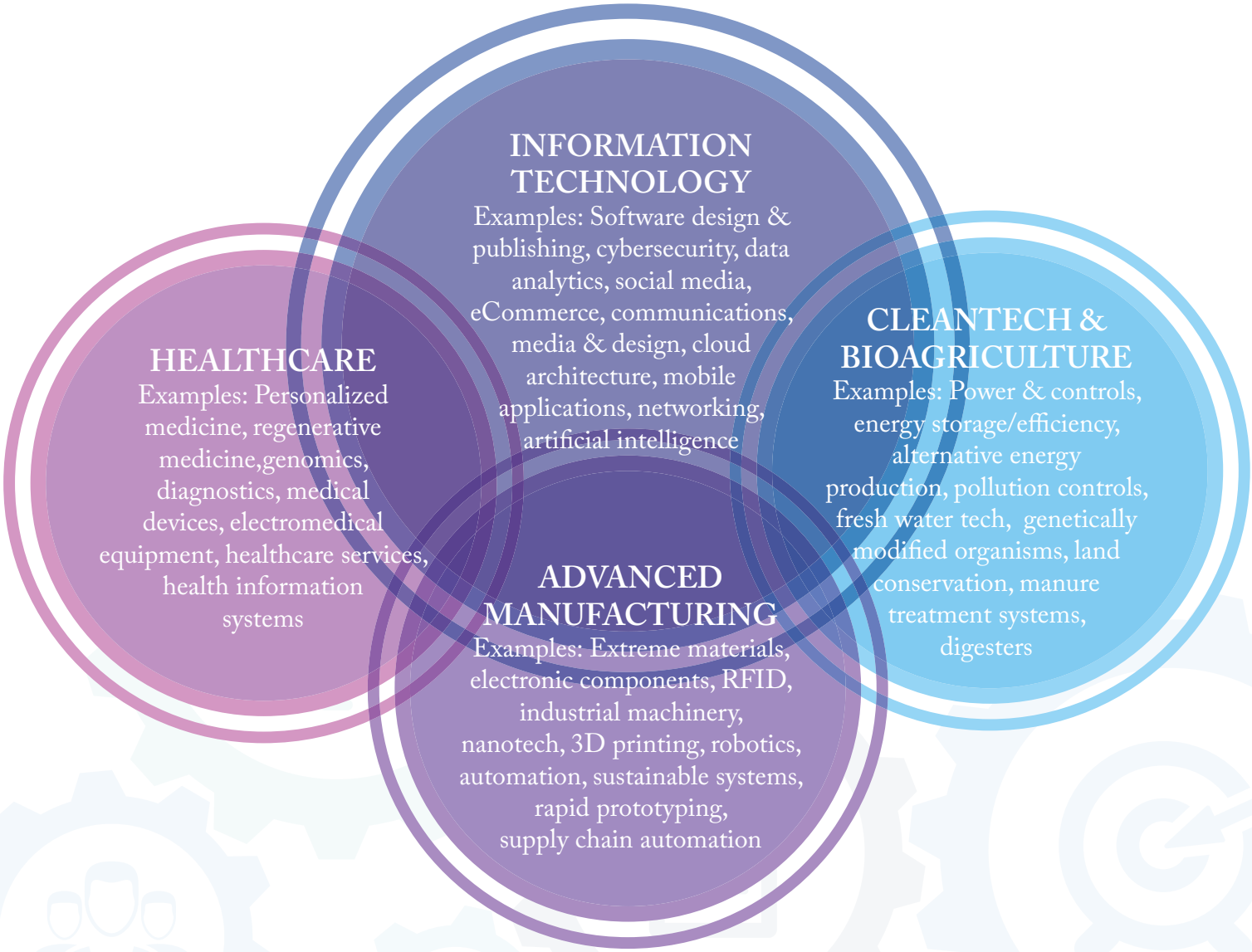
CompTIA is the world's leading tech association. With more than 2,000 members, 3,000 academic and training partners and tens of thousands of registered users spanning the entire information communications and technology (ICT) industry, CompTIA has become a leading voice for the technology ecosystem.

CONTACT: Timothy Jemal, CompTIA Executive Director
(949) 636-8946 | tjemal@tecna.org | www.comptia.org

Wisconsin's Interdisciplanary Technology Clusters

The model below shows how Wisconsin's top industries connect across different sectors, with information technology increasingly playing a larger role in massive markets such as healthcare, advanced manufacturing and energy technologies.

Many of the recommendations in this publication are ways state policymakers can continue to support existing growth industries while emphasizing the skills, programs and investments needed for future jobs in Wisconsin.



PROUDLY SPONSORS

Wisconsin Technology Council

2018 'White Papers'

Michael Best & Friedrich LLP is proud to support the Wisconsin Technology Council's publication of the 2018 White Papers, bringing important ideas to the state's tech-based community. Our Venture Best® team is committed to working closely with start-up and emerging technology companies to help find financial backing to grow their business.

Gregory J. Lynch • Partner
Board Chairman, Wisconsin Technology Council
608.283.2240 • gjlynch@michaelbest.com

Melissa M. Turczyn • Partner
Chair, Venture Best®
608.257.7484 • mmturczyn@michaelbest.com

michaelbest.com | venturebest.com

Board of Directors

JAMES ANTCZAK
Medical College of Wisconsin

ERIC APFELBACH
PegEx

MARK BAKKEN
HealthX Ventures

JAY BAYNE
Stratum4

VIVEK BHATT
GE Healthcare

MAGGIE BRICKERMAN
gBETA

DAVID BRUKARDT
UW System

SUJEET CHAND
Rockwell Automation

RENEE CLAIR
Johnson Controls

RAY CROSS
UW System

DERON CURLISS,
BOARD TREASURER
BDO

RANDY DIMOND
Promega

MARK EHRMANN
Quarles & Brady

MICHAEL FLANAGAN
Flanagan Financial and Functional Biosciences

GARY FRINGS
Exact Sciences

JONATHAN FRITZ
Symphony Corp.

MARK GEHRING
HealthMyne

MINDI GIFTOS
Husch Blackwell

CHARLIE GOFF
NEW Capital Management

AARON HAGAR
Wisconsin Economic Development Corp.

SUSAN HEALY
Ulta Beauty

LORRIE HEINEMANN
Madison Development Corp.

BILL HICKEY
Wolf Track Ventures

STEVE HOLZHAUER
Eppstein Uhen Architects

GRETCHEN JAMESON
Concordia University Wisconsin

JIM JERMAIN
AT&T

RICH JOHNSON
DXC Technology

ANDY KIRKPATRICK
Accuray

RANDALL LAMBRECHT
Aurora Healthcare

BRIAN LINDSTROM
Connecture

GREG LYNCH, BOARD CHAIR
Michael Best

JOHN NEIS
Venture Investors

AARON OLVER
University Research Park

ILKE PANZER, BOARD SECRETARY
BloodCenter of Wisconsin

ALEXANDER "SANDIE" PENDLETON
Pendleton Legal

CHRIS READER
Wisconsin Manufacturers and Commerce

DAN REED, BOARD VICE-CHAIR
American Family Ventures

FRED ROBERTSON
Baird Capital

IAN ROBERTSON
UW-Madison College of Engineering

GREG ROBINSON
4490 Ventures

JED ROHER
Godfrey & Kahn

ARJUN SANGA
WiSys Technology Foundation

DON SCHLIDT
Dedicated Computing

JAMES SCHMIDT
UW-Eau Claire

BRAD SCHWARTZ
Morgridge Institute for Research

TONI SIKES
CODAworx

TOM STILL
Wisconsin Technology Council

MICHAEL SUSSMAN
UW-Madison Biotechnology Center

BRIAN THOMPSON
UW-Milwaukee Research Foundation

TIM TOEPEL
Epic

CARRIE THOME
Wisconsin Alumni Research Foundation

MARK TYLER
OEM Fabricators

DENISE WEBB
Marshfield Clinic Health System

ROLF WEGENKE
WI Association of Independent Colleges and Universities

JAMES ZYLSTRA
Wisconsin Technical College System

EMERITUS:
BOB BRENNAN
UW-Madison Office of Corporate Relations and Greater Madison Chamber of Commerce