Human Capital
Learning, Working, and Innovating

This theme addresses factors that determine whether our region's economy will thrive due to the availability of skilled workers and a climate in which commercial creativity can flourish. The chapter on Human Capital includes two areas of recommended actions:

5. Improve Education and Workforce Development 164

6. Support Economic Innovation 180

The Regional Vision describes a future economy with a "global status" that "ensures superior job opportunities" by "enhancing our...education systems and physical infrastructure... [as well as] workforce development programs and other training" and being a "center of innovation across all disciplines."

To achieve this, GO TO 2040 supports economic growth and innovation without overly involving the public sector in private sector decisions, by investing in infrastructure, education, and workforce training for jobs of all skill levels, by seeking ways to support new economic sectors such as green jobs, and by creating a supportive business environment, including addressing tax policy.

The seven-county metropolitan Chicago region is among the nation's few global economic centers. GO TO 2040 seeks to maintain and strengthen this position. A global region needs to have a modern infrastructure; a diversity of business types and economic activity; a skilled workforce, including a strong higher education system; active cultural institutions; and a high overall quality of life.

TO TRAINS

RECOMMENDATION

5 Improve education and workforce development

For our region to prosper economically and sustain a high quality of life, it needs an educated, skilled labor force. Researchers, business leaders, and elected officials agree that the quality of our workforce is one of the most important factors — if not the most important — in strengthening the region's economy.

A skilled labor force does not develop on its own; strategic investments in education and workforce development that tie these systems to the needs of employers are needed. Therefore, GO TO 2040 recommends that the region's education and workforce development systems be improved to create a high-quality labor force for our future.

However, there are significant challenges to achieving this goal. Not just in the region but across the U.S., student achievement has been declining compared to other industrialized nations. Access to high-quality educational opportunities is quite inequitable, with dramatic differences in achievement across racial, ethnic, and economic lines. The workforce development system — which is meant to provide people with skills they need to succeed in the workplace — is complex, with a variety of programs, initiatives, and funding sources. Because of the number of players, coordination and communication between both the education and the workforce development systems is limited, and the actual needs of employers and workers are often not fully reflected. As the rate of economic and technological change grows, individuals increasingly need to learn new skills and be retrained multiple times, meaning that effective, adaptable, and coordinated systems for education and workforce development are increasingly important.

To improve the quality of the region's labor force, GO TO 2040 makes recommendations in the following areas:

Coordination of education, workforce development, and economic development, with a strengthened role for local service providers — including community colleges, universities, vocational training programs, community based workforce organizations, and other workforce intermediaries — that can coordinate between employers' needs and training and education. Alignment between these systems is difficult due to the large number of organizations active in each of these fields, but is necessary to create the efficient and adaptable systems that we need.

Available information and data in the education and workforce development fields. Tracking progress, assessing program effectiveness, and planning for future needs require better data sources than are currently available.

Delivery of workforce development services. Inflexible funding programs pose a particular barrier to improving workforce development systems; more flexible service delivery is needed.

Education quality, access, and coherence. The plan does not make specific policy recommendations in this area, but supports efforts by state, local, and other groups that seek to improve the region's education system.

The focus of these recommendations is on improving the region's workforce. That is clearly not the only purpose of education, which also is meant to provide for social, civic, and personal development. The education system must not be viewed solely as a means of preparing individuals for the workforce. Therefore, while workforce readiness is the focus of GO TO 2040's approach to education, it is important to recognize there are numerous other important purposes of the education system that are not fully addressed in this recommendation area.

5.1 Benefits

The importance of education to our region's future is universally recognized. Education quality is among the top issues that people in our region, from members of the public to business leaders to elected officials, believe will drive our future economy and overall quality of life.

Participants in CMAP's GO TO 2040 "Invent the Future" workshops during summer 2009 consistently discussed the need for a strong economy that provides good jobs for all residents, and they emphasized the need for better educational opportunities to reach this goal. Although the important role of workforce development is generally less recognized by the general public, it is also a central component of having a skilled, well-trained workforce, which is a precondition of a prosperous region. The benefits of quality education and workforce systems — including but not limited to their economic impacts — are described in the following pages.

Economic

For our region to maintain its place as an important player in the global economy, it must successfully compete with other major metropolitan areas, both nationally and internationally, to retain and attract businesses. Both businesses and people are increasingly mobile, easily able to move to desirable regions or leave undesirable ones, so there is a continual need to improve the region's global standing.

The quality of the labor force is probably the single most important factor driving future economic prosperity, according to academic research, surveys of businesses, and anecdotal evidence from economic development experts.[1] Academics and business leaders alike increasingly stress "human capital" — or the knowledge and skills of the labor force — as the primary driver of today's economy.[2] While workforce quality has always been an important component of economic success, there is evidence that this is increasing, as economic growth occurs in industries that require more knowledge and skills. A review of recent academic studies that examined the causes of economic growth found that educational levels were the most consistent predictor of future regional growth.[3] In other words, having an educated, skilled workforce is more important than any other factor in creating economic prosperity.

This academic evidence is echoed by regional business leaders and the economic development community. Businesses of all types consistently rate the quality and availability of a diverse and talented workforce as one of the most important factors influencing their location decisions and ability to succeed. In an April 2009 survey conducted by the Illinois Chamber of Commerce, the availability of skilled and educated employees was one of the most important factors in site selection decisions. A 2008 survey by ComEd of businesses in northern Illinois generated similar results; respondents agreed that it was critically important but had mixed opinions as to whether the quality of the region's labor force was a strength or a weakness. This result indicates that the seven counties of metropolitan Chicago have some economic sectors where the labor force is meeting the needs of businesses, but more where it needs improvement.

1 Based on internal research and interviews conducted by the Chicago Metropolitan Agency for Planning from 2007-2009. Other significant factors include infrastructure supply and quality, the overall business environment (including tax policy, the regulatory environment, and support for innovation), proximity to consumers and suppliers, and amenities.

2 Robert Weissbourd, "Into the Economic Mainstream: A Discussion Paper on Bipartisan Policies for Inclusive Economic Growth," Opportunity Finance Network and Robert Weissbourd, RW Ventures, LLC., August 1, 2006.

3 Based on a review of the following studies: C. Simon, "Human Capital and Metropolitan Employment Growth," Journal of Urban Economics 43 (1998): 223-243. E. Glaeser, et al, "Economic Growth in a Cross-Section of Cities," Journal of Monetary Economics 36 (1995): 117-43. E. Glaeser and J. Shapiro, "Urban Growth in the 1990s: Is City Living Back," Journal of Regional Science 43 (2003): 139-65. J. Pack, Growth and Convergence in Metropolitan America (Washington, D.C : Brookings Institution, 2002). E. Glaeser and A. Saiz, "The Rise of the Skilled City," Brookings-Wharton Papers on Urban Affairs 5 (2004): 47-94. R. Green, "Airports and Economic Development," Real Estate Economics 35 (2007): 91-112. P. Blumenthal et al., "Understanding the Economic Performance of Metropolitan Areas in the

The region is in constant competition with other metropolitan areas to attract both businesses and skilled workers. Regions that lack a strong labor force will have difficulty competing because, for most industries, labor force quality has become more important than physical assets or location.[4] Skilled and educated workers drive the productivity of today's economy and the decisions of businesses, making them the most valuable assets that a metropolitan area can have.[5]

An important consideration, but one that goes beyond the scope of this recommendation, is retaining skilled workers in the region after they graduate or receive training. Beyond developing highly skilled workers, the region also needs abundant economic opportunities and a high quality of life to keep them here or to attract skilled workers from other regions. In other words, developing a skilled workforce through education and workforce improvements is not by itself sufficient but is a primary component of prosperity.

In contrast, failure to improve education and workforce systems will have serious negative economic consequences. Lower levels of educational attainment correspond to lower workplace skills, with long-term consequences for individual earning power and the region's economic vitality. From an economic perspective, low educational performance can make some residents an economic liability to the region and its communities rather than an asset; for example, incarceration rates of high school dropouts are double the rates of graduates.

Quality of Life

While the economic benefits of improving our labor force are clear, there are other quality-of-life benefits as well. Education is essential for an overall healthy society, and high levels of education are correlated with increased civic participation and health status, lower risk of incarceration, and improvements in most other measures of personal well-being. Educational attainment prepares residents to be positive participants in society, not just employees.

Therefore, while the economic impacts of education are critical and improved coordination between educational institutions and employers is needed, education should not be equated with vocational training only. It should also foster personal growth, social development, an appreciation for the arts, and other desirable outcomes. According to the *Education for the Future of Northeast Illinois* report:

> *Preparing students for employment should not be the sole purpose of education, however. Although it is impossible to predict the relative proportion of information-intensive jobs vs. low-skill, service-sector jobs in the coming decades, or even whether there will be sufficient work to sustain a standard 40-hour work week, the workplace cannot be the sole or even the primary determinant of educational policy and curriculum in K-12 schools. As the nature of work changes and reduces the skill level required for some jobs, it may be tempting to "dumb down" the public school curriculum for lower-performing students to match the needs of the low-skill workplace, as historians tell us occurred a century ago. This temptation must be resisted on ethical and democratic grounds, as each student deserves to be educated to his or her fullest potential. It would likely be bad economic policy as well. Even in the service sector, inadequate levels of literacy and poor analytic and problem-solving skills are costly to employers.*[6]

This is not an argument against better coordination across educational institutions and workforce training programs; it is a reminder that quality education has many benefits beyond economic growth.

United States," Urban Studies 46 (2009): 605-27. M. Greenstone and E. Moretti, "Bidding for Industrial Plants: Does Winning a Million Dollar Plant Increase Welfare?" NBER Working Paper 9844 (2003). See **http://www.nber.org/papers/w9844**. Z. Acs and C. Armington, "Employment Growth and Entrepreneurial Activity in Cities," Regional Studies 388 (2004): 911-927.

4 Economic Modeling Specialists Inc., "Labor Market Data & Analysis for Site Selection," White Paper, February 2008. See **http://www.economicmodeling.com/?p=emsi**.

5 Robert Weissbourd of RW Ventures discusses the main attributes of global economies, especially the importance of human capital in Moscow in the following: H. Michael, Henry H. Perritt, Jr., and Adele Simmons, "The Global Edge: An Agenda for Chicago's Future," Chicago Council on Global Affairs, 2007. See **http://tinyurl.com/2fmhmnv**.

6 GO TO 2040 Education Strategy Report, 2009. See **http://www.goto2040.org/education/**.

5.2 Current Conditions

Although this recommendation addresses both education and workforce development, these two different systems exist in separate worlds. There are obvious logical intersections between them, but in practice, communication and coordination is limited and often inefficient.

In this subsection, current conditions within the region's education system will be presented, followed by current conditions with the workforce development system. In conclusion, areas of current and potential coordination between education and workforce systems will be presented, as well as a discussion of why this coordination is so important in the changing economy.

Figure 37. Higher education degrees conferred regionwide, 2007

20,987	38,774	30,207
Associate Degrees	Bachelor Degrees	Master Degrees

Source: Integrated Postsecondary Education Data System

Education

The education system is not a single, unitary system, but a variety of institutions and organizations, each with their own decision-making processes and funding structures.[7] At the K-12 level, the region contains 293 public school districts (slightly higher than its number of municipalities) and over 2,000 public schools, not to mention a wide variety of private schools. The administration of early childhood education, which occurs before entry into the K-12 system, is quite complex; it is funded through federal, state, and local sources, and different elements of it are governed by the federal government and various state agencies (including the Illinois Department of Human Services [IDHS] and the Illinois State Board of Education [ISBE]). Public universities and community colleges and private colleges and universities are also part of the mix; because community colleges are of particular interest to GO TO 2040 due to their links with workforce development training, they will be covered in greater detail later in this section. With so many decision makers, coordinating reforms or changes to the education system is far from a simple task.

Funding of education is a critical issue, and there are significant concerns about both the overall level of funding and its distribution. In Illinois, public education at the K-12 level is funded through a combination of state and local funds. The primary funding source is the local property tax, which Illinois relies upon more heavily to fund education than most other states do; only Nevada relies on it more. For school districts where reliance on property tax would result in per-pupil-expenditures that are below a certain "foundation" level ($6,119 per student), the state contributes funding to meet this foundation. Through this system, all school districts in the state are guaranteed at least a certain level of per-pupil-expenditures, but school districts with higher property tax receipts can exceed this level. The adequacy of the foundation funding level to provide a high-quality education remains a matter of debate. In contrast to K-12 funding, which tends to be publicly supported, higher education is, for the most part, individually financed. The State of Illinois Monetary Award Program (MAP) provides aid to lower-income college students and is one of the nation's largest and most successful programs of its kind. Despite this, the ever-increasing costs of higher education have made college inaccessible to many.

7 This section relies heavily on GO TO 2040 Education Strategy Report, 2009. See http://www.goto2040.org/education/.

There is broad agreement that the quality of education in our region — as measured through student achievement and overall educational attainment — is lacking and in many cases getting worse. As a nation, the U.S. lags behind other industrialized nations in standardized test scores as well as high school and college graduation rates, and Illinois fares even worse than the national average in meeting basic achievement standards. This has occurred even though instruction has often focused on improving achievement test scores, to the neglect of broader educational goals.

The quality of education also varies tremendously between schools. Despite the negative trends and overall performance cited above, many schools in the region provide excellent educational opportunities. But there are serious, systematic inequities in access to education and in educational achievement and attainment by income and race and ethnicity. Educational outcomes at all levels of the education system are considerably lower for African Americans and Latinos than for other racial and ethnic groups. In 2004-2005, the high school graduation rate for African Americans in Illinois was 44 percent, compared to 83 percent for whites.[8] College attendance and graduation is also correlated with race and ethnicity; in 2000, only 12 percent of African Americans and 8 percent of Latinos in Illinois had college degrees, compared to a 34-percent statewide average. By 2040, African Americans and Latinos are expected to make up a much larger share of the region's workforce than today. The negative effects of poor education outcomes often persist throughout a person's life, so low educational attainment leads to lower workplace skills and income levels — and the disparities noted above will have ever-increasing economic impacts on the region as a whole.

Workforce Development

GO TO 2040 broadly defines "workforce development" as services that provide people with skills they need to succeed in the workplace and advance their careers.[9] The most identifiable workforce development program is the federal Workforce Investment Act (WIA), but it provides only a fraction of public funds for workforce development (about 16 percent of public workforce funding in Chicago). Nine federal agencies administer 20 programs related to economic development which often include training components, and six federal agencies administer 15 programs related to workforce development.[10] Funding flows through 10 state departments, and local governments and philanthropy add to the myriad of workforce development programs and services.

The role of the private sector is also substantial. Workforce development is highly related to and partially funded by other systems, such as economic development, education, and human services, which often have goals and policies related to workforce. However, this has resulted in a fragmented approach to improving the region's labor force, in which institutions and programs often operate independently of each other despite sharing similar goals. A variety of services and programs are needed to serve the diverse regional labor market, of which a quarter has only a high school degree and an additional 15 percent has less than a high school degree. Despite the range of workforce development programs offered, access to training by low skilled adults continues to be limited. Overall, the workforce development "system" — which is really a dispersed network of organizations that provide training and other types of services — has an extremely important role to play in making our region economically strong, but is not currently meeting its potential.

The core workforce development program, WIA, receives funding from the federal government, which is passed through the Illinois Department of Commerce and Economic Opportunity (DCEO) to local Workforce Investment Boards (WIBs), which are tasked with administering this funding for workforce development purposes. There are eight of these boards in the region, organized primarily by county, and made up of representatives from education, community based organizations, human service agencies, the business community, and others. Service delivery generally takes place at workNet Centers (as they are called in Illinois) — local one-stop centers for all types of workforce training needs — or at community-based providers or affiliates. At the 60 service delivery locations in our region, most provide general services, while two (in Chicago) are focused on specific industries.

8 The Schott 50 State Report (2008).

9 This section relies heavily on GO TO 2040 Workforce Development Strategy Report, 2009. See **http://www.goto2040.org/workforce/**.

10 Beth Siegel and Karl Seidman, "The Economic Development and Workforce Systems: A Briefing Paper," prepared for the Surdna Foundation, December 14, 2009. See **http://tinyurl.com/3yqz74t**.

Public investment in workforce training also occurs outside of traditional workforce development systems. Having long recognized the importance of a skilled labor force, economic development organizations often sponsor programs to help employers pay for training; the Employer Training Incentive Program, administered through DCEO, is an example of this.

Workforce training has become increasingly important to human service organizations, as federal public assistance programs are oriented toward workforce participation by recipients. Private and nonprofit organizations also play a significant role in workforce development systems, sometimes acting as contractors for publicly-funded workforce services.

It should be noted that most workforce development is not publicly funded at all. Beyond traditional education systems, most training occurs through employers and is funded entirely by the employer or the individual; this includes professional development activities, for example. Generally, low-income workers are more likely to use publicly funded systems for their workforce training needs, while higher-income workers either pursue this individually or through their employer.

To summarize, the region's network of workforce development services is extremely complex, reflecting the diversity of the groups interested in improving the region's labor force and the funding streams available for workforce training. This complexity presents a challenge to the efficiency and effectiveness of the workforce development system. Because so many public and private entities operate workforce development programs, service delivery is at best complicated and in some cases duplicative. These problems are exacerbated by limited coordination between the many different workforce programs, each of which operates within its own "silo" of funding and decision making. Job seekers and businesses often have difficulty navigating the maze of systems and programs; due to the variety of organizations offering assistance, there is no comprehensive source of clear, up-to-date information for job seekers and businesses. The same lack of coordinated data and information can be equally problematic for the service providers themselves, as they try to design effective and non-duplicative programs.

A particular challenge in the workforce development field is the lack of flexibility in many public funding streams. The federal WIA program requires that "universal services," such as basic work-readiness and job-search skills, must be provided before direct training can occur.[11] This requirement has reduced the amount of actual training — arguably the core function of workforce development — that programs funded through WIA can offer. At the same time, these programs have needed to serve more people due to workforce-focused requirements of public assistance programs, which have increased demands on the workforce development system without accompanying funding increases or policy guidance. In fact, the focus of public assistance (placing recipients in jobs) sometimes is contradictory to workforce development efforts, as recipients are encouraged to take any job they can find, rather than developing their skills for more productive employment later. These federal requirements have limited the ability of publicly funded workforce development efforts to adapt to changing conditions and needs. To add to these challenges, public workforce funds are often geographically specific to political jurisdictions. This does not align with the reality that economies are regional in scale, meaning that workers and jobs are quite mobile and frequently cross jurisdictional boundaries.

11 David Campbell, Cathy Lemp, Jeanette Treiber, "WIA Implementation in California: Findings and Recommendations," November 2006. See **http://groups.ucanr.org/CCP/files/33964.pdf**.

Coordination Between Education and Workforce Development

Though there are significant challenges within education and workforce development, one of the most difficult issues involves transitions between systems — for example, going from an early childhood education program into kindergarten, or from a low-skilled job to a workforce training program and then on to a higher-skilled job. In the education system, students need considerable support during points of transition. If institutions are not ready to provide this — and often they are not, due to incomplete coordination across education levels — it can begin a downward spiral of student performance and ultimately lead to lower educational attainment. An even greater challenge is moving from the education system or workforce training programs to employment. There are mismatches between the skills that employers need and the focus of education and training programs. Ironically, this is particularly true in fast-growing industries, because education and workforce development programs do not adapt quickly enough to changing business needs.

The importance of having an advanced degree (beyond a high school diploma) to succeed in the labor market has increased for decades, and this is expected to continue.[12] However, a recent analysis of the Illinois economy showed that nearly half of the jobs in the state were at a skill level between some post-secondary education and a four-year college degree.[13] In other words, "middle skill" jobs — that require more than a high school degree, but not as much as a four-year college degree — make up the majority of the jobs in the state's economy, and this is expected to continue. There are labor shortages in this skill range, particularly in critical industries such as health care and freight. This further emphasizes the importance of institutions like community colleges and accredited occupational training institutions, which are well-placed to provide specialized workforce training at this level.

Improving alignment between education, workforce development, and the needs of employers is critical in our constantly changing economy. As technological changes continue to accelerate, workers are likely to hold multiple jobs and need to learn new skills multiple times over their careers. It is simply not possible to predict which specific workplace skills will be most desirable in 2040. Therefore, in the long term, our education and workforce systems need to be flexible enough to constantly adapt to the changing skills needed by businesses and the changing demographic characteristics of the labor market. The business community needs to take a stronger role in developing workforce programs.

5.3 Indicators and Targets

It is important to establish indicators to measure the quality and outcomes of education and workforce development policies, programs, and investments.

However, because of the complexity of these systems, these indicators are not fully developed, meaning that existing data does not cover the entire region or the full range of education and training outcomes. Because comprehensive and complete datasets are not available or accessible, GO TO 2040 recommends pursuing strategies to collect, develop, and integrate additional information into accessible data systems so decisions can be based on better information and the outcomes can be measured more completely.

12 David H. Autor, Frank Levy, Richard J. Murnane, "The Skill Content of Recent Technological Change: An Empirical Exploration," Federal Reserve Bank of San Francisco, November 2003. The authors found that computerization between 1970 and 1998 decreased the demand for rote manual and cognitive labor, and increased demand for workers with college degrees.

13 The Workforce Alliance, "Illinois' Forgotten Middle-Skill Jobs," September 2008.

5.4 Recommendations

GO TO 2040 recognizes that improving education and workforce development systems is absolutely necessary for our region's future, and this is a high priority of the plan.

The plan's recommendations primarily approach education and workforce development from an economic perspective, and therefore its focus is improving the quality of the region's labor force. GO TO 2040 makes recommendations for improvements in four major areas: coordination between education, workforce, and economic development; availability of information and data to guide both education and workforce development decisions; delivery of workforce development services through increased funding flexibility and other means; and education quality, access, and cohesion. It does not provide detailed education policy recommendations, but focuses on strengthening coordination between education and other systems, and supporting the work of other organizations as they seek to improve our region's education system.

More detailed recommendations are contained in the source reports on education and workforce development, developed for GO TO 2040 with funding from the Chicago Community Trust.[14]

Improve Coordination of Education, Workforce Development, and Economic Development

One of the most difficult challenges in improving the quality of our labor force is aligning education and workforce training programs with the needs of employers. The importance of strengthening the connections between these systems is clear: the education and workforce development systems have central roles in creating a skilled labor force, but cross-system coordination between these players is limited and not well aligned with employer needs. Solving this will require proactive efforts to improve communication by educational institutions, workforce training providers, and representatives of the economic development and business community.

A first step in addressing this challenge is analyzing the degree to which coordination occurs now. Performing this analysis for the entire economy is impossibly complex, due to the thousands of organizations involved. Therefore, GO TO 2040 recommends focusing on a few key economic sectors and drilling down in detail to understand current conditions. To start with, the sectors of focus should be the freight/logistics and energy industries because these are growth industries within the region, have a rather high level of public sector involvement, are related to other GO TO 2040 priorities, and are the subject of ongoing coordination work by CMAP and its partners.[15] The assessment should include identifying and convening existing economic development, education, and workforce leaders who are active in each sector, determining areas of duplication or gaps, and producing an "assessment report" that describes current practices and recommends steps to improve coordination. The assessment report should be used as a baseline for further work, including setting common goals among the economic development, education, and workforce organizations involved in each industry, establishing ongoing mechanisms for communication between them, and beginning to implement the assessment report's recommendations. While CMAP should assist in the preparation of the assessment report and can serve as the official convener of the effort, it should be led by an agency with workforce development expertise.

14 These reports are available at **http://www.goto2040.org/education/** and **http://www.goto2040.org/workforce/**.

15 These include the Green Collar Jobs initiative, the Chicago Region Retrofit Ramp-up program, and State Energy Sector Partnership and Critical Skills Shortage Initiative research on freight.

A number of successful regional examples can serve as best practices to guide efforts to improve coordination within specific industries. For example, the Chicago LEADS (Leading Economic Advancement, Development, and Stability) program was formed in 2007 to improve the performance of workforce development programs in the city and better match them to employer needs, having shown positive results already in sectors such as health care, transportation and logistics, and hospitality; this program has now been transitioned into the work of the Chicago Workforce Investment Council (CWIC).

Another example is the Shifting Gears initiative, led by the state's community colleges, which developed "bridge" programs that combine basic education and occupational training, allowing participants to acquire both post-secondary education and specific, short-term credentials that help them with finding employment immediately. And finally, in the state's Critical Skills Shortage Initiative led by DCEO, health care employers worked with workforce and education stakeholders to identify their most pressing employment needs and develop strategies to fill them. These efforts combined public and private funding, with significant support from philanthropic organizations, and they serve as models for future cross-system coordination work and opportunities to apply lessons learned to future projects. GO TO 2040 supports a stronger role for community colleges (which include the City Colleges of Chicago), universities, vocational training programs, apprenticeship programs, and other programs that provide a critical link between the education and workforce development systems.

An important function of these organizations is to effectively link education, workforce development, and employers. There are 20 community colleges in the region, many of which have multiple branch campuses, meaning that they are widely accessible. These institutions offer degree programs, along with specialized occupational training and adult education that include basic math and reading, English as a second language, and high school completion programs. Many community colleges collaborate with nearby employers, nonprofits, or public agencies to support programs focused on particular industries or businesses; these are positive initiatives that should continue and expand. GO TO 2040 does not recommend significant changes to the structure or function of community colleges, but they should assert their role as a critical link in preparing our workforce, and actively engage the business community in designing programs. Increasing coordination between community colleges within the region would help with this and should be pursued.

In addition to education and training institutions, WIA affiliates and a variety of community based organizations connect many residents to education, training, and employment. Importantly, because so many residents access training and employment through different channels, our region must strengthen these links for workers at all skill levels. WIBs are designed to be business-led intermediaries that link employers' needs to training programs and education curriculum. The eight WIBs that serve the seven-county region collaborate through a consortium known as Workforce Boards of Metropolitan Chicago. Collaboration between these intermediaries provides an opportunity to address workforce issues and opportunities with a regional perspective. The role of the Workforce Boards of Metropolitan Chicago should be strengthened to ensure the businesses' workforce needs are met efficiently and effectively.

Both within and beyond community colleges, "career pathways" are recognized as useful workforce development tools. Career pathways lay out long-term programs of education and training that prepare students and workers for future employment and advancement in a certain industry or combination of industries, or occupation.

These should be developed in partnership with representatives from the selected industry, to ensure that the pathways accurately show which skills are needed by employers. There has been considerable work already completed to determine and map out career pathways; the state's community colleges have done this for a variety of industries[16] and several community based organizations have developed career pathways as well. Due to the variety of organizations involved in workforce development, however, the components of these career pathways analyses are dispersed, resulting in gaps and the potential for duplication of effort. These disparate career pathway analyses should be compiled to identify areas of duplication, overlap, and gaps. Publishing the results online, continually updating them, and making them widely available to workforce development organizations, education institutions, and economic development agencies would help to avoid future duplication of effort. Most importantly, making this information broadly available would help workers to advance their careers and employers to have access to the skilled labor they need. This activity would be most effectively undertaken by a regional nonprofit organization with expertise in workforce development, with funding from interested philanthropic groups.

16 Natasha A. Jankowski, Catherine L. Kirby, Debra D. Bragg, Jason L. Taylor, and Kathleen M. Oertle, "Illinois' Career Cluster Model," Office of Community College Research and Leadership at the University of Illinois at Urbana-Champaign, June 2009. See **http://tinyurl.com/2bcpy7a**.

Information and Data

Education and workforce development experts agree that better information and data are necessary to improve the performance of both of these systems. Tracking our progress, assessing the impact of programs, and planning for future needs all rely on robust, comprehensive sources of data. Unfortunately, complete sets of such data are not currently available. In addition, available data from the variety of local, state, and federal programs as well as other sources are not fully utilized due to lack of integration and analysis. In partnership with the Chicago Community Trust, CMAP will launch the Regional Indicators Project website, MetroPulse, which will track the region's progress in implementing the principles of GO TO 2040. This is a necessary step, but further work is needed to completely fill the need for better data in both the education and workforce fields.

ISBE is currently developing a longitudinal data resource, the Student Information System, which will track education information over time. When fully developed, the system could track student performance as they progress through the system, from entering state-funded preschool programs to finishing high school. Beyond tracking academic performance, it is hoped that the system can also compile data that can be used to assess physical health, social development, and participation in the arts. This type of robust data is critical because it allows researchers to assess the performance of pilot programs, for example, or to identify transition points that negatively affect student performance. GO TO 2040 supports the state's efforts, and further encourages ISBE to coordinate with early childhood, higher education, and workforce training providers to expand the Student Information System beyond preschool and K-12 education.

A particular need for improved data exists for early childhood education. Considerable scientific research has shown that early childhood learning improves educational outcomes, and this research has been effectively used by advocates to make Illinois a leader in offering early childhood education. But more data and information on the effectiveness of early childhood education programs is necessary to ensure that they are increasing school readiness. A critical transition point in the education system occurs when students first enter kindergarten; not being prepared for kindergarten can limit student performance for the rest of their educational careers. Measuring school readiness can help to ensure that students are prepared to succeed, and many states — but not Illinois — use kindergarten readiness assessments to monitor trends and improve educational outcomes. The state should create an early childhood education data system, linked with the Student Information System described above, for this purpose.

Better data and information are also needed in the workforce development system. The Regional Indicators Project, through its MetroPulse website, should be used as the initial basis for improved data provision. It should collect and warehouse existing relevant data, and should continually be improved through input from educational institutions, workforce development providers, and economic development groups. More than just raw data, there is also a need for data to be analyzed and translated into information that guides decision making and communicates labor market and industry trends.

In the longer term, the region should investigate possibly expanding the City of Chicago's CWICstats program throughout the region. This program tracks individual participants as they use services through public agencies, including Chicago Public Schools (CPS), the City Colleges, and various City departments. In addition, the new system aims to measure impact by tracking program participants' wage earnings. At present, as individuals enter and leave education, workforce, and employment systems, their history is generally not tracked, meaning that each new system starts with no information about the individual. For example, a person may drop out of high school, work for a period before earning a General Education Development (GED), receive public assistance while taking classes at a community college, and receive training through a WIA-funded program; currently there is no communication between the public agencies involved in this sequence. This data can be used not only to improve service delivery, but also to determine what types of services are in greatest demand, and allow robust analysis of different types of programs. Expanding this program across jurisdictions faces many barriers — not the least of which are privacy concerns — but it also has promise to improve the workforce development system considerably. GO TO 2040 recommends that the regional implementation of a program like CWICstats be scoped by identifying obstacles, determining data management needs, and estimating approximate costs. CWICstat leaders are well-positioned to lead this scoping, which could be supported by philanthropic resources.

Improve Workforce Development Service Delivery

In general, GO TO 2040 recommends that the workforce development system play a stronger role in meeting the region's labor force needs. The recommendations described above — improving coordination with education systems and the needs of employers, and improving data and information — would go a long way toward improving its performance. Beyond these, increasing the flexibility of workforce development funding sources, strengthening community-focused delivery of workforce training, and increasing regional coordination would also strengthen the workforce development system. Further details on all of these recommendations can be found in the workforce development report prepared for CMAP by the Chicago Jobs Council (CJC), with funding support from the Chicago Community Trust.[17]

A critical barrier to improving workforce training programs is inflexible public funding. Federal WIA programs have requirements that limit flexibility in service delivery. During the upcoming reauthorization of WIA, the federal government should loosen the restrictions on using these funds, allowing workforce boards to be more adaptive and effective in their design of programs. Other public funding sources that can be used for workforce training, like Community Development Block Grants (CDBGs), have considerably fewer requirements, and increasing their use should be explored; other state-funded programs have varying degrees of flexibility. A regionwide documentation of existing public funding streams is a necessary starting point to address this issue, and to make it possible to make informed recommendations for changes; the CJC should take on this project, with funding support from philanthropic organizations or public sources like DCEO.

It should be noted that GO TO 2040 does not recommend dramatic changes to the structure of workforce development programs, nor the establishment of a regional entity that would add another layer of administration to the system. The current structure has challenges associated with it, but these can be overcome through better coordination and shared information.

In addition, the structure of the current system does have strengths; for example, a community-focused, decentralized system with multiple funding sources can often respond to new opportunities or challenges more quickly than a centralized and entirely publicly-funded system. In fact, workforce training by community-based organizations, often offered in conjunction with other services, can be very effective. GO TO 2040 recommends that community-focused workforce efforts should continue, but that duplication should be avoided through regional coordination.

Improve Education Quality, Access, and Coherence

The above recommendations have focused mostly on workforce development, rather than education. This is not because reform of our education system is unimportant; it is critical to our region's future. The approach of GO TO 2040 is to highlight the extreme importance of this issue, and support the work of other organizations that are trying to solve the difficult and intractable challenges of improving our region's education system.

The *Education for the Future in Northeast Illinois* report, prepared for CMAP by a coalition of education groups and funded by the Chicago Community Trust, lays out a framework for improving the region's education system. An overarching recommendation is to support a "P-20" approach — which goes beyond K-12 to include early childhood and post-secondary education — to comprehensively improve education.

Beyond taking a comprehensive, P-20 approach, the region should address three major challenges to improve education:

> **Raise the *quality of education* in the region. Education quality relies heavily on quality of educators, so professional preparation of teachers and principals should be a focus.**
>
> **Strengthen *equitable* access to high quality education and ensure all students' readiness for success. Students from lower-income families simply do not have adequate access to educational opportunities; addressing public school funding and the rising cost of higher education is necessary to solve this problem.**
>
> **Create greater *coherence and collaboration* within and across levels of education. Improving data systems and strengthening transitions between levels of education, and beyond that to the workforce, should be pursued.[18]**

As noted earlier in this section, the "education system" is really made up of a variety of institutions and organizations, so improving it will require considerable coordination, and ultimately action by many groups. GO TO 2040 recommends that the *Education for the Future in Northeast Illinois* report, which was developed through an inclusive and consensus-based process, be used by leaders of education, civic, business, and community-based organizations to lay out a strategy for improving education in the region.

17 GO TO 2040 Workforce Development Strategy Report, 2009. See **http://www.goto2040.org/workforce/**.

18 GO TO 2040 Education Strategy Report. See **http://www.goto2040.org/education/**.

5.5 Implementation Action Areas

The following tables are a guide to specific actions that need to be taken to implement GO TO 2040. The plan focuses on three implementation areas for improving education and workforce development:

Improve Coordination Between Education, Workforce Development, and Economic Development

Data and Information Systems

Improve Delivery of Workforce Development Services

Implementation Action Area #1: Improve Coordination Between Education, Workforce Development, and Economic Development

Prepare assessment reports on cross-system coordination LEAD IMPLEMENTERS: Nonprofits, philanthropic	Focus initially on the freight and energy industries of the economy; later expand to other industries. Identify and convene economic development, education, and workforce leaders in each industry, and determine areas of duplication or gaps. Summarize the conclusions of this work in a report for each sector with recommendations for next steps, including setting of common goals and pursuit of pilot programs to improve coordination.
Expand on successful workforce development coordination programs LEAD IMPLEMENTERS: State (DCEO), community colleges, Workforce Investment Boards, economic development organizations	Build on successful programs like CWIC to expand it beyond the City of Chicago. Also build on the Shifting Gears initiative of the state's community colleges and DCEO's Critical Skills Shortage Initiative to expand them to cover additional industries. Expand other initiatives that engage the private sector and economic development organizations and strengthen partnerships between education institutions and the business community.
Strengthen role of workforce intermediaries — including community colleges, universities, proprietary schools, apprenticeship programs, vocational programs, community based organizations, Workforce Investment Boards, and Workforce Investment Act affiliates LEAD IMPLEMENTERS: Community colleges, nonprofits, other education, workforce and economic development groups	Expand programs that have succeeded at individual education institutions and training providers to be applied broadly across the region. Improve communication between education institutions and training providers through regional forums that also involve economic development groups. Increase the profile of workforce intermediaries as a critical link in the education and workforce development system.
Collect, compile, and publicize career pathways analyses LEAD IMPLEMENTERS: Community colleges, nonprofits, philanthropic	Identify existing analyses of career pathways, or programs of education and training that prepare students for future employment in a certain field. Compile these and make them available to education institutions, workforce service providers, and employers. Update this compilation frequently to reduce duplication, and prepare new career pathways to eliminate any gaps in coverage of new or expanding industries.

Implementation Action Area #2: Data and Information Systems

Launch and continually improve the Regional Indicators Project website LEAD IMPLEMENTERS: CMAP, the Chicago Community Trust	Develop and maintain a website that describes the tracking indicators and allows users to tabulate, graph, or map this information. The website will be continually improved to incorporate new data sets and new technologies as they become available. Education and workforce development indicators are among those featured on the website.
Identify additional data sources concerning education and workforce, including existing data and newly developed or innovative data measures LEAD IMPLEMENTERS: State (IDES, DCEO), CMAP, higher education institutions and community colleges	Analyze existing education and workforce information and data sources, including CWICstats, Illinois Department of Employment Security (IDES), DCEO, Illinois Community College Board (ICCB), Northern Illinois University (NIU), and Shifting Gears, among other sources. Identify barriers to making new data sources publicly available on the Regional Indicators Project website and determine incentives or mechanisms needed to overcome these barriers.
Expand the CWICstats system to cover the region LEAD IMPLEMENTERS: CMAP, CWICstats leaders, WIBs, education institutions, workforce providers	The CWICstats program tracks education and training participants as they move through public education, workforce development, and other social service systems. It promises to be an extremely useful data source for monitoring program effectiveness, but currently only covers the City of Chicago. There are significant barriers to expanding it, including institutional coordination, data management, and cost; these should be scoped in partnership with current CWICstats leaders and potential participants outside of Chicago.
Expand the Student Information System beyond K-12 education LEAD IMPLEMENTERS: State (ISBE), early childhood educators, higher education institutions, workforce providers	Implement the Student Information System to track student performance over their educational careers, including data beyond academic achievement. Expand this to coordinate with early childhood education, higher education, and workforce development data systems.
Create measures of school readiness to improve early childhood education programs LEAD IMPLEMENTERS: State (ISBE), early childhood educators	Create a measure of school readiness for students entering kindergarten. Use this to evaluate the effectiveness of various early childhood education programs at preparing students for success in school. Link this assessment with the Student Information System described above.

Implementation Action Area #3: Improve Delivery of Workforce Development Services

Increase the flexibility and federal funding for workforce development and increase flexibility of State discretionary workforce funds LEAD IMPLEMENTERS: Federal, state (DCEO), WIBs, workforce providers	Modify the requirements of WIA funding to allow workforce boards to exercise more flexibility in how these funds are used. Permit differences in how WIA funds are used between regions to reflect their different economic profiles and related training needs.
Investigate the use of other funding sources for workforce development LEAD IMPLEMENTERS: Nonprofit, philanthropic	Explore the use of more flexible funding sources such as CDBGs to be used more extensively for workforce development. Create a regionwide documentation of existing public funding streams to allow the development of specific recommendations for funding changes.
Monitor impact of more flexible funding and communicate outcomes LEAD IMPLEMENTERS: Federal, workforce providers	The outcomes of modified policies and funding streams should result in better matches in workforce skills and business needs. Routine and regular monitoring of effectiveness in meeting regional goals will be an ongoing activity.
Strengthen community-focused provision of workforce services LEAD IMPLEMENTERS: State (DCEO, Governor's Office), community based organizations, business community, WIBs, other workforce funders	Continue offering workforce development services through community-based organizations, in conjunction with other services. Evaluate local community-focused programs, determine which approaches are most effective, and promote further use of these programs.

5.6 Costs and Financing

Education

Education makes up a significant portion of the expenditures of federal, state, and local governments. As noted in the "current conditions" section of this document, different types and levels of education are funded through different means, both public and private. It is expected that the actions included in this recommendation — in particular, improving educational quality and making access to educational opportunities more equitable — will require additional public sector expenditures. Because these recommendations are quite high-level and conceptual, cost estimates for their implementation have not been prepared. GO TO 2040 encourages education stakeholders to develop more specific recommendations for policy changes and estimate the cost of achieving them.

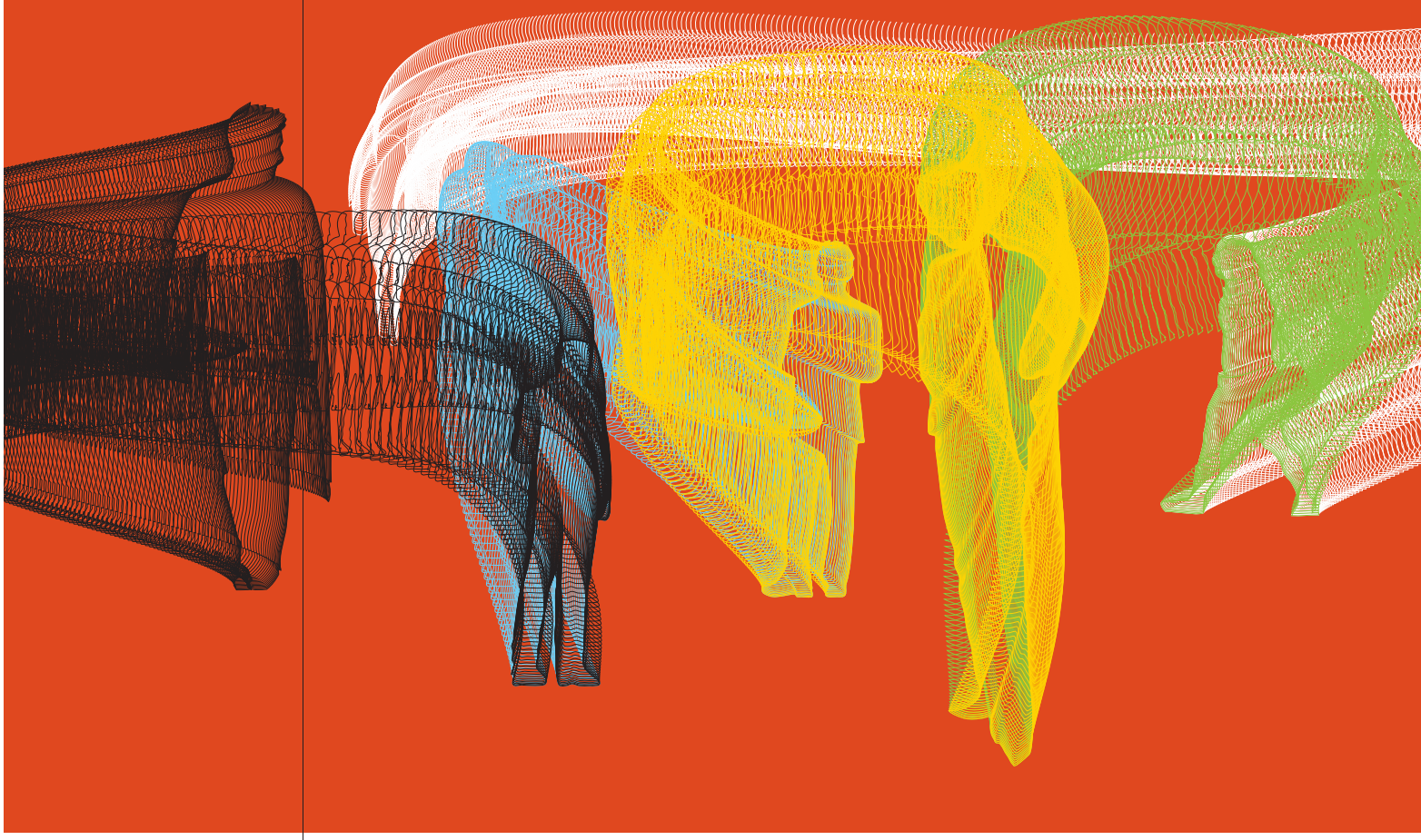
Workforce Development

The recommendations related to the workforce development system are likely to be revenue-neutral, and may even reduce costs. Improving coordination and reducing duplication in service delivery are likely to make the workforce development system more efficient; relatively small expenditures to catalog existing career pathways and make them broadly accessible, for example, will help to prevent this work from being unknowingly duplicated by other groups in the future. Some recommendations, such as those related to regional data systems, will have start-up costs in the short term, but these will be more than compensated for by the improved coordination and efficiency that they will create.

GO TO 2040 calls for a central role for philanthropic organizations in some of the plan's recommendations; this is among them. Because philanthropic groups have considerable flexibility and discretion in their funding decisions, they can fund coordination efforts— such as the coordination assessment reports and career pathways research — that may be difficult or unwieldy to fund with public sector resources. Therefore it is recommended that philanthropic groups take a leadership role in working with nonprofit organizations with expertise in workforce development to achieve many of the recommendations on the previous pages.

RECOMMENDATION

6 Support economic innovation



The process by which new ideas transform into new goods and services is certainly not as visible as infrastructure or the layout of a community. It is also not as well researched as the education system, nor does it necessarily demand the level of public investment.

However, economic innovation plays a major role in producing sustainable economic prosperity and enhancing the global competitiveness of places around the world. The propensity to conceive and develop new products, technologies, processes, business models, and markets results in goods and services that are faster, cheaper, and better.

Transforming new ideas into concrete, tangible realities has long been a part of the U.S. mindset. Over the last two centuries, Americans have experienced a 20-fold increase in living standards.[1] While this is due in part to increased accumulation and better allocation of capital, it is also due to the commercialization of new forms of production, products, business models, and in the creation of new markets and how they are served. These are advances clearly generated by the private sector but also supported through public policy.

While innovation is not easy to define with precision, the concept is not completely obscure either. The more tangible breakthroughs of contemporary human history — inventions like the light bulb and airplane — are examples of innovations. But the same goes for things like biotech breakthroughs, allowing more drugs to be produced easily and cheaply, or business model breakthroughs like changes in inventory systems that let manufacturers purchase and receive components just before they're needed on the assembly line. Innovations can manifest themselves in both astounding breakthroughs and more mundane, subtle shifts in process. Both of these types of outputs can generate tremendous efficiencies and increased economic vitality.

While the metropolitan Chicago region is certainly imbued with the types of assets to support innovation — world class research institutions, a diverse industry mix, and strong civic organizations and foundations — the available data indicate that the region has been underperforming relative to other metro areas, in terms of its success at commercializing technologies and other processes. For the region to remain globally competitive and a retainer of world class talent, these trends must change. As economies are fundamentally metropolitan in scale, strategies targeting clusters of regional specialization can help address the fragmentation and unfocused investment that sometimes undermines the emergence of new marketable products and technologies.

Since innovation is generated by the private sector, the role of the public sector is to find ways to help spur innovation by supporting ideas, institutions, and relationships. The public sector should be primarily focused on providing support and services that are essential to innovation, but that are unlikely to be provided by private businesses. The public sector can also play important roles in identifying and measuring innovation. Other organizations, including civic groups, foundations, and economic development agencies, can also play important roles in enhancing the regional culture around innovation.

1 Advisory Committee on Measuring Innovation in the 21st Century, "Innovation Measurement: Tracking the State of Innovation in the American Economy," report prepared for the U.S. Secretary of Commerce, January 2008.

The metropolitan Chicago area should be focused on several activities that can help industries to innovate and grow. GO TO 2040 recommends the following actions:

Improve Data and Information Systems
Better systems for collecting, tracking, and analyzing important measures should be pursued. This includes both outcome indicators of innovation, like number of businesses and jobs in key sectors, as well as the success of particular programs and financial incentives, which should make public sector investment decisions more efficient.

Nurture the Region's Industry Clusters
Organizing the region strategically around clusters of regional specialization can help target investment decisions and reduce duplication of effort. These efforts should focus on how to make the region's successful clusters grow and prosper in the 21st Century and enable the region to be proactive in terms of funding and other opportunities.

Increase the Commercialization of Research, Target Investment Decisions, and Pursue New Financing Opportunities
Increasing the commercialization of research requires better linkages among diverse groups, more awareness about what research is being done, and better training for both researchers and entrepreneurs. Leaders should also explore ways to increase the supply of venture capital to enable entrepreneurs and start-up firms to locate and thrive in this region.

Create a Culture of Innovation
To become a leader in innovation, our region needs to change attitudes to support the experimentation and creativity necessary to produce commercial innovations. Innovative success stories should be publicized to help educate the region about the value of experimentation. Furthermore, the state and local government should identify and reform regulations or ordinances which might be creating barriers to innovation.

Beyond these actions, a highly skilled workforce is vital to support economic innovation.[2]

6.1 Benefits

Innovation directly impacts major economic outcomes, like increased global competitiveness and good jobs. The outputs of innovation — goods and services that are faster, cheaper, and better — benefit consumers in a multitude of ways.

New technologies and processes can save people money and time, enhance quality of life, and improve health and life expectancy. Businesses that operationalize new ideas can achieve profitable growth and gain a competitive advantage in the marketplace. The fact that innovative businesses generate more economic growth is common sense, and well known in business[3] and academia.[4]

The regional economy can gain substantial benefits from innovation through the creation of high-paying jobs, specifically knowledge and high tech jobs. The types of institutions and firms directly involved with innovation — research laboratories, technology parks, and advanced manufacturing firms, to name a few — attract and retain the kind of human capital the region requires to remain thriving and globally competitive. The metropolitan Chicago region is already home to powerhouse universities and other research institutions. Harnessing the ideas and people involved in these institutions will be a vitally important strategy for our region to pursue. Seeing that the ideas generated in these institutions are brought to market locally should be a top priority, given the large positive economic returns that will result.

2 See the GO TO 2040 section titled "Improve Education and Workforce Development."

3 Blair Kingslad, "Thinking Big for Innovation and Growth," Industry Week, June 6, 2007.

4 F.M. Scherer, Innovation and Growth, (MIT Press, Cambridge, MA) 1986.

6.2 Current Conditions

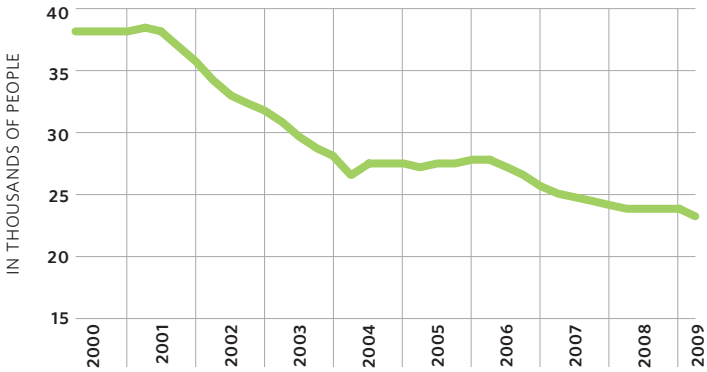
The metropolitan Chicago region has many assets, including a diversified economy with regional specializations in several key sectors, including biomedical/biotechnical, advanced materials manufacturing, and transportation/logistics, as well as emerging specialization clusters like green energy and technology.

The region is home to a number of world class universities, such as Northwestern University, the University of Chicago, and the University of Illinois at Chicago (UIC) and research laboratories like Argonne, Abbott, and Fermilab. The region has strong business and civic organizations as well as a philanthropic community with a long history of supporting diverse initiatives.

In recent years, numerous important innovations have been brought to market by our region's firms and research institutions. While examples abound, here are just a few recent notable cases. Abbott Laboratories, with its national headquarters in Lake County, produced a new drug-eluting stent that prevents previously opened arteries from closing. The Gas Technology Institute (GTI), located in Des Plaines, developed a method for enhanced heat recovery from steam generators and water heaters, a new process that can greatly increase fuel-to-steam efficiency and result in greener, more fuel efficient industrial products. Groupon, a popular website based in Chicago and now operating in markets across the U.S., has harnessed the unique concept of collective buying to promise businesses a minimum number of customers and, in turn, offer deals for consumers that aren't available elsewhere.

At the same time, both the available data, as well as interviews with practitioners in the innovation field, indicate that the region is underperforming and falling behind other places in the U.S. While new types of technologies and business models are certainly emerging locally, the available data indicate that our region is not doing as well as it should. The metropolitan Chicago region is generating fewer successful commercialized innovations from technology transfer programs, employing fewer workers in research and development (R&D) jobs (see **Figure 38**), and receiving less venture capital funding. The pace of innovation (as reflected in the number of patent applications) has stagnated. Furthermore, there is a strong sense within the business community that the Chicago region is simply not perceived as being a hotbed of innovation, in comparison to other places such as Silicon Valley, Boston's Route 128 Technology Corridor, or North Carolina's "Research Triangle."

Figure 38. Research and development employees in northeastern Illinois, 2000-2009



Source: Moody's Analytics

Clusters of Regional Specialization

Our region's industry clusters play a critical role, not only in creating quality jobs, but also in spurring innovation through research and collaboration. Clusters are interdependent firms that share common resources and technologies and depend on a similar labor pool and institutions. Industries and firms in clusters can draw a productive advantage in their close geographic proximity, which can help develop innovative products, build knowledge creation, and enhance cooperation and competition among firms. Clusters of regional specialization provide a substantial amount of the "value added" that the Chicago region brings to the economies of the Midwest, the nation, and the world. These specialization clusters include freight and logistics, advanced manufacturing, financial and related services, health and biomedical products and services, and emerging clusters like green energy and technology. An understanding of regional clusters can focus the efforts of public policy and investment decisions.

Several of these sectors are becoming increasingly more important and merit particular focus. The growing green economy sectors, including green manufacturing, have competitive advantages in the Chicago region, especially for headquarters and white collar jobs. Growth in new wind farms in or near the region has been dramatic in the last two years following the adoption of the state Renewable Portfolio Standard — one of the most aggressive in the country — and the extension of the federal production tax credit for wind power producers. The region's substantial manufacturing base supports technological advances by enabling energy entrepreneurs to interact with engineers, build prototypes when they need to, and purchase goods and services locally. An example of this is the turbine and turbine generator manufacturing industry (the Chicago region produces about four percent of U.S. sales).[5] This industry enjoys a competitive advantage by being able to purchase a much larger share of inputs and specialized labor within the region than similar businesses in neighboring states.

While industry clusters have generated a good deal of research and discussion, many disconnects remain, including a lack of coordination between researchers and entrepreneurs, and unfocused and insufficient public investment. Job training, research collaborations, and even the simple discussion of ideas are subject to "market failure" problems — individual firms cannot capture all the benefits of job training, and understandably, private companies often do not encourage potentially mutually beneficial discussion of ideas because they are concerned that their ideas may be taken by their competitors. Since this is a tendency that cuts across all businesses and sectors, there is a very real economic justification for public sector involvement as well as other collaborative efforts to develop and nurture industry clusters. The region's economic development community may find that "rallying behind" the region's clusters can maximize the effectiveness of different strategies and initiatives, and also get the region organized to respond to funding opportunities, particularly on the federal level.

5 "Turbine and Turbine Generators Industry," 2007 Illinois, Iowa, Indiana, Wisconsin and U.S. Industry Input-Out Model compiled by IMPLAN, based on data collected by the U.S. Census Bureau, Bureau of Economic Analysis and the Bureau of Labor Statistics.

Research Institutions and Technology Transfer

Numerous studies have found that the most essential ingredient for innovation and economic growth is human capital and the production of knowledge.[6] By that standard, the metropolitan Chicago region should be doing very well, given the world class research institutions in the area. These places are obviously important for the research they bring to bear, which is often of both scientific and commercial interest. However, this research needs to be transferred to something tangible of commercial value for it to be profitable in the marketplace. "Technology transfer" encapsulates the process, usually accomplished between entrepreneurs and research institutions, of commercializing theoretical innovations into new goods and services. Universities, other research institutions, and private firms often have technology transfer staff dedicated to this process. However, technology transfer does not happen easily or automatically — it requires coherent information sharing and coordination across different institutions and people.

Despite the number and quality of research institutions in the region, local technology transfer program performance lags other metropolitan areas. Available data indicates that the rate of success in the Chicago region is relatively low, given the stature of the universities. Technology transfer can be measured by a number of metrics, including license income due to patents, number of active licenses, R&D expenditures at universities, and number of start-up firms generated through the process. Northwestern University ranks fourth nationally in license income ($85.3 million in 2007), though much of this income comes from a single drug, Lyrica. The number of active licenses generated by Northwestern (173), University of Chicago (192), and the University of Illinois (399), is much less than places like the University of Washington (1040), University of Minnesota (756), or the University of California system (1819).[7]

While the region can pride itself on a number of technology transfer success stories across diverse areas like life and medical sciences, nanotechnology, engineering, and clean technologies, a number of challenges persist. Early efforts by scientists and engineers to raise working capital for developing and marketing ideas are often counterproductive. Researchers often present overly technical ideas that may confuse or fail to interest prospective funders. Some of the region's research institutions are sometimes seen as aloof and overly focused on theory rather than practicality. At the same time, research leaders have remarked that public investments in technology infrastructure and facilities have been unfocused and scattershot, and more recently, lacking altogether.[8]

6 See W. Baumol, R. Litan, and C. Schramm, Good Capitalism, Bad Capitalism (New Haven: Yale University Press) 2007; P. Blumenthal, H. Wolman, and E. Hill, "Understanding the Economic Performance of Metropolitan Areas in the United States," Urban Studies, Vol. 46 (2009): 605-627.

7 Association of University Technology Managers (AUTM), annual surveys.

8 These views are based on interviews with officials from the Illinois Institute of Technology (IIT) and Samuel Pruitt, President of the Chicago Technology Park (CTP) in the Illinois Medical District at the University of Illinois at Chicago.

Patents and Venture Capital

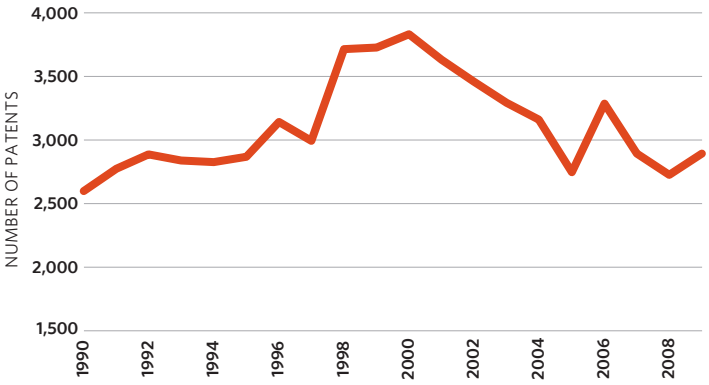
Firms which can develop and get patents for new products have more competitive advantages and can pay higher wages. Metropolitan areas imbued with high tech and R&D jobs, labs, and corporate facilities — places like the San Francisco Bay Area, Boston, and Austin — usually generate the highest numbers of patents. From 1990 to 2001, Illinois and the Chicago region typically experienced annual yearly increases in the number of total patents granted (see **Figure 39**). However, since that time these numbers have shown steady declines. This is in contrast to some other metropolitan areas, such as Boston, which had historically trailed the Chicago region, but now eclipse it in terms of annual patents issued.[9]

Once ideas have been created, and patents filed, funding for commercialization is crucial. The availability of venture capital is an important factor that can incent or limit the amount of innovation-to-market success. Venture capital is the seed money that helps move a small business with a solid marketing plan into a stage where production can advance to actual marketing, and products can be produced. Not all companies need venture capital, but access to venture capital speeds the development of companies and enables them to enter new markets with strength and the backing of resources to help ensure success. There are more than 80 venture capital firms with offices in the metropolitan Chicago region. One major example is the ARCH Development Corporation and its affiliate, ARCH Venture Partners, which work on commercialization with Argonne National Laboratory and focus on seed and early stage investing.

During the period 2000-2009, venture capital funding to the Chicago area fell dramatically, from $2.4 billion to $175 million (see **Figure 40**). This mirrors a national trend post the "dot-com boom," and venture capital has fallen in other places as well, though the declines have often been less dramatic — for example, the Boston area received over $9.6 billion in 2000, but only $1.6 billion in 2009.[10] Although the Chicago region is rich in resources, industry, and intellectual firepower, the majority of venture capital funding that enables production and marketing remains directed toward the coasts. Venture capital funding in Illinois represents only 1.7 percent of the total for the nation, relative to places like Massachusetts (12 percent) and New York (over four percent). Pennsylvania and Minnesota both outpace Illinois as well.[11]

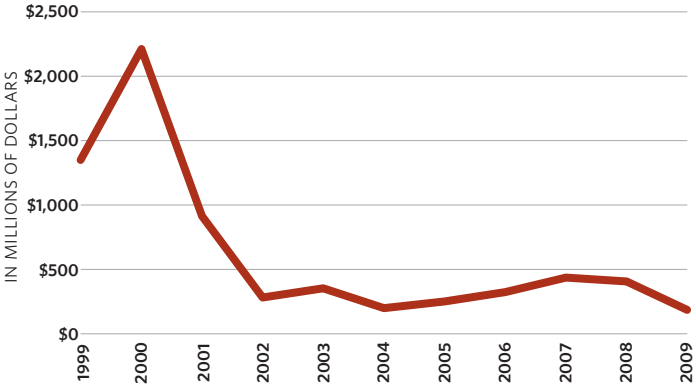
Low and reduced levels of venture capital funding is a trend not just in metropolitan Chicago, but across the Great Lakes states, which are not keeping pace with venture capital powerhouses like California and Massachusetts. Some of the challenges to venture capital in our region and across the Great Lakes include inadequate local deal flow (caused in part by a failure to commercialize research ideas), higher costs for early stage investors, and quite simply, venture capital funds that remain too small. There is some evidence that early-stage companies often choose to relocate to the coasts as a necessary condition of receiving funding.[12]

Figure 39. Total patents granted in Illinois, 1990-2009



Source: U.S. Patent and Trademark Office, Calendar Year Patent Statistics.

Figure 40. Venture capital funding in northeastern Illinois, 1999-2009



Source: PricewaterhouseCooper/Thomson Reuters/National Venture Capital Association MoneyTree Survey

9 U.S. Patent and Trademark Office, Calendar Year Patent Statistics. See http://tinyurl.com/2vszo8l.

10 2010 PricewaterhouseCooper/Thomson Reuters/National Venture Capital Association MoneyTree Survey.

11 Frank E. Samuel Jr., "Turning Up the Heat: How Venture Capital Can Help Fuel the Economic Transformation of the Great Lakes Region," Brookings Institution, January 2010.

12 Frank E. Samuel Jr., "Turning Up the Heat: How Venture Capital Can Help Fuel the Economic Transformation of the Great Lakes Region," Brookings Institution, January 2010.

Government and Nongovernment Institutions Involved with Innovation

Beyond the private sector and universities, numerous other organizations and groups work to encourage and fuel innovation by providing an array of financial resources, technical assistance, and support networks. Many programs and financial resources are offered through public-private partnerships (PPPs) and some operate in the region but are part of a larger national or international network. Some programs target specific industries and others target specific types of firms like start-up companies. The variety of programs is significant; the following provides a brief overview of the key agencies and programs that facilitate business development and innovation in the Chicago region.

The Illinois Department of Commerce and Economic Opportunity (DCEO) is the state agency that is most directly involved with programs that relate to innovation. DCEO administers a variety of programs that provide access to capital through loans, grants, and tax incentives. DCEO oversees nine loan programs, six grant programs, and seven tax incentive programs for businesses and financial institutions to promote economic development, job creation, and innovation. Each program targets different markets and utilizes different delivery mechanisms. For example, some programs focus on modernizing equipment while other resources are directed towards upgrading employee skills. The Illinois Department of Employment Security (IDES) complements these efforts. IDES collects and disseminates data on unemployment by sector in the region, serving as an information clearinghouse for workers to help them find information about benefits, jobs, and training.

In addition to the state, many municipal and county governments operate financial assistance programs to support business development and innovation within their own jurisdictions. The City of Chicago offers one of the only publically administered financial assistance programs that targets a specific innovation industry, the Laboratory Facilities Fund. This program expends tax increment financing (TIF) capital to pay for up to 25 percent of eligible lab construction costs, targeted towards companies involved in technology.

In addition to financial assistance, the state and many local governments provide other services to businesses to support their success. DCEO's Illinois Entrepreneurship Network (IEN) offers entrepreneurship centers geared towards different types of businesses. These centers are operated by business development organizations and education institution partners, and a variety of services are offered, including business plan development and access to capital, technology, and networks. Two nongovernmental agencies that operate Entrepreneurship Centers in the Chicago region include the Chicago Entrepreneurial Center, an affiliate of the Chicagoland Chamber of Commerce, and the iBIO Entrepreneurship Center, which operates within the iBIO organization and focuses specifically on biotechnology companies. Another key IEN center in the region is the Chicago Manufacturing Center. Previously, DCEO also provided the Illinois Technology Enterprise Centers (ITEC) program, which helped innovators and small businesses with critical business startup and marketing needs, and served to create new connections between academia, business, and budding entrepreneurs.

Beyond state funded programs, other resources support institutions and agencies that provide focus on promoting innovation and economic development. The Chicagoland Chamber houses the InnovateNow initiative, which brings together businesses, schools, and government to promote the relationships needed for economic prosperity and innovation. The Chicagoland Chamber also facilitated the development of an alliance of several key Chicago innovators to position Illinois to be a leader in the clean technology industry. Known as the Illinois Clean Energy Trust, this group includes leaders in business, government, education, research, and finance. World Business Chicago (WBC) is another regional agency with a focus on attracting businesses and promoting business expansion. The Metropolitan Economic Growth Alliance (MEGA) is an emerging coalition of county economic development agencies and other members with the mission to support effective business development.

6.3 Indicators and Targets

Despite the popular consensus that innovation drives economic growth and prosperity, measuring success in innovation remains elusive. Little consensus exists on the right performance measures, or how best to weigh them.

Innovation indicators often include elements such as number of high tech jobs, degrees granted in science and engineering, number of patents, research and development funding, venture capital funding, or license income (or number of licenses) resulting from technology transfer programs. None of these measures, in isolation, work well to measure progress. For example, high license income resulting from technology transfer programs often reflects only one active license, which does not serve to measure overall success. On the other hand, technology transfer programs which are evaluated based on quantity of patents may be incentivized to encourage innovators to present one idea over several patents, instead of producing a single idea and proceeding to market it.

While problems persist in the data, tracking certain indicators is still important. The longer term goal should be improving collection and analysis of the measures. The most optimal outcome will likely be combining a number of different measures to create an "innovation index" that can be tracked over time. Recently, some groups, including a national Advisory Committee on Measuring Innovation in the 21st Century, have issued reports offering frameworks for how to measure innovation.[13]

GO TO 2040 will track the following indicators related to innovation, with the recommendation that better data collection and analysis on these measures be pursued.

Employment in Research and Development

Employment in "R&D" comprises jobs in high-tech knowledge economy jobs. These are typically good, high-paying jobs that attract and retain talented workers. Since the year 2000, R&D jobs have been on the decline in the Chicago region. On the whole, implementation of GO TO 2040 should increase the number of these knowledge workers, which should improve the overall regional economy.

Venture Capital Funding

Venture capital funding peaked in the year 2000, fell dramatically by 2002, and has remained relatively the same since then. On the whole, the implementation areas listed in this section should increase the amount of venture capital to a level more consistent with other metropolitan areas, like Boston.

13 Advisory Committee on Measuring Innovation in the 21st Century Economy ,"Innovation Measurement: Tracking the State of Innovation in the American Economy," a report to the Secretary of Commerce, January 2008.

6.4 Recommendations

It will require serious action to increase economic innovation to keep the metropolitan Chicago region thriving and globally competitive.

The data indicate that the region is underperforming across a variety of innovation measures, and that the region is falling behind compared to other U.S. metropolitan areas. Relative to other regions, there are fewer successful commercialized innovations coming out of technology transfer programs, there is less venture capital available, and the pace of innovation (as reflected in the number of patent applications) appears to have stagnated. The plan's innovation recommendations seek to address these deficiencies and capitalize on new opportunities.

The goal of the innovation recommendations are to improve government policies, measurement and tracking, regional coordination, and services that can enhance innovation and support our regional industry specializations. Progress toward these goals will increase economic prosperity and provide more jobs in the region. Research, collaboration, and policy implementation are major elements of these recommendations. Emerging funding opportunities, particularly from the federal government, will require regions to be highly organized to be competitive. These recommendations can help position the region to be more competitive for public and private funding over the long term.

It should be stressed that the primary driver of the region's future economic prosperity is the quality of the labor force. Though innovation requires a supportive environment, at its heart it is created by people with ideas — in most cases, these people are educated, well-trained, and experienced. Improving the region's workforce is critical to both meeting current hiring needs as well as showing businesses within and outside of the region that Chicago has a high quality labor pool ready to help the region grow. GO TO 2040 includes a separate chapter with recommendations on these issues.

Improve Data and Information Systems

Improving data and information systems relative to innovation should be a top priority for the region and the State of Illinois. Innovation remains a rather elusive concept for many policymakers to grasp. Better systems for collecting, tracking, and analyzing important measures, including the success of particular programs and financial incentives, will make public sector investment decisions more efficient. Particularly desirable metrics include the number of new business openings, movements, closures, and jobs created within specific, innovation-intensive sectors (a similar measure was developed by San Diego's CONNECT program).[14] These measures could help assess the region's ability to commercialize innovative ideas into the outcomes that truly matter for the region: new businesses and good jobs.

Improved measurements of the success of technology transfer and commercialization are also necessary. The problem with judging success on the basis of the number of licenses is that one idea can be developed into multiple licenses, while the energy spent on meeting the standard for reward might be better spent on developing commercial applications of the idea. A sector-specific analysis of the problem, oriented to improving innovation in the Chicago region, may be able to produce a better evaluation framework that could improve the region's technology transfer programs.

Some measures of innovation are specific to particular sectors. Tracking this data can inform the public and private sector about particular economic trends. Advances in environmentally sustainable/green practices are a good example. Energy consumption and source by sector, the number of energy efficient homes, and greenhouse gas emissions by sector and county are all outcomes that show evidence of regional innovations in energy. There is an effort underway at the federal level to measure this part of the economy. The U.S. Bureau of Labor Statistics is in the process of formulating measures for green economic activity and green jobs. These data, once defined, should be useful for tracking the progress of the region's companies to adopt green technologies and business practices and for charting the development of the growing green technology and energy cluster.

14 For more information on San Diego's CONNECT program, see **http://www.connect.org/**.

Nurture the Region's Industry Clusters

Chicago's regional specializations should be supported to better enable them to compete nationally and internationally. Since each industry faces unique challenges, opportunities for innovation will vary by sector. Using a sector or cluster-based approach to innovation will help identify shared research, collaboration, and implementation needs. An implementation strategy that focuses on specific strategic industries will help build our regional specializations and support long term job growth and regional prosperity. Some examples of clusters of particular importance are freight/logistics, advanced manufacturing, and biomed/biotech. The developing cluster of green energy/technology businesses and institutions is also likely to be fundamental to long term economic growth. Additional sectors should also be targeted to identify specific actions for implementation.

Organizing the region strategically around clusters can help target investment decisions (such as training and infrastructure) and reduce duplication of effort. While the region does not necessarily require a single overall "innovation leader," the presence of a lead organization or group for each cluster will help coordinate efforts, act as a clearinghouse for information, and form coalitions to apply for and receive external funding. The Illinois Clean Energy Trust, established by several key area investors and facilitated by the Chicagoland Chamber of Commerce, is an example of this type of coordination. This group aims to accelerate the development and increase the number of clean tech jobs and companies in the region. This type of leadership should be supported and it can potentially serve as a model for other efforts around industry clusters. It should be stressed that these types of efforts should not revolve around "picking winners" or specific firms to attract. Rather, the efforts should focus on how to make the region's successful clusters grow and prosper in the 21st Century and enable the region to be proactive in terms of funding and other opportunities.

Lastly, environmentally responsible and sustainable business practices and industrial operations, and the "green jobs" that result — will be an integral part of successful business in the future. These are areas where innovations are occurring rapidly and where new solutions are very marketable. Solutions may include highly visible efforts like building wind turbines, or they may mean continuing business as usual but with more environmentally sensitive production processes. Changing to meet green business practice standards may be difficult; providing training information on how to make these changes may be an important role for the public sector and other organizations. It will be very important to publicize the practices of different green innovations across industries to give credit to early adopters and to provide ideas about how to become green for other businesses in the region.

Enhance the Commercialization of Research, Target Investment Decisions and Pursue New Funding Opportunities

Private sector industries must be more closely linked with the region's researchers to draw ideas from them for implementation. The transfer of ideas will provide a valuable testing ground for research, and commercialize ideas into tangible products that can be brought to market. Coordination has sometimes proven difficult among researchers and entrepreneurs, as well as among other groups in the region with an interest in innovation. Multiple programs and resources are offered by both the public sector and nongovernmental groups. In many cases, these resources are not known to a wide swath of the business community and often the programs may be duplicative.

Increasing the commercialization of research requires better linkages among diverse groups, more awareness about what research is being done, better training for both researchers and entrepreneurs, and more targeted public sector investment. At this time, there is no one entity specifically positioned to lead these efforts, though many different entities currently have involvement. Organizations like DCEO, Innovate Now, the Illinois Technology Development Alliance, the Illinois Science and Technology Coalition, and the Illinois Clean Energy Trust should facilitate dialogue and information exchange within and across private industries, universities and other research institutions (including the region's federal laboratories), entrepreneurial programs, and producers and consumers.

Creating new connections among academia, business, and budding entrepreneurs is vital. State programs like IEN and the formerly funded ITEC program have effectively served technology-based entrepreneurs, innovators, and small businesses by assisting them with critical business startup and marketing needs. The ITEC program has been particularly mentioned by some practitioners as being an effective vehicle for assisting entrepreneurs to locate pre-seed and early stage financing, furthering technical or managerial skills, and assisting with new product development and marketing, thus nurturing new venture development in Illinois. Under this program, universities donated faculty time to review technology commercialization plans for start-up firms in a competitive setting. While the costs for this program were quite modest, state funding for this program has unfortunately been cut — while eight ITEC centers existed in 2002, none remain today. The effectiveness of present and past programs like IEN and ITEC should be evaluated, and the state should increase funding for those that have produced positive outcomes.

In an era of constrained state finances, Chicago area businesses, governments, and other organizations must work together to insure that some key innovative businesses survive and move toward expansion.

While Chicago has several venture capital firms, the amount of venture capital funding in the region is relatively low. Collaborative work by businesses, civic organizations, philanthropic groups, and government can seek private and public monies to make some kind of development funding available to the Chicago region. A new major venture capital fund, focused on the metropolitan Chicago region but possibly designed to extend to other regions and states in the Great Lakes region, should be explored. The fund should be targeted toward particular industry clusters. A particular focus on green technology may be a wise focus for this fund.

The Illinois Innovation Accelerator Fund (I2A) may be a good model. I2A is a public-private partnership that has raised several million dollars and makes early investments in well managed companies that have developed a value plan based on recent innovations. I2A makes investments in local companies and in companies willing to relocate to Illinois.

Federal funding opportunities on the horizon increasingly encourage more regional collaboration across business, government, and nonprofits. Federal funding has historically been of great importance in promoting and enabling new science and technology in laboratories, research facilities, and factories across the U.S. Reauthorization of the federal America COMPETES Act (Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science), which invests in science and innovation, is likely to include the establishment of a competitive regional industry cluster grant program that would make available competitive grants and information to stimulate the collaborative interactions of firms and other institutions to produce more commercial innovations and higher paying jobs.[15] Planning activities, including technical assistance and data analysis, are likely to be a major component of this. Given the Chicago region's current room for improvement across a variety of innovation metrics, the region can be competitive for these types of dollars, but it will need to organize its efforts.

On the state side, until June 2008, the State of Illinois provided funding through the Illinois Innovation Challenge Grant, matching grants to recipients of two federal grant programs — the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR). These were relatively small grants, with a corresponding small program cost: approximately $1 million per year for the entire program for the entire state. These grants, however, had an important impact. For example, a two-person Chicago-based firm specializing in radar imaging applications received this grant in 2008. This firm survived and now has 10 employees. Both Indiana and Wisconsin continue to offer similar matching grants. The experience of the Illinois Innovation Challenge Grant should be analyzed and a new, similar program should be instituted in its place.

Other financing strategies should also be addressed. Challenges faced by small businesses should be identified along with new models to support entrepreneurship. For example, micro-loan programs, social entrepreneurship programs, and tax incentives that are most likely to support innovation should be enhanced. It will be important to identify opportunities, gaps, and redundancies in existing state and local programs that seek to assist these sectors.

15 A five-year reauthorization of the America COMPETES Act passed the U.S. House of Representatives in May 2010.

Develop a "Culture of Innovation"

The Chicago region has some of the world's best research institutions, human capital, preeminent foundations, and capable industry which should make the region a hotbed of innovation and economic development. While a host of factors are involved, there is some evidence that few businesses, within or outside the region, envision this region as a powerful engine of growth. To become a leader in innovation, our region needs to change attitudes to support the experimentation and creativity necessary to produce commercial innovations. Furthermore, all levels of government should ensure that their regulatory environments are not creating undue barriers to innovation.

Innovation, by its nature, involves risk-taking and, frequently, failure. These are characteristics that many people do not believe are supported by the culture of the Chicago region.

The cultures that are present in highly innovative parts of the country, and in highly innovative industries in the Chicago region, should be explored to see if any lessons can be applied in other, more risk-averse sectors. Many of the region's innovators have been successful despite initial setbacks; these people should be consulted to learn what barriers they faced and how they overcame them, and their stories should be publicized to help educate the region about the value of experimentation and resiliency following initial setbacks.

There are several existing programs at all educational levels that promote innovative thinking, provided by both civic and academic organizations. Educational programs and competitions that encourage innovation among students should be expanded upon and linked to foster greater dissemination of knowledge and expose more thinkers to each other. Students must learn that often mistakes are valuable learning experiences; the increasingly popular business motto of "Fail Fast and Learn" emphasizes this mentality. Existing innovation competitions, such as the Chicago Innovation Awards, should be continued and expanded to encourage budding entrepreneurs to experiment and provide them with practical experience in how to present their ideas and innovations to external audiences.

There may be a large role for the philanthropic community to play in creating a better culture for innovation. The region's foundations are a strong asset and to date have funded extensive efforts in education, arts and culture, and human services. Focusing more on the regional economy and innovation makes sense on many levels for foundations, as these are truly the catalytic investments which can help the region sustain a high level of prosperity and vitality. Foundations might start their entrée into innovation through an initial group of forums which showcase the region's innovative success stories and create linkages among divergent groups involved in the various fields. Foundations can also strive to support those groups working to organize regional initiatives and policy around a "cluster approach."

Lastly, government can play a role in ensuring that outdated regulations do not create barriers to innovation. Regulations and development ordinances tend to be oriented toward the technological standards in existence when they were promulgated or amended, and there are few avenues for regulations and ordinances to be updated as technology advances. For example, many municipal ordinances regulating the construction and placement of household green energy improvements such as solar panels, small-scale windmills, and energy efficiency retrofitting are based upon 1970s era technologies. This limits what can be developed and deployed and opportunities to harness renewable energy may be precluded because past technologies used for this purpose created problems for their neighbors. By modernizing the technical standards in development regulations, opportunities for local businesses to innovate and capitalize on green energy demands will be created, making local businesses stronger and the region greener.

6.5 Implementation Action Areas

The following tables are a guide to specific actions that need to be taken to implement GO TO 2040. The plan focuses on four implementation areas for supporting economic innovation:

Improve Data and Information Systems

Nurture the Region's Industry Clusters

Increase the Commercialization of Research, Target Investment Decisions, and Pursue New Financing Opportunities

Create a Culture of Innovation

Implementation Action Area #1: Improve Data and Information Systems

Evaluate the success of state innovation programs and financial incentives LEAD IMPLEMENTERS: State (DCEO, and other relevant state agencies)	The history and impacts of state programs and incentives for innovation should be evaluated. Such an evaluation can inform the re-creation of certain programs, like ITEC and Innovation Challenge grants, which have experienced funding cuts in recent years. The state should also evaluate current programs, like IEN as well as the range of other financial incentives and services offered to entrepreneurs and businesses. There is good evidence that many of these state programs have been quite successful — these successes need to be better documented and publicized to inform future state legislation.
Collect data relative to innovative business starts and closures in the region LEAD IMPLEMENTERS: CMAP, WBC, InnovateNow, IDES	Currently there is no solid information about how innovations translate into larger economic effects, such as jobs and business starts. CMAP should measure the number of new innovation start-up firms and jobs created (a similar measurement was developed by San Diego's CONNECT program). This is the best way to track the growth in new firms, as well as their longevity. This information should also have useful research consequences beyond the study of innovation.
Collect and analyze other pertinent data related to innovation outcomes LEAD IMPLEMENTERS: CMAP, WBC, InnovateNow, CMRC, IDES, additional outside experts	CMAP can serve a vital role as a central repository for the collection of data related to innovation. CMAP should also consider how to best measure success through this data — other groups have created weighted measures of a variety of variables — an "innovation index" — which can work to measure future success.
Research and redesign technology transfer evaluation criteria LEAD IMPLEMENTERS: State (DCEO), technology transfer programs at universities and other institutions	There is some evidence that innovators are changing their products to be responsive to the criteria by which technology transfer programs are judged. This is likely inefficient. Alternative metrics that better reward commercialization of new innovations should be explored. Applied research should be carried out by interviewing tech transfer officials and researching other evaluation metrics.

Implementation Action Area #2: Nurture the Region's Industry Clusters

Form coalitions around the region's vital industry clusters to organize regional strategies and obtain public and/or private funding LEAD IMPLEMENTERS: State (DCEO), CMAP, local governments, nonprofits (Chicagoland Chamber, CMC, MEGA, WBC), Chicago Fed, workforce boards, philanthropic, private sector	The region should use its various clusters of regional specialization as an overarching organizing framework for future coordination, collaboration, and proactive initiatives, including organizing around potential funding opportunities such as the reauthorization of America COMPETES, which should include funding for a Regional Innovation Clusters Initiative. Build public/private coalitions to attract funding and involve research labs and universities as appropriate. The Clean Energy Trust, hosted by the Chicagoland Chamber, is a recent initiative that may be a model for such future activity.
Perform a "drill down" analysis into specific established industry clusters, including freight/logistics, advanced manufacturing, and biotech/biomed, as well as emerging clusters such as green technology and energy LEAD IMPLEMENTERS: CMAP, Chicago Fed, regional leaders or coalitions around industry clusters	Industry clusters have been researched extensively, but many gaps, practical linkages and pertinent policy responses remain poorly understood. CMAP should direct research toward "drilling down" into specific industry clusters and groups of interrelated firms in the fields of freight/logistics, energy and advanced manufacturing, and biotech/biomed, for starters. Analyses will present data specific to these clusters, identify infrastructure, workforce and financing needs, present strategies for coordination and communication, and make policy recommendations.

Implementation Action Area #3: Increase the Commercialization of Research, Target Investment Decisions, and Pursue New Financing Opportunities

Bolster or reinstitute successful state programs which assist entrepreneurs and create linkages between researchers and the private sector LEAD IMPLEMENTERS: State (General Assembly, DCEO)	State elected officials should bolster or reinstitute state programs with a track record of success in assisting entrepreneurs with critical business startup and marketing needs, locating pre-seed and early stage financing, furthering technical or managerial skills, and assisting with new product development and marketing. IEN is one current program along these lines. In addition, the ITEC programs previously awarded funding that could be used to put together documentation for venture capital or "angel" investors, apply for federal SBIR money, apply for a patent, or put together a business plan. ITEC is currently unfunded by the state.
Re-institute the Illinois Innovation Challenge Matching Grant program LEAD IMPLEMENTERS: State (General Assembly, DCEO)	Some version of the Innovation Challenge Matching Grant program should be reinstated to provide matching funding for federal SBIR and STTR recipients. SBIR and STTR are federal programs funding small businesses working with universities.
Explore the creation of a major new venture capital fund, at the regional or mega-regional level LEAD IMPLEMENTERS: State (Governor's office, DCEO), the business community, the Federal Reserve Bank of Chicago, nonprofits, I2A fund, philanthropic	A new venture capital fund should be created to help investors and entrepreneurs create and grow profitable businesses in the metropolitan Chicago region and potentially beyond. The fund should be managed and operated by a private firm, but exploration should be done first by government, civic organizations, foundations, and the private sector. The fund should be targeted toward clusters of regional specialization. A range of private and public revenue sources should contribute to such a fund, and philanthropic organizations can play a large role.
Create a more robust national innovation policy LEAD IMPLEMENTERS: Federal (Congress)	Provide more incentives for public/private collaboration around innovation. Provide federal funds that can be leveraged with private resources. Provide competitive funding for regional approaches around specific industry clusters. Many of these types of approaches are being discussed as part of the upcoming reauthorization of America COMPETES, a federal technology, research and education act.

Implementation Action Area #4: Create a Culture of Innovation

Research, compile, and publicize examples of successful innovation LEAD IMPLEMENTERS: State (DCEO), nonprofits (Chicagoland Chamber, CMC, MEGA, WBC) philanthropic, private sector, universities	Innovation success stories should be collected and publicized. Commonalities of these experiences should be emphasized, and the role of experimentation and perseverance must be taught so that workers, entrepreneurs, and sources of funding see experimentation as an important stepping stone to innovation and growth.
Expand and link innovation related training LEAD IMPLEMENTERS: Nonprofit (Chicagoland Chamber, MEGA, WBC), universities	There are multiple conferences and educational programs that support innovative thinking in the region. These programs should be expanded to reach wider audiences. Educational programs, conferences, and innovation competitions should also be linked so that budding innovators can interact across fields and disciplines to share experiences and foster further innovative thinking.
Reorient philanthropic giving toward innovation LEAD IMPLEMENTERS: Philanthropic	The region's foundations are a strong asset and to date have funded extensive efforts in education, arts and culture, and human services. Focusing more on the regional economy and innovation makes sense on many levels for foundations, as these are truly the catalytic investments which can help the region sustain a high level of prosperity and vitality. Foundations can work to support those groups working to organize regional initiatives and policy around a "cluster approach."
Identify opportunities for state and local regulatory reform and modernize local ordinances LEAD IMPLEMENTERS: State (DCEO), municipalities, nonprofits (Chicagoland Chamber, MEGA, WBC), the business community	Review and implement reforms in existing state and local regulations, especially in areas of rapidly changing technology and changes in federal regulation. Convene innovative companies to learn about potentially limiting local regulations or ordinances. Provide model ordinances that contain language about up-to-date regulation and how to keep it updated. Review validation, information sharing, and technical assistance programs for new technology development and implementation. Recommend updates as appropriate.

6.6 Costs and Financing

The costs of the innovation recommendations to the public sector should be modest. The recommendations in this section were designed to minimize costs and to make the best possible use of existing, available resources.

Any gains made, such as businesses remaining in business through the recession, or even expanding, will be substantial, especially in comparison with the modest costs of the programs. The small-scale training and funding programs recommended are the most easily identifiable costs. When the recommended programs (ITEC and the Illinois Competitive Matching Grant) were in place in the past, they were funded at a combined level of $3 million per year, for the entire state. Other initiatives and incentives can be specifically retargeted.

Other efforts, such as the proposed venture capital fund, would require significant financing. A recent report estimated that a new Great Lakes region venture capital fund would likely require in the range of $1 billion to $2 billion in financing.[16] A regional effort could be much smaller than this, though financing needs would still be significant. Public and private sources, as well as philanthropic giving, would likely play a role.

16 Frank E. Samuel Jr., "Turning Up the Heat: How Venture Capital Can Help Fuel the Economic Transformation of the Great Lakes Region," Brookings Institution, January 2010.