REPORT CARD FOR ILLINOIS INFRASTRUCTURE

2018

Illinois Section of the American Society of Civil Engineers

INFRASTRUCTUREREPORTCARD.ORG/ILLINOIS

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

EXECUTIVE SUMMARY

Infrastructure is the backbone of our daily lives and communities. While we don't always acknowledge it, the condition of our infrastructure has a very real impact on every person and business. We all depend on roads and bridges to get us where we are going, water infrastructure that delivers clean water to our taps, and a system of inland waterways, ports, rail, roads and transit to move goods and people that fuels our economy.

Illinois has a unique competitive economic advantage being at the crossroads of the country's rail, air, roadway and waterway systems. Historically, large investments were made in our infrastructure to capitalize on these advantages, which created and promoted growth and advantages for Illinois' economy and citizens. In recent years however, there has been a trend of underinvestment that threatens our competitive advantage and the health, safety and welfare of our citizens. In 2010, a panel of Professional Civil Engineers and American Society of Civil Engineers (ASCE) members throughout the State graded our infrastructure as a D+. In 2014, that grade increased slightly to a C- due to investments from the Illinois Jobs Now program, Illinois Tollway and City of Chicago. However, over the last four years, our State's infrastructure has been on a starvation diet, plagued by years of budget impasses, unpaid bills, pension crises, and a lack of focus from our elected officials on the very infrastructure that built this great State.

This past year, an expert team of more than 30 civil engineers was assembled to evaluate and study the major components of our infrastructure. In 2018, the grade has remained as a C-. The conclusion is not a surprise but more an alarm that over the course of the last four years, our investment and prioritization of infrastructure has faltered, and the systems' condition are starting to decline because of it. Those responsible for the day-to-day design and maintenance of our infrastructure systems are struggling to effectively maintain the foundation of our modern society with inadequate funding in the face of increased usage, aging systems, and rapidly changing lifestyles and economies. As a result, many of our infrastructure systems are struggling to stay in adequate condition. As these systems continue to surpass their intended lifespans, Illinois residents and policymakers must decide if we collectively value the personal and economic advantages that come from a robust infrastructure network, and if we do, to make it a priority moving forward.

The Report Card was created to help Illinois understand the state of our infrastructure. As civil engineers, our job is to plan, design, construct, and maintain our infrastructure networks and this document allows us the opportunity to share that information with the public. The Report Card provides a snapshot for residents and policymakers to engage in conversation about where we are and where we want to be. We hope that this information provides the insight needed to start that conversation and ignite action.

ABOUT THE INFRASTRUCTURE REPORT CARD

GRADING CRITERIA

The Illinois 2018 Report Card Committee is a group of dedicated civil engineers from Illinois, who volunteer their time to collect and analyze data, prepare, review, and revise each section, and develop the final Report Card. The committee worked with the ASCE's Committee on America's Infrastructure and ASCE Infrastructure Initiative staff to provide Illinois with a snapshot of the state of our infrastructure, as it relates to us at home, and on a national basis.

The Report Card Sections are analyzed based on the following eight criteria:

CAPACITY Does the infrastructure's capacity meet current and future demands?

CONDITION What is the infrastructure's existing and near-future physical condition?

FUNDING What is the current level of funding from all levels of government for the infrastructure category as compared to the estimated funding need?

FUTURE NEED What is the cost to improve the infrastructure? Will future funding prospects address the need?

OPERATION AND MAINTENANCE What is the owners' ability to operate and maintain the infrastructure properly? Is the infrastructure in compliance with government regulations?

PUBLIC SAFETY To what extent is the public's safety jeopardized by the condition of the infrastructure and what could be the consequences of failure?

RESILIENCE What is the infrastructure system's capability to prevent or protect against significant multi-hazard threats and incidents? How able is it to quickly recover and reconstitute critical services with minimum consequences for public safety and health, the economy, and national security?

INNOVATION What new and innovative techniques, materials, technologies, and delivery methods are being implemented to improve the infrastructure?

SOLUTIONS TO RAISE THE GRADE

If Illinois is ready to improve our infrastructure, we offer the following suggestions to start raising the grade.

PRIORITIZE INFRASTRUCTURE

Illinois must make infrastructure a priority again. After the last four years of pension crises, unpaid bills and budget stalemates, infrastructure has fallen off the radar of our policymakers - and our citizens are paying the price.

SUSTAINABLE FUNDING

Our leaders must consistently pass balanced budgets and develop new revenue sources that provide adequate long-term sustainable funding for infrastructure. Existing programs such as CREATE for passenger and freight rail, Public-Private Partnerships for roadways and bridges, and TFIA for transit must be fully utilized and leveraged.

PASS A CAPITAL PLAN

The State needs to pass a Capital Plan to ensure we have a roadmap for the future. The previous Illinois Jobs Now program was passed in 2009 and has run its course. While a Capital Plan does not solve the need for sustainable long-term funding, it does provide desperately needed resources for the State's infrastructure after several years of budget stalemates and reduced funding.

CAPITALIZE ON ADVANTAGES

We must capitalize on our location at the crossroads of the nation. Our existing network of railways, roadways, inland waterways, and location next to the Great Lakes gives our State a competitive economic advantage. However, without investment in these infrastructure systems, that advantage will be squandered.

FORWARD THINKING

The backbone of our state's infrastructure was built 50 to 100 years ago and upgrades are necessary for modernization, resiliency and to accommodate its changing users. We need to consider emerging technologies and shifting social and economic trends as we design our future infrastructure with clear economic, social, and environmental benefits in mind.

GRADING SCALE

A EXCEPTIONAL: FIT FOR THE FUTURE

The infrastructure in the system or network is generally in excellent condition, typically new or recently rehabilitated, and meets capacity needs for the future. A few elements show signs of general deterioration that require attention. Facilities meet modern standards for functionality and resilient to withstand most disasters and severe weather events.

B GOOD: ADEQUATE FOR NOW

The infrastructure in the system or network is in good to excellent condition; some elements show signs of general deterioration that require attention. A few elements exhibit significant deficiencies. Safe and reliable with minimal capacity issues and minimal risk.

C MEDIOCRE: REQUIRES ATTENTION

The infrastructure in the system or network is in fair to good condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies in conditions and functionality, with increasing vulnerability to risk.

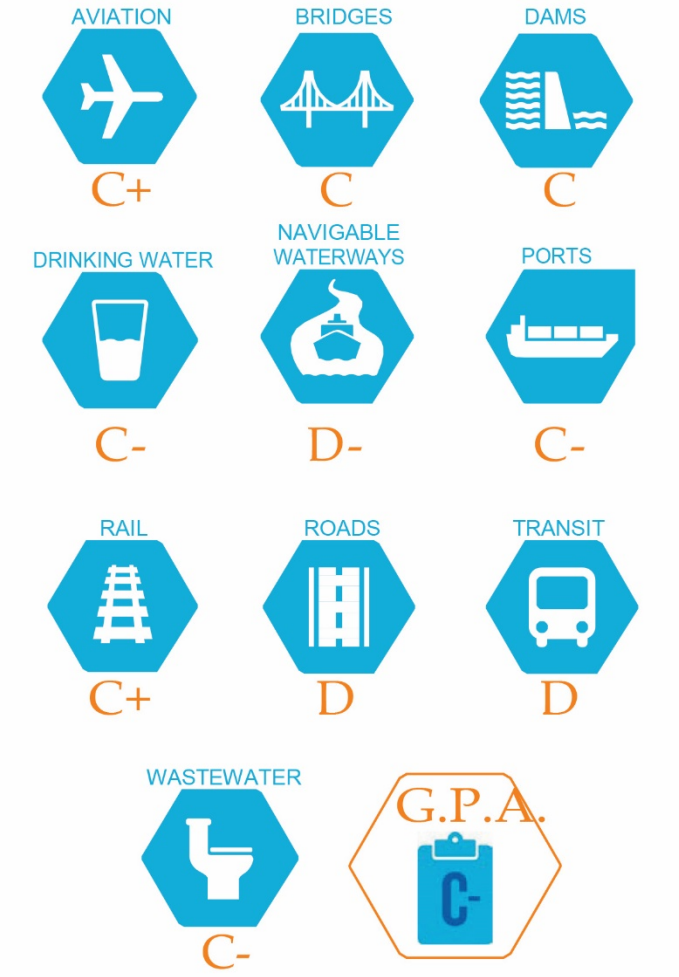
D POOR: AT RISK

The infrastructure is in poor to fair condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration. Condition and capacity are of significant concern with strong risk of failure.

F FAILING/CRITICAL: UNFIT FOR PURPOSE

The infrastructure in the system is in unacceptable condition with widespread advanced signs of deterioration. Many of the components of the system exhibit signs of imminent failure.

ILLINOIS GRADE SUMMARY



AVIATION

EXECUTIVE SUMMARY

Illinois is home to the nation's second and twenty-fourth busiest airports in the nation, collectively accommodating more than 48.5 million enplaned passengers and 5.2 million tons of cargo annually. Located in the crossroads of the country, Illinois airports play a critical role in linking pilots, passengers, and cargo to airports, roadways, railways, and shipping routes and in linking communities within and beyond the state. Serving approximately six million enplaning international passengers, Illinois is home to the seventh busiest international airport in the nation. Illinois ranked fifth in the nation based on the value of air freight flows in the state. Aviation is critical to Illinois' economy and its connection to the global community. In terms of the total impact of general aviation on the economy, Illinois is in the top ten states in the nation based on Gross Domestic Product (GDP).

To meet increased demand, Illinois has continued to invest in airport infrastructure, including airfield, terminal, ground access, and cargo facilities, supported by Illinois Department of Transportation (IDOT) and Federal Aviation Administration (FAA) funding. Despite the aviation infrastructure improvements in Illinois, based on the national airport infrastructure needs increasing 32% since 2015, projected Illinois funding need of over $5 billion over the next five years, and minimal growth in projected funding over that same time, Illinois is assigned a grade of C+, maintaining the same grade as was assigned in the 2014 Illinois Infrastructure Report Card.

BACKGROUND

Illinois has a total of 115 public use airports (77 are publicly owned and eligible to receive public funding; 38 are privately owned and not eligible for public funds. 87 of the airports in Illinois are included among the 3,340 airports that comprise the National Plan of Integrated Airport Systems (NPIAS), determined to be significant to national air transportation.

Commercial service is provided at 12 of the airports in the state, linking Illinois both nationally and internationally. Two of these, O'Hare and Midway, are classified as large hubs by the FAA. Passengers and cargo reach over 280 non-stop destinations outside the state from commercial service airports in Illinois. In addition, nine airports are designated relievers providing congestion relief at commercial service airports and improved general aviation access to the overall community. Commercial service airports in Illinois include:

- O'Hare International Airport; Chicago (ORD, 75.3% of Illinois total)
- Midway International Airport; Chicago (MDW, 22.2%)
- Rockford International Airport; Rockford (RFD, 0.2%))
- MidAmerica St. Louis Airport; Belleville (BLV, 0.2%)
- Central Illinois Regional Airport; Bloomington/Normal (BMI, 0.4%)
- University of Illinois Willard Airport; Champaign/Urbana (CMI, 0.2%)
- Quad City International Airport; Moline (MLI, 0.7%)
- Williamson County Regional Airport; Marion (MWA, 0.02%)
- General Wayne A. Downing Peoria International Airport; Peoria (PIA, 0.6%)
- Abraham Lincoln Capital Airport; Springfield (SPI, 0.2%)
- Quincy Regional Airport – Baldwin Field; Quincy (UIN, 0.02%)
- Decatur Airport; Decatur (DEC, 0.02%)

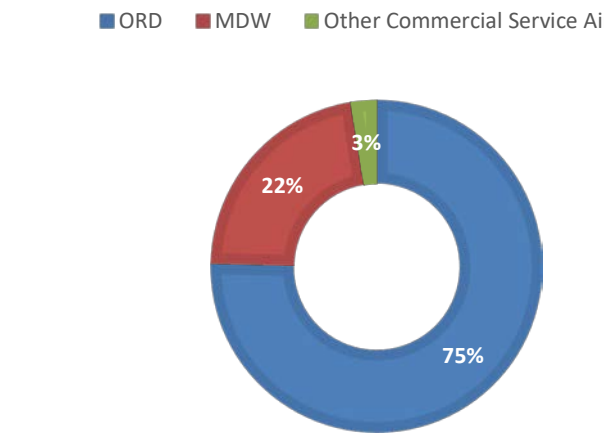


Figure 1. Illinois Public Airports

Aviation in Illinois extends beyond commercial passenger activity with nearly 100 general aviation airports in the state, three Air National Guard bases including a joint-use airport (MidAmerica Airport/Scott Air Force Base), significant all-cargo aircraft activity, and multiple university-level aviation programs.

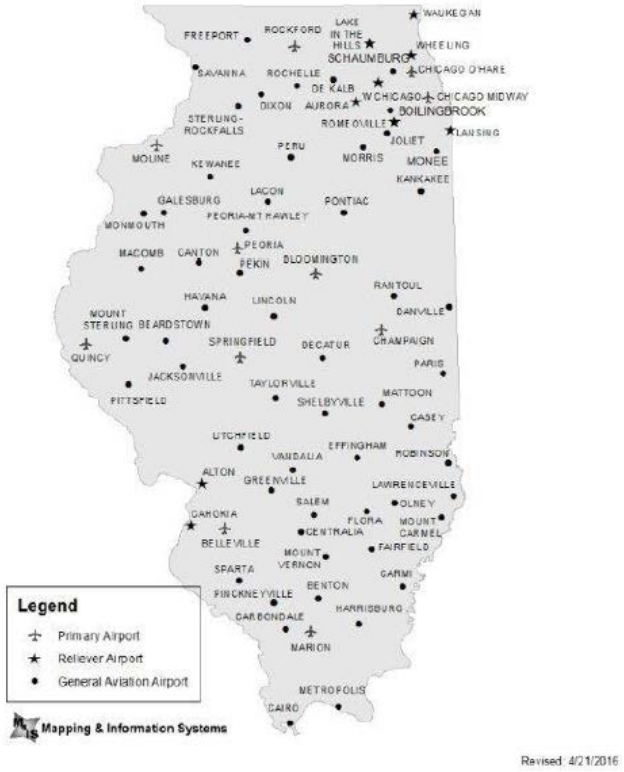


Figure 2. Illinois Public Airports

CAPACITY

Airports in Illinois are forecast to experience continued growth in passenger activity, aircraft operations and cargo volumes. According to the FAA's *2016-2045 Terminal Area Forecast* (TAF), enplaned passengers at Illinois airports will increase by nearly 70% between 2015 and 2045, an annual growth rate of 1.8%. Over this same period, there is projected to be an 18% growth in aircraft operations and a 29% growth in based aircraft (an indicator of general

aviation growth.) The less robust growth in aircraft operations relative to enplaned passengers reflects an evolution in commercial aircraft fleets to newer and more fuel-efficient aircraft with larger average seating capacities and in general aviation fleets toward an increasing business jet component.

Much of the aviation activity in Illinois is concentrated at its two large hub airports, Chicago O'Hare and Midway International Airports. According to the *2016-2045 TAF*, enplaned passengers at large hub airports, which include both Chicago O'Hare and Midway International Airports, are predicted to grow at an annual rate of 2% through 2045, reaching over 1 billion passengers by 2045. This translates into more than an 80% increase in large hub airport enplaned passengers over 2015 levels. Large hub aircraft operations are forecast to approach 20 million over this same period, an increase of over 55%. The O'Hare Modernization Program currently under construction is positioning this airport to safely and efficiently accommodate growth over a portion of this 30-year horizon; however, the ability of Midway International Airport to accommodate increasing demand over these decades is constrained by surrounding development and transportation infrastructure.

Based on the *2016-2045 TAF* the five busiest commercial service airports in Illinois are forecast to collectively reach over 80 million enplaned passengers by 2045, according the *2016-2045 TAF*, an overall increase of 70% and an annual increase of 1.8% over this period. Similarly, total aircraft operations at these top five Illinois airports will exceed 1.6 million by 2045, an overall increase of more than 31% and an annual increase of 0.9%.

Aviation capacity in Illinois has grown in recent years with the continued implementation of the O'Hare Modernization Program, which includes airfield, terminal, and landside/access capacity increases, dominating capacity gains in the state. However, there have been incremental capacity increases at other airports including an expansion of terminal and cargo capacity at Rockford International Airport, expansion of landside facilities at MidAmerica Airport, expansion of terminal capacity at General Wayne A. Downing Peoria International Airport, and multiple other capacity-related improvements.

The FAA predicts growth at both Chicago O'Hare and Midway International Airports to be robust with combined enplaned passengers and operations at these two airports to increase by over 70%(1.8% annually) and 34% (1% annually), respectively, by 2045. While O'Hare International Airport had the most operations in the nation in 2015, it is forecast to slip to third nationally by 2045.

While passengers and commercial flights dominate activity in the state, the FAA's National Aerospace Forecast projects national cargo to grow at more than 3% annually between 2017 and 2037 (measured as revenue ton miles), highlighting the critical role that Chicago Rockford International Airport and other airports fill in the state's aviation infrastructure.

CONDITION

A key factor in condition is runway pavement quality. In 2012, IDOT completed an inventory of airport infrastructure in the state, including airport pavement information. The state had catalogued approximately 7.6 million square yards of runway pavement (excluding Chicago Midway and O'Hare International Airports because these airports maintain independent pavement management systems used to define pavement infrastructure needs). Of those catalogued pavements, 6.8 million square yards, or over 88%, were classified as "good" with PCI values exceeding 70. However, at that time approximately 4% of the pavements rated poorly, having reached a stage where complete replacement may be the only cost-effective measure for rehabilitation.

While investments in Illinois airport pavement rehabilitation have been made in the last several years, with the potential to increase the amount of "good" pavement, during this same period there has been increasing aviation activity including operations by larger and heavier aircraft to meet aviation demand. Consequently, some Illinois airport pavements have the potential for a reduced PCI if a more recent inventory were available.

The state annually collects runway pavement condition data as a key indicator to demonstrate the progress toward achieving the identified outcomes for the AIP. The desired benchmark is for 80% of Illinois runway pavement to be in good or better condition. In FY 2016 the rating was 74%; FY 2017 was 63%; and the estimated FY 2018 is 70%.

Aging infrastructure will continue to present challenges to airports in Illinois given that most have been in operation for many years. While the infrastructure has been maintained overall, replacement, rehabilitation, and/or upgrading will be necessary as these facilities reach the end of their useful economic life.

FUNDING/FUTURE NEED

While projects yielding capacity gains have been both realized and planned for the near future, the 87 Illinois airports in the NPIAS have documented development needs of more than $1.8 billion during the 2017-2021 timeframe. Over $800 million of this need is at general aviation and reliever airports that typically have more limited funding sources.

The primary source of funding for NPIAS airports is the federal Airport and Airway Trust Fund (AATF), administered through the Airport Improvement Program (AIP). The AATF generates funds from various taxes and user fees collected from different segments of the aviation industry (passengers, cargo, and aviation fuel). Illinois is one of 10 states that participate in the State Block Grant Program (SBGP) and assumes responsibility for administering the federal AIP grants at non-primary commercial service (enplaning fewer than 10,000 passengers annually), reliever, and general aviation airports. Inclusion in the SBGP does not translate to additional federal funding for Illinois, but bases funding on project priorities and allows Illinois more control over which projects will be funded at the reliever and general aviation (non-primary) airports.

Federal funding comes from the federal AATF; state funds are provided from Transportation Series B Aeronautics Bonds and Road Funds. Typically, projects are funded using 90% federal funds, 5% state funds, and 5% local funds, with the exception of Chicago O'Hare and Midway International Airports, which are funded using 75% federal and 25% local funds.

According to FAA data, the stream of trust fund revenues has been relatively stable over the past several years. However, the Congressional Research Service states that there is concern regarding the long-term vitality of the AATF because it is heavily reliant on airline ticket sales and therefore is affected directly by air travel demand. Changes in air carrier operating and business models, and the recent trend of airlines imposing add-on service fees, has adversely affected the AATF, which only levies taxes on the base ticket price. In 2015 air carries generated over $3.8 billion in baggage fees alone which translates into more than $285 million that the AATF could have received.

IDOT maintains a Multi-Year Transit/Rail/Airport Improvement Program, which includes a 3-year Proposed Airport Improvement Program (FY2016-FY2018). For FY 16 to FY 18 nearly 225 projects have been identified by the State AIP at a total cost of $438 million, of which $360 million (82%) will be covered by federal funds, $8 million (2%) by state funds, and $70 million (16%) by local funds.

The State-Local Airport Improvement Program (SLAP) is a state funded program that targets general aviation airport projects that would not be optimal candidates for federal funds or projects that are not federally eligible. The SLAP program awarded $15 million in FY 2013 to FY 2014. In FY 2017, the program consisted of $11.6 million in projects with 9 general aviation airport projects ($5.6 million) and 10 primary and reliever airport projects ($5.9 million). The program requires a 90/10 cost share between the state and project sponsor.

The other component to funding airport improvement projects is the Passenger Facility Charge (PFC), which is currently capped at $4.50 per passenger flight segment. All 12 of the commercial service airports in Illinois rely on PFC funding with 11 of these airports currently collecting the maximum allowable amount.

According to the Airports Council International – North America and the organization's March 2017 *Infrastructure Needs Study*, U.S. airports have identified nearly $100 billion in infrastructure needs during the 2017 - 2021 timeframe

to accommodate growth, maintain existing infrastructure, and support aircraft innovation. Over the five-year window, this equates to about $20 billion in annual infrastructure needs, which current funding sources do not meet. For Illinois specifically, the estimated infrastructure need, including non-federal funding eligible projects, is $5 billion for 2017 to 2021, or $1.25 billion per year. This is significantly greater than the $1.8 billion identified for Illinois in the NPIAS for the same period, suggesting that the true aviation infrastructure investment need is notably greater than that identified by the FAA through the NPIAS.

PUBLIC SAFETY AND RESILIENCE

IDOT has embraced principles of sustainability, recognizing that it is critical to economic development, protection of the environment, resiliency, and the state's social strength and stability. The 2012 Illinois Long Range State Transportation Plan included a section on sustainable practices. The eight categories of sustainable practices included Planning, Design, Environmental, Water Quality, Transportation, Lighting, Materials, and Innovation. These sustainable practices are expected to be addressed throughout IDOT, including the Division of Aeronautics. The City of Chicago has made sustainability a driving force in the implementation of the O'Hare Modernization Program, culminating in the development of the *Sustainable Airport Manual (SAM)*, which is used by airports outside of Illinois as they seek to incorporate sustainability initiatives in the development and operation of aviation facilities.

Airports and aircraft throughout Illinois might be used in response to a disaster for transportation of critical supplies and water, equipment, emergency personnel, and to support aerial evacuations.

INNOVATION

Airports in Illinois have initiated innovative projects that seek to expand how the needs of aviation are met in the state. Examples of innovation include a solar farm and a planned micro-grid at Rockford International Airport (which will increase resiliency by allowing continued operation of critical facilities in the event of an outage of the main electrical grid), and a microgrid at the FAA's Chicago Air Route Traffic Control Center in Aurora.

RECOMMENDATIONS TO RAISE THE GRADE

The ASCE Illinois Section offers the following recommendations, including actions at the state and federal levels.

- Pass a state capital bill that is beneficial to the aviation sector in meeting funding needs
- Assure the IDOT programs the necessary match to maximize available federal funds and maintain or grow the SLAP program.
- Prioritize investment in aviation infrastructure projects that enhance safety and that are necessary to meet evolving standards.
- Prioritize investment in capacity enhancements to support state, regional and local economic development and stability.
- Increase the cap on PFCs, index PFCs to inflation, and investigate modifications to the program to maximize its utility in funding aviation infrastructure improvements.
- Extend the federal ticket tax to airline-imposed baggage and fuel surcharges or other program modifications to strengthen the Airport and Airway Trust Fund.
- Facilitate innovative project financing and delivery options to encourage sponsor creativity in undertaking infrastructure improvements and to achieve more efficient project delivery.
- Coordinate efforts to integrate modes of transportation with aviation infrastructure investments, as supported by IDOT's FY 2016-2021 Proposed Transit/Airport/Rail Transportation Improvement Program.
- Enact timely multi-year reauthorization of federal aviation programs to ensure predictability and stability in airport improvement funding.

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BRIDGES

SUMMARY

Illinois has the third largest bridge inventory in the nation. Of these bridges, 8.6% are classified as structurally deficient. There are an average of 9 million trips across the 2,303 structurally deficient bridges in Illinois each day. While the percentage of structurally deficient bridges in Illinois has not increased, the rate of improvement has stalled, falling far below the national improvement rate over the past four years. The Illinois Department of Transportation multi-year program has identified $2.6 billion in bridge maintenance funding, to be spent over the next six years. However, the anticipated investment is insufficient, as Illinois has identified an estimated $10 billion in present-day needed bridge repairs. A targeted investment policy and additional funding is necessary to enhance the State's bridge conditions and further decrease the number of structurally deficient bridges in the State.

CONDITION AND CAPACITY

Illinois has the third largest bridge inventory in the nation with 26,775 bridges. Keeping such a large inventory in good condition with limited funding is a constant challenge. Bridges are inspected every two years and numeric ratings are assigned to various elements of the structure. When one of the main ratings falls below a minimum value, the bridge is classified as structurally deficient. While a “structurally deficient” designation does not imply that a bridge is unsafe, these bridges may require weight restrictions limiting the routes trucks and emergency vehicles may take. These bridges typically require costly repairs to remain in service and will eventually require major rehabilitation or replacement to address the underlying deficiency. Illinois has the fifth highest number of structurally deficient bridges in the nation, in part due to its large bridge inventory.

Illinois drivers are currently crossing one of the state’s 2,303 structurally deficient bridges nine million times each day. Over the past four years, the percentage of Illinois structurally deficient bridges has remained stagnant. The percentage of bridges in the state – 8.6% - is slightly less than the national average of 8.9%. However, the national average has seen a steady decrease of structurally deficient bridges over the past decade, leaving Illinois behind. In fact, over the last year, the Illinois’ structurally deficient percentage rose by two tenths of a percent, whereas the national percentage dropped by the same amount. Figure 1 compares the historical percentage rates for Illinois structurally deficient bridges to the national average.

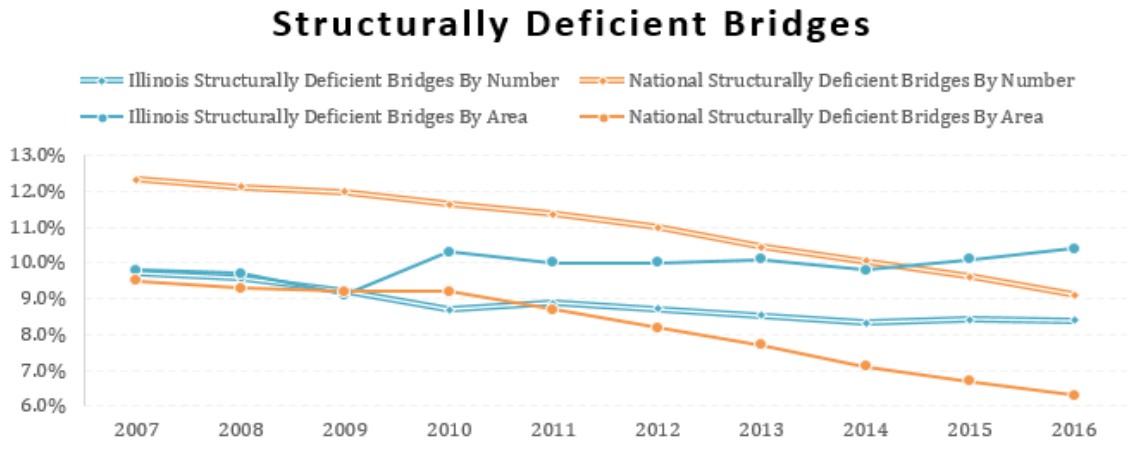


Figure 1. Structurally deficient bridges

FUNDING AND FUTURE NEED

Federal funding for roads and bridges is authorized by Congress and allocated to Illinois by the U.S. Department of Transportation from the Highway Trust Fund. State funds are appropriated to the Illinois Department of Transportation (IDOT) by the Illinois General Assembly and come from the Road Fund, State Construction Fund, Series A Bond Fund and Series D Bond Fund. The revenue for the Road Fund comes from fuel taxes, driver's license fees, and other vehicle registration & title fees. Portions of these revenues also contribute to non-transportation purposes. Local funding and re-appropriations also serve as sources for Illinois transportation funding. Figure 2 shows the breakdown for bridges and roads funding for FY2017.

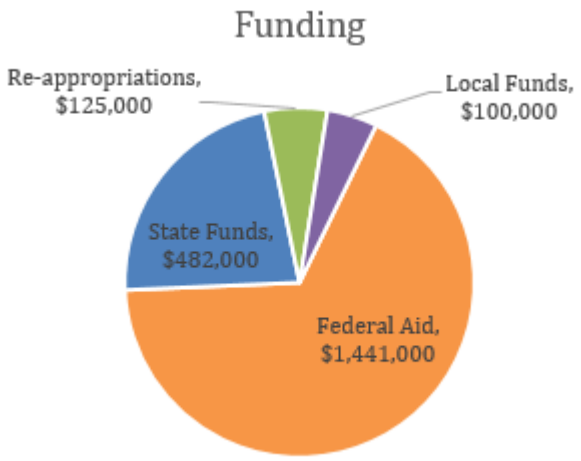


Figure 2. Fiscal Year 2017 Highway Improvement Program Funding for the State of Illinois

A successful infrastructure program must have funds to support both new bridge construction as well as the rehabilitation of existing bridges. Additionally, funds need to be set aside for system expansion and emergency situations. Sufficient funding is essential to ensure accessibility, structural integrity, and safety. With almost a quarter of overall transportation funding being provided by State funds, any decrease in State funding will substantially reduce the overall funding available. Figure 3 shows the downturn in available State funding over the past 2 years.

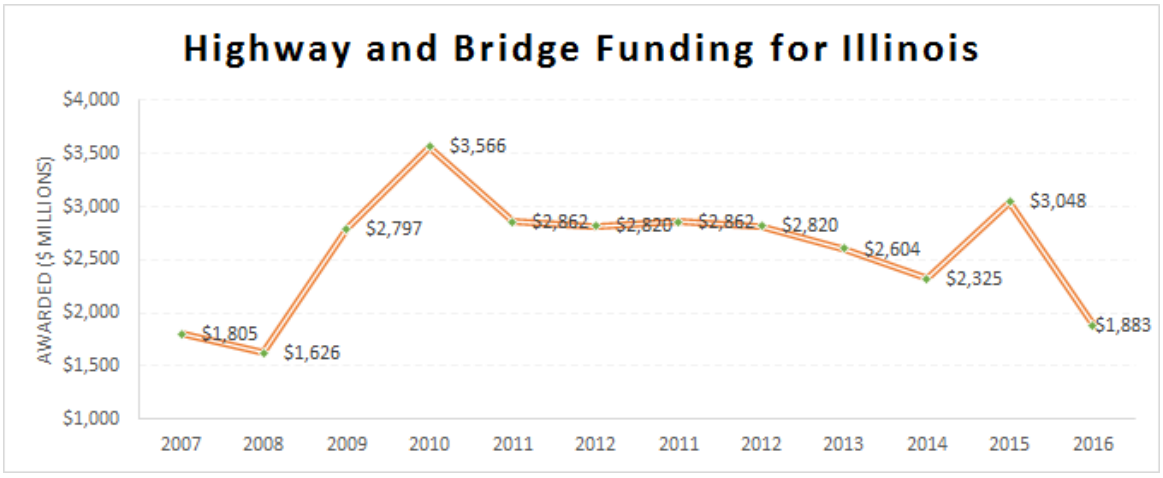
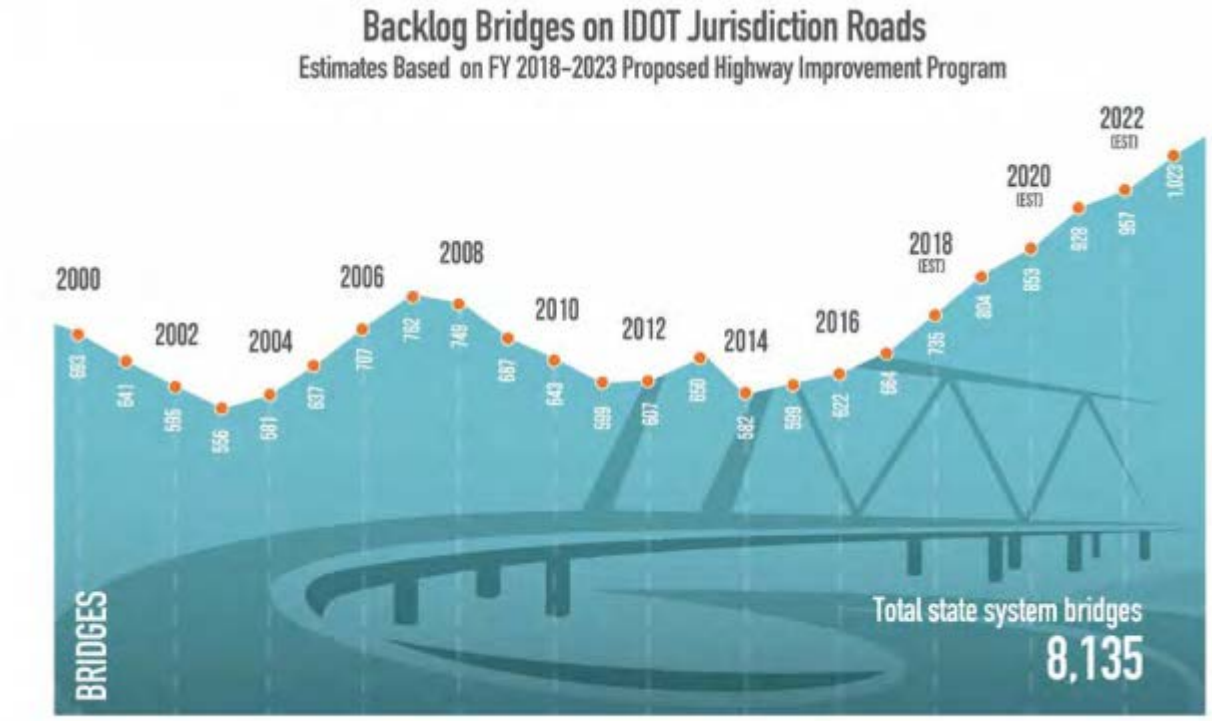


Figure 3. Highway and Bridge Funding for the State of Illinois

The awarded Highway Improvement Program for 2016 provided $1.88 billion overall for highway improvement projects, $1.37 billion for the state system program and $510.7 million for the local system program. In FY2016, 30% of the state system program, or $409.4 million, was used to maintain the 8,135 bridges on the state system (60% of

the state's bridge deck area) and $510.7 million of local projects were awarded to maintain the 18,253 bridges on the local system program (34% of the state's bridge deck area). Although additional bridges are being repaired every year, obligations also continue to lag for construction activities for the state and local bridge programs. IDOT has stated that their goal is to reduce the number of bridges that are structurally deficient to 7%. As shown in the Figure 4, reaching this goal will require additional funding.



Source: Illinois Department of Transportation, 2016.

Figure 4. Backlog of bridges on Illinois State system

The IDOT multi-year program (MYP) is the strategic capital investment plan for the state. The FY 2018-23 MYP identifies a total of $11.65 billion of anticipated investments on state and local highways. Approximately 19% of the anticipated investment, or $2.6 billion over six years, is allocated for bridge maintenance. Funding for the six-year program is made up of $8.863 billion in federal funds; $2.165 billion in state funds and $622 million in local funds.

While the $2.6 billion in bridge maintenance funding identified in the MYP will be helpful, it is insufficient to comprehensively address needed bridge maintenance, rehabilitation, and replacement. Illinois has identified an estimated $10 billion in present-day needed bridge repairs.

OPERATIONS AND MAINTENANCE

Passed in 2015, the Fixing America's Surface Transportation (FAST) Act maintains and builds upon the program structure of the previous Moving Ahead for Progress in the 21st Century (or MAP-21) program from 2012, which required funding re-allocations to the National Highway System (NHS) if the percentage of structurally deficient bridge deck area exceeds 10% for any consecutive three-year period. Although the data is subject to constant fluctuation as bridges are inspected, repaired, or replaced, the latest numbers published by FHWA from 2016 indicate that the percentage in Illinois exceeds the threshold with 11.3% of the total NHS deck area being structurally deficient.

When bridges are inspected, the bridges and their associated elements are classified into good, fair and poor condition categories. Maintenance and repair efforts over the past four years have kept the percentage of bridges in the poor category constant. However, due to a lack of funding to address the maintenance backlog, routine maintenance such as replacing expansion joints and painting structural steel has gone unfunded. This has caused a

steady drop in the percentage of bridges in the good condition category which are falling to the fair category. This delayed maintenance will degrade roads and bridges more rapidly than before.

Although the FAST Act provides $7.5 billion in federal funding for Illinois highways and bridges through FY 2020 (or $1.5 billion per year over five years), the concerns about securing new revenue streams to meet the increasing demands of restoring an aging and deteriorating bridge inventory remain unaddressed. In 2016, Illinois voters confirmed that they too share these concerns when they approved a proposed constitutional "lockbox" amendment to maintain that existing state-generated transportation revenues should be used for transportation investment despite pervasive public perception of budgetary problems across the state where funding could be reallocated. The approval of this amendment insures that transportation funding cannot be diverted to non-transportation uses. While this is a good step, it does not increase revenues for the transportation industry and does not fully prevent current revenues from being reallocated. In 2017, a portion of the Road Fund was reallocated to mass transit projects that were previously funded by the General Revenue Fund. This diversion resulted in further depletion of funding for Illinois bridges and roads. If Illinois wants to pass legislation that will actually improve its transportation infrastructure, it must increase revenues.

INNOVATION AND RESILIENCE

Innovation in both the design and construction of bridges is necessary to improve the safety, economy, durability, constructability and sustainability of our infrastructure. One increasingly popular innovation that has offered impressive results in recent years is Accelerated Bridge Construction (ABC). ABC significantly reduces the construction time for removal, replacement, or repair of existing structures with the use of advanced equipment and design. Particularly in high traffic volume areas, ABC provides impressive returns for projects where the most costly constraints are the maintenance of traffic or the impacts of closure to local commuters and commerce. Recently, IDOT utilized ABC for a new bridge at Illinois 115 over Gar Creek in Kankakee County. This project's slide-in-bridge-construction technique was highlighted by the FHWA's Every Day Count's program.

Other new innovations with benefits to the industry focus on more advanced and resilient materials such as Ultra High-Performance Concrete or UHPC. UHPC utilizes a combination of high strength steel fibers, superplasticizers and smaller more homogenous particle sizes that create concrete mixtures with exceptional strength and impermeability. In addition to prolonging the long-term performance of the bridge, UHPC has made it essential to many ABC applications which require its unique properties to establish durable connections between prefabricated precast bridge elements. The first use of this technology in Illinois was on the Peoria Street over I-290 bridge in Chicago which utilized precast concrete deck panels with UHPC joints, allowing for accelerated bridge deck construction.

PUBLIC SAFETY

In addition to detecting the structural defects and failures that lead to catastrophic losses, bridge inspection and maintenance programs also identify functional deficiencies that can be corrected to improve the day to day traffic safety of the bridge. While safety inspection of the primary load carrying elements of the bridge is of the highest importance, the deterioration of secondary bridge elements can also pose significant risk to traffic safety. Damage or failure of elements such as bearings, joints and approach pavements can cause tire and vehicle damage that could also cause accidents. Furthermore, once the need for a repair is identified, the delay of actually performing the repair due to lack of funds often accelerates the scope and severity of deterioration, which prolongs the length of time required for construction and maintenance of traffic. When repair projects are adequately funded and expedited, the time that construction crews and the travelling public are in conflict within construction zones is reduced as is the risk of injury to both.

CONCLUSIONS

Approximately 8.6% of the bridges in Illinois are structurally deficient. The existing funding sources for bridge repair and reconstruction are unable to keep up with the demand of maintaining and improving the conditions of the bridge inventory. At the current rates of increasing deterioration and stagnated investment, it is estimated that the percentage of structurally deficient bridges in the state will rise to 13% by FY 2023.

RECOMMENDATIONS TO RAISE THE GRADE

Since bridges are decaying at a pace outpacing rehabilitation efforts, American Society of Civil Engineers (ASCE) Illinois Section recommendations to improve the grade of bridges in the State of Illinois are as follows:

- Develop a dedicated, reliable funding stream to pay for bridge investments and reduce the number of structurally deficient bridges. This funding stream could come from increased user fees, an increase the motor fuel tax or other mechanism
- Use alternate project delivery methods such as Design-Build in lieu of Design-Bid-Build to achieve cost savings to expedite construction. This could reduce the number of structurally deficient bridges for large scale infrastructure projects at a quicker pace at a reduced cost to the State.
- Adopt new technologies to extend the life and performance of bridge components, (i.e. post-tensioning and use of stainless steel where benefits could be realized) which would increase the lifespan of bridges currently being constructed, allowing the focus to be on older structures.
- Develop and implement a bridge rehabilitation prioritization program such as a bridge health index. This index would allow the State to more effectively program maintenance and rehabilitation projects making the funding dollars go further in improving the overall condition of the system.

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DAMS

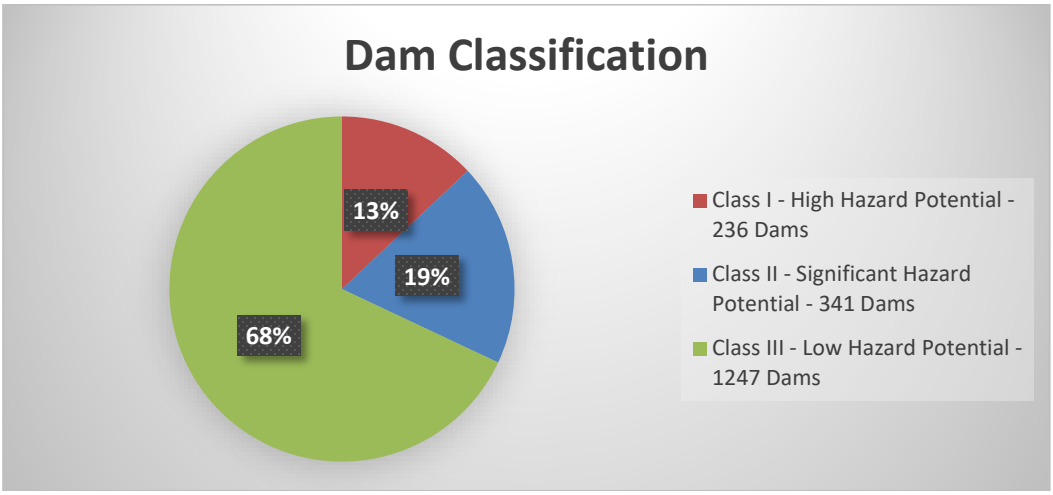
EXECUTIVE SUMMARY

Illinois' dams have multiple potential functions, carry differing levels of risk, and are owned and operated by both the public and private sectors. Over 50% of the dams in the state are over 50 years old, and within four years, nearly 80% of Illinois dams will be over 50 years old. Many infrastructure components are nearing their design life and are expected to require significant maintenance in the near future. Publicly-owned dams are generally in satisfactory condition, but nearly 75% of the state's dams are privately-owned dams and have limited access to public funding mechanisms for major repairs. Additionally, the Illinois Department of Natural Resources (IDNR) dam safety program is suffering from a lack of funding and a reduction of staff, adversely impacting a state succession strategy.

INTRODUCTION

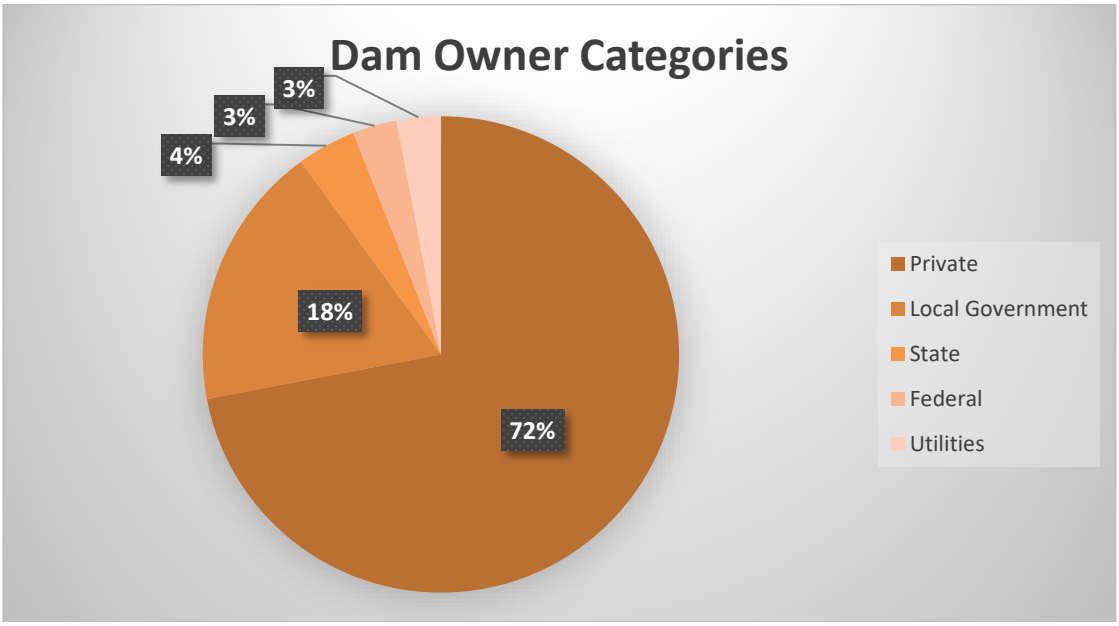
The IDNR Office of Water Resources (OWR) oversees the state's dam safety program primarily through permitting and inspection of dams. In Illinois, dams are categorized and regulated according to their hazard classification: High Hazard (Class I) Potential; Significant Hazard (Class II) Potential; and Low Hazard (Class III) Potential. Class I dams are located where failure has a high probability for causing loss of life or substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed. Class II dams are located where failure has a moderate probability for causing loss of life or may cause substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed. Class III dams are located where failure has low probability for causing loss of life, where there are no permanent structures for human habitation, or minimal economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed.

There are currently 1,824 dams in the IDNR regulatory database: 236 (13%) Class I dams, 341 (19%) Class II dams, and (68%) 1,247 Class III dams. Many of the Class III dams are non-jurisdictional due to limits on size and impounding capacity. There are also additional dams in Illinois which are not in the IDNR database. The IDNR dam safety regulatory program requires dam owners to obtain a permit for the construction/modification, operation and maintenance of jurisdictional dams. Approximately 800 of the dams in the IDNR database are permitted by the IDNR. Approximately 80% of the Class I dams are permitted, approximately 50% of the Class II dams are permitted, and approximately 25% of the Class III dams are permitted.



CONDITION

The U.S. Army Corps of Engineers (USACE) National Inventory of Dams (NID) currently includes 1,607 dams located in Illinois.



Over 84% of dams in Illinois are constructed of earth. Other types of dams listed in the NID include gravity, arch, concrete, and rockfill, amongst others. Individually, the types of dams other than those constructed of earth range from less than 1% to 2%.

While many dams in the inventory do not list a completion date, 304 (about 17% of the inventory) are listed as having been constructed after 1980.

PUBLIC SAFETY

Since 2007, Illinois has pursued the rehabilitation or removal of many run-of-the-river dams due to the danger they represent to the public at the dam and the desire for improved fish migration and canoeing/kayaking recreational opportunities.

The State Dam Safety Program is intended to improve public safety with respect to dams and is administered by a regulatory division of the Illinois Department of Natural Resources. Rules promulgated from the Illinois Administrative Code define the engineering design criteria for new dams and modifications to existing dams, operation and maintenance requirements for dams, and Emergency Action Plan (EAP) requirements for owners of high and significant hazard potential dams. In addition to reinvesting in dam maintenance and infrastructure improvements, EAPs are a critical component to improving the safety of people living, working, or recreating downstream of dams. 93% of state-regulated high hazard potential dams have an EAP; up from 70% in the year 2000. However, only 68% are considered full (meeting all the FEMA guidelines) and only 23% have been recently exercised.

The NID, since 2009, has collected condition data on state regulated High Hazard Potential dams. States voluntarily submit this data which includes an infrastructure rating of either satisfactory, fair, poor, unsatisfactory, or not rated. Illinois collects condition data on state regulated dams but uses it for internal purposes only and does not provide it to the NID or the general public. Hence, Illinois state-regulated dams are listed as "Not Rated" in the condition assessment field of the NID. Federally owned or regulated dams will have a condition assessment in the NID.

However, the condition of permitted dams can be generalized through the review of inspection reports for individual dams. These inspection reports are required to be filed with IDNR by dam owners. Of the approximately 1,200 inspection reports submitted to IDNR over the last four years, 180 (15%) were reviewed to inform the report card

grade. The dam inspection reports reviewed consisted of 30% Class I, 54% Class II, and 17% Class III hazard classifications. Within this dataset, 59% of the Class II dams, and 22% of the Class III dams, were unpermitted. This sample is assumed to be an adequate representation of the inspection report set. Based upon this evaluation, the overall condition of inspected dams in Illinois appears to be above average.

FUNDING/FUTURE NEED

Since the cost of new water supply dams is expected to be borne by water customers, the funding question for dams revolves around 1) new flood control projects, 2) regulatory oversight, and 3) inspection, operation, maintenance and rehabilitation of the existing dam inventory. As part of management of the state's dams, removal of obsolete dams should also be considered. Funding for Illinois dams should be divided into three categories: 1) Illinois State Dam Safety Program; 2) publicly owned dams; and 3) privately owned dams. 72% of the dams in Illinois are privately owned and therefore, most decisions regarding funding of these dams are beyond the public knowledge.

State Dam Safety Program

A relatively simple approach to determine if the program is adequately funded is to assess whether there is an acceptable level of review and oversight from the program. In essence, how many dams (by class) is each full-time employee responsible for? The Association of State Dam Safety Officials (ASDSO) recommendation and comparison to other states was used as a basis for comparison.

Based upon 2016 ASDSO statistics, Illinois has a full-time employee (FTE) equivalent dedicated to dam regulation of 3. This is down from 4.7 in the 2013 report card. The national average of state regulated dams per FTE was slightly over 200 dams; for Illinois there are about 600 dams per FTE. The national average of state regulated High Hazard Potential dams per FTE is 30; for Illinois there are about 75 High Hazard Potential dam per FTE.

Three major areas for the state dam safety program where funding should be focused are:

- Bringing all the Class I and II non-permitted dams into compliance
- Determining the true hazard category for all unpermitted dams
- Dam owner outreach regarding proper operation and maintenance of all dams

Publicly and Privately-Owned Dams

Public and private funding data for dams in Illinois is not available. Based upon information from IDNR and ASDSO, Illinois does not have a state loan/grant funding program to assist dam owners with repair, abandonment, or removal of privately-owned dams.

The owners of all permitted Class I and II dams must submit a financial responsibility statement as part of the IDNR approval process. This documentation is considered when evaluating overall private owner financial capacity to operate and maintain the dam.

OPERATION AND MAINTENANCE

To determine the owner's regulatory compliance and ability to operate and maintain, the dams were again split into categories of permitted and unpermitted.

For the sample of the permitted dams reviewed, the number of dams based on the inspection reports with an emergency condition or immediate maintenance condition code was noted. This may be indicative of dams that are not being properly operated and maintained. This was categorized by hazard category.

Of the dams reviewed for this evaluation, there were no dams, either Class I or Class II, with an 'emergency condition' noted. Only four of 29 Class I dams and three of 30 Class II dams had "immediate maintenance" notations. This suggests good regulatory compliance and adequate operation and maintenance among the permitted dams.

For many unpermitted dams, there is no documentation indicating whether the dams are being operated or maintained properly. For existing dams to become permitted is usually either the result of an action by the owner to modify the dam or through the development of an inspection report by IDNR/OWR that advises the owner of the deficiencies found at the dam and their responsibility to address the deficiencies and obtain a permit for their dam(s).

RESILIENCE

Illinois ranks 19th in current FEMA Flood Insurance in-force ($8.1 billion in policies) and ranks 14th in total flood insurance claim payouts since 1978 ($519 million). In the twenty years after 1993, there were on average over 22 Illinois counties for each of the 15 Presidential Disaster Declarations, the majority for flooding. Some of the damages due to declared flood disasters might have been mitigated by additional storm water management efforts. In some instances, in-stream and off-line reservoirs, or similar flood control dam structures, have the potential to help alleviate local flood control/detention issues. Most counties and communities that participate in the FEMA Flood Insurance Program have adopted floodplain management ordinances which require site runoff detention reservoirs for any new development. Many of the dams for these detention reservoirs are jurisdictional for the IDNR/OWR due to their urban setting and close proximity to residential development. Additionally, some also serve as recreational or aesthetic amenities for the developments.

Dams create the surface water reservoirs a large portion of the state's residents rely on. Surface water sources of water supply in Illinois are Lake Michigan, interstate rivers (Mississippi and Ohio), intrastate rivers (Fox, Illinois, Kankakee, Kaskaskia, and Little Wabash), and 96 dam reservoirs. Other than some groundwater aquifers near major rivers, most communities in the southern two thirds of the state receive their water supply from surface water reservoirs created by dams. Amid discussions of climate change, there is increased focus on water conservation and water supply resilience during droughts. The search for supplemental water supply sources is leading to increased consideration to construct new dams for the purposes of water supply in Illinois.

INNOVATION

Hydropower accounts for a relatively small portion of the state's energy needs but virtually all the navigation dams on the Illinois and Mississippi rivers have the potential for hydropower additions. The Federal Energy Commission (FERC) regulates hydropower and inspections for hydropower dams. There are six licensed hydroelectric dams in Illinois and three bordering other states (two on the Mississippi River and one on the Ohio River). Additionally, there are 11 preliminary permits to study the feasibility of hydroelectric sites in Illinois. FERC inspects each dam annually and an independent inspection is required every five years. The licensee must keep the facilities in good condition or risk having to surrender their license.

RECOMMENDATIONS TO RAISE THE GRADE

Since the majority of dams in the state are privately owned, the state dam safety program is a key component to improving Illinois' dam infrastructure.

Regulatory oversite promotes investment in dam maintenance and infrastructure improvements, and reduction of risk to the public. Methods to achieve this goal include:

- Increasing the number of FTEs in the IDNR dam safety program, to align with national norms for dams per FTE, will enable more frequent dam inspections and increased communication with dam owners, which leads to improved owner accountability for the maintenance of dam infrastructure. This will require increased funding for the program.
- IDNR has been improving the number and quality of EAPs in place. IDNR should continue to promote dam owners to complete thorough EAPs, prioritizing high hazard dams.
- Provide IDNR dam safety program with enforcement support staff to bring all unpermitted dams into compliance and correct deficiencies in permitted dams.
- Outreach and education can improve public awareness about the risk and liability associated with dams and foster community support for funding and owner accountability to maintain and/or improve dam infrastructure to reduce risk. Methods to achieve this goal include:
- Consider making certain information about dams, particularly high and significant hazard dams, readily

available to ensure that local officials and the general public are aware of the permit status, inspection status, general condition and risks associated with living downstream of dams.

- Partner with the Illinois Realtors Association to promote realtor training and disclosure of risk associated with dam ownership and property ownership downstream of dams.

- Investigate developing a state funded revolving loan program, modeled after successful loan programs in other states, to assist with funding for public and private dam infrastructure maintenance and repairs.
- ASDSO works with the Department of Homeland Security (DHS) and each state to collect data that will show site-specific and national progress toward reducing security risks within the dam sector. Presently Illinois does not participate in the Homeland Security Information Network. Illinois should consider participation in the Homeland Security Information Network.

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DRINKING WATER

EXECUTIVE SUMMARY

In 2017, the Chicago Metropolitan Planning Council published "Glass Half Full," which estimated the cost of maintaining the state's water infrastructure through the year 2030 at $21.5 billion. This needs number is growing; by comparison, the 20-year investment needs in 2011 and 2007 were $19 billion and $17 billion (respectively).

Existing funding is insufficient. The Illinois Environmental Protection Agency (IEPA), through its Public Water Supply Loan Program, has a draft intended use plan identifying a possible $280 million for public water supplies for the next 20 years starting with FY 2017. The Chicago Department of Water Management is currently in its sixth year of a 10-year plan to invest $225 million annually to replace approximately 900 miles of aging pipes.

CONDITION & CAPACITY

Drinking water systems provide a critical public health function and are essential to quality of life and economic development and growth. Disruptions in service can hinder disaster response and recovery efforts, expose the public to waterborne contaminants and cause damage to roadways, structures, and other infrastructure, endangering lives and resulting in billions of dollars in losses.

In 1900, the average residential use of potable water in the U.S. was five gallons per day per person. Today, that number has increased to 100 gallons per day per person. In Illinois, oversight of the Public Water Systems (PWS) is divided between the IEPA and the Illinois Department of Public Health (DPH). The IEPA has been designated as the lead agency for primary enforcement authority and oversees the state's Community Water Supply (CWS) program, which are those PWS that serve 15 or more year round service connections or 25 or more year round residents. During 2015, there were 1,740 CWS. The DPH oversees the non-community water systems.

Below is the breakdown of the 1,740 CWS within Illinois regarding their source of water as of 2015. A total of 12,007,441 persons are served by those systems:

- Surface Water – 39%
- Purchased Surface Water – 34%
- Purchased Ground Water – 2%
- Ground Water – 25%

It is worth noting that although only 27%of the population is served by ground water, ground water systems comprise almost 66% (1,147 of the 1,740) of the total number of community water systems.

Many cities, towns and villages are facing water issues as their reserves of water are depleting. Much of the rain that falls on catchment areas either evaporates or becomes run-off as surface water, while only a small percentage replenishes scarce ground water. In Illinois, water scarcity is aggravated by environmental degradation of water sources and in particular, reduced water quality and quantity due to pollution from urban or land-based activities. Not enough money and attention is paid to improving such basic infrastructure as water and wastewater systems. The lack of consensus on who should pay for water and wastewater infrastructure makes it difficult to build sustainable water and wastewater systems.

Illinois also contends with water main pipe breaks, which result in billions of gallons of treated water seeping into the soil before it's ever used. In the Chicago area alone in 2016, over 25 million gallons of water drawn from Lake Michigan were lost due to water main breaks. The towns of Hometown, East Hazel Crest, Posen, Burnham, Riverdale, Flossmoor, Lyons, and Maywood lost at least 30% of their water, according to an analysis by the Chicago Tribune. The cost to residents is enormous – Maywood residents paid $1.66 million for their wasted water, Hometown $163,000, Flossmoor $846,000, East Hazel Crest $198,000, Posen $351,000 and Burnham $257,000.

FUNDING & FUTURE NEED

The state's community PWS face a staggering public investment need which federal assistance alone cannot address. The state of Illinois currently requires and investment of $21.5 billion dollars through the year 2030 to address the states aging water system. This needs number is growing; by comparison, the 20-year investment needs in 2011 and 2007 were $19 billion and $17 billion (respectively).

One bright spot is Illinois' Low-Interest Revolving Loan Fund, administered by IEPA, to help communities finance infrastructure investments. Since the fund's creation in 1989, IEPA has funded more than $2 billion in water supply infrastructure improvement projects. The IEPA, through its Public Water Supply Loan Program, has a draft intended use plan identifying a possible $363 million for public water supplies in FY 2017. Additionally, the IEPA committed a total of nearly $385 million new loan resources during the reporting period.

Regardless of available financing for water infrastructure projects, the underlying investment gap remains. Many locally managed systems do not adequately account for their investment needs and charge rates below cost, generating insufficient revenue to finance investment. Cost processes for rates are antiquated. The life-cycle costs of water system components are often overlooked and unaccounted for, creating a funding deficit when inevitable replacements are necessary.

A limited amount of federal financing is available through the Safe Drinking Water Act State Revolving Fund (SRF) program. Since FY 1997, Congress has appropriated only between $700 million and $1.4 billion annually for the SRF program. The American Recovery and Reinvestment Act (ARRA) of 2009 invested $2 billion in drinking water, but even with that infusion of funding, federal assistance has failed to keep pace with demand. The following table illustrates the federal funding from 2008 to 2017, including the ARRA investment. Overall, federal funding has remained consistent over the past 10 years, while the state's needs have continued to rise.

Table 1. Federal Investment in Drinking Water

Year	Federal Investment	Illinois Share
2008	$829M	$33M (4.1%)
2009	$829M	$33M (4.1%)
ARRA - 2009	$2B	$80M (4.1%)
2010	$1.4B	$51M (3.8%)
2011	$942M	$36M (3.8%)
2012	$898M	$34M (3.8%)
2013	$842M	$32M (3.8%)
2014	$884M	$37M (4.2%)
2015	$879M	$37M (4.2%)
2016	$831M	$35M (4.2%)
2017	$824M	$34M (4.1%)

OPERATIONS & MAINTENANCE

Far too often the approach toward public infrastructure is to build and operate it with minimal maintenance until it wears out. Water systems need to fully account for the costs to manage their assets accounting for the life cycle of the system. With the implementation of Geographic Information Systems (GIS) databases and the reporting requirements of Governmental Accounting Standards Board 34. tools are available for agencies to perform a full accounting of their entire systems by age, component, maintenance costs, including main breaks, hydrant repair, pump repairs and other maintenance areas. Based on this information, agencies should be able to put together a maintenance and replacement plan for their water systems, similar to the way transportation agencies rate and schedule roadways for improvements. Thus, by appropriately managing its assets, a system's overall investment needs and operating costs can be reduced.

Along with managing the maintenance of the assets the system managers need to account for the personal required for operations and take all costs involved to adequately determine usage rates that cover the costs of maintaining and operating the systems.

PUBLIC SAFETY

In 2015, the percentage of Illinois residents served by community PWS compliant with all health requirements was 98.3%– leaving more than 204,000 people at health risk. This is a decrease from the 2014 and 2010 Illinois Report Cards, which found that 96.5% and 93.9% compliant (respectively), or 400,000 and 700,000 residents (respectively) at a health risk.

RESILIENCE & INNOVATION

Replacing existing standards with newer technologies can provide regulators, engineers, and drinking water operators with a host of benefits. These include the potential for longer-lasting systems, lower constructions costs, earlier detection of faults in existing systems and more efficient distribution methods.

Additionally, the state must adopt a new approach to water resources management. Water is not an unlimited resource. Every day tens of millions of gallons of Lake Michigan water are lost due to leaks, faulty meters or accounting errors, never producing any revenue. Water also goes to waste through inefficient plumbing and excessive outdoor use. Both lost water and wasted water are a financial burden. Water audits and demand management should be implemented. Community education, increasing awareness and effective stakeholder participation in decision making and policy development are critical components in water demand management. Through programs coordinated by the Chicago Metropolitan Planning Council and IEPA Illinois, the state is beginning to take steps to change the way we view water.

RECOMMENDATIONS TO RAISE THE GRADE

The Illinois sections of ASCE encourage our leaders to support the following recommendations:

- Manage demand and rethink supply. Strategies such as conservation pricing can significantly reduce stress on the water systems and related infrastructures.
- Promote annual system-wide evaluations of water systems in order to produce a maintenance plan to replace damaged infrastructure and reconstruct areas that have exceeded their life expectancy. The annual replacements can also improve areas of poor pressure and/or water quality due to the increasing demands placed on the system.
- Create true "cost of service" rate structures, including the full range of costs, both sunk and replacement. Rate structures must be sustainable over time and provide the means to operate, maintain and replace the water infrastructure.
- Encourage municipalities to use pricing structures or lifeline rates that mitigate impacts on low-income households or develop a rate reduction program, similar to the federal low-income Energy Assistance Program, to cushion the impact of rate increases on low-income households.
- Establish statewide infrastructure needs inventory administered by the state's municipal planning organizations to create a mechanism to differentiate between expenditures for current consumption and long-term investment and reduce major inefficiencies in the planning, design and construction process for

long-term investments. An infrastructure needs inventory would help increase public awareness of the problems and needs facing the state's physical infrastructure and would help the state Legislature focus on programs devoted to long-term growth and productivity.

- Encourage state government to play an essential role in promoting the research, development, testing and evaluation of new technologies and the dissemination of information about proven technologies. Research at state-supported universities into wastewater treatment technology and potable water distribution technology may reduce capital expenditures and operation and maintenance costs and create economic opportunities with public-private partnerships licensing the new technologies.
- Continue to fund low-interest loans to farmers to implement best management practices for manure handling and storage and land management to protect water sources.
- Address power and system redundancy through the construction of dedicated emergency power generation at key drinking water utility facilities, increased connections with adjacent utilities for emergency supply, and the development of security and criticality criteria.
- Illinois' drinking water systems are not highly resilient and lack the capabilities to prevent failure and properly maintain or reconstitute services. Redundancy with back-up equipment and supplies are sporadic. The interdependence on the energy sector contributes to the lack of overall system resilience. Investment prioritization must take into consideration system vulnerabilities, interdependencies, improved efficiencies in water usage via market incentives, system robustness, redundancy, failure consequences, and ease and cost of recovery.
- A policy change is needed for what amounts to nearly $21.5 Billion in critical drinking water investments in Illinois during the next two decades. Not meeting the investment needs of the next 20 years risks reversing the public health, environmental and economic gains of the past.

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NAVIGABLE WATERWAYS

EXECUTIVE SUMMARY

Illinois has 1,118 miles of navigable waterways passing through or bordering the state. In 2015, Illinois ranked eighth nationally among the states in total tonnage of waterborne freight, and third in domestic tonnage. However, this competitive advantage is threatened by locks that have long exceeded their 50-year design life, the majority of which are too small to fully accommodate modern barge traffic.

Despite the importance of our inland waterway system, the maintenance needs have surpassed the level of annual federal funding for the system. The system is being operated with a fix-as-fail strategy and repairs are only made when something breaks or fails. Given the 94 million tons of freight shipped annually, failure of just one of the critical locks can cost more than $1.5 billion annually in additional transport costs and the loss of more than $2 billion in farm-based income.

INTRODUCTION

The State's navigable waterways are the unseen backbone and a critically important segment of the freight transportation system for Illinois, and thus, critical to the Illinois economy and the nation. In 2013, waterways and ports were estimated to support 48,195 Illinois jobs and directly contribute $6.4 billion to Illinois' economy. The $6.4 billion included $3.4 billion in direct business revenues, $2.5 billion in personal income, and another $470 million in local purchases.

In 2015, Illinois ranked eighth nationally among the states in total tonnage of waterborne freight, and third in domestic tonnage (behind Louisiana and Texas). Illinois was the third largest exporter of agricultural products valued at $8 billion in 2015, and was also the nation's top exporter of soybeans, soymeal and vegetable oil. Additionally, the Chemical Industry Council of Illinois indicates that $18 billion of Illinois industry products are exported annually via the navigation system.

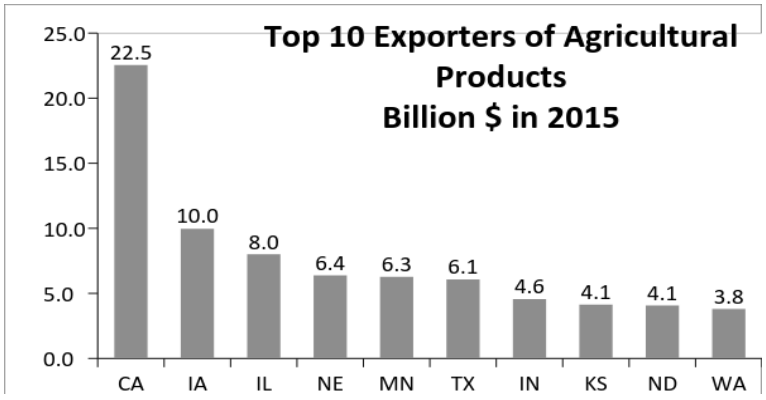

Figure 1. Top U.S. State Exporters of Agricultural Products

Source: USDA Economic Research Service; USDA Foreign Agricultural Service (Global Agricultural Trade System). May 2017

The Illinois maritime system retains a cost competitive advantage for lower value-to-weight goods, including grain and crude materials such as gravel and sand, due to the fuel economy offered by inland waterways. Without much needed investment, U.S. infrastructure continues to become less reliable and efficient, and our competitive advantage is at risk.

Over the next 20 years, economists estimate that nationwide freight movement through inland navigation will increase by more than 35% (ASCE). The strategic management of specific commodities and the growth in freight on inland waterways offers an opportunity to reduce road congestion, lower shipping costs, improve safety and reduce greenhouse gas emissions within the intermodal freight system.

Table 1. Fuel Efficiency by Mode (2014)

Mode	Ton-Miles/Gallon
Inland Towing	647
Railroads	477
Trucks	145

Figure 2. Upper Mississippi River Basin Waterway

Illinois Waterway

The Illinois Waterway connects the Great Lakes to both the Ohio and Mississippi Rivers. Illinois' inland waterway system consists of 336 miles of water and links the Atlantic Ocean and the Gulf of Mexico via the St. Lawrence Seaway and the Great Lakes. There are eight locks on the Illinois Waterway, 15 locks on the Mississippi River along the Illinois western border, and three locks on the Ohio River along the Illinois southern border. The confluence of these three waterways is one of the most crucial points in the nation's navigation system – the hub of the inland waterways navigation system.

CAPACITY

The capacity of a 600-foot long lock chamber is approximately 45 to 55 million tons per year. In contrast, the capacity of a 1,200-foot long chamber is 100 million tons per year. As locks approach their capacity, delays can increase exponentially.

Currently, the capacity of the system is limited by the existing lock facilities. All but three of the locks within the existing system are 600 feet long. The modern 15-barge tow size has a length approaching 1,200 feet long. As a result, tows must lock through using a two-step process, which takes approximately an hour and a half to two hours. In contrast, a tow can lock through a 1,200-foot lock in approximately a half to one hour. For example, the Illinois Waterway handled over 24 million tons of cargo during 2014. Reliance on existing lock facilities to move this cargo through the two-step process doubles to triples lockage times, increases costs and wear to lock machinery, and exposes deckhands to higher accident rates.

CONDITION

Most of the locks and dams along the Illinois, Mississippi and Ohio rivers were built in the 1930s with a 50-year design life. The navigation system is at risk and unreliable due to the extent of deferred maintenance. According to the U.S. Army of Engineers (USACE), the maintenance needs of the aging lock infrastructure on the Illinois Waterway have surpassed the level of annual federal funding for the O&M of this system. USACE is operating with a fix-as-fail strategy, making repairs when something breaks or fails. Such repairs take days, weeks or months, with no advance notice to shippers and carriers and can result in major financial consequences.

The volume of traffic handled by this system is substantial, and therefore the risks from system failure are substantial. In September 2012, a 5-day closure stranded 63 tows (455 barges) at a cost of **$2.8 million/day**. Shippers estimated that to offload "stranded" product would have required 6,100 railcars, or 26,400 trucks. The roads and rails portion of the Illinois freight transportation system are incapable of adsorbing such offloads. The delays from the degraded condition of the navigation system result in lower agricultural prices for Illinois producers and increased shipment costs overall.

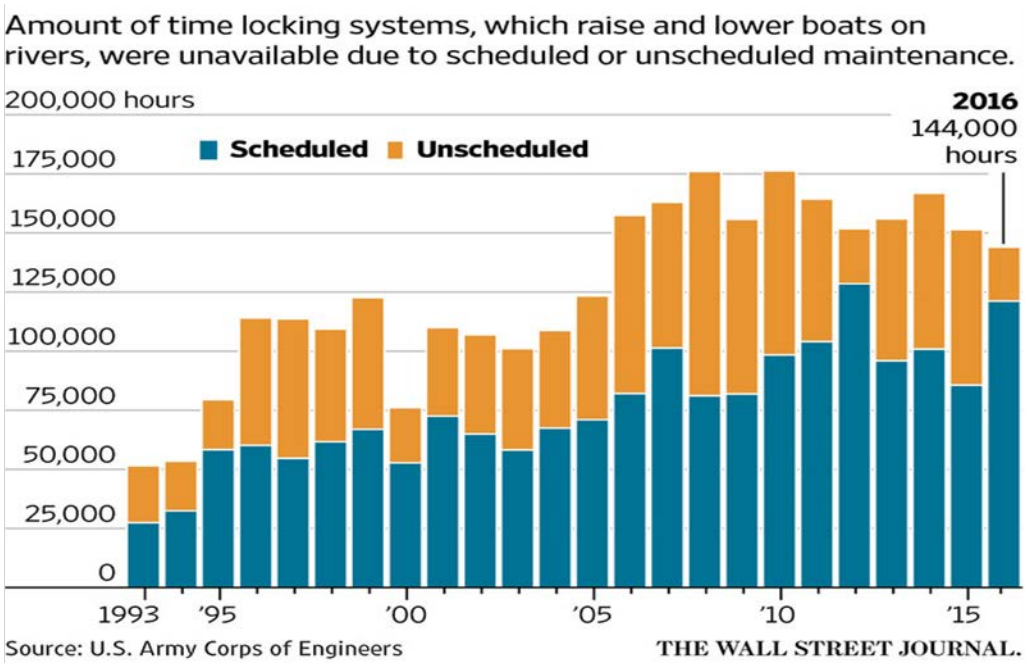

Figure 3: Lock Closures for the Ohio River, Illinois Rivers and the Upper Mississippi River

FUNDING

Almost $13 billion in cumulative investment will be needed by 2020 just to maintain current level of service. However, current funding levels support only $7 billion funding in 2020. By maintaining the current level of investment, the increased shipping costs because of unreliable infrastructure will result in a loss in production, income and spending, resulting in 738,000 fewer jobs in 2020, and 1.4 million fewer jobs in 2040 (ASCE; IMTS).

The federal government owns the inland waterway system and the water resources development legislation is the main source of funding for navigable waters. WRDA 2007 provided more than $2 billion for major work on the locks and dams on the Upper Mississippi and Illinois rivers. However, in subsequent federal legislation passed in 2014 and 2016, no construction funds were appropriated for this work outside of the Ohio River system. The following projects were prioritized by USACE but not funded:

- Seven new 1,200-foot locks on the Mississippi River and two on the Illinois River.
- Mooring facilities at six Mississippi River Locks and Dams and one at LaGrange Lock on the Illinois Waterway.
- Switchboats at five Mississippi River Locks and Dams.

The federal government, through appropriation legislation, pays 50% of any capital investment to the system, while the Inland Waterways Trust Fund covers the other 50%. However, the federal government pays for 100% of O&M costs with general revenues. With the level of funds being made available from the federal government declining, much of the O&M needs risk are deferred until they reach $20 million and are considered capital projects. This results in further deterioration leading to increased cost to shippers and unreliability in the system.

FUTURE NEED

Table 2 shows the volumes for inbound and outbound freight along the navigation system serving Illinois in 2010 along with projected tonnage for 2040, the relative importance of specific segments of the Illinois system in moving freight and the future growth projected.

Table 2. Inbound and Outbound Freight Tonnage by Waterway

Waterway	Outbound 2010 ('000)	Outbound 2040 ('000)	Inbound 2010 ('000)	Inbound 2040 ('000)	Total Projected Growth
Lake/Illinois River	12,989	15,123	9,024	12,115	24%
Illinois/Mississippi River	48,008	55,152	6,175	8,289	17%
Mississippi River Only	1,755	1,815	421	565	9%
Mississippi/Ohio River	41,470	47,640	1,771	2,377	16%
Total	**104,222**	**119,730**	**17,391**	**23,347**	**18%**

Source: Transearch, 2010

The key corn and soybean producer states (led by Illinois) are dependent on barge transportation, especially for export shipments. Inland waterways represent a major part of the overall US agricultural supply chain.

Additionally, the Panama Canal Authority's new set of locks will allow the canal to handle ships with more than double the previous maximum capacity. The larger vessels are expected to represent 62% of total container ship capacity by 2030. Illinois, as one of the largest soybean exporters in the US could benefit from that expansion (Institute for Water Resources).

OPERATIONS AND MAINTENANCE

USACE is responsible for the maintenance and operation of the infrastructure within the navigable waterways. This includes the locks and dams and dredging within the authorized channel to the 9-foot authorized depth. However,

funding shortfalls are frequent and appropriations are inconsistent. This causes delays in maintenance dredging and often leads to an increase in unscheduled delays at the locks. The lock system is especially sensitive to the funding shortfalls due to the advanced deterioration of the locks.

The National Research Council suggests that the appropriate maintenance investment in infrastructure should total 2 – 4% of the value of the system annually. O&M funding is far below that estimate and currently runs about 0.23%. This is akin to buying a $30,000 car and spending $69 annually on repair and maintenance with no warranty.

One of the main issues regarding the lack of funding is a direct result of inconsistent data collection within the inland river system. O&M funding is primarily allocated based on tonnage data. Without consistent and integrated data, the system is underfunded. The condition of the locks with their growing reduced capacity and unreliable availability lead shippers to consider other modes for their products. This reduction of tonnage moving on the inland waterways system directly leads to reduced funding being appropriated by Congress because of the appearance that the system doesn't have the traffic to support investment. Additionally, while discussions of the inland waterways tend to focus on navigation, the structures in place for navigation provide other benefits to a diverse set of uses such as water supply for municipal, industrial and farming purposes, as well as recreation, all of which are not paying into the O&M needs of the system they rely upon.

PUBLIC SAFETY

Public safety is a collaborative effort between the government agencies who hold jurisdiction over the waterways (e.g., USACE, IEPA, IDNR, USCG, Port Districts), public utilities, the users of the waterways such as vessel and terminal operators, and the public. While there are varying opinions on the best use of the waterways, all the stakeholders work together to ensure the system operates as needed. However, many of the uses are competing in a way that is not in concert with one another. For example, levees which are constructed to protect land uses affect how the river reacts to heavy rainfalls within its watershed, often leading to intense flooding conditions on the rivers. Safety is also compromised when 15-barge tows must be uncoupled to travel through 600' locks. The threat of Asian Carp and other invasive species traveling through the waterways is a constant reminder of the environmental risks associated with our waterway system.

RESILIENCE

One of the most difficult challenges facing the inland river system is the unpredictable environmental conditions of the river. The rivers tend to have large swings in levels throughout the year outside of the lock system. It is not uncommon to see the river levels move 30-40 feet in depth throughout the seasons. Over the past few years, the system has experienced some extreme flood and drought conditions, which have made it difficult for shippers and operators to provide reliable service.

INNOVATION

Without adequate funding for needed operation and maintenance, USACE has difficulty implementing innovation within the navigation system. However, WRRDA 2014 implemented the "3x3x3" rule with the Corps in regard to studies. This new rule requires any feasibility study undertaken by the Corps to be completed within three years, at the cost of no more than $3 million dollars, and require three levels of vertical coordination. The final report will be less than 100 pages in length. In addition, the Corps has implemented several new technologies in effort to extend the life of existing infrastructure within the inland river system. These efforts range from using ultrasonic imaging for underwater inspections to a variety of new polymers being used in repairs.

RECOMMENDATIONS TO RAISE THE GRADE

- Congress should appropriate funds for the projects authorized in WRDA and WIIN. A 2014 report identified several key locks needed for expanding agricultural exports and taking advantage of the opportunities from the Panama Canal expansion and other projects.
- Due to the importance of better understanding the impact of the navigable waterways to the Illinois economy, Illinois DOT should compile the many sources of data related to waterborne tonnage, traffic and commodity volumes traveling the navigation system.

- Illinois DOT should establish a Ports and Navigation section with responsibility to incorporate navigation as a part of statewide transportation plans.
- A long-term strategy to increase investment in the system must be proposed within the IDOT's transportation freight plan in order to maintain reliable and cost effective inland navigation.
- IDOT should aggressively pursue United States Maritime Administration (MARAD) Marine Highway grants for the three marine highways (M-35, M-55, and M-70) designated in Illinois.
- User fees should be considered for the non-navigational beneficiaries of the inland river system such as water supply sources for municipal, industrial and farming purposes, as well as, the recreation industry "to provide additional funding for the O&M needs of the inland river system.

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ACRONYMS

O&M = Operations and Maintenance
ORS = Ohio River System
USACE = U. S. Army Corps of Engineers
WRDA 2007 = Water Resources Development Act of 2007

PORTS

EXECUTIVE SUMMARY

Illinois has 19 public port districts and over 350 private terminals located along the Illinois, Kaskaskia, Ohio, Mississippi and Wabash Rivers, as well as Lake Michigan. These ports promote economic development, including industrial, commercial and transportation activities, with a total revenue impact of $6.4 billion while supporting over 48,000 jobs. These ports and their respective industrial parks are responsible for more than $81 billion of manufactured goods, $37 billion of agricultural products and $18 billion of chemical products that are shipped to and from Illinois through its waterways and ports. While their economic impact is great, the conditions of the Illinois' ports are as diverse as the jurisdictions they serve. Unlike many other states within maritime network, the ports within Illinois receive no funding from the state. Instead, they raise their own revenue for projects and compete for the various competitive federal grants or financing available to them.

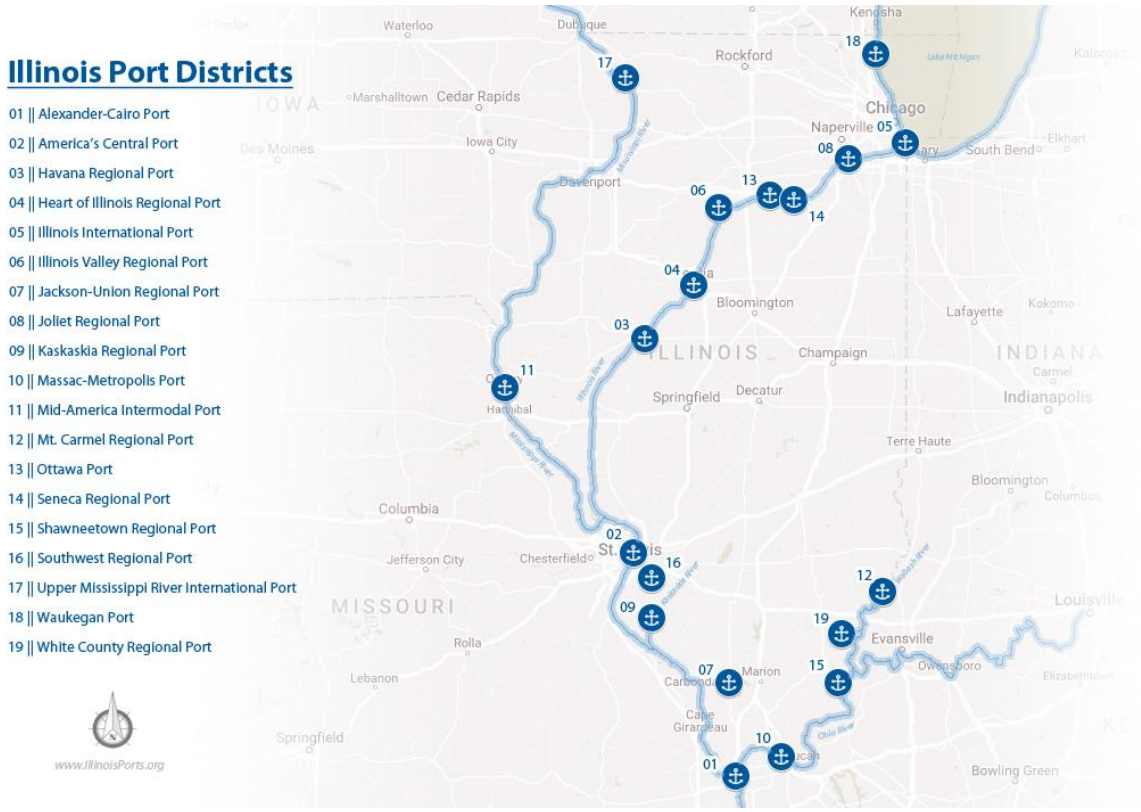

Figure 1. Map of Illinois Port Districts (source: illinoisports.org)

CAPACITY

One of the greatest assets the ports in Illinois have to offer is capacity. Nearly all Illinois ports have development sites available for industrial development within their jurisdiction. Illinois is one of the few states which has access to the multiple cross-country interstate highways, all seven north American Class I railroads (including over 26 shortlines) and major utility services; all of which allow for Illinois ports to be positioned well for economic prosperity. Much of the commodities moving through Illinois ports are agricultural products, manufactured goods and chemicals.

CONDITION

According to the U.S. Chamber of Commerce, there are more than $81 billion of manufactured goods, $37 billion of agricultural products and $18 billion of chemical products that are shipped to and from Illinois through its waterways and ports. The waterways and ports located in Illinois have a total revenue impact of $6.4 billion and support over 48,000 jobs. Illinois has three ports in the leading 100 U.S. ports according to the U.S. Army Corps of Engineers (USACE) in 2015. Additionally, Illinois ranks 8th in U.S. waterborne traffic in 2015. With economic impacts at this level, it is easy to conclude that the ports in Illinois help drive the state's economy. However, the conditions of the Illinois' ports are as diverse as the jurisdictions they serve.

OPERATIONS & MAINTENANCE

With funding sources limited, maintenance of existing infrastructure tends to be a struggle for nearly all the ports. Much of the infrastructure in operation today was built decades ago and have considerable deferred maintenance needs that compound as time progresses. The ports who do have budgets that allow for routine maintenance still fall short of their overall needs, especially since the infrastructure associated with marine and rail transportation is costly. Additionally, most ports struggle to adequately fund unscheduled maintenance and repairs. Revenue streams are needed by the Ports to apply to their O&M needs and capital developments. This could be gained through local economic development deals the Ports themselves broker, or from a new funding allocation through the State.

FUNDING

Unlike many other states within maritime network, the ports within Illinois receive no funding from the state. While many of the ports allow for the levying of taxes within their jurisdiction, few of them have pursued this as a revenue option. This leaves the ports to fund their developments and projects using their own funds and compete for the various competitive federal grants available to them or loans like TIFIA.

Ports struggle with finding matching funds for large grant opportunities. When capital projects range in the tens of millions of dollars, finding funds to match grant programs such as TIGER or INFRA (formerly FASTLANE) is practically impossible for the smaller ports with limited or no revenue in their annual budget and often stress the budget of the more developed ports. For example, America's Central Port received $14.5 million in TIGER funds to apply to their $28 million South Harbor Project; leaving the Port to find creative ways to fund the $13.5 million shortfall in order to complete the project.

While there are benefits to Illinois' ports to attract new business, some have issues, such as the Illinois International Port District which struggles to pursue large capital projects due to lingering financial obligations that are not being addressed by the State legislature. It would be prudent for the state to ensure that all ports have the legislative tools necessary to attract and retain development within their jurisdiction.

FUTURE NEED

In order to be ready for future freight needs which the U.S. Bureau of Transportation Statistics estimates to nearly double over the next 20 years, ports will have to invest in large-scale capital projects that leverage the unique transportation assets they have available. This means construction of new cargo facilities that will meet the rising consumer demand, which results in an increase in raw commodity movements in agriculture and petroleum. Additionally, efforts are underway to utilize the inland waterways for Container-on-Barge traffic to provide optimizations and efficiencies on the movement of consumer goods due to the Post-Panamax traffic through the gulf.

PUBLIC SAFETY

Both the USACE and U.S. Coast Guard have jurisdiction over the safety of the inland river systems. Ports typically have their operators and tenants apply any appropriate safety protocols and procedures that are necessary for their industry.

One of the greatest benefits ports bring to the transportation industry are its efficiencies and economies connecting intermodal freight from rail and road to the waterways. One 15 barge tow moving on the river system takes over 1,000 trucks off the road and two-unit trains off the rail system. This results in less congestion on the highway system, lower fuel consumption and reduced fatalities and injuries. The Texas Transportation institute has shown that of the three modes, river transportation significantly reduces environmental contamination due to spills and emissions.

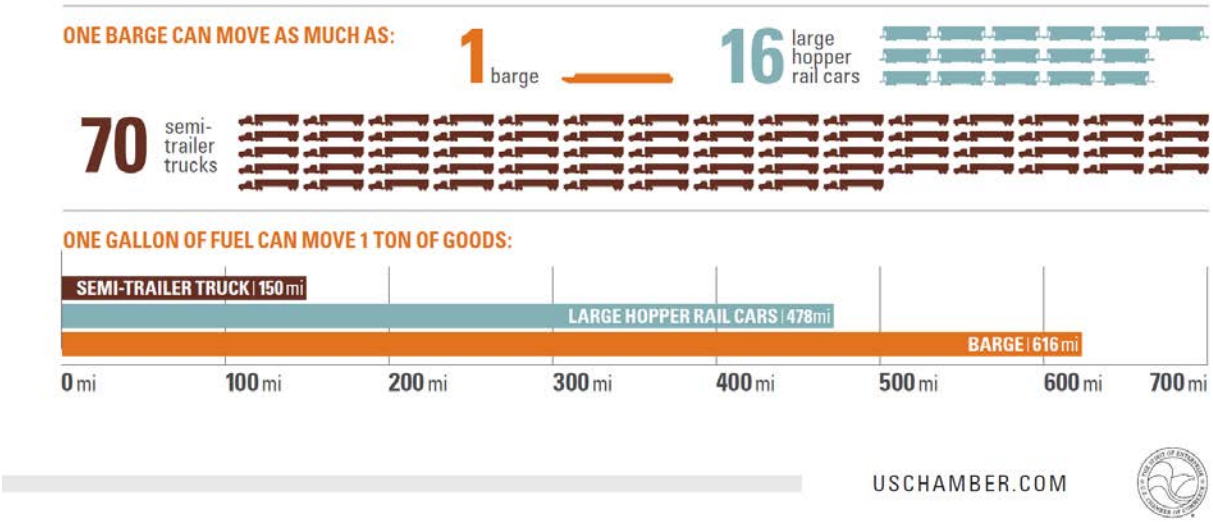

Figure 2. Modal Comparison (source: U.S. Chamber of Commerce)

One of the main issues that could have a significant impact on the ports within Illinois, especially those located on the Illinois River, is the issue with aquatic nuisance species; specifically, the Asian carp. The USACE has made efforts to keep the Asian Carp from moving into the Great Lakes via the river system by installing electric barriers. However, these efforts are being questioned as to its effectiveness in deterring the movement of the fish north. The threat of stopping navigation from the river system into the Great Lakes will have an incalculable and significant impact on how goods are shipped and the viability of some ports and their operators.

RESILIENCE

Transportation connections to the ports via rail and road are reliable, but the river system has many complex dynamics, which can result in limited reliability. While the Upper Mississippi River's lock and dam system provide for a consistent flow and channel depth, the Mississippi River south of St. Louis has seen periods of low water, resulting in reduced cargo movements and even closures of the system.

INNOVATION

Some of the ports within Illinois have been working with the U.S. Department of Transportation's Maritime Administration to develop Marine Highway Corridors. The M-55 has been established from St. Louis to the Great Lakes, as well as, the M-35, which runs from St. Louis to Minneapolis/St. Paul. The M-55 corridor has already attracted a pilot project for container-on-barge along the Illinois River and America's Central Port to the Gulf. Kaskaskia Regional Port has undergone several feasibility studies in the recent years to position their port and operators to better leverage the use of the Kaskaskia River.

The St. Louis Metropolitan Region has developed the St. Louis Regional Freightway to provide site selection and other assistance to manufacturing, logistics and multimodal transportation companies. Through this effort, the ports located in the region are marketed in a collaborative effort that offer unique combinations of competitive advantages.

RECOMMENDATIONS TO RAISE THE GRADE

- Identify additional funding opportunities for capital investment within ports. Specifically, find ways to apply local matches for large federal grant programs.
- Enhance the Illinois Department of Transportation's interaction with the public ports and further integrate their needs into the State Freight Transportation Program.
- Integrate funding into the State budget for Port Development.
- Develop legislation that further enhances the economic toolbox of the Port Districts to attract and retain development within their jurisdiction, as well as review existing legislation to identify obstacles or encumbrances to the ports and their economic development missions.

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RAIL

EXECUTIVE SUMMARY

The rail industry is integral to the Illinois economy. The 7,000-mile-long track network is the second largest in the country, and Illinois is the only state in which all seven Class I freight railroads operate. Nearly one quarter of the nation's rail-shipped goods and services move through Chicago, and more carloads of freight are carried through Illinois than any other state in the nation. Significant investments have been completed or are underway to expand capacity and improve the condition of publicly and privately-owned rail infrastructure, including well over $3 billion by Class I railroads over the last eight years in Illinois. However, substantial investments to the railroad infrastructure in Illinois will need to be made to accommodate future growth in freight rail traffic.

INTRODUCTION

Illinois is home to one of the most important rail hubs in the country. The Illinois rail network is the second largest in the country, with roughly 7,000 miles of track, and it is the only state in which all seven Class I (major) freight railroads operate.

Chicago is the single busiest and largest rail city in the nation. Every day 500 freight trains with 37,500 cars and 700 passenger and commuter trains (with 329,500 of passengers) pass through Chicago. Nearly one quarter of the nation's rail-shipped goods and services move through the city, carrying more carloads of freight than any other state.

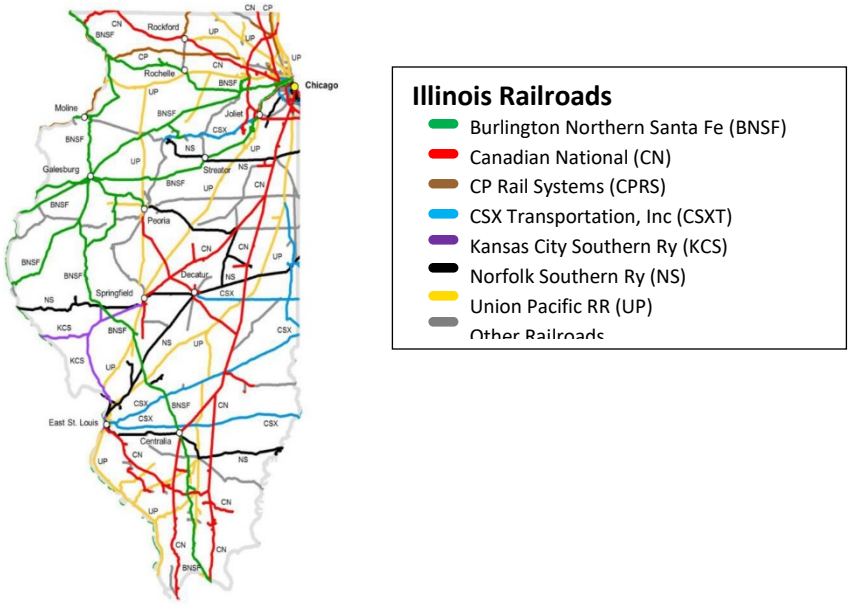


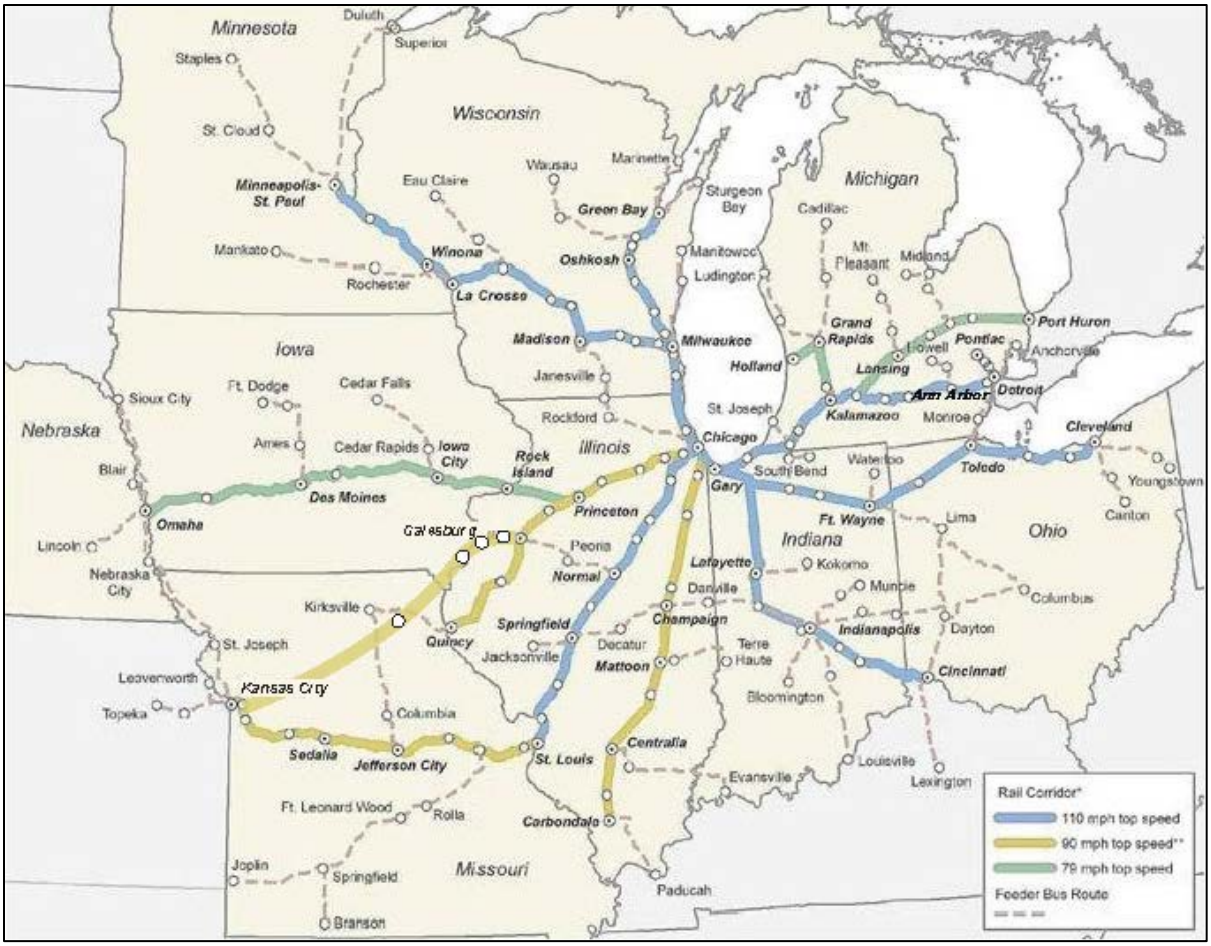
Figure 1. Illinois Rail Network Map

Modernization of the Chicago rail hub began in 2003 as a multi-year, multijurisdictional campaign, involving the U.S. Department of Transportation (USDOT), the State of Illinois, the City of Chicago, Metra, Amtrak, and the nation's freight railroads with the mission to unclog rail lines in and out of Chicago. So far, the Chicago Region

Environmental and Transportation Efficiency (CREATE) program has made progress in reducing travel times through Chicago and Northeastern Illinois, but more work remains.

Meanwhile, Illinois' railroads are experiencing a competitive resurgence as both an energy- efficient freight transportation option and a viable city-to-city passenger transportation service. In 2016, Amtrak recorded a ridership of 31.3 million passengers nationally, the sixth consecutive year with over 30 million riders. In Illinois, Amtrak recorded ridership of 5.9 million passengers in 2016. Ridership in Illinois has experienced a decrease of 7.6% between 2013 and 2016.

Chicago is the Midwest hub for Amtrak and serves as the transfer point for 13 regional and transcontinental routes as shown in Figure 2. This figure depicts the vision for expansion of the passenger rail network in the Midwest. In addition, Illinois provides supplemental funding for 29 daily stops between Chicago and St. Louis, Milwaukee, Quincy, and Carbondale.



2.Midwest Regional Rail Initiative

FREIGHT RAIL

Illinois ranks at or near the top according to nearly all available metrics by the Association of American Railroads (AAR) regarding the size and extent of its rail industry. In their 2016 publication, the Illinois rail system was ranked as follows:

- First in carloads carried with nearly 11 million
- First in carloads terminated with 3.7 million, and second in carloads originated with 3.4 million
- Second in tons originated with 109.5 million and second in tons terminated with 157.8 million
- Second in railroad mileage with 6,986 route miles

- Third in tons carried with 481.6 million tons

PASSENGER RAIL

Passenger rail service providers carry over 87 million passengers per year within Illinois. In Illinois, Amtrak operates eight long-distance routes and four corridor services. Additionally, Illinois supports operation of three in-state routes and jointly supports the Chicago-Milwaukee Hiawatha service with the State of Wisconsin. Along with Amtrak, Illinois is home to Metra, which has the second highest average weekday ridership of any commuter rail system within the United States. The Metra system is comprised of eleven separate lines radiating out from Chicago's Loop, and serves more than 100 communities with 241 rail stations.

CONDITIONS AND CAPACITY

Chicago is America's speed bump. Shippers complain that a load of freight can make its way from Los Angeles to Chicago in 48 hours, and then take 24 hours to travel across the city. A recent trainload of sulfur took some 27 hours to pass through Chicago — an average speed of 1.13 miles per hour, or about a quarter the pace of many electric wheelchairs.

Regarding rail capacity, Illinois ranks fourth highest in the number of operating railroads. A total of 46 operating railroads in the state are comprised of seven Class I railroads, three regional railroads, twenty-seven short line railroads, and nine terminal carriers. The rail network ranks second among all states in total railroad route mileage. Chicago boasts the largest intermodal system in the nation and the third largest in the world. This network offers an efficient means of freight distribution and provides direct connections to coasts, as well as Canada and Mexico.

The seven Class I railroads operating within Illinois are responsible for approximately 80% of the track in the state and account for approximately 6,986 total route miles. The remaining track in Illinois is owned and operated by Metra, Amtrak, regional railroads, short-lines, and small switching, terminal railroads.

Metra is the commuter rail provider serving the Chicago metropolitan area. According to data by the American Public Transportation Association (APTA), Metra has the second highest average weekday ridership of any commuter rail system within the United States behind the Long Island Rail Road. Chicago's Union Station, which started a six-year, $1 billion renovation project in 2017, is the fourth busiest Amtrak station behind New York Penn Station, Washington Union Station, and Philadelphia 30th Street Station.

The conditions of the railroads in the state are safe and reliable and continue to provide around the clock service for business, products and commuters on a daily basis. However, in several areas there are needs for improved conditions. Rail capacity can be improved by reducing bottlenecks, upgrading components for operations and separating conflicting modes of transportation. The most notable bottlenecks are in the City of Chicago, where current conditions cause significant delay to users across the board.

OPERATIONS AND MAINTENANCE

Freight railroads in Illinois are generally responsible for the operation and maintenance of track and signal systems for freight and passenger services (Amtrak and Metra) through trackage agreements. Private railroads perform regular maintenance and invest in capital improvements to keep the rail infrastructure in serviceable condition. Their capital investments include ballast, track, bridge, signal, and drainage improvements. Overall, Class I railroads invest approximately 14% of their annual spending on maintaining infrastructure and equipment. Unlike other modes of transportation, railroads own the property and infrastructure over which they operate. This private network requires continuous investment to maintain desirable operating standards and regulations.

PUBLIC SAFETY

The most significant public safety concern is highway/railroad at-grade crossings. There are nearly 7,800 public at-grade crossings in Illinois with nearly 790 at-grade crossings in Cook County, the highest populated county in the State.

The Illinois Commerce Commission (ICC) and IDOT invest in the installation of improved safety warning devices for trains, pedestrians and vehicles at locations throughout Illinois. IDOT also undertakes studies to determine if certain at-grade crossings may be eliminated entirely. The Grade Crossing Protection Fund helps pay for the following type of projects:

- Warning device upgrades
- New and improved grade separations
- Vertical clearance improvements for grade separations
- Pedestrian grade separations
- Signal interconnects
- Crossing surface renewals

The ICC is also involved in the national Operation Lifesaver safety program. Operation Lifesaver relies on a combined approach of public education, enforcement, and engineering to decrease the number and severity of pedestrian and vehicle accidents at railroad crossings.

In Illinois the efforts to improve railroad grade crossing safety is working. Over the last ten years there has been a 35% decrease in the number of collisions at public at-grade railroad crossings. A consistent and increasing funding stream can help to assure that this positive safety trend continues.

Positive Train Control (PTC), which was initially passed by Congress in 2008 to increase safety, required America's privately-owned railroads to finance, develop, install and test this technology across the nation's rail network by December 31, 2015. The original deadline proved unworkable and was later extended by three years to 2018 by the Surface Transportation Extension Act of 2015. While the development of PTC will improve rail operation safety by preventing train-to-train collisions and preventing incursions by trains onto restricted sections of track, significant resources from the railroads have been used for PTC in place of other infrastructure improvements.

INVESTMENT AND FUNDING

Class I railroads are able to finance capital improvements on their own systems. These capital improvements are for maintaining the condition of its track and right-of-way, as well as railroad bridges and tunnels. However, many Regional and Short line railroad operators only maintain their segments to the most efficient level of operation, and high fixed costs and the addition of new regulations can force operators to discontinue service.

Both freight rail companies and passenger rail have been investing heavily in their tracks, bridges, and tunnels as well as adding new capacity for freight and passengers. It is estimated that the Class I railroads have made well over $3 billion in investments over the last eight years in Illinois. Since 2010, the State of Illinois has invested approximately $1 billion in freight and passenger rail improvements. This is in addition to the $1.5 billion investment by the Federal Government in passenger rail improvements and $0.5 billion investment in the CREATE program.

CREATE has invested in several critical improvements to increase the efficiency of the region's passenger and freight rail infrastructure. The CREATE program began in 2003 with 70 projects, including 25 highway/rail grade separation projects. To date, 28 of these projects have been completed, including 6 of the highway/rail grade separation projects. There are currently 17 of these projects in either the design phase or the environmental phase and 6 projects currently under construction. Nineteen of the projects are still waiting for funding.

The State of Illinois is also investing in upgrades to the Chicago to St. Louis corridor to reduce travel time for passenger trains, increase service reliability, and enhance safety. The upgrades include longer sidings, segments of second main tracks, bridge replacements, upgrades to the track structure, and highway grade crossing improvements. The state is also investing in two additional Amtrak start-up services between Chicago and Moline, IL and the Quad Cities and Danville, IL.

FUTURE NEEDS

By most measures, Illinois is the busiest railroad state in the nation. This dominance is expected to continue. Based on information in the 2012 Illinois State Rail Plan, it is forecasted that over the next 30 years, rail freight shipments from Illinois going out-of-state are expected to grow by 30%, freight shipments just passing through Illinois are predicted to grow by 25% over the same period, inbound (into Illinois) rail freight shipments are expected to grow by 4% and intrastate freight traffic is expected to grow by over 9%.

Substantial investments to the railroad infrastructure in Illinois will need to be made to accommodate the growth in freight rail traffic. Illinois divides its list of future rail investments into lists of short-term, happening in the next five years, and long-term capital projects, occurring in the next to 20 years. The combined total of the short-term projects is $3 billion, not counting grade crossing projects (which improve highway traffic). The combined total of the longer-term projects is $17.5 Billion, not including the costs for the remaining CREATE projects.

If the current level of funding is projected into the future and compared to the listed short- term and long term projects, it is clear that there are insufficient funds available. A prominent example is the previously mentioned CREATE program. Nineteen more grade separation structures are planned for the CREATE program, however, the funding does not exist to construct those projects. Of the original $3.2 billion required for the program, only $1.2 billion has materialized. Funding to complete the full CREATE program does not yet exist.

RECOMMENDATIONS TO RAISE THE GRADE

In an effort to sustain the gains made since 2014, the American Society of Civil Engineers (ASCE) Illinois Sections makes the following recommendations:

- Integrate rail into a State multimodal transportation policy that recognizes and takes advantage of efficiencies in the movement of people and goods. Include an investment program in collaboration with rail providers and neighboring states.
- Improve passenger rail in dense urban corridor markets and as an alternative to air and automobile travel for intercity markets
- Increase and expand passenger rail commuter services in urban areas and intercity passenger services linking major cities
- Support a regulatory and financial environment that encourages continued private investment in the state freight railroad system.
- Capitalize on Strong Public Support to Develop Policies that Focus on Bringing the System into a State of Good Repair: When fuel prices increased, transit ridership saw a correlated increase. Public support for investment is strong, which suggests that the public would support policies to ensure that the transit system remains in a state of good repair once the system is returned to this state.
- Evaluate and Build Stakeholder Awareness of the Backlog of Capital Projects: The condition of the transit system has deteriorated due to chronic underfunding and a recent downturn in capital investment. As transit funding continues to be a concern, agencies can do more to educate policymakers about the risks of underinvestment and explore how funding would be channeled to deal with the deterioration of the system.
- Identify Sustainable Design Practices that address changing physical conditions and increase infrastructure resiliency. The recent devastation of transit in Texas and the Gulf Coast in Florida attributable to Hurricanes Harvey and Irma, demonstrates the need to have contingency planning for aging systems that are costly to repair.
- Develop a Predictable Funding Stream for Capital Investment over a Multi- Year Period: The evidence suggests the level of support needed to avoid further deterioration of the system and replace obsolete assets is significant. It is critical to have an integrated regional transportation system plan with funding needs identified to promote an efficient and effective transport system for the long-term.

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ROADS

EXECUTIVE SUMMARY

Illinois has more than 145,700 miles of roadway and is third in the nation for total interstate miles. Despite its extensive network, the State's roadways were ranked third worst nationally for travel delay, excess fuel consumed, truck congestion cost, and total congestion cost. Despite the need for maintenance and repair, Illinois' 19 cent-per-gallon motor fuel tax has remained the same since 1991. Facing the realities of restricted revenue, the Illinois Department of Transportation (IDOT) Multi-Year Plan reduces available funding by over $1 billion total from FY 2018-2023. Meanwhile, Illinois residents are still paying; driving on roads in need of repair costs Illinois motorists $4.8 billion a year in extra vehicle repairs and operating costs, or $566 per motorist. While several high-profile projects have been completed by IDOT and the Illinois Tollway, long-term sustainable funding sources are required to meaningfully address the quality of the State's road system.

WHAT YOU SHOULD KNOW ABOUT ILLINOIS' ROADS

Illinois has more than 145,700 miles of roadways, of which 15,969 miles (11%) are state-owned and maintained by the IDOT. In all, there are 2,185 interstate miles that serve the state, making Illinois the third ranking state in the U.S. in terms of interstate miles. Illinois is at the crossroads of the nation.

Many of Illinois' interstates are owned and maintained by the Illinois Tollway. The Tollway operates and maintains 292 miles of interstate tollways in 12 counties in northern Illinois with revenue from toll collection. The Tollway is currently operating in year six of its 15-year, $14 billion program called *Move Illinois: The Illinois Tollway Driving the Future*. The Tollway runs almost exclusively with revenue from tolls. It is independent of the State of Illinois and IDOT and is removed from their funding issues. This document, therefore, focuses primarily on IDOT. Other owners and maintainers of non-interstate roads in Illinois include 102 counties, 1,432 townships, and 1,299 incorporated municipalities.

On a yearly basis, IDOT develops fiscally constrained six-year funding programs called Multi-Year Plans or MYPs. For the development of the current MYP, Fiscal Year (FY) 2018-2023, IDOT used a new tool called Value-Driven Project Selection, which included the following performance measures and goals.

Improved Traffic Operations / Congestion Reduction			Safety		Economic Development				Livability				Regional Input
AADT	Volume/Capacity Ratio	Hours of Delay	Safer Road Index	Safety Benefit	Travel Time Reliability	Freight Hours of Delay	Intermodal Accessibility	Economic Development Proximity Index	Access to Jobs	Access to Multimodal Choices	Active Transportation Accessibility	Enviornmental Impact	Regional Ranking

Source: IDOT, FY 2018-2023, Proposed Highway Improvement Program, Draft

Illinois has a 19-cent per gallon motor fuel tax, an amount that has remained the same since 1991.

In 2016, Illinois residents shared their concerns about transportation funding when they approved the Safe Roads Amendment (a.k.a. Lockbox Amendment) requiring that all transportation funding be used only on transportation investments. This amendment does not provide any new revenue but rather protects existing transportation revenue from being used for non-transportation uses.

Through the most recent federal transportation bill – Fixing America's Surface Transportation (FAST) Act – IDOT is supposed to receive approximately $7.5 billion in federal funding for highways and bridges over five years, which equates to an average of $1.5 billion per year, which is sixth highest in the nation.

FUNDING

In May 2017, IDOT released its draft Fiscal Year (FY) 2018-2023 MYP, which included a total of $11.65 billion and $2.2 billion for FY 2018.

In July 2017, Illinois lawmakers, for the first time, transferred funds from the Motor Fuel Tax (i.e. the Road Fund) to non-road related uses, more specifically transit, in an effort to shore up funding that was previously paid for by the General Revenue Fund.

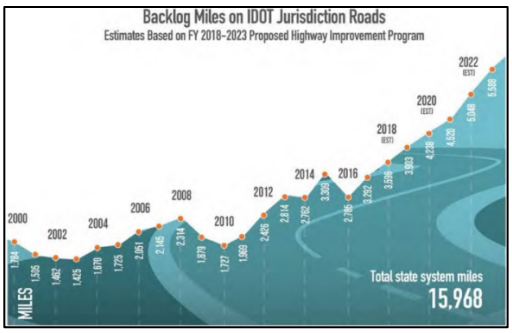
While the Lockbox Amendment is a good step, it does not increase revenues for the transportation industry and does not fully prevent current revenues from being reallocated. In July 2017, Illinois lawmakers, for the first time, transferred funds from the Motor Fuel Tax (i.e. the Road Fund) to mass transit in an effort to shore up funding that was previously paid for by the General Revenue Fund. This diversionary transfer further depleted funding for Illinois roads. This transfer will likely not be a one-time occurrence, and could last in perpetuity. IDOT will face similar cuts each year if these transfers are not reversed or eliminated. Such a transfer from the Road Fund is not a violation of the previously approved Lockbox Amendment because the transfer will be going to transportation-related items. The Lockbox Amendment "loophole" was predicted by experts around the state and has come to fruition in year one.

The net result for IDOT's FY 2018 program, which was finalized in October 2017, is as follows. The program will be reduced from $2.2 billion to $1.9 billion. IDOT was forced to defer 124 miles of road improvements and 22 bridge improvements into later fiscal years. Looking ahead, IDOT's FY 2018-2023 MYP will be reduced by over $1 billion, and Illinois will be in a worse position to compete for federal funds because of fewer state dollars for matching.

One bright side is that the Chicago Metropolitan Agency for Planning (CMAP) recently undertook a new initiative at the request of, and with funding from, IDOT and the Tollway. The Expressway Vision will look to strategically guide future capital investments, coordinate expressway operations across jurisdictions, address freight congestion while also incorporating public transit into the existing system. One drawback is that it currently focuses only on northeastern Illinois.

FUTURE NEEDS

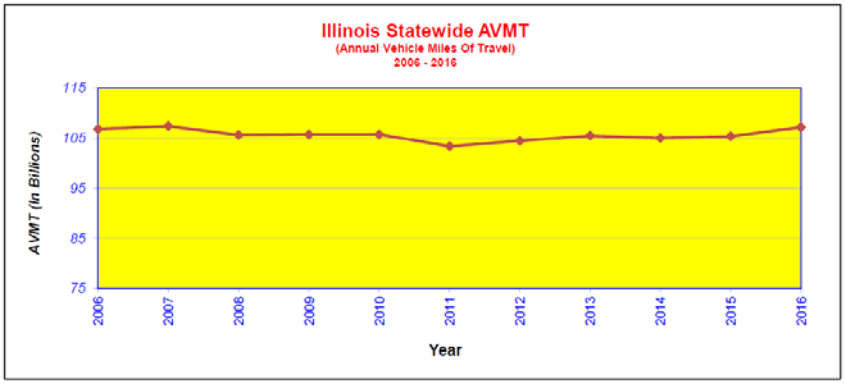
IDOT defines "backlog" as a road that has deteriorated to a point where an improvement is needed now. IDOT's backlog decreased between 2015 and 2016. However, it is projected to increase continuously from 2016 to 2022 and beyond. The graphic below does not incorporate the recent funds transfer away from roads for FY 2018 and beyond.



Source: IDOT, FY 2018-2023, Proposed Highway Improvement Program, Draft

CAPACITY

Statewide annual vehicle miles of travel (AVMT) has been steady since 2006. In 2016, 72.3% of AVMT was on interstates, other principal arterials, and minor arterials. Also in 2016, the breakdown of AVMT was 89% passenger vehicles and 11% trucks. However, it is the AVMT increase of 1.7% between 2015 and 2016 that is worth digging deeper. This upward trend in AVMT in combination with a population decrease between 2015 and 2016 indicate that capacity on Illinois roads is decreasing. Or, from a different perspective, perhaps full capacity on Illinois roads has already been reached and is now contributing to a negative population growth. This observation has been identified in other states such as Maine.



Source: IDOT, 2016, Illinois Travel Statistics

According to the Urban Mobility Scorecard by the Texas A&M Transportation Institute, the Chicago area is ranked third worst nationwide in the following four categories: (1) travel delay, (2) excess fuel consumed, (3) truck congestion cost, and (4) total congestion cost. Drivers in the Chicago area experience 61 hours of delay per year per commuter.

IDOT analyzed 16 urbanized areas throughout the state and found that the top six areas for increased daily vehicle miles of travel per mile (DVMT/MI) are: (1) Chicago, (2) Rockford, (3) East Cape Girardeau (as part of the Jackson, Missouri metropolitan area), (4) Springfield (the state capital), (5) Bloomington, and (6) Kankakee.

CONDITION

In order to measure the condition of highways and roadways, states are required to report the International Roughness Index (IRI) for the interstate system, other principal arterials, rural minor arterials, and the National Highway System to the Federal Highway Administration (FHWA). The IRI method of rating highways and roadways is recommended by FHWA because it is a standardized and objective measurement.

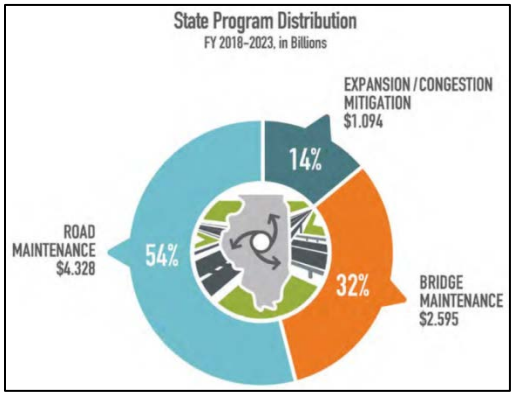
Road Condition: 2013 (in miles)							
-	Very Good (IRI <60)	Good (IRI 60-94)	Acceptable (IRI 95-170)	Not Acceptable (IRI 171-220)	Poor (IRI >220)	Not Reported	Average IRI
United States	90,793	206,333	276,698	73,890	65,776	12,527	122
% of U.S. Total	12.51%	28.42%	38.11%	10.18%	9.06%	1.73%	N/A
Illinois	2,634	9,636	12,304	3,226	3,141	0	125
% of IL Total	8.51%	31.14%	39.77%	10.43%	10.15%	0.00%	N/A

Source: **Adapted** from U.S. Department of Transportation, 2015, State Transportation Statistics

In 2011, the U.S. average IRI was 123, but it improved slightly to 122 in 2013. Meanwhile, Illinois was the 36th ranked state in 2011 with an average IRI of 131, but it improved to become the 26th ranked state in 2013 with an average IRI of 125. While road conditions have improved more in Illinois than they have nationwide, they still remain lower than the U.S. average. And, driving on roads in need of repair still costs Illinois motorists $4.8 billion a year in extra vehicle repairs and operating costs, or $566 per motorist.

OPERATION AND MAINTENANCE

IDOT's draft Fiscal Year (FY) 2018-2023 MYP originally included a total of $4.328 billion for roadway maintenance, or approximately 54% of the MYP.



Source: IDOT, FY 2018-2013, Proposed Highway Improvement Program, Draft

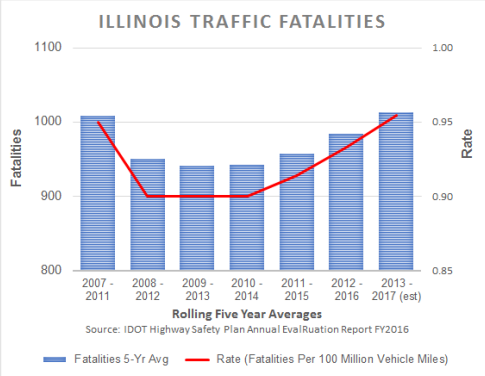
Roadway maintenance included reconstruction, resurfacing/widening, and safety projects. This also included $730 million for interstate resurfacing projects and $466 million for safety improvements.

The Funding section above identifies negative impacts soon to be experienced under operation and maintenance.

PUBLIC SAFETY

From 2014 to 2016, traffic related fatalities per year and fatality rate per miles driven in Illinois were on the rise. Once medical costs, lost productivity, travel delays, workplace costs, insurance, and legal costs are taken into account, the impact on the state's economic health was estimated to total $4.2 billion according to TRIP, a national transportation research group.

The IDOT 2016 Highway Safety Program Annual Evaluation Report defines performance measures to be used for setting safety goals, which are based on rolling five-year averages for measures such as total traffic fatalities. Illinois traffic fatalities for 2016 increased by 0.2 deaths per 100 million vehicle miles traveled (VMT) over 2015. This 6% fatality increase in Illinois matches the 6% increase for the United States.



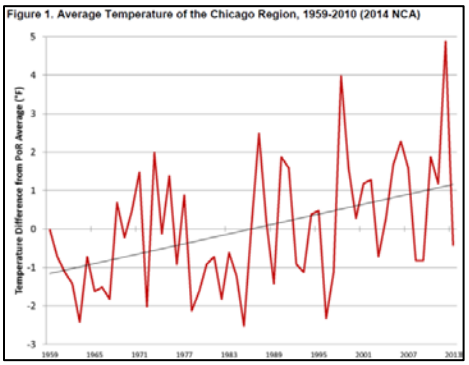
Source: **Adapted** from IDOT, 2016, Highway Safety Program Annual Evaluation Report

Possible factors contributing to the recent upward trend of the fatality rate include increased distracted driving, increased VMT without capacity improvements, and reduced funding for safety improvements.

RESILIENCE

One goal in IDOT's 2017 Long Range Transportation Plan (LRTP) is: *Resilience: Proactively plan and invest in the state's transportation system to ensure that its infrastructure is prepared to sustain extreme weather events.* IDOT anticipates completion of the 2017 LRTP by the end of 2017. ASCE recommend that it will cover the following topics and beyond.

- What investments will be made to improve resiliency?
- How redundant is the resiliency plan?
- Will road closures be easily re-routed or will parts of the roadway system be shut down?
- How will the roadway system bounce back from an extreme event?



Source: CMAP, 2017, Climate Resilience Strategy Paper

INNOVATION

IDOT is pursuing a managed lanes project for I-55 that enters Chicago from the southwest. The corridor is anticipated to include Intelligent Transportation Systems that will support congestion management strategies. IDOT is exploring many different options to deliver this project. In January 2016, IDOT advertised for a Public-Private Partnership (P3) advisor to assist with leveraging private investments for innovative project delivery. Despite ongoing preliminary engineering and a public meeting on December 6, 2017, the P3 portion of this project continues to be considered as alternative even though it is being stalled by statewide legislation.

The Tollway launched the new I-90 SmartRoad in 2017, a 16-mile stretch of interstate between the northwest suburbs of Chicago and O'Hare Airport. This state-of-the-art corridor was designed to deliver real-time information to drivers to provide safer, more efficient travel. Over-the-road signs installed every half mile allow the Tollway to communicate travel times, traffic incident information, lane closures, and traffic pattern changes. Data collected by the Tollway is also being shared with navigation applications such as Waze, MapQuest, and Google Maps.

RECOMMENDATIONS TO RAISE THE GRADE

- Re-evaluate the Lockbox Amendment "loophole" to ensure that additional transportation related items paid for from other sources (i.e. the General Revenue Fund) are not re-obligated to the Road Fund
- Create sustainable, long-term funding mechanisms at all levels of government to repair, improve, and expand the Illinois surface transportation system and fill or narrow the gap between funding available and funding required.
- Implement congestion pricing strategies on the expressways, including tolling and managed lanes, to decrease highway congestion, to relieve congestion costs for travelers, and to aid economic development.
- Increase funding for long-term, advanced highway research.
- Continue and increase federal funding provided to Illinois under the FAST Act.
- Address the long-term viability of fuel taxes for transportation funding and explore the viability of the most promising options to strengthen this funding.
- Evaluate non-traditional practices including road user fees, public-private partnerships, and design-build practices.

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TRANSIT

EXECUTIVE SUMMARY

96 out of Illinois' 102 counties offer transit service and 63 public transit operators and providers support an estimated 736 million annual trips. Much of the infrastructure for a world-class transit system, particularly in Northeastern Illinois, is in place. Unfortunately, transit in the state has suffered as a result of age and lack of funding. Current multi-year capital needs for transit in northeastern Illinois require an annual funding level of between $2 and $3 billion to bring the system back into a state of good repair and undertake limited modernization, enhancement and expansion initiatives, but the current capital funding plan provides only about half of what is needed. Meanwhile, intra-suburban commuting poses a major challenge for transit given the automobile orientation of many suburban developments, although environmental concerns and the cost of gasoline make transit appealing to some commuters.

CAPACITY & CONDITION

Transit improves Illinois' quality of life and environment. As a vital mode of transportation for many commuters, transit helps reduce congestion by clearing the roadway for other drivers and provides mobility throughout the region. For people who do not drive or own a car, transit is a lifeline, enabling them to get around safely, conveniently and affordably. Additionally, transit reduces pollution, use of petroleum and travel times.

Public transit is a critical component of Illinois' multimodal transportation system. Illinois has made significant growth in public transportation over the past decade. In recent years, the Illinois Department of Transportation (IDOT) has worked with regional groups to develop coordinated public transportation-human service transportation plans throughout the State. Additionally, Illinois has seen dramatic growth in new and expanded public transportation services in the rural areas of the State. State capital programs have provided needed funding for transit projects throughout the state, yet the need for additional funding to maintain a state of good repair and enhance Illinois' public transportation system is still needed.

Across the state, 63 public transit operators/providers help millions of people reach their destinations every day. Illinois ranks third in transit ridership across the nation with approximately 680 million trips in 2013. 96 out of the state's 102 counties offer some type of transit service to their communities.

The Regional Transit Authority (RTA) is responsible for the planning, funding and oversight of public transportation for six counties and 277 municipalities located in Northeastern Illinois. RTA allocates funding to three Service Boards: the Chicago Transit Authority (commuter trains and buses), METRA (commuter trains), and PACE (suburban buses and regional paratransit). The RTA network serves the third largest U.S. transit market, with approximately 8.4 million residents and 636 million rides annually comprising the second largest public transportation system in the United States. PACE provided or facilitated approximately 7.7 million rides via specialized transportation including paratransit, vanpool, and dial-a-ride services in 2015.

Outside of northeast Illinois, 14 fixed route urban bus systems provided nearly 40 million rides in 2013 with ridership growing between 2 and 5% each year since 2008. More than 93% of the population in Downstate Illinois has access to some form of public transportation. The six largest transit agencies carry over 25.6M riders per year.

- Connect Transit in Bloomington – over 2.5M rides
- Champaign-Urbana MTD – over 12.7M rides
- CityLink in Peoria – over 3M rides
- MetroLink in Rock Island – over 3.5M rides
- Madison County Transit in St Louis Metro area – over 2.6M rides
- Rockford Mass Transit District – over 1.3M rides

The transit system includes approximately 7,500 passenger vehicles, over 400 stations and 70 maintenance facilities serving Chicago and hundreds of suburbs spread across six counties. Some parts of the system are newer and function well, while other parts of the system are more than a century old and in need of a major overhaul. For safety reasons, slow zones exist on several city and suburban train lines, causing daily delays for commuters. Some of the busiest train lines are so crowded during rush hour that people cannot board. Many buses, trains and passenger vans are past their design life, leading to frequent breakdowns. At the same time, needed train and bus services have been added to growing suburban communities. In addition, services have been added to serve important segments of the population, including people with disabilities and senior citizens.

OPERATIONS & MAINTENANCE

The RTA initiates an annual capital asset condition assessment program to estimate the total capital need for each of the Service Boards, based upon a condition assessment of the current asset inventory. The 2016 current capital investment analysis determined that the RTA faces a SGR backlog of $19.4 billion ($2015). In addition to the backlog projects, the region also requires a normal reinvestment, which results in a total 10-year backlog capital need of $37.7 billion. Backlog is defined as the cost of replacing and repairing assets that are beyond their useful life: normal reinvestment is the ongoing capital needs required to keep an asset in a state of good repair, including asset replacement, rehabilitation, and minor capital repair. Exhibit 2-1 shows the ten-year investment needs for each Service Board.

EXHIBIT 2-1. BACKLOG AND 10-YEAR NORMAL REINVESTMENT NEEDS SUMMARY (2015 $ IN MILLIONS)

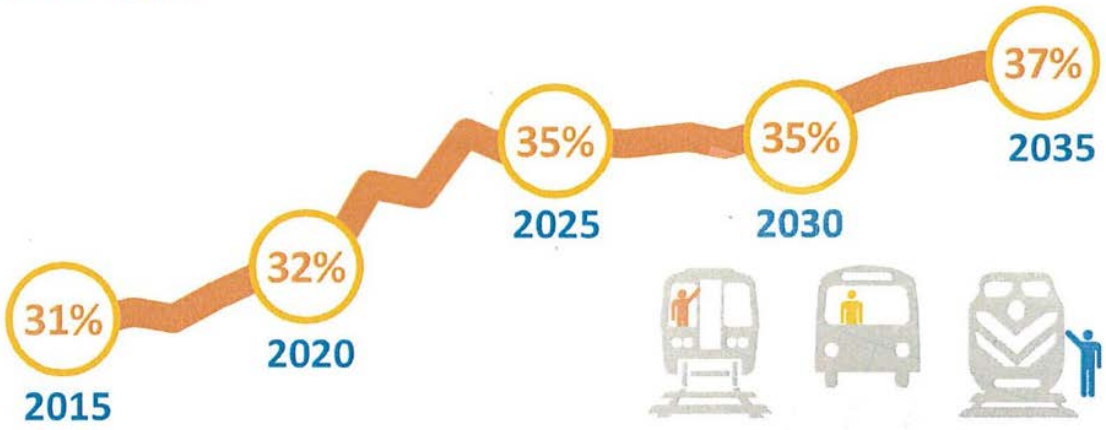
Service Board	SGR Backlog	Normal Reinvestment			Total
		Replace	Rehab	Capital Maint.	
CTA	$12,456	$5,729	$4,199	$698	$23,082
Metra	$6,139	$4,260	$1,282	$323	$12,004
Pace	$755	$1,150	$561	$120	$2,586
Total	**$19,350**	**$11,139**	**$6,043**	**$1,140**	**$37,672**
% of Total	51.4%	29.6%	16.0%	3.0%	100.0%

At present, approximately 31% of RTA assets are not in a State of Good Repair. Without an increased investment, that percentage will grow each year as shown in Exhibit 2-2. By 2035, the percentage of RTA assets not in a state of good repair is projected to reach 37% given the current investment levels.

The RTA system confronts a large gap between available capital funds and the growing list of deferred needs. A lack of sufficient investment will lead to reduced operating speeds and decreased service reliability. Declining reliability of the transit system will ultimately drive riders away.

The goal of the RTA system is to achieve an asset condition with at least 80% of assets in a state of good repair within twenty years. To achieve this goal, the region requires an investment level of $2-3 billion per year, an increase from the $785 million average annual funding level.

EXHIBIT 2-2. PROJECTED PERCENTAGE OF RTA ASSETS NOT IN STATE OF GOOD REPAIR



Assets Exceeding Useful Life as Percent of Total Replacement Value
Projected funding at current levels of $785 million annually

FUNDING & FUTURE NEED

RTA has a $5 billion total capital budget for the next five years. Funding is collected through Service Board system-generated revenue and public funding. Service Board revenue and the RTA sales tax each provide approximately 40% of the total budget, while State funding sources provide approximately 20%, the vast majority of which is comprised of a state match on a percentage of RTA sales tax dollars collected.

A substantial portion of that available funding is committed to debt service and the Red-Purple Modernization (RPM) Program Phase 1, so not much is available for discretionary capital use. Without a State capital program, the transit agencies rely mostly on Federal funding to rebuild their infrastructure and purchase new vehicles. To keep construction projects and capital programs moving, CTA is using bonding and Tax Increment Financing dedicated to the RPM Program. Metra has increased fares to develop a dedicated pool of capital funds and has pursued lease programs with locomotive manufacturers. Pace has also bonded and put some projects on hold pending availability of State funding.

In addition, regional growth will require that the system continue to expand while sustaining service quality. This will require increased levels of capital investment and an increased commitment of operating funds if the strategic vision and goals are to be achieved.

On July 1, 2016, the Illinois legislature passed a new policy that will aid the financing of transit projects. Both the House & Senate approved the Transit Facility Improvement Area (TFIA). This is an innovative approach to finance specific transit projects in the City of Chicago. By authorizing the TFIA, the Illinois General Assembly created a way for the City of Chicago to provide the necessary match for the Red/Purple Line modernization and the critical improvements to Union Station.

This is how the TFIA works: The added value that the enhanced transit service brings to the surrounding property is captured in the form of property taxes and used to finance the improvements to the transit facility {that captured the increase in the first place}. Passage of the TFIA was a great step forward in the battle to maintain the Chicago region's transportation infrastructure and remain competitive in the global economy.

PUBLIC SAFETY

Illinois' aging RTA transit system creates real performance and safety challenges. There are slow zones where the train speeds must be restricted to maintain safe travel. Typically, slow zones occur in track sections that are beyond their service life and need repair or replacement.

RECOMMENDATIONS TO RAISE THE GRADE

The federal government makes billions of dollars available each year for public transit projects, for which state and local governments need to provide matching funds. The Illinois Section of ASCE supports the following recommendations:

- Implement a new State capital program that can provide a predictable, sustainable level of funding is essential to the development of a long-term regional capital program.
- Make investing in the state of good repair (SGR) needs of the nation's largest and oldest transit systems a central goal of federal surface transportation authorization. According to the recent FTA Rail Modernization Study, the seven largest transit systems (which included CTA) have a SGR backlog over $50 billion ($2008). The transit system in northeastern Illinois (including CTA, Metra and Pace) needs at least $37 billion to bring the system up to a SGR. The transit system can only reach its full potential if the SGR needs are addressed.
- Provide significant additional investments by the federal government to expand the system to reach more riders and increase the level of service across the region.

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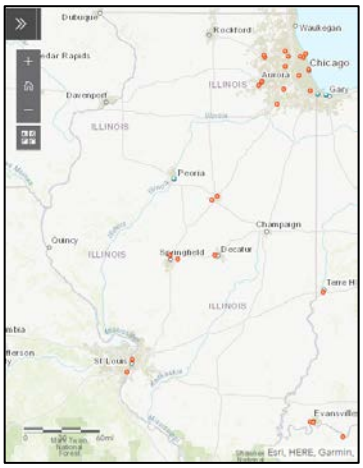
WASTEWATER

EXECUTIVE SUMMARY

Illinois' 12.8 million residents are served by over 800 wastewater treatment facilities. Overall, the capacity and condition of these facilities have remained consistent over the past few years. Combined sewer overflows that discharge directly into rivers and lakes continue to be of concern. The state needs $6.5 billion to meet the water quality and water-related public health goals of the Clean Water Act, according to survey results published in 2016. Funding is especially needed for secondary wastewater treatment, combined sewer overflow correction, and conveyance system repair. Local governments looking to construct new wastewater facilities or rehabilitate existing systems can apply for financing through Illinois' Water Pollution Control Loan Program. Awards have more than tripled since 2016; an estimated $1.4 billion will be approved this year. While this is a step in the right direction, additional dedicated and available funding is needed to comprehensively address the State's wastewater needs.

OVERVIEW

Illinois' roughly 12.8 million residents live in 1,300 municipalities with more than 800 wastewater treatment facilities. One of the major potential concerns related to wastewater is when a combined sewer overflow (CSO) occurs. In newer developments, the sanitary sewers and stormwater sewers are usually separate systems. However, in a combined sewer system, the sanitary waste and stormwater flow in the same pipes and are transported to the wastewater treatment plant. The treatment plants are generally designed to handle the dry-weather flow, but if there is an event like a heavy rain or a snow melt, it can cause the treatment system to be overwhelmed and the combined stormwater and raw sewage is discharged directly into rivers and lakes. This is a source of water pollution and a public health concern. It can lead to beach closings and degraded water quality. To address the issues of CSOs, long term control plans were required, and these are in the process of being implemented. Illinois has 108 CSO permits, or 108 cities with combined sewer systems, and 742 outfalls, or pipelines and tunnels that discharge waste into nearby water. In 2014, Illinois reported 41 CSO events in the Chicago region, mostly to Chicago-area rivers, and one event to Lake Michigan.



Map of Combined Sewer Overflow Systems serving a population of 50,000 people or more

Since 2014, the state of Illinois has made progress in encouraging wastewater treatment facilities to improve reduction and recovery of nutrients. This goal of nutrient reduction has provided wastewater utilities the opportunity to deploy new technologies for their treatment facilities. At the same time, it requires more capital costs to go towards improving infrastructure that has met pollutant removal requirements in the past but is no longer adequate to meet the lowered pollutant limits for nutrients.

CAPACITY, CONDITION, PUBLIC SAFETY, AND OPERATION AND MAINTENANCE

Illinois' 12.8 million residents are served by over 800 wastewater treatment facilities. Wastewater treatment is very localized and there is limited publicly available data with statistics that encompass the entire state. Based on the limited survey responses that were received from wastewater agencies, the capacity, condition, public safety, and operations and maintenance of wastewater treatment plants has remained consistent.

Fifteen restricted and 24 critical status treatment facilities exist throughout the state. Restricted status means that the Illinois Environmental Protection Agency (IEPA) has determined that the plant has reached design capacity and additional sewer connection permits may no longer be issued without causing a violation. Critical status is defined as a plant that is approaching the design capacity and additional sewer connection permit applications will require close scrutiny

As mentioned, 108 Illinois municipalities continue to have CSO events, which affect Lake Michigan and local waterways. CSOs are regulated by the U.S. Environmental Protection Agency (EPA). The CSO Control Policy, published by the U.S. EPA, requires all combined sewer communities to develop and implement a Long-Term Control Plan. One example is the Chicago metropolitan area, which is served by a combined sewer system, has implemented the Tunnel and Reservoir Plan (TARP) to meet the long-term control plan requirement. Phase I of the plan has been completed and Phase II is underway. This has already led to significant improvements in water quality and fewer CSOs.

In the Great Lakes Basin in Illinois, there are 41 CSO communities (this is counting the city of Chicago plus 40 satellite communities within the TARP area). In 2014, there were 41 CSO events reported with one of those events discharging to Lake Michigan and the rest of the events discharging to Chicago-area rivers that do not flow to Lake Michigan. The volume of untreated wastewater that was discharged to the lake was 525 million gallons. CSOs can pose risks to public safety due to their impact on water quality. These incidents sometimes make water unsafe for swimming, boating, or fishing.

The condition of the sewer systems impacts the operational costs of the plants. The aging sewer system contributes to more infiltration, which means that the water volume the plants need to treat increases, creating more cost.

Operation and maintenance of the huge infrastructure wastewater treatment system is a large undertaking. Federal funding cannot be used to pay for operations and maintenance, so the burden falls on the rate payers. The funds raised by rates are often insufficient to address the needs of the aging wastewater system.

FUNDING AND FUTURE NEED

Complying with federal wastewater and stormwater regulations are often some of the costliest capital projects for cities and towns. The sources of the funds vary, including dedicated fees (such as stormwater or watershed restoration fees), local taxes, sewer rates, and the federal government.

The state of Illinois needs $6.5 billion to meet the water quality and water-related public health goals of the Clean Water Act, according to survey results published in 2016. The greatest percentage (44%) of these funds are needed for Secondary Wastewater Treatment. Combined Sewer Overflow Correction and Conveyance System Repair are the two next largest needs.

Since the 2014 Report Card, no new funding has been provided under the Illinois Green Infrastructure Grant Program for Stormwater Management (IGIG), a state of Illinois grant program to help fund stormwater projects. However,

wastewater projects have successfully secured funding and financing through alternative methods. The Illinois Clean Water Initiative provides low-interest loans for wastewater and Stormwater projects through the State Revolving Fund (SRF). The SRF annual report indicates funding has improved in recent years. The state is in the process of approving approximately $1.4 billion in Water Pollution Control projects for 2018 which more than triples the number of projects that received awards for funding in 2016. If funding continues to increase at this rate, it is on target to reach 2014 funding level recommendations by the year 2025 and the 2016 survey funding recommendation of $6.5 billion by 2036.

The Water Infrastructure Finance and Innovation Act (WIFIA) of 2014 authorized funds to be used to provide loans or other kinds of credit support for major projects (over $20 million) or to increase capital for SRFs. WIFIA is a useful tool to help fill the gap for funding for larger infrastructure projects (most SRFs are unable to finance projects of this size).

The increased funding of the SRF and continued investment in low-interest loan rates means an overall improvement to the state's commitment to funding wastewater infrastructure. However, the additional funding is still necessary to meet the demands of treating both wastewater produced by the state's population and that entering the treatment facilities from storm events.

INNOVATION AND RESILIENCE

With the need to reduce nutrients discharged into waterways leading to the Gulf of Mexico, replenish aquifer levels, and make a conscious effort to find other uses for treated wastewater, the state of Illinois has made strides towards its investigation of updating its treatment technologies.

On August 18, 2017, the state of Illinois amended 415 ILCS 5/22.56a, the state biosolids statute, to include Exceptional Quality (EQ) biosolids. This modification transforms biosolids from a byproduct of the treatment of wastewater to a resource to be recovered by wastewater treatment facilities. With the enacting of more stringent nitrogen and phosphorus limits in National Pollution Discharge & Elimination System (NPDES) permits, this modification provides municipalities a means to offset their costs for additional treatment requirements and encourages those same municipalities to treat their biosolids as a beneficial resource to their communities.

In the Chicago area, some industries have explored accessing treated wastewater as a source for non-contact industrial applications. In addition, the state of Illinois is exploring ways to reuse greywater, water from bathroom sinks, showers, and washing machines under Bill HJR0073. Although neither program has been approved, these applications would reduce the strain on treated potable water and reduce influent loadings on local treatment facilities.

Finally, Illinois faces the threat of natural disasters each year in the form of flooding, tornadoes, and other severe weather. This challenges treatment facilities' resiliency, as most are located near waterways and are a vital resource to their communities' human and environmental health. In Illinois, an organization knows as Illinois Water/Wastewater Agency Response Network (ILWARN) has been organizing member communities with agreements to provide resources and aid in the event of natural disasters. ILWARN has a membership of 90 wastewater utilities in the state, providing coverage to approximately 80% of the state's population, of which 47 have signed agreements for mutual assistance. This organization has grown in membership since 2014, demonstrating an awareness by utilities of the need to be prepared.

Combining these different efforts for reducing nutrient loading in wastewater, modifying the biosolids statutes to allow additional land application, finding uses for nonpotable water sources, and developing a network for municipalities to quickly organize and respond to natural disasters, the state is growing in its resilience as its population further taxes water resources.

RECOMMENDATIONS TO RAISE THE GRADE

Since the 2014 Report Card, the state of Illinois has made improvements that align with ASCE's recommendations. Therefore, the state's score is raised to a C-, but additional efforts must be made to keep the state's efforts from

slipping back and the grade falling once more.

- Increase funding to the State Revolving Loan Fund as recommended in the previous Report Card.
- Continue to fund low-interest loans.
- Support the creation of a federal Water Infrastructure Trust Fund.
- Encourage municipalities to treat biosolids to an exceptional quality. In the state of Illinois this will allow for land application beyond those applications already allowed under the current Class A and B biosolids statutes. Doing so will provide additional sources of revenue for publicly owned treatment works and promote reuse of nutrients found in wastewater as a vital resource.
- Encourage municipalities to find uses for its greywater and treated wastewater.
- Continue to encourage industrial, agricultural, and municipal partnerships to explore sustainability in each of its practices as it pertains to recovering resources from wastewater.
- Establish a statewide infrastructure needs inventory administered by the state's municipal planning organizations that would help increase public awareness of problems and needs facing the state's physical infrastructure and would help the state Legislature focus on programs devoted to long-term growth and productivity.
- Continue to fund research for new wastewater treatment technology.
- Create statewide pollutant trading markets.

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