2022

REPORT CARD FOR ILLINOIS INFRASTRUCTURE

ILLINOIS SECTION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

ASCE
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2022 Illinois Report Card Executive Summary

Whether we realize it or not, every person in Illinois uses infrastructure every day. From brushing our teeth, taking the train to work, or going to the grocery store, infrastructure is the backbone of our daily lives and communities. While we may not fully acknowledge it, the importance and condition of our infrastructure has a very real and direct impact on every person, business and community. We all depend on roads and bridges to get us where we are going, pipes that delivers clean water to our taps, and a network of inland waterways, ports, rail, and transit to move goods and people. These systems drive and improve our economy and subsequently, our lives.

The crossroads of our country's rail, air, roadway and waterway systems run through Illinois which provides our state with a unique competitive economic advantage that should be protected and enhanced. The last few years have shown that investing in our infrastructure has benefits. From the Rebuild Illinois Capital Plan and low interest loans for drinking water and wastewater projects to the recently passed Federal Infrastructure Investment and Jobs Act, infrastructure funding has increased grades for several categories while laying the critical foundation for investment in

our future over the next decade. These investments will help Illinois capitalize on our geographical advantages, which in turn will create and promote growth for our state's economy and citizens. However, we cannot become complacent. There is still significant underinvestment in several categories that threaten our competitive advantage and the health, safety and welfare of our citizens. We need to continue the momentum of investing in the infrastructure engine that drives our lives and economy.

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The Report Card was created to help every citizen, stakeholder and decision-maker in Illinois understand the state of our infrastructure and where we can collectively work to improve it. As civil engineers, our role in society is to plan, design, construct, and maintain our infrastructure networks and this document allows us the opportunity to share that information with the public. This infrastructure snapshot enables us to track how our investments are doing while engaging in conversations about where we want to be going in the future. We hope that this information provides the insight needed to start that conversation and ignite action.

About The Report Card for Illinois' Infrastructure

While you may not think about infrastructure every day, civil engineers do because we have pledged to build it, maintain it, and keep the public safe. As an organization of civil engineers who live and work in Illinois, we want to share what its condition is and what can be done to improve it.

Methodology

The purpose of the Report Card for Illinois' Infrastructure is to inform the public and decision makers of the current condition of our state's infrastructure in a concise and easily accessible format of a school report card. Each of the categories of infrastructure covered in the Report Card is assessed using rigorous grading criteria and recent data to provide a comprehensive assessment of the area's infrastructure. ASCE has used the following criteria to discuss and grade the state of the infrastructure:

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?

GRADING SCALE

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 are resilient to withstand most disasters and severe weather events.

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.

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.

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.

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.

INCOMPLETE

The infrastructure in the system or network does not have sufficient data to provide a grade.

2022 Report Card for Illinois' Infrastructure

G.P.A.

AVIATION C+	
BRIDGES C	RAIL C+
DAMS C+	ROADS D+
DRINKING WATER D+	STORMWATER D+
INLAND WATERWAYS D	TRANSIT D+
PORTS C-	WASTEWATER C-

Recommendations to Raise the Grade

1. The recent additional funding for Illinois' infrastructure is much needed and signals a new era for our state's built environment, but it must be accompanied by workforce development. Drinking water and wastewater treatment operators – particularly in rural areas – are in short supply, and technical training and apprenticeship programs can help close the skill gap.

2. Illinois' communities and water agencies are starting to make real progress on identifying the scope of the lead service line problem. A clearer picture is starting to form on the true magnitude of this problem, and steps must be taken to begin developing and implementing replacement plans. Financing and funding should be obtained by applying for federal grants, obtaining bonds, and raising rates to reflect the true cost of service.

3. With aging stormwater infrastructure and increasingly severe rainfall events, our stormwater management systems are and will continue to be under intensifying pressure and in need of significant investment. Dedicated funding sources through stormwater utilities and fully leveraging available state and federal funds will be critical to reducing urban flooding and improving water quality throughout the state.

4. Over the past 15 years, Illinois' many local jurisdictions have better collaborated to alleviate freight bottlenecks and secure increased funding. Improvements have been made, but challenges remain, especially as supply chains buckle under COVID-19 related challenges. Looking forward, decision makers at all levels of government should prioritize investments in the Illinois multimodal freight network and accelerate progress, particularly in the rail, ports, inland waterways, and roadway network.

Aviation

C+

EXECUTIVE SUMMARY

Illinois' airports are a gateway for approximately 6 million passengers and 10 billion pounds of air cargo annually. To keep these people and cargo moving, airports require significant infrastructure investment. Fortunately, Illinois' largest airport has seen this investment in recent years with the substantial completion of the $6 billion O'Hare Modernization Program. Outside of Chicago, $94 million in funds are expected to be released as part of the Rebuild Illinois Capital plan signed into law in 2019. These funds provide a state/local program that complements existing federal funding for public-use airports. Despite this increased investment, much more is needed to improve Illinois' aging aviation infrastructure. Only 61% of Illinois' runways and 58% of Illinois primary taxiways are in good condition. Illinois needs $6.5 billion in investment over the next five years to keep up with infrastructure needs, and airports continue to struggle to find funding sources for these projects.

BACKGROUND

Aviation is critical to the Illinois economy and is a primary connection to the global community. Serving approximately six million international passengers, Illinois is home to the seventh busiest international airport in the nation (O'Hare International Airport). Illinois ranked fifth in the nation based on the value of air freight flows in the state and is home to nine Customs and Board Patrol ports-of-entry, which allow people and goods to enter from abroad.

Illinois has a total of 116 public use airports – 78 are publicly owned and 38 of which are privately owned. 82 of the airports in Illinois are included among the 3,310 airports that comprise the National Plan of Integrated Airport Systems (NPIAS), determined to be significant to national air transportation. 12 airports in Illinois offer scheduled commercial service linking Illinois both nationally and internationally. Of these 12 airports, two are considered the largest type - Primary-Large Hub airports. These airports are O'Hare International Airport and Midway International Airport. Almost 1,200 flights per day originate from Chicago to over 250 destinations. Together, pre-pandemic, the airports annually accommodated over 50 million passengers and 5 million tons of cargo.

FIGURE 1.
ILLINOIS PUBLIC AIRPORTS

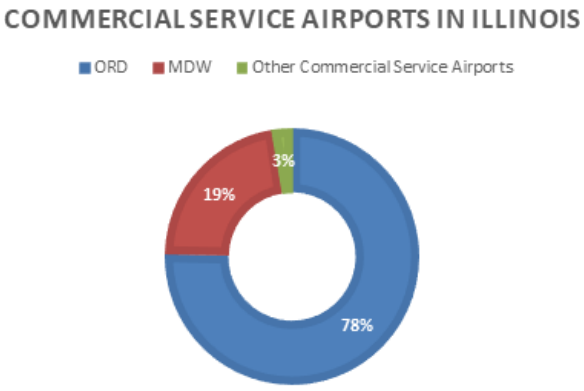
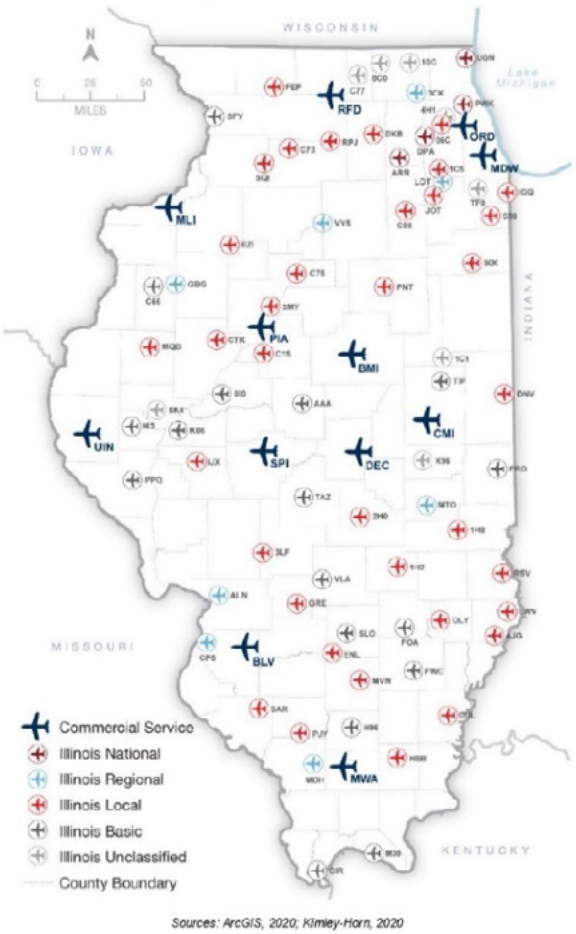


FIGURE 2. ILLINOIS AVIATION SYSTEM PLAN



Sources: ArcGIS, 2020; Kimley-Horn, 2020

Over 100 airports in Illinois are categorized as general aviation airports, meaning they do not offer reoccurring scheduled flights. Instead, these airports provide services to their communities including emergency response, aerial firefighting, law enforcement, corporate flight, flight instruction, agricultural support, survey support, courier service, and many more. In terms of the total impact of general aviation on the economy, Illinois is in the top 10 states in the nation based on Gross Domestic Product, and the 2020 Illinois Aviation Economic Impact Analysis estimates that the Illinois' aviation system contributes $95.5 billion in total economic activity and provides nearly 500,000 jobs to the state.

CONDITION

The Illinois Department of Transportation (IDOT) commissions a Performance Condition Index (PCI) Survey for pavement at each airport that provides a PCI rating score of 0-100, with 100 being perfect conditions and a score of 70 rated as satisfactory. As of 2020, the state had catalogued approximately 15.5 million square yards of runway, taxiway, and apron pavements. The survey indicated 61% of primary runway and 58% of taxiway pavements were rated "good", with PCI values exceeding 70. Midway and O'Hare maintain independent pavement management systems, with Midway having a weighted PCI of 69 in year 2021, while O'Hare averaged a PCI of 74 in the most recent year of available data - 2017.

Despite recent investments in Illinois airport pavement rehabilitation, increasing aviation activity by larger and heavier aircraft has generated more aviation demand. Consequently, Illinois airport pavements remain in danger of reduced PCIs.

CAPACITY

Aviation infrastructure capacity depends on many complex variables. It includes the rate of takeoffs/landings, passenger processing, gate space for transient aircraft, passenger vehicle parking, and passenger flow through the airport.

The imbalance between capacity and demand was a source of long lines and delays at Chicago O'Hare and Midway as recently as January 2020. However, the Chicago Department of Aviation (CDA) reported COVID-19 fueled decreases in passenger traffic by 64% and 57% in 2020 at O'Hare and Midway, respectively. Cargo filled part of the breach, with O'Hare handling a 14.8% increase in tonnage and nearby Chicago-Rockford International Airport reporting an impressive 97% increase in cargo over the last three years. Despite pandemic-related setbacks and reconfigurations, the FAA indicated O'Hare was the busiest US airport by operations in 2020, with 644,000 aircraft operations and the CDA identified O'Hare as the #1 airport in North America for cargo by value at more than $200 billion per year. Capacity profiles for Chicago O'Hare and Midway indicate that pre-pandemic, each airport operated at or near maximum capacity in good weather and at or overcapacity in poor weather conditions.

The FAA 2020-2045 Terminal Area Forecast predicts that operations at O'Hare and Midway will not return to 2019 levels until 2028 and 2025, respectively. Despite the expected delay in recovery, they expect O'Hare to be the second busiest airport in the nation in 2045 with 1.26 million operations. This represents a nearly 100% increase from 2020 activity levels and a nearly 40% increase from 2019 activity levels. Although the pandemic has provided short-term capacity relief, airfield and terminal improvements are necessary to meet the long-term demand.

Recent projects have provided some increase in capacity. The recently completed $6 billion O'Hare Modernization Program (OMP) has streamlined runway operations, and as the OMP comes to an end, the O'Hare 21 program ramps up. This $8.5 billion investment will expand and renovate existing terminals including a new global terminal. Airports outside of Chicago have also realized incremental capacity increases with an eye towards increased cargo demands. This includes an expansion of terminal and cargo capacity at Rockford International Airport, expansion of landside facilities at MidAmerica Airport, and expansion of terminal capacity at General Wayne A. Downing Peoria International Airport.

Capacity profiles for Chicago O'Hare and Midway indicate that pre-pandemic, each airport operated at or near maximum capacity in good weather and at or overcapacity in poor weather conditions.

OPERATION & MAINTENANCE

Operational and maintenance needs at airports in Illinois include snow removal, deicing, pavement and NAVAID maintenance, wildlife management, security services and more. The Illinois Aviation System Plan reported 2,035 full-time and 344 part-time airport employees contribute to the day-to-day operations of airports statewide.

Illinois can be subjected to harsh winter conditions, with northern regions of the state receiving up to 38 inches or more of snow yearly. Despite these conditions, only 61% of the airports surveyed reported dedicated snow removal equipment with a storage building or a mutual aid agreement for snow removal operations. Funding sources for this and other operations and maintenance equipment is hard to come by for many small airports who need to balance the needs of capital improvement investments.

FUNDING

IDOT is finalizing a new Illinois Aviation System Plan (IASP) and updating the 2012 Economic Impact Analysis (EIA). The draft IASP and EIA was made available in 2021 and provides IDOT the tools for distribution of state and federal funding to all system airports.

Airports have two major sources of funding. One is internal user fees such as flowage fees on fuel, lease payments, passenger facility charges, parking fees, and more. The other primary source of funding comes from government sources. The 82 NPIAS airports within Illinois receive grants from the federal Airport and Airway Trust Fund (AATF), administered through the Airport Improvement Program (AIP). Typically, projects are funded using 90% federal funds, 5% state funds, and 5% local funds, except for O'Hare and Midway, which are funded using 75% federal and 25% local funds.

AIP funding has remained relatively stable over the past several years and has even included supplemental funding appropriated by Congress. Additional federal funding was made available during the pandemic to provide economic relief and the 2021 Infrastructure Investment and Jobs Act allocated $25 billion to airports nationally for airport modernization and safety projects. 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.

The other component to funding airport improvement projects is the Passenger Facility Charge (PFC), which has remained capped at $4.50 per passenger flight segment since 2001. All 12 of the commercial service airports in Illinois rely on PFC funding with 11 of these airports currently collecting the maximum allowable amount.

In 2019, a 6-year capital bill, Rebuild Illinois, appropriated $144 million for improvements to airports listed in the IASP, with $94 million distributed through a competitive grant process. IDOT maintains a Multimodal Multi-Year Improvement Program, which includes a 5-year Proposed Airport Improvement Program (FY2020-FY2025). The IDOT FY 20 to FY 25 Airport Improvement Programs totals $532 million, of which $454 million (85%) will be covered by federal funds, $16 million (3%) by state funds, and $62 million (12%) by local funds.

FUTURE NEED

Within the NPIAS FY 2021 – FY 2025, the documented need for Illinois airports is $2.9 billion, which includes $1.26 billion for O'Hare and $385 million for Midway. According to the Airports Council International – North America, Illinois airports need an estimated $6.5 billion for 2021 to 2025, or $1.3 billion per year. This is significantly greater than the $2.9 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.

The IASP aviation activity forecasts indicate modest growth over the next 20-years in enplanements, general aviation operations, commercial service operations and based aircraft. Over that same period, IDOT estimates that the overall need for the Illinois aviation system is approximately $11.2 billion, with $10.3 billion for O'Hare and Midway International Airports and $900 million for the remaining aviation system.

PUBLIC SAFETY

The FAA provides guidance to airport operators on how to develop and implement an Airport Emergency Plan (AEP). These plans are meant to enhance public safety and mitigate aviation-related emergencies. The 2021 IASP reports that 58 percent of Illinois airports have adopted and maintain an emergency response plan. In addition to developing an AEP, 47 percent of Illinois airports also maintain or have access to emergency response equipment via a mutual aid agreement. Mutual aid agreements enable airports to share resources with the neighboring communities where resources are scarce, particularly in less densely populated areas.

RESILIENCE

Airports must confront a need for resilience as extreme weather continues to challenge our infrastructure. The IASP sets a target of 100% adherence to stated resiliency goals for Illinois NPIAS airports within the next five years. The goal applies to systemwide preparedness for emergencies, natural disasters, spills, and snow removal. The 12 commercial service airports in Illinois score 83% adherence across all goals, with the shortcomings mostly associated with emergency response equipment or dedicated snow removal equipment. Smaller airports, including regional, local, and basic Illinois airports score lower on resiliency goals. Airport planners in Illinois must continue to incorporate resilience into long-term strategy assessments and capital improvements.

INNOVATION

Innovation is paramount for success in aviation. Laws and regulations continue to evolve for Unmanned Aerial Systems (UAS) and their commercial uses. Multiple companies have been given approval to operate drones for the delivery of packages. Though these services remain in their infancy, they may drastically change the way we use air infrastructure. One such study being performed by the University of Illinois at Urbana-Champaign with the Illinois Center for Transportation is a study on advanced aviation including electrification and vertiport projects.

There has also been innovation in the ways that Illinois and the CDA receive and disburse funding, and in how projects and programs are administered. For the first time in 2019, the CDA selected three Construction Managers at Risk to administer $116 million contracts for project delivery as part of the O'Hare 21 program. This project delivery method transfers risk to the contractor, allows for streamlined scheduling, and provides for larger percentage of participation by minority and women owned businesses.

Aviation

RECOMMENDATIONS TO RAISE THE GRADE

- Pass an Illinois state capital bill that provides for continuous, sustainable, indexed funding to close the gap between funding need and funding provided.
- Facilitate innovative project financing and delivery options to encourage creativity in infrastructure improvements and achieve more efficient project delivery.
- Increase human capital to support airport initiatives, aviation programs, and to boost aviation systems statewide and nationally.
- Implement value engineering to increase awareness of sustainability needs in airport infrastructure
- Coordinate efforts to integrate modes of transportation with aviation infrastructure investments.
- Invest early in the infrastructure necessary for nascent technologies to keep Illinois competitive and at an advantage into the future.
- Enact timely multi-year reauthorization of federal aviation programs to ensure predictability and stability in airport improvement funding.
- 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.

Aviation

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Bridges

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EXECUTIVE SUMMARY

Bridges connect our communities and economic centers. Illinois has the 3rd largest bridge inventory in the nation and a significant backlog of needed maintenance. Currently, there are 2,405 bridges in poor condition – or 9% of all bridges in the state that are crossed by motorists every day in Illinois. Approximately 70% of Illinois bridges in poor condition are owned by counties, towns, or cities, suggesting local maintenance backlog is a significant challenge. Fortunately, the future is bright. The Illinois Department of Transportation recently revised their guidance to emphasize continuous bridge maintenance rather than waiting until a bridge needs major rehabilitation, which is a more cost-effective approach to bridge management. Additionally, the state legislature passed the Rebuild Illinois Capital Plan, which is the largest capital program in the state's history and will provide nearly $5 billion over six years to bridges, including those on the local system. Finally, $1.4 billion in bridge-specific funding is now available for Illinois from the federal Infrastructure Investment and Jobs Act. These investments should meaningfully reduce the state of good repair on Illinois bridges in the coming years.

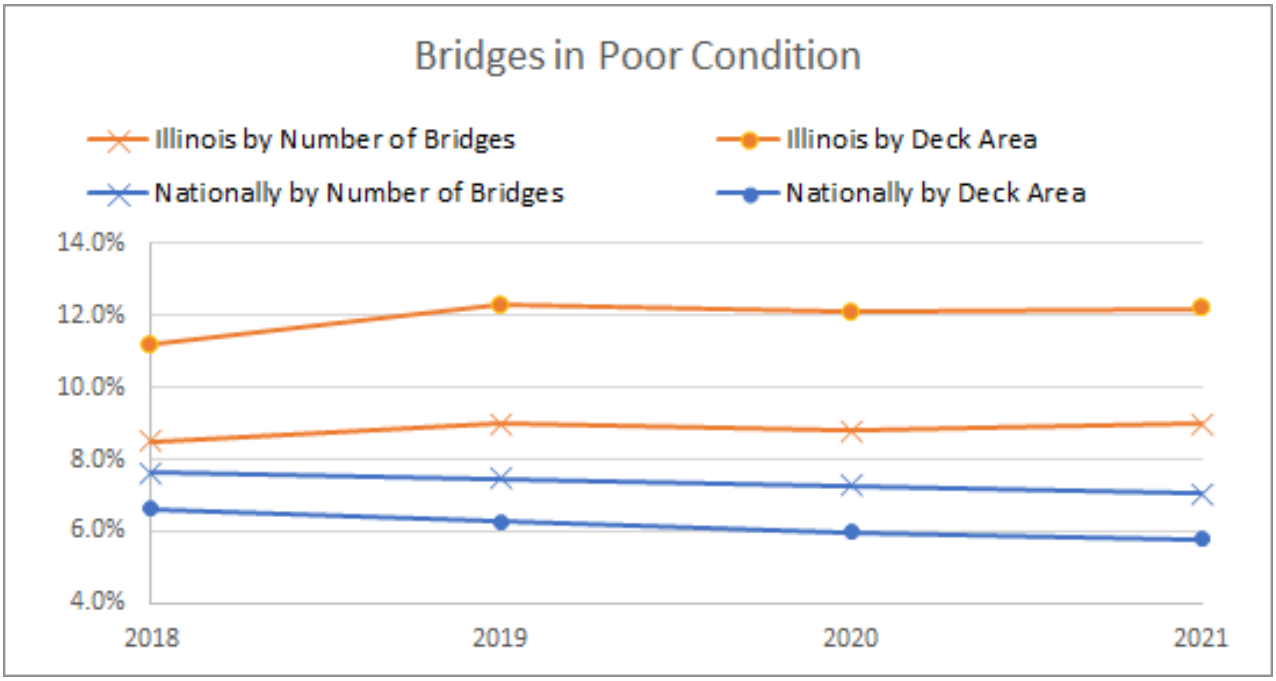
CONDITION & CAPACITY

Illinois has the 3rd largest bridge inventory in the nation, with 26,846 bridges. All bridges in Illinois are inspected and a numeric rating is assigned to various elements of the structure. The Bridge Condition is determined by the lowest numerical rating of each of these various elements. If the lowest rating is greater than or equal to 7, the bridge is classified as Good; if it is less than or equal to 4, the classification is Poor. Bridges rated 5 or 6 are classified as Fair. While a poor designation does not imply that a bridge is unsafe, these bridges may have limits for speed and weight, and typically require significant maintenance and repair to remain in service. It also means that the designated bridges will eventually require major rehabilitation or replacement to address the underlying deficiency.

There are two ways to consider the overall condition of the Illinois bridge inventory – by looking at the number of bridges in poor condition or by looking at the bridge deck area in poor condition. As of January 1, 2021, 9% of Illinois's total bridges or 2,405 were considered in poor condition. This is an increase of approximately 0.5% since 2018. 12.2% of Illinois' total bridge deck area was considered to be in poor condition which is an increase of 1% since 2018.

Looking across the entire U.S. over the same time period, from 2018 to 2021, both the number of bridges in poor condition and the bridge deck area in poor condition reduced on average (0.6% and 0.8% respectively). In 2018, Illinois was ranked 20th in the nation for percentage of bridges in poor condition – in 2021 Illinois is ranked 14th in the nation. This highlights the fact that the condition of Illinois's bridge inventory deteriorated while the national bridge inventory improved.

FIGURE 1: TRENDS IN BRIDGES IN POOR CONDITION OVER TIME COMPARED TO NATIONAL AVERAGES



These trends are also reflected in the number of bridge contracts awarded each financial year. As can be seen in Table 1, the number of bridge contracts awards has steadily declined from 2017 to 2020. While bridge funding has seen an increase, there is typically a lag in the time when funding becomes available and when bridge contracts are let for construction and the structural deficient bridges are removed from the list. Many times, the preliminary engineering and environmental clearances can take several years before design engineering can begin.

TABLE 1: BRIDGE CONTRACTS AWARDED IN ILLINOIS

STATE FISCAL YEAR	NUMBER OF BRIDGE CONTRACTS AWARDED
2017	162
2018	155
2019	154
2020	128

171 of the structurally deficient bridges are on the National Highway System, which consist of the highways and interstates that serve as a means of transportation between various key facilities. A total of 83.5% of the bridges in poor condition are not on the National Highway System, which includes the Interstate and other key roads linking major airports, ports, rail and truck terminals. 1,178 bridges are posted for load, which may restrict the size and weight of vehicles crossing the structure. The state has identified needed repairs on 4,099 bridges at an estimated cost of $6.4 billion.

FIGURE 2: BREAKDOWN OF BRIDGE CONDITION FOR ALL BRIDGES IN ILLINOIS

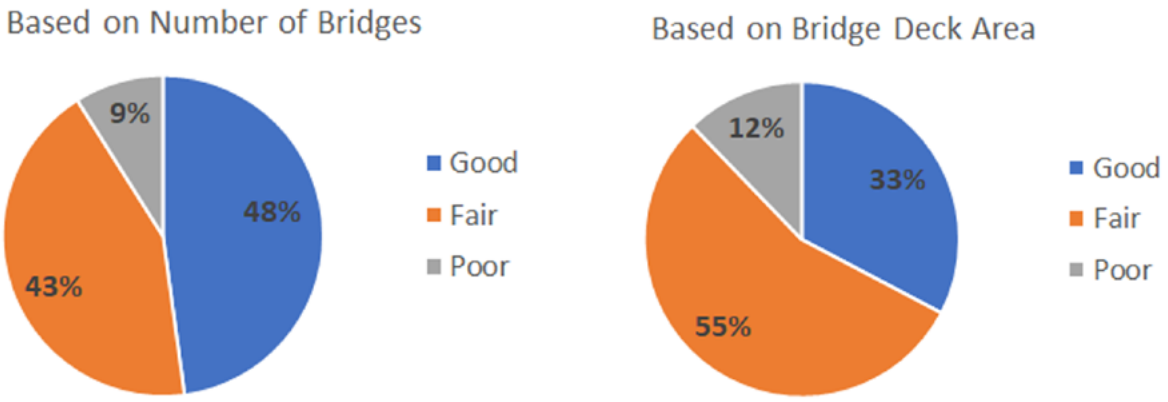
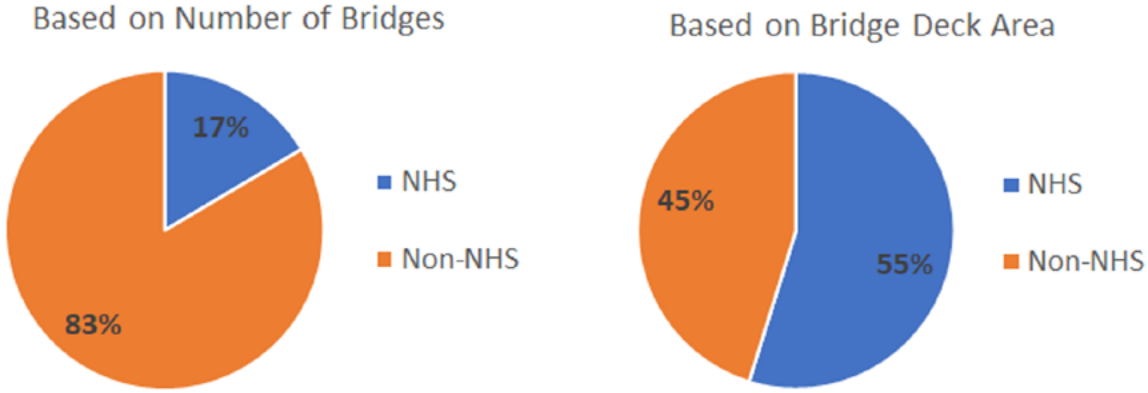


FIGURE 3: BREAKDOWN OF BRIDGES IN POOR CONDITION IN ILLINOIS THAT ARE ON AND OFF THE NATIONAL HIGHWAY SYSTEM



FUNDING AND FUTURE NEEDS

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.

A successful infrastructure program must have funds to support both new bridge construction as well as rehabilitation and maintenance. Additionally, funds should be set aside for emergency situations. Sufficient funding is essential to ensure accessibility, structural integrity, and safety.

From 2018 to 2022, according to the IDOT Multi Year Plan, state funding increased from $482,0000,000 to $1,528,000,000. This significant increase in funding has been generated through the Rebuild Illinois Capital Plan which is the largest capital program in the state's history

and was signed into law in June 2019. Through this plan, over $33 billion has been allocated to infrastructure and $25.3 billion allocated specifically to roads and bridges. The Rebuild Illinois Capital Plan has increased Motor Fuel Tax, Passenger Vehicle Registration Fees, Truck Registration Fees and Certificate of Titles Fees. Motor Fuel Tax was initially doubled to 38 cents per gallon. Prior to this increase in 2019, the last tax increase had occurred in 1990. The Rebuild Illinois legislation includes an automatic annual increase of the tax rate indexed to inflation.

The Infrastructure Investment and Jobs Act (IIJA), signed into law by President Biden in November 2021, will provide $15.8 billion in state funds for highway, bridge and transit investments in Illinois over the next five years, including a 41% funding increase in FY 2022. Specifically for bridges, $1.4 billion over five years is available from USDOT through formula funds, and the state has the opportunity to compete for millions more through a new bridge-specific competitive grant program.

The IDOT multi-year program (MYP) is the strategic capital investment plan for the state. The FY 2022-27 MYP identifies a total of $20.7 billion of anticipated investments on state and local highways. Approximately 23% of the anticipated investment, or $4.8 billion over six years, is allocated for bridge maintenance. While the $4.8 billion in bridge maintenance funding identified in the MYP will be helpful, and is a significant increase from the $2.6 billion allocated in the FY 2018-23 MYP, it is insufficient to comprehensively address needed bridge maintenance, rehabilitation, and replacement. Illinois has identified an estimated $6.4 billion in present-day needed bridge repairs. It should be noted that this investment gap was calculated before passage of the IIJA; federal funding will partially help close the gap.

FIGURE 4: FISCAL YEAR 2021 HIGHWAY IMPROVEMENT PROGRAM FUNDING FOR THE STATE OF ILLINOIS

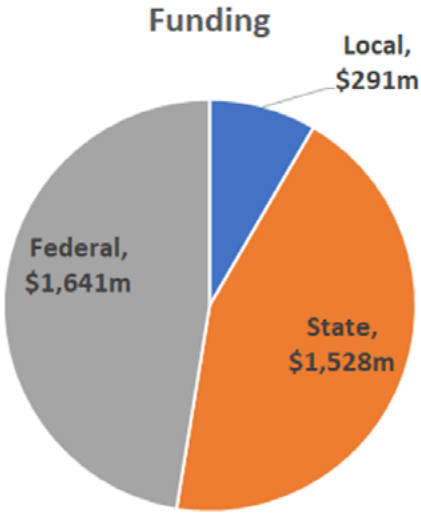
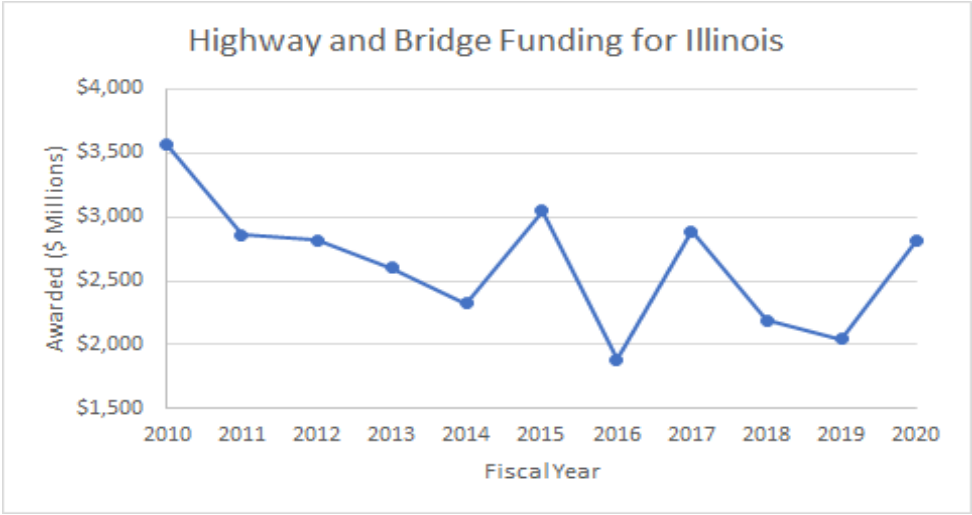


FIGURE 5: TREND IN HIGHWAY AND BRIDGE FUNDING OVER TIME



INNOVATION

New Project Delivery Methods

In May 2021, the General Assembly of the State of Illinois introduced the Innovations for Transportation Infrastructure Act, permitting the design/build (D/B), Construction Manager/General Contractor (CM/GC) project delivery methods and use of Alternative Technical Concepts in Illinois. These methods and processes have the potential to capture private sector innovation and safely deliver infrastructure projects on more predictable schedules and budgets. Earlier completion and lower cost for projects are possible with the ability to shift or share risks with the private sector that are generally retained by the public in the conventional design-bid-build project delivery method.

IDOT continues to utilize innovative materials on pilot projects on local agency and less traveled bridges to refine the specifications and plan details. One such example of this is the first use of a galvanized steel press brake tub girder bridge that was constructed in 2021. This bridge type takes advantage of the torsional rigidity of a tub shape to minimize the structure depth, providing an alternative to Precast Prestressed Concrete (PPC) deck beam bridges. Another example is IDOT experimenting with Ultra High-Performance Concrete as a superstructure material type, both to join together precast concrete deck panels and as an overlay and grout for PPC deck beams. This material use looks to expand once material suppliers can refine mix designs and provide competitive pricing. Lastly, IDOT has looked to expand on its accelerated bridge construction, experimenting with a full bridge slide in, built in 2021 and precast concrete elements such as foundation elements.

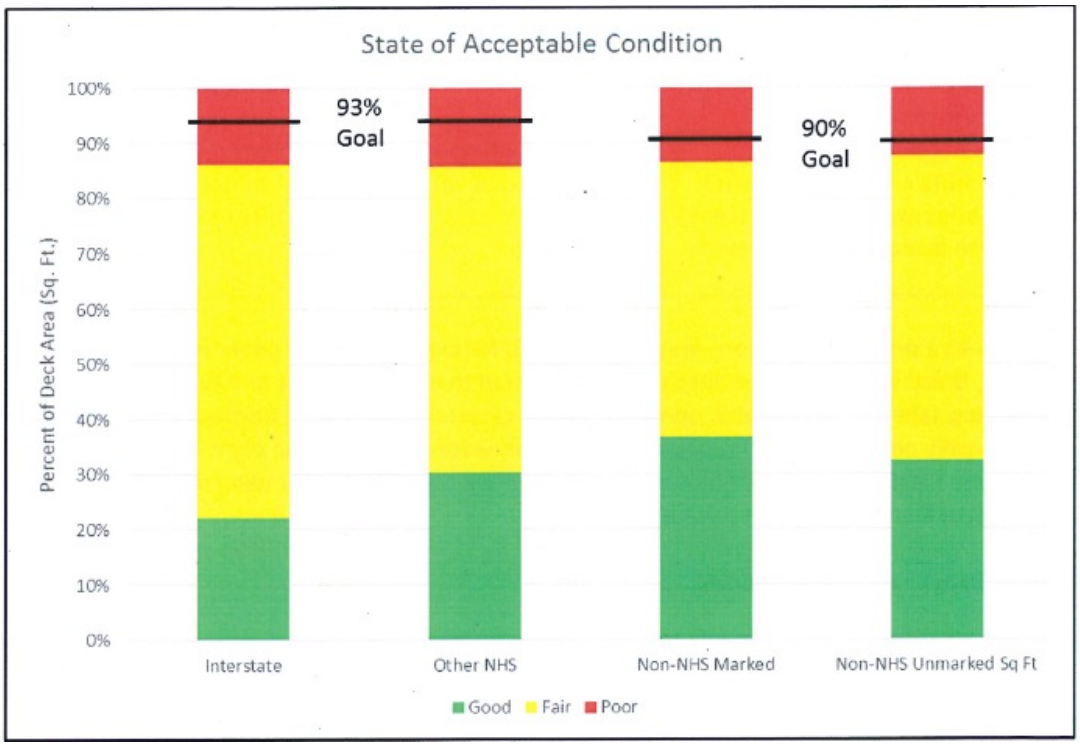
Within the overall bridge industry, research continues to develop new materials and applications for existing technologies seeking to reduce construction costs, reduce long-term maintenance, and extend the service life of structures, both in place and currently being designed. The steel industry is researching additional ways to harness the strength and durability of bent steel plate shapes and construction efficiency through the use of Bridge Information Modeling (BrIM). The American Association of State Highway Transportation Officials (AASHTO) is sponsoring research in many bridge-related topics including repair of the ends of concrete beams using Ultra High Performance Concrete, bridge expansion joint technologies, and other innovative opportunities.

To develop innovative products and bridge building techniques, IDOT regularly employs the research arm of the University of Illinois at Urbana-Champaign, the Illinois Center for Transportation. These research projects vary from the evaluation of new concrete mixes and curing methods to reinforcing steel corrosion testing. The continued use of this research arm at the disposal of IDOT will lead to further innovation in the future.

With the increased funding available for bridge replacement and rehabilitation, we expect IDOT and local agencies will make increased use of bridge bundling. The Federal Highway Administration (FHWA) defines bridge bundling as "the use of a single contract award for preservation, preventive maintenance, rehabilitation, or replacement of multiple bridges." Bridges can be bundled to take advantage of geographic locations, common features and/or materials, and performance can be limited to construction or extend through years of preventive maintenance. The management and economic advantages of this approach will allow bridge owners to improve a greater number of structures than commonly achieved through single bridge contracts.

OPERATIONS AND MAINTENANCE

Illinois historically used performance targets of 90/93 for percent of bridge decks in a state of acceptable condition. This allowed for deterioration of the bridge to reach a poor condition prior to repair. These targets were based on a measure of "backlog", defined as being in a state of deterioration. Addressing bridges when they reach backlog is the most expensive way to maintain a system. The figure below shows the 93% goal is for interstate and other bridges on the National Highway System (NHS), with the 90% goal being extended to non-NHS state owned bridges. These same targets are typically extended to local public agency structures.



In November 2019, IDOT released the Bridge Preservation Guide, the first such manual, which provides guidance, goals, and strategies for the preservation of bridges. The goal of this program is to maintain bridges in a state of acceptable condition using cost effective strategies implementing timely preventative maintenance measures on structurally sound bridges to extend service life. These maintenance measures include bridge/deck washing to remove corrosive materials, deck sealing, expansion joint replacement, and bridge deck patching and overlays. By implementing this guide, Illinois will strive to maintain its assets in a state of acceptable condition and this strategy will help save money as a far more cost-effective approach.

Through the use of element level bridge inspections on NHS bridges for state and locally owned bridges, the various bridge component conditions can be monitored, and the preventative maintenance strategy can be utilized. Having this defined bridge preservation program in place, IDOT can enable the use of federal funding for preventative maintenance activities.

RESILIENCE AND PUBLIC SAFETY

In recent years, IDOT has adopted a wider use of durable bridge building materials in an effort to make their reconstructed bridges more resilient to the harsh winter climate and the corrosive snow removal chemicals used. Superstructures are utilizing more concrete or galvanized steel beams to eliminate the need for future painting. IDOT has also adopted the use of the 81" and 90" PPC I-beam sections which will push span lengths close to 190' long, reducing the number of substructure units needed. Jointless structures, through the use of integral and semi-integral abutments, are being utilized for overall structure lengths over 600', which is critical in eliminating expansion joints and protecting beam ends. Stainless steel rebar is starting to be introduced to bridge decks to extend the overall life of the bridge.

In addition to resilient structures, Illinois is implementing standards to make the bridges safer. Longitudinal bridge deck grooving has been introduced on any bridges longer than 150' and average daily traffic over 10,000 vehicles with the intent of making a more uniform and smoother riding surface, providing for an overall safer ride. In 2019, IDOT began utilizing the constant slope parapet instead of the traditional F-shape parapet which satisfies the new crash loads and barrier height requirements of the AASHTO 2016 Manual for Assessing Safety Hardware (MASH). Standard details for these barriers were developed for TL-4 and TL-5 crash level testing.

Bridges

RECOMMENDATIONS TO RAISE THE GRADE

- Develop an investment fund to allow counties or municipalities to have funding for maintenance efforts (painting, sealing, overlays, expansion joints) rather than just major rehabilitation or replacement.
- Develop a strategic plan to prioritize the projects that will provide economic benefits to the state.
- Ensure that dedicated, reliable funding streams like gas taxes are maintained and look for additional funding sources so adequate funding is available to maintain and grow the Illinois bridge inventory.
- Develop a targeted investment strategy to decrease the number of structurally deficient and functionally obsolete bridges further in the state.
- Use alternate project delivery methods such as Design Build in lieu of Design Bid Build to achieve cost savings.
- Increase the use of bundling bridge rehabilitation or replacement projects together in a contract to make for efficient pricing
- Continue to use new technologies to extend the life and performance of bridge components, (i.e. post-tensioning, stainless steel rebar and hot dipped galvanized steel girders where benefits could be realized).
- Utilize new superstructure types which could extend bridge span lengths to limit the number of substructure elements, thereby reducing costs
- Adopt new technologies like Bridge Information Modeling (BrIM) to allow for more intelligent asset management that ties into IDOT's Transport Asset Management Plan.

SOURCES

U.S. Department of Transportation, Federal Highway Administration. National Bridge Inventory ASCII files. https://www.fhwa.dot.gov/bridge/nbi/ascii.cfm?year=2016

Illinois Department of Transportation, Proposed Highway Improvement Program, FY 2022-2027, https://idot.illinois.gov/transportation-system/transportation-management/transportation-improvement-programs-/multi-modal-transportation-improvement-program/index

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https://illinoisepi.org/rebuild-illinois/transportation-funding/

https://artbabridgereport.org/state/ranking

Dams

C+

EXECUTIVE SUMMARY

There are 1,892 dams in Illinois, the majority of which support recreational activities. The construction, operation, maintenance, repair, inspection, and removal of dams are the responsibility of the dam owner. Currently, Illinois does not have a state loan or grant funding program to assist dam owners with rehabilitation of dams. Over half of the dams classified as having a high hazard potential are privately owned, which equates to about 252 dams. Today Illinois has four full-time employees (FTEs) dedicated to dam safety, up from three in 2018. There are 63 high hazard potential dams per FTE, down from 75 in 2018. Investment in the removal of aging low head dams has increased, helping restore river ecosystems and opening opportunities for recreation. Hydropower generates less than 1% of the state's energy needs and it is not expected to increase significantly, but future innovation could help increase that amount.

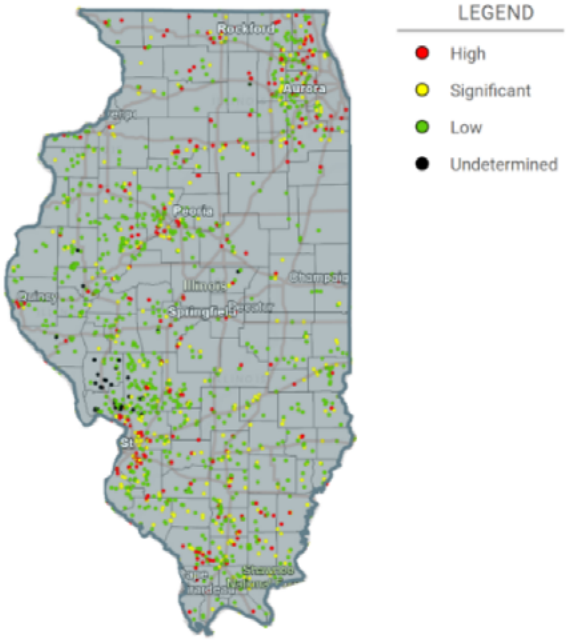
INTRODUCTION

The Illinois Department of Natural Resources Office of Water Resources (IDNR OWR) oversees the State's dam safety program primarily through permitting and inspection of dams. In Illinois, dams are categorized and regulated by hazard potential classifications Class I, II, and III. Class I dams are those having a high hazard potential 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 those 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 those 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.

CONDITION AND CAPACITY

There are currently 1,892 dams in the IDNR regulatory database, an increase of 68 dams from 2018. However, the National Inventory of Dams (NID) database only lists 1,643 dams. The NID classifies dams based on the hazard potential of high, significant, and low. The NID classification criteria is similar but not exactly the same as the IDNR classification of Class I, II, and III discussed above. Thus, Class I dams are categorized as high hazard potential, Class II dams are categorized as significant hazard potential, and Class III dams are categorized as low hazard potential. In the NID, for Illinois, there are 252 (15%) dams listed with High Hazard Potential, 361 (22%) listed with Significant Hazard Potential, 992 (60%) listed with Low Hazard Potential, and 38 (2%) listed as undetermined hazard dams due to not having yet been assessed or incomplete data at the time the NID report was published. Figure 3 shows the locations of dams by hazard potential.

FIGURE 1: MAP OF ILLINOIS SHOWING LOCATION OF: - HIGH HAZARD (RED), - SIGNIFICANT HAZARD (YELLOW), - LOW HAZARD (BLACK) POTENTIAL DAMS

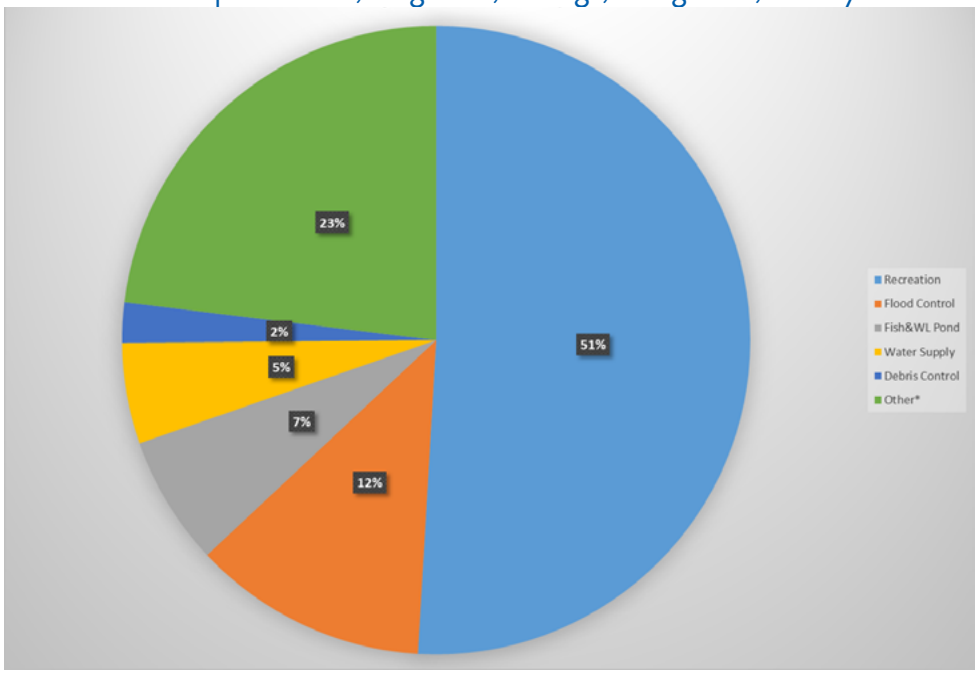


(from 2022 NID Database)

According to the NID, the primary purpose of dams in Illinois is recreation, as shown in Figure 2, followed by flood control, fish and wildlife purposes, and water supply needs. Other purposes include debris control, fire protection, stock, or small fishponds, irrigation, tailings, navigation, and hydroelectric. Many of the dams that have purposes other than recreation also indirectly facilitate recreational activities as well. For example, the 11 navigational dams on the Illinois Waterway and the Mississippi River and dams that are intended primarily for fish and wildlife purposes also provide a wide range of recreational opportunities.

According to the NID, 50% (829) of the dams in Illinois are over the age of 50, and at least 5% (79) are over the age of 100. Seven percent (124) of dams have been modified, most within the last 25 years. The average age of dams in Illinois is 53 years, slightly younger than the 2021 national average of 57 years, and 69% of Illinois dams will be at least 50 years old by 2030. Most dams are built to a 50-year lifespan, and older dams were not built to current standards. Furthermore, at the time of their construction, these dams may have been considered low hazard potential. Today, many of these structures protect businesses and residents now located downstream. They may not be able to withstand the increasingly frequent and severe weather events we see today or meet newer standards that improve resilience and reduce risk.

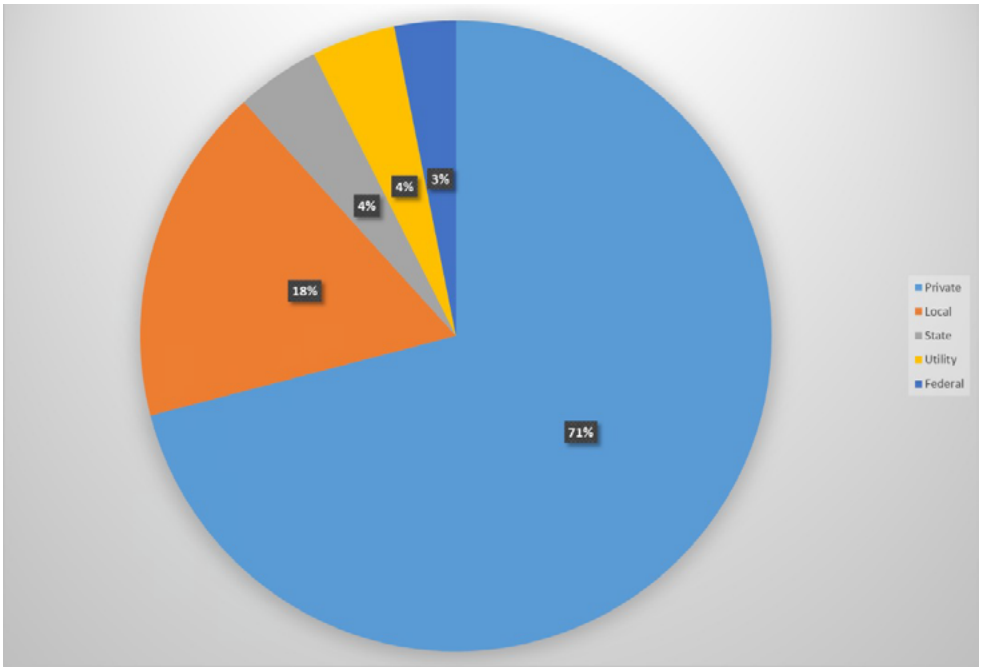
FIGURE 2: DAM PURPOSES
(*other includes fire protection, irrigation, tailings, navigation, and hydroelectric)



OPERATION & MAINTENANCE

According to Illinois Code, the construction, operation, maintenance, repair, inspection, and removal of dams are the responsibility of the dam owner. The IDNR OWR dam safety program requires dam owners or prospective owners obtain a permit for the construction/ modification or operation and maintenance of dams. Only engineers who are registered as a structural and/or professional engineer (SE or PE) in the State of Illinois, with expertise in the investigation, design, construction, and operation of dams can prepare the engineering data to be submitted with an application for a permit. The number of licensed professional engineers in the state has remained steady for the last five years at about 20,000 and the number of structural engineers at about 3,300. Looking ahead, there is a continuing and future need to support the training for licensure of professional engineers in the state with an emphasis in hydraulics.

FIGURE 3: ILLINOIS DAM OWNERSHIP



As shown in Figure 3, 71% of the dams listed in the NID are privately owned, followed by 18% owned by local governments. Of the 252 high hazard dams, 56% are privately owned, followed by 27% local government owned. Therefore, private owners and local government municipalities are responsible for the operation and maintenance of most dams, including high hazard dams. This suggests a need not only for state regulation of dams, but careful consideration and prioritization of dams by local governments. Of note, the biggest high hazard dams in the state based on storage and surface area are owned by the federal government and include Carlyle Lake, Lake Shelbyville, Rend Lake, and Crab Orchard.

Based upon information from IDNR and ASDSO, Illinois does not currently have a state loan or grant funding program to assist dam owners with repair and rehabilitation of dams. This could have an impact on the state's ability to obtain grant funds through dam safety programs such as the U.S. Army Corps of Engineers' High Hazard Potential Dam Rehabilitation Grant Program and the National Dam Safety Program, both of which are currently subject to cost sharing or limitations and state funding conditionality.

FUNDING & FUTURE NEED

Based upon 2019 ASDSO statistics, Illinois has a full-time equivalent (FTE) employee dedicated to dam regulation of four, up from three in the 2018 report card. Also, the IDNR OWR does have an additional 14 employees available on an as needed basis. The national average of state regulated dams per FTE was slightly over 191 dams; for Illinois there are about 405 dams per FTE, down from 600 in 2018. The national average of state regulated high hazard potential dams per FTE is 28.6; whereas for Illinois there are about 63 high hazard potential dam per FTE, down from 75 in 2018. The average FTE for midwestern states is five FTEs and 496 dams per FTE, with an average of 34 high hazard potential dams per FTE.

The Illinois state dam safety annual budget has risen in the last four years from $320,000 in 2017 to $430,000 in 2019. Even though funding for Illinois' dam safety program has improved from where it was, it is still significantly below the national average, suggesting the need for additional resources.

PUBLIC SAFETY & RESILIENCE

In Illinois, dam inspection frequency is once every year for Class I dams, once every three years for Class II dams, and once every five years for Class III dams. Dam owners are responsible for conducting inspections and submitting the resulting inspection report to the IDNR OWR. The IDNR OWR reviews all instances of alleged non-compliance and, along with the Illinois Emergency Management Agency, provides assistance to local officials and property owners in instituting emergency procedures for areas threatened by the failure of a non-complying dam.

Illinois submits dam information to the NID and, although condition rating data on state regulated dams in collected by IDNR OWR, the information is not provided to the NID. The state requires an Emergency Action Plan (EAP) for all Class I and II or high and significant hazard potential dams. EAPs are a critical component to improving the safety of people living, working, or recreating downstream of dams. According to the NID, 78% of high hazard potential dams in Illinois have an EAP, although the IDNR database indicates this percentage is much higher, at 94%.

Since 2007, Illinois has pursued the rehabilitation or removal of many run-of-the-river dams (low head) due to the danger they represent to the public at the dam and the desire for improved fish migration and canoeing/kayaking recreational opportunities. Low-head dams are relatively small, constructed barriers with a hydraulic head of less than 25 feet, have limited storage, and water flows over the entire length of the dam. At least 15 dams have been removed since 2012 with more removals planned for the future.

Water supply for Illinois comes from a variety of sources including surface waters. The primary purpose of 5% of the Illinois dams listed in the NID is water supply. Another 5% of dams have water supply listed as a secondary purpose. Adequate and reliable water supplies are critical to Illinois for residential, agricultural, commercial, and industrial purposes. Since 2006, the IDNR has funded the Illinois State Water Survey (ISWS) to lead regional water supply planning activities. According to the ISWS over the past 115 years, the state has experienced several serious droughts. Proper planning will address risk management, cost analysis, maintenance, and conservation and help build infrastructure resilience.

Other ways to build resilience in the community are by engaging and educating communities near dams about the potential risks of failure from dam breaks, by communicating the multiple benefits of dam removals, and by developing and maintaining local regulations for public and private dams in the community.

INNOVATION

In the past two decades, IDNR has engaged in an Illinois state-wide initiative of removing low head dams to improve water quality, aquatic habitat, and recreational safety. Removing these aging structures has opened opportunities for recreation, and the growing interest in restoring the natural flow of rivers and fish passage has created new funding opportunities to support dam removal. Based on the Rebuild Illinois Capital Plan, $19.8 million is allocated for state-managed dams and waterway projects to remove unnecessary dams and restore Illinois' rivers.

Although Illinois has many rivers, its relatively level terrain limits traditional hydropower potential. Hydropower generates less than 1% of the state's energy needs. According to the NID, there are only 10 hydroelectric dams in Illinois. Non-traditional approaches, such as integrated turbine/generator units, alternative materials, and modular components could transform development of hydropower projects in the state.

Dams

RECOMMENDATIONS TO RAISE THE GRADE

- Establish and maintain a state dam rehabilitation loan and grant program, with the potential to leverage available federal funds, primarily to assist municipally owned dams, but also with consideration to privately owned Class I dams. Any federally backed program should be designed to work with the existing state program to encourage the continuation and maximize the benefits of both funding sources.
- Continue to provide an adequate budget, staff, and authority for the IDNR OWR to carry out the dam safety program.
- Ensure all high and significant hazard dams have an EAP and update and exercise these on a regular basis.
- Expand education about the importance of dams to ensure the public is aware of the importance and role of dams in their community and dam owners understand their responsibilities and liability toward the downstream public and environment.
- Ensure the advancement and expansion of the technical expertise of dam practitioners, including licensed professional engineers, hydrologists, and geomorphologists, through training and higher education programs.
- Encourage all counties and municipalities to develop and maintain a comprehensive plan and zoning regulations that protect and address the role that both public and private dams have in the community.
- Continue investment in the removal of unnecessary dams and restoration of the river ecosystem.

SOURCES

Association of State Dam Safety Officials (ASDSO)

The United States Society on Dams (USSD)

Federal Emergency Management Agency (FEMA)

Illinois Compiled Statutes (615ILCS5), originally enacted June 10 1911, and last amended February 7, 1996.

Illinois Administrative Code, Title 17 (Conservation), Chapter I (Dept. of Natural Resources), Subchapter h (Water Resources). These rules were originally adopted September 2, 1980 and last revised April 10, 1998.

Illinois Department of Natural Resources (IDNR)

Illinois State Water Survey (ISWS)

National Inventory of Dams (NID) accessed March 2022.

U.S. Department of Energy (USDOE)

Illinois Association of Regional Councils

U.S. Bureau of Labor Statistics

Rebuild Illinois Capital Plan" passed in June 2019 which includes $45 billion worth of investments with $33.2 billion earmarked for transportation projects. https://idot.illinois.gov/transportation-system/rebuild-illinois.html

Drinking Water

D+

EXECUTIVE SUMMARY

Drinking water systems are essential for public safety and quality of life. Unfortunately, Illinois groundwater resources are becoming depleted and the number of community water supply systems in violation of one or more of the U.S. EPA's drinking water compliance programs is also up significantly since 2018. Also of major concern is that out of 4 million total service lines, over 675,000 have been identified as lead and almost 380,000 as copper with lead solder services. Fortunately, financial assistance for these challenges is on the way. Approximately $288 million is provided by Congress in FY22 for Illinois water infrastructure, more than double the amount awarded in FY21. Additionally, the Illinois EPA (IEPA) is assisting communities with the replacement of lead service lines by allowing a one-time, $95 million transfer of wastewater loan funds to the drinking water loan program. Those funds will be solely dedicated to lead service line replacement activities in FY 21 – 23.

CONDITION & CAPACITY

Source Water

In Illinois, oversight of Public Water Systems (PWS) is divided between the IEPA and the Illinois Department of Public Health (IDPH). 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. In 2019, there were 1,756 reported CWS. The IDPH also oversees the non-community water systems (facilities such as schools, factories, restaurants, resorts and churches served by their own water supply), of which there were 3,692 in Illinois in 2019.

In 2019, the 1,756 CWS within Illinois serve more than 12 million people and are sourced in the following ways:

- Surface Water – 39%
- Purchased Surface Water – 35%
- Purchased Ground Water – 2%
- Ground Water – 24%

Although only 26% of the population is served by ground water, ground water systems comprise almost 65% of the total number of community water systems.

Many cities, towns and villages are facing water issues as their reserves of water are being depleted. Much of the rain that falls on catchment areas either evaporates or flows to surface water bodies as run-off, while only a small percentage replenishes the ground water. A 2015 report released by the Illinois State Water Survey (ISWS) detailing Illinois' groundwater capacity explained that if changes are not made to our unsustainable water use practices, some groundwater-dependent communities and industrial wells could be unusable within 15 years, and even more will be at risk by 2050.

In Illinois, groundwater depletion 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.

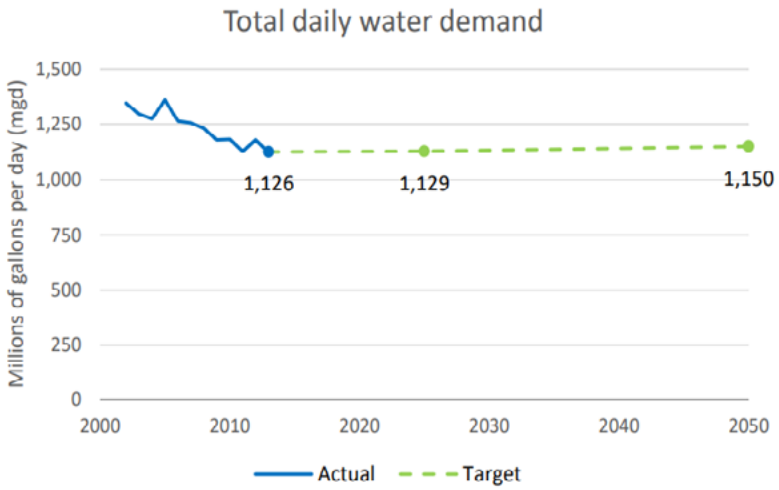
Distribution

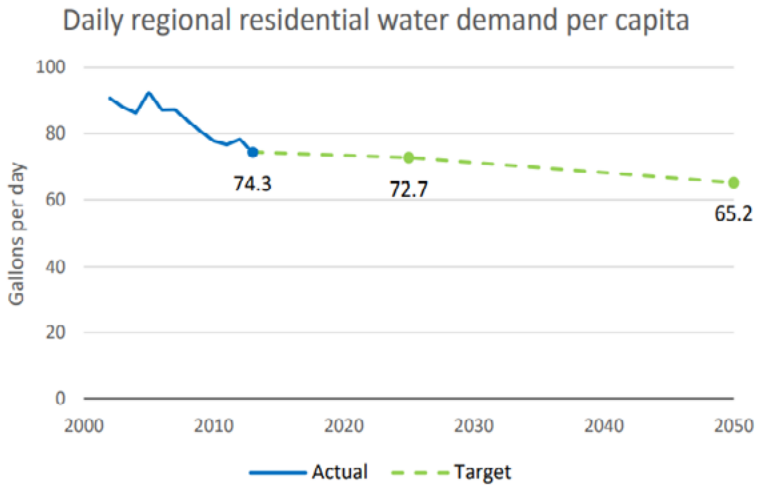
Illinois water utilities, along with utilities in almost every other state, struggle with non-revenue water loss – meaning water that is treated but not charged for. Non-revenue water is a result of many things such as water main breaks, theft, high municipal usage that is not tracked, faulty reporting, or uncalibrated meters. In 2017, a total of 106 million gallons per day (MGD) were lost amongst Lake Michigan allocation permittees. At the same time, non-revenue water as a percent of annual pumpage amongst all permittees was approximately 13% of water supplied on average. This is down from 117 MGD and 15% in 2016, and 135 MGD and 16% in 2014. Though the trends are moving in the right direction, they are still above the 10% threshold required by the Illinois Department of Natural Resources (IDNR).

Additionally, as of June 2020, there were over 675,000 lead and almost 380,000 copper with lead solder services known out of the nearly 4 million total service lines. This means approximately 28% of the water services currently documented in Illinois can leach lead into drinking water.

Usage

Looking forward, the Chicago Metropolitan Agency for Planning (CMAP) anticipates a total water usage in the Chicagoland area of 1,129 MGD in 2025 and 1,150 MGD in 2050. This 25-year water use trend is relatively stable due to a prediction that population will increase, but per capita water usage will continue to decrease, from 72.7 gallons per capita per day (gpcd) in 2025 to 65.2 gpcd in 2050. Predicted future total and per capita daily water demand is provided in the following two figures.





FUNDING & FUTURE NEED

As this report was being compiled, the Infrastructure Investment and Jobs Act (IIJA) was signed. It provides tremendous opportunities for Illinois to invest in drinking water needs, address critical issues such as lead exposure and focus on the needs of historically underserved communities. The federal commitment for Illinois water infrastructure investment in fiscal year 2022 ($288 million) will provide over double the amount awarded in water infrastructure for fiscal year 2021 ($116 million). (These figures include drinking and wastewater/stormwater funds).

The IEPA has implemented a Source Water Assessment Program (SWAP) pursuant to the 1996 amendments to the federal Safe Drinking Water Act. Through SWAP, IEPA has conducted assessments of all public water supplies in Illinois and identified areas in need of water infrastructure improvements. The agency's drinking water loan program has provided $910.1 million in funding for such improvements across the state between 2018 and 2021. The amount loaned each year has steadily decreased from a high of $337.7 million in fiscal 2018. The IEPA imposed funding caps on the program in 2019 in order to remain solvent in perpetuity, as required by U.S. EPA. The agency has also imposed funding caps per project to maintain fiscal health and distribute the funds to as many communities as possible. It continues to be one of the most cost-effective means of constructing virtually every kind of necessary public water supply system improvement, including water meters, distribution mains, and storage and treatment facilities.

The life-cycle costs of water system components are often overlooked and unaccounted for, creating a funding deficit when inevitable replacements are necessary.

In August 2021, the governor signed into law the Lead Service Line Replacement and Notification Act, making Illinois the third state in the nation to require full replacement of lead drinking water pipes. Illinois has more lead pipes than any other state in the nation, with at least 675,000 connecting homes to water mains. The bill bans partial replacement of lead service lines, in which only the utility's side of the lead line is replaced, while the portion of the line that runs under a private property remains.

IEPA is working to assist communities with the replacement of lead service lines by taking advantage of recent federal action allowing a one-time $95 million transfer of wastewater loan funds to the drinking water loan program. Those funds will be solely dedicated to lead service line replacement activities. This transfer will enable IEPA to fund additional lead service line replacement projects in fiscal years 2021 through 2023.

Regardless of available financing for water infrastructure projects, the underlying investment gap remains. One estimate from the U.S. Environmental Protection Agency found a 20-year gap of nearly $21 billion. Many locally managed systems do not adequately account for their capital investment needs and charge usage rates below cost, generating insufficient revenue to finance investment. Smart management processes, such as annual water loss audits, should factor into investment decisions. Cost processes for rates are also antiquated. CMAP has analyzed the need for better processes for water pricing, and funding for that analysis and development has been variable because of state budget constraints. The life-cycle costs of water system components are often overlooked and unaccounted for, creating a funding deficit when inevitable replacements are necessary. Alternatives such as smaller service providers combining resources can provide savings to communities.

The following table illustrates the federal funding for drinking water programs from 2017 to 2021. Drinking water is receiving the much-needed federal investment, as can be seen from the trends shown below. Historically, Illinois receives approximately 4% of the available federal funding in this area. As acknowledged above, the IIJA will inject even more funding into this crucial piece of Illinois' infrastructure.

TABLE 1. FEDERAL INVESTMENT IN DRINKING WATER

Federal Fiscal Year (FY)	Water Infrastructure Finance and Innovation Act (WIFIA)*	Environmental Programs and Management / Drinking Water Programs	State and Tribal Assistance Grants / Drinking Water State Revolving Fund (DWSRF)	State and Tribal Assistance Grants / Categorical Assistance: Public Water System Supervision (PWSS)
FY 21	$890.8M	$108.4M	$1,224.3M	$110.3M
FY 20	$40.8M	$102.0M	$1,133.5M	$109.1M
FY19	$32.6M	$0.2M	unavailable	unavailable
FY 18	$12.23M	$2.4M	unavailable	unavailable
FY 17	$3.6M	$94.1M	$863.9M	$102.3M

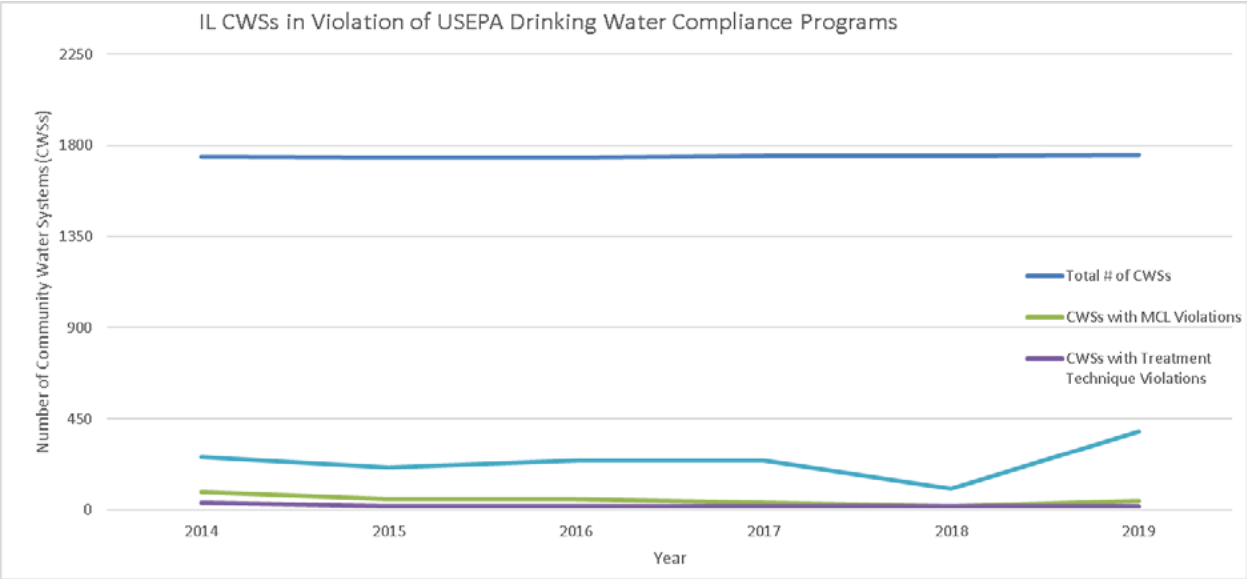
PUBLIC SAFETY

In 2019, a reported 444 IL CWSs were in violation of one or more of the U.S. EPA drinking water compliance programs, up from 97 in 2018. The average number of CWSs in violation from the years 2014 through 2017 was 278.

86% of the 444 systems in 2019 were in violation of significant monitoring reporting rules, while only 4% and 10% were in violation for treatment techniques and maximum contaminant levels (MCLs) respectively. However, if CWSs are not monitoring and reporting their activities and water quality to the IEPA, it is unknown if these communities are meeting all treatment technique and MCL standards.

Shockingly, according to the Centers for Disease Control and Prevention (CDC)'s National Outbreak Reporting System, there were 83 illnesses, 50 hospitalizations, and 16 deaths attributed to drinking water borne diseases from 2015 through 2018 in the state of Illinois.

While IEPA and IDNR continue to pass new monitoring and reporting regulations and build upon the Illinois Administrative Code to prevent these public safety issues, if CWSs are not held accountable for these reporting standards, public safety will remain an apparent issue.



OPERATION & MAINTENANCE

Far too often, the approach toward public infrastructure is to build and operate systems with minimal maintenance until the infrastructure 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 all 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 personnel required for operations and take all costs involved to adequately determine usage rates that cover the costs of maintaining and operating the systems.

Because water systems are growing and total water demand is anticipated to increase by 21 MGD over the next 30 years in the Chicagoland region alone, Illinois will need additional certified public water supply operators. In reality, the number of certified public water supply operators is slowly dropping from year to year. From 2018 to 2019, this number dropped by more than 3%. As monitoring, reporting, general operation, and maintenance requirements grow with these growing systems, it will be critical for Illinoisans to educate and hire more properly-trained staff.

RESILIENCE & INNOVATION

With the uncertainty that climate change introduces into our future, resiliency and innovation in addressing water sector needs and improvements cannot be underestimated. Emerging threats such as Per and Polyfluoroalkyl Substances (PFAS) – colloquially know as forever chemicals – in water supplies, and the reality of managing public services through a pandemic, add complexity to risk and management strategies.

In 2019, in the absence of a federal standard for PFAS in drinking water, the IEPA, began developing a plan to establish maximum contaminant levels for PFAS in the state. The multi-phase plan includes testing all public water supplies, working with the Illinois Department of Public Health to develop the risk assessment and health effects, and examining the technical feasibility and economic impacts of remediation before proposing any rulemaking. The first step of the first phase began in the fall of 2020.

Technologies such as leak detection, combined with an emphasis on increasing consumer awareness and education about the value and finite nature of water as a resource will open the door to important public conversations about management strategies. It will draw attention to this critical piece of infrastructure that is largely out of sight and out of mind.

Community water suppliers should focus on four foundational strategies: universal metering, water accounting and loss control, water costing and pricing, and public information and education. Recognizing the need to plan for future demand and growth, Oswego, Illinois and surrounding communities have started to explore options including governance of a shared water treatment plant. Educating the consumer regarding the actual cost of providing services is key.

And while jobs in the water sector may not have the cache that careers in newer tech industries have, it is important to focus efforts on replacing the existing workforce, one third of which is retirement eligible in the next 10 years. Illinois has unparalleled opportunities for education through its city/community college programs and collaboration with the Illinois Section of the American Water Works Association. An example of raising awareness of water industry needs and water sector jobs, organizations such Chicago-based Current (currentwater.org) provide information, outreach, education and job opportunities in the field. Jointly funded by the City of Chicago, the Metropolitan Water Reclamation District and the region's research universities, this non-profit works to find new solutions, bring potential partners together, and improve the water sector and economy.

Drinking Water

RECOMMENDATIONS TO RAISE THE GRADE

- Encourage water conservation efforts among municipalities by creating a water accounting program, similar to IDNR's Lake Michigan Water Allocation program, for non-Lake Michigan water users.
- Reducing per capita water usage through 2050 is critical to Illinois' ability to meet future water demands. Encourage water conservation efforts among individuals, including supporting the use of low-flow accessories/appliances and rain-barrels.
- Support full lead service line replacement by allowing these projects to be funded through state loan and grant programs.
- 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. 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.
- Require municipalities to report on the condition of their critical infrastructure.
- Community water suppliers should focus on four foundational strategies: universal metering, water accounting and loss control, water costing and pricing, and public information and education.
- Fund efforts by CMAP and other public or non-profit entities to provide planning and guidance resources to support water management efforts.
- Low tech solutions like use of rainwater and greywater can decrease the demand for drinking water. Regional or state-wide emphasis on strategies such as groundwater protection and conservation measures will further protect water resources for the future.
- Involve non-profit organizations, such as Illinois Clean Energy, in conversations about applying sustainable energy practices to the water sector.
- Prioritize hiring for IEPA and IDPH, to ensure adequate staffing needed to address inspection and compliance needs.
- Ensure state funding is made available to provide required matching funds to ensure optimal utilization of available federal grant and loan funding.
- Planning initiatives should focus on gaining efficiencies through collaboration and/or consolidation of utilities and services regionally.
- Develop a comprehensive plan to introduce training and career information on water jobs in public community and state colleges.

Drinking Water

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Inland Waterways

D

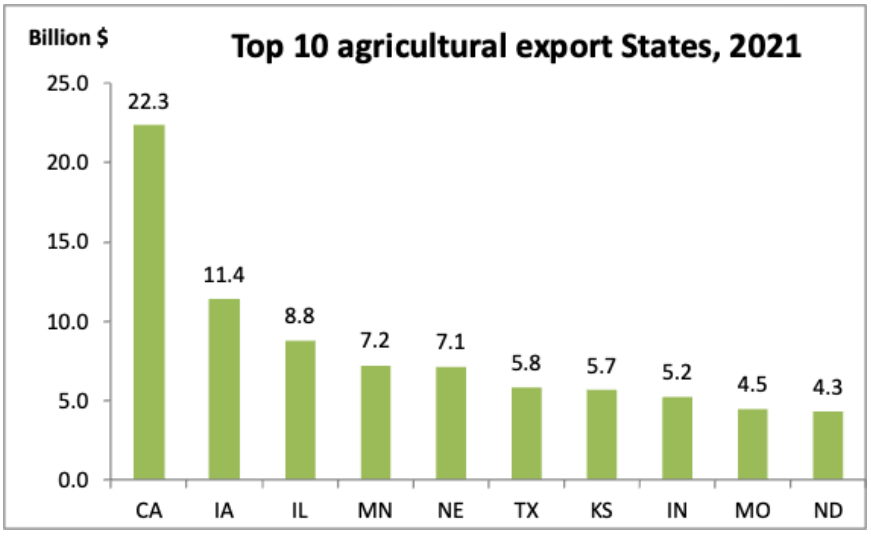
EXECUTIVE SUMMARY

Illinois has 1,118 miles of navigable inland waterways passing through or bordering the state. With 29 river locks, 350 active ports, and the nation's only all-water connection between the Great Lakes and the Mississippi River system, Illinois' inland waterways network is key to the future of marine and intermodal freight movement throughout the Midwest. In recent years, significant increases in federal funding have allowed for the completion of several large maintenance projects on both the Mississippi River and the Illinois Waterway and meaningful improvements to the condition of the inland system. However, freight traffic is forecasted to increase 50% over the next 30 years. It is critical that there is continued investment in lock and dams to sustain current usage but to also meet future capacity demands to ensure that Illinois' crops and commodities reach markets in a timely and cost-effective manner.

INTRODUCTION

The state's navigable inland waterways are the unseen backbone and a critically important segment of the freight transportation system for Illinois and the nation. In 2019, Illinois ranked ninth 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 $8.8 billion in 2021. Other top commodities transported by water include coal, petroleum products, chemicals, and sand and gravel.

FIGURE 1. TOP U.S. STATE EXPORTERS OF AGRICULTURAL PRODUCTS



Source: United States Department of Agriculture (USDA) Economic Research Service; USDA Foreign Agricultural Service (Global Agricultural Trade System). 2021

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.

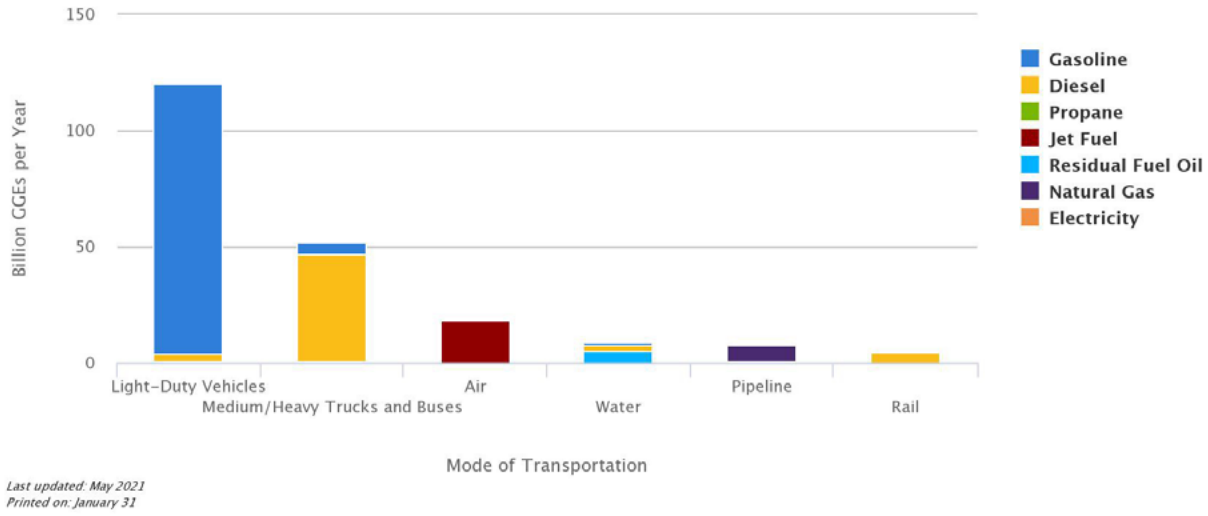
Over the next 30 years, economists estimate that nationwide freight movement will increase by more than 50% (U.S. Department of Transportation's Bureau of Transportation Statistics and the Federal Highway Administration). The strategic management of specific commodities and the growth in freight on inland 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. ENVIRONMENTAL STATISTICS BY MODE (2017)

Mode	Fuel Efficiency	Emissions
	Ton-Miles/Gallon	Tons of CO2
Inland Waterway Transport	647	15.6
Rail	477	21.2
Trucks	145	154.2

Source: A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001–2014. Texas A&M Transportation Institute, sponsored by the National Waterways Foundation. January 2017

FIGURE 2. ENERGY USE BY TRANSPORTATION MODE AND FUEL TYPE



Source: United States Department of Energy, Energy Efficiency and Renewable Energy. May 2021

FIGURE 3. UPPER MISSISSIPPI RIVER BASIN WATERWAY

Illinois Inland Waterway System

The Illinois inland waterway system connects the Great Lakes to both the Ohio and Mississippi Rivers, providing an essential 336-mile waterborne linkage between 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, seventeen locks at fifteen locations on the Mississippi River along the Illinois western border, one lock on the Kaskaskia River, and four locks at two locations on the Ohio River along 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.

FIGURE 4: MISSISSIPPI LOCK AND DAM NO. 15 JANUARY 2022 DEWATERING

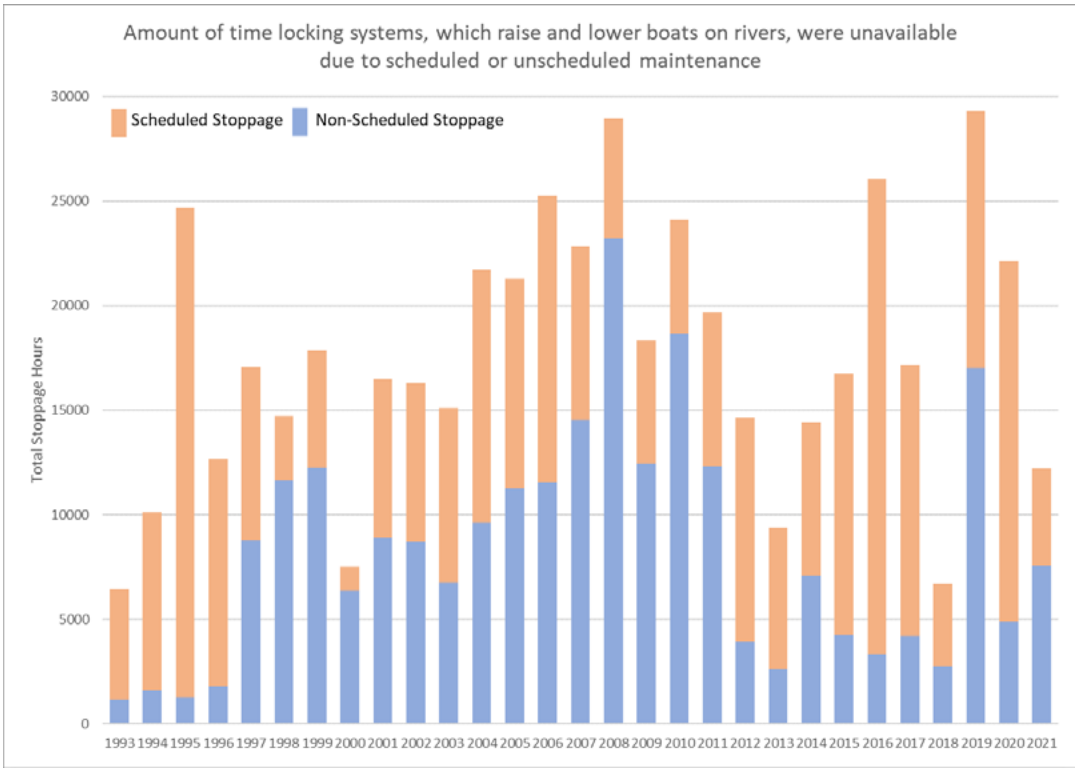
CONDITION

In September 2018, the Olmsted Locks and Dam became operational, replacing the deteriorated and overstressed Locks 52 and 53 on the Ohio River. Subsequently, during a four-month consolidated closure in 2020, five locks on the Illinois River received much-needed repairs, updates, and maintenance. These lock and dam rehabilitation projects, at LaGrange, Peoria, Starved Rock, Marseilles, and Dresden Island, have been described as "the largest investment in the Illinois Waterway since its inception" with a total investment for these projects in the range of $200 million. This still leaves most of the locks and dams along the Illinois, Mississippi, and Ohio rivers built in the 1930s with a 50-year design life.

Overstressed locks that are operating past their intended lifespans are more likely to break down, causing significant challenges for farmers, manufacturers, and others relying on the inland system to get their goods to market. 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.

Figure 6 provides a 28-year snapshot between scheduled and non-scheduled stoppages seen along the Illinois waterway, Mississippi, Kaskaskia, and Ohio Rivers. The significant decrease in unscheduled closures is due in part to the completion of major rehabilitation and maintenance work completed along the Illinois Waterway in 2020. That planned work required a deferral of some scheduled maintenance in 2018 and a four-month scheduled closure of the Illinois waterway in 2020, but since its completion, the frequency and duration of unscheduled closures has been significantly reduced. It is anticipated that the future work planned in 2023 should further reduce unscheduled closures for the Illinois Waterway, ultimately benefiting the American industries that rely on the inland system and the supply chain in general.

FIGURE 6: LOCK CLOSURES FOR THE ILLINOIS WATERWAY, UPPER MISSISSIPPI, KASKASKIA, AND OHIO RIVERS



Source: United States Army Corps of Engineers (USACE), 2021

CAPACITY

The capacity of a 600-foot long lock chamber is approximately 45 to 55 million tons of freight per year. In contrast, the capacity of a modern, 1,200-foot long chamber is 100 million tons per year. As locks approach their capacity, delays can increase exponentially. The modern 15-barge tow size has a length approaching 1,200 feet long.

All but five of the locks within the existing system are 600 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. 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.

FIGURE 5: STARVED ROCK LOCK AND DAM

FUNDING

The federal government owns the navigable inland waterway system and the federal biennial water resources development legislation is the main source of authorizations for funding components within the system. The actual funding comes through the federal appropriations legislation, which does not always sync with the authorizations. Federal appropriations pay 50% of any capital investment to the system, while the Inland Waterways Trust Fund covers the other 50%. In contrast, the federal government pays for 100% of Operations and Maintenance (O&M) costs with general revenues.

A number of Congressional actions taken from 2018 through 2022 have clearly recognized the need for maintenance and upgrades to the inland waterway system serving Illinois and the nation. Earlier reports identified $13 billion in cumulative investment to maintain the current level of service. In 2020 and 2021, through a major accomplishment of coordination of funding and design, the Corps performed major rehabilitation and repairs at five lock and dam locations on the Illinois Waterway.

More recent authorizations and appropriations continue the investment in inland waterways. Federal passage of the Infrastructure Investment and Jobs Act (H.R. 3684) which provides for $2.5 billion in emergency appropriations to the USACE for the construction of inland waterway projects and additional $4 billion for operations and maintenance.

Funds allocated from the 2022 Infrastructure Investment and Jobs Act for key inland waterway projects in Illinois include:

- Lock and Dam 25 Navigation & Ecosystem Sustainability Program: $732 million
- Major Rehabilitation for T.J. O'Brien Lock and Dam on the Illinois Waterway: $52.52 million
- Fish passage at Lock 22: $97.10 million
- Illinois Waterway O&M including work at seven locks and dams at Starved Rock, Brandon Road, Lagrange, Peoria, Lockport, Marseilles and Dresden Island: $83.34 million
- Kaskaskia River O&M: $10.295 million

The current approved funding does not fully address the long-term needs of the system. However, the funding represents recognition of inland waterways as key components of the nation's freight transportation system.

FUTURE NEED

Table 2 shows the volumes of freight movement along the Illinois navigation system in 2017 along with projected tonnage for 2045, the relative importance of specific segments of the Illinois system in moving freight and the future growth projected. Regular and robust investment is necessary to plan for future freight volume growth as well as maintain consistency for the supply chain.

TABLE 2. INBOUND AND OUTBOUND FREIGHT TONNAGE BY WATERWAY

Waterway	Tons 2017 (In Thousands)	% Of State	Tons 2045 (In Thousands)	% Of State	Projected Growth (In Thousands)	% Change
Chicago Region	17,616	19%	24,083	25%	6,467	37%
Illinois River	26,074	29%	28,650	30%	2,576	10%
Kaskaskia River	1,385	2%	1,604	2%	219	16%
Mississippi River	24,590	27%	23,023	24%	-1,567	-6%
Ohio River	11,611	13%	8,065	9%	-3,546	-31%
Other	9,285	10%	9,285	10%	0	0%
Total	**90,561**	**100%**	**94,710**	**100%**	**4,149**	**5%**

Source: Illinois Marine Transportation System Plan and Economic Impact Analysis, Illinois Department of Transportation. March 2021.

OPERATION 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.

One issue regarding the lack of funding is 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.

FIGURE 7: PEORIA LOCK AND DAM DEWATERING, JULY 2020

PUBLIC SAFETY

Barging along the inland waterways is possibly the safest way to move freight. For every ton of product moved a mile, there is one injury along the waterway, 80.9 injuries on rail, and 696.2 injuries with truck traffic. However, safety can still be compromised when 15-barge tows must be uncoupled to travel through 600' locks.

RESILIENCE

One of the most difficult challenges facing the inland waterways 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, the Corps has implemented several new technologies to extend the life of existing infrastructure and to improve operational efficiencies. These efforts have ranged from using ultrasonic imaging for underwater inspections to deviations from the more traditional materials and machinery used in repairs. These advancements include the usage of a variety of new polymers, glass fiber-reinforced polymer composite wickets, and use of rotary actuators over hydraulic cylinders to reduce footprint.

Inland Waterways

RECOMMENDATIONS TO RAISE THE GRADE

- A long-term strategy to increase investment in the system must be proposed within the IDOT's transportation freight plan to maintain reliable and cost effective inland navigation.
- Maintain a continued focus on authorization and appropriations for infrastructure investments to the Illinois Inland Waterway System.
- IDOT should aggressively pursue U.S. Maritime Administration (MARAD) America's 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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Inland Waterways

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ACRONYMS

MARAD	=	U.S. Maritime Administration
O&M	=	Operations and Maintenance
USACE	=	U. S. Army Corps of Engineers
USDA	=	U. S. Department of Agriculture

Ports

C-

EXECUTIVE SUMMARY

With a total of 1,118 miles of inland navigable waterways from Mississippi, Ohio, Kaskaskia and Illinois rivers, including the Chicago Area Waterway System, 19 public port districts and over 400 private terminals, Illinois is the freight epicenter of the nation. Nearly all Illinois ports have sites available for industrial development within their jurisdiction as they provide access for multimodal transportation. Generally, waterway infrastructure needs to be improved along the entire Mississippi River System and the Great Lakes inland waterways to ensure reliable freight movement. Accordingly, in the Spring of 2019, the Rebuild Illinois Capital Bill appropriated $150 million to IDOT for the Illinois Port Facilities Capital Investment Grant Program with the rest of the funding – an overall $33.2 billion – going to other forms of the state's aging transportation system.

CAPACITY

In Illinois, Lake Michigan has three harbors for large ocean-going vessels and more for recreational boats. The harbors along Lake Michigan that handle freight-bearing ships are the Waukegan Harbor, Chicago Harbor, and the Calumet Harbor. Waukegan is also a port, while the Calumet Harbor connects to the Illinois International Port / Port of Chicago via the Calumet River and Lake Calumet. The Chicago Harbor is not a port, but some freight cargo passes through to access the Chicago River and the Illinois River and canal system. The ports utilize the waterways with a variety of types of vessels that can hold large volumes of goods including lakers, tug-barge combinations, and "salties."

With a population of 12.67 million, a total of 1,118 miles of inland navigable waterways from Mississippi, Ohio, Kaskaskia and Illinois rivers, including the Chicago Area Waterway System, 19 public port districts and over 400 private terminals, Illinois is the freight epicenter of the nation which has been integral to the state's development.

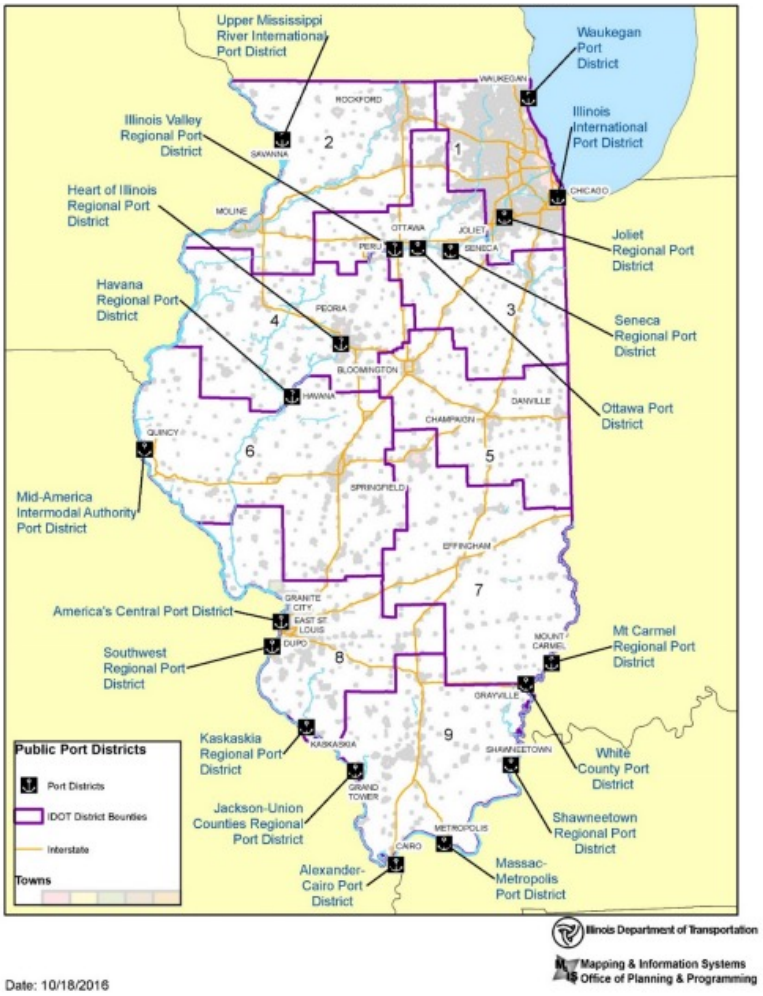
According to the Illinois Department of Transportation's (IDOT) new Illinois Marine Transportation System (IMTS) Plan published in March 2021, the Illinois waterway system as a whole transports 90.6 million tons of goods annually, bringing $36 billion in economic activity and supporting 160,000 jobs. IDOT reported that over 1 billion tons of freight, valued at nearly $3 trillion, was moved to, from, or within Illinois in 2014, the highest recorded to date. Annual reports from the U.S. Army Corps of Engineers (USACE) Waterborne Commerce Statistics Center (WCSC) reported 75.1 million tons of freight commerce traffic for Illinois in 2020, ranking the state 8th in U.S. waterborne traffic, however a 30% decline from previous years. Projections by IDOT (2020) and USACE (2015) both indicate flat to modest growth in Illinois waterway tonnage reporting that by 2045 statewide waterways freight volumes will increase by almost 5% to 95 million tons.

The 19 port districts within Illinois encompass either all or a portion of 37 counties as they range from the

smallest boundaries of a single municipality (Mt. Carmel Regional Port District) to the largest which makes up 10 counties (Mid-America Intermodal Authority Port District). With its critical role in the movement of freight nationwide, nearly all Illinois ports have sites available for industrial development within their jurisdiction. While the main intent of the ports is to encourage the use of the waterways, a few districts have little to do with them.

In Illinois, freight movement relies on a multimodal network of highways, railroads, waterways, and airports all of which allow for Illinois ports to provide an access point for multimodal transportation and positioned well for economic prosperity. As a multi-modal terminal, Illinois ports can handle loading or off-loading of cargo from barges, vessels, trucks and rail cars.

FIGURE 1. MAP OF ILLINOIS PORT DISTRICTS



(source: IDOT)

Supply chain businesses depend on much of the commodities moving through the ports of Illinois which are agricultural products, raw materials, manufactured goods and chemicals. However, there has been a disruption in the global supply chain, prompted by the COVID-19 pandemic, causing shipping delays, worldwide shortages and affecting consumer patterns.

According to NPR, Illinois businesses are feeling the supply chain crunch as entrepreneurs are unable to fully restock their supplies, creating limited inventories and increased prices. Major American ports, including those in Illinois, became inundated with historic amounts of inbound cargo by mid-2021. Cargo often remained at port for days or weeks due to staffing shortages. Landside

consequences have also taken effect across the shipping, trucking, and rail industries. Chicago is emerging as a new bottleneck in the global supply chain as rail, trucking and logistics operators struggle with imports from Asia reaching the Midwestern freight hub.

Consequently, there is a capacity crunch underway in the North American freight markets. While there is generally not a shortage of trucking companies, there can be a shortage of drivers, and thus difficulties in getting trucks. Companies such as J.B. Hunt and FedEx Freight, recently had to restrict capacity to certain customer locations to control the flow their shippers give them to reduce delayed arrivals and decay of service. There is hope that supply shipments will return to normal and more reliable service as the pandemic subsides and operators and staff return to work. However, with lack of certainty, a goal on ensuring that the state maintains a similar level of performance in the future and a flexible transportation network that can effectively shift freight modes is crucial to mitigate inefficiencies and absorb shocks throughout the network.

CONDITION

Port development and activity in Illinois involves private industry and the State, which uses enabling legislation to create port districts. As private entities, they are not subject to the same level of transparency as the public sector beyond reporting requirements set by federal regulation. Each port district is unique, faces different challenges, and uses different approaches to encouraging waterway use. Several port districts own and lease property. They support their tenants by improving rail, road, and waterway infrastructure for cooperative use. Furthermore, they reinvest their revenue into the port to maintain state of good repair, attract more businesses and continue growth. These port districts contribute a total of 6,675 jobs and generate $1.5 billion in economic contribution to the state. There are many port districts which do not own or operate any property, most of which are actively looking for development opportunities through local support and the powers provided to them through the General Assembly.

Port districts remove the barrier to entry by providing the infrastructure and equipment needed to ship and receive commodities via the IMTS. Ports are contingent on infrastructure improvements both landside and waterside. This includes docks, seawalls, roads, warehouses, and other facilities throughout the port allowing for multiple businesses to be port district tenants.

Generally, waterway infrastructure needs to be improved along all of the Mississippi River System and

Each port district is unique, faces different challenges, and uses different approaches to encouraging waterway use.

Great Lakes inland waterways to ensure reliable freight transportation. Many vessel operators have stated that the condition of the infrastructure at ports and harbors in Illinois is outdated, causing challenges in attracting and retaining port users and tenants. Reports of broken docks falling into the water, narrowing channels leading up to ports and harbors, and fluctuating water levels have all resulted in delayed and reduced operations affecting capacity and freight volume potential at the ports.

Over one-third of vessel movements experience delay due to the length and width of the lock chambers in the broader Chicago region, and vessels experience significant delays due to periodic unscheduled and schedules lock closures. Dredging is also a continual challenge, as it is needed to create sufficient water depth in the Calumet River and Harbor. Various port districts in Illinois have improvement and expansion projects planned to further develop intermodal facilities which will include the need for expanded rail, road, water access, and land. Upgrades are also required for general cargo docks, revitalizing rail tracks, and multiple road reconstructions.

OPERATION & MAINTENANCE

The ability to on-load and off-load commodities onto barges and vessels requires specialized infrastructure and equipment that is costly. Port districts can act as a catalyst to facilitate the movement of goods by investing in capital infrastructure. As a port that had predominantly moved coal, Kaskaskia Regional Port District (KRPD) saw that commodity drop from a high of 4 million tons annually to just 400,000, and realized the need to form relationships with new customers, diversify the product line and invest in infrastructure to succeed. By 2019 the port district purchased a 50-ton overhead crane that built some added capacity, attracted a steel processor, followed by a fertilizer company and doubled to more than 600,000 tons of cargo moved along with 3.1 million tons of sand and gravel. Recent investments like these within the ports of Illinois should lead to additional growth.

A strength to the entire marine system in Illinois is the large number of operators which introduces competition and ensures that barge transportation remains an affordable option for shippers. While there are opportunities for increased barge shipping through the ports, some operators note that current infrastructure at the port is believed insufficient for increased operations so continued investment in infrastructure at port terminals is critical to maintaining reliability, safety, and availability.

FUNDING

Historically, Illinois does not offer a dedicated port funding mechanism. However, in the Spring of 2019, the Rebuild Illinois Capital Bill appropriated the sum of $150 million to the IDOT for the Illinois Port Facilities Capital Investment Grant Program. In 2020, the governor announced that the state will provide $40 million dollars from the $45 billion capital plan to go directly to the Alexander-Cairo Port District to construct a river port at the confluence of the Mississippi and Ohio Rivers. Final permits are needed from the state and federal governments, including the Corps of Engineers, but officials say they are confident those will be obtained in time for a late-2022 construction start.

Proposals from public port operators sought to distribute the remaining $110 million in funding via Rebuild Illinois to modernize and revitalize the state's marine transportation system. The state transportation department received 23 applications for projects at public ports and a total of 12 projects are receiving funds. Thus far, America's Central Port District in Granite City is one of the grant recipients, receiving a total of $21 million to improve efficiency at the port and reduce sediment in Madison Harbor.

The Waukegan Port District received $12 million for a quay wall reconstruction project to double the port's operational window by dampening waves. Quincy's Mid-America Intermodal Port will receive $13.2 million to enhance the port's capacity and efficiency by raising the dock and access road to protect against flooding and upgrade an existing site to a multimodal facility that can be used by barge, rail and truck shippers. Work is expected to begin this year. Remaining projects are to be announced by early 2022.

Moreover, through the bipartisan Rebuild Illinois capital plan, IDOT was able to manage approximately $2.4 billion in multimodal improvements to 1,314 miles of highway and 142 bridges, as well as 194 safety improvements in the 2021 fiscal year. Overall, Rebuild Illinois is expected to invest $33.2 billion into the state's aging transportation system with the promise of creating jobs and promoting economic growth. It is the largest program in state history to improve all modes of transportation across the state.

Additional funding sources are also available as America's Central Port was further awarded $1.26 Million from a Marine Highway grant in 2020 for the purchase of a 275-ton crane and container tilter to handle the loading of containers onto barges, as well as other commodities. The state also received 19 million from INFRA grant FY 2021 for the Archer Avenue and Belt Railway Company of Chicago (BRC) Grade Separation Project to grade separate roadway and two existing rail tracks. Furthermore, the Infrastructure Investment and Jobs Act passed by Congress in November 2021 dedicates $17 billion dollars to Illinois over the next five years, ensuring the sustained investment in a safe, equitable, resilient, multimodal transportation system for many years to come.

Currently, the Harbor Maintenance Trust Fund, which provides approximately $34 billion in infrastructure investment for U.S coastal and inland harbors over the next decade has collected more revenue from shippers

than Congress has appropriated to the U.S. Army Corps of Engineers to maintain harbors. Approximately $9.3 billion in already collected revenue sits idle in the U.S. Treasury, not being used for its intended purpose of investing in our Nation's ports and harbors.

FUTURE NEED

The governor signed House Bill 253, requiring IDOT to implement a performance-based program to improve the efficiency and effectiveness of the state's transportation system. Starting in 2022, IDOT is required to select certain projects for inclusion in its multi-year plan based on a process that weighs a variety of factors determined with input from the public.

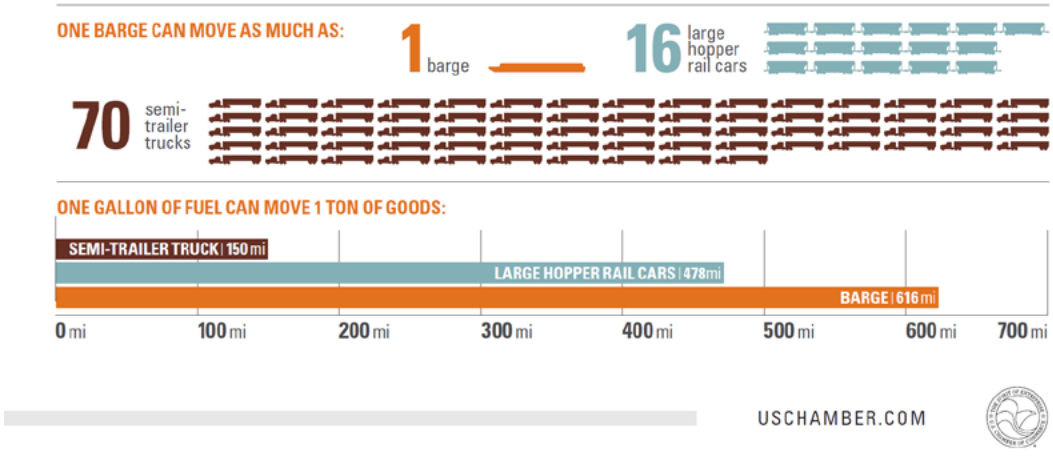
As of early 2021, the Illinois International Port District is amidst a master planning process to better understand its capital investment and improvement needs. For ports that do not own or operate terminal facilities, continued major investments of millions of dollars would be required to include operational resources such as heavy cranes, dredging, and storage facilities. Additionally, along with the major investment, feasibility studies would be required to establish final viability for the construction of new terminals.

PUBLIC SAFETY

Due to the vulnerability of the port districts with respect to commercial vessels, many flying foreign flags, the U. S. Coast Guard continually monitors and assesses port infrastructure and personnel issues and conducts periodic audits with the Port Facility Security Officer to ensure that all requirements are being met and maintained. Ports typically have their operators and tenants apply any appropriate safety protocols and procedures that are necessary for their industry. In 2018, new port security provisions were introduced in Congress, and a number of new laws were passed to improve security of U.S. ports, such as, Creation of the Transportation Worker Identification Credential, establishment of interagency operational centers for port security, Port Security Grant Program, Container Security Initiative, Foreign port assessments, and Customs Trade Partnership Against Terrorism.

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 removes 1,050 large semi tractor-trailers off Illinois roads, the equivalent of 216 rail cars and six locomotives. As commerce continues to rise, truck traffic is expected to increase and the marine system can serve an important role in continuing to mitigate congestion resulting in lower fuel consumption and roadside fatalities and injuries which estimated over 1,200 in 2020.

FIGURE 2. MODAL COMPARISON



(source: U.S. Chamber of Commerce)

RESILIENCE

The Texas Transportation institute has shown that of the three modes, river transportation significantly reduces environmental contamination due to spills and emissions. There are proposals for environmental related uses of the river system and surrounding lands near ports including the development of a "blue/green corridor" that uses a river and adjacent lands to establish an interconnected passageway between natural habitats. This provides people with a place to play while allowing for the natural movement of wildlife and open space for rainwater to be absorbed and filtered and reduces the threat of high water levels to terminal operators as they increase damage inflicted by storms. A study prepared for the Friends of the Chicago River suggests that investing in this type of corridor would create over $192 million in annual economic benefits over a 15-year timespan while simultaneously creating 1,614 jobs and increasing nearby residential and commercial property values.

INNOVATION

Within Illinois there are four designated marine highway routes including M-35, M-55, M-70, and M-90. The M-55 corridor has attracted a pilot project for container-on-barge (COB) along the Illinois River and America's Central Port to the Gulf that launched in 2020. Given the supply chain disruption shippers need alternatives and container-on-barge is providing even more flexibility for shippers as it generates competition and may lower costs on other modes. Since launching COB service at America's Central Port, empty containers are now headed south every other week for repositioning in the gulf to get them back overseas to Asia where they were needed. The goal is to continue to grow the number of containers and start moving product via this COB service. The projected impact will increase daily freight traffic by 60%, where an estimated 1.5 additional barges will be loaded each day, removing 31,500 long-haul trucks from the road each year.

With current investment at the quay wall at Waukegan's inner harbor, new advances in dock design technology, wave-absorbing technology are being integrated into the plan for replacing the deteriorated wall. Further innovation includes a recent agreement between the Alexander Cairo Port District, Plaquemines Port Harbor & Terminal District and American Patriot Container Transport to make the proposed Cairo river port terminal a key logistics hub terminal for next generation inland waterways container vessels. The Alexander Cairo Port Authority has spent years developing a new Mississippi River port terminal that would include a state-of-the-art intermodal rail design capable of handling both containers and other valued cargoes, high speed cranes and other terminal capabilities needed to support modern container shipping logistical requirements. The port will also serve as a hub for moving bulk agricultural products and other materials for domestic and global markets. Eighty percent of inland barge traffic in the U.S. passes by Cairo's strategic location. The new port will be serviced by Class 1 railroads and several major highways and will be protected from flooding by recently reinforced levees.

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RECOMMENDATIONS TO RAISE THE GRADE

- Identify additional funding opportunities and implementation support for capital investment within ports for districts to develop, expand, and/ or improve their terminal facilities, truck and rail access, berths and channels, supporting logistics facilities, and water-dependent non-freight activities. Specifically, find ways to apply local matches for large federal grant programs.
- Develop a reliable long-term mechanism for IMTS and ports funding, following up on the one-time Port Capital Grant Improvement Program allocation.
- Finalize the design of the Port Capital Grant Improvement Program, covering an estimated five years of port funding, subject to potential modifications due to the COVID-19 pandemic and necessary state financial responses.
- Re-establish the Port Revolving Loan Fund to support short-term port and IMTS investment needs, such as local matches to discretionary grants or quick-response expenditures; loans could be funded out of an expanded Port Capital Grant Improvement Program or a parallel program, based on further exploration.
- Integrate funding into the State budget for Port Development and educate the public about freight transportation and improving general awareness of the marine system.
- Enhance technical support for port districts to document and communicate their capabilities, assets, and economic importance to a broad range of public and private stakeholders.
- Enhance the Illinois Department of Transportation's interaction with the public ports and further integrate their needs into the State Freight Transportation Program.
- 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.
- Enhance existing infrastructure to handle potential future intermodal freight growth.
- Enhance integration and connectivity across and between transportation modes for Illinois and the nation resulting in increased multi-modal options for freight movement.
- Advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources.

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Rail

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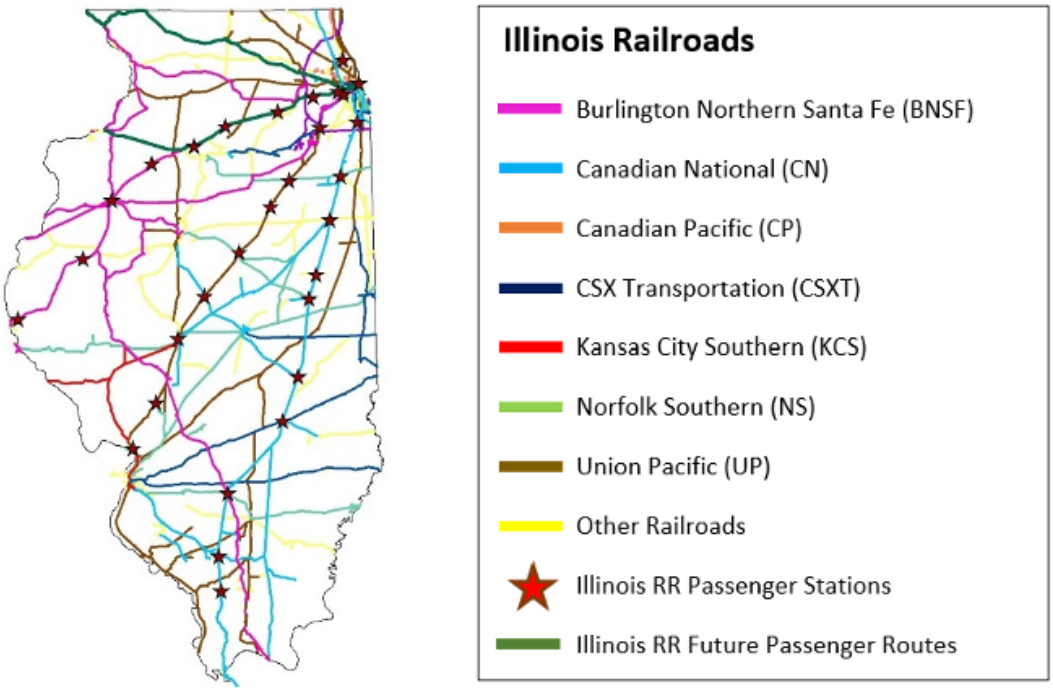
EXECUTIVE SUMMARY

Illinois is at the heart of the North American rail network, and nowhere else in the country do all seven Class I railroads converge and operate. The nearly 7,000 miles of Class I track play a key role in moving goods and people throughout the continent. However, parts of the Illinois rail system are well over 100 years old, and substantial investments are needed to accommodate growing freight traffic, which is forecasted to double from 2017 to 2025. Chicago remains extremely congested, with an estimated 500 freight trains and 760 passenger trains passing through the region every day. The CREATE program, an innovative public-private-partnership, aims to improve rail network speeds and eliminate rail-rail and rail-highway chokepoints in the Chicago region. CREATE includes more than 70 projects at a capital cost of $4.6 billion that will generate an estimated $31.5 billion in economic benefits when completed. As of 2021, 31 out of 70 projects have been completed. More recently, St. Louis has grown into the nation's third busiest rail and multimodal hub. To ease congestion, that region has developed a list of 21 priority capital freight projects estimated at $2.75 billion.

INTRODUCTION

The Illinois rail network is one of the most important transportation hubs in the country, with a comprehensive rail network of approximately 7,000 miles of Class I track, second only to Texas according to the Association of American Railroads (AAR). Illinois is the only state where all seven Class I railroads operate: Burlington Northern Santa Fe (BNSF), Canadian National (CN), Canadian Pacific (CP), CSX Transportation (CSXT), Kansas City Southern (KCS), Norfolk Southern (NS), and Union Pacific Railroad (UP). Close to 40 other Class II and Class III railroads operate throughout the state providing regional and local freight carrier service.

FIGURE 1 – ILLINOIS RAIL NETWORK MAP



CONDITION & CAPACITY

More than 9,000 track miles are operated by Class I, II, and III freight railroads, according to the latest Illinois State Rail Plan from 2017. The AAR 2019 Illinois fact sheet reports more carloads (3.8 million originated and 3.6 million terminated) are moved in and out of Illinois than any other state. Freight volumes are expected to increase 50% in the coming decade, and the current rail network will need substantial capital investment to accommodate the forecasted growth in rail traffic volumes.

Chicago is the nation's busiest rail hub, with an estimated 500 freight trains and 760 passenger trains passing through the region every day. It has long been reported that a carload could take more than 24 hours to travel across the Chicago terminal rail network. To modernize the aging and congested Chicago rail network, an innovative public-private partnership (PPP) titled the Chicago Region Environmental and Transportation Efficiency (CREATE) Program was started in 2003. This PPP includes the State of Illinois, City of Chicago, Cook County, U.S. DOT, AAR, BNSF, CP, CN, CSX, NS, UP, Amtrak, and Metra. The main objectives of the CREATE program are to:

- Increase capacity and efficiency and reduce travel times for freight and passenger trains
- Eliminate or reduce railroad crossing delays for motorists and emergency vehicles
- Benefit the local communicates in which CREATE projects are located
- Reduce train idling, emissions, and horn noise

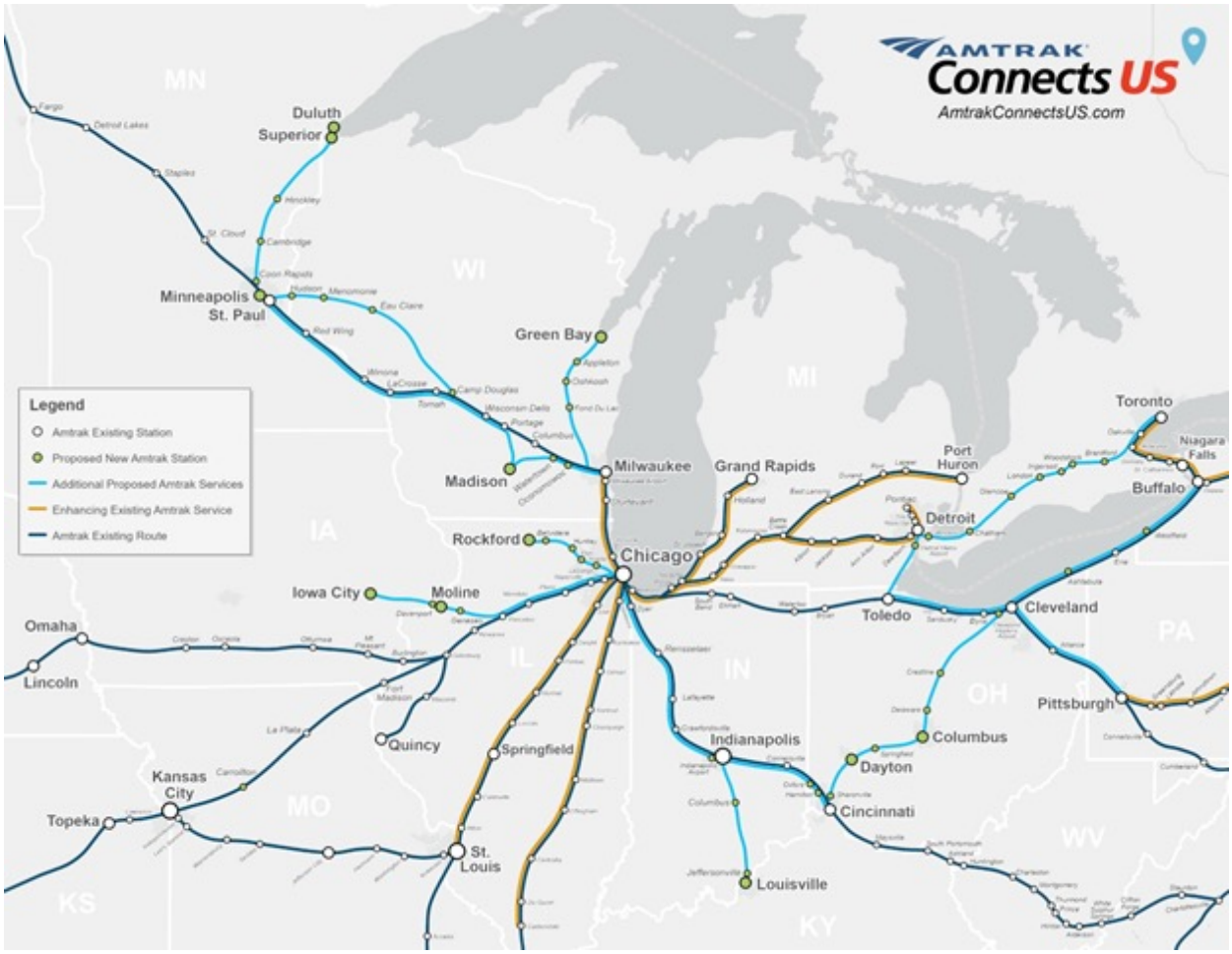
CREATE includes more than 70 projects at a capital cost of $4.6 billion generating an estimated $31.5 billion in economic benefits when completed. As of 2021, 31 projects have been completed, improving speeds through the rail network and eliminating rail-rail and rail-highway choke points. An additional 39 CREATE projects, at an estimated $3 billion in capital cost, are needed to mitigate the forecasted demand on the region's rail network.

East St. Louis also provides a key rail gateway to the national network. According to the St. Louis Regional Freightway, the region has grown into the nation's third busiest rail and multimodal hub. The Freightway has developed a list of 21

priority capital freight projects estimated at $2.75 billion in total capital cost. Similar to the CREATE program, the Freightway projects leverage federal grants to match local and private railroad funding.

Chicago is also a hub for Amtrak's national and Midwest passenger rail networks. Currently, seven state supported routes and eight national routes originate from or run through Chicago. In spring 2021, Amtrak released a plan to improve and expand passenger rail service within Illinois and the Midwest. Figure 2 shows existing routes, routes to be enhanced, and additional proposed Amtrak routes running within Illinois, with Chicago and St. Louis serving as key hubs from the 2021 Corridor Vision.

FIGURE 2 – AMTRAK 2021 VISION PLAN MIDWEST MAP



In Fiscal Year 2019, Amtrak served 4.7 million riders boarding and alighting at Illinois passenger stations. These passenger trains mostly operate on freight railroad right of way in Illinois.

Chicago Union Station (CUS) is the fourth busiest Amtrak station in the country. CUS served approximately 3.3 million riders in 2019, serving more passengers than Chicago Midway Airport. This critical rail hub is undergoing a more than $1 billion redevelopment to better serve passengers, including improved concourse, rehabilitation of the great hall, and development of the CUS site with a new office tower.

OPERATION & MAINTENANCE

Unlike other transportation modes that rely primarily on public funding for capital improvements, the private rail network requires considerable investment by the private owner railroads simply to maintain existing infrastructure.

Due to the high cost of routine maintenance, it is critical that public-private partnerships (see example in Funding section) are continued with multiple funding streams to construct large and complex rail projects in Illinois to benefit both the railroads and public.

FUNDING

Much of the state rail network is owned, operated, and maintained by freight railroads. The AAR estimates freight railroads spend around 19% of their revenue on capital expenditures annually. This investment covers the cost of maintaining the physical plant of the rail system to safely operate trains over their right of way but does not always include sufficient funds to eliminate major network bottlenecks. Similarly, Amtrak relies on federal funds to maintain its stations, rolling stock, and other infrastructure, even as it operates on private rail lines in most of the state.

The recently passed Infrastructure Investment and Jobs Act (IIJA) allocates $66 billion in total funding for passenger and freight rail projects. The funding is broken into five major programs:

1. Amtrak (National Network $15.8b and Northeast Corridor - $6b)
2. Federal-State Partnership for Intercity Passengers Rail Grant Program - $36b
3. Consolidated Rail Infrastructure and Safety Improvements (CRISI) Grant Program - $5b
4. Railroad Crossing Elimination Grant Program - $3b
5. Restoration and Enhancements Grant Program - $250m

There are also competitive grants for nationally significant projects such as the Infrastructure for Rebuilding America (INFRA) program ($8b), Rebuilding American Infrastructure Sustainability and Equitably (RAISE) grants ($7.5b), and National Infrastructure Project Assistance or "Megaprojects" program ($5b) that can help fund critical rail projects in Illinois.

In 2020, the Rebuild Illinois infrastructure bill passed, directing sizeable funding to multimodal transportation capital projects. Rebuild Illinois is the largest capital program in state history and includes specific funding for passenger rail projects across the state including:

- Quad Cities Passenger Rail - $225m (totaling $408 million for entire corridor)
- Chicago to Rockford intercity Passenger Rail Expansion - $275m
- Chicago to Carbondale Passenger Rail Improvements - $100m
- CREATE Funding - $400m
- Springfield 10th Street program - $122m
- IDOT grade crossing improvements - $78m

The CREATE program has been successful in leveraging private, state, and local funding to secure major federal grants and four projects have been completed since the 2018 report card. A recent example of a successful PPP projects is the $1 billion 75th Street Corridor Improvement Project (CIP) in Chicago which will improve rail lines for CSX, NS, BRC, CN, CP, Metra, and Amtrak and improve the surrounding community. The first phase of this project, totaling $474 million, relied on a mix of funding from state, railroad, local stakeholders and a federal INFRA grant. To complete the final phase of this critical project, additional funding is needed from various stakeholders as well as competitive IIJA grant money.

Other major rail projects within the state that benefit both the private rail network and general public should explore federal funding opportunities such as INFRA or CRISI grants following the playbook from the CREATE and St. Louis Freightway programs.

FUTURE NEEDS

According to the latest Illinois State Rail Plan, the current rail network generally provides sufficient capacity for current needs, but the volume of freight rail traffic is expected to double from 2017 to 2025.

The COVID-19 pandemic has impacted the global supply chain and considerably increased shipments of goods via rail. This explosion of demand for e-commerce and other shipments has put a strain on the Illinois rail network. According to the Wall Street Journal, imports from California to Chicago increased by 32% in 2021 compared to pre-pandemic 2019 figures. Congestion in the Chicago terminal has reached such high levels that rail carriers have started to reroute traffic through other east-west gateways such as St. Louis.

To accommodate the current and future demand for shipping freight and moving passengers along the Illinois rail network, substantial investment is required for enhancing existing and building new infrastructure. This includes finding funds to complete the remaining 39 CREATE projects at an estimated $3 billion in capital cost.

PUBLIC SAFETY

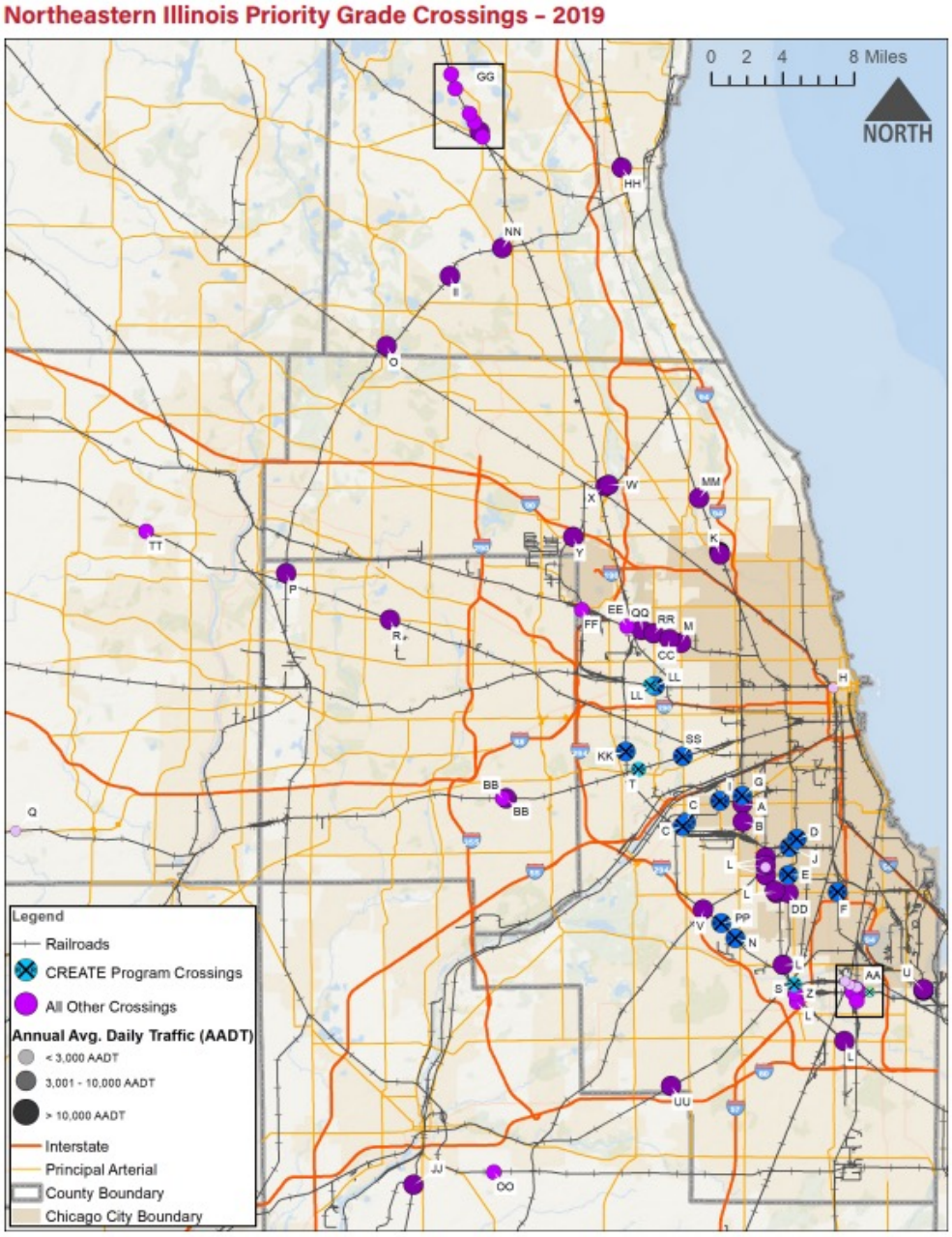
Illinois has the second highest number of highway-rail crossings, second again to Texas, with 7,557 public at-grade crossings in the state. The Illinois Commerce Commission (ICC) and IDOT invest in the installation of improved safety warning devices for trains, pedestrians, and vehicles at locations throughout Illinois. Although collisions at public highway-rail crossings decreased by 21% between 2019 and 2020, from 104 to 82, more investment is needed to eliminate dangerous crossings throughout the state. Figure 3 below shows details of the highway-grade crossing collisions for Illinois in 2020 from the ICC FY 22-26 Crossing Safety Improvement Program.

FIGURE 3 – ICC ILLINOIS HIGHWAY-RAIL GRADE CROSSING COLLISIONS IN 2020

Type of Collision	Total Collisions	Fatal Collisions	Total Fatalities
Train Struck Vehicle	45	6	6
Vehicle Struck Train	26	2	2
Pedestrian	11	9	9
Total	**82**	**17**	**17**

The Chicago Metropolitan Agency for Planning (CMAP) has developed a priority list of the busiest railroad crossings in Northeastern Illinois. Figure 4 shows the list of 47 priority crossings identified based on: traffic and congestion data, safety reports, mobility, and feasibility of construction. Most of these crossings still require dedicated and reliable funding to complete planning, design, and construction of the proposed improvements.

FIGURE 4 – CMAP PRIORITY GRADE CROSSINGS



Map data sources: Illinois Department of Transportation, Illinois Commerce Commission, CREATE Program, and Federal Railroad Administration.

Positive Train Control (PTC), which was initially passed by Congress in 2008 to increase safety, required America's railroads to finance, develop, install, and test this technology across the nation's rail network. While the development of PTC will help improve rail operation, significant resources from the railroads have been used for PTC versus constructed other infrastructure improvements. According to the Federal Railroad Administration PTC dashboard, the Class I freight railroads that operate in Illinois have made substantial progress implementing the various PTC components.

RESILIENCE & INNOVATION

The North American rail network is one of the most resilient transportation systems in the country thanks to the financial commitment the railroads' owners make every year. Both private and public railroads reinvest capital into routine and preventative maintenance to maintain a state of good repair of the various infrastructure systems to ensure the railroad's reliability.

In Illinois, major bottlenecks within the network that create delays for rail traffic and the motoring public with at-grade crossings often require large expensive capital projects to eliminate. These large projects with great benefits for both public and private stakeholders have leveraged PPPs and other innovative financing strategies to untangle the rail and roadway bottlenecks. The CREATE program and the St. Louis Freightway initiative have both successfully utilized PPPs to get major $100 million projects built. To construct more of these major capital projects that will reduce congestion and increase efficiency of the dense Illinois rail network, innovative financing should continue to be utilized.

Rail

RECOMMENDATIONS TO RAISE THE GRADE

- Increase state Intermodal Engineering resources to lead and advance rail projects that are needed to reduce congestion, increase efficiency, and build a more resilient rail network
- Support and advance capital projects within the CREATE and St. Louis Freightway programs
- Update the State Rail Plan to include a priority list of key statewide projects eligible for dedicated state funding
- Identify critical state rail network bottlenecks and develop strategic capital strategy to fund the planning, design, and construction of key projects leveraging PPPs or IIJA competitive grants
- Continue to progress rail projects identified in Rebuild Illinois
- Work with Amtrak to prioritize capital projects needed to implement their Midwest 2021 Corridor Vision plan
- Continue and increase reliable funding streams to Metra and state-supported Amtrak routes

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Rail

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Roads

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EXECUTIVE SUMMARY

Roadway conditions are improving in Illinois. The percentage of state-maintained highways in excellent condition grew 5.2% in 2020 when compared to 2019, as the state DOT began investing the additional revenue provided by Rebuild Illinois. Congestion remains a challenge. The Chicago region reported a travel time index of 1.29 in 2019, meaning during peak hours it takes nearly one-third longer to make a given trip. This was a minor improvement from 1.32 in 2017. Available funding for the surface transportation network has grown substantially thanks to Rebuild Illinois and the federal Infrastructure Investment and Jobs Act. However, the outlook for long-term, sustained revenues indicates these gains may be short-lived. With commitments being made to reduce carbon emissions and eliminate production of internal combustion engines by 2030, a steep decline in fuel tax revenues is anticipated. Additionally, the recent adoption of increased rainfall intensities highlights the inadequacies of drainage systems designs which leads to an overall loss of resiliency for the system's capacity.

BACKGROUND

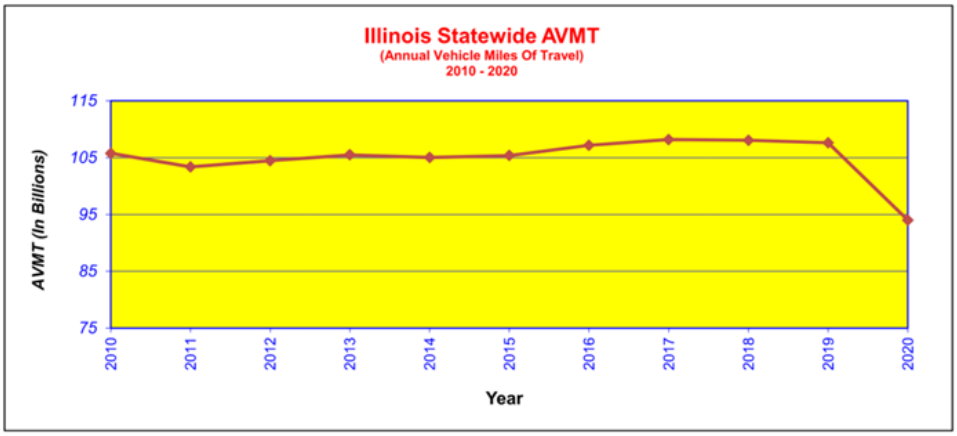
Roadways are a major component of the overall transportation network in Illinois, connecting people and freight with transit, rail, waterways, and air carriers, and often completing the "last mile" of any trip. Illinois is a diverse state with major metropolitan areas such as Chicago, Naperville, and Rockford that host industrial, commercial, and intermodal hubs, while 75% of the state's area focuses on agricultural production. This diversity is also represented in the roadway usage throughout the state, whether for business, pleasure, or bringing goods to market. Illinois is centrally located at the heart of the nation's highway network with I-80 and I-90 extending from coast-to-coast along with multiple north–south corridors, including I-39, I-55, and I-57 traversing the state. Only California and Texas have more interstate mileage.

CONDITION & CAPACITY

Illinois has more than 147,000 miles of roadways, of which nearly 16,000 miles (~11%) are state-owned and maintained by the Illinois Department of Transportation (IDOT). The interstate highway system serves motorists throughout the state of Illinois with a system total of 2,185 centerline miles, of which 294 miles are under the jurisdiction of the Illinois Tollway. Between 2010 and 2019, the annual vehicle miles traveled increased by 1.8% overall, but peaked at over 108 billion VMT in 2017 and declined by 0.51% between 2017 and 2019 to more than 107 billion VMT.

The population of the state of Illinois has decreased for seven straight years, with 80,000 residents leaving the state in 2020 alone. While VMT has flattened and decreased, congestion has not improved. According to a U.S. Census Bureau survey from the spring of 2021, traffic volumes have been rebounding to pre-pandemic levels though traffic patterns have decreased based on a 35% reduction in office commutes.

FIGURE 1 – ILLINOIS STATEWIDE ANNUAL VEHICLE MILES OF TRAVEL



Source: IDOT 2020 Illinois Travel Statistics

The 2021 Urban Mobility Report by the Texas A&M Transportation Institute ranked urban areas in congestion-related categories. Compared to other areas nationwide, the Chicago area ranked 10th for auto commuter yearly travel delay. It totaled 74 hours of delay per year per commuter, which is unchanged from 2017. For the year 2020, the Chicago area ranked 5th for excess fuel consumed, and 9th for congestion cost. These categories were both worse than in 2017. Nationally, the Chicago area ranked 3rd for person-hours of truck delay and 3rd for annual truck congestion costs. Travel time index is a measure of the ratio of travel time in the peak period to the travel time at free-flow conditions, with a ratio greater than 1, congestion-related delays are occurring. The Chicago area ranked 19th in 2019, with a travel time index of 1.29. This means during peak hours it takes nearly one-third longer to make a given trip. This was a minor improvement from 1.32 in 2017.

In order to measure the condition of highways and roadways, the Federal Highway Administration (FHWA) requires states to report the International Roughness Index (IRI) for the interstate system, other principal arterials, rural minor arterials, and the National Highway System. The IRI method is a standardized and objective measurement of the pavement's surface profile and represents the vertical movement caused to a vehicle driving over the roadway. The higher the IRI values, the rougher the ride. Overall, the statewide weighted average IRI value improved slightly from 114 in 2017 to 112 in 2019.

Illinois was the 26th ranked state in 2013 with an average IRI of 125 and fell to 28th in the national ranking for 2019. Driving on roads in need of repair still costs Illinois motorists $5.4 billion a year in extra vehicle repairs and operating costs, or $628 per motorist.

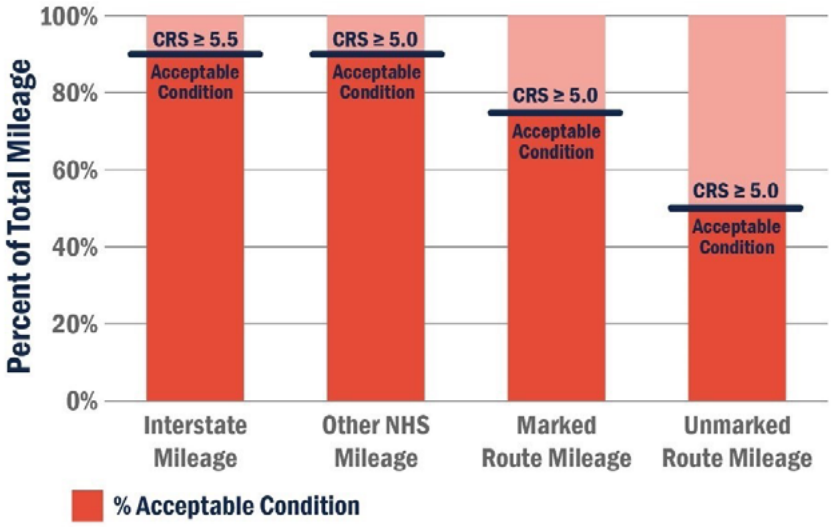
TABLE 1 - ROAD CONDITION: 2019 (IN MILES)

	Very Good IRI <60	Good IRI 60-94	Acceptable IRI 95-170	Not-Acceptable IRI 171-220	Poor IRI >220
United States	112,335	237,561	314,634	83,515	80,843
% of US Total	13.55%	28.66%	37.96%	10.08%	9.75%
Illinois	3,161	9,092	12,433	3,237	2,981
% of IL Total	10.23%	29.42%	40.23%	10.48%	9.65%

Source: Adapted from U.S. Department of Transportation, 2019, State Transportation Statistics

IDOT also performs Condition Rating Surveys of the highway system and assesses the pavement condition annually on alternating halves of the state, except for the interstate system, which is reviewed every year in its entirety. Overall, for the year 2020, the state highway miles were rated as 26.4% Excellent, 24.9% Good, 30.1% Fair, and 18.6% Poor. This was an improvement over 2019, with a 5.2% gain in the Excellent category and incremental decreases in the other categories.

FIGURE 2 – STATE OF ACCEPTABLE CONDITION



OPERATION & MAINTENANCE

Roadway maintenance accounts for 37% of IDOT's budget. Maintenance includes reconstruction, resurfacing, widening and pavement preservation projects. The FY 2020 program highlights more than $52 million in maintenance, traffic and physical research/formal contracts. IDOT's coordinated use of the FHWA's mandated Transportation Asset Management Plan (TAMP) is intended to improve or preserve the condition of assets and the performance of the system. With this asset management system, pavement condition data drives the construction of maintenance projects to use low-cost solutions to extend the life of the roadway. IDOT has made a concerted effort to promote and fund maintenance projects through the TAMP program. These projects are listed in the Multi-Year Program. Recent investments made with the REBUILD Illinois funding has assisted many communities in achieving one-time, bondable maintenance projects.

The CRS (Condition Rating Survey) rating of 5.5 on Interstates and 5.0 on all other roads is the lowest rating at which preservation treatments remain a cost-effective option to maximize the life of our assets and keep good pavements in acceptable condition by doing the right treatments at the right time. Once ratings fall below these levels, rehabilitation or reconstruction becomes the only option, albeit more costly.

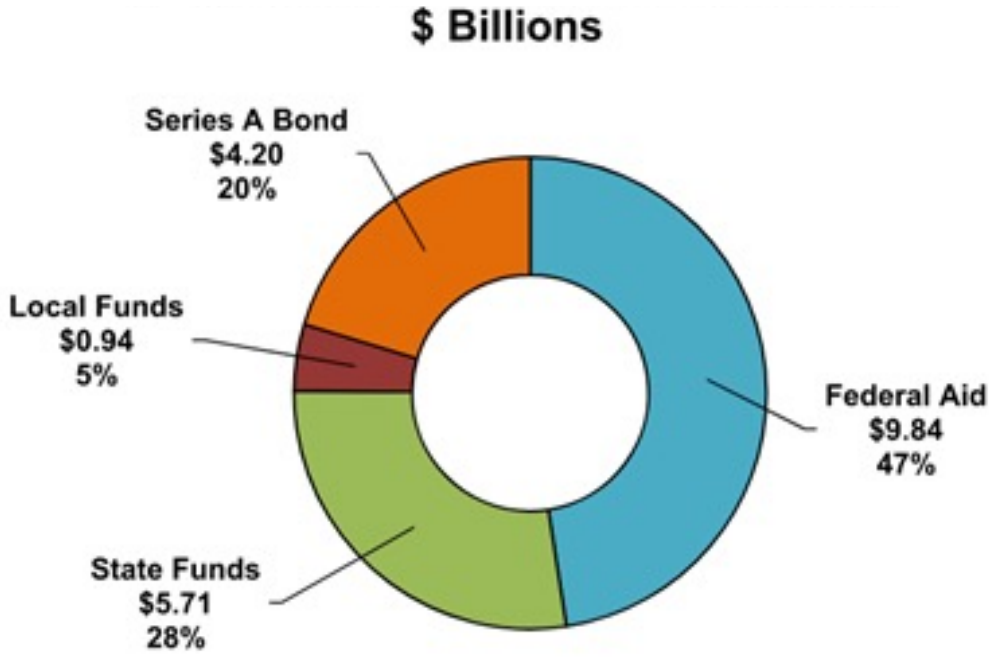
Investment in road maintenance on the part of local agencies varies by jurisdiction. With over 1,200 municipalities, 1,400 townships and 102 counties, there are many different types of roads with a variety of traffic levels and users in Illinois. Each community is responsible for their respective maintenance priorities based on policy decisions, citizen input and funding levels.

The need for snow removal in Illinois is a seasonal constant, though amounts can vary depending on the year and location within the state. IDOT and other agencies overseeing snow removal prioritize snow routes depending on amount of snow, traffic, and emergency response needs. This operational priority enables motorists to have a reliable expectation of road conditions during the winter.

FUNDING

Illinois receives funding from federal reimbursements, state motor fuel taxes, local funds, Series A bonds, as well as various fees, fines, tolls, permits, and other sources.

FIGURE 3 – FY 2022-2027 PROGRAM FUND SOURCES



The last federal transportation bill - Fixing America's Surface Transportation (FAST) Act- delivered an average of $1.5 billion per year in federal funding for highways and bridges. In November 2021, Congress passed the five-year, $1.2 trillion Infrastructure Investment and Jobs Act. Over the next five years, Illinois expects to receive from the IIJA $9.8 billion for highway projects, which is a 38% increase over the FAST Act.

State funding has also increased, thanks to action by the Governor and the state legislature in 2019 to pass Rebuild Illinois, the largest capital program in the state's history. The plan provides approximately $9.9 billion from FY 2022-2027, including $5.79 billion for highway reconstruction, $2.59 billion toward new roads, and $1.21 billion for safety improvements. Rebuild Illinois is funded in part by an increased gas tax, which will result in an additional $1.2 billion for roads and bridges annually. The proceeds of the gas tax increase are split roughly in half between the state and localities.

As of July 1, 2021, the state gas tax was set at 39.2 cents per gallon and its diesel tax at 46.7 cents per gallon. Rebuild Illinois included a provision to automatically raise the tax every July 1 by the rate of inflation recorded in March of that year, and not to exceed 1 cent. Table 2 shows the Illinois gas tax, effective July 1, 2021, versus the national average. Illinois has the third highest Total State plus Federal Excise Tax rate on fuel, only exceeded by California and Pennsylvania, respectively.

TABLE 2 - ILLINOIS VERSUS NATIONAL AVERAGE GAS TAX (CENTS PER GALLON)

	Gasoline				Diesel			
State	State Excise Tax	Other State Taxes/ fees	Total State Taxes/ fees	Total State plus Federal Excise Taxes	State Excise Tax	Other State Taxes/ fees	Total State Taxes/ fees	Total State plus / Federal Excise Tax
IL	39.2	20.36	59.56	77.96	46.7	18.52	65.22	89.22
US avg	25.97	12.22	38.19	56.59	26.56	12.77	39.27	63.67

The Rebuild Illinois Plan also empowered localities to raise their own revenue for surface transportation. Lake, DuPage, Kane, McHenry, and Will are permitted to raise their county gas taxes to a maximum of 8 cents per gallon if needed, as Cook County was already permitted to do. Rebuild Illinois also authorizes all municipalities within Cook County to adopt a local gas tax at a rate no higher than 3 cents per gallon, and Home Rule municipalities throughout the state may continue to adopt gas taxes at any desired rate.

The Illinois Tollway is a user-fee system – no state or federal tax dollars are used to support maintenance and operations. On January 1, 2022, truck/trailer toll rates increased to help rebuild, improve, and expand the agency's 294-mile system of toll roads. In an effort to reduce daytime congestion, overnight (10:00 p.m.-6:00 a.m.) toll rates for semitrucks are 25% lower as an incentive for truckers.

PUBLIC SAFETY

IDOT relies on the Illinois' Strategic Highway Safety Plan (ILSHSP) to guide roadway safety programs. The plan's goal is zero fatalities. IDOT's commitment to safety is a program that allocates $850 million specifically for safety improvements. This includes $634 million in Highway Safety Improvement Program (HSIP) funding. HSIP funds are competitively sought by non-IDOT agencies, though the robust application process and Grant Accountability and Transparency Act (GATA) paperwork is seen as a deterrent to smaller agencies who have fewer staff to manage the requirements. Additionally, the Highway Safety Plan grants funding to enforcement, and some non-enforcement agencies.

Year to date fatalities for 2021 are at 1,064 deaths, up 67 from last year's count of 997 fatalities. While no fatality is acceptable, this increase of 6.3% is significantly less than the current nationwide rate increase of 18.5% during the pandemic. Historic fatalities on Illinois roads heavily involve pedestrians, motorcyclists, and semi-trucks. Also involved are pedal-cyclists and work zones. By road classification, the historic majority of fatalities occur on state/US route and city streets. Behind those road types is county/township roads and interstates. Continued investments in all areas of safety—engineering, education, enforcement, evaluation and emergency medical services, as well as partnering with other safety and roadway user stakeholders—will drive down the fatalities.

FUTURE NEED

The MYP includes identified funding for the state-maintained system of roads and bridges as well as funding for roads and bridges maintained by local agencies. While this program includes funding amounts and proposed improvements for both the state and local program through this planning effort, the department is primarily focused on the decisions made on the state system.

Developing IDOT's Program:

Steps in Developing the Proposed Highway Improvement Program for projects outside of routine operations and maintenance.

FIGURE 4 – PROPOSED HIGHWAY IMPROVEMENT PROGRAM STEPS

Asset management, along with federal transportation performance measure requirements, necessitated a change to the overall philosophy of how IDOT programs projects and the manner in which we report "accomplishments." This MYP shows the continuation of the effort to focus on preserving assets to ensure they remain in a state of acceptable condition.

It is anticipated that the FY 2022-2027 Proposed Highway Improvement Program will:

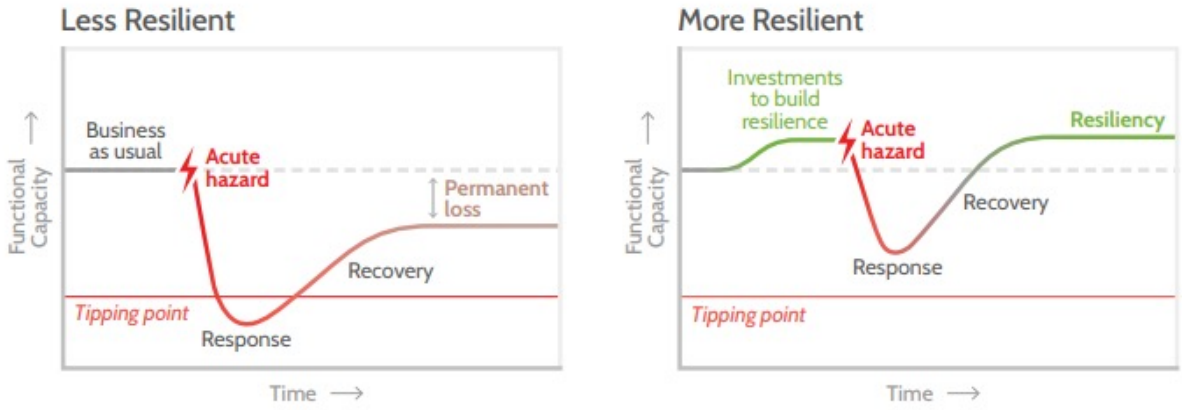
- Provide funding to reconstruct or rehabilitate 2,779 miles of state-maintained roads.
- Allocate $1.42 billion to lower-cost treatments to preserve state-maintained roads and bridges and keep them in a state of acceptable condition.
- Provide funding to maintain 756 miles on the locally maintained system.
- Provide funding for railroad crossing safety improvements throughout the state.
- Provide funding for traffic and safety improvements that further enhance highway safety as part of IDOT's regular highway improvement program by targeting specific fatal and severe crash locations.
- Enhance public right-of-way accessibility as part of IDOT's regular highway improvement program by removing barriers to accessibility as identified in the agency's Americans with Disabilities Act (ADA) Transition Plan.

With the exception of the Illinois Tollways, Illinois roadways are largely funded by the motor fuel tax, vehicle registration, certificates of title, drivers' license fees, and local sources, in addition to federal funding. While the recent passage of the federal Infrastructure Investment and Jobs Act (IIJA) and adoption of 2019 Rebuild Illinois capital bill have led to an increase in transportation revenues in recent years, the anticipated needs still exceed the programmed funding levels. Needed infrastructure improvements resultant from the backlog of deferred maintenance, ongoing safety and congestion issues and functionally obsolete roadways, combined with the erosion of the major funding source of the motor fuel tax, indicate a gap between the long-term funding needs and the revenues to support them. Data clearly indicates enough funding is not currently available to address all existing roadways in poor condition, and that need is only expected to grow in the future.

RESILIENCE

The narrative of the 2019 IDOT Long Range Transportation Plan (LRTP) incorporates a goal for resiliency of the system to "Proactively assess, plan and invest in the state's transportation system to ensure that our infrastructure is prepared to sustain and recover from extreme events and other disruptions."

FIGURE 5 – RESILIENCE PICTORIAL DEFINITION



The report details strategies, performance measures, and implementation responsibilities for five objectives within this resiliency order. These objectives are as follows:

- Improve safety on the Illinois transportation system by reducing the number of injuries/fatalities attributable to extreme events;
- Minimize the frequency and duration of facility closures due to extreme events and other disruptions;
- Enhance transportation system redundancy;
- Identify current and future transportation system vulnerabilities to extreme events and climate change
- Address transportation system vulnerabilities to extreme events and climate change within the transportation planning, design, and asset management processes

IDOT has advanced the All-Hazards Transportation Vulnerability Assessment through 2017, noting that a portion of the data was reviewed individually and has empirically expanded upon the results to advance an understanding of the risk exposure to these hazards.

Types of Hazards:	
MANMADE:	**NATURAL:**
Explosives	Precipitation-Flooding/Snow/Ice
Small Arms Attack	Temperature – Extreme Heat/Cold
EMP	Wind – Tornado/ Straight Line
Cyber-Attack	Geologic – Earthquake/Landslide/ Subsidence

The LRTP calls out that recommended strategies and actions are to be incorporated as policy to guide the programming decisions and system investments. As such, the ultimate effectiveness of the resiliency impetus in the LRTP depend on timely information from other reports such as the Illinois All-Hazards Transportation System Vulnerability Assessment (2017) and regionalized input such as the Chicago Metropolitan Agency for Planning (CMAP) Climate Resilience Paper (2014). The All-Hazards Vulnerability Assessment is awaiting update.

Other agencies are also generating plans to address resiliency in the region through adoption of measures to reduce or mitigate climate change. Many MPOs have adopted Climate Action Plans such as The Greenest Region Compact and CMAP Climate Action Plan, along with other municipality specific climate action plans and measures being put in place to try to address several root causes of these resiliency concerns.

Additionally, the State has made progress in advancing the Transportation Asset Management Plan (TAMP) and is now moving forward with tools for more comprehensive programming of facility work based on a Data-Driven Decisions protocol which is intended to incorporate the Vulnerability Assessment and Climate Resilience. Based on these combined moves, it appears that the State is following through on progress to catalog all of the facilities and their existing conditions and rates of wear, identify potential for future hazards, and the related future capacity and rehabilitation needs to rank projects and fund according to these needs.

In a 2020 survey of Chicagoland municipal partners, 87% of respondents reported project delays with IDOT, with 42% stating delays of over a year in duration. Reported reasons for delays included review times for contract agreements, and plan and permit reviews. The survey recommended addition of staff and adjustment of policies to allow the municipalities more flexibility to advance their projects, but it appears that budgetary constraints, cultural constraints, and the pandemic have not been beneficial to the hiring process.

INNOVATION

The state continues to promote innovation through adoption of such programs as the TAMP plan and development of a Data-Driven Decisions program using new technologies and strategies. Additionally, the State DOT and the Illinois Tollway continue moving forward with development of Central Region EV corridors which would provide origin-to-destination recharging capabilities along the major highways for electric vehicles and just announced the REV Midwest — the Regional Electric Vehicle Midwest Coalition to promote this EV network throughout Illinois, Indiana, Michigan, Minnesota and Wisconsin.

In 2017, the Tollway launched its first active traffic management corridor along I-90 (SmartRoad), designed to deliver real-time information to drivers to provide safer, more efficient travel, as well as to improve regional mobility by allowing public transit bus use of the wide inside shoulder (Flex Lane) to bypass congestion. The system features over-the-road indicator signs installed every half mile to communicate travel times, traffic incident information, lane closures, and traffic pattern changes to Tollway users and data collected by the system is shared with navigation applications such as Waze, MapQuest, and Google Maps. Since its opening, compliance with Scott's Law has increased by 30%. Also, in the first 10 months of service, the Flex Lane was opened to Pace more than 250 times to support transit travel time reliability. Ridership on these routes experienced a 32% increase over the period. Building on this success, the Tollway has plans to further expand SmartRoad along the Central Tri-State where active traffic management will be essential to opening up capacity in critical areas to relieve daily congestion.

In contrast, IDOT has not been as successful in advancing these types of innovations. The last report card noted the IDOT initiative to implement dynamic signing and managed lanes projects for I-55 entering Chicago from the southwest, potentially using a P3 arrangement to achieve funding and project viability. The project has not made substantial progress since the last report card.

Roads

RECOMMENDATIONS TO RAISE THE GRADE

- Funding from the Rebuild Illinois Program, authorized in 2019, has significantly increased the projected dollars targeting roadway infrastructure repair and reconstruction. With the increase in federal funding for transportation, staffing and processes to address the additional workload at agencies needs to increase agency capacity to handle the expected surge in demand in order to minimize project delays.
- 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. There are several considerations to this recommendation:
    i. The State needs to address the accelerated decline of revenues based on use of traditional carbon-based fuels and transition the tax structure to guarantee a stable funding source for maintenance and upkeep of the roadway network. State and local governments should ensure their funding mechanisms (motor fuel taxes or other) are sufficient to fund their needed investment. All levels of government need to think long-term about how to fund their roads and consider potential alternatives to the motor fuel taxes, including further study and piloting of Vehicle Mile Tax (VMT) mileage-based user fees.
    ii. We anticipate that additional federal funds will be made available for projects viewed as reducing carbon emissions and being a net positive for the environment. Illinois took a leap forward with the development of the Illinois - Livable and Sustainable Transportation Rating System and Guide (I-LAST). We recommend that IDOT innovate by updating material and construction policies and guidelines to increase use of new material mixes incorporating recycled materials including plastics with a goal of reducing, eliminating, or potentially absorbing carbon emissions, and to adjust planting and stormwater management practices to minimize adverse impacts of storm events related to climate change.
- Evaluate alternative delivery methods for design and construction such as public-private partnerships, and design-build practices.
- Prioritize maintenance and the state of good repair to maximize the lifespan of roads. Follow through with advancing enabling legislation.
- Tackle congestion through policies and technologies that maximize the capacity of the existing road network and create an integrated, multimodal transportation system. This may include implementing congestion pricing strategies on the expressways, including tolling and managed lanes, to raise revenue, decrease highway congestion, to relieve congestion costs for travelers, and to aid economic development. Increase funding for long-term, advanced highway research.
- 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
- Continue and increase federal funding provided to Illinois under the FAST Act.
- Continued investments in all areas of safety—engineering, education, enforcement, evaluation and emergency medical services, as well as partnering with other safety and roadway user stakeholders—will drive down the fatalities.

Roads

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Stormwater

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EXECUTIVE SUMMARY

Illinois' extensive network of legacy stormwater infrastructure was built to protect nearly 13 million residents, property, and the environment from flooding. Unfortunately, many of these systems are aging and undersized based on current rainfall standards and, when subject to increased rainfall trends from climate change, are likely to be woefully inadequate. The U.S. EPA estimated Illinois' most recent stormwater management need at $88 million in 2012, and without significant federal investment, this gap has certainly increased. To try to bridge the funding gap, 29 municipalities now have stormwater utilities that can collect fees for maintenance and upgrades to their stormwater systems. These stormwater utilities charge an average of $5 monthly per household, less than the national average of $5.87. With population growth, rainfall trends expected to increase, and billions of dollars in urban flood damages reported, Illinois' current stormwater systems will not have sufficient capacity to meet future needs and protect residents. Additional funding and resources will be needed to repair, upgrade, and/or replace these systems and seize the opportunities to improve stormwater management in Illinois.

INTRODUCTION

Illinois has an area of approximately 58,000 square miles. It drains into the Illinois River basin (which includes Lake Michigan), the Mississippi River Basin, and the Ohio River Basin which comprise more than 87,000 miles of rivers and streams and more than 917,000 acres of natural wetlands.

Stormwater originates from rain and snow melt that does not soak into the soil, evaporate, or become stored on land but results in surface runoff. If not properly managed, surface runoff can threaten public health and infrastructure, including buildings, transportation systems and utilities. Impervious areas are a major cause of flash flooding, erosion, and structural issues, because nearly all rainfall landing on it turns into runoff.

CONDITION

The state struggles with a lack of data on the condition of stormwater infrastructure (both traditional gray infrastructure and green infrastructure). There are systems at the state, county, township, and municipal levels, but very few of those entities have an asset management system to track infrastructure and its condition. Instead, the reporting that is required under the Federal Clean Water Act (CWA) is for municipalities, industry, and water treatment facilities to maintain stormwater infrastructure and monitor the

water quality leaving the system. Per the requirements of the CWA, every two years the Illinois Environmental Protection Agency (IEPA) publishes a report on the water quality of Illinois water bodies called the Integrated Water Quality Report, or the 303(d) List. This report offers a concise analysis of navigable streams, rivers, and lakes throughout the state that either support or do not support beneficial uses to the public. The IEPA typically assesses about 15% of the surface waters every two years. These water bodies are broken down based on whether they are impaired or not.

Table 1 presents the percentage of assessed water bodies considered to be impaired in Illinois on a biennial basis going back to 2004.

TABLE 1 - IMPAIRED WATER BODIES IN ILLINOIS

Report Year	Percent of Assessed Streams on 303(d) Impaired List	Percent of Assessed Freshwater Lakes on 303(d) Impaired List	Percent of Assessed Lake Michigan Harbors[a] on 303(d) Impaired List	Percent of Assessed Lake Michigan Open Waters on 303(d) Impaired List	Percent of Assessed Lake Michigan Shoreline on 303(d) Impaired List
2018	56.5	97.5	12.4	100.0	100.0
2016	56.1	95.6	67.5	100.0	100.0
2014	53.8	96.4	100.0	100.0	100.0
2012	53.4	96.3	100.0	100.0	100.0
2010	51.0	96.7	100.0	100.0	100.0
2008	54.1	94.8	100.0	100.0	100.0
2006	54.7	92.8	100.0	100.0	100.0
2004	53.6	90.0	100.0	100.0	100.0

[a] Lake Michigan Harbors are not assessed for primary contact.

To get a sense of how much stormwater contributes to these impaired waters, data from the 2018 Illinois Integrated Water Quality Report was used to pinpoint the potential sources of impairments in publicly owned lakes throughout Illinois. Although IEPA does not exclusively label "stormwater" as one of the impairment sources, impacts from nearby storm sewers, golf course, and highway/bridge runoff can be inferred and estimated to be the source of pollution for more than 31% of publicly owned lakes in Illinois.

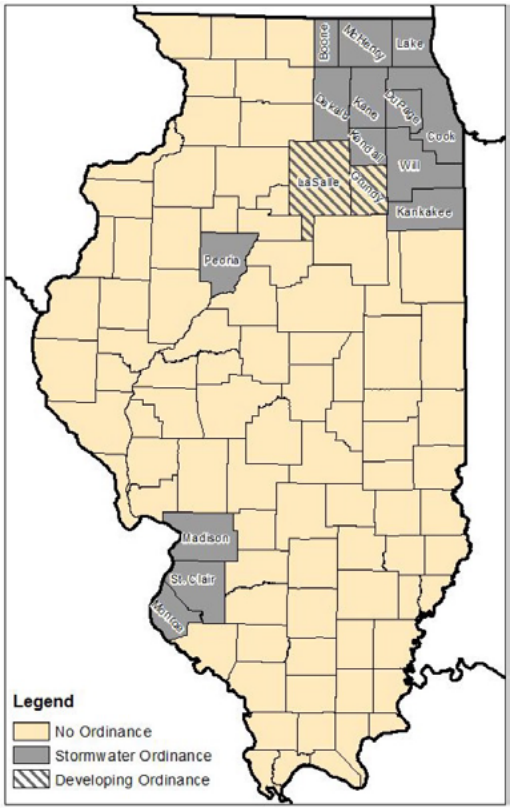
CAPACITY

There is no comprehensive database of stormwater management assets in Illinois. The National Pollutant Discharge Elimination System (NPDES) Municipal Storm Sewer System (MS4) permits require municipalities to map their storm sewer system and outfalls. Some counties in Northeastern Illinois have begun cataloging assets on a countywide basis.

In general, there is no statewide stormwater capacity requirement. Instead, stormwater capacity is managed at the municipal and county level, with 16 of Illinois' 102 counties having been granted countywide stormwater planning authority by the state. The stormwater planning authority allows for consolidation of countywide stormwater efforts and setting minimum

design standards through development of stormwater ordinances and plans. A majority of these 16 counties have effectively implemented programs, projects, and regulations to prevent flooding, mitigate stormwater, and improve water quality.

ILLINOIS COUNTIES WITH STORMWATER PLANNING AUTHORITY (NOTE GRUNDY COUNTY HAS SINCE IMPLEMENTED A STORMWATER ORDINANCE)



Stormwater quality is not universally addressed in stormwater ordinances. Typical storm sewer design standards in Illinois are based on a 10-year storm return interval design for storm sewers while southern and central Illinois mandate 5-year or 10-year (sometimes 2-year) return interval capacity. Most stormwater detention facilities throughout Illinois are sized based on the 100-year, 24-hour design storm. However, these design standards address only new development, leaving most legacy systems lacking modern stormwater designs and practices and with lower capacities. Furthermore, the recent increase in rainfall trends, growing urbanization, and outdated design standards drive the actual capacity much lower. Upsizing large networks of existing legacy stormwater systems to meet current standards requires significant capital investments and engineering challenges.

FUNDING

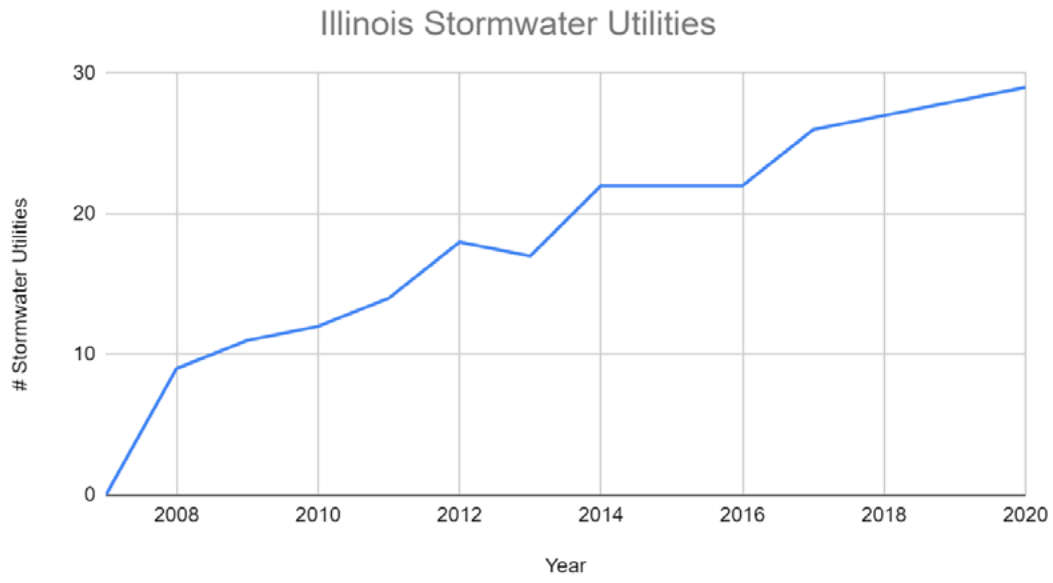
Stormwater infrastructure funding can come from numerous sources, including but not limited to: state revolving funds, grants, cost share programs, public-private partnership, low-interest loans and a local government's general fund. Less frequently utilized sources include stormwater utility revenue, municipal bonds, one-time federal infrastructure stimulus relief (such as The American Rescue Plan Act of 2021),

dedicated tax revenue, and special service area charges where those that benefit from improvements contribute.

Unfortunately, communities often lack the dedicated funding sources to address identified needs. In 2012, the U.S. EPA estimated Illinois' statewide stormwater management need at $88 million, an increase of 109% since the 2008 survey. However, neither the U.S. EPA nor the state of Illinois have updated this estimate. Therefore, without data indicating significant statewide investment since then, the cost for stormwater management has likely increased significantly. This growing price tag for the state's stormwater infrastructure further exacerbates the demand for sustainable funding sources.

One funding source that has been utilized over the years is the Illinois EPA's low-interest loan program through the State Revolving Fund called the Water Pollution Control Loan Program (WPCLP). Since 2011, the IEPA has loaned over $1.1 billion through the Water Pollution Control Loan Program.

More recently, since 2018, this funding has increased and continues to be utilized by qualified applicants. Total available funding each year has grown steadily from $450MM in FY2019 to $700MM in FY2021. With the implementation of the federal Infrastructure Investment and Jobs Act (IIJA), Illinois is poised to receive $1.7 billion in water funding that will largely come through the SRF programs. However, the SRF programs are not dedicated to only stormwater infrastructure projects but are shared with drinking water and wastewater projects. Insufficient education exists among elected officials, professional administrative leaders, and the public on the need and benefits of more sustainable local stormwater funding and stormwater utilities, which perpetuates the current gap between available funding and demonstrated need.



An often-misunderstood funding source is stormwater utilities. Illinois has made significant strides by adding 29 utilities since 2008, though since 2018 there has been a modest addition of just two utilities. Compared to our neighbors in Iowa, Wisconsin and Indiana, Illinois is lagging behind in the number of stormwater utilities established to help fund maintenance and improvement to our stormwater systems. At the time of the last survey, Illinois stormwater utilities charged an average fee of $5.00, compared to the national average at $5.87.

FUTURE NEED

Stormwater runoff is primarily a function of the amount and intensity of rainfall as well as the ability of the ground surface to absorb rainfall. Therefore, changes in our rainfall and development patterns are of primary importance in understanding the future needs of our stormwater management systems. The federal legislature has recognized this and has put forth HR 1437 which requires NOAA to update rainfall estimates every five years. Data on rainfall patterns (the intensity, duration, and frequency of storm events) specific to the State of Illinois have been recorded and studied for over a century. In March of 2020, the Illinois State Water Survey issued Bulletin 75. This study recognizes an increase in the frequency of extreme events and subsequently has modified the rainfall data used by stormwater engineers in Illinois to reflect this increase. The ISWS study also recognizes that our rainfall patterns are changing and the increases in extreme events are not simply random variations of a static system, but rather they are signs that our statistical rainfall patterns are changing. However, current approaches to stormwater management systems do not consider this level of future climate modeling within their designs, perpetuating systems that are likely undersized and result in inadequate performance.

The second area which impacts stormwater runoff is the ability of surfaces to absorb stormwater where it falls. Many communities throughout Illinois have adopted regulatory structures that require stormwater management when new impervious areas are constructed. The Chicago Metropolitan Agency for Planning "ON TO 2050" plan shows population growth projected to continue for the next 30 years. Properly managing stormwater runoff from infrastructure growth associated with population growth is critical to the wellbeing of our communities and waterways.

With the two primary drivers of stormwater runoff (rainfall and impervious cover) expected to increase, we can also anticipate that our current systems will lack sufficient capacity. Additional funding and resources will be needed to repair, upgrade or replace our current stormwater systems.

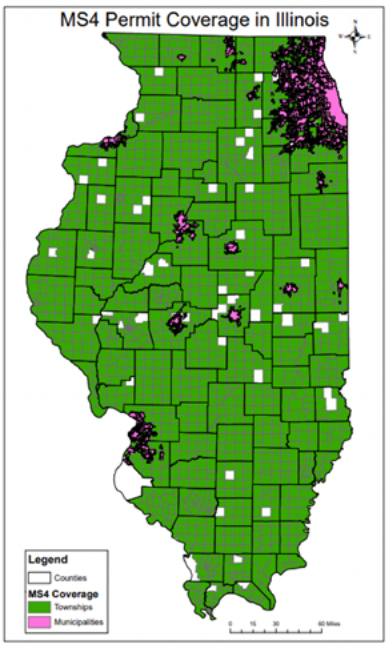
OPERATION & MAINTENANCE

Local municipalities, townships, counties, and several state authorities are responsible for maintaining their stormwater management systems. These governing bodies must make decisions on how to allocate monies out of their public infrastructure budgets toward design, construction, and upkeep of their stormwater systems. Throughout Illinois, a substantial amount of combined sewer infrastructure was built before WWII, and with the expansive growth of suburbs post-WWII, many separate sewer systems were constructed over 50 years ago. Thus, governing bodies must balance continued growth and new construction of stormwater infrastructure while maintaining or upgrading existing infrastructure, a sometimes-costly endeavor.

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Sewer System (MS4) permit outlines steps those permittees must take to maintain stormwater infrastructure and protect water quality. The latest permit cycle (2016-2021) urged local entities to continue enforcing the six minimum control measures (MCMs) outlined in the permit. MS4 owners take responsibility for 1) Public education and outreach, 2) Public participation/involvement, 3) Illicit discharge detection and elimination, 4) Construction site runoff control, 5) Post-construction runoff control, and 6) Pollution prevention/good housekeeping. Permittees are encouraged to publish information, annual reports, and stormwater management plans online for easier public access. Furthermore, the MS4 permit encourages local governments to work together to improve water quality since watersheds frequently extend past municipal limits.

Figures 1, 2, and 3 display the status of MS4 permittees throughout the entire state, townships, and local municipalities, respectively. Almost the entire state is covered by an MS4 permit. Furthermore, a prime example of entities working together to improve water quality can be seen in DuPage County (details below in Resilience & Innovation). Many of the individual municipalities are considered to have waiver status because of their cooperation with DuPage County itself in maintaining stormwater infrastructure.

FIGURE 1



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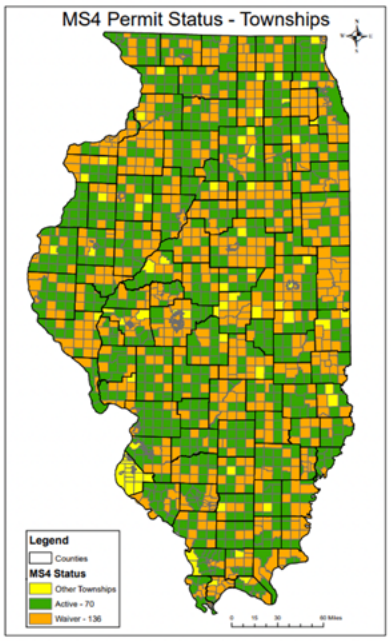
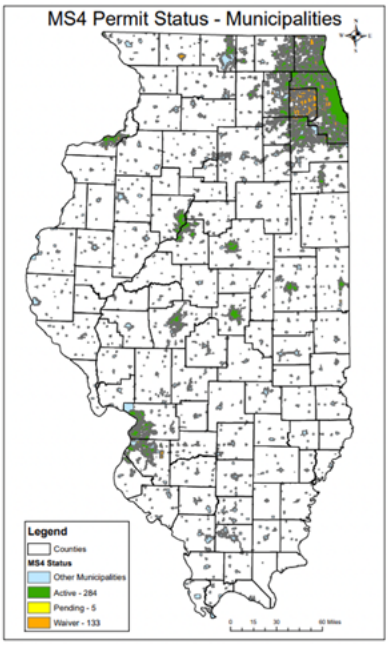


FIGURE 3



PUBLIC SAFETY

Like the rest of the nation, flooding is one of our state's greatest natural hazards, carrying catastrophic public safety and economic tolls. The relatively flat topography and intense urbanization makes the state susceptible to flooding from excess rainfall that can destroy roads, ruin crops, damage homes, cause economic disruptions, reduce property values, and even tragically take people's lives. Within Illinois, flooding in urban areas resulted in $2.32 billion in documented damages from 2007–2014 with 90% of the urban flood damage claims coming in areas outside of the FEMA mapped floodplain. There have been 12 flood related Federal Disasters declared in Illinois in the last 20 years.

The long-term economic, social, and environmental damages from chronically flooded urban areas can be considerable and oftentimes disproportionately affect minority communities. These damages include increases in respiratory problems, uninsurable houses, and urban blight. Industry experts estimate that wet basements can lower property values by 10-25% and are cited among the top reasons for not purchasing a home.

FLOODED BASEMENT IN CHICAGO SUBURB – JULY 2017

Excess stormwater runoff can also inflow into sanitary sewer systems causing overflow of sewage into local waterways. Lack of stormwater controls can also contribute to nonpoint source pollution in the state's rivers and lakes.

To protect property and improve public safety, municipalities and counties participate in the National Flood Insurance Program (NFIP) and implement policies as part of the Community Rating System (CRS) Program. Statewide, 87% of counties participate in the NFIP. However, only 5% of municipalities and 12% of counties are enrolled in the CRS Program.

RESILIENCE & INNOVATION

Climate change is expected to lead to more severe precipitation events in the Midwest. These events will not only cause riverine flooding, but localized flooding as well. Illinois will need to prepare for these events by designing resilient infrastructure. Much of our infrastructure is designed based on outdated rainfall values that under-report the regional rainfall values. Not only does infrastructure need to be designed to Bulletin 75 rainfall depths, but the uncertain climate also needs to be accounted for during the design process to properly prepare for the future.

Communities throughout Illinois are implementing alternate strategies to manage stormwater. The DuPage River-Salt Creek Workgroup (DRSCW) was formed to address concerns about total maximum daily load (TMDLs) in the region's bodies of water. The workgroup is composed of local community, sewage treatment districts, and other agency representatives to develop the tools to properly analyze the issues and the authority to implement regulatory changes. Creating regional and/or watershed-level alliances and partnerships to take on stormwater challenges like the DRSCW can be an efficient use of resources and create an equitable development landscape.

Low Impact Development (LID) and green infrastructure are two tools communities throughout Illinois can use to increase resilience by reducing the impacts of severe wet weather events. LID incorporates practices that mimic the natural landscape by encouraging infiltration and evapotranspiration. LID practices can encourage reduction of impervious areas using Green Infrastructure such as permeable pavement, green roofs and biofiltration areas. Local agencies and communities throughout Illinois, such as the City of Chicago and surrounding collar counties have adopted ordinances that either require or encourage the use of these practices (in combination with typical gray infrastructure) to meet stormwater requirements.

Stormwater

RECOMMENDATIONS TO RAISE THE GRADE

- Continue to encourage communities to develop stormwater utility fees to fund the local share of stormwater needs.
- Fully utilize and leverage the funding coming to the state from the Infrastructure Investment and Jobs Act (IIJA) with the Rebuild Illinois Capital Plan and local funding sources through existing programs such as the State Revolving Loan Fund (SRF) and the Water Infrastructure Finance Innovation Act (WIFIA) programs and maximize the amount of funding that is dedicated for stormwater.
- Stormwater Planning and Management authority should be granted to all Illinois counties to adopt countywide stormwater ordinances, projects, and programs. The authority to generate revenue from fees, to plan, implement and maintain stormwater management/drainage programs/facilities should be granted to all County Stormwater Planning and Management Agencies (55 ILCS 5/5-1062), counties (55 ILCS 5/Div. 5-15) and municipalities regardless of home rule status.
- Educate elected officials, professional administrative leaders, and the public on the benefit of and need for sustainable local stormwater funding and the value of stormwater utilities as a way to lessen the stormwater funding gap.
- Increase participation in the National Flood Insurance Program (NFIP) and Community Rating System (CRS) program.
- Adopt Bulletin 75 rainfall depths for design standards throughout the state.
- Regulatory agencies throughout the State develop policies that consider the impacts of potential climate change as it relates to more intense rainfall events for the full life of the stormwater management assets
- Increase the use of buffers, wetlands, cover crops, and other best management practices to improve water quality in streams, rivers, and lakes.
- Incentivize MS4 permittees within the same watershed to work together to address water quality degradation.

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Stormwater

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Transit

D+

EXECUTIVE SUMMARY

101 out of Illinois' 102 counties offer transit service, and 57 public transit operators and providers supported an estimated 600 million trips in 2019. Much of the infrastructure for a world-class transit system, particularly in northeastern Illinois, is in place. Unfortunately, the State's transit infrastructure suffered for many years with inadequate funding. Current multi-year capital needs for transit in northeastern Illinois require an annual funding level of approximately $2 billion to bring the system back into a state of good repair and undertake limited modernization, enhancement, and expansion initiatives. However, for many years, state and federal capital funding was only providing approximately half of what was needed to modernize systems. Fortunately, federal investment has grown the last few years, and the State enacted the Rebuild Illinois program, investing in transit infrastructure. The funding to improve the condition of the infrastructure has begun to flow. For example, in 2022, Metra is budgeting operating expenses of $900 million, which is $100 million or 12.5% higher than in 2021.

CAPACITY & CONDITION

The Chicago region's 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 (CTA 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.

The RTA's 2018–2023 Regional Transit Strategic Plan, Invest in Transit, highlights $30 billion of projects that are needed to maintain and modernize the region's transit network. Maintaining and preserving the current system in a State of Good Repair (SGR), as well as addressing the backlog of deferred SGR projects, requires a capital investment of $2 to $3 billion per year. The Rebuild Illinois and PAYGO funding will expedite overdue repair and replacement projects, reduce the backlog of deferred improvements, and move the system toward a state of good repair. The funds enable real progress on the state of good repair by allowing improvements, and in some cases, replace aging system assets.

Although this has been a difficult time due to operating funding shortfalls related to COVID–19, the Service Boards are continuing with the implementation of their capital programs. Their report includes 28 Rebuild Illinois and 25 PAYGO projects representing over $2.75 billion in state funding. Many of these projects started recently and have ongoing activities. Expenditures are

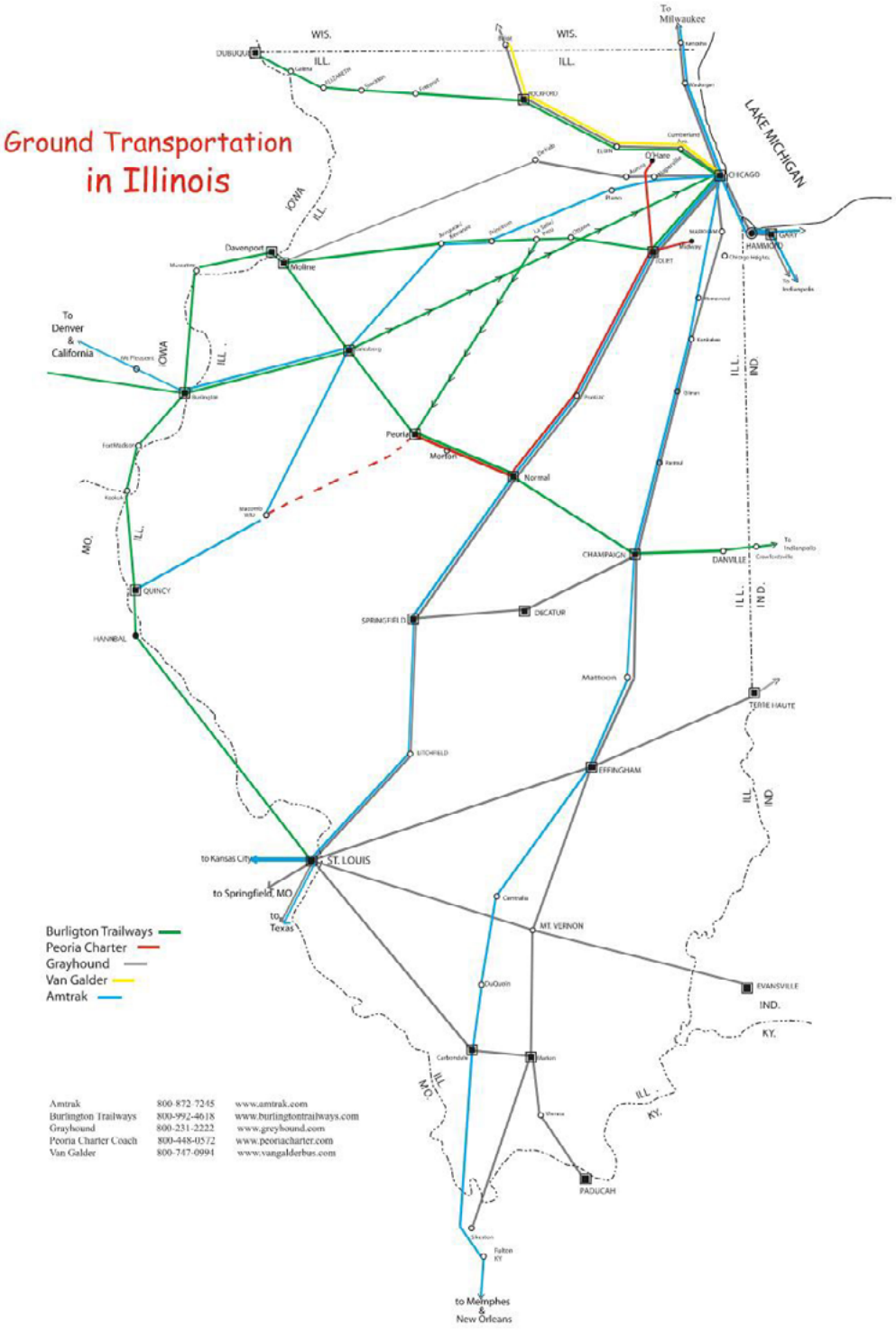
low due to payment milestones on the projects not yet being achieved. There are also many other Rebuild Illinois projects that are in planning or under procurement and will be included in future reports. The 80 projects detailed in their report together represent over $7.16 billion worth of construction, maintenance, and procurement. Many of these projects address outstanding capital needs, while others are directed toward enhancing customer experience, safety, and security. All of the state funded projects are within budget

Outside of northeast Illinois, 12 fixed route urban bus systems provided nearly 34 million rides in 2019. More than 95% of the population in Downstate Illinois has access to some form of public transportation. The six largest downstate transit agencies carry over 27.3 million riders per year.

The COVID-19 pandemic brought significant challenges to the public transportation industry across the country and in Illinois. Since the onset of the pandemic, transit has served a vital role in providing essential workers and others with safe and reliable transportation to hospitals, police stations, firehouses, groceries, and other essential workplaces. But at the height of the pandemic, weekly ridership saw a nearly 73 percent decline from 2019 passenger levels. This loss of riders has resulted in a catastrophic loss in fare and service contract revenue for transit systems statewide. Ridership in 2020 totaled approximately 265 million. Fortunately, the CARES Act and other federal legislation provided Illinois with $1.43 billion for transit agencies to continue providing operations, and many of the worst cuts to service and personnel were avoided.

In general, transit operators across the state have made huge strides in rebuilding ridership and continuing to provide safe and reliable transportation to their communities. Economic recovery from the pandemic will require a vibrant transit system, and the significant financial challenges brought about by the pandemic threaten the ability of the transit agencies to sustain service. Continued robust state and federal support will be necessary.

Across the state, 57 public transit operators/providers help millions of people reach their destinations every day. Illinois ranks third in transit ridership across the nation, with nearly 600 million trips in 2019. 101 out of the state's 102 counties offer some type of transit service to their communities.


Ground Transportation
in Illinois
WIS.
ILL.
IOWA
LAKE MICHIGAN
To Milwaukee
DUBUQUE
GALENA
ELIZABETH
FREEPORT
ROCKFORD
ELGIN
O'Hare
CHICAGO
HAMMOND
GARY
To Indianapolis
Davenport
Moline
To Denver & California
MO.
QUINCY
HANNIBAL
Peoria
Morton
Normal
CHAMPAIGN
DANVILLE
SPRINGFIELD
DECATUR
Mattoon
TERRE HAUTE
EFFINGHAM
ST. LOUIS
to Kansas City
to Springfield, MO
to Texas
Centralia
MT. VERNON
EVANSVILLE
IND.
KY.
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Carbondale
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Grayhound 800-231-2222 www.greyhound.com
Peoria Charter Coach 800-448-0572 www.peoriacharter.com
Van Galder 800-747-0994 www.vangalderbus.com

OPERATION & MAINTENANCE

For 2022, Metra is budgeting operating expenses of $900 million, which is $100 million, or 12.5% higher, than its 2021 amended budget. Bridges, track, and structures are the foundation of the Metra system. Metra has nearly 1,055 miles of rail that must be inspected, maintained, or replaced on a continuous cycle. Renewal of track components, retaining walls, and bridges are critical to maintaining safe operating conditions, service reliability, and the on-time performance our customers deserve and have come to expect. Metra has historically replaced 80,000 ties and 25 rail crossings annually but intends to initiate a new business process in 2022 to increase the length of track surfaces that can be repaired in a single construction season.

Pace Suburban Bus, which operates service throughout the Chicagoland region, received over $200 million in new capital funding from the Rebuild Illinois state capital program. Pace is building a new bus garage to house its Northwest Division, replacing an obsolete facility, a new Plainfield garage to accommodate expansion of its Bus-on-Shoulder express bus service, and renovations and expansions to several other existing garages and transit centers throughout its service area. These expansions will help bring Pace's facilities to a state of good repair, and also present a timely opportunity for Pace to continue its transition from diesel to alternative fuels including compressed natural gas and battery-electric. Pace has committed to fully electrify its fleet by 2040 and is currently advancing a pilot project to introduce its first 10 battery-electric buses in its North Shore Division in the next 1-2 years.

FUNDING AND FUTURE NEED

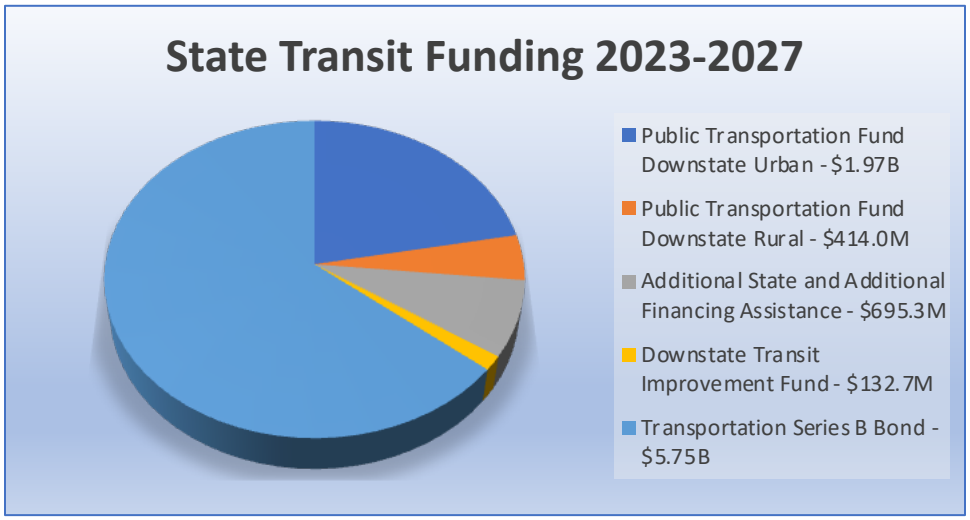
In 2019, the Illinois General Assembly passed Rebuild Illinois, a robust capital plan that secures long-term state support for public transportation infrastructure for the first time in the state's history. Lawmakers approved a $45 billion, 6-year capital program, supporting critical infrastructure improvements across the state, both transportation and non-transportation related. Prior to passage of Rebuild Illinois, the state had not seen a state motor fuel tax increase for 29 years, and revenues to support transportation infrastructure investment had grown woefully inadequate. Additionally, Illinois had not passed a capital plan for 10 years, so state support of transit capital has been virtually non-existent for the last several years. The General Assembly's plan included a much-needed 19 cents per gallon increase in motor fuel tax, which will be now indexed to inflation, and a $50 increase in annual motor vehicle registration fees, putting Illinois in similar range for both to surrounding states.

These increases, combined with a robust bond program, will generate more than $20 billion in transportation investment over the life of the 6-year program. Public transit alone will receive approximately $4.5 billion in state capital support in those six years. Included in this is pay-as-you-go support for transit, an annual sustainable source of funding, that goes beyond the life of the 6-year program Rebuild Illinois. The pay-as-you-go portion for transit, which is 20% of the revenue generated by the increase in motor fuel tax, is expected to equal nearly $250 million in fiscal year 2020 and is expected to grow each year with inflation.

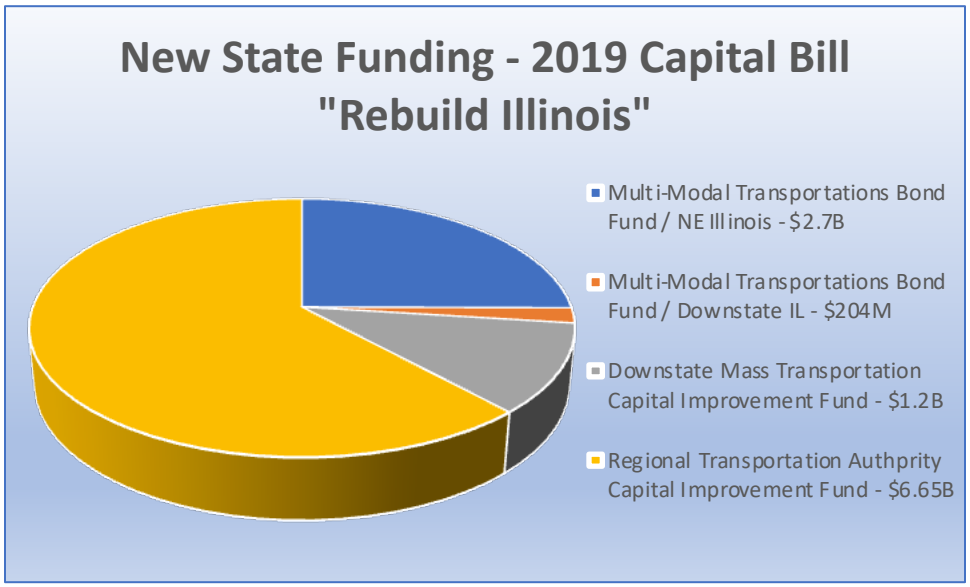
Downstate, public transportation's share of the transit state funding is approximately $450 million, which will go a long way in addressing the current $381 million state of good repair backlog. Downstate transit agencies should expect to see more than $25 million in ongoing funding each year because of the state motor fuel tax increase.

In another move that stands to provide significant additional resources to Illinois transit systems, Congress passed the Infrastructure Investment and Jobs Act in November 2021. This bill will invest an estimated $4 billion in Illinois transit systems over the next five years.

To secure federal transit funds and to continue the improvements to the public transportation systems, the state will need to provide additional bond authorizations and appropriations. State funding categories are summarized below.



Public Act 101-0029 (HB0062) took effect on July 1, 2019. This legislation provides the first Capital Bill in Illinois in over a decade and will provide much-needed capital investment Statewide for a variety of public transportation projects.



RTA is working toward the 2025 deadline when the more than $3 billion in federal relief funding to sustain transit operations will run out. The RTA has ensured that the CTA, Metra and Pace will be stable until; then because all federal emergency dollars have been allocated. Buying RTA, the necessary time to both plan and act.

Federal Funding

Federal legislation establishes the funding amounts for Illinois' transit systems. MPO-generated FY 2022-2027 program estimates are based on the current levels of funding from the Fixing America's Surface Transportation Act. Estimated for FY 2022 were based on assumption of full-year FY 2018 figures remaining the same, with an additional 3 precent increase, and 2 percent annual increases utilized to estimate a total amount for the five-year period FY 2023-2027. Note that federal funding levels may be subject to change.

Urbanized Area Formula Grants	FY 2020 Est. Appor: Northeastern IL: $258M Downstate Urban: $ 35.5M	FY 2023-2027 Est. Appor. Northeastern IL: $1.36B Downstate Urban: $188.4 M
Enhanced Mobility of Seniors and Individuals with Disabilities	FY 2022 Est. Appor. Northeastern IL: $7.4M Downtstate Urban: $ 4.4M Downstate Rural: $1.5M	FY 2023-2027 Est. Appor. Northeastern IL: $39.2M Downstate Urban $23.3M Downstate Rural: $7.9M
Rural Area Formula Grants	FY 2022 Apportionment: $318,070	FY 2023-2027 Est. Appor: $1.6M
Rural Area Formular Grants	FY 2022 Est. Appor: 5311: $19.2M CARES: $27M CRRSA/ARP: $12.4M	FY 2023-2027 Est. Appor. 5311: $101.9M CRRSA/ARP: $24m
State of Good Repair Grants	FY 2020 Est. Appor: Northeastern IL: $316.5M	FY 2023-2027 Est. Appor. Northeastern IL: $1.68M
Bus and Bus Facility Grants	FY 2022 Est. Appor: Northeastern IL: $19M Downstate Urban: $7.7M Statewide: $3.7M	FY 2023-2027 Est. Appor: Northeastern IL: $ $100.8M Downstate Urban: $40.8M Statewide: $19.6M

State Funding

To secure federal transit funds and to continue the improvements to the public transportation systems the state will need to provide additiona bond authorizations and appropriations.. State funding categories are summareized below with estimated funding levels (in millions) based upon the state's FY 2018 budget.

Public Transportation Fund	FY 2022 Est. Appor: Downstate Urban: $373M Downstate Rural: $78M	FY 2023-2027 Est. Appor: Downstate Urban: $1.97B Downstate Rural: $414M
Additional State and Additional Financial Assistance	FY 2022 Est. Appor: Northeastern IL: $13M	FY 2023-2027 Est. Appor: Northeastern IL: $695.3M
Downstate Transit Improvement Fund	FY Est. Appor: Downstate IL: $25M	FY Est. Appor: Downstate IL: $132.7 M
Transportation Series B Bond	FY 2022: Statewide: $1.085B	FY 2023-2027 Statewide: $5.75B

New State Funding - 2019 Captial Bill "Rebuild Illinois"

Public Act 101-0029 (HB0062) took effect on July 1st, 2019. This legislation provides the first Capital Bill lin Illinois in over a decade and will provide much-needed captial investment Statewide for a wide variety of public trqnsporstation projects statewide.

Multi-Modal Transportations Bond Fund		FY 2022-2027 Northeastern IL: $2.7B Downstate IL: $204M
Downstate Mass Transportation Capital Improvement Fund	FY 2022 $231M	FY 2023-2027 $1.2B
Regional Transportation Authority Captial Improvement fund	FY 2022 $1.25B	FY 2023-2027 $6.65B

PUBLIC SAFETY

Since implementing a 50% systemwide schedule reduction in March 2020 in response to the COVID-19 pandemic, Metra has increased service on all lines over the course of the last year and a half to accommodate ridership demand, allow for social distancing, and grow new markets. Metra approved a contract in March 2021 to upgrade air filtration and purification on its railcars. This new system uses ultraviolet light, electrical fields, and stronger filters to remove 99% of all airborne particulates, bacteria, and viruses.

As of Dec. 31, 2020, Metra has fully implemented the federally mandated Positive Train Control (PTC) safety system, the biggest safety initiative the railroad industry has ever undertaken. PTC is a GPS-based safety technology that slows or stops a train to enforce track speeds, prevent unauthorized entry into work zones, prevent train-to-train collisions, prevent over speed derailments, and prevent a train from moving through a switch that isn't properly aligned.

Along the CTA network, public safety equates to pedestrian safety so that all users can safely navigate stations and facilities. The CTA's efforts on this end have involved optimizing bus stop locations so that Americans with Disabilities Act (ADA) criteria can be met. In 2018, CTA has created the All Stations Accessibility Program (ASAP) to lay out the plan to increase vertical accessibility to ground rail stations above or below through the addition of or improvement to elevators. This will allow pedestrians who are unable to use stairs the ability to navigate throughout rail stations. The goal is to make the CTA network 100% accessible over the next 20 years. CTA aims to ensure that customers and employees have a safe and secure transit system and workplace that prioritizes safety over all other aspects of service delivery. This is a Strategic Priority in the FY21 budget.

Since implementing a 50% systemwide schedule reduction in March 2020 in response to the COVID-19 pandemic, Metra has increased service on all lines over the course of the last year and a half to accommodate ridership demand, allow for social distancing, and grow new markets.

RESILIENCE & INNOVATION

The Illinois FY 2020-2025 Proposed Multimodal Multi-Year Program (MYP) is oriented around five performance goals, which were developed as part of IDOT's Long-Range Transportation Plan (LRPT):

- Economy – Improve Illinois' economy by providing transportation infrastructure that supports the efficient movement of people and goods.
- Livability – Enhance the quality of life across the state by ensuring that transportation investments advance local goals, provide multimodal options and preserve the environment.
- Mobility – Support all modes of transportation to improve accessibility and safety by improving connections between all modes of transportation.
- Resiliency – Proactively assess, plan and invest in the state's transportation system to ensure that our infrastructure is prepared to sustain and recover from extreme events and other disruptions.
- Stewardship – Safeguard existing funding and increase revenues to support system maintenance, modernization and strategic growth of Illinois' transportation system.

The LRTP establishes a set of policies to guide future development rather than outlining specific improvements, like those in this MYP. These policy goals provide the broad framework for new decision-making and future analysis tools.

As part of the Vision 2020 plan to modernize public transportation, Pace developed an initial network of Pulse corridors intended to enhance mobility and regional travel options. Seven priority corridors were identified for development for a near-term timeframe of approximately 10 years. These corridors constitute the Near-Term Priority Pulse Network. Pace's rapid transit service provides frequent, fast and reliable transit. Pulse service combines transit signal priority technology and limited-stop service with raised platforms at stations to reduce travel times and provide enhanced rider amenities.

Among these near-term corridors, Pace has constructed and implemented the Pulse Milwaukee Line from the Golf Mill Mall in Niles to the CTA's Jefferson Park Transit Center, 7.6 miles in length. The next three corridors currently in project development include Dempster Street, which is currently under construction, and Halsted Street and 95th Street, which are still in the planning phase.

Pace also continues to experiment with emerging mobility solutions to better serve its vast suburban service area. Pace is currently implementing a pilot project to encourage some customers eligible for Americans with Disabilities Act (ADA) paratransit service to receive subsidized Uber trips on-demand instead of more expensive and less convenient traditional paratransit, which requires 24-hour advanced booking by phone. Pace's recently published strategic plan, Driving Innovation, also calls for the agency to explore augmenting or replacing its traditional fixed route bus service with microtransit, which enables customers to summon bus service via an app and provides the ability to travel where they need to go, when they need to go.

Transit

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RECOMMENDATIONS TO RAISE THE GRADE

- Continue to fund transit at the current levels to improve the existing systems and services.
- Offer intercity buses and increase connectivity between cities, counties, airports, and major transit stops.
- Further develop public transit systems to cover more areas and reduce bus headways.
- Expand initiatives to inform residents about transportation options available to them.
- Reduce the carbon footprint of transit fleets by investing in alternative fuel and electric vehicles.

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Wastewater

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EXECUTIVE SUMMARY

Approximately 85% of Illinois' residents are served by more than 800 wastewater treatment facilities and 690 wastewater collection systems; the remaining residents rely on septic systems. Adequate prioritization of Illinois' wastewater infrastructure is vital to protecting our abundant water resources and providing a safe and clean resource for all users. Unfortunately, deficiencies in Illinois' wastewater infrastructure poses a threat to our water resources. The U.S. Environmental Protection Agency (EPA) determined in 2016 that a total of $6.5 billion was necessary to meet the water quality and water-related public health goals of the Clean Water Act. To help communities with inadequate or nonexistent wastewater collection and treatment facilities, $20 million per year is now available through the Illinois Environmental Protection Agency's (IEPA) Unsewered Communities Grant Programs to assist communities with new wastewater facility construction grants. Meanwhile, communities are investing to avoid combined sewer overflow events. In 2017, there were 37 CSO events reported in Chicago while in 2020, only 19 CSO events were reported.

CAPACITY AND CONDITION

According to the EPA's Clean Watersheds Needs Survey (CWNS), Illinois has over 800 operational municipal wastewater treatment facilities and 690 wastewater collection systems serving more than 85% of the state's 12.8 million residents . The percentage of Illinois residents served by municipal wastewater treatment facilities is greater than the national average.

Data for determining the status of treatment facilities is limited, as the most recent publicly available data for critical and restricted facilities maintained by the Illinois Pollution Control Board (IPCB) was last updated in 2011. These lists provide a set of treatment facilities and operators that the IPCB has deemed to be approaching or reached design capacity, requiring additional scrutiny of future permits. A review of currently issued discharge permits revealed that all of the publicly owned treatment facilities on the list have current active permits even under the heightened scrutiny of being on the 2011 lists. Although not definitive, this implies the 2011 issues have been or are being addressed to the satisfaction of the Illinois EPA.

Aging infrastructure and new wastewater discharge limits are posing challenges to Illinois' municipal wastewater utilities. A review of publicly available reports demonstrates many utilities have either started evaluating their collections systems, completed their evaluation, and/or started remediating and improving deteriorating infrastructure. Over the past three years, Illinois wastewater utilities have taken a proactive approach to improving the conditions of its collection system.

The state of Illinois operates a Water Pollution Control Loan Program. Under this program, Illinois aids in

construction and improvement of wastewater treatment facilities. Since 2018, Illinois has maintained a priority project list (PPL) with needed assistance that exceeds available funds. As such, Illinois continues to help as many applicants as possible with the existing resources. For the Fiscal Year 2022, Illinois EPA has identified $1.7 billion in projects, of which only $350 million can be funded with available resources. An examination of the PPL reveals many projects are for facility upgrades, including phosphorus removal to meet new permit limits, disinfection, and collection system repair.

PUBLIC SAFETY

Illinois municipalities continue to have Combined Sewer Overflow (CSO) events that affect local waterways. CSOs typically occur when the capacity of the combined sewer system is overtaxed due to heavy rainfall or rapid snowmelt leading to large volumes of partially treated or untreated wastewater bypassing the treatment process and entering local waterbodies. CSOs can pose risks to public safety due to their impact on water quality. These incidents often make water unsafe for swimming, boating, or fishing.

CSOs are regulated by the EPA. Their CSO Control Policy requires all combined sewer communities to develop and implement a Long-Term Control Plan. For instance, the Chicago metropolitan area has implemented the Tunnel and Reservoir Plan (TARP) to meet the long-term requirements. TARP consists of a series of deep tunnels and larger storage reservoirs. These improvements have already led to positive strides in water quality and fewer CSOs. In 2017, there were 37 CSO events reported in Chicago while in 2020, only 19 CSO events were reported.

More recently, the issue of PFAS (per- and polyfluoroalkyl substances) has become an area of concern for Illinois wastewater agencies. PFAS are a class of over 5,000 chemicals discovered in the late 1930s that were widely manufactured in subsequent years for applications including firefighting foams, consumer products, fast food containers, and industrial processes. Often referred to as "forever chemicals," PFAS are highly stable in the environment and can be detected at very low concentrations.

Public clean water utilities receive and treat a broad range of wastewater from various sources including domestic, industrial, and commercial sources. This influent, which is not generated by the utility, but which the utility is responsible for treating, may contain PFAS constituents ranging from trace amounts to higher concentrations based on the nature of the dischargers connected to the sewer system.

Last year, the IEPA released new proposed groundwater quality standards regulating PFAS. There could be unintended consequences that hold public utilities potentially liable for cleanup costs, particularly where biosolids from the treatment process containing low levels of PFAS have been beneficially applied as fertilizer. Removing these chemicals from wastewater requires advanced treatment techniques such as granular activated carbon (GAC), ion exchange (IX) or reverse osmosis (RO). These treatment methods are prohibitively expensive for the volume that needs to be treated. Therefore, the challenge persists regarding how and where residual PFAS from these processes will be disposed.

OPERATION & MAINTENANCE

Operation and maintenance (O&M) of wastewater treatment infrastructure is a significant component of a system's budget. Federal funding cannot be used to pay for operations and maintenance, so the burden falls on the rate payers. However, the funds raised by rates are often insufficient to address the needs of an aging wastewater system.

One issue that increases costs for routine O&M is the condition of the collection system. An aging or inadequately maintained sewer system contributes to more inflow and infiltration, which means that the volume of water the plants need to treat increases, creating more wear and tear on the system, and driving up the costs.

Wastewater utilities have an asset management plan, generally framed or guided by the governing bodies in the county or municipality in which they are located. While some of these counties/municipalities regularly update their plans, several of them do not have the required resources or manpower to update the plans at a pace that makes them relevant to the utilities. The lack of resources increases the risk on non-compliance at a future date.

Another issue facing wastewater agencies is a shortage of plant operators. This shortage – mainly attributable to retirements occurring in an aging workforce – is leaving many systems in need of immediate replacements or relying on short-term transition plans. Without qualified individuals to ensure standards are met, communities run the risk of failing to provide an essential public health service to their residents and local businesses.

Small, rural towns are particularly at risk. Many rely on operators to perform more tasks around the treatment plant than the narrow scope of operations. Small system operators are often the record keepers and have institutional knowledge that may not be written or stored anywhere. A sudden retirement, illness, or extended leave has the potential to significantly impair system operations.

Recognizing this problem, the National Rural Water Association has established an apprenticeship program for the wastewater operation profession. The program, developed according to standards recommended by the U.S. Department of Labor, is made available through state Rural Water Associations. As of January 2022, thirty-three states have approved the program, including Illinois. The apprenticeship program aims to ensure that competent, qualified people will have access to the training and licensing needed, helping to stem the shortage of wastewater operators.

Likewise, the City of Evanston operates an apprentice program to provide introductory training for a career in sewer collection system maintenance. Since the program's implementation, the City has provided paid, on-the-job training to a number of Evanston residents seeking to update their job skills. Many of these residents have gone on to successfully find full-time employment at the City of Evanston or with other employers in the sewer industry.

FUNDING AND FUTURE NEED

The need to comply with federal wastewater regulations often drives some of the most expensive capital projects for cities and towns. The sources of 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 2012. At that time, 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. However, EPA has not provided Congress with an updated Clean Watersheds Needs Survey since 2012, so the current amount needed for wastewater infrastructure is difficult to assess fully and accurately.

The low-interest loans through the State Revolving Fund (SRF) Water Pollution Control Loan Program (WPCLP) remain an important source of funding for wastewater projects. Federal capitalization grant funds for the program in Illinois have remained relatively consistent since 2018, as shown in the table below. States including Illinois have been leveraging the loan repayments by issuing revenue bonds to increase the total available funds for projects.

The total funds for the WPCLP that were used or projected to be available for Illinois (which includes the CWSRF federal capitalization grant as well as bond funds, loan repayments, reimbursements, and accrued interest) are also shown in the table below. In 2020, the projected funding level was $450 million; however, the actual amount of the allocated funding that was used dipped due to a slowdown in activity due to the COVID-19 pandemic. The unused funds from 2020 were carried over to 2021, resulting in a higher than anticipated amount of funding being available in 2021.

The projected Illinois funding levels remain at a high level. The Infrastructure Investment and Jobs Act (IIJA) was passed in November 2021 and includes the Drinking

Water and Wastewater Act of 2021 that reauthorizes the Clean Water State Revolving Fund (CWSRF) at $11.7 billion over 5 years, approximately doubling this important funding source for wastewater projects.

In addition, resources are being made available through two IEPA Unsewered Communities Grant Programs funded by the Rebuild Illinois capital plan. This program assists communities by providing resources to address inadequate or nonexistent wastewater collection and treatment facilities. Illinois EPA is aware of more than 200 Illinois communities that have inadequate or nonexistent wastewater collection and treatment facilities that could benefit from these programs. The planning grant includes $1 million per year available to assist communities to develop a project plan to address wastewater issues, and there is $20 million available per year for the construction grant. The IIJA also provides $1.4 billion over five years for Sanitary Sewer Overflows and Stormwater Reuse Municipal Grants, 25 percent of which are reserved for rural or underserved communities.

An additional funding source that has the benefit of improving treatment plants and improving energy efficiency was announced by the IEPA's Office of Energy: $422,250 in grant money was awarded to four treatment plants to reduce the amount of energy consumed by wastewater treatment operations.

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. In Illinois, there are four projects that have been invited to apply and one that has submitted an application. All combined, these five projects total just over $1 billion dollars in WIFIA funds. The WIFIA loan program was reauthorized by the IIJA at $50 million annually.

Other federal sources of funding include HUD's Community Development Block Grant (CDBG) program (wastewater projects are one of the many eligible uses) and the USDA's rural water and wastewater disposal program. Illinois HUD CDBG allocations have ranged from $163-169 million from 2018 to 2021, but the Rural Development Grant Awards for water and waste disposal in Illinois have gone down from $49 million in 2018 to $4 million in 2021.

Year	Region 5 – Illinois CWSRF Federal Capitalization Grant Funds	Illinois WPCLP Annual Funding Levels
2018	$ 72.6 million	$ 395.6 million
2019	$ 71.9 million	$ 433.0 million
2020	$ 71.9 million	$ 255.5 million
2021	$ 71.9 million	$ 407.9 million
2022	$ 81.2 million	$ 600.0 million *projected
2023	To be determined	$ 450.0 million *projected
2024	To be determined	$ 425.0 million *projected

INNOVATION AND RESILIENCE

Given the increasing frequency and intensity of wet weather events in the Midwest, severe weather has the potential to jeopardize operations. Evidence of such events are available through meteorological data for Illinois. The Illinois Water/Wastewater Agency Response Network (ILWARN) continues to be an effective way to warn populations about impending natural disasters and to assist wastewater utilities during such events. Based on the responses to a survey of wastewater utilities, 50% of the respondents said that their capacity to meet wet weather demands had improved while 50% said it remained unchanged.

Some plants have implemented innovative technologies such as enhanced biophosphorus removal (EBPR), which removes nutrients from effluent stream, driving down in-process treatment costs over the lifespan of the system, and also reduces the potential pollutants entering surface waters. Other plants are looking into forward-looking sludge management strategies such as biochar from biosolids, which create opportunities for value-added products that can drive down treatment and handling costs and promote carbon sequestration. However, the number of utilities embracing these changes remains limited due to infrastructure funding concerns at the local level. There is also increasing awareness that stricter discharge regulations are likely to be implemented to curb traditional pollutants including nitrogen and phosphorus, and emerging pollutants including PFAS. Wastewater utilities have also developed the capability to detect and monitor organisms such as COVID-19.

There is no clear trend on whether water shortages are creating innovations because the investment across the state in the infrastructure and technology remains limited. However, there is anecdotal evidence of sporadic initiatives to reduce the amount of sewage treated, graywater collection and use in irrigation, but it remains limited at best.

There is no clear trend on whether water shortages are creating innovations because the investment across the state in the infrastructure and technology remains limited. However, there is anecdotal evidence of sporadic initiatives to reduce the amount of sewage treated, graywater collection and use in irrigation, but it remains limited at best.

Agencies include sustainability requirements to a limited extent, and follow-through on project sustainability goals are influenced by cost concerns in the implementation phase. An example is the City of Anna in Union County, which received a grant from the IEPA as part of the Office of Energy's Wastewater Treatment Plant Energy Efficiency Program. With improvements funded by the grant, the city is looking to save about 56 percent on the cost of electricity to operate their water reclamation facility. The Illinois EPA Office of Energy administers this program from the U.S. Department of Energy State Energy Program. The program provides funding and technical assistance to advance state-led energy initiatives and maximize the benefits of decreasing energy waste.

However, uniformity in stated policies on sustainability is lacking. Although management at wastewater utilities is generally aware of the sustainability design process, implementation of processes such as Envision remains limited.

Wastewater

RECOMMENDATIONS TO RAISE THE GRADE

- Increase transparency and amount of information available to the public by federal and state agencies. The EPA needs to reestablish regular and timely reporting to Congress with updated Clean Watersheds Needs Surveys. Similarly, the IPCB must update its critical and restricted facilities lists to help in identifying where current capacity concerns exist.
- Similarly, the IEPA should establish a statewide infrastructure needs inventory 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.
- The EPA should develop a federal response that appropriately reflects the risks posed by PFAS, close the unresolved scientific gaps—including fate, transport, and toxicity of PFAS using a science-based approach—and evaluate the appropriate regulatory response.
- Increase investment in critical wastewater infrastructure improvements through the State Revolving Loan Fund and streamline SRF loan application forms and website. Standardize and simplify the loan application process and increase awareness of the fund.
- Commit 20% of any future infrastructure funding to wastewater improvements so that the industry gets their "fair share." Too often, wastewater funding is an afterthought when it comes to allocating money for infrastructure.
- Wastewater utilities should charge rates that reflect the true cost of service, 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 wastewater infrastructure. Such rates should also contain pricing structures that mitigate impacts on low-income households or include a rate reduction program (like the federal low-income Energy Assistance Program) to cushion the impact of rate increases.
- Encourage investment in innovative collaborative research that is likely to produce practical and long-term sustainable solutions and to build system resiliency.
- Develop an incentive-based program at the state level to reward utilities that implement innovative strategies of wastewater reuse, and wastewater sludge reduction measures. Develop clear goals for sludge management, including biosolids, and develop the mechanisms to fund the technologies and processes that help wastewater utilities attain these goals.
- Implement training/apprenticeship programs at the community college level to recruit and certify new operators to help replenish the wastewater workforce.

Wastewater

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Wastewater

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