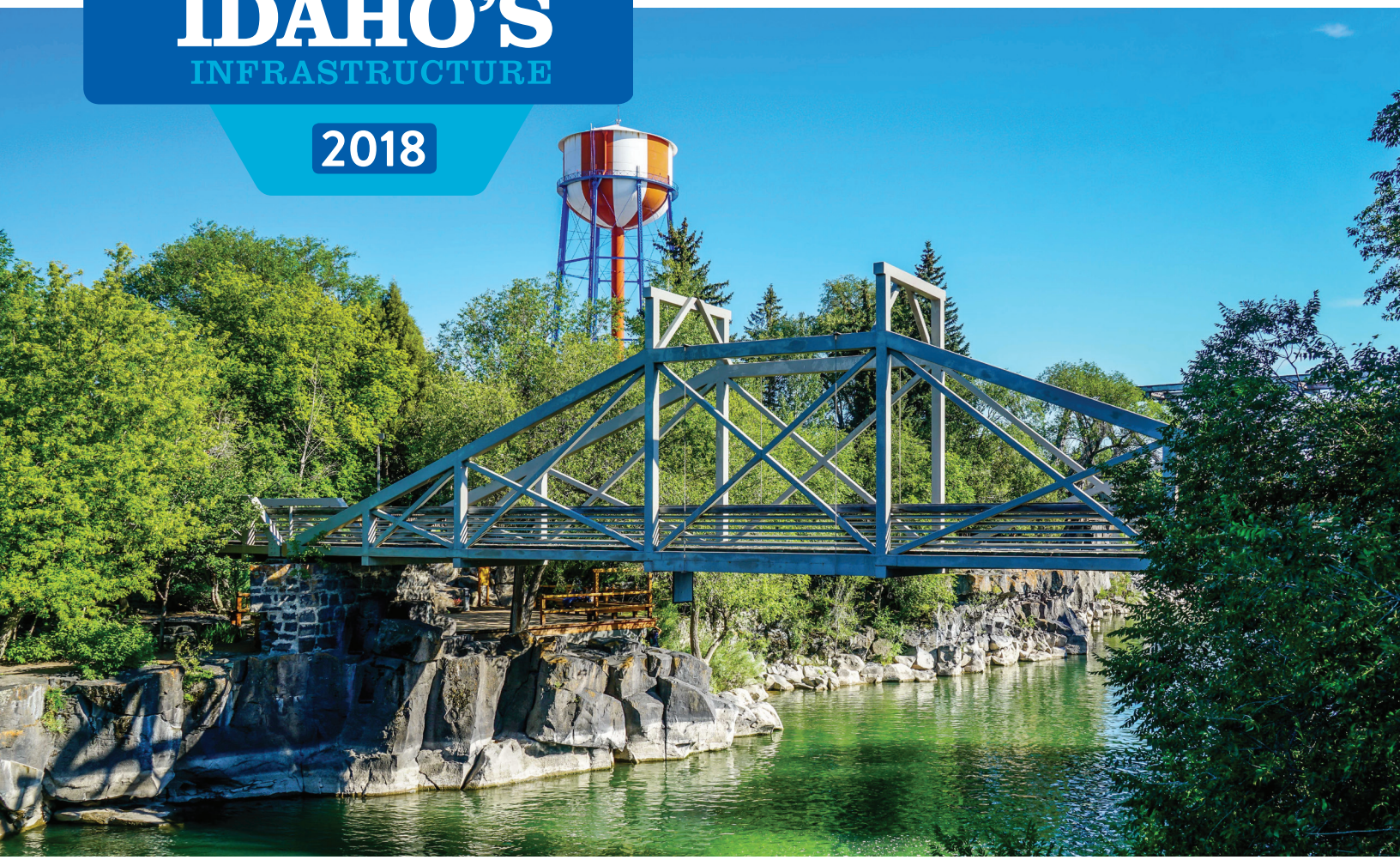
REPORT CARD FOR IDAHO'S INFRASTRUCTURE

2018



Southern Idaho Section of the American Society of Civil Engineers

INFRASTRUCTUREREPORTCARD.ORG/IDAHO

ASCE

AMERICAN SOCIETY OF CIVIL ENGINEERS

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COVER PHOTO: The beautiful Snake River running through Idaho Falls in Southeast Idaho.

EXECUTIVE SUMMARY

Since the first American Society of Civil Engineers (ASCE) Report Card for Idaho's Infrastructure was released in 2012, Idaho's population has continued to increase. Idaho is now the fastest growing state in the United States.

An important question to ask is how is our infrastructure going to keep up with this growth? This 2018 Report Card for Idaho's Infrastructure, prepared by an experienced team of civil engineers and infrastructure professionals, shows that while some progress is evident, more should be done to make Idaho a stronger, safer, healthier, and more prosperous state.

As civil engineers, we have a responsibility to safeguard the life, health, property, and welfare of the public. To uphold this responsibility, we have produced this Report Card to inform the public and our elected leaders about the state of our infrastructure. This evaluation includes the existing condition, capacity, funding, future need, operation and maintenance, public safety, resilience, and innovation.

One of the primary reasons people are moving to Idaho is the high quality of life we all enjoy. For us to maintain this priceless benefit, we must support infrastructure improvements, encourage innovative solutions to challenging infrastructure scenarios, and urge elected leaders to prioritize and provide funding for critical infrastructure.

We hope this Report Card provides an additional resource to help the public and policymakers throughout Idaho make more informed decisions.

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OVERALL RECOMMENDATIONS

1. **BE PROACTIVE** – With Idaho's continued population growth, we must be proactive in our approach to funding, maintaining, and improving our infrastructure to meet the ever-increasing need.

2. **INCREASE LOCAL INFRASTRUCTURE INVESTMENT** –Large portions of Idaho's land is federally owned and has traditionally relied on federal funding extensively on infrastructure investment. In recent years, infrastructure funding from the federal government has been insufficient to meet system needs. As a result, more pressure is being placed for state and local jurisdictions to come up with funding solutions. We need to encourage passage of local funding initiatives and promote policies aimed at empowering local entities that are prioritizing infrastructure investment.

3. **FOCUS ON CRITICAL INFRASTRUCTURE** – Whether it's a high hazard dam, a structurally deficient bridge, a poorly maintained road, ageing pipelines, or other questionable infrastructure, we must prioritize care for, and investment in, critical infrastructure to allow for the continued safety of the public.

4. **TAKE A STAND** – As citizens of Idaho, we must take a stand and get engaged with decision-makers. The Report Card for Idaho's Infrastructure arms every citizen with the information needed to make the case the built world around us is critical to our economy and way of life. We must reach out to our elected officials and show our support for comprehensive infrastructure planning and long-term funding solutions.

The spillway drains water from Dworshak Dam on the Clearwater River in Idaho. Dworshak Dam is the highest straight-axis dam in the western hemisphere, and the third tallest dam in the country.

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BRIDGES
GRADE: D

EXECUTIVE SUMMARY

There are 4,492 bridges in Idaho. Of these, 1,848 bridges are on the state highway system, and 2,375 are local bridges; the remainder are owned and maintained by federal agencies. Most twentieth century bridges were designed for a 50-year life span. 45% of the existing bridges (837) on the state highway system are 50 years or older and nearly 30% of the local bridges are 50 years or older. Based on currently planned bridge replacements, in just three years the number of bridges 50 years and older will rise to 911, or over 49% of the bridges on just the State Highway System. While rehabilitation of older bridges can extend the lifespan of that structure beyond the 50-year design life, the aging of Idaho bridges is of concern. In total, Idaho has identified needed repairs on 1,520 bridges, and the state estimates the cost of repair to these bridges will total $2.2 billion.

CONDITION

Idaho is home to 4,492 state and local bridges. A total of 393 bridges, or 8.7% of total bridge stock, in Idaho are rated structurally deficient. This is just under the national average; 8.9% of U.S. bridges were structurally deficient in 2017. While structurally deficient bridges are not unsafe for the traveling public, the rating indicates that a bridge is in need of maintenance, rehabilitation, or sometimes replacement. 45 structurally deficient bridges are on the state highway system and 280 on the local highway system, which is 8% of the state and local bridges. The remainder of bridges are owned and maintained by federal agencies. While the percentage of structurally deficient bridges has remained roughly consistent since 2007, an indication that available funding is insufficient to meaningfully address needed bridge repairs. The structural deficiency rating means there is some component of the bridge that may restrict the normal traffic and may limit some of the commercial truck traffic, thereby potentially impacting the movement of goods and emergency vehicles. Meanwhile, the asset management system utilized by the Idaho Transportation Department (ITD) has increased the percentage of bridges in good condition from 67% in 2006 to 75% in 2016.

CAPACITY

Planning organizations across Idaho indicate that congestion continues to increase. Studies indicate that various roadway corridor sections show travel times longer than 2.5 times free-flow conditions during peak hour traffic. Traffic will continue to increase with Idaho's projected growth. In the Treasure Valley, for example, the number of vehicles traveling along I-84 in Canyon County every day has increase by about 30,000 over the last decade. The number of vehicles on State Street in Ada County is estimated to increase from about 35,000 to 65,000 by 2040. Increased pressure will be placed on existing bridges in Idaho to support this growing traffic load.

Time Zone Bridge located in Riggins, Idaho. This tied arch bridge spans the Salmon River and provides a critical north-south connection.

OPERATION AND MAINTENANCE

Idaho employs bridge management practices that include four features:

- Measurements of performance of bridges and culverts with targets for performance.
- Work programs that respond to performance measurements and targets.
- Reporting to stakeholders on performance of bridges and culverts.
- Commitment within ITD to preservation of existing assets.

This asset management system) has increased the percentage of bridges in good condition from 67% in 2006 to 75% in 2016.

All bridges, in accordance with Federal law, are inspected biennially. Bridges that have a low sufficiency rating are inspected more frequently to track their condition, and whether additional restrictions or emergency repairs are necessary to protect the public. As the bridge inventory continues to age, the cost of maintenance of the bridges goes up. When maintenance is necessary, it normally is more expensive as the bridge gets older.

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FUNDING & FUTURE NEED

In 2015, the Idaho State Legislature increased the state fuel tax by seven cents and distributed the additional revenue to the Idaho Transportation Department and the 288 local highway jurisdictions for road and bridges projects. Additionally, the state directed a portion of its budget surplus to ITD and local highway jurisdictions. During the 2017 Session, Idaho legislators approved $300 million in additional GARVEE bonds, but the impact on the bridges shortfall will be limited.

The 2011 Governor's Task Force identified an annual State and local revenue shortfall of $543 million divided between maintenance, safety, and capacity. The FY2015 revenue increase has reduced the annual shortfall for bridges an roads to approximately $450 million. While this extra revenue is helpful, more is needed, as current funding levels are running far short of needs. Idaho has identified needed repairs on 1,515 bridges, and the state estimates the cost of repair to these bridges will total $2.2 billion. Over the last 10 years, the Idaho Transportation Department has been able to construct approximately 36 bridges per year and do major rehabilitation work on approximately 8 bridges per year, but funding for a quicker rate of rehabilitation and replacement is needed to lower the number of structurally deficient bridges in the state.

PUBLIC SAFETY

Bridges, as required by Federal Law, are inspected at least biennially. If deficiencies are found in a bridge, it can have emergency repairs, more frequent monitoring, lane and/or load restrictions, or closure to maintain the public safety.

The bridge inspection process in Idaho is very good in terms of monitoring, and posting and/or closing when necessary, those bridges that are structurally deficient to minimize the likelihood of a catastrophic failure of a bridge.

INNOVATION

The ITD staff abilities have increased greatly since automated bridge management systems were introduced, resulting in more accurate and up-to-date management information. ITD has also been focused on innovations that result in savings and efficiency improvements. For example, ITD's District 1 developed a new way to install bridge girders, reducing the time to install girders on an I-90 overpass from several months to only three weeks, and reducing the impact on the public.

Bridge reconstruction in St. Maries, Idaho

RECOMMENDATIONS

- **Additional funding for the most critical bridges needs to be addressed immediately, both on the state and local system.**
- **Among other criteria, more of a focus on prioritization for replacement or rehabilitation of bridges on the state and local system that have met or exceeded their design life.**
- **The long-term funding to support a bridge improvement program needs to be carefully studied, so that deficient bridges are replaced or rehabilitated.**

SOURCES

- Transportation Asset Management Case Studies, Federal Highway Administration - Bridge Management Practices in Idaho, Michigan and Virginia, 2011
- Road and Bridge Data by State, Grow America, US Department of Transportation, 2016
- State Transportation Statistics 2015, Road Bridge Conditions: 2014, Bureau of Transporation Statistics, US Department of Transportation
- State Bridge Profile Idaho, American Road & Transportation Builders Association, 2015 (Highlights from FHWA's 2014 National Bridge Inventory Data)
- Structurally Deficient Bridges by State, 2007 - 2016, American Road & Transportation Builders Association, 2017
- Treasure Valley Annual Congestion Management System Report (2016), Community Planning Association of Southwest Idaho, December 7, 2017
- Fiscal Year 2016 Annual Report, Idaho Transportation Department
- Dashboard - Performance Measures, Idaho Transportation Department, 1917
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- Rural Connections: Challenges and Opportunities in America's Heartland, TRIP (a national transportation research group), June 1917

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DAMS
GRADE: C

EXECUTIVE SUMMARY

In the time since the 2012 Report Card was issued, the state witnessed improved funding for safety regulation of existing dams, but saw a negligible change in monies made available for maintenance, repair or replacement of deserving private dams. While Idaho's rapidly growing population has generated increased revenue for state coffers, the per capita reservoir storage capacity decreased, due to a lack of construction of new, or replacement water storage projects. Six years older, the inventory of existing dams remains largely unchanged. We still lack a strategy to provide reliable funding to sufficiently correct progressive physical deterioration of private dams. Funding is clearly needed to mitigate some of the greatest risks to downstream life and property posed by existing dams. Additionally, independent means to provide safety oversight for Idaho's system of canals and levees has not been legislatively authorized, despite the close proximity of such infrastructure to population centers.

CONDITION AND MANAGEMENT

Irrigation facilities were constructed in Idaho more than 150 years ago. The realization that much of Idaho's harsh desert could be transformed into highly productive agricultural lands prompted the demand for reliable water storage and delivery systems consisting of dams and canals. Thanks to the ambition, investment, sacrifice, and freedom to act that encouraged earlier pioneers, Idaho citizens today enjoy the variety of benefits afforded by dams; including flood risk reduction, hydropower generation, wildlife habitat, and recreation. Importantly, dams today still serve to store water for agriculture, municipal, commercial and industrial uses.

The majority of state regulated dams and reservoirs in Idaho are non-federal structures. However, the bulk of above-ground water storage volume in the state is impounded by dams owned and/or regulated by various federal agencies totaling approximately 12.9 million acre-feet. This value includes hydropower dams licensed by the Federal Energy Regulatory Commission (FERC). The U.S. Bureau of Reclamation (USBR) and the U.S. Army Corps of Engineers (USACE) have the largest share of water storage projects, 5.6 and 3.9 million acre-feet respectively. Idaho is fortunate to have been the recipient of federal funding for the development of much of existing reservoir capacity, but water-related infrastructure currently is proportionally diminished due to the state's rapidly growing population, and the increased costs associated with permitting, design, and construction. In addition, the availability of non-contested water resources has declined due to limitations imposed by climate, wildlife, and prior appropriation of both surface and ground water.

The Idaho Legislature in 2016 revised the definition for dams and reservoirs subject to regulation by the Idaho Department of Water Resources (IDWR) Dam Safety Program. The inventory of state regulated dams currently is 397, and includes both water storage reservoirs and mine tailings impoundment structures. Due to the removal of smaller, low hazard dams from state inspection, more time has been made available for increased scrutiny of larger, more hazardous structures.

New York Canal and levee through Boise

Other important constructed water barriers and delivery systems in Idaho include levees and canals; however, they are exempted from state dam safety regulation per statute. No other state agency has been directed either by statute or executive order to provide oversight for their safety regulation. This apparent lack of independent supervision for Idaho's extensive system of canals and levees is a concern, especially with regard to the state's growing population and the incremental but continued development in floodplains. Although the National Flood Insurance Program (NFIP) establishes a monetary value for flood insurance premiums charged to property owners who live in flood-prone areas, the regular inspection of existing levees is not a state function. Consequently, the current status of such existing privately-owned infrastructure largely is unknown at this time. The USACE is currently recruiting information regarding all known levees and levee systems for inclusion in the National Levee Database, and this exercise may prove to be an excellent opportunity for the state to participate in assessing the physical condition of all Idaho's levee systems at nominal cost.

CONDITION AND PUBLIC SAFETY

Idaho statute mandates that all regulated dams in Idaho must be designed, constructed, operated and maintained to ensure downstream life and property is protected against the consequences of failure and uncontrolled release of water. Regarding public safety, IDWR has jurisdiction for all dams located within state boundaries, cooperatively assisted by federal agencies where appropriate. For example, a majority of dams that are owned by the federal government or licensed for hydropower generation typically receive additional safety inspections performed by federal safety programs beyond those required by the state. In these instances, the extra effort is justified because such dams are tall and/or impound large capacity reservoirs where failure and uncontrolled release of water could result in loss of life. Periodic inspection of all other regulated dams is a priority of Idaho's Dam Safety Program, and includes existing state, local and privately-owned dams. Another variety of state regulated dams include privately-owned mine tailings impoundment structures, which store a combination of water, slurry and sediment.

Methods used by the state to prioritize all dams with respect to public safety consist of a three-tier classification system known as Hazard Potential. Hazard classification is based on likely failure consequences that would negatively impact downstream life and property, and is broadly divided into High, Significant and Low categories. A catastrophic failure of a high hazard dam is presumed to result in a direct loss of human life; a significant hazard implies that significant economic damage will occur to developed property; and a low hazard classification suggests economic losses will be low, with no potential for loss of life. A preferred method for mitigating potential damage to downstream life and property is for all owners of high hazard dams to prepare an Emergency Action Plan (EAP), and to conduct tests of the plan at regular intervals. Although federal dam safety programs require periodic testing of EAPs for federal or hydropower generating dams, the state currently does not have a similar requirement for owners of private dams.

Each dam's hazard classification is then examined with a four-tier condition rating system that can be used to estimate the overall risk each structure presents to downstream life and property. Factored into the condition assessment is a determination of whether the structure meets certain design, operation and maintenance standards.

- *Satisfactory* dams have no recognized existing or potential dam safety deficiencies. Acceptable performance is expected under all identified loading conditions in accordance with applicable regulatory criteria and industry standards.
- *Fair* implies that no existing dam safety deficiencies exist for normal design loading conditions, but the effects of extreme or rare probability events may result in less than acceptable performance.
- *Poor* condition assessment describes a situation of a known dam safety deficiency under normal loading conditions, or when enough uncertainty exists to prevent an adequate analysis of the structure's response to normal loading conditions. Remedial action and/or further investigations are necessary to resolve the deficiency.
- *Unsatisfactory* means a dam safety deficiency exists that requires immediate correction, including lowering or draining the reservoir as appropriate.
- *Not Rated* is used sparingly and typically is reserved only for dams that have not yet received the benefit of a complete inspection.

State law requires that owners of regulated dams possess a valid Dam and Reservoir *Certificate of Approval,* which authorizes impoundment of water in the reservoir behind the dam based on the results of periodic safety inspection. Prior to expiration of the Certificate, IDWR must again inspect each dam before renewing storage authorization, and renewal may be conditioned to include instructions that address public safety concerns. Although existing statute does not contain specific language that require owners of high hazard dams to prepare, update and exercise an EAP (currently 90% of high hazard dams have an EAP), the state's dam safety program often includes on the Certificate for all high hazard dams the provision that a valid Operation and Emergency Plan is a condition for storage authorization.

TABLE 1. IDAHO DAM STATISTICS SUMMARY (2016-17 DATA)

CATEGORY	FACTOR ASSESSED	NO. OF DAMS
Hazard Classification	High Hazard Classification	90
	Significant Hazard Classification	151
	Low Hazard Classification	155
	Not Classified	1
Condition Assessment	Satisfactory	139
	Fair	209
	Poor	38
	Unsatisfactory	3
	High Hazard with Unsatisfactory	1
Risk Mitigation	All Dams with an Emergency Action Plan *	89
	High Hazard Dams with an EAP	81
	Dams not required to have an EAP	301

* Some reservoirs have multiple dam(s) impounding a common body of water

OPERATION AND MAINTENANCE

Excepting most hydroelectric generating dams, little improvement has been made generally to privately-owned structures in the period since the 2012 Idaho Report Card was published. Hydroelectric dams, although privately-owned, typically have revenue sources which are used to meet current dam safety requirements and to implement upgrades to their respective facilities as appropriate. Federal dams also have dedicated budgets for operation and maintenance (O&M), and therefore are better positioned to include maintenance and repair as an annual operating cost. For most other privately-owned dams however, the overall assessment has worsened due to the inability of private owners to acquire sufficient monetary resources to perform timely repair or replacement of any item(s) requiring large capital expenditure. Taxes, permitting, return-on-investment, and annual commodity costs all affect significantly how much money an individual, business, or limited partnership can keep in reserve for long-term maintenance, repair, and replacement.

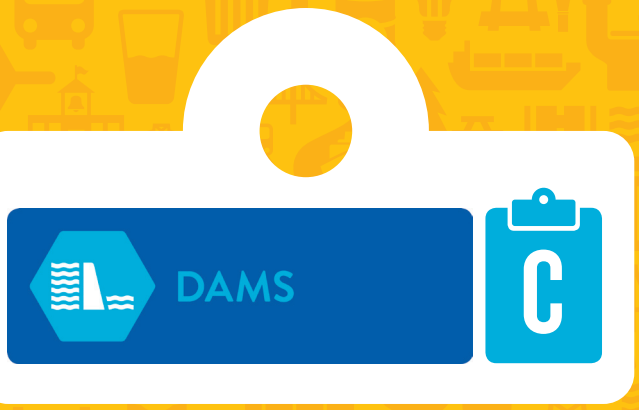
FUNDING AND FUTURE NEED

The state average age for Idaho's dams is approaching 60 years. Remarkably, few new water storage projects are currently being considered, and none are being designed or constructed to replace those whose service life is, or soon will exceed 75 years. The cost for repair has increased steadily, while replacement costs for existing structures have increased exponentially since the last large dam was built in Idaho in the 1970's. The problems experienced at California's Oroville Dam in 2017 provide a good example to illustrate how much more cost may be incurred as a result of deferred maintenance and repair for a relatively young, albeit large dam. Current estimates of construction costs for repair of that facility are estimated to exceed $500 million, on top of $140 to $160 million in emergency response costs. These costs exclude lost revenues from water and power sales. Smaller, privately-owned dams experience similar competing demands for dollars needed to perform critical maintenance and repair; however, often without dedicated revenue or O&M budgets typical of hydropower and federal dams.

Funding for the state's dam safety program has improved slightly in the past few years and was $487,752 in fiscal year 2016. The budget for the state dam safety program compares favorably to the national average for both all dams and high hazard potential dams. However, monies dedicated solely to supervised repair, rehabilitation and/or breach of privately-owned dams bearing a poor to unsatisfactory condition assessment is urgently needed to ensure continued safety of the downstream public.

RESILIENCY AND CAPACITY

Resiliency continues to decline due to changing conditions imposed by increasing population, shifting hydrology that reflects trends toward seasonally earlier snow melt and drier summers, and minimum stream flow requirements that compete for a static water supply. Due to arid climate and seasonal runoff, much of the western United States is heavily dependent upon reliable sources of stored water. Largely unchanged from the 2012 Report Card, Idaho's dams and reservoirs have existing capacity to store approximately 15 million acre-feet water. Since the last report was tabulated, Idaho's population has steadily increased to 1.683 million residents (2017 est.). This fact has reduced the per capita value from approximately 10 acre-feet in 2012 to currently less than 9 acre-feet annually.



RECOMMENDATIONS

- **Develop a reliable, balanced and consistent method to secure and dedicate financial resources for repair, modification and new construction to avoid costly emergency repair and/or operational restrictions at existing facilities.**
- **Assess each dam's operational limitations and flexibility with regard to Idaho's water supply system to anticipate future challenges impacted by budgets, climate variability, and increasing population.**
- **Fund the federal Dam Rehabilitation Program for non-federal dams.**
- **Investigate whether a need exists to regulate all existing hydraulic structures exhibiting potential failure consequences that would result in significant property damage or loss of life.**

SOURCES

- IDWR Dam Safety Program Inventory Database – 2016-17 Summary
- Idaho Code, Title 42, Chapter 17 – 2016 Revised Edition
- Association Of State Dam Safety Officials (ASDS0), Performance Report for State of Idaho (http://damsafety.org)
- Idaho Department of Labor – 2015 Census Tables, 2016 & 2017 Updates
- U.S. Army Corps of Engineers – 2015 National Inventory of Dams
- US News webpage: https://www.usnews.com/news/us/articles/2017-10-19/oroville-dam-repair-costs-will-top-500-million 10-19-2017.

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DRINKING WATER

GRADE: C

EXECUTIVE SUMMARY

Idaho's approximately 1,960 public water systems consists of pipes, plants, and pumps that work together to deliver clean water to the state's homes and businesses. The costs to maintain and improve this infrastructure are paid by users and rates can vary. Recent population growth has helped spur investment in new drinking water systems in some parts of the state. The Environmental Protection Agency estimates Idaho will need $961.8 million over 20 years to maintain, repair and replace its existing drinking water infrastructure and accommodate a larger population.

BACKGROUND

Drinking water infrastructure, including filtration plants, pipes, and pumps, work together to extract, sanitize, and distribute water to Idaho businesses and homes. This water infrastructure is managed and operated by a wide variety of owners, including homeowners' associations, businesses, nonprofit organizations, and local municipalities.

The federal Safe Drinking Water Act (SDWA) authorizes the U.S. Environmental Protection agency (EPA) to regulate public drinking water systems. EPA works with the Idaho Department of Environmental Quality (DEQ) to protect air and water quality in the state and carry out SDWA provisions. DEQ functions as a regulatory agency and a partner with private and public-sector groups, local and tribal governments, businesses and industries, community organizations, and citizens.

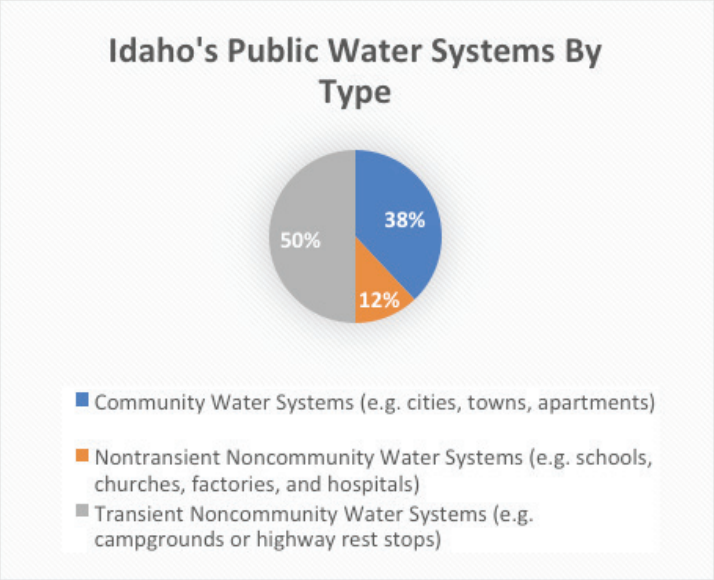
To collect information on drinking water infrastructure from owners and operators in the state, and to obtain results reflective of actual conditions of the infrastructure, ASCE created and distributed a survey to as many Idaho communities as possible. 46 responses were received, representing approximately 197,000 people, or 12% of the state's population. The survey results will be referenced throughout this chapter.

CAPACITY

Public water systems provide water intended for human consumption through pipes or other conveyances. There are approximately 1,960 public water systems in Idaho. Refer to Figure 1 for the breakdown of public water systems by type.

Other Idaho residents get their drinking water from private wells. Private wells are not regulated under the Safe Drinking Water Act and well owners are responsible for ensuring their water is safe.

FIGURE 1: IDAHO DEQ



Groundwater is the source of drinking water for 95% of the Idaho's residents. The remaining 5% of residents rely on surface water, such as streams, rivers, reservoirs, and springs. Idaho has easier access to groundwater than most states, due to the size and number of aquifers below ground. Surface water, while generally more expensive to treat than ground water, can provide flexibility for things like spikes in demand. Some parts of the state rely more on surface water than others; for example, in Boise, approximately 30% of residents rely on water drawn from the Boise River.

CONDITION

Recent growth in Idaho has necessitated the construction of new drinking water infrastructure. For example, the Boise suburb Meridian, while long the fastest growing city in the state, is anticipating a 98% population increase over the next 30 years. To accommodate existing and projected growth, Meridian's water department had drilled 23 wells as of 2016, with three more under construction. Most of these facilities are brand new.

Respondents to ASCE's survey had varying responses when asked about the overall condition of their drinking water system. 22% of respondents classified their infrastructure as in "excellent" condition; 43% responded their infrastructure was "good," and 28% selected "fair." Only 6% of respondents classified their drinking water infrastructure as "poor."

DRINKING WATER DISTRIBUTION	
Total Miles Surveyed	545
Actual Miles Replaced annually	2.8
Percent Repair/Replaced	0.6

Because many of Idaho's cities are experiencing rapid population growth, conditions related to drinking water infrastructure are better than what may be seen in other areas in the U.S. Idaho's challenge will be to maintain and increase funding for ongoing maintenance, to ensure that the conditions remain steady and older systems are given the support they need.

OPERATION & MAINTENANCE

Recently replaced redwood drinking water piping

Drinking water infrastructure operations and maintenance (O&M) costs are paid by users, primarily through a rate-based system. Rates can vary greatly, depending on where you live. In Meridian, the water base fee is $5.49 and the water usage charge (per 1,000 gallons used) is $1.90. In Boise, the base fee is $7.15 and the water usage charge (per 748 gallons used) is $4.07. Idaho Falls, meanwhile, is one of the largest unmetered cities in the state, meaning regardless of how much water is used, each household pays the same flat rate. These varied approaches and prices exemplify the differing approaches to rate structure, as well as the contrast of need and investment across the state. Higher rates better reflect the true cost of service, but public assistance programs are important to implement in low income populations.

In recent years, man water utilities in Idaho have raised their rates, in part to address the backlog of maintenance projects across the state. In Idaho Falls, rates were raised 20% in 2015 and an additional 5% each year from 2016 to 2020 to help offset the costs of improving the quality of aging pipes. In Nampa, the City Council voted to increase domestic water rates by 18% in 2016. Suez Water Idaho, which provides water to approximately 90,000 businesses and residential customers in Boise, increased rates at the end of 2015 by over 10%.

Despite the fact that some localities in Idaho have begun to raise rates, many drinking water system owners and operators feel funding is insufficient and does not reflect the true needs of the system. ASCE surveyed infrastructure owners and operators on whether budgets were adequate for facility maintenance, operations costs, and planned upgrades required for increasing capacity and meet regulatory requirements. Respondents were divided in their responses; 50% said they agreed budgets were adequate, while 50% said they somewhat agreed, somewhat disagreed, disagreed, or strongly disagreed.

FUNDING

Idaho and its local governments pick up the bulk of capital spending for drinking water infrastructure and all the operations and maintenance costs. The U.S. Conference of Mayors estimates that nationally, 95% of spending on water infrastructure is made at the local level.

The federal government provides limited support for drinking water infrastructure through the Drinking Water State Revolving Fund (DWSRF). The DWSRF provides low interest loans to local governments and utilities so that they can make improvements to their pipes, filtration systems, and pumps. The DWSRF is administered by the EPA, which provides an allotment of funding for each state. Each state in turn provides a 20% match.

Since the DWSRF program was created in 1997, the federal government has provided Idaho with $196 million in annual DWSRF capitalization grants. Those funds have leveraged state match and repayment funds, allowing the state to provide $230 million in DWSRF loans. In 2017, the average interest rate across the state of Idaho was 1.3%.

FUTURE NEED

Idaho's drinking water infrastructure needs will grow in future years, especially as existing infrastructure ages and the state's population grows. The EPA estimated in its 2011 Drinking Water Infrastructure Needs Survey Idaho needs $961.8 million in funding over the next 20 years. Small clean water systems, which are defined by the EPA as serving 3,300 persons or fewer, are grappling with a significant portion of the total overall bill. The EPA estimates over the next 20 years, Idaho's small clean water systems will need an estimated $776.9 million.

The Boise area is the fastest growing region in the country. Other parts of the state are also seeing their populations surge. Idaho needs to prepare for current and future population growth by building new facilities, expanding pipelines, and investing in existing drinking water assets. ASCE's survey results demonstrate that there is unease from system owners and operators contemplating system capacity over future needs. 70% of respondents reported capacity was insufficient to meet various levels of anticipated growth.

PUBLIC SAFETY

The EPA sets legal limits for over 90 contaminants in drinking water. The Safe Drinking Water Act further encourages states to set their own drinking water standards and enforce them, so long as they meet or exceed national standards. By all accounts, Idaho's drinking water remains safe. In 2016, the University of Idaho sampled over 80 different chemicals and found very little contamination.

ASCE's survey asked about source water and protections against pollution sources and showed similarly encouraging responses. 77% of survey respondents reported source water was "extremely" well protected or "significantly" protected, with no or very limited pollution sources. 23% of respondents answered that source water has some protection. 0% of respondents reported that source water was not well protected or had serious contamination problems.

RESILIENCE AND INNOVATION

Changing weather patterns across the state are contributing to more severe seasons. From 2011 to 2016, drought warnings were in effect across the state. Then in 2016, the state saw the wettest January to April on record, resulting in heavy snowpack in the mountains and full reservoirs. Extreme weather is creating a need to store more water when the snow melts for use during extremely dry parts of the year. However, water-related infrastructure this century is proportionally diminished, due to the state's rapidly growing population and the increased costs associated with permitting, design, and construction. Additionally, the availability of uncontested water resources has declined due to limitations imposed by climate, aquatic life, and prior appropriation.

RECOMMENDATIONS

- **Congress should continue to fund loan efforts (such as the State Revolving Funds and USDA's Rural Development effort) at the federal level. While self-sufficiency will continue to be part of states' outreach efforts, it is improbable that this message will be universally embraced.**
- **A national Public Service Announcement effort, that explains the true cost of water, would help ease the way towards financing current and future efforts.**

Sources

- ASCE Drinking Water and Wastewater Survey presented to municipalities in Idaho during fall of 2017.
- EPA needs surveys from 2016 and 2012
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ENERGY
GRADE: B-

EXECUTIVE SUMMARY

While Idaho's energy infrastructure is aging, Idaho's utility companies have completed a number of new energy and transmission projects over the last several years. Currently, Idaho enjoys the fifth lowest average price of electricity. While Idaho's energy consumption continues to rely on out of state production for its energy capacity, a number of diverse renewable energy generation projects have been developed in recent years. Looking ahead, Idaho has significant opportunities for increased energy generation capacity, particularly with geothermal, solar, and wind. Continual upgrades and expansion of the state's energy infrastructure will be necessary to maintain the condition and accommodate Idaho's projected population growth.

BACKGROUND

The current Idaho Energy Plan was adopted by the Idaho Legislature in March 2012. In February 2016, the Idaho Strategic Energy Alliance (ISEA) presented an update of the Idaho Energy Primer for the Idaho Governor's Office of Energy Resources.

OPERATION, MAINTENANCE, AND CONDITION

Idaho's existing infrastructure is aging, but new energy and transmission projects are coming online each year. As larger systems age and regulations change, it is becoming more difficult to maintain the infrastructure condition while maintaining regulatory compliance. Idaho's utility companies generally maintain their existing infrastructure through continued prioritized maintenance and capital improvement programs, resulting in systems which are generally in good condition.

Approximately 86% of Idaho's electric consumers are served by three investor-owned electric utilities (Avista Corporation, Idaho Power Company, and PacifiCorp/Rocky Mountain Power). The remaining 14% are served by 11 municipal utilities and 17 rural electric cooperatives.

- AVISTA CORPORATION is an investor-owned electric and natural gas utility headquartered in Spokane, Washington, serving over 127,000 electric customers in northern Idaho, Washington and Oregon. Electric customers receive a mix of hydroelectric, natural gas, coal, biomass, and wind generation delivered over 2,200 miles of transmission line and 18,000 miles of distribution line. Approximately half of Avista's electricity in the winter comes from hydropower resources. Natural gas is provided over 124 miles of transmission main and over 12,800 miles of distribution pipelines. Avista has a portfolio of hydroelectric resources located in western Montana, eastern Washington, and north Idaho; ownership shares of Montana coal plants; and natural gas-fired baseload and capacity in Idaho, Oregon, and Washington.

- IDAHO POWER COMPANY serves 534,000 customers in southern Idaho and eastern Oregon across a 24,000-square mile service territory. The number of Idaho Power customers is expected to increase to over 750,000 by 2034. Idaho Power is the largest provider of electricity in the state. Idaho Power owns and operates 17 hydroelectric projects, three natural gas-fired plants, one diesel-powered plant, and shares ownership in three coal-fired facilities. Idaho Power's supply-side portfolio includes long-term contracts with several large wind and solar projects, two geothermal projects and numerous small-scale independent power producers. As of June 2017, Idaho Power had contracts with 131 independent generation facilities that were online with a combined nameplate capacity of 1,114.5 MW. Of those, wind was the largest source, with 33 projects totaling 727.9 MW of capacity; 14 solar projects were online with a total of 289.5 MW of capacity. Idaho Power also has 9.9 MW of PV capacity online through their net metering tariff, primarily from residential rooftop solar (as of July 13, 2017).

- PACIFICORP serves retail customers in six western states: Washington, Oregon, Idaho, Wyoming, Utah, and California. Rocky Mountain Power, a division of PacifiCorp, serves 73,871 customers in Southern Idaho (approximately 4% of PacifiCorp's total customer base). Wind, hydro, geothermal, and other non-carbon-emitting resources currently make up approximately 27% of PacifiCorp's owned and contracted generating capacity, accounting for nearly 20% of total energy output. As of September 2015, PacifiCorp had 1,031 megawatts of owned wind generation capacity and long-term purchase agreements for more than 915 megawatts from wind projects owned by others.

- There are 28 RURAL ELECTRIC COOPERATIVES AND MUNICIPALITIES providing electric service in Idaho. These utilities serve more than 130,000 customers throughout Idaho, accounting for 16% of Idaho's load. The Bonneville Power Administration supplies over 96% of the wholesale electric power to the municipal and cooperative utilities. All rural electric cooperatives and municipalities in Idaho deliver electricity to customers "at cost." Most of these utilities collaborate under the Idaho Consumer Owned Utilities Association on issues of administrative, governmental, and regulatory significance.

CAPACITY

Historical data shows that economic growth and energy consumption are closely correlated. As Idaho grows, so will the demand for energy. Idaho's population is projected to grow from 1.6 million in 2015 to 1.9 million in 2025. Across the nation, power generation has driven up consumption of natural gas 2.2% annually between 2006 and 2016. Current and projected capacity needs for the next five years are being met. A number of Idaho's utility companies are developing projects to meet the projected reliability and capacity long-term needs.

Idaho only produces approximately 26% of the energy it consumes, with about 74% of the total energy coming from outside the state. The state's reliance on energy from neighboring states indicates that infrastructure maintenance and development such as highway, rail, pipeline, and power lines are critical to support economic development. Continued improvements to Idaho's transmission infrastructures are needed to improve the resiliency of the systems. Idaho's primary energy consumption is summarized in Table 1.

TABLE 1. IDAHO'S ENERGY CONSUMPTION, 2015

ENERGY SOURCE	TRILLION BTU	PERCENT OF TOTAL CONSUMPTION
Coal	4.2	0.8%
Natural Gas	107.9	20.5%
Petroleum (including motor gasoline)	172.2	32.8%
Nuclear	0	-
Hydroelectric	81.6	15.6%
Biomass	38.4	7.3%
Geothermal	2.2	0.4%
Solar	0.1	> 0.1%
Wind	21.2	4.0%
Net Interstate Electricity Flow	96.6	18.5%

FUNDING

Funding for energy in Idaho is primarily controlled by private utilities, which periodically raise rates to cover rising operation, maintenance, and renewable contract costs. The increase in demand for energy will be passed on to the consumers directly as the needs arise.

Regional power plants built in past decades, including hydro and coal-fired plants, continue to provide service at legacy prices. However, new power plants and power lines needed to serve growing energy demand will pressure prices upward. Idaho ranked as having the 5th lowest average price of electricity across all customer sectors as of July, 2017.

FUTURE NEED

While the State's total energy consumption is increasing, the per capita consumption in the state is decreasing. The decrease in per capita consumption is a result of technological advances in energy generation and consumption along with consumer education. The future needs for energy in Idaho will be met by repairing or replacing aging infrastructure and constructing new infrastructure to adjust for the state's increasing population, as well as to increase resilience of energy generation and distribution.

PUBLIC SAFETY

The energy sector has consistently maintained a high level of public safety with minimal incidents, partially due to government oversight (e.g., FERC, NERC, WECC, and PUCs).

RESILIENCE

Reliability and redundancy remain a focal area for the energy sector, including cyber security. Currently there are 10 standards with over 60 requirements from the Federal Energy Regulatory Commission addressing personnel, controls, physical security, electronic security, incident response, incident reporting, recovery plans, and security management. The ever-increasing cybersecurity threats to the state's energy generation and distribution will need to be addressed and implemented.

In generally, weather related impacts to Idaho's energy infrastructure have been minimal. Occasionally, snow, wind and forest fires will cause downed lines, but these are repaired quickly through the utility companies' operations and maintenance programs.

INNOVATION

The largest area of innovation in Idaho's energy infrastructure is driven by the renewables industry as it is constantly changing and improving in efficiency. In general, the price for these renewable systems is significantly higher than utility owned traditional sources. As technology advances, the prices of these systems are anticipated to reduce. Some of Idaho's recent advances in renewable energy markets includes:

- More than 140 existing hydro plants with combined capacity of approximately 2,700 MW.
- Wind generation increased by 13% in 2014. Recent wind mapping studies estimate that Idaho has approximately 25,000 MW of wind generation potential, the 13th largest potential in the U.S. Wind generation in Idaho is currently providing 16% of net electricity generation.
- Idaho has the first utility-scale geothermal power plant in the Pacific Northwest with U.S. Geothermal's Raft River Facility in Cassia County. This plant has a nameplate production capacity of 15.8 MW, while present net electrical power output from the plant is approximately 11.5 MW.
- Development of utility-scale photovoltaic (PV) solar systems in Idaho was very limited until 2015, when development of 14 utility-scale solar projects have been approved in Idaho, with a combined total capacity of 289 MWs.
- In 2014, there were 87 MW of installed capacity for biomass electricity that produced 650,000 MWh or 4.3% of Idaho's electricity production. In 2014 Idaho has one operating ethanol plant capable of producing 64 million gallons per year.

RECOMMENDATIONS

- **Idaho's energy needs will need to be met by continual updating of energy infrastructure as well as expansion to accommodate Idaho's projected population growth.**
- **Idaho has resources available for continued growth in energy generation, particularly in the renewable sector with opportunities in the geothermal, solar, and wind markets.**
- **Continued investment in resiliency and cyber security will become increasingly important to protect Idaho's energy generation and distribution facilities.**

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ROADS

OVERALL GRADE: C-
LOCAL HIGHWAYS: OVERALL GRADE: C-
STATE HIGHWAYS: OVERALL GRADE: C

EXECUTIVE SUMMARY

Highways provide a critical transportation link between the places we live, work, and play. Over 75,891 lane miles of roads in the state transport 650,000 residents to work each day and 150 million tons of freight, worth $80.5 billion, each year. Of these 75,891 miles, approximately 12,000 lane miles are state highways (interstate, US, and Idaho roads), and 63,607 lane miles are local roads and streets (owned by city, county, or highway district). While the Idaho legislature has made strides in identifying additional funding for the state's highways and roads, available funding is insufficient to meet current and future demands. Over the next 20 years, the state will experience a $3.6 billion shortfall if funding remains stagnant.

CAPACITY

While the capacity on Idaho's roadways is generally sufficient, some of the urban areas in the state are prone to capacity challenges, principally in the Boise-Nampa-Caldwell Metropolitan Area, Coeur d'Alene Urban Area and the Pocatello Urban Area. Additionally, Idaho is the fastest growing state in the nation. Looking ahead, increased pressure will be placed on existing infrastructure to support the state's growing population.

Local Highways

In Idaho, the majority of local highway capacity issues are related to poor access management in rural areas. Typically, existing resources and maintenance dollars focus only on roadway surface needs. Limited funding is available for expansion projects, which are not prioritized, as discussed later in this chapter. Overall however, capacity issues on local highways are largely experienced during peak hours and are typically short in duration.

State Highways

The portions of the state highway system most prone to capacity problems exist in the urban areas. Fortunately, significant capacity improvements have been completed through the Boise-Nampa Caldwell Metropolitan area, including the addition of through lanes and the rebuilding of the interchanges on the interstate system. Some rural areas with heavy seasonal tourist traffic also present a challenge. Often these areas are in difficult terrain, presenting challenges for projects that would widen the road or provide passing opportunities due to short sight distances.

CONDITION

Idaho is a unique place to maintain highways. There are extreme temperature fluctuations, flat and mountainous terrain, and numerous highway jurisdictions, which result in varied best management practices. While the Idaho Transportation Department (ITD) and local jurisdictions have done a commendable job preserving and restoring existing roads, they face growing needs and a continued funding shortfall.

Local Highways

While the local transportation system is complex with 33,358 miles of roadways, local highway maintenance practices are good for the local conditions. However, almost 40% of local paved roadways, 18,243 miles, were in fair or poor condition according to Idaho's Local Road, Local Bridge, and State Bridge Inventory, LHTAC 2014.

State Highways

ITD manages 12,274 lane miles. The Pavement Management System (PMS) uses three measurement tools to determine if a pavement is deficient: the cracking index, the roughness index, and the rutting index. The lowest score for each section of pavement is used to rate the section. In 2011, the pavement condition of those lane miles showed just 13% of the lane miles to be deficient. That was a 3% improvement from the 2010 amount of 16% deficient. This resulted from a decision by the Idaho Transportation Board to focus much of their funding on pavement treatments. By 2016, the percentage of deficient pavement had risen back to 15%. With the current strategy of investing $100 million annually in pavement treatments that are more preventative in nature, consisting of seal coats, overlays, and minor rehabilitations, the PMS predicts that by 2021, the deficient pavement on Idaho state highways will grow to 19%.

Road Contruction in Idaho

FUNDING AND FUTURE NEED

In 2015, the Idaho State Legislature increased the state fuel tax by seven cents and distributed the additional revenue to the Idaho Transportation Department and the 288 local highway jurisdictions for maintenance and replacement projects. Additionally, the state directed a portion of its budget surplus to ITD and local highway jurisdictions. While this extra revenue is helpful, more is needed, as current funding levels are running far short of needs. Boise State estimates the state will experience a $3.6 billion shortfall over the next 20 years if funding remains stagnant.

Local Highways

The 2015 gas tax increase provided less than $50,000 in additional funds to more than 64% of the local jurisdictions. Only 20% of the jurisdictions receive over $200,000 annually. Additionally, the law stipulated that funds were not to be used for increased capacity projects. As a result, 52% of the additional revenue was directed to road rehabilitation, 29% toward pavement chip sealing and seal coating, 6% to bridge rehabilitation and maintenance, and 12% to other miscellaneous maintenance. As the gas tax was further phased in, local jurisdictions received an additional 27% of funds over the previous year. However, they still reported a $299.9 million shortfall in delayed transportation funding.

More recently, the state legislature has authorized surplus funds to be used for transportation maintenance funding. During the 2015 legislative session, a law was passed to take the state surplus at the end of the fiscal year to be split between the rainy-day fund and transportation funding. The first two years this transportation funding was used by ITD on state highways. During the 2017 session, the legislature changed the distribution formula, sending 60% to ITD and 40% to the local highway jurisdictions. The July 2017 surplus created $11 million in funds to be distributed to the local jurisdictions. Importantly, this is not a sustaining annual amount and should not be anticipated by transportation jurisdictions since it is based on the income of the state.

If sustainable new revenues are not identified and provided to the system, the local highways will rapidly deteriorate to the point that they are unusable and unsafe.

State Highways

The FY 2017 Budget for ITD totals nearly $656 million. Of that total, more than half ($391.6 million) is budgeted for contract construction and right-of-way acquisition. An additional $194.9 million is budgeted for highway operations, which includes personnel and operations expenditures.

The Governor's Task Force on Modernizing Transportation Funding in Idaho, completed in January 2011, confirmed Idaho's significant and growing transportation funding shortfall. The Task Force reported the state system experiences an annual operation, preservation, and restoration shortfall of $155 million and an additional capacity and safety enhancements annual shortfall of $207 million.

The FY 2017 Appropriation to the State Highway Account includes $301.4 million (45.7%) from Federal funds. For the first time in ten years, Congress passed a long-term funding bill that was signed into law in December 2015, and covers a five-year period. While the new bill does provide some certainty in the amount of Federal funds that will be available over the next few years, the certainty is temporary. The chronic insolvency of the Highway Trust Fund and the national debt situation, combined with the high

level of dependency of state highway system funding on Federal sources, continues to cause concern. The Federal gas tax has not increased since 1993, resulting in a $15 billion annual federal shortfall. To bridge the gap, funds would be transferred from a number of uncertain sources.

Additional state funding provided in FY 2015 and FY 2016 from the fuel tax increase and budget surplus transfer has helped address the backlog in infrastructure funding. Also, Idaho legislators approved a one-time boost of $300 million in additional GARVEE bonds in 2017. However, the remaining annual shortfall of nearly $450 million will result in a continuing struggle to meet future needs.

PUBLIC SAFETY

650,000 Idahoans use the state's roads to travel to work every day. It is essential that these roads remain safe and in a state of good repair. Unfortunately, in 2016, vehicle crash deaths increased 16.1% in Idaho. The growth in vehicle crash deaths is more than double the national increase of 7.2% and underscores the necessity of well-maintained infrastructure and good driving techniques.

Local Highways

Nearly half of Idaho's annual fatal and serious injury crashes occur on the road system that is owned and operated by local agencies. Many of these crashes are a result of poor access management and intersections. Idaho's local highway system has crash rates similar or below the national average, primarily due to lower rates of speed on local highways than on state roads.

State Highways

The five-year fatality rate for Idaho has increased from a rate of 1.15 fatalities per 100 Million vehicle miles in the 2012 to a rate of 1.43 per 100 Million vehicle miles in 2016. The national average in 2016 was 1.16. The goal is zero deaths. One high risk corridor where improvements should help is on US Highway 20 between Idaho Falls and Rexburg where six new interchanges have been completed since 2000. This four-lane divided highway previously had at-grade crossings. A seventh interchange has just been completed.

I-15 resurfacing near the Bonneville County line

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OPERATIONS & MAINTENANCE

State and local governments are responsible for the operation and maintenance (O&M) of highways. Operating and maintaining roads in Idaho falls to ITD and the local jurisdictions, and as Idaho's existing highways age, the costs associated with maintaining these assets increases.

Local Highways

Local highway jurisdictions in Idaho use varying practices for operations and maintenance due to discrepancies from climate and terrain. Some mountainous areas receive many feet of snow during winter months. The populous Treasure Valley, by contrast, is relatively mild and has less snow, but has the majority of traffic impacts on the local highway system state-wide. The 2016-2017 winter was harsh and necessitated emergency repairs for many jurisdictions. Funding for these emergency repairs will come from FHWA, FEMA, and the state of Idaho.

State Highways

ITD has reduced their overall staffing level by 7% since 2010. During this time, the funding level has increased from $160.8 million in FY 2013 to $194.9 in FY2016 for highway operations. This is an increase in the percentage of the annual budget from 28% to 29.7%.

RESILIENCE

Local & State Highways

Shrinking budgets and a lack of redundancy in the roadway system impacts Idaho's roadway resiliency. For example, while there were no collapses or other catastrophic failures in 2016, there were wash outs during flood conditions. If certain state and local highways becomes blocked or impassable, it could literally require a detour of more than 100 miles for local travelers. A major flood in one of the many canyons where State Highways are located can cause major economic impacts to the state, both in the costs to restore the roadway and the disruption to travel patterns during the time the roadway is being reconstructed. Rural communities can be cut off from critical services. While these situations are extreme, they do exist. In the mountainous areas of the state this is an ongoing concern. The northern and southern regions of the state have a more robust network of roads which provide for redundancy of services. Recovery from incidents is most easily accomplished in the areas of larger populations. These areas typically have redundancy built into the system, and moreover resources to deal with emergency situations. Federal assistance is necessary for catastrophic failures leaving the infrastructure unusable due to event-based failures.

INNOVATION

Local & State Highways

ITD has focused on innovations that result in savings and efficiency improvements. Since 2014, 424 innovations have been developed and implemented by ITD employees, resulting in a savings of $2.1 million in savings and efficiencies. In District 1, a new way to install bridge girders on an I-90 overpass reduced installation time from several months to three weeks, benefiting the impacted motorists. ITD's "Swarm the Storm" staffing approach uses technology and advanced weather forecasting to improve storm response. "Swarm the Storm" allowed ITD to cut staffing levels by 6% and increase winter mobility. The time highways are clear of ice and snow during storms increased from 28% in 2010 to 65% in 2016.

RECOMMENDATIONS

- **Preserve the principle of "user pays" by updating the gas tax for the short term to include indexing it to the Consumer Price Index (CPI).**
- **Develop a revenue (tax) system based on "Ton Mile" fee. This would have those using the transportation system and the damage caused to be equitable. The current system does not charge larger trucks for the damage caused to the highway.**
- **Additional dedicated state revenue needs to be identified from a sustainable and appropriate funding source. Emphasis should be placed on eliminating the funding shortfall for pavement that is on the verge of failure.**
- **A study should be made of compensation levels of state transportation employees to ensure an adequate workforce with appropriate levels of training and experience.**
- **Work should begin on a subsequent Federal Transportation Bill to be implemented when the FAST Act expires in December 2020. The bill should include an adequate increase in an appropriate and sustainable dedicated funding source.**

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SCHOOLS
GRADE: C-

EXECUTIVE SUMMARY

A high-quality education for the students of Idaho is a priority and the physical facilities at those schools make a difference, for better or worse. Public education funding continues to play a large role in Idaho politics, but physical facilities are largely left out of the discussion. From FY2011-2013, the state spent approximately $639 on average annually per student on operation and maintenance; the national average during the same time frame was $1,039. While local districts have used levies and other tools to fund new buildings, many existing buildings are lacking the maintenance and/or upgrades to accommodate increasing student enrollment or facility demands. While current capacity in schools is generally sufficient, the National Center for Education Statistics projects that, between 2012 and 2024, Idaho will have a statewide enrollment increase of 28,166 students, or the equivalent of 9.9%. Sufficient funding for school infrastructure must be identified to accommodate this growth.

BACKGROUND

Researchers have found that students in deteriorating school buildings score between 5 to 11 percentile points lower on standardized achievement tests than students in modern buildings. K-12 public school facilities are the second largest public infrastructure investment after transportation in the United States. While there is a fair amount of data, there is not consistent, representative reporting on public school infrastructure in Idaho. This makes the ongoing maintenance, funding, planning, and constructing of Idaho's public schools more of a challenge.

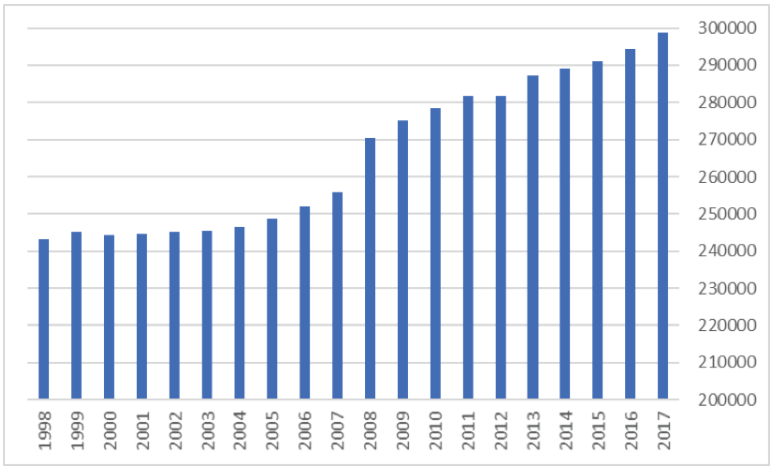
As part of the effort to put together the 2018 Report Card for Idaho's Infrastructure, an email survey was sent to all the public-school superintendents, including charter schools (those receiving public funds), across the state. We asked the superintendents to assess various physical facilities of their respective school districts. The respondents represented approximately 15% of the student enrollment in the state, which gives only a snapshot of the current environment.

CAPACITY AND CONDITION

As population in Idaho continues to increase, the strain on the capacity of the public-school system will increase proportionally. There were 115 K-12 public school districts containing 745 public schools in 2015-2016. Student enrollment was 294,471 and schools employed 15,306 teachers in 2016, for a pupil/teacher ratio of 19.2. In the 2016-2017 school year, student enrollment rose to 298,787, up 16.7% from 256,004 in 2006-2007.

Student enrollment over the last 20 years has varied since 1997 from a decrease in 2000 to 1.91% increase in 2013. The average increase has been 1.07% over the same timeframe. Figure 1 illustrates the student enrollment in Idaho public schools for the last 20 years.

FIGURE 1 – IDAHO PUBLIC SCHOOLS ENROLLMENT 1998-2017



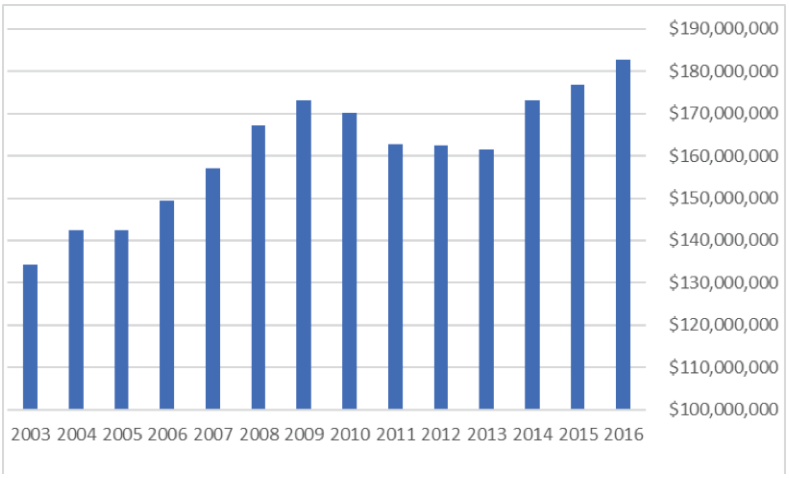
In addition, the National Center for Education Statistics projects that, between 2012 and 2024, Idaho will have a statewide enrollment increase of 28,166 students, or the equivalent of 9.9%. Over 90% of the respondents of the statewide survey indicated that they felt the current school capacity meets the current student demand, but only half felt confident that the school capacity can meet future student demands.

The average age of the main instructional building at schools across the United States is 44 years. The respondents to the survey indicated that the average age (or latest major renovation) of their school(s) was 27.5 years. While the relative age may be less than the national average, 15% of the respondents indicated that the overall condition of their school facilities was poor or very poor.

OPERATION AND MAINTENANCE

Effective operation and maintenance programs are critical to the longevity of school physical facilities. In Idaho, approximately $639 on average annually per 2013 student (FY2011-2013) was spent on maintenance and operation while the national average was $1,039. Maintenance and operation expenditures in the state of Idaho is presented in Figure 2. These expenditures have stayed at approximately 10% of the overall expenditures in the state.

FIGURE 2 – IDAHO PUBLIC SCHOOLS M&O EXPENDITURES 2003-2016



Only 14% of the respondents to the survey prepared as a part of this report agreed that current budgets are adequate for facility maintenance, operations costs, and planned renovations required for increasing capacity and meeting facility standards.

FUNDING AND FUTURE NEED

Across the United States, funding for capital construction typically comes from 82% local share and 18% state share. However, Idaho is one of only 12 states that provide no state funding support for K-12 construction. Less than 5% of survey respondents indicated affirmatively that the current level of funding meets the needs of their schools. Only 28% agreed that future funding prospects will meet the future needs of their schools.

While Idaho continues to recover from the 2008 recession, we still can make additional progress when it comes to investment in Idaho public schools. The National Council on School Facilities estimates that Idaho has a projected annual gap of $561 M for K-12 facilities responsibilities.

PUBLIC SAFETY AND RESILIENCE

As civil engineers, we play a role in the public health, safety, and welfare of all Idahoans. Schools facilities are no exception. More than half of the respondents in the survey indicated that there are existing occurrences where the current condition of their schools' infrastructure may jeopardize the student's safety.

We all want our schools to be safe and, in many cases, schools act as an emergency shelters in times of need. When necessary, the public relies on these schools and expect them to be resilient and be ready for the next emergency. Deferred maintenance or needed safety improvements may not only impact the students currently attending the schools in Idaho, but it also may make these shelters less reliable in an emergency.

Innovation can be key to maintaining public safety and resilience. One innovative solution an Idaho school has used included converting the library, which was due for an overhaul, into a makerspace and funding the project through grants. Other schools have used partnerships with Boy Scouts of America, where Eagle Scout Projects carry out improvements/maintenance with the schools providing the materials and the Eagle Scout candidate managing the labor.

RECOMMENDATIONS

- **Perform and publish regular updates of the Statewide Facilities Needs Assessment, preferably on a 5-year recurring cycle, to better understand current conditions and needs of schools.**
- **Conduct comprehensive construction and maintenance programs that consider student safety.**
- **Establish state revenue streams for capital improvement projects and new construction.**

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REPORT CARD FOR IDAHO'S INFRASTRUCTURE 2018

WASTEWATER
GRADE: B-

EXECUTIVE SUMMARY

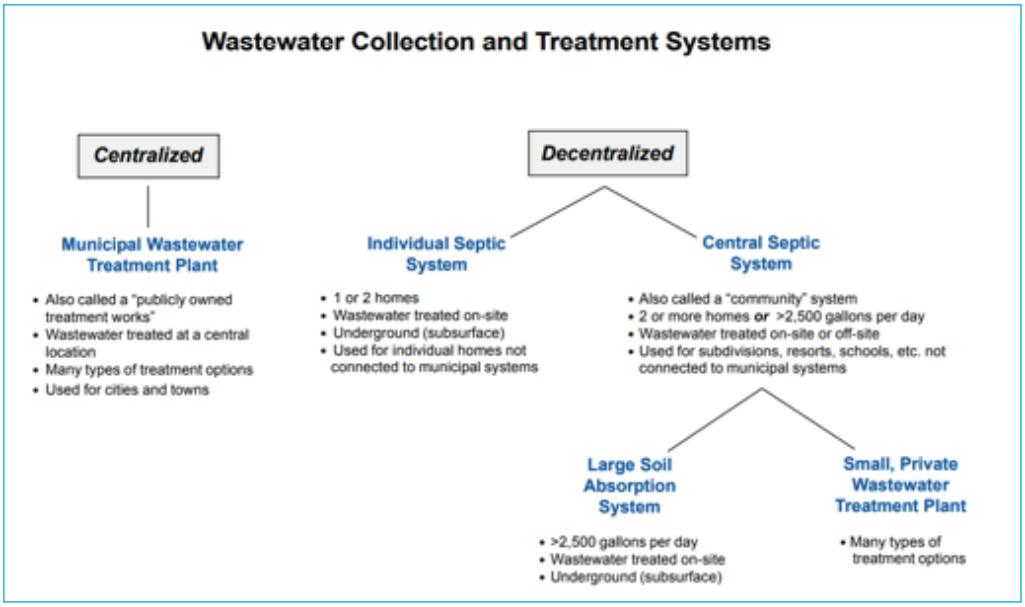
Idaho's 1.68 million residents rely on a variety of wastewater collection and treatment systems, including municipal wastewater treatment plants and septic systems. The state's population is growing rapidly, and Idahoans are benefiting from some new wastewater collection and treatment facilities built to accommodate the increased demand. However, Idaho's challenge will be to maintain and increase funding for ongoing maintenance requirements. The U.S. Environmental Protection Agency reports that over the next 20 years, Idaho will need $1.38 billion in funding for wastewater infrastructure.

BACKGROUND

Idaho's wastewater infrastructure is owned, operated and maintained by a host of private and public entities, including homeowners' associations, businesses, nonprofit organizations, and local municipalities. These organizations are charged with ensuring adequate capacity and condition of wastewater infrastructure. They work with the Idaho Department of Environmental Quality (DEQ), the agency responsible for protecting air and water quality in the state and managing cleanups. DEQ serves as the state's counterpart to the federal US Environmental Protection Agency (EPA) and functions as a regulatory agency and a partner with private and public-sector groups, local and tribal governments, businesses and industries, community organizations, and citizens. To collect information on the infrastructure from operators in the state and to obtain results reflective of actual conditions in the state, ASCE created and distributed a survey to as many Idaho communities as possible. 46 communities responded, representing approximately 197,000 people, or 12% of the state's population.

CAPACITY & CONDITION

Idaho's 1.68 million residents rely on a variety of wastewater collection and treatment systems. Urban populations typically utilize municipal wastewater treatment plants, where wastewater is treated at a central location. The Boise sewer system, for example, consistent of more than 782 miles of pipes. In the City of Twin Falls, Idaho, approximately 157 miles of line and 2,750 manholes feed into five pumping stations, one air injection station, and two measuring stations. Sun Valley relies on the Ketchum Wastewater Collection Trunk System, which consists of over 30 miles of pipe.



SOURCE: The Idaho Department of Environmental Quality, https://www.deq.idaho.gov/media/492862-wastewater_graphic.pdf

210,000 Idahoans, or 26% of the population, rely on septic systems. This percentage has remained consistent over the last 20 years. Septic systems are frequently utilized in unincorporated areas of the state where patchwork developments are decentralized. Developers, looking to minimize costs, utilize "package plants," or on-site septic systems for wastewater management. These systems typically do not follow construction standards compatible with local municipal systems and present a challenge to retroactively connect to centralized utility service. Further, because septic systems are buried underground, there is an "out of sight, out of mind" mentality about maintenance and upkeep. Improperly cared for septic systems can contaminate groundwater and create safety risks.

Estimates show Treasure Valley's population will grow from 600,000 people to 1.57 million over the next 50 years. Significant investment from municipalities will be needed to account for the growing population connecting to municipal wastewater treatment systems. Meanwhile, aging wastewater infrastructure is a challenge, and many of Idaho's communities are grappling with treatment facilities and collection and distribution systems that are in need of updates or replacement. While 54% of ASCE survey participants reported that the overall condition of the wastewater system was good, 31% of respondents reported the wastewater system was in "fair" condition" and 15% responded "poor." None of the respondents from the ASCE survey said their wastewater system was in "excellent" condition.

FUNDING

State and local governments pick up the bulk of capital spending for wastewater infrastructure and all the operations and maintenance (O&M) costs. The U.S. Conference of Mayors estimates that nationally, 95% of spending on water infrastructure is made at the local level, primarily through a rate-based system. Rates can vary greatly. A 2014 survey of the nation's 50 largest cities ranged from $12.72 in Memphis to $149.35 in Atlanta. In Boise, the total average monthly sewer fee in 2016-2017 was $35.64. In smaller cities like Nampa, for example, residents pay on average $24.47. Southeastern Idaho in particular has historically maintained a culture of low sewer rates, making it difficult to raise rates and impose additional fees for necessary system improvements.

The availability of capital investment funding depends on the municipality. According to ASCE's wastewater infrastructure survey, 33% of wastewater system respondents reported no capital replacement fund was in place last fiscal year. An additional 33% of respondents reported either a variable amount year-to-year or a reduction in capital funding to meet unexpected O&M costs last fiscal year.

When federal support for wastewater infrastructure is available, it typically comes in the form of loans through the Clean Water State Revolving Fund (CWSRF) program. CWSRF allows the federal government and states to partner to provide communities with low-cost financing for wastewater infrastructure projects. Since the program was created in 1987, Idaho has received over $200 million in annual CWSRF grants, which it has in turn leveraged to provide more than $552 million in low-interest loans for water quality and wastewater projects.

OPERATIONS & MAINTENANCE

Local governments are the primary funding source for wastewater infrastructure operations and maintenance. Increasingly stringent federal regulations to protect public health and the environment have resulted in costly compliance costs, and some towns in Idaho are struggling to keep pace. When respondents to ASCE's wastewater survey were asked whether their budgets were adequate for facility maintenance, operations costs, and planned upgrades required for increasing capacity and meeting regulatory requirements, 23% agreed, 31% somewhat agreed, 8% somewhat disagreed, and 31% disagreed.

FUTURE NEED

The EPA reports that over the next 20 years, Idaho will require $1.38 billion in wastewater infrastructure needs. Population growth is already demanding sewer system capacity expansion in Idaho. Additionally, there is tension between existing, current-day jurisdictional boundaries and the need to plan for tomorrow. Future communities will exist outside current-day city limits, and coordination to float bonds and plan comprehensively is needed.

Responses to the ASCE survey on wastewater infrastructure demonstrate that the ability of Idaho's systems to meet various levels of anticipated growth is a cause for concern. 50% of respondents reported their jurisdiction was capable of meeting only 70% to 90% of anticipated growth.

Fortunately, there are instances in which Idaho's cities and towns are preparing for the future. Boise invested in an asset management program and is investing $200 million to ensure adequate capacity and condition over the next 10 years. In 2013, voters in Twin Falls, Idaho approved a $32 million bond for technology to increase capacity at its wastewater treatment facility and an additional $6 million for collection lines. Capacity was increased, and the plant went from processing 9.6 million gallons per day to 16 million gallons per day. The increase in capacity benefits companies like Chobani, who owns a research center in Twin Falls. Other cities like Meridian expect to spend $160 million over the next 10 years to improve the municipality's wastewater treatment plant. The city's population has increased four-fold over the past 20 years.

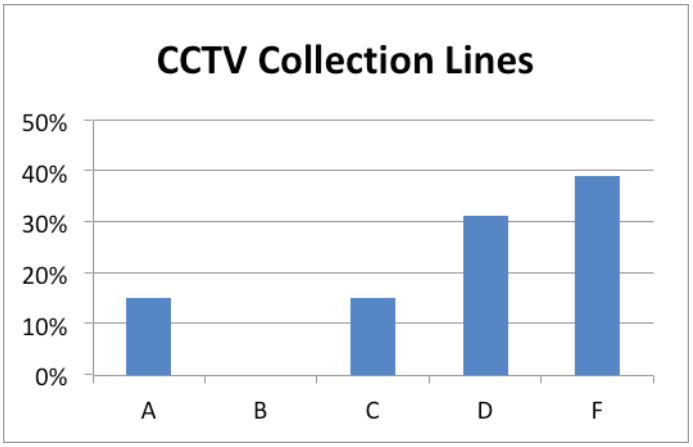
PUBLIC SAFETY

Municipal wastewater treatment plants are required to be permitted under the Clean Water Act and are authorized through the National Pollutant Discharge Elimination System (NPDES). According to the EPA, 114 municipal wastewater treatment plans in Idaho have NPDES permits. 81% of NPDES holders violated their permits at least once from 2013 to 2016. Violations result from a plant's failure to comply with pollutant limits and results in untreated sewage and other pollutants leaking into nearby water. Most Idaho facilities reported fewer than 10 violations over the three-year period, but a few facilities reported violating permits more than 100 times.

Idaho is heavily reliant on groundwater; 95% of the state's residents rely on it as a source of drinking water. When wastewater treatment facilities discharge unsafe pollutants, groundwater is endangered. Ensuring Clean Water Act compliance is critical to maintaining clean, usable groundwater.

RESILIENCE AND INNOVATION

Over the last 10 years, a number of communities have commenced with closed circuit television inspection (CCTV), which assist in the assessment of collection system condition. CCTV is also an indication of collection system maintenance since pipes are typically cleaned before CCTV is performed. However, CCTV is not used universally, as the results of our survey showed. ASCE asked communities what percentage of their collection systems underwent CCTV in the past 10 years:



NOTE: A = > 80%, B = 60% - 80%, C = 40% - 60%, D = 20% - 40%, AND F = < 20%

Finally, as Idaho's population grows, so too will the state's demand for water. To increase the amount of water available, water managers will look in part into reusing treated water from sewage plants.

RECOMMENDATIONS

Recent growth in the state of Idaho has contributed to some new facilities, resulting in better grades than may be seen in other areas of the United States. Idaho's challenge will be to maintain and increase funding for ongoing maintenance to ensure that the grades below do not fall below what they currently are and improve conditions for older systems in the state.

- **Congress should continue to fund loan efforts (such as the State Revolving Funds and USDA's Rural Development effort) at the federal level. While self-sufficiency will continue to be part of states' outreach efforts, it is improbable that this message will be universally embraced.**
- **A national Public Service Announcement effort, that explains the true cost of water, would help ease the way towards financing current and future efforts.**
- **Provide subsidized funding for small systems that do not have the rate base to afford infrastructure improvements.**
- **Since most water pollution is now caused by nonpoint sources, additional point source discharge requirements need to be very weighed against the implementation costs for small systems.**
- **Systems should seriously consider consolidating with neighboring systems, when it is cost effective to do so.**
- **Continue to explore reuse as a water conservation measure.**

SOURCES

The following Sources were utilized in developing this report:

- ASCE Drinking Water and Wastewater Survey presented to municipalities in Idaho during fall of 2017.
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