



2012 REPORT CARD

for Idaho's Infrastructure





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Executive Summary

Idaho's infrastructure has an ever increasing need for improvement. This is the main conclusion of the *2012 Report Card for Idaho's Infrastructure*, developed by the Southern Idaho Section of the American Society of Civil Engineers (ASCE). Though many of the infrastructure categories showed areas of satisfactory performance, the vast majority indicated that Idaho's infrastructure lacks funding, is not properly maintained, and is poorly equipped to deal with its increasing demands as Idaho continues to grow.

Infrastructure is a part of our daily lives. Too often we take it for granted, even though in a typical day, most of us use or are impacted by each of the 11 infrastructure categories we assessed. Before you even leave the house, you will turn on a light, which works because of **energy** infrastructure; take a shower using **water** and **wastewater** infrastructure; eat a piece of toast, made with wheat grown using **dam** infrastructure and transported on **roads** and across **bridges** or possibly **rail** infrastructure; perhaps you'll open a bill, mailed to your house using **aviation** infrastructure. After breakfast you might watch your kids leave for **school**, and then take public **transit** to work. We expect infrastructure to work efficiently and when it doesn't, we may no longer take it for granted.

ASCE's mission is to provide essential value to our members and partners, advance civil engineering, and serve the public good. In carrying out that mission, ASCE advocates infrastructure and environmental stewardship and has developed a national Report Card for American's Infrastructure since 1995. The most current National Report Card, published in 2009, indicated an overall grade of "D." The Southern Idaho Section of ASCE serves more than 500 members, and we are joining over 30 other states and regions that have developed Report Cards to complement the National Report Card.

As civil engineers in the state of Idaho, we have a responsibility to safeguard the life, health, property, and welfare of the public. We believe it is part of this responsibility to provide the public, including our elected leaders, with critical information about the current state of our infrastructure, which is the main goal of this Report Card. Our hope is that with this knowledge, the public will increase support for infrastructure improvement and maintenance and urge elected leaders to take action to prioritize funding so that our vital infrastructure meets the current and future needs of Idaho citizens.

Volunteers from public agencies, private firms, and non-profit groups have contributed to this effort. Of these, more than 25 civil engineering experts have compiled issue briefs for 11 different infrastructure categories over the last 18 months. Peer reviews were then performed, often by a subject matter expert that had no prior involvement with the Report Card. The collaboration of public, private, and non-profit volunteers, along with the peer review process, resulted in this comprehensive assessment of Idaho's infrastructure.

In general, seven fundamental grading components were considered in developing the assigned grades for each category:

-  **Capacity:** Evaluate the infrastructure's capacity to meet current and future demands.
-  **Condition:** Assess the infrastructure's existing physical condition.
-  **Funding:** Identify current level of funding and predicted current and future investment in the system.
-  **Future Need:** Evaluate the cost to improve infrastructure and measure the projected demand.
-  **Operation and Maintenance:** Evaluate the owners' ability to operate and maintain the infrastructure properly to preserve the system.
-  **Public Safety:** Evaluate to what extent the public's safety is jeopardized by the condition of the infrastructure and what the consequences of failure may be.
-  **Resilience:** Assess the infrastructure's ability to prevent or protect against significant threats and incidents and the ability to recover and reconstitute critical services with minimum damage to public safety and health, the economy, and security.

The *2012 Report Card for Idaho's Infrastructure* followed a traditional letter grade scale with any exceptions noted:

-  **A = 90-100%**
-  **B = 80-89%**
-  **C = 70-79%**
-  **D = 51-69%**
-  **F = 50% or lower**

This Report Card is a useful and powerful tool. Where infrastructure is not performing satisfactorily, whether that be in its current condition, future need, funding, or other capacity, immediate action should be taken by each individual of the public and elected leaders to do what they can personally do to change the trend and improve the grade. The Southern Idaho Section of ASCE plans to periodically update the Report Card to inform the public and our elected leaders on where we have improved and where more resources should be allocated. With this effort, we hope to share our knowledge and expertise to make Idaho a stronger, safer, healthier, and a more prosperous state.

ASCE Southern Idaho Section – Idaho Report Card Committee

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Category	2012 Idaho Grade	Comments
Aviation	C	Idaho has more aviation services per capita than most Americans, however, incompatible land uses around airports reduce their function and value.
Bridges	D+	Many bridges are reaching the limits of their life expectancy. Current funding levels are far outpaced by the replacement need, particularly for critical bridges.
Dams	C	The average date of construction completion for Idaho dams is 1952. As a result, funding needed to service, maintain, repair or replace dams will continue to increase at an accelerated pace.
Drinking Water	C+*	Repair and replacement of distribution lines is well below ideal rates. Some municipalities do not have significant and active source protection programs.
Energy	C+	Energy prices remain low in Idaho, but as Idaho continues to grow, so does the demand for energy. Transmission is increasingly vital.
Local Highways	C-	Most of the local highways across Idaho meet their capacity needs, but funding shortfalls and limitations will hamper improvements.
Rail	C+ (Freight) D- (Passenger)	Private companies continue to invest in rail improvements for Idaho's critical freight rail system. Passenger rail options are limited across the state.
Schools	C-	School facilities continue to age and overcrowding will continue to challenge school districts. The lack of recent assessment prevents a complete understanding of the growing needs.
State Highways	D+	The existing budget for the state highway system is well below the need and Idaho's reliance on federal funding will limit our ability to meet future needs.
Transit	D	Transit in Idaho is safe and relatively efficient, but lacks the accessibility and funding to meet the needs.
Wastewater	B-*	Replacement and repair of collection pipelines is not keeping pace with the ageing infrastructure. Many wastewater systems have not been video inspected in the last 10 years.

*Drinking Water and Wastewater grades are based on survey results.

**Aviation
Category
Overall Grade:**

C

AVIATION

Aviation infrastructure in Idaho continues to have an increasing impact on the well being of the state. Whether it's a major airport or one of the many backcountry airstrips, aviation infrastructure provides critical access, mobility, convenience, and safety to all Idahoans.

Idaho's citizens have access to substantially more aviation services per capita than 97.3% of Americans, on average. Idaho has:

-  3,914 registered aircraft, which ranks 8th nationally per capita
-  4,777 certified pilots, which ranks 7th nationally per capita
-  125 public-use airports, which ranks 5th nationally per capita

The Idaho Aviation System celebrates 100 years of providing consistent and responsive service to pilots and aviation businesses throughout the United States with:

-  3,233 based aircraft at Idaho airports that are anticipated to grow at a modest rate of 1.32% annually.
-  2.1 million enplaned passengers at Idaho airports that are anticipated to grow at a modest rate of 3.27% annually.
-  17 State courtesy cars at 12 locations.

Sixty percent of Idaho's aviation related Economic Impact comes from the Boise Airport, twenty percent (20%) from the other Commercial airports, and twenty percent (20%) from all General Aviation airports. The data used to compile this Report Card was recently prepared as part of the *Idaho Airport System Plan Technical Report 2010*.



Capacity

Capacity measures the accessibility of an airport for people living and working in the state of Idaho. For Idaho's aviation system the established approach and weather reporting objectives vary based on the current airport role. Airports in Idaho are assigned to one of five role categories: Commercial Service, Regional Business, Community Business, Local Recreation, and Local Recreation – Unpaved. Each airport role category includes established criteria for runway length, width and strength, taxiway (configuration), instrument approach, visual aids, runway lighting, weather reporting facilities and services, and other facilities.

Component Grade:

C

The following facts illustrate the capacity of Idaho's Aviation System.

- ✦ 89% of Idaho's population is within a 30-minute drive of any airport, while 78% of Idaho's population is within 90 minutes of a Commercial Service Airport with multiple airlines or 60 minutes of a Commercial Service Airport with a single airline.
- ✦ 72% of Idaho's runways meet their Approach Objectives.

Approach objectives for all Commercial Service, Regional Business and Community Business airports include an instrument approach type based on the facilities and services objectives established for each of these airport role categories and consist of precision, near-precision and non-precision approach. Seventy-nine percent (79%) of the state's population and 10% of its land area are currently within a 30-minute drive to an airport with an instrument approach. The objective targets for instrument approach are 86% and 15%, respectively.

- ✦ 65% of Idaho's airports meet their weather reporting objectives.

Weather reporting is an industry service offered by an Automated Weather Observation System (AWOS), Automated Surface Observation System (ASOS), or weather reporting at an air traffic control tower (ATCT). For those airports with an instrument approach, on-site weather reporting is required to provide pilots with the lowest approach minimums. Seventy-seven percent (77%) of the statewide population and 8% of Idaho's land area lie within a 30-minute drive to an on-site weather reporting facility.

Based on facility and service objectives, Commercial Service, Regional Business, and Community Business airports should have on-site weather reporting. When these airports are considered, target performance for this benchmark is calculated to include 86% of Idaho's population and 15% of its land area within a 30-minute drive to an airport with on-site weather reporting.

Operation and Maintenance

Component Grade:

D

Operations and maintenance assesses the degree to which Idaho's airports comply with regulatory requirements. The following facts illustrate the operation and maintenance status of Idaho's Aviation System.

- ✦ 70% of Idaho's airports meet their airside facilities objectives. Airside facilities play the most significant role in the ability of airports to support system needs. These objectives include: primary runway length, width and strength; taxiway; instrument approach; visual aids; runway lighting; and weather reporting facilities.

- ✎ 60% of Idaho's airports meet their landside facility objectives. These objectives include terminal, hangar(s), apron(s) and automobile parking.
- ✎ 76% of Idaho's airports meet their aviation service objectives. These objectives include telephone and restroom services, fixed base operator (FBO), maintenance, AvGAS/Jet A fuel, and courtesy or rental car facilities.

Condition

Component Grade:

C

Condition is a measure of the physical qualities of airport infrastructure and services available to Idahoans. The following facts illustrate the condition status of Idaho's aviation system.

- ✎ 79.6% of Idaho's airport runway pavements meet their established condition rating.
- ✎ 84.3% of Idaho's airport taxiway pavements meet the established condition rating.
- ✎ 77.5% of Idaho's airport aircraft parking apron pavements meet the established condition rating.
- ✎ 79% of Idaho's airport runways meet the airfield lighting requirements.
- ✎ 49% of Idaho's airport runways meet the requirements for visual approach aids.

Funding

Component Grade:

B

Funding is the measure of the amount of maintenance, operations, and capital improvement funding received for Idaho airports relative to the amount of funding to meet all maintenance, operations and capital improvement needs and desires.

Total annual airport maintenance and development funding from all sources averages \$33 million annually while the funding need averages \$37 million. As a result, Idaho airports receive an average of 89% of the funding they need annually.

Total annual airport maintenance and development funding from the state of Idaho averages \$845,000 annually while funding needs average just over \$1 million. As a result, Idaho airports receive an average of 82% of the state's funding they need annually.

Future Need

Component Grade:

B

Future need is a measure of the economy's ability to generate sufficient revenue to meet the needs for funding airports maintenance, operations, and capital improvements to keep pace with the demands of the aviation industry for aviation facilities in Idaho.



The state of Idaho has experienced the negative effects of the recent economic recession, increased unemployment, and volatile credit markets with a notable reduction in aviation fuel tax revenues, which is the primary source of aviation related funding for the state of Idaho. Idaho recently increased the aviation fuel tax rate in order to both maintain and improve our system airports. During the recent recession, the tax increase allowed the state to maintain a funding rate of about 73% of maintenance and improvement needs.



During the next 10 years Idaho is predicted to experience a shortfall of about \$1.5 million for its share of airport funding, which means that only about 85% of airport funding needs will be met.

Public Safety

Component Grade:
B

This is a measure of Idaho airports level of public safety relative to public safety at other airports in the region (CO, ID, MT, OR, UT, WA, WY). The FAA Northwest Mountain Regional Airport Plan (RAP) - 2011 reports the FAA's progress meeting national and regional objectives at the 136 most active "focus" airports in the region. These focus airports include certificated commercial-service and general aviation airports.

Idaho's 12 "focus" airports include: The Boise Air Terminal/Gowen Field (Boise), Nampa Municipal Airport (Nampa); Caldwell Industrial Airport (Caldwell), Friedman Memorial Airport (Hailey), Idaho Falls Regional Airport (Idaho Falls), Pocatello Regional Airport (Pocatello), Coeur D'Alene Air Terminal (Coeur d'Alene), Lewiston-Nez Perce County Airport (Lewiston), McCall Municipal Airport (McCall), Joslin Field - Magic Valley Regional Airport (Twin Falls), Gooding Municipal Airport (Gooding), and Driggs-Reed Memorial Airport (Driggs).

The main focus of the FAA is to improve airport safety at these focus airports. This is accomplished by building standard runway safety areas (RSAs), correcting line-of-sight problems to reduce runway incursions, building access roads around runway ends to reduce the need for runway crossings, correcting confusing airfield geometrics, and constructing parallel taxiways for enhanced access. In addition, the FAA is enhancing operational safety by funding wildlife hazard assessments (WHAs) at all eligible airports, including general aviation locations.

The following summarize the current status and planned RAP projects at Idaho's twelve "focus" airports.

- ✎ All twelve Idaho "focus" airports meet the FAA requirements for RSA's.

- ✎ Projects are currently in the planning stages for parallel taxiways at Hailey (Friedman Memorial) and McCall to enhance access. The Hailey project will relocate the entire airport to meet C-III design standards.
- ✎ All twelve Idaho “focus” airports meet the FAA line-of-sight requirements.
- ✎ All twelve Idaho “focus” airports meet the FAA vehicular runway crossings requirements.
- ✎ WHAs are currently planned for the Nampa Municipal Airport in Nampa, the Caldwell Industrial Airport in Caldwell, the Coeur d’Alene Air Terminal in Coeur d’Alene, and McCarley Field in Blackfoot.
- ✎ The FAA RAP indicates that planning for a new airport is underway or upcoming for Hailey (Friedman Memorial) and Burley.

Resilience

Component Grade:

D-

Resilience is a measure of the number of airports having positive zoning measures in place to protect the airport from incompatible land uses that could reduce its function and value to its community and to the state.

- ✎ 28% of Idaho airports have adopted and enforce compatible land use zoning.
- ✎ 51% of Idaho airports have adopted and enforce height zoning.
- ✎ 53% of Idaho airports exercise full control of all land uses and activities within their runway protection zones.

RECOMMENDATIONS

- ✎ Increase support of compatible land use zoning efforts at state and local levels.
- ✎ Improve focus on meeting regulatory requirements through facility and service objectives.
- ✎ Modernize air traffic control systems to improve aviation efficiency.

SOURCES

- 1 Idaho Airport System Plan, Technical Report 2010, Idaho Transportation Department, Division of Aeronautics.
- 2 Northwest Mountain Regional Airport Plan – 2011, United States Federal Aviation Administration.

BRIDGES

Bridges Category
Overall Grade:

D+

There are 1,806 bridges on the state highway system, which amounts to 11 million square feet of deck surface. Most bridges are designed for a 40 to 60 year life span, yet nearly 32% of the existing bridges (574) on the state highway system are 50 years or older. An additional 522 bridges (another 29%) will be 50 years old in the next 10 years. This means that fifty percent of the bridges on the state highway system will be 50 years old or older by 2016 which will likely translate into additional needs for maintenance and funding. In 2011, 164 of the bridges reached 70 years old, and that number increases to 233 bridges being more than 70 years old on the state highway system by 2021.

In addition to the state highway system bridges, there are another 2,371 bridges on the local highway system. There are 605 bridges on the local highway system that are 50 years old or older, and another 502 bridges that will be 50 years old by 2021. There are 249 bridges on the local highway system that are already 70 years old, and another 102 bridges that will be 70 years old by 2021, bringing the total to 351 bridges. The bridge deck surface on the local highway system is approximately 5.7 million square feet.

There are also 53 bridges on the state highway system that are structurally deficient and 203 that are functionally obsolete. That compares to 288 bridges on the local system that are structurally deficient, and 163 bridges on the local system that are functionally obsolete. There are also bridges not included in either state and local highway systems that are owned by federal agencies, such as the U.S. Forest Service, the Bureau of Indian Affairs, and the Bureau of Reclamation that are also rated as structurally deficient (35) or functionally obsolete (61), that are not addressed in this Report Card.

Capacity

Component Grade:

B

There are 203 functionally obsolete bridges on the state highway system and 163 bridges on the local highway system. While not all of these 366 bridges are functionally obsolete, because they don't have the capacity for the roadway they carry, many of them are obsolete because of not enough capacity. These functionally obsolete bridges make up less than 9% of the total bridges on both the state and local system. The number of functionally obsolete bridges will most certainly grow over the next 10 to 20 years; the more significant issue for the bridges in Idaho relates to their age and the sheer number of bridges reaching the design life, which is addressed in other categories.

Condition

Component Grade:

B

There are a total of 376 bridges in Idaho that are rated as structurally deficient. Fifty-three bridges are on the state highway system, and 288 are on the local highway system, which represents 8% of all state and local bridges. The remaining are bridges owned and maintained by federal agencies. The

structural deficiency rating means that there is some component of the bridge that cannot handle the normal highway loading and is therefore limiting some of the commercial truck traffic.

Funding

Component Grade:

D-

Funding is the amount of maintenance, operations, and capital funding received for state highway bridges relative to the amount of funding required to meet all expected needs. Over the last 30 years, the Idaho Transportation Department has constructed approximately 15 bridges per year. At that funding level, approximately \$16 million per year for those last 30 years, it would take 120 years to replace the existing bridges on the state highway system, with most bridges designed to last between 40 and 60 years, which would require them to last more than double their design life, if they were all new bridges.

On the local highway system, more than 25% of the bridges are already 50 years old or older, and another 21% will be 50 years old by 2021.



Future Need

Component Grade:

D-

Future need is the measure of the economy's ability to generate sufficient revenue to meet the needs for funding state highway maintenance, operations, and capital needs to keep pace with the demands of the traveling public and movement of goods and services in Idaho. With more than 30% of the bridges on the state highway system already 50 years old, and that number reaching over 60% within the next 10 years, there is an immediate need for additional bridge funding just to catch up with the backlog of bridges needing replacement. Since bridges on the state highway system need to last more than twice as long as their normal design life would also indicate, the funding needs should be at least doubled in order to replace the bridges as they reach their normal life expectancy. While the percentage of bridges on the local highway system that

are 50 years old is slightly lower, they are in the same general area in terms of needed additional funding.



Operation and Maintenance

Component Grade:

C

The Idaho Transportation Department uses an asset management tool for all their bridges called PONTIS, which is supported by AASHTO. All bridges on the state highway system are inspected at least every other year by a well-trained team of bridge inspection experts, and the data put into PONTIS for help in rating each of the bridges. Bridges that have a low sufficiency rating are inspected annually, at a minimum, to track their condition, and to determine if additional restrictions 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 is typically more expensive as the bridge gets older.



Public Safety

Component Grade:

C

The bridge inspection process in Idaho is very good in terms of monitoring and posting, when necessary, any bridges that are structurally deficient to minimize the likelihood of a catastrophic failure of a bridge. Given the nature of the Idaho topography, there are many bridges that provide service in rural or remote areas, that if something happens to cut off that service, the detour to cross the barrier could be very extensive. In urban areas, while a bridge out of service may be an inconvenience, there are generally other alternatives for crossing the barrier until the bridge can be fixed or replaced. On the state highway system, the length of the detours required range from nearly 550 miles to less than 1 mile. The impact on the availability of emergency services, while it varies depending on the location, could be very significant.



Resilience

Component Grade:

D

With the age of bridges on the state highway system, and many of those bridges located in rural areas where the detours are extensive, it is a major concern that 50% of the bridges on the state system will be more than 50 years old by 2016. That is a major concern for the future economic vitality of the state, and the resilience of the bridges on the state and local highway systems. It would not

only impact the movement of goods and services in Idaho, but it would also affect emergency services for the citizens of the area affected.

RECOMMENDATIONS

- ▶ Additional funding for the top 60 critical bridges needs to be addressed immediately.
- ▶ The backlog of bridges that need to be replaced because of their age, in both the state and local highway systems, needs to be a focus by Idaho Transportation Department and the locals to catch up with the aging bridge inventory.
- ▶ The long-term funding to support the bridge replacement program needs to be carefully studied, so that bridges are replaced as they reach their life expectancy.

SOURCES

- 1 Statewide Bridge Inventory Data Base, Idaho Transportation Department, 2012.
- 2 National Bridge Inventory Data Base, 2012.
- 3 State Bridge Inspection Engineer, Idaho Transportation Department, June 2011 and January 2012.

DAMS

Dams Category
Overall Grade:

C

Major dam facilities were constructed in Idaho by its earliest agrarian settlers more than 150 years ago. Today, Idaho's citizens enjoy the many vital benefits afforded by dams including: flood risk reduction, water storage for domestic, commercial, municipal, industrial and irrigation purposes, hydropower generation, habitat for aquatic species, recreation, as well as impoundment of mine, industrial, and agricultural byproducts.

The Idaho Department of Water Resources (IDWR) has jurisdiction, as required for public safety, of all dams within state boundaries. However, dams owned by the U.S. government and some federally-licensed hydroelectric dams, which total less than 10% of regulated dams in Idaho, each have their own dam safety program that is comparable to or exceeds the requirements of the state. Federal circumstances are not reflected in these Report Card grades.

Idaho's Dam Safety Program regulates 516 dams that meet or exceed the minimum size criteria of 10 feet or more in height, 50 acre-feet storage or more, and mine tailings impoundment structures greater than 30 feet high. A similar but different set of size criteria are used to select dams to populate the National Inventory of Dams (NID). Idaho's contribution to the national inventory is 428 dams, according to the most recently published NID (2010).



Canals and levees are specifically exempted from Idaho Dam Safety regulation, and no other state agency has been directed by statute to provide for its regulation. The lack of regulation regarding canal and levee infrastructure is a major concern, not only for the canals and levees themselves, but how the canals and levees across the state of Idaho impact the dams. Although the National Flood Insurance Program (NFIP), supervised under the auspices of the Federal Emergency Management Agency (FEMA), establishes a dollar amount for flood insurance charged to property owners who live in areas protected by levees; or absent a levee, levee safety is not part of the state's function for administering the Floodplain Management Program. The safety of levee infrastructure can directly impact the safety of dams.

Condition and Public Safety

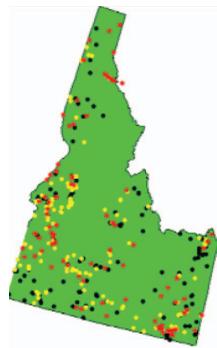
Component Grade:

C

The periodic inspection of existing dams is a priority of Idaho's Dam Safety Program. Presently, the method used by the state to prioritize dams with respect to public safety consists of assigning each structure a *hazard classification* and a *condition assessment rating*. The hazard classification combined with the condition assessment rating is used to estimate the overall

risk each dam presents to public safety. Federal agencies have established other means for assessing risk associated with their respective dams.

The state's hazard classification process sorts each dam into one of three broad categories used to estimate the potential consequences to downstream life and property in the event of a dam failure and sudden release of water.



Red Dots - High Hazard (H) classification presumes that direct loss of human life will occur in the event of a dam failure and sudden release of water.

Yellow Dots - Significant Hazard (S) implies that significant economic damage will occur to developed property, with potential for indirect loss of life.

Black Dots - Low Hazard (L) classification indicates only minor damage to developed property, with no potential for loss of life.

The classification is independent from the physical condition of the dam and depends only on the potential consequences of a sudden failure. Currently, there are 103 high hazard dams in Idaho, but this number is likely to increase as people and businesses continue to move into areas below existing dams. As an example of the population at risk, the Treasure Valley holds roughly ½ Idaho's population, and a catastrophic failure of Lucky Peak Dam at full pool could directly affect ½ of the Treasure Valley.

The state's condition assessment is broken into four categories that represent an estimate by a qualified inspector as to the physical condition of the dam and appurtenant works. Factored into the condition assessment is a determination of whether or not the dam meets certain design and operation standards. The condition assessment rating consists of four (4) possible selections, in order from best to worst:

-  A *Satisfactory* rating is assigned to dams where no existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria .
-  *Fair* implies that no existing dam safety deficiencies are recognized for normal loading conditions, but under rare or extreme hydrologic and/or seismic events, a dam safety deficiency may result.
-  *Poor* ratings result if a dam safety deficiency is recognized for loading conditions which may realistically occur or when uncertainties exist that prevent an adequate analysis necessary to identify a potential dam safety deficiency. Remedial action and/or further investigations and studies are necessary.
-  *Unsatisfactory* is defined as a dam safety deficiency that requires immediate or emergency remedial action for problem resolution.

A fifth placeholder “Not Rated” is reserved for dams that have not been inspected, do not fall under state jurisdiction, or have been inspected but, for whatever reason, have not been rated.

Risk mitigation is best achieved by helping to prevent dam failures through regular inspection and repair/replacement of defective components or inadequate design. Since high hazard dams pose the highest public safety risks, available resources are particularly focused on these structures. A useful tool to reduce risk associated with each high hazard dam and reservoir is the preparation of an Emergency Action Plan (EAP). The EAP is a document that describes critical operational aspects of the dam, and includes a predetermined list of trained individuals and emergency responders to be contacted in the event of an emergency or a developing emergency situation. An important part of any EAP is a map illustrating the inundation boundaries that are expected to result from a dam breach and sudden release of water. Another important aspect of any EAP is periodic testing to verify that instructions, contact information, and physical features of the dam are accurate and up-to-date, and responsible personnel are familiar with their respective roles.

The impact of dam failures on Idaho and its’ citizens is varied and dependent on the particular dam, but reviewing the past can give us an indication as to how we might be affected.

Idaho does not require owners of high hazard dams to prepare, update, or exercise an EAP for their respective dams. Most federal dams and federally-licensed hydroelectric dams have EAPs; however, private high hazard dam owners are less successful in meeting this responsibility but equally affect citizens’ safety.

Table 1 summarizes the statistics relating to hazard classification, condition assessment rating, and EAP completion for Idaho’s state-regulated dams.

TABLE 1. IDAHO DAM STATISTICS SUMMARY (2010 DATA)

Category	Factor Assessed	No. of Dams
Hazard Classification	High Hazard Classification	103
	Significant Hazard Classification	156
	Low Hazard Classification	237
	Not Classified	20
Condition Assessment	Satisfactory Condition Assessment	340
	Fair Condition Assessment	107
	Poor Condition Assessment	11
	Unsatisfactory Assessment	7
	High Hazard Dam with Unsatisfactory Assessment	2
Risk Mitigation	Have Emergency Action Plan	150
	High Hazard Dam with EAP	99
	Not Required to Have EAP	217

Operation and Maintenance

Component Grade:

C

Dam operation is a function of its primary purpose(s), be it flood control, hydropower, irrigation, sport fishing, or municipal use. Federal facilities are also operated within rules developed in accordance with Endangered Species Act requirements. Reservoirs, particularly authorized multiuse federal facilities, are governed by operational rule curves, which are seasonal water control diagrams that define the operations of each unique facility for its defined purpose(s). Reservoir operations are becoming increasingly complex, as additional variables such as wind power integration are added to the many existing requirements.

Facility maintenance can be evaluated using the condition assessment data. Dams that are rated Satisfactory or Fair generally reflect adequate maintenance practices.

Funding and Future Need

Component Grade:

D

Expenditure data by dam owners and operators for routine and extraordinary maintenance is not available, except on a case-by-case basis.

Funding is becoming more limited in the dam safety program. The Idaho dam safety total budget has been reduced from over \$300,000 in 2003 to just over \$200,000 in 2008. In addition, the dam safety budget per regulated high hazard dam was over \$3,000 in 1999, which was above the national average at the time. But in 2008, the dam safety budget per regulated high hazard dam in Idaho was just above \$2,000 falling well below the national average of over \$5,000. As a result, the state's Dam Safety Program has been substantially



reduced from 4.5 full-time employees in 2008 to one full time employee and four regional staff in 2011. Each of the regional staff can only use 25% of their available time directed toward dam safety activities. These individuals are responsible for performing all inspections, design review, and hazard classifications for dams in the State Dam Safety Program.

The cost of travel associated with performing dam inspections and meeting with owners and local emergency management officials is greater per unit dam in larger-sized western states. Reduction in the number of dam safety personnel at the state's regional offices has resulted in more distant travel from the main office in Boise, placing a greater burden on the state's dam safety program budget.

To support such a non-centralized dam safety program as presently exists in Idaho, it is absolutely necessary that all regional offices have access to updated,

real-time information. A dedicated individual with database skills is vital to perform the functions necessary to keep all staff members in the Dam Safety Program current with the collection and dissemination of applicable information, especially inspection results and updates to EAPs. Maintaining the state and NID inventories is a continuing effort that requires personnel and resources. It is also important to keep these inventories up to date because such information is used for other purposes, including the National Flood Insurance Program's Community Rating System and the Department of Homeland Security.

The average dam in Idaho is more than 50 years old. With the ageing infrastructure, funding and future need becomes increasingly crucial. Several types of financial opportunities exist through the Idaho Water Resources Board (IWRB), including direct loans, grants, and other disbursements from the Revolving Development Fund and Water Management Account, and the Revenue Bond Program. Ageing dams are eligible to receive assistance from the IWRB for repair, rehabilitation, or replacement. The amount of available funding is limited and is subject to committee review and recommendation. These programs are not dedicated exclusively to dams, but instead include all water development projects and concepts. All awards and/or loans are competitive based on perceived benefit(s) to life, property, and economic improvement.

Resilience

Component Grade:

C+

Resilience, as it is pertinent to dams, could be defined in at least two ways. One definition is the ability for a water storage system to recover after failure has set in. Another definition involves the flexibility of a water storage system, particularly a large federally-owned facility, to partially or fully accommodate pertinent changed conditions beyond its authorized purpose(s). Variables may include changing hydrologic conditions, endangered species habitat, instream flow needs, and varying electricity generation demands. Future needs, not yet identified, may further reduce system resilience.



Resiliency is being lost as changed conditions present competing operational needs. A range of institutional and structural changes may be needed to accommodate current and new challenges.

Capacity

Component Grade:

A-

Idaho's dams store approximately 15 million acre-feet of water. Idaho is home to approximately 1.5 million people, which averages to approximately 10 acre-feet per person per year of stored water capacity. This value encompasses all

Conversely, well over 1 million acre-feet of water leaves Idaho every year as instream flow. Proponents of more storage, and hydroelectric development in particular, encourage water resource-related economic development while preserving stream flows to protect existing values and uses. Water conservation and banking are preferred in lieu of new impoundments for sources of additional water, this due in large part to the costs of construction and permitting obstacles. Water conservation examples include using sprinkler over flood irrigation practices, xeriscaping, and limiting water demands in buildings.

RECOMMENDATIONS

After implementation of the National Dam Safety Program began in 1996, Idaho established a State Dam Safety Program that by 2009 had resulted in better-than-average state compliance with the national Model State Dam Safety Program. However, State Dam Safety Program funding and staffing levels in subsequent years have dropped well below the national average.

As Idaho's dams continue to age, the need for infrastructure repairs and replacement is expected to grow. Other external challenges imparted by narrowly focused interest groups continue to emerge, resulting in mounting pressures on operational flexibility, such as minimum stream flows and water quality issues.

As a result of reduced funding and personnel resources, the current level of state compliance will not be able to be maintained. A consistent, balanced approach to short- and long-term programmatic state funding and public/private financing is needed to avoid crisis management of facilities and their operations. A better understanding of facility and systemic flexibility is also necessary to anticipate future operational challenges.

SOURCES

- 1 IDWR Dam Safety Database – 2010 Summary.
- 2 Hashimoto, T., J.R. Stedinger, and D.P. Loucks, Reliability, resiliency, and vulnerability criteria for water resource system performance evaluation, *Water Resources Research*, 18, 14-20, 1982.
- 3 Idaho Water Resource Board, Financial Program. 2011.
- 4 Association of Dam Safety Officials, Performance Report for the State of Idaho. <http://damsafety.org>

DRINKING WATER & WASTEWATER INFRASTRUCTURE

**Drinking Water
Grade: C+**
**Wastewater
Grade: B-**

The water and wastewater infrastructure in the state of Idaho is primarily managed and operated by local municipalities. In addition there are smaller public and private water and wastewater systems that have been considered.



A primary consideration in developing the grade for the water and wastewater category was obtaining results that are reflective of actual conditions in Idaho. It was also important that the results have credibility with the municipal community. To address this issue a collaborative approach with several organizations that support the municipal community and provide a forum for discussion and dissemination of information were involved in the data collection process. These organizations included:

-  Association of Idaho Cities;
-  Association of Idaho Public Works Professionals;
-  Idaho Rural Water Association;
-  Idaho Department of Environmental Quality;

Collaboration with these organizations resulted in an overall grade for Idaho's water and wastewater infrastructure that has credibility with municipalities and is more reflective of actual conditions.

The grading process involved the following steps:

1. Introduction of the report card to collaborating organizations;
2. Development of a grading strategy and approach;
3. Development and dissemination of an infrastructure condition survey;
4. Receiving and reviewing survey responses to develop preliminary grades;
5. Review preliminary grades with collaborating organizations;
6. Final development and presentation of overall grades.

The survey included questions addressing the following areas:

-  Annual Repair/Replacement
-  Condition
-  Capacity
-  Operations Budget
-  Source Protection/Condition
-  Collection System Investigation/Maintenance

The survey was distributed to as many Idaho communities as possible. Forty six responses were received. The survey data represented approximately 441,000

people for water and 740,000 people for wastewater. This translates to approximately 28% of Idaho's population for drinking water and approximately 47% of Idaho's population for wastewater.

A traditional grading system was developed assigning grades ranging from A to F. An A was assigned a value of 4.0 and an F was assigned a value of 0.0. Options were provided for each survey question corresponding to a grade. Grades were weighted according to population. Below are the results.

Collection and Distribution Repair/Replacement

Two questions were asked related to amount of distribution and collection system lines each community has and the amount repaired/replaced annually. The questions were:

Component Grade for Water: D+

Component Grade for Wastewater: C-

-  What is the total length of collection or distribution lines for your community?
-  What length of collection or distribution lines are repaired or replaced each year?

These questions provide insight into how well we are keeping up with pipeline repair/replacement on average around the state. The results of these questions assume a 100 year life for pipe and an ideal rate of replacement of 10%. Here are the results.

	Drinking Water Distribution	Wastewater Collection
Total Miles Surveyed	2,578	3,176
Ideal Annual Replacement (miles)	25.8	31.8
Actual Miles Replaced annually	9.4	14.0
Actual to Ideal	36%	44%
Grade	D+	C-

Condition

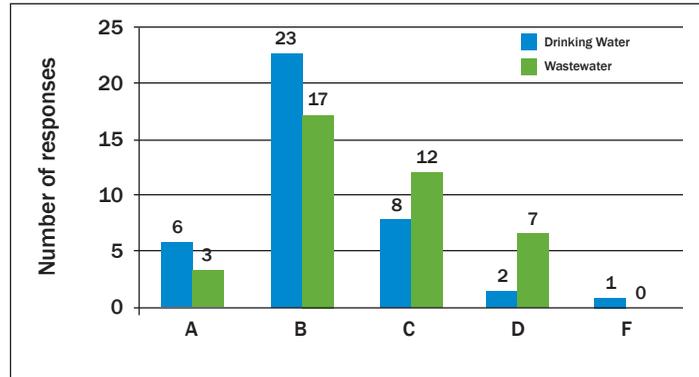
Each community surveyed was asked what the condition of their water or wastewater system was. Each community was asked to provide their best judgment of the condition of the majority of their system. The response options and corresponding grade as well as the response results are shown below.

Component Grade for Water: C+

Component Grade for Wastewater: B-

Drinking Water and Wastewater

Response Options	Grade
Excellent	A - 4.0
Good	B - 3.0
Fair	C - 2.0
Poor	D - 1.0
Failed	F - 0.0



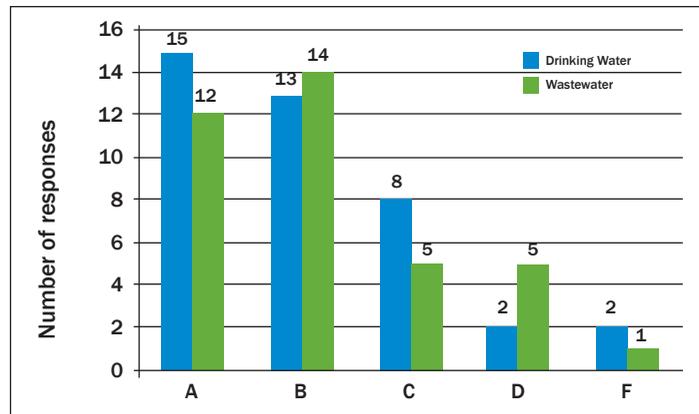
The condition survey after responses were weighted according to population translates to an overall grade of C+ for drinking water and B- for wastewater.

Capacity

Component Grade for Water: B
Component Grade for Wastewater: B+

The survey included an assessment of system capacity for water and wastewater. Each community was asked to provide their best judgment on the capacity of their water and wastewater system to meet various levels of anticipated growth. These results are shown below.

Response Options	Grade
100% + long-term growth	A - 4.0
100% + short-term growth	B - 3.0
90% to 100%	C - 2.0
80% to 90%	D - 1.0
70% to 80%	F - 0.0



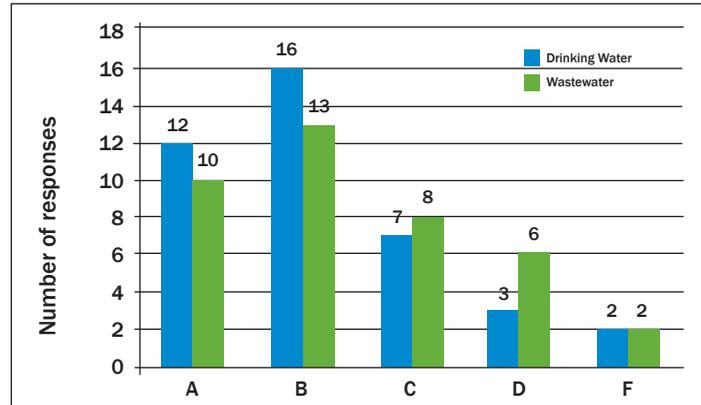
The overall grade for capacity weighted according to population is B for drinking water and B+ for wastewater.

Operations Budget

Component Grade for Water : B+
Component Grade for Wastewater: B-

The water and wastewater survey included questions regarding the operations budget for each community. Communities were asked if they agree or disagree whether budgets were adequate for facility maintenance, operations costs, and planned upgrades required for increasing capacity and meeting regulatory requirements. Here are the surveyed results.

Response Options	Grade
I agree	A - 4.0
I somewhat agree	B - 3.0
I somewhat disagree	C - 2.0
I disagree	D - 1.0
I strongly disagree	F - 0.0



The final population weighted grades for this component are B+ for water and B- for wastewater.

Source Water Condition

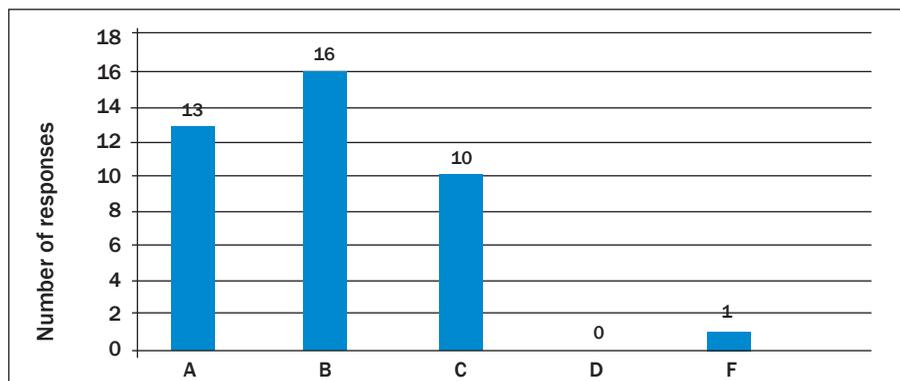
Component Grade:

C+

Source water condition was surveyed by asking the level of protection and whether contamination problems were present. The response options and related grading scale is show below.

Source Water...	Grade
is extremely well protected and has no significant pollution sources.	A - 4.0
is protected by significant and active source water protection program, but some pollution sources may exist.	B - 3.0
has some protections but no significant and active source protection program.	C - 2.0
is not well protected, and there is clear evidence of substantial source water pollution.	D - 1.0
is largely unprotected and has serious contamination problems.	F - 0.0

The following is a summary of the responses received.



The overall population weighted grade for this component is C+

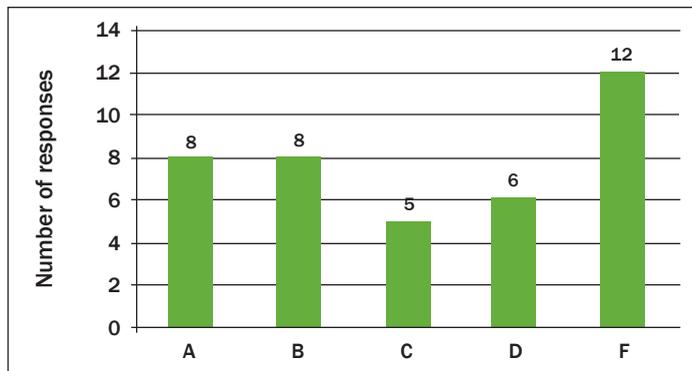
Component Grade:

B-

Collection System Inspection (Closed circuit television inspection, CCTV)

Closed circuit television inspection (CCTV) is an important tool used to determine the condition of a collection system. It is also an indication of collection system maintenance since pipes typically are cleaned before CCTV is performed. The survey asked each community what percentage of their collection system had been CCTVed in the last 10 years. The grading scale is shown to the right and the survey results are provided below. The survey data resulted in an overall grade of B- for this component.

Response Options	Grade
>80%	A - 4.0
60% to 80%	B - 3.0
40% to 60%	C - 2.0
20% to 40%	D - 1.0
<20%	F - 0.0



SUMMARY

Grades from each of the components surveyed above were combined to generate the overall grades for water and wastewater systems in Idaho. As shown below, the overall grade for water is C+ and the overall grade for wastewater is B-. Recent growth in the state of Idaho has contributed to somewhat 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 are and improve conditions for older systems in the state.

Maintenance funding will be critical to maintaining and improving overall grades for the State

	Weighted Results	
	Drinking Water	Waste Water
Repaired/Replaced Annually	1.53/D+	1.77/C-
Condition	2.68/C+	2.81/B-
Capacity	3.00/B	3.32/B+
Operations Budget	3.36/B+	2.99/B-
Source Water	2.61/C+	-
CCTV	-	2.86/B-
Average (4.0 scale)	2.63	2.75
Grade	C+	B-

SOURCES

- 1 ASCE Drinking Water and Wastewater Survey presented to municipalities in Idaho during fall of 2011.

ENERGY

Energy Category
Overall Grade:

C+

In 2007, after extensive public involvement and public hearings, the Idaho Legislature adopted the “Idaho Energy Plan” which became the first state energy policy in a quarter century. The 2007 plan called for a five-year review to manage and adapt to the changes of the ever-changing energy industry. The Idaho Legislature recently tasked the Interim Energy, Environment, and Technology Committee (with assistance from the Office of Energy Resources and the Idaho Strategic Energy Alliance) with the 2007 plan review and update, which is to be presented to the 2012 legislature. The 2012 Draft Idaho Energy Plan was recently (Early February) was presented to the Idaho House of Representatives. As of this report a final vote of acceptance has not been obtained.

The documentation used to support this portion of the Idaho Report Card was gathered from both the 2007 Idaho Energy Plan and 2012 Draft Idaho Energy Plan. Portions of each document were used and compared in an effort to conduct a preliminary evaluation of Idaho’s current electrical infrastructure, generation, and transmission status. Please note that this Report Card is not all inclusive to resources associated with electrical infrastructure within Idaho. The availability of information is limited to what has been released to the public by the various utility companies. Further evaluation is recommended to establish a more detailed and applicable grade. However, at this time, based on the understanding that power generation needs are currently being met and additional improvements are being made to meet future power needs, ASCE’s Idaho Section gives Electricity a grade of B-. The information associated with this portion of the Report Card should be used as a building block for the next stages of information gathering.

Table 1 represents a summary of general energy use/consumption facts associated with Idaho.

TABLE 1. COMPARISON OF 2007 VS. DRAFT 2012 IDAHO ENERGY PLAN

Fact/Statistic	2007	Draft 2012	Difference +/-
Approximate amount Idaho citizens and businesses spent on energy in 2003/2009.	\$3 Billion	\$4.9 Billion	+ \$1.9 Billion
Approximate amount each Idaho household spent on energy (including gasoline) in 2003/2009.	\$3,000	\$4,500	+ \$1,500
Idaho’s rank among all other states in percent of median household income spent on energy (household energy bills/household income) including transportation fuel.	-	31st	-
Share of median household income spent on energy in 2003/2009.	8%	10%	+ 2%

Fact/Statistic	2007	Draft 2012	Difference +/-
Idaho's rank among the 50 states for average electricity prices in 2005 / 2009.	2nd Lowest	2nd Lowest	Stable
Idaho's rank among the 50 states for residential natural gas prices in 2005.	6th Lowest	14th Lowest	+ 8 in State Ranking
Percent of increased energy efficiency and conservation savings by Idaho investor-owned utilities since 2004.	-	1,112%	-
Total amount of coal, oil, and natural gas produced in Idaho in 2005 / 2009.	0	0	Stable
Share of Idaho's 2003 / 2009 energy supply that was imported from out of state.	81%	52%	- 29%
Share of Idaho's 2005 / 2009 electricity supply that was imported from out of state.	45%	52%	+ 7%
Share of Idaho's 2005 / 2009 electricity supply that came from hydroelectricity.	48%	50%	+ 2%
Share of Idaho's 2005 / 2009 electricity supply that came from coal-fired power plants.	42%	38%	- 4%
Share of Idaho's 2005 / 2009 electricity supply that came from non-hydro renewable energy sources.	1%	3.4%	+ 2.4%
Share of Idaho's 2015 / 2020 electricity supply that is expected to come from non-hydro renewable energy sources, based on current Idaho utility resource plans.	8%	46.5%	+ 38.5%
Share of Idaho's 2004 electricity demand that was saved due to historical investments in energy conservation.	6%	-	-
Average share of 2004 electricity demand that was saved due to historical investments in energy conservation for 10 large Pacific Northwest utilities.	11%	-	-
Idaho's energy intensity as a share of the state economy compared to other states.	-	19th Highest	-

Historical data shows that economic growth and energy consumption are closely and positively correlated. As Idaho grows, so will the demand for energy. Energy use in Idaho reflects both a growing economy and the nature of agriculture and industry within the state, along with the native climate. Consequently, the health of Idaho's economy today depends on access to affordable energy resources.

Across the nation, power generation has driven up consumption of natural gas 3% annually for the last decade.¹ There are a number of reasons to believe this

¹ New Projections for Oil and Natural Gas, Jason Stevens, Morningstar Stock Investor, July 2011, page 21.

pattern will persist. Over the past decade natural gas power plants have been the primary resource to supply the nation's growing electricity needs. Additional natural gas power generation will be needed to replace retirements of old power plants that lack necessary environmental controls to meet government regulations.

The price of electricity is a function of both national and regional factors. Idaho enjoys low electricity prices which has been a historic advantage to Idaho that is expected to persist as the state continues energy policies consistent with the past. 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. The magnitude of price changes is difficult to predict and the average price of electricity in Idaho is anticipated to have a high correlation with overall price changes.²

Idaho produces approximately 25% of the energy it consumes.³ Most of the energy produced in the state comes from hydroelectric dams. 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. Idaho energy consumption is primarily a blend of electricity and natural gas, along with gasoline and diesel. Gasoline and diesel provide about 31% of energy used in Idaho. Natural gas provides about 16% of the state's energy, while electricity provides 53% of state's energy.⁴ Roughly half of electricity consumed in Idaho comes from neighboring states.

Capacity

Consumers are served by three investor-owned electric utilities, or IOUs (Avista Corporation, Idaho Power Company, and PacifiCorp/Rocky Mountain Power), 11 municipal utilities, and 14 rural electric cooperatives. The three IOUs serve approximately 84% of the state's electricity needs.⁵ The remainder are served by municipal and rural cooperative utilities.

Avista Corporation is an investor-owned electric and natural gas utility headquartered in Spokane, Washington, that currently serves more than 200,000 electric and natural gas customers in Idaho's north and central

² U.S. Energy Information Administration, www.eia.gov/electricity/data.cfm#sales & U.S. Bureau of Labor Statistics

³ U.S. Energy Information Administration, www.eia.gov/state/seds/sep_prod/pdf/PT2_ID.pdf

⁴ U.S. Energy Information Administration,

www.eia.gov/state/seds/hf.jsp?incfile=sep_use/total/use_tot_IDcb.html&mstate=Idaho

⁵ www.icua.coop

regions, and is the second largest electricity provider in Idaho. Electric customers receive a mix of hydroelectric, natural gas, coal, biomass, and wind generation delivered over 2,100 miles of transmission line and 17,000 miles of distribution line. Approximately half of Avista's electricity comes from hydropower resources that provide a significant price benefit for its customers. Natural gas is delivered over 6,100 miles of natural gas distribution mains. 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 490,000 customers in southern Idaho and eastern Oregon across a 24,000 square mile service territory. Idaho Power is the largest provider of electricity in the state. With its 17 low-cost, emission-free hydroelectric projects at the core of its generation portfolio, it is one of the nation's few investor-owned utilities with a significant hydroelectric generating base. The heart of this system is the 1,167 MW Hells Canyon Complex. Other resources include baseload coal facilities located in Wyoming, Oregon, and Nevada. Idaho Power also has natural gas-fired combustion turbines and a natural gas-fired combined cycle project that is scheduled to be placed in service in 2012, all located in Idaho. In addition to its company-owned resources, Idaho Power's supply-side portfolio includes several long-term contracts with wind and geothermal facilities, and it has contracts with 116 Public Utility Regulatory Policies Act (PURPA) projects, including more than 650 MW of wind generation.⁶

PacifiCorp serves retail customers in 6 western states: Washington, Oregon, Idaho, Wyoming, Utah, and California. PacifiCorp serves more than 1.7 million customers across its 136,000 square mile service territory. PacifiCorp began operating in Idaho in 1989 through its merger with the Utah Power & Light Company, which began serving customers in Idaho in 1912.⁷ PacifiCorp was purchased by Mid-American Corporation in 2006, and subsequently changed the name of its eastside retail operating division to Rocky Mountain Power. Rocky Mountain Power serves 72,348 customers in Southern Idaho (approximately 4% of PacifiCorp's total customer base). PacifiCorp owns 78 generating plants capable of 10,483 MW of net generation capacity, including coal, hydroelectric, natural gas, and wind resources. As a stand-alone utility, PacifiCorp is second only to Mid-American Energy Company in the ownership of wind generation. Wind, hydro, geothermal, and other non-carbon-emitting resources currently make up approximately 24% of PacifiCorp's owned and contracted generating capacity, accounting for nearly 10% of total energy output. At year-end 2010, PacifiCorp had more than 1,000 megawatts of owned

⁶ Avista 2011 IRP.

⁷ <http://www.rockymountainpower.net/about/cf.html>

wind generation capacity and long-term purchase agreements for more than 600 megawatts from wind projects owned by others.⁸

There are 28 rural electric cooperatives and municipalities providing electric service in Idaho. These utilities serve more than 120,000 customers throughout Idaho, accounting for 16% of Idaho's load. The municipal and cooperative utilities are relatively small in size, ranging from 31 customers and 123 MWh of annual sales (Vigilante Electric Cooperative) to 26,033 customers and over 695,317 MWh of annual sales (City of Idaho Falls).⁹ 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.

Idaho currently has no commercial coal, oil or, natural gas resource extraction operations (although natural gas exploration and test wells have been drilled and production is anticipated to begin in late 2011). Idaho does have a variety of renewable resources available for potential development, including wind and small hydro power, geothermal, biomass, and solar energy. Idaho does not have commercial nuclear generating assets or uranium resources (although neighboring states and Canadian provinces do).

Hydroelectricity

Idaho has more than 140 existing hydro plants with combined capacity of approximately 2,500 MW. The largest hydroelectric projects are the 1,167 MW Hells Canyon Complex owned by Idaho Power and the 400 MW Dworshak dam operated by the U.S. Army Corps of Engineers. Idaho dams produce approximately 1,300 MW of electricity in an average year, approximately half of Idaho's 2010 electricity consumption. While Idaho's most promising hydroelectric sites have already been developed, an INL site-based assessment study resulted in the identification of 373 additional Idaho hydro projects having a combined capacity increase potential of 1,655 MW.¹⁰ Sixty-eight percent of these projects are small in size, less than 5 MW, and include upgrades at existing hydropower sites as well as newly identified potential sites listed in the INL assessment.

⁸ www.midamericanenergy.com/newsroom/asp/facts9.aspx

⁹ Idaho Consumer-Owned Utilities Association: www.icua.coop

¹⁰ U.S. Hydropower Resource Assessment for Idaho, Alison M. Conner, et al., Published August 1998, Idaho National Engineering and Environmental Laboratory, <http://hydropower.inl.gov/resourceassessment/pdfs/states/id.pdf>

Wind

Because of recent experience and technology improvements, wind energy is maturing quickly and is now responsible for nearly 2.5%¹¹ of U.S. electricity produced. Over 42,000 MW of nameplate wind was in operation at the end of June 2011 with another 7,400 MW under construction.¹² Idaho has experienced a wind construction boom, growing from 75 MW at the end of 2008 to nameplate capacities of nearly 350 MW by mid-2011, with the total expected to reach nearly 500 MW by the end of 2011¹³ (as of this report, final 2011 capacities have not been identified). An additional 150 MW (nameplate capacity) of wind projects are under construction in Idaho as of August 2011.¹⁴ Approximately 4% of Idaho's total nameplate capacity 2010 generation capacity came from wind generation, and its share should more than double to around 10% in 2011 (as of this report, final 2011 capacities have not been identified). Recent wind mapping studies estimate that Idaho has approximately 25,000 MW of wind generation potential, the 13th largest potential in the U.S.¹⁵

Geothermal

Currently Idaho has one operating geothermal power plant at Raft River in Cassia County. This plant is designed to provide 13 MW (net) of capacity. The Raft River project expects to add two or more 13 MW power plant modules in the coming years and may one day produce up to 100 MW. In May 2010, the Idaho Public Utilities Commission (IPUC) approved a power purchase agreement for approximately 22 MW of generation from the Neal Hot Springs Geothermal Project located in eastern Oregon. The Neal Hot Springs project is under development and is expected to begin commercial operations in 2012. Idaho has a number of sites that can be developed for geothermal power generation. A new 25 MW generation power plant is under construction within Idaho Power's service territory for U.S. Geothermal's Neal Hot Springs project that incorporates new power plant technology providing for modularity, leading to lower cost and a higher efficiency power conversion cycle. The most advanced sites are the Crane Creek area near Weiser in Washington County, the Roystone Hot Springs area near Sweet, and the Magic Reservoir area near Hailey. Thermal springs and geothermal resources located in Blaine, Owyhee, Lemhi, Valley, Bannock, and Camas counties may provide future power generation development opportunities for Idaho given sufficient exploration.

¹¹ Energy Information Administration, 2010 calendar year statistics from EIA-923 January - December

¹² American Wind Energy Association (AWEA)
www.awea.org/learnabout/publications/reports/upload/2Q-2011-Public-Market-Report.pdf

¹³ Renewable Northwest Project, http://rnp.org/project_map

¹⁴ Ibid.

¹⁵ Wind Task Force Initial Mandate Response to the Idaho Strategic Energy Alliance, February 2009, page 7.

New Resource Additions

Table 2 shows the total planned additions by all companies through 2020, weighted by the percentage of each company's load located in Idaho. The actual resources may be located outside of Idaho.

TABLE 2. PLANNED INVESTMENTS IN ELECTRIC GENERATING FACILITIES BY IDAHO INVESTOR-OWNED UTILITIES, 2012-2020

Year	Investment Type	Nameplate Capacity (MW)	Utility
2010-2015	Distribution Efficiencies	28	Avista
2011-2015	Oregon Solar Programs	19	PacifiCorp
2011-2021	Coal Plant Turbine Upgrades	65	PacifiCorp
2012	Northwest Wind	120	Avista
2012	Combined-Cycle Combustion Turbine (Langley Gulch)	300	Idaho Power
2012-2018	Micro Solar- Water Heating	30	PacifiCorp
2014-2016	Combined-Cycle Combustion Turbine	1,222	PacifiCorp
2015	Shoshone Falls Upgrade	49	Idaho Power
2016	Boardman to Hemingway Transmission	450	Idaho Power
2018-2019	Existing Thermal Resource Upgrades	4	Avista
2018-2019	Northwest Wind	120	Avista
2018-2029	Wind, Wyoming	2,100	PacifiCorp
2019	Simple Cycle Combustion Turbine	83	Avista
2019	Combined-Cycle Combustion Turbine	475	PacifiCorp
2020	Simple Cycle Combustion Turbine	83	Avista

Transmission Planning

Pursuant to recent rules adopted by the Federal Energy Regulatory Commission (FERC), Idaho's investor-owned utilities are required to participate in local and sub-regional transmission planning and to coordinate with neighboring sub-regional planning groups. Two Pacific Northwest planning groups—Northern Tier Transmission Group (NTTG) and Columbia Grid—now produce transmission expansion and economic study plans on a periodic basis. Additionally, Idaho's electric utilities, the Idaho PUC, and the Idaho OER are participating in numerous committees under the umbrella of the Western Electricity Coordinating Council (WECC) to develop a Western Interconnection-wide 10-year Regional Transmission Expansion Plan (RTEP). These local, sub-regional, and regional planning processes are providing the opportunity to explore transmission project costs, benefits, and risks, and their allocation to customer group beneficiaries, as well as to explore opportunities for project coordination at the sub-regional and regional levels in order to avoid costly duplication of facilities.

FERC sets policies for investor-owned utilities concerning new resource interconnection and transmission service requests. FERC sets cost-based rates for transmission services, as does BPA through its own rate cases, the results of which are then subject to FERC approval. An investor-owned utility may seek incentive rates of return from FERC for specific transmission projects.

Idaho's consumer-owned utilities have historically taken transmission service from BPA, despite their physical location on the grids of investor-owned utilities. BPA has, in turn, relied upon a system of agreements with the investor-owned utilities known as General Transfer Agreements (GTAs), which allow BPA to serve its customers without having to construct duplicate transmission facilities. BPA delivers power to approximately 60% of its preference customers through transfer arrangements. In 2011, BPA received notice from PacifiCorp of its intent to terminate the GTA. This notice means BPA will be required to deliver power to systems in Southeast Idaho after June 22, 2016, through another arrangement possibly including constructing new transmission lines. It is unclear for many of these utilities whether, how, and at what cost they will receive power resources and be able to bring new resources to load.

LOCAL HIGHWAYS

Local Highways
Category Over-
all Grade:
C-

Local Highways provide a critical transportation link between the places we live, work, and play and also provide connections to state highways. Cities, counties, and highway districts provide the necessary structure to enable the appropriate measures to keep this critical link functioning efficiently and effectively. The data used to compile this Report Card was recently prepared as part of the Local Highway Technical Assistance Council's report on Local Highway Financial Needs. In addition to the data within each category below, a few general observations are of interest:

-  Idaho's Local Highway system has 19,269 centerline miles of local paved roads and 14,065 gravel and dirt roads. This totals 33,334 miles of improved highways. Idaho's local highway system has 2,362 bridges with 5.7 million square feet of bridge deck.
-  55% of all commercial goods movements occur on local highways within the state of Idaho.
-  93% of local highway commercial traffic is concentrated on Arterial and Collector classified roadways.
-  Local highways within the state of Idaho have the highest collision rates as well as the highest amount of injuries as compared to state highways.

Capacity

Component Grade:
B

In Idaho, the majority of local highway capacity issues are due to poor access management. However, most resources focus only on roadway surface needs for maintenance dollars. Expansion was not considered because there is very little or no funding available as discussed below under Funding and Future Need. The capacity issues are largely relegated to peak hours and are typically short in duration and some of these issues were addressed through funding from the American Reinvestment and Recovery Act of 2009 wherein 63 projects were constructed in 2010 and 2011. Overall, Idaho has very little in the way of congestion due to traffic volume. As Idaho continues to grow, however, increased pressure will be placed on the infrastructure to support the need.

Condition

Component Grade:
C-

Idaho is a unique place to maintain local highways. There are extreme temperature fluctuations, flat and mountainous terrain, and 290 local highway jurisdictions, which result in varied best management practices. While the system is complex, maintenance practices are good for the local conditions, and overall the local highway surfaces are in good condition, however, almost 39.8%

of local highways were in fair or poor condition according to the most recent breakdown of pavement condition statewide. This amount is forecast to increase to 43% in fair or poor condition by 2028.

Funding and Future Need

Component Grade:

D-

Current funding levels are running far short of needs. Over the next 20 years, it is estimated that there will be a \$3.6 billion funding shortfall if new revenues are not identified and pumped into the system. This will lead to a rapidly deteriorating local highway system, and ultimately leave the local highways in an unusable and unsafe condition. These conditions could be catastrophic if nothing is done to augment the funding system.

The share of local funding for the local highway system has steadily increased over time.

Currently local highway jurisdictions generate approximately 57% of all revenues from non-user fees. The national recommended proportional split between user and non-user fees is 65/35. Local highway jurisdictions in Idaho do not have adequate regulatory authority to impose voter-approved taxes for local roadway maintenance and improvement. Without a set of tools to generate funds or a new dedicated source of funding, the local highway jurisdictions are tied to the local property tax and the constraints and realities of shrinking property values in an uncertain economy and a declining general fund.



Operation and Maintenance

Component Grade:

C

Local Highway Jurisdictions in Idaho use varying practices for operations and maintenance due to differences in divergent parts of the state due to climate and terrain. Some mountainous areas receive many feet of snow during winter months while the Treasure Valley (where the largest concentration of population exists in the state) is relatively mild and has less snow, but has the majority of traffic impacts on the local highway system state-wide.

Public Safety

Component Grade:

B

In Idaho, 37 percent of all crashes occur at intersections, driveways, and alleys. While there are more accidents on Idaho's local highway system than the state system, and the injury rate is similarly higher, the fatality rate is lower than the

state highway system. The state highway system is right at or slightly below the national average for fatal crashes, thus the local highway system is similarly at or below the national average. This is primarily due to lower rates of speed on local highways than on state roads.

Resilience

Component Grade:

D

The resilience of the local highway system is suspect. This is due to shrinking budgets and a lack of redundancy in the roadway system. There haven't been too many infrastructure failures in the state, however there have been a couple of bridge wash outs during flood conditions but no collapses or other catastrophic failures have occurred. In a few instances if a local highway system road becomes blocked or impassable, it could literally require a detour of more than 100 miles for local travelers. While these situations are extreme, they do exist. In the mountainous areas of the state this is an ongoing concern. 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.

SOURCES

- 1 Local Highway Technical Assistance Council's Study on Local Highway Financial Needs
- 2 Annual Report, Local Highway Technical Assistance Council, Fiscal Year 2011
- 3 Communities in Motion 2035, Community Planning Association of Southwest Idaho, September 20, 2010.

FREIGHT RAILROADS

**Freight
Railroads
Grade:**

C+

**Passenger
Railroads
Grade:**

D-

Idaho's economy, particularly in rural areas, relies heavily upon the rail freight system to facilitate movement of the state's agricultural, mineral, lumber, and wood, chemical, and other natural resources and manufactured products to local, national, and international markets. Railroad abandonment (discontinuance of service and track removal) can substantially increase the cost of transporting many commodities to market, particularly heavy or bulk commodities. A healthy rail freight system supports the competitiveness of Idaho's freight shippers, enhancing the economic vitality of the state, particularly in rural areas. Because of spatial isolation, a balanced, competitive, multi-modal transportation system is important to the efficient flow of commerce necessary to sustain Idaho's rural economy.

There are three categories of railroads in the U.S and Idaho: Class I, regional, and short lines. The Class I railroads in Idaho are the two large western mainline railroads, the Union Pacific Railroad (UP) and the BNSF Railway (BNSF). They provide long-haul transportation consisting primarily of bulk commodities (coal, agricultural and forest products, minerals, etc.), and intermodal traffic using containers and trailers on railcars. The Class I railroads link Idaho to destinations throughout the United States, Canada, and Mexico. The UP and BNSF operate 972 track miles in Idaho.



The UP and BNSF constantly invest in the hardening and expansion of its infrastructure. For example, the UP in 2010 invested \$2.5 billion in its national system and \$17.6 million in its 849-mile rail operation in Idaho. In 2011, the UP is committed to investing \$3.3 billion as part of a long-term strategy to provide safe, efficient service across its 32,000-mile network.

There has been a significant increase in the formation of short-line railroads over the last two decades nationwide and in Idaho. Currently six short lines and one regional railroad, Montana Rail Link, operate 696 miles of track in Idaho.

The short lines function as feeders to the Class I railroads. Short-line railroads help keep the rural areas of Idaho connected to the national railroad main-line network. Short lines often have taken over routes that were marginal in the Class I railroad system because they did not generate sufficient revenue to justify continued reinvestment. With a lower cost structure and more flexible service, short lines have been relatively successful in keeping most, but not all, of these rural lines operational.

The primary advantages of short-line operations are lower labor costs, a local ownership presence, and the ability and incentive to develop additional business. These advantages can result in viable operations where larger railroads have been unable to thrive.

Capacity

Component Grade:

C-

The capacity of Idaho's current rail system is quite good. Idaho is a relatively small railroad state, ranking 37th or 38th in rail mileage and traffic among the states. The Class I carriers and short lines can handle most current rail traffic. However, Idaho has lost more than a third of its rail system over the last 30 years through abandonment, and much of the rural areas of the state are without rail service, so a lower grade was assigned.

Condition

Component Grade:

B

The system is in relatively good condition due to investments by the owning railroads. Also contributing are a few past and present federal programs such as the Section 45G Short Line Railroad Track Maintenance Credit and the Idaho Rural Economic Development and Integrated Freight Transportation Program. The condition in Idaho is probably similar to other western states.



Funding and Future Need

Component Grade:

B

This is difficult to predict because most funding is provided by the railroads themselves as private sector companies, but based on the explanation under condition, the same component grade was assigned.

Operation and Maintenance

Component Grade:

C

Most Idaho track and bridges are fully operational, except about 100 miles that have been approved for abandonment by the U.S. Surface Transportation Board that are still in place but no service is being provided. Some branch lines are at a reduced speed limit because of track conditions and to save on fuel costs.

Public Safety

Component Grade:

C

Minimal public safety is jeopardized by the Idaho railroads beyond rail-highway at grade crossings and a minimally possible occasional derailment or spillage of railcars of hazardous materials. The latter is quite unlikely to occur in Idaho because the state produces very few hazardous materials. Two exceptions are the nuclear waste that moves in and out of the Idaho National Laboratory near Idaho Falls and the rail right-of-way in the EPA Superfund Site in north Idaho's Silver Valley that has been encapsulated as a bike/pedestrian trail.

Resilience

Component Grade:

C

Railroads provide a critical link of the supply chain. Working in conjunction with other transportation infrastructure, railroads provide redundancy and improve response to adverse conditions. The Department of Homeland Security National Infrastructure Protection Plan has a goal of building a safer, more resilient America by strengthening national preparedness and rapid recovery of critical infrastructure and key resources in the event of a disaster or emergency. Rail is part of this critical infrastructure and acts of nature, i.e. floods, earthquakes, high winds, excess rain, etc., could have an adverse effect on the resilience of Idaho's railroads' bridges and track structure.

Inland Waterways – Port of Lewiston

The Port of Lewiston is Idaho's only seaport and the farthest inland port on the west coast. Located at the confluence of the Snake and Clearwater Rivers, Lewiston is the final stop on the Columbia/Snake River inland waterway system, 465 miles upriver from the Pacific Ocean.

The Port specializes in intermodal transportation- barge, rail, and truck, making it a good location for a variety of businesses. The Port is served by three tug and barge lines, two U.S. highways, five truck lines, and a short line railroad which connects with the Union Pacific Railroad and BNSF Railway.

Between a one half and one million tons of wheat and barley are exported through the Port annually. Six steamship lines provide containers to move an additional million tons of containerized cargo.

Containerized shipments relay exports to the coast, enabling the Port to ship to some 60 foreign countries in eight major regions of the world.

As noted in the national ASCE infrastructure report, there is no recognized engineering specialty to comprehensively address the current and future waterways systems challenges in the Columbia-Snake system and the Port of Lewiston. Therefore, also reflecting similar findings to the national ASCE infrastructure report, we were unable to assess the condition of, or assign a grade to, the infrastructure of the Columbia-Snake system and the Port of Lewiston due to a lack of data.

PASSENGER RAILROADS

Amtrak currently operates only one long-distance train through Idaho, the Empire Builder (daily Chicago-Minneapolis-Seattle/ Portland service via the one Idaho stop in Sandpoint).

As part of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), Amtrak was directed to perform a number of studies, including one for restoration of service over all or part of the Seattle-Portland-Boise-Denver-Chicago Pioneer route, which was discontinued in 1997. Amtrak completed this study by the October 16, 2009, deadline in the law.

In the Amtrak Pioneer feasibility study, Amtrak recommends that federal and state policymakers determine if intercity passenger rail service along the former Pioneer route should be reintroduced and, if so, that they identify the preferred option for service restoration and provide the required levels of capital and operating funding to Amtrak. Upon such a decision, Amtrak will aggressively work with federal and state partners to restore the Pioneer service. Unfortunately, no capital and operating funding sources have been provided to date. In the study, Amtrak estimated ridership at 82,000-111,000 per year for the entire route.

The different components were not broken out for passenger rail. It is simply unacceptable to not have passenger rail in southern Idaho when there is currently resurgence in passenger rail in other parts of the country, even in the neighboring Pacific Northwest from Vancouver, B.C.-Seattle-Portland-Eugene.

SOURCES

- 1 Idaho on the Move: Idaho Transportation Department's Long-Range Plan to Improve Safety, Mobility and Economic Vitality, [Technical Report 16: Railroad System Overview](#)
- 2 Railroad e-mail surveys
- 3 Amtrak Pioneer Service Study-PRIIA Section 224, <http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&cid=124124566922>
- 4 National Infrastructure Protection Plan, Partnering to enhance protection and resiliency, U.S. Department of Homeland Security, 2009

SCHOOLS

**Schools
Category
Overall Grade:**
C-

Schools have dominated the headlines the last few years in Idaho, regarding funding, legislation, teaching, and other aspects of our education system. Even though topics in education are numberless, our effort in the *2012 Report Card for Idaho's Infrastructure* is focused on the physical facilities for students in grades K through 12.

In 1991, a Statewide School Facilities Needs Assessment Committee was established. As a result of that effort, a Statewide School Facilities Needs Assessment was published in 1993¹ summarizing the findings. This report included an inventory of school facilities and technology, an assessment of the physical condition of the schools, and the capacity of permanent school buildings to meet enrollment needs. An update to the 1993 assessment was released in 1999.² Unfortunately, since the 1999 update, there has been no statewide assessment performed and the lack of adequate information makes assessing the state's public school facilities a difficult process.

Capacity

Component Grade:
C+

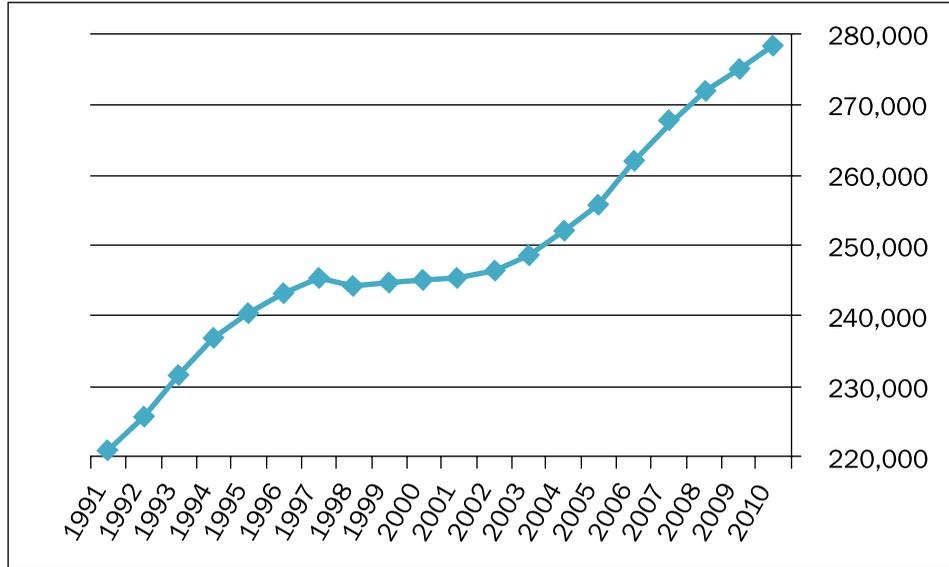
Capacity in the Idaho public school system is a growing concern as budget constraints threaten to increase student to teacher ratios across the state as enrollment increases. The following facts illustrate the scope of Idaho's K through 12 education system.

-  There were 115 public school districts containing 755 public schools in 2009-2010.³
-  Public schools employed about 15,200 teachers in 2009-2010.³
-  281,593 students are enrolled in public schools in 2010-2011, which is up almost 15 percent from 2000-2001.⁴

The 1999 update reported that the 1998-1999 total statewide capacity in permanent and temporary structures was 235,094 students to go along with an enrollment of 244,556 students. It also stated that "the state has made considerable progress reducing the 1993 need of 2 million square feet by 40%, while accommodating the growth in enrollment of 12,902 new students."

Enrollment has continued to increase since the time the 1999 update was prepared. The percent increase in enrollment since 1999 has varied from 0.1 percent per year to 2.3 percent per year with an average increase of 1.2 percent per year. Figure 1 illustrates the increase in enrollment in Idaho public schools for the last 20 years.⁴

FIGURE 1 – IDAHO PUBLIC SCHOOL ENROLLMENT 1991-2010



Component Grade:
C+

Condition

During the 1993 Needs Assessment, 71 buildings were identified as being in the worst condition across the state.¹ The 1999 Update indicated that 18 of those 71 buildings were removed from service and “of the remaining 53 buildings still currently in service, 21 have had major renovations totaling over \$12.5 million. 18 have had minor renovations with an estimated renovation cost of \$281,000, and the remaining 14 have not had any significant repairs since 1993 and are still considered to be in unsatisfactory condition.”²

As a part of our preparation of this Report Card, the Southern Idaho Section of ASCE requested data of all the school districts across the state of Idaho. One of the questions addressed the condition of the 14 remaining buildings. Results showed that at least 5 of the remaining 14 buildings were removed from service or had major renovations since the 1999 update.⁵

The physical condition of schools is often outward evidence of a school’s age. The U.S. Department of Education produced a report in 1999 stating, “concerns that older schools are in more disrepair, lack the necessary infrastructure for advanced telecommunications systems, have inefficient mechanical systems, and may lack modern safety features have raised concern about the age of America’s schools.”⁶ One of the terms used to describe the age of schools is functional age, or the years since construction, or the years since the most recent major renovations.

As part of the requested data mentioned previously, we were able to observe the functional age of school buildings across the state. Data on about one-third of

the schools in the state found that, of the schools responding, public schools in Idaho were built, on average, 36 years ago, and the average functional age was approximately 24 years. Overall, about 15% of the public schools responding had a functional age of less than 5 years, 32% had a functional age of 5 to 14 years, 26% had a functional age of 15 to 34 years, and 26% had a functional age of 35 years or more. Thus, about half of the schools had a functional age of less than 15 years. A report by the U.S. Department of Education indicated that 6 out of 10 schools across the nation had a functional age of less than 15 years.⁶ Idaho is below this national average.

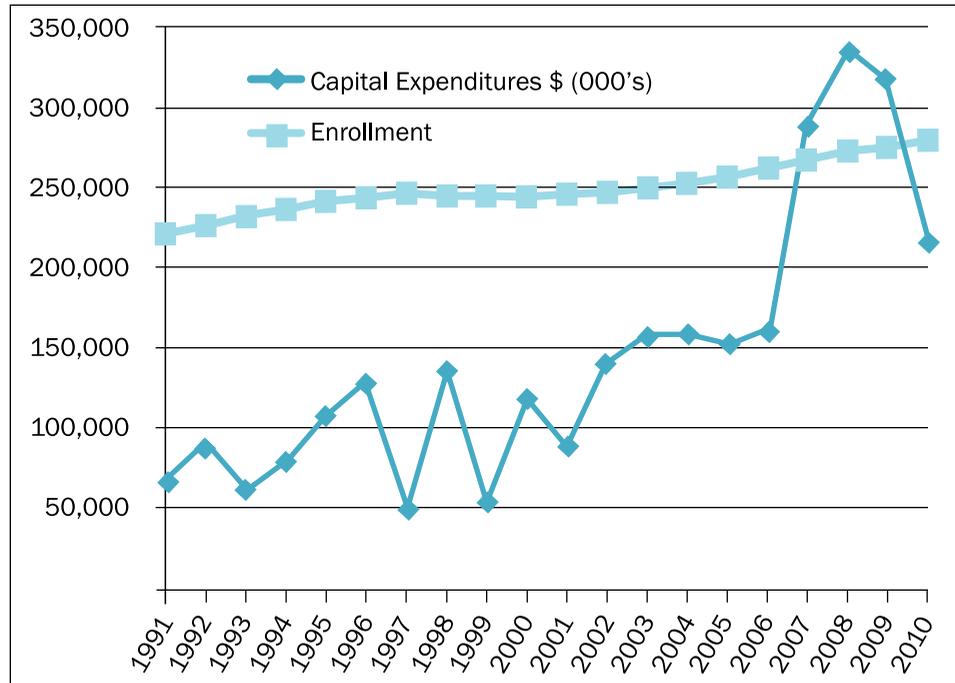
Funding

Component Grade:
C+

A 2008 U.S. Census Bureau survey indicated that Idaho was second to last in elementary-secondary per pupil current spending amounts by state. The spending amount was \$6,931 per pupil which was more than only Utah, which had a spending amount of \$5,765 per pupil. Both of these amounts are far below New York, the highest spending amount, which spent \$17,173 per pupil.⁷ While these amounts include more than capital expenditures on facilities, it gives an indication of a challenge Idaho must address in public school funding.

Figure 2 illustrates the capital expenditures in Idaho public schools along with enrollment. While enrollment has increased, so have capital expenditures, particularly in the late 2000's. Spending has dropped off since 2008.

FIGURE 2 – IDAHO PUBLIC SCHOOL CAPITAL EXPENDITURES AND ENROLLMENT 1991-2010⁸



Funding of public schools in Idaho is a common backdrop for many legislative sessions. One case that has effected public school facility spending is Idaho Schools for Equal Educational Opportunity (ISEEO). In 2001, a district court ruled that the state had failed in its constitutional duty to provide a thorough education for Idaho's public school students in a safe environment conducive to learning, especially as it pertains to the poorest of school districts. The case was then brought to the Supreme Court of Idaho in 2005 where the Supreme Court affirmed the conclusion of the district court that the current funding system is simply not sufficient to carry out the Legislature's duty under the constitution.⁹ In 2006, the Idaho Legislature passed the School Facilities Improvement Act to increase funding for school building projects.



Future Need

Component Grade:
C-

The 1999 School Facilities Needs Assessment Update reference earlier stated that the total estimated funding for additional capacity is approximately \$136 million in 1999 construction dollars. The report also stated that since 1993, not only has the increased enrollment been accommodated, but the deficit has been reduced by about 40%. Without any additional comprehensive authoritative data since that time, it's difficult to determine if the positive trend has continued.

Operation and Maintenance

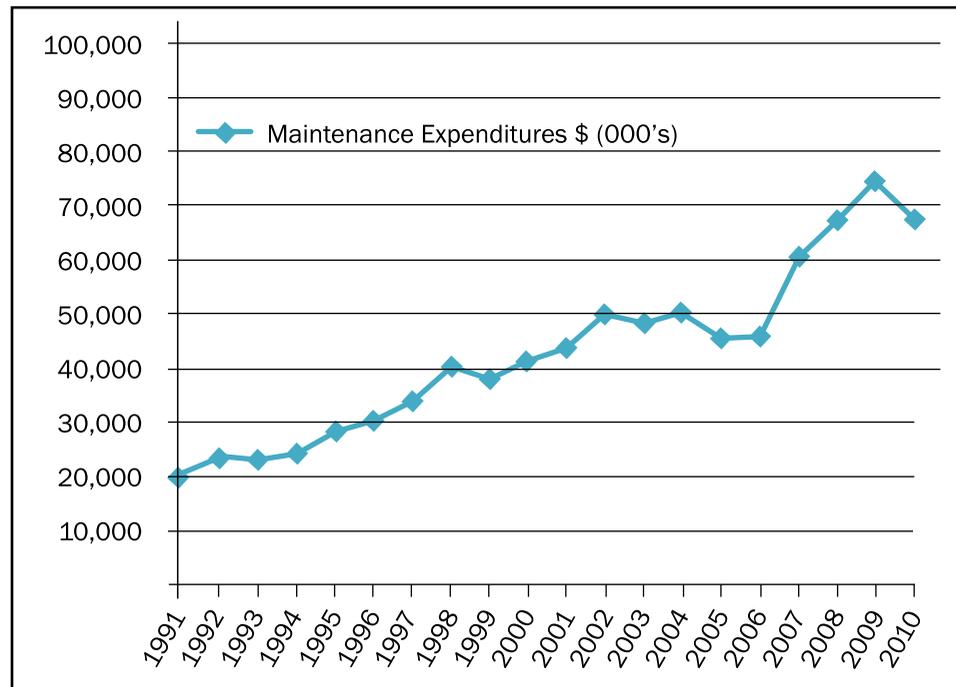
Component Grade:
B+

As part of the School Facilities Improvement Act, a requirement of the Division of Building Safety and the State Department of Education to consult and prepare best practice maintenance plans for school buildings. The resulting maintenance plan stated the following purposes¹⁰:

-  Preserve taxpayers' investments in public buildings.
-  Help buildings function as they were intended and operate at peak efficiency, including minimizing energy consumption.
-  Prevent failures of building systems that would interrupt occupants' activities and the delivery of public services.
-  Sustain a safe and healthful environment by keeping buildings and their components in good repair and structurally sound.
-  Provide maintenance in ways that are cost-effective.

Figure 3 illustrates the maintenance expenditures in Idaho public schools. As shown, maintenance expenditures have continued to increase, particularly since 2006.

FIGURE 3 – IDAHO PUBLIC SCHOOL MAINTENANCE EXPENDITURES*



RECOMMENDATIONS

- ✦ Publish regular updates of the Statewide Facilities Needs Assessment to ensure a clear view of current conditions.
- ✦ Encourage school districts to implement comprehensive construction and maintenance programs.

SOURCES

- 1 Statewide School Facilities Needs Assessment, Statewide School Facilities Needs Assessment Committee, Idaho State Legislature, 1993.
- 2 1993 Statewide School Facilities Needs Assessment Update, 3D/International, Inc. and Facility Planners, Co., September 1999.
- 3 National Center for Education Statistics, Idaho State Education Data Profile, nces.ed.gov, accessed on November 30, 2011.
- 4 Idaho State Department of Education, Historical Fall Enrollment/Membership by Grade for Idaho Public Schools, 2011.

- 5 Data collected from Idaho School Districts via email requests, November – December 2011.
- 6 U.S. Department of Education, Center for Education Statistics, NCES 2000-032, Condition of America's Public School Facilities: 1999, June 2000.
- 7 U.S. Census Bureau, 2008 Survey of Local Government Finances – School Systems.
- 8 Idaho State Department of Education, historical financial data for Idaho public schools, capital expenditures and maintenance expenditures, 2011.
- 9 The Supreme Court of the State of Idaho, Docket No. 29616, 2005 Opinion No. 131, Filed December 21, 2005.
- 10 State Department of Education, Idaho, Best Practices Maintenance Plan for School Buildings, September 2006.

STATE HIGHWAY SYSTEM

**State Highway
Category
Overall Grade:**

D+

Over the past two decades, Idaho has managed about 12,000 lane miles with additions and subtractions annually. The Idaho Transportation Department (ITD) strives to reduce deficient pavement, increase preventative maintenance, and give motorists a safer and smoother ride. The term “deficient” is used to indicate that pavement has fallen below a certain threshold and requires structural remedy. In 2009, the Idaho Transportation Department (ITD) invested in a new pavement management system (PMS). The PMS uses three measurement tools to determine if a pavement is deficient: the cracking index, the roughness index, and the rutting index. Each measurement has thresholds that determine if a pavement is rated good, fair, poor, or very poor. Poor and very poor pavements are considered deficient.



Pavement deficiencies on the State Highway System have been reduced from 41% in 1993 to 13% by the end of 2011. The PMS became active on December 17, 2010, and contains an analysis engine which applies the state’s construction history, decision processes, and pavement performance curves to accurately and consistently predict pavement deterioration.

Capacity

Component Grade:

B

The capacity the State Highway system measures how it handles the existing and projected traffic volumes. The portions of the State Highway System most prone to capacity problems exist in the urbanized areas of the state, principally in the Boise-Nampa-Caldwell Metropolitan Area, and to a lesser extent, the

Coeur d'Alene, Idaho Falls, and the Pocatello Urban Areas. Some rural areas which have heavy seasonal tourist traffic also present a capacity challenge.

Condition

Component Grade:

B

At the end of 2011, ITD managed nearly 5,000 centerline miles (approximately 12,190 lane miles) on the state highway system. In 2011, the pavement condition of those lane miles on the state highway system shows just 13% of the pavement is considered deficient. That is a 3% improvement from the 2010 amount of 16% deficient pavements. Out of the 13% deficient, 1% are very poor and 12% are poor. Further, 24% of the state highway system is rated fair, and 63% is rated good. This current pavement condition reflects the Idaho Transportation Board's decision to focus much of their recent funding on pavement treatments. The current pavement strategy for the Idaho Transportation Board is to invest approximately \$100 million annually in pavement treatments that are more preventative in nature, consisting of seal coats, overlays, and minor rehabilitations. Even with this strategy, the PMS predicts that by 2021, the deficient pavement will grow to 28%.

Funding

Component Grade:

D-

ITD has an annual budget of nearly \$584 million. Of that total, \$298.7 million is budgeted for contract construction and right of way acquisition, and \$160.8 million is budgeted for Highway Operations, which includes personnel and operation 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 acknowledged the additional amounts needed are \$155 million annually for operation, preservation, and restoration of the state system, and \$207 million annually for capacity and safety enhancement for the state system. That amounts to a need of a 62% increase above the existing budget for the state highway system.

Future Need

Component Grade:

D-

54% of ITDs' FY 2013 funding will come from Federal Funds. With the current status of the next Transportation Funding bill, the Highway Trust Fund, and the National debt situation, that high of a dependency on funding for the state highway system has many Idahoans very concerned. The Governor's Task Force identified a need for an additional \$362 million annually assumes the federal funding levels would remain at least at the 2012 levels. The last time Idaho increased its' state gas tax was 1996. Future increased funding for transportation is scheduled to be addressed in 2013, but it will be a major battle to get legislative approval and is likely will be phased in over three to five years. If the economy hasn't shown a larger turnaround by 2013, that battle will be even more difficult.

Operation and Maintenance

Component Grade:

D

ITD has recently gone through a “realignment” of the department work force, which has reduced the layers of management and put the decision-making closer to where the work is being done, and moved more of the staff positions to the front line to help accomplish the operation and maintenance tasks of the department. The FY 2013 budget for highway operations is \$160.8 million, or about 28% of the annual budget. The investment in the new Pavement Management System in 2009 has assisted ITD’s move to being more efficient and has allowed the department to implement innovative business practices. The current turnover rate of employees at the front line maintenance level is approaching 50% and a major focus of ITD in the future. Compensation pay is a major contributor to that turnover rate because lack of funding has prevented raises for employees over the past 4 years. The additional funding anticipated in 2013 might help with this issue.



Public Safety

Component Grade:

C

The 5-year fatality rate for Idaho has dropped from a rate of 1.86 fatalities per 100 million vehicle miles in the 2002 to 2006 time period, to a rate of 1.53 fatalities per 100 million vehicle miles in the 2006 to 2010 five year period. The goal for 2012 is 1.38.

Resilience

Component Grade:

D

Idaho’s mountainous topography often presents serious problems in maintaining the resilience of the State Highway System. One 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. Landslides and avalanches are another maintenance issue that periodically occurs in Idaho. These natural disasters cause rural communities to be cut off from critical services. The northern and southern regions of the state have a more robust network of roads which better provide for redundancy of services.

RECOMMENDATIONS

-  A new Federal Highway Bill needs to be passed in order to provide a multiyear plan that establishes funding levels that ITD can plan and count on for developing their program.

- ⚠ Additional state revenue needs to be identified no later than 2013, which would include as a minimum an additional \$155 million annually for operation, preservation and restoration of the state highway system.
- ⚠ Additional state revenue needs to be identified no later than 2013, which would include as a minimum an additional \$207 million annually for capacity and safety enhancement for the state system.
- ⚠ Address the compensation levels of all state employees to catch up with industry levels currently estimated to be 14% to 17% behind the industry, and in particular other governmental agencies, to reduce turnover rate.

SOURCES

- 1 Idaho Transportation Department Accountability Report, 2011.
- 2 Idaho Transportation System 2011 Pavement Performance Report.
- 3 Treasure Valley Annual Congestion Management System Report, 2011.
- 4 2012 to 2016 Five Year Idaho Transportation Investment Plan.
- 5 Governor's Task Force on Modernizing Transportation Funding, 2011.
- 6 FY13 Presentation to the Joint Finance and Appropriation Committees, February 10, 2012.

Transit Category
Overall Grade:
D

TRANSIT

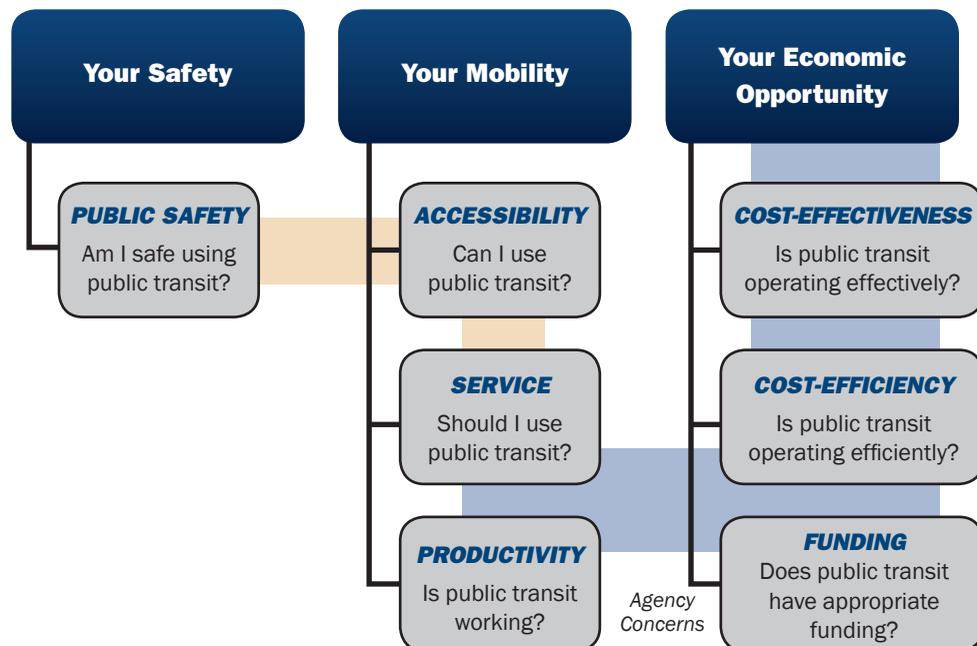
It is the purpose of this Report Card to examine and grade key components of Idaho's Public Transit. This Report Card uses the most recent available data from 2010 and evaluates fixed-routes and demand response services of Idaho's Public Transit System.



This Report Card is intended to give a snapshot analysis of Idaho's Public Transit as a whole to help reveal its successes and failings.

The components within the Transit Category were chosen based on how well they addressed fundamental issues related to a successful public transportation system in Idaho. The components are Public Safety, Accessibility, Service, Productivity, Cost-Effectiveness, Cost-Efficiency, and Funding. These components fall under the Idaho Transportation Department (ITD) mission: Your Safety, Your Mobility, and Your Economic Opportunity (Figure 1). This structure will allow ITD to easily monitor and achieve their mission.

FIGURE 1



There are component distinctions between passenger concerns and agency concerns. The passenger concerns measure the function of public transit from the rider's perspective. The agency concerns measure the function of public transit from an internal perspective.

In preparation, 2010 data was gathered regarding public transit services for both fixed-route systems and demand response systems. Some statistical and Geographical Information Systems (GIS) data was available and collected from the U.S. Census Bureau, Idaho Transportation Department and independent contractors. Other needed data was obtained through agency surveys and reporting documentation. Some of the components required two separate grading metrics due to the differences between the fixed-route and demand response services provided.

Idaho's Public Transit System received an overall grade of a D. This grade is based on the percentage of optimal goals achieved through the analysis of the identified components.

Public Safety

Component Grade:

A

Public Safety is a measure of safety provided as well as the confidence instilled with customers who are using the transit system. Public Safety is essential for those who depend on transit to get from point A to point B. High Public Safety grades should also enhance ridership numbers by adding passengers that are not dependent on public transit, but would choose public transit if it was a safe mode of transportation.

The following facts reveal the Public Safety of Idaho's Transit System:

-  96% of vehicle revenue miles were serviced with zero accidents.
-  100% of vehicle revenue miles were serviced with zero fatalities.

Idaho's fixed-route buses and demand response vehicles serviced 4,996,145 revenue miles in 2010. Over the course of these miles there were only two reportable transit-related accidents that occurred in Idaho and zero fatalities. The accident rate for Idaho's Public Transit was .4 accidents for every 1 million revenue miles driven. This is excellent compared to the 2.26 accidents per 1 million revenue miles which is the national average. Using this number for the average and zero accidents as optimal, Idaho has serviced 96% of its revenue miles with zero accidents and 100% with zero fatalities.

Accessibility

Component Grade:

D-

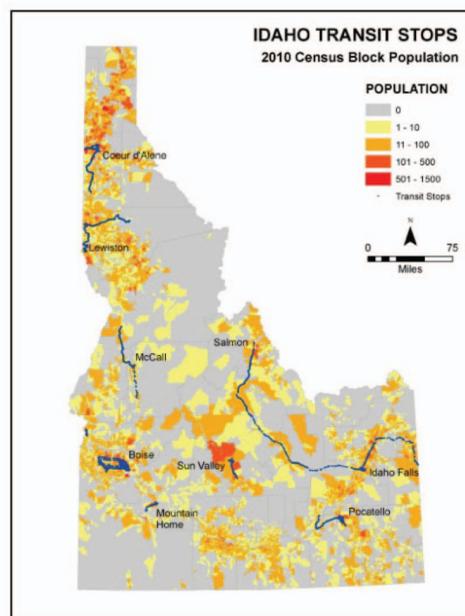
Accessibility is a measure of the ability of Idahoans to access public transit to get to their desired destinations. The success of a transit system is closely tied to the access and location of transit stops. Higher accessibility to public transportation can lead to decreased congestion, improved air quality, and increased economic opportunity for individuals and communities in Idaho.

The following facts reveal the Accessibility of Idaho's Transit System:

-  56% of the accessibility goal was achieved.
-  60% of the high-density accessibility goal was achieved.

The Accessibility components for fixed-route systems were graded using GIS analysis. Transit stop locations and 2010 U.S. Census Bureau block data were overlaid to identify residents that resided near a transit stop (Figure 2). Approximately 501,440 of Idaho residents had access to a transit stop, which was 32.0% of Idaho's total population of 1,567,582. According to the 2010 U.S. Census, Idaho population was approximately 65% urban and 35% rural. According to these findings, Idaho's Transit System provided access to approximately 49% of its urban population. Idaho's Transit System provided demand response service to 62% of Idaho's total population. Taking this into

FIGURE 2



account for the grading process, it would be optimal for 95% of Idaho's urban population to have access to a fixed-route transit stop. It would be optimal for 100% of Idaho's population to have access to demand response service. These combined findings resulted in an overall rating of 56% for Idahoans with access to transit.

It is critical for high-density areas to have access to a transit stop. For this report, areas with a density of 6 housing units per acre or more were considered to be high-density. GIS analysis was then used to identify the percent of high-density census blocks that had access to a transit stop. Taking this into

account for the grading process, it would be optimal for 100% of these high-density areas to have access to transit. According to these findings, 60% of high-density areas had access to a transit stop.

Service

Component Grade:

D

Service is a measure of activity and, therefore, quality of public transit. This measure captures the experience that passengers have or expect to have on public transit. Customer satisfaction of transit service comes from good maintenance, service efficiency, modern technology, respectful and qualified

staff, and quick responsiveness. High service grades will increase ridership by providing a reliable and preferred alternative to private vehicles.

The following facts reveal the Service of Idaho's Transit System:

- 🚩 86% of the goal was achieved for vehicle revenue miles between vehicle failures.
- 🚩 58% of the goal was achieved for minutes between bus service frequency at each transit stop.

The reliability of Idaho's Transit System was determined by calculating the number of vehicle revenue miles between vehicle failures for both fixed-routes and demand response vehicles. Based on the agency's that provided data, Idaho's vehicles serviced an average of 14,576 revenue miles between vehicle failures. The national average of revenue miles between failures was 7,500. States comparable to Idaho had averages between 5,000 and 25,000 revenue miles between vehicle failures. For grading purposes, Idaho's target is 18,000 vehicle revenue miles between vehicle failures. Therefore, for vehicle revenue miles between vehicle failures, Idaho is meeting this target 86% of the time.

Bus service frequency is a significant measurement for the service available to passengers. The average service frequency for Idaho's Transit System was 54 minutes. Express routes that ran only one or two trips per day were excluded from this calculation; however, they provide a great value to travelers with schedule demands. Reviewing service frequency of large metropolitan and rural bus routes revealed an optimal frequency of 15 minutes. Therefore, Idaho's average bus service frequency achieved 58% of this goal.

Productivity

Component Grade:

D

Productivity is a measure of the success of public transit as a mode of transportation and is a reflection of the safety, accessibility, and service that is provided. This measure captures the number of passenger trips and quantity of trips that are accomplished, which can be used to determine costs, needed funding, and long-range transportation planning.

The following facts reveal the Productivity of Idaho's Transit System:

- 🚩 59% of the goal for passenger trips per capita was achieved.
- 🚩 73% of the goal for passenger trips per revenue hour was achieved.

In 2010, the number of passenger trips taken on Idaho's fixed-route and demand response vehicles was approximately 3.4 million, and the average number of passenger trips per capita was 2.2. The national average for passenger trips per capita is 16.9 which is significantly higher than Idaho. Five comparable states were combined for an average of 2.4 trips per capita. However, these statistics were among the lowest since the density is essential in

obtaining high ridership numbers, and Idaho is ranked 44th in the nation for density. These limitations were taken into consideration to determine the optimal number of trips in Idaho to be 6.0 per capita. According to these findings, 59% of this targeted goal was achieved.

Another metric to show the productivity of Idaho's Transit System is the passenger trips per revenue hour ratio. The fixed-route systems in Idaho run 14.2 trips per revenue hour and demand response vehicles run 2.9 trips per revenue hour. Compared to states with similar demographics it was determined 34 fixed-route trips per revenue hour and 3.2 demand response trips per revenue hour would be optimal for Idaho. According to these findings, 57.5% of fixed-route goals and 87.5% of demand response goals were reached in 2010. This is a combined overall grade for passenger trips per revenue hour to be 73%.

Cost-Effectiveness

Component Grade:

D+

Cost-effectiveness is a measure of the services received for the money spent. For this report, measures of the cost per passenger trip and fare box return ratio were used to analyze the cost effectiveness of Idaho's Public Transit System. The fare box return ratio measures the amount of revenue generated from customer fares as a fraction of the cost of the total operating expenses. These metrics only evaluate costs of the system and do not measure the ability to meet the needs of passengers or communities.

The following facts reveal the Cost-Effectiveness of Idaho's Transit System:

- 79% of the goal for costs per passenger trip was achieved.
- 55% of the goal for fare box return ratio was achieved.

Transit operating costs were used to determine costs per passenger trip so that comparisons to other transit systems could be effective. Capital costs, such as vehicle purchases, were evaluated in the Funding component and were not included in this analysis on Cost-Effectiveness.

The average cost per passenger trip on Idaho's Public Transit system was \$4.60 for fixed-route buses and \$17.04 for demand response trips. The national average for fixed-route costs per passenger trips was \$3.58 and demand response was \$33.00. It would be optimal for Idaho's costs per passenger trips to be \$2.50 for fixed-routes and \$20.00 for demand response. According to these findings, 57.5% of fixed-route goals were reached and 100% of demand response goals were reached. This is a combined overall grade for costs per passenger trip to be 79%.

Fare box return ratio measures funds received from passenger fares to help fund the total transit costs. It should be noted this metric reveals the lack of funds received from fares by transit systems in Idaho, which may be the intention of

the community to provide affordable service to its residents. This grade was, therefore, given a lower grading weight. The fair box recovery ratio was 8.65% for fixed-route systems and 3.54% for demand response. Peer analysis determined the optimal fair box return ratio in Idaho to be 23.7% for fixed-route systems and 29.9% for demand response. According to these findings, 58% of fixed-route goals were reached and 51% of demand response goals were reached. This is a combined overall grade for fare box return to be 55%.

Cost-Efficiency

Component Grade:

B

Cost-efficiency is a measure of the ability of public transit to manage its costs appropriately by keeping costs low and within budget. This measure reflects the financial return on the community's investment and will identify the resourcefulness of the system. This component requires Idaho's Public Transit to be well-organized and able to reduce waste.

The following facts reveal the Cost-Efficiency of Idaho's Transit System:

-  85% of the goal for cost per vehicle mile was achieved.
-  84% of the goal for cost per vehicle hour was achieved.

Costs per vehicle revenue mile are a reflection of Idaho's Transit System's cost-efficiency. The average cost per vehicle revenue mile for Idaho's Public Transit was \$4.54 for fixed-route systems and \$3.92 for demand response. Peer analysis determined the optimal cost per vehicle mile in Idaho to be \$2.94 for fixed-route systems and \$3.02 for demand response. According to these findings, 80% of fixed-route goals were reached and 89% of demand response goals were reached. This is a combined overall grade for costs per vehicle revenue mile to be 85%.

The average cost per vehicle revenue hour for Idaho's Public Transit was \$65.13 for fixed-route systems and \$49.23 for demand response. Peer analysis determined the optimal cost per vehicle revenue hour in Idaho to be \$38.01 for fixed-route systems and \$35.41 for demand response. According to these findings, 76% of fixed-route goals were reached and 92% of demand response goals were reached. This is a combined overall grade for costs per vehicle revenue hour to be 74.3%.

Funding

Component Grade:

D-

Funding is a measurement of the ability of Idaho's Public Transit System to obtain needed funding to sustain and grow in order to meet the needs of the communities. The majority of the funding for Idaho's Public Transit system falls onto Federal, State and Local entities and requires a necessary partnership to provide appropriate funding.

The following facts reveal the Funding of Idaho's Transit System:

-  27% of identified funding needed was actually received.
-  58% of the local funding goal was achieved.
-  33% of the state funding goal was achieved.
-  57% of the federal funding goal was achieved.

Idaho's Public Transit funding needs were assessed in 2009 and it was determined that approximately \$141 million was needed for sustainability and growth of the fixed-route and demand response services. In 2010, Idaho received approximately 27% of that identified needed funding. Based on the national distribution percentages of 21% from local funding, 20% from state funding, and 27% from federal funding, Idaho should have received \$29.6 million in local funds, \$28.2 million in state funds, and \$38 million in federal funds to meet the funding needs identified. Of the total funding needed, Idaho received 8.5% from local funds, .02% from state funds, and 10.1% from federal funds. These percentages translate into grades of 61% for local funding needed actually received, 33% for state funding needed actually received, and 62% for federal funding needed actually received resulting in an overall funding grade of 49%.

RECOMMENDATIONS

Idaho's public transit systems needs a significant amount of funding in the future to have a sustainable system that meets the fixed-route and demand response needs of Idaho communities. In addition, five highly populated areas are in need of new or additional routes to meet the growing demands. Finally, an increase in bus service frequency is needed for many routes on the existing systems.

There were other valid issues of consideration this document did not address, but may need to be evaluated in the future as Idaho's population increases. Items that may be addressed in the future are as follows:

-  Technology advancements
-  Staff training
-  Complaint rates
-  Bus Stop Safety
-  On-Time Performance

Even with the many obstacles faced in obtaining a fair and accurate grade, the performance measurement methodologies outlined in this document can be a starting point in developing an optimum outlook for Idaho's Public Transit system. The circular process of performance management will allow for continual analysis and modifications to the grading criteria, which will be valuable for decision makers and future policy.

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