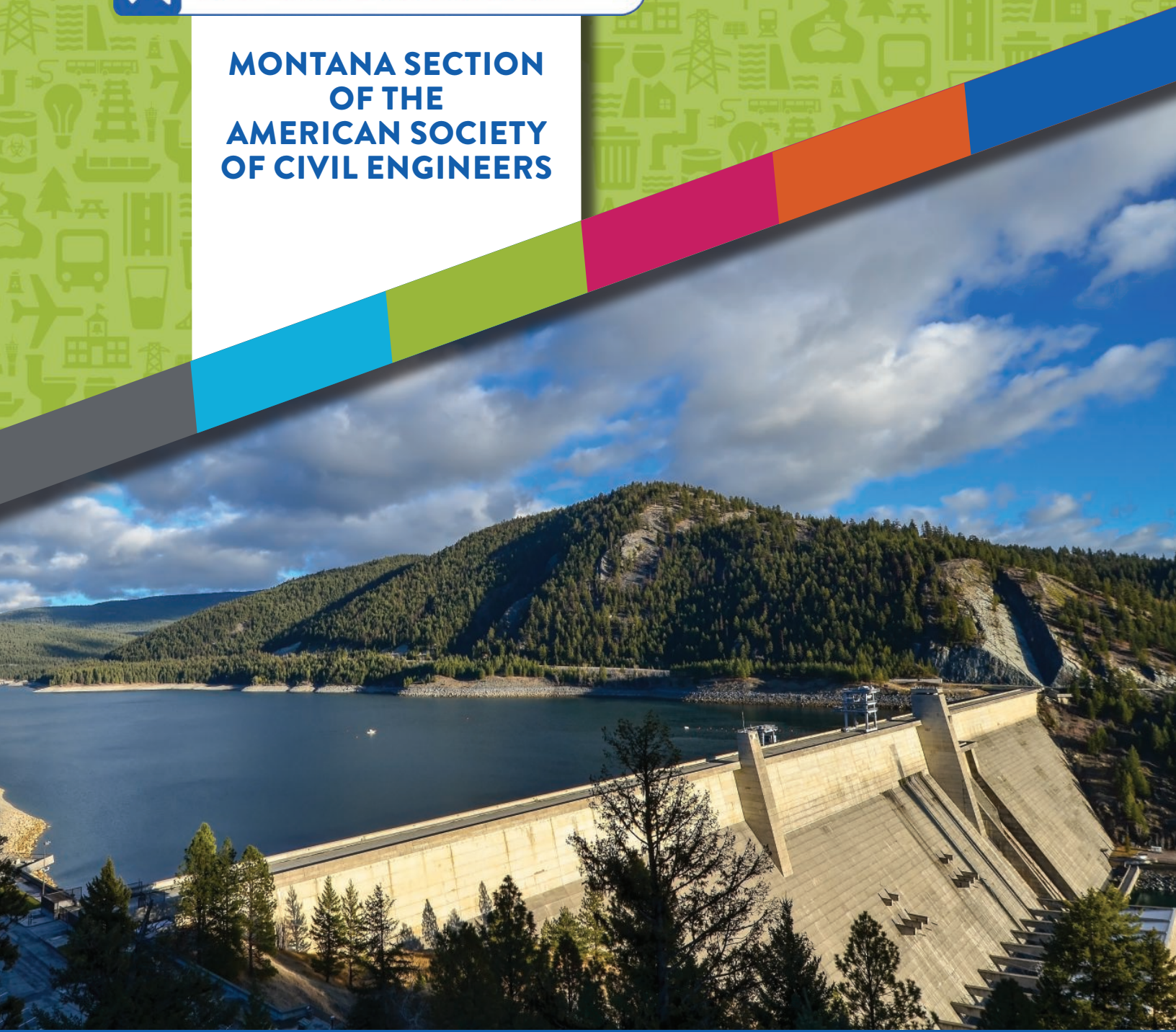
2024 REPORT CARD FOR MONTANA'S INFRASTRUCTURE

MONTANA SECTION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS



ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

INFRASTRUCTUREREPORTCARD.ORG/MONTANA

2024

REPORT CARD FOR MONTANA'S INFRASTRUCTURE

TABLE OF CONTENTS

ACKNOWLEDGMENTS

We thank each infrastructure professional for contributing to the *2024 Report Card for Montana's Infrastructure*.

COMMITTEE CHAIR

Lexi Leffler

RELEASE, MARKETING, & LOGISTICS SUPPORT

Dan Karlin, PE
Shane Stack, PE
Tim Diedrich, PE
Christina Eggensperger, MS, EIT
Dustin Hover, PE
Susan Brurud
Ryan Bossard
Kali Smelich, MA
Anthony Laslovich, PE

AUTHORS/CONTRIBUTORS

Category leads are listed below in bold.

Aviation—**Steve Brown**
Bridges—**Kathy Thompson, PE**, Karl Yakawich, PE
Broadband—**Matt Smith, PE, PMP**
Dams—**Tim Diedrich, PE**, BJ Cope, PE, Jerry Davis, PE
Drinking Water—**Matt Mudd, PE**, Christina Eggensperger, MS, EIT, Mike Kynett, PE, Craig Nowak, PE, Lane Urick
Energy—**Brian Terry, PE**
Hazardous Waste—**Lexi Leffler**, Zach Heffernan
Public Parks—**Shari Eslinger, PE**, Megan Terry, PLA, SITES AP, ASLA, Zach Heffernan
Rail—**Peter Klevberg, PE**, Chris Ward, PE
Roads—**Karl Yakawich, PE**, Kathy Thompson, PE, Lexi Leffler
Schools—**Dustin Hover, PE**, Anthony Laslovich, PE
Solid Waste—**Christina Eggensperger, MS, EIT**
Stormwater—**Lexi Leffler**, Zach Heffernan
Wastewater—**Matt Mudd, PE**, Christina Eggensperger, MS, EIT, Mike Kynett, PE, Craig Nowak, PE, Lane Urick
Other Contributors—Stephanie Beckert, PE, John Juras, PE, Mark Juras, PE, Melissa Matassa-Stone, PE, LEED AP, Jeremiah Theys, PE, Whitney Kross, PE, Brienne Meyer, CIH

EXECUTIVE SUMMARY

INTRODUCTION

Montana's infrastructure is the foundation that supports its growing economy, connects its communities, sustains tourism, and fosters resilience across both urban and rural areas. However, Montana's vast geography and unique landscape bring distinct challenges. The state spans over 147,000 square miles and includes over 27 million acres of public lands, seven American Indian reservations, nine national forests, and two major national parks—Glacier and Yellowstone. These areas attract visitors and define Montana's natural heritage, but also demand specific infrastructure solutions to support access, safety, and environmental stewardship.

Montana's infrastructure has historically faced underinvestment, leading to deferred maintenance and increased pressure on essential systems. However, recent initiatives have sparked critical improvements. Montana has benefitted from federal investments such as the 2021 Infrastructure Investment and Jobs Act (IIJA) and the 2022 Inflation Reduction Act (IRA). These, alongside other funding sources, have infused $8 billion into state infrastructure – plus $2 billion more from the private sector. These investments targeted urgent needs, including replacing aging water lines, modernization of transportation networks, and expanding broadband access in rural and remote areas.

Improving Montana's infrastructure requires careful planning and strategic funding solutions. Montana's infrastructure must also adapt to risks from extreme weather events, public health imperatives such as removing lead water lines, and new environmental challenges such as "forever chemicals" in water supplies.

The 2024 Report Card on Montana's infrastructure provides a snapshot of the state's current infrastructure landscape, capturing areas of progress and identifying challenges that remain. This report emphasizes that continued long-term investment across all infrastructure categories is vital to support Montana's future. Addressing these critical infrastructure needs will enhance public safety, boost economic resilience, and improve the quality of life across Big Sky Country. This report calls for coordinated efforts between residents and decision-makers to build a resilient, inclusive, and sustainable future for every Montanan.

AVIATION C

Montana's public aviation system comprises nearly 130 airports: eight primary service, four commercial service, and 117 general aviation airports. These facilitate the movement of passengers and cargo and provide medical evacuation services, agricultural support, and bases for wildland firefighting. Enplanements at primary and commercial service airports grew 19% from 2019 to 2023, amid population growth in the state. All primary airports have been expanded, rehabilitated, or begun new terminal construction projects in the last five years. Pavement conditions on runways, taxiways, and aprons rated satisfactory on average in 2021, but those surfaces are aging, necessitating continued preservation work. Over the last 20 years, federal funding for state airports jumped from $36 million in 2003 to $63 million in 2020, and an average of $113 million from 2021 through 2023. State grant funding increased tenfold to $2.3 million in 2023 following a 2020 aviation fuel tax increase. Workforce development, proactive planning, and partnerships with sustained funding will improve state airports.

BRIDGES C-

Montana has over 5,200 bridges, with state-owned structures averaging 50 years in age. The overall condition of bridges – categorized as good, fair, or poor – remained relatively stable between 2019 and 2023, with 15% requiring immediate repairs in both analysis years. However, the number of load-posted or closed bridges has steadily increased, now totaling 600 and growing by 10% to 20% annually. In Montana's rural areas, detours for closed or restricted bridges, when available, can add substantial distances to trips. Ownership influences the severity of the issue: while only 2% of state-owned bridges are load-posted or closed, 20% of locally owned bridges face these restrictions. Recent federal investments and the 2023 Montana Legislature's passage of three bills to increase tax revenue for state and local bridge maintenance have provided some relief. Nevertheless, a significant funding gap remains. Over the next decade, anticipated funding of $535 million falls far short of the $4.4 billion needed to address Montana's bridge infrastructure needs.

BROADBAND I

Montana has made considerable progress in the past several years to address deficiencies in broadband throughout the state, though it is ranked at the bottom nationally in overall access. Only 71% of locations served by internet service deliver today's speed standard of 100 MBps download and 20 MBps upload, compared to the national mark of 93%. In 2021, the Montana Legislature directed $275 million into broadband projects from 2021's American Rescue Plan Act. The Infrastructure Investment and Jobs Act passed by Congress that same year will deliver at least $775 million of broadband investments, including almost $100 million in Tribal communities. Montana's Governor and the Montana Broadband Office have enhanced planning efforts with a target to make broadband accessible statewide by 2030. Adoption of broadband connections lags accessibility, in some cases, because of affordability and computer literacy gaps. To complete the deployment of these federal and state investments and earn a letter grade, decision-makers should collect more data on broadband infrastructure condition, capacity, reliability,

DAMS C-

Montana's geography and varied climate mean the state's more than 3,000 dams represent an inventory 50% bigger than any other western state. 81% are privately owned, 10% are federally owned, and only 5% are state-owned, posing challenges to Montana leaders. Out of 3,000 total, 206 are High-Hazard Potential (HHP) potentially threatening life should they fail. Of these 206 HHP dams, 81 have federal owners, and 78 possess Emergency Action Plans (96%), compared to 91% of the HHP dams owned by Montana with those plans. Dams are aging in Montana, with an average age of 70 – beyond the common 50-year design life. Funding is limited to improve these structures. 2021 data showed that eleven state-owned HHP dams required work that could take over a decade to fund. Private owners managing the bulk of dam inventory have even less access to public funds. Montana decision-makers should prioritize and remedy the areas of greatest risk with increased funding and nurture the workforce necessary to deliver.

DRINKING WATER C

Montana has nearly 2,300 water systems operated by public and private entities, including various water treatment, distribution, and storage facilities. These systems serve over one million residents and the state's vital tourism and recreation industries. While several of Montana's larger cities have recently significantly upgraded their water treatment plants and distribution systems, much work remains. The Environmental Protection Agency (EPA) estimates that Montana will need$2.3 billion for water infrastructure improvements, with the greatest needs being in treatment and storage. In recent years, the total annual funding for water and wastewater projects in Montana has averaged over $250 million, up from $160-$170 million annually due to increases in federal funding. These funding levels must be maintained to meet the EPA's goals for infrastructure improvements needed in Montana. Additionally, Montana faces challenges related to a decreasing number of certified water operators. There is a critical need for recruitment and training to fill the growing demand for these professionals. Furthermore, new regulations require Montana communities to conduct lead service line (LSL) assessments, remove lead in water lines, and comply with emerging contaminant limits (e.g., PFAS), all of which are expected to further increase costs.

ENERGY C-

Montana's energy infrastructure is a diverse mix of coal, petroleum, natural gas, hydro, and renewables like wind and solar. The state ranks 4th in the nation for per capita energy consumption due to its energy-intensive industries, long travel distances, and harsh winters. Montana exports approximately 40% of its electricity, primarily to neighboring western states, making it a key player in the regional energy market. Despite its resources, Montana faces challenges in modernizing its grid to support growing renewable energy projects, ensure reliability, and meet increasing demand driven by population and tourism growth. Grid modernization, renewable energy development, and careful policy planning are crucial to securing Montana's energy future. By investing in innovative technologies and leveraging federal and private funding, Montana can enhance the resilience, sustainability, and affordability of its energy infrastructure.

HAZARDOUS WASTE C-

Montana has been increasingly active in managing and remediating hazardous waste sites in response to rising industrial activity, population growth, and stricter environmental regulations. The state is home to 18 Superfund sites listed on the National Priority List (NPL), hundreds of permitted hazardous materials sites and cleanup projects, thousands of underground storage tanks, and numerous brownfield sites. Montana has successfully leveraged funding from federal programs, including the Infrastructure Investment and Jobs Act (IIJA) and the Leaking Underground Storage Tank Fund (LUST), to support environmental cleanup and promote economic revitalization. State agencies are incorporating sustainability practices into infrastructure projects and adopting waste minimization strategies to address significant challenges posed by climate change. These challenges include increased storms, flooding, and rising temperatures, which threaten vulnerable hazardous waste sites. Despite these efforts, Montana faces ongoing difficulties in securing adequate funding and resources to address all hazardous waste management needs. New site identifications and evolving regulatory requirements further compound these challenges, emphasizing the need for continued investment and innovative solutions.

PUBLIC PARKS C-

Montana, renowned for its vast landscapes spanning over 30 million acres of state and federal lands, is a paradise for outdoor enthusiasts. The state is home to two national parks, Glacier and Yellowstone, with Glacier accounting for 3 million of the 5.7 million total national park visits in 2023. Montana's state parks also attracted 3 million visitors in 2022, marking a 19% increase since 2019. This surge in outdoor recreation has placed a significant strain on park facilities and infrastructure. A 2024 survey rated road conditions in state parks at 7 out of 10 and water systems at 6 out of 10. Staffing shortages, driven in part by a lack of affordable housing for seasonal workers, have further hampered park operations and public safety efforts across local, state, and national parks. These challenges are compounded by budget constraints and rising costs for operations, maintenance, and capital improvement projects. Despite these hurdles, Montana remains committed to preserving its natural and cultural heritage while ensuring equitable access to outdoor recreation for both Montana residents and visitors alike.

RAIL C+

Montana's rail infrastructure serves as a crucial link in the transportation network, facilitating the movement of goods across the state and to international markets. With nearly 3,700 miles of track, Montana's rail system supports the state's agricultural, energy, and industrial sectors while connecting rural communities to larger economic hubs. Freight operations dominate, with Class I railroads owning over 70% of track in the state, and short-line and regional railroads providing essential first- and last-mile connections. Passenger rail is limited to Amtrak's Empire Builder, which traverses the Hi-Line region. While Montana's rail infrastructure plays a vital role in the economy, it faces significant challenges, including aging infrastructure, capacity limitations, insufficient safety measures, and vulnerabilities to extreme weather events. Federal funding and innovative technologies offer opportunities for modernization, but targeted investment and coordinated planning are essential to meet current and future demands. Without action, Montana's rail network risks losing its ability to sustain economic growth, ensure public safety, and adapt to evolving transportation needs.

ROADS C-

Montana's highway system is a critical asset that supports travel, recreation, and commerce, making it a cornerstone of the state's economic vitality. The road network includes almost 13,000 miles of state highways and interstates, managed by the Montana Department of Transportation (MDT), as well as over 63,000 miles of county, municipal, and tribal roads. Despite its importance, long-term funding levels fall short of the need, with needs outpacing available revenue by a ratio of 3:1; thus, jeopardizing the future of Montana's transportation system. Population growth and increased vehicle miles traveled (VMT) further stress this infrastructure, underscoring the urgency of addressing systemic funding challenges. To secure the future of Montana's transportation network, increased funding from all levels of government, expanded preventative maintenance, and the adoption of advanced construction technologies are essential. Without decisive action, the state risks jeopardizing public safety, economic growth, and quality of life. A long-term commitment to investment and innovation will ensure a sustainable and resilient road system for future generations.

SCHOOLS D

Montana has 826 K-12 public schools that serve over 149,879 students, with facilities averaging 53 years in age. Two-thirds (68%) of these schools were built before 1970, highlighting a growing need for repairs and upgrades. While funding is available for critical safety issues, the Montana School Facility Reimbursement Program, which supports general maintenance, has experienced reduced revenue since 2010. This has created significant funding gaps for routine repairs, code compliance, and energy efficiency improvements. The challenges are further compounded by rising energy costs and declining student enrollment, placing additional strain on already tight school budgets. As a result, Montana's schools are struggling to meet the demands of their aging infrastructure while providing a safe and healthy learning environment for students. Addressing these issues requires sustained investment and innovative solutions to modernize facilities and support the long-term success of Montana's education system.

SOLID WASTE C

Montana residents generated approximately 1.5 million tons of municipal solid waste (MSW) last year, a per capita waste generation rate of 8.2 pounds per person per day, significantly higher than the national average. The state operates 31 landfills, and a total landfill capacity of about 30 million tons is unevenly distributed. Some regions are nearing or at capacity, highlighting a need for expanded waste management solutions and infrastructure upgrades. Montana's recycling infrastructure is limited, with only around five material recovery facilities (MRFs) and a recycling rate of about 19%, well below the national average of 32%. Additionally, less than 1% of MSW is converted to energy, indicating a potential area for development in waste-to-energy practices. Funding gaps in the solid waste management system, such as insufficient resources for innovation and infrastructure development, highlight the need for improved investment and strategic planning to advance sustainable waste management practices.

STORMWATER D

Montana's rural character and diverse landscapes make managing stormwater runoff a significant concern. While local stormwater utilities help address these challenges, their effectiveness is limited as Montana's 14 permitted districts cover only the state's few urban areas. Many smaller communities lack the capacity and funding to address local stormwater issues effectively. The Montana state government works with these districts to ensure that construction sites, urban areas, and industrial operations implement pollution control measures. However, agricultural runoff—often containing fertilizers, pesticides, and sediments—remains largely unregulated, posing a significant source of contamination. The full cost of implementing more robust stormwater management remains unclear. In 2022, the Environmental Protection Agency (EPA) estimated Montana's stormwater infrastructure needs at $22 million, though state-reported data may underestimate the costs of addressing urban runoff and mitigating agricultural pollution. Compounding these challenges, Montana's 2017 Climate Assessment predicts more severe precipitation events and increasingly unpredictable seasonal patterns, which existing systems—often designed with outdated data—cannot effectively manage. Addressing Montana's stormwater needs will require greater funding, improved regulatory coordination, and enhanced infrastructure design to create resilient systems capable of withstanding these evolving challenges.

WASTEWATER C-

Montana's wastewater infrastructure is a mix of public and private systems. Approximately 616,000 residents, or 58% of the state's population, are served by around 500 public wastewater systems, while private septic tanks and drain field systems serve the remainder. Although several of Montana's largest municipalities have completed significant upgrades benefiting about 25% of the population, many other systems—particularly those relying on lagoon treatment—have not been updated in over 30 years. The Environmental Protection Agency's (EPA) 2023 Clean Watersheds Needs Survey estimates that Montana requires $347 million in wastewater improvements, particularly in collection systems, lift stations, and advanced treatment upgrades. While recent federal legislation, including the American Rescue Plan Act (ARPA) and the Infrastructure Investment and Jobs Act (IIJA), has boosted funding, a substantial gap remains. Continued investment and innovative approaches are essential to meet the state's growing wastewater infrastructure needs and ensure environmental and public health protection.

GRADING METHODOLOGY

The *2024 Report Card for Montana's Infrastructure* was written by a committee of civil engineers from Montana who volunteered their time to collect and analyze data, prepare and review their findings. The committee worked with staff from ASCE National and ASCE's Committee on America's Infrastructure to provide a snapshot of our infrastructure, as it relates to us at home, and on a national basis.

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

CAPACITY

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

CONDITION

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

FUNDING

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

FUTURE NEED

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

OPERATION AND MAINTENANCE

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

PUBLIC SAFETY

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

RESILIENCE

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

INNOVATION

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

GRADING SCALE

A — EXCEPTIONAL: FIT FOR THE FUTURE

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

B — GOOD: ADEQUATE FOR NOW

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

C — MEDIOCRE: REQUIRES ATTENTION

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

D — POOR: AT RISK

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

F — FAILING/CRITICAL: UNFIT FOR PURPOSE

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

I — INCOMPLETE: NEED MORE DATA

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

SOLUTIONS TO RAISE THE GRADE

Montana's grades show that our infrastructure is in mediocre condition and requires attention. There is no one solution that can increase our GPA. Instead, we recommend a number of steps to raise the grades, which in turn, will strengthen our economy and prepare us for tomorrow.

ESTABLISH DEDICATED, LONG-TERM FUNDING FOR CRITICAL INFRASTRUCTURE CATEGORIES

Temporary or inconsistent funding sources have led to deferred maintenance and increased infrastructure vulnerabilities. Dedicated funding streams can ensure sustained investment in critical infrastructure, securing economic growth and public safety for the long term.

STRENGTHEN REGULATORY FRAMEWORKS TO ADDRESS EMERGING CHALLENGES

Updated regulations and design standards are essential to protect public health from emerging contaminants, preserve thriving public lands, and improve traffic safety. Design should support multiple users and benefits – like "nature-based" green infrastructure and "complete street" roadways.

ADDRESS WORKFORCE DEVELOPMENT TO SUSTAIN INFRASTRUCTURE PROGRESS

Montana's infrastructure improvement requires a larger, more skilled, well-resourced workforce. Investments in education, training programs, and apprenticeships will ensure a pipeline of qualified workers to build, maintain, and modernize infrastructure while boosting economic opportunity.

PRIORITIZE CLIMATE RESILIENCE IN INFRASTRUCTURE PLANNING AND DEVELOPMENT

Montana's diverse geography and extreme weather risks require robust strategies to enhance resilience. Investing in infrastructure capable of withstanding severe conditions, such as improved stormwater systems and wildfire-resistant designs, enhances resiliency and safeguards communities.

2024 REPORT CARD FOR MONTANA'S INFRASTRUCTURE

FOSTER PARTNERSHIPS AND POLITICAL LEADERSHIP TO SUPPORT COLLABORATIVE INFRASTRUCTURE SOLUTIONS

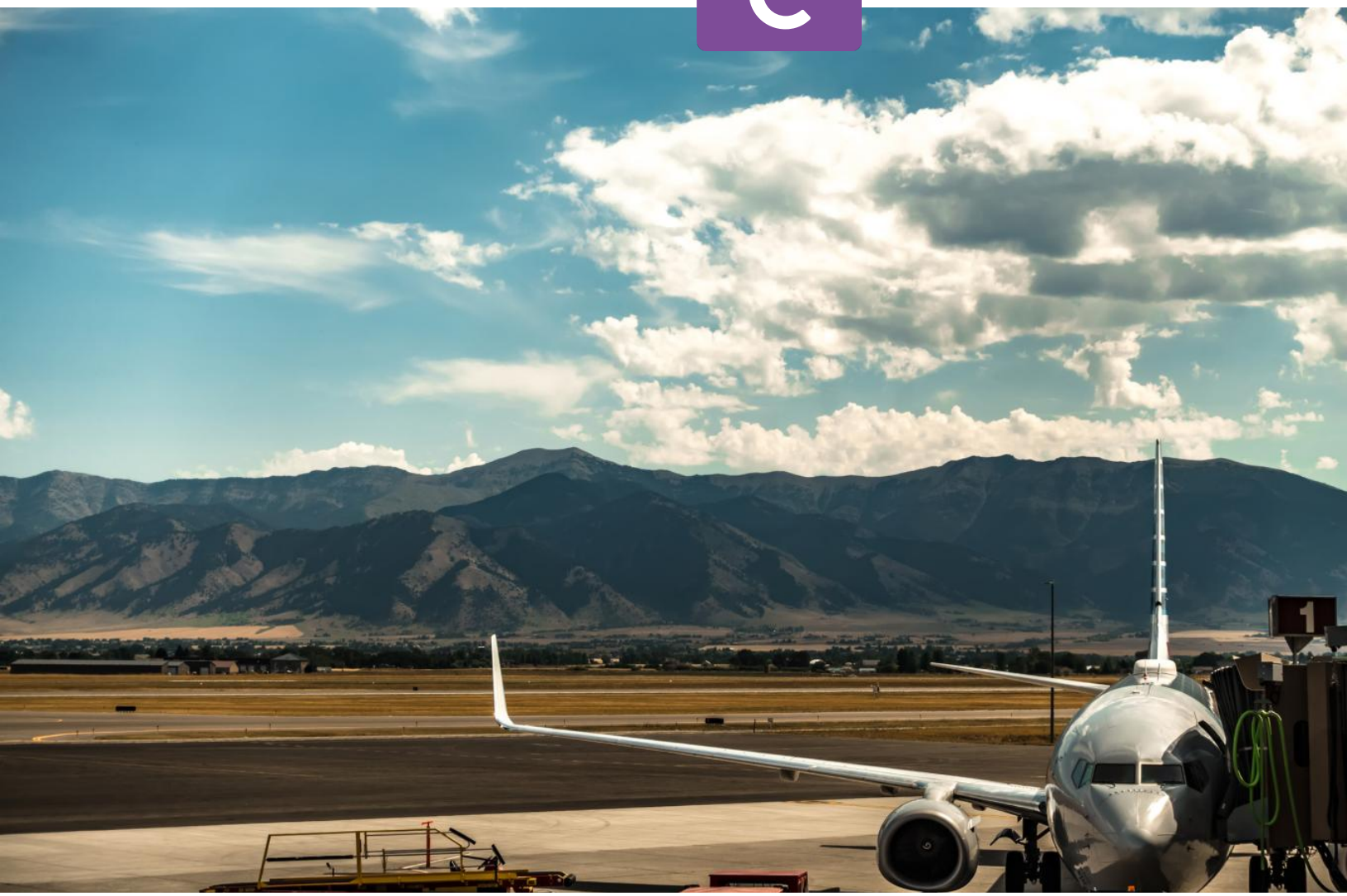
Collaboration among federal, state, tribal, and local stakeholders is vital to Montana's success. State leaders should champion policies that enhance coordination, leverage federal resources, and encourage innovative solutions tailored to the state's unique needs.

2024 REPORT CARD FOR MONTANA'S INFRASTRUCTURE

MONTANA GRADE SUMMARY

AVIATION

2024 MONTANA C



EXECUTIVE SUMMARY

Montana's public aviation system comprises nearly 130 airports: eight primary service, four commercial service, and 117 general aviation airports. These facilitate the movement of passengers and cargo and provide medical evacuation services, agricultural support, and bases for wildland firefighting. Enplanements at primary and commercial service airports grew 19% from 2019 to 2023, amid population growth in the state. All primary airports have been expanded, rehabilitated, or begun new terminal construction projects in the last five years. Pavement conditions on runways, taxiways, and aprons rated satisfactory on average in 2021, but those surfaces are aging, necessitating continued preservation work. Over the last 20 years, federal funding for state airports jumped from $36 million in 2003 to $63 million in 2020, and an average of $113 million from 2021 through 2023. State grant funding increased tenfold to $2.3 million in 2023 following a 2020 aviation fuel tax increase. Workforce development, proactive planning, and partnerships with sustained funding will improve state airports.

BACKGROUND

Aviation plays a significant role in Montana's growth, diversification, and the transportation of people, goods, and services. Today, aviation is critical to moving people, and goods and distributing services around, to, and from the Big Sky state, which comprises over 147,000 square miles of rugged mountainous terrain, rolling hills, and plains. Montana continues to invest in developing aviation infrastructure to rapidly move people and goods into and out of the state for business and recreation purposes. Montana's publicly owned airports are mostly run by local governments and receive funding for improvements through the Federal Aviation Administration's (FAA) Helena Airports District Office (ADO). Most funding assistance for Montana airports comes directly from the FAA, while some of Montana's publicly owned airports also receive assistance from the Montana Department of Transportation's (MDT) Aeronautics Division.

CAPACITY

The capacity of Montana's public and private aviation infrastructure can be assessed by evaluating passenger enplanements and cargo transportation, airside and landside infrastructure, economic benefits of airports, and aircraft registration.

In 2023, Montana airports accounted for 0.31% of nationwide primary and commercial service enplanements and 0.36% of cargo transportation in the U.S., respectively. Montana's primary service airports located in the cities of Bozeman/Belgrade, Missoula, Kalispell, Billings, and Great Falls Airports were nationally ranked 93, 139, 140, 143, and 191 in passenger enplanements, respectively. Billings and Great Falls were ranked 63 and 100, respectively, for the movement of landed cargo in the U.S.

Since the COVID-19 pandemic, Montana has experienced significant population growth. Communities across the state, such as Bozeman, Kalispell, Missoula, and Billings, are experiencing historical population growth as the result of people relocating to Montana. In 2023, there were nearly three million passenger enplanements at primary and commercial service airports in Montana. This is an increase of nearly 19% compared to pre-pandemic passenger enplanement numbers. Of the 12 airports providing commercial airline flights listed in Table 1 below, primary airports in Montana's seven largest cities made up for just over 99% of passenger enplanements.

TABLE 1. MONTANA'S PRIMARY AND COMMERCIAL SERVICE ENPLANEMENTS

LOC ID	CITY	PASSENGER ENPLANEMENTS			% Δ BETWEEN YEARS	
		2019	2022	2023	2019 VS. 2022	2022 VS. 2023
MT State	-	2,417,544	2,636,948	2,876,684	9.1%	9.1%
BIL	Billings	463,555	384,697	417,714	-17.0%	8.6%
BZN	Belgrade/Bozeman	785,706	1,135,681	1,231,566	44.5%	8.4%
BTM	Butte	25,926	18,896	15,995	-27.1%	-15.4%
GTF	Great Falls	177,964	143,437	181,135	-19.4%	26.3%
HLN	Helena	118,743	82,735	89,423	-30.3%	8.1%
GPI	Kalispell	356,297	419,536	453,701	17.7%	8.1%
MSO	Missoula	455,272	424,945	459,161	-6.7%	8.1%
GGW*	Glasgow	4,001	2,975	2,884	-25.6%	-3.1%
HVR*	Havre	3,343	2,863	2,964	-14.4%	3.5%
SDY*	Sidney	9,740	6,573	8,047	-32.5%	22.4%
OLF*	Wolf Point	3,821	3,069	3,166	-19.7%	3.2%
WYS**	West Yellowstone	10,605	7,197	8,735	-32.1%	21.4%

*Commercial Service (CS) Airport | **Seasonal Primary (P) Airport

While Montana's enplanement data indicates passenger growth, some primary service airports are experiencing significant enplanement reductions. Typically, prolonged enplanement reduction leads to lost services, reduced air carriers, and reduced revenue, which are all necessary to support infrastructure maintenance. Alternatively, enplanement increases typically lead to expanded services, additional air carriers, and increased revenue, which result in stress and strain on existing infrastructure.

A small percentage of passenger enplanements come from Montana primary, commercial service, and general aviation airports rely on the Essential Air Service (EAS) program to provide rural to urban connection opportunities. Airports such as Butte, Glasgow, Glendive, Havre, Sideny, West Yellowstone, and Wolf Point communities have offered EAS options providing same day travel for non-urgent medical appointments, business travel, and personal travel as a first or last leg that connects the community to air travel from the eight primary airports. The most recent EAS report indicated that between 307 and 369 additional seats per day are available as a result of the EAS program in Montana.

Billings Logan International and Great Falls International Airports are the largest cargo transportation airports in Montana. In 2022, Billings and Great Falls landed over 543 million and 219 million pounds of cargo, respectively and were ranked in the top 140 cargo transportation airports in the U.S.

Airport infrastructure capacity issues can be categorized between airside and landside infrastructure. Airside infrastructure generally includes runways, taxiways, aprons, lighting systems, navigational aid (NAVAID) systems, service roads, air traffic control towers, terminal secure areas and operational support (such as snow removal equipment, airport rescue and firefighting, and fuel systems). Landside infrastructure generally includes terminal non-secure areas and support buildings, access roads, passenger and rental car parking lots, businesses, and operational support (such as rental car washes and parking lot toll plazas).

One of the current airside and landside capacity issues affecting Montana airports include is population growth. Counties containing cities such as Billings, Bozeman/Belgrade, Helena, Kalispell, and Missoula have exhibited population increases of 15%, 40%, 16%, 23%, and 11%, respectively. The rapid growth within these communities has the potential to result in encroachment of non-aeronautical development around airports, leading to capacity issues. Significant airside infrastructure issues will become a reality if effective planning and protection of compatible land uses surrounding airports is not a priority of local governments.

To stay ahead of the population growth, primary and commercial service airports have prioritized updating Montana's undersized and outdated terminals. In the last five years, all eight primary airports in Montana have expanded, rehabilitated, or begun new terminal construction projects to improve passenger experience, increase energy efficiency, and modernize outdated terminals. In conjunction with the terminal airside improvements airports, many have also improved access roads and vehicle parking areas.

Montana airports contribute significantly to local and state economies. Airports offer good jobs, generate payroll, pay taxes, and purchase goods and services at the local, state, and regional level.

Figure 1 below shows interest in aviation in Montana continues to grow as evidenced by the number of aircraft registered in Montana. There were 4,094 registered aircraft in 2015 and 5,656 registered aircraft in 2023, an increase of 38%. This growth impacts how airports, mainly GA airports, manage infrastructure priorities.

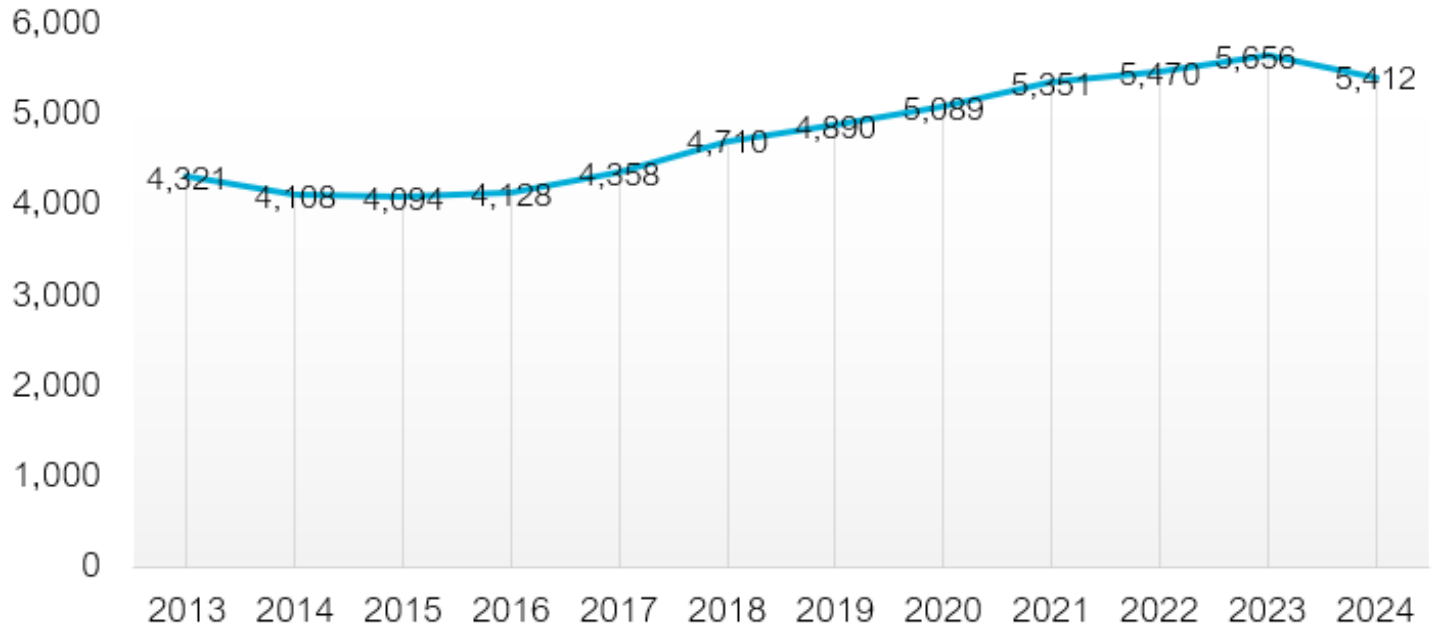


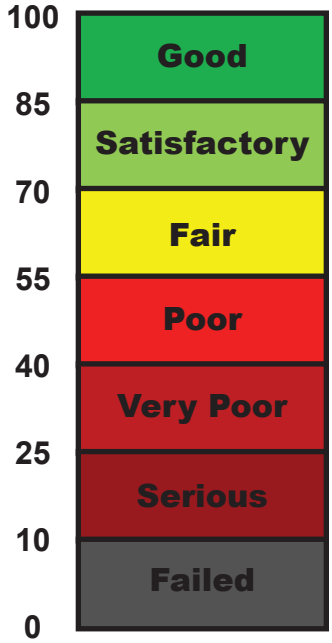
FIGURE 1. MONTANA AIRCRAFT REGISTRATIONS

As a condition of accepting federal funds, no federally obligated airport can deny public access to their airport. That means airports must meet federal standards for the type of aircraft and traffic volumes they experience. NPIAS airports cannot refuse traffic and are obligated to meet the safety standards associated with the demand. Meeting safety standards requires expansion, which can be expensive in a growing market like Montana.

CONDITION

Airfield pavements and terminals are two of the most significant costs when constructing and operating a public airport. Constant maintenance of this infrastructure is critical to the performance, longevity, and function of airports.

Every three years, a statewide survey of airport pavement condition index (PCI) is completed for most of the non-primary public airports, while the primary airports typically complete their own PCI studies on an "as needed" basis in conjunction with projects involving pavement rehabilitation or reconstruction. The last statewide study was completed in 2021 and included 54 GA, one primary, and four commercial service NPIAS airports. A typical PCI scale, which accounts for type, quantity, and severity of identified distresses, includes values ranging between 0 (failed) and 100 (good). Montana statewide PCI average results for runway, taxiway, and apron pavements of the 56 surveyed airports was 77, 76, and 77, respectively.



Montana's airport pavements have continued to remain in "satisfactory" condition for about the past decade. This is a result of airports using available funding to complete maintenance on pavements rated "fair" and above and rehabilitation projects on pavements rated "poor" and below. Maintenance and rehabilitation projects are critical to ensuring viable pavements that are functional with the potential to exceed design performance life.

Current inflated construction costs and decreased funding have the potential to impact pavement conditions in Montana and other states. Inflated construction

costs and decreased funding have resulted in less pavement being rehabilitated, which will lead to degraded pavement condition and an increased backlog of rehabilitation needs. To compound potential issues, pavement continues to age. In 2020, 26% of Montana's total pavement area was between 16 and 20 years old and 23% was 20 years old or older. If pavement preservation does not remain a priority at Montana airports, the overall future pavement condition airports will start to decline.

In recent years, all of Montana's primary and a few of the commercial service airports have completed construction projects to expand and/or upgrade terminals. Missoula Montana Airport just completed construction of a new terminal building in 2023. New construction, expansions, or upgrades to terminals promote efficient use of terminal space, reduce energy consumption by installing higher efficiency heat and air conditioning systems and light fixtures, increase safety, comply with ADA guidelines, and enhance the passenger experience.

FUNDING

In 2023, there were eight primary, four commercial service, and 59 basic/local classified general aviation publicly owned airports in Montana that were part of the federal National Plan of Integrated Airport Systems (NPIAS). For 2023-2027, Montana public airports estimated a need of over $521 million in funding for infrastructure improvements between 2023 and 2027. A summary of the publicly funded airports versus funding needs is shown in Table 1 below.

TABLE 2. MONTANA NPIAS AIRPORT REQUESTED FUNDING FOR 2023-2027

AIRPORT CLASSIFICATION	# OF AIRPORTS	CIP 2023-2027 PLANNED INFRASTRUCTURE NEEDS
Primary Service	8	$296,350,455
Commercial Service	4	$16,033,719
General Aviation	59	$209,447,761
TOTAL:	71	$521,831,935

Capital to maintain existing and construct new infrastructure is the most critical component to providing safe and resilient airports. Capital to maintain and construct Montana airport infrastructure is funded by a combination of federal, state, and local sources. Montana NPIAS-classified airports rely mainly on federal funding with some state and local funding sources, while non-NPIAS airports rely heavily on state and local funding sources. Table 3 below shows available federal funding for Montana airports for Fiscal Year (FY) 2022-2023. From this limited data set, it appears that primary, non-primary, and cargo entitlement fund availability increased, while state apportionment and discretionary fund availability decreased.

TABLE 3. COMPARISON OF AVAILABLE FEDERAL FUNDING (SHOWN IN MILLIONS)

AIP FUNDING SOURCE	FY2022	FY2023	% Δ
Primary Entitlements	$18.836	$19.401	2.9%
Non-Primary Entitlements	$8.400	$8.583	2.1%
Cargo Entitlements	$0.387	$0.393	1.5%
State Apportionment	$5.048	$4.976	-1.4%
Discretionary	$26.574	$20.271	-31.1%
TOTAL:	$59.245	$53.624	-10.5%

Federal funding used by Montana airports has generally increased, from around $35.7 million in 2003 to $63.3 million in 2020. As a result of stimulus packages, these figures rose to $139.5, $95.0, and $103.6, respectively in FY21-23.

Another source of funding that all eight primary service Montana airports rely on is the passenger facility charge (PFC) program. PFCs are charges that can be assessed by the airlines for passengers enplaning on the first two legs of their ticketed journey. The collected PFC funds stay at the charging airport and can be used by the airport to supplement AIP funding, to service debt on bond-funded projects and for projects that are ineligible for AIP funding. Since 1994, Montana airports have collected and utilized over $164 million in PFC funds to pay for airport improvements that have enhanced safety, capacity, and conditions.

As previously stated, federal funding used by Montana airports has trended upward from 2003 to 2020, with years 2021 through 2023 showing increased funding sources available to GA and primary service airports. There were also several federal legislative packages that airports benefited from, including the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the Coronavirus Response and Relief Supplemental Appropriations Act (CRRSAA), the American Rescue Plan Act (ARPA), and the Infrastructure Investment and Jobs Act (IIJA).

Consistent with federal funding, Montana grant funding available to airports has also trended upward since 2003, with a major change in 2020 when House Bill 661 was approved and raised the state's aviation fuel tax from four cents per gallon to five cents per gallon. In 2003, almost $100,000 in state funding was available compared to nearly $2.3 million in 2023.

TABLE 4. COMPARISON OF STATE AWARDED AVAILABLE GRANT FUNDING

FY YEAR	STATE SPONSORED GRANT	% Δ
2023	$2,279,067	91.4%
2018	$195,014	-64.9%
2013	$321,510	39.3%
2008	$195,014	50.3%
2003	$96,899	

Better management of general aviation non-primary entitlement funds has been a topic of discussion amongst Montana airports in recent years. Too often GA airports lack the amount of federal funding necessary to complete a project, while other GA airports do not need the funding, and the funds go unused or expire. Unused and recovered federal funding typically leads to reduced federal funding.

FUTURE NEED

Future need for Montana airports will parallel population growth in the years to come. Should Montana's population growth continue, the state's airports will need to meet the demands of the aviation industry by completing robust planning efforts, acquiring land adjacent to airports to protect compatibility, maintaining existing infrastructure, and completing necessary capital improvement programs that strategically align with planning efforts and available funding. Federal funding will need to remain aligned with growth and inflation trends for Montana airports to maintain and expand future needs.

OPERATION & MAINTENANCE

Most Montana primary airports manage and operate independent of city, municipal, or county governments as authorities with a Board that oversees everything. Primary airport administration and operations staff operate under the Board and are responsible for operating and maintaining the airport, including managing budgets, coordination with airlines, tenants, security/TSA, concessionaires and rental car companies, operating parking lots and terminals, and maintaining landside and airside improvements. Most Montana commercial service and GA airports are owned by Montana counties or municipalities and also operate under a board or commission. The board or commission is responsible for managing and operating the airport. In both cases, most Montana airports are operated and maintained to provide services that effectively transport passengers and cargo. Montana airport maintenance is driven by available funding. Primary airports generally have more available income to put towards maintenance than commercial service and GA airports have. NPIAS airports also tend to have more available funding to complete maintenance than non-NPIAS airports. As evidenced by the PCI mentioned earlier, Montana airports utilize available federal funding to complete regular maintenance cycles of eligible pavements.

PUBLIC SAFETY

Public safety for Montana airport infrastructure users is a top priority for airport owners, MDT Aeronautics, and the FAA. One of the primary goals of the MDT Aeronautics Division is to ensure airport safety. In partnership with the FAA, MDT Aeronautics completes annual inspections at approximately 40 public airports each year. Each inspector flies to each airport and is trained to assess and evaluate each airport from the pilot's perspective in the air and from the ground after they land. Ground inspections include assessing runway pavement and light conditions and evaluation of obstruction and approach angles.

Similar to MDT Aeronautics, FAA personnel regularly visit Montana airports to evaluate and discuss airport safety. All eight primary airports and one commercial service airport have Part 139 Certification inspections that evaluate and promote safety. All primary service airports have Runway Safety Action Teams that regularly meet to discuss, evaluate, mitigate, and promote safety.

In 2015, the Northwest Mountain Region Airport Plan (RAP) included initiatives for next levels of safety. Initiatives emphasized in the RAP were related to completing projects to increase safety within Runway Safety Areas, mitigate runway incursions, replace Aircraft Rescue and Fire Fighting (ARFF) and Snow Removal Equipment (SRE), complete wildlife hazard assessments and mitigation, and complete airport improvements to accommodate larger and faster aircraft. Even though the RAP is almost 10 years old, the initiatives contained within the plan are still valid and data will likely show that instituting RAP initiatives has increased safety at Montana airports and the NWMR collectively.

A new problem that has the potential to lead to a decrease in safety at airports across the country and in Montana is the shortage of air traffic controllers. The U.S. is currently short 3,000 air traffic controllers, and towers have had to close during certain operating hours as a result of the shortage.

Montana airport 2019-2023 capital improvement programs show programs where there are multiple projects focused on increasing airport safety with nearly $15 million programmed in 2023 to complete safety related projects, such as runway safety area grading and pavements, taxiway safety area grading and pavements, lighting systems, NAVAIDs, weather observation systems and cameras, acquisition of ARFF and SRE vehicles, and vehicle service access roads.

RESILIENCE

Montana's weather, geography, lack of workforce, and population changes have led Montana airports to develop robust funding, capital improvement, emergency response, and snow and ice control plans and be prepared to consistently and rapidly implement the plans to minimize passenger and cargo service disruption. All primary service airports are required to regularly update their snow and ice control plans for new pavements. MDT Aeronautics completes annual inspections at GA airports and provides safety training opportunities such as the annual search pilot and winter survival clinics.

INNOVATION

In order to remain resilient, Montana airports must seek new and innovative ways to maintain and improve levels of service. Inflation, anticipated reductions in available federal funds, and increased environmental regulations present challenges that will require Montana airports to rely on existing partnerships. The FAA and MDT's Aeronautics Division are constantly developing plans to evaluate and inventory existing airport infrastructure as well as plan for future needs. MDT's Aeronautics Division has developed a program to provide low-cost installation of cameras that can provide real-time on-the-ground weather at Montana airports. The cameras are linked to and can be viewed with other cameras on the FAA's Weather Camera Program website. As of June 2024, there are 35 Montana airports that have partnered with MDT's Aeronautics Division and the FAA to install cameras that show real-time weather conditions.

Innovation will be necessary to provide infrastructure necessary to support the reduction of carbon emissions. Electric vertical take-off and landing (eVTOL) aircraft will require specific infrastructure at airports, such as electric charging stations and a location to land, if they become a viable form of transportation.

AVIATION C

SOLUTIONS TO RAISE THE GRADE

- Strategic investment in personnel training related to operations and equipment. Airports should continue to seek opportunities to train operations personnel on maintenance, snow removal, Aircraft Rescue and Fire Fighting (ARFF), and lighting system and NAVAID troubleshooting and maintenance.
- Primary, commercial service, and GA personnel should develop and maintain contact networks with the FAA's Helena Airports District Office, MDT's Aeronautics Division, and other airports to regularly communicate and discuss operations procedures, changes with FAA guidance and maintenance practices, and other issues.
- Airports need to continue to vigorously maintain a consistent maintenance program to preserve existing infrastructure and seek funding assistance through federal and state opportunities and utilize MDT's Aeronautics Division programs that provide assistance such as windsocks, courtesy cars, lights, and NAVAID equipment.
- Montana airports should continue to seek airfield operator training opportunities, and work with the FAA HLN ADO and MDT Aeronautics Division to develop, promote, and implement safety procedures.
- Support capital to construct new and maintain existing infrastructure is the most critical need for safe and resilient airports across the nation. Developing more efficient uses of available funds and alternative funding methods should be a priority.
- Continue airport condition assessments, including for pavements and terminals, economic impact reports, master record inspections, and layout condition studies.
- Continue to complete the statewide pavement study and look at other methods of managing Montana airport pavements to reduce backlog and share resources to improve conditions at non-primary airports.
- Develop and implement detailed preventative maintenance programs.
- Encourage NPIAS and non-NPIAS airports to complete robust planning efforts that inventory existing infrastructure, schedule preventative maintenance, forecast needs, identify funding avenues, and be pre-positioned for unique funding opportunities.
- Remove the federal cap on Passenger Facility Charges (PFC) to allow airports to generate capital to cover local needs.
- Encourage airports to partner with MDT's Aeronautics Division and the FAA to install weather cameras.
- Update existing eligibility guidance on necessary infrastructure that serves airports, such as access roads and parking lots.
- Develop and implement a statewide system to manage and distribute non-primary entitlements for GA airports.
- Encourage replacement of inefficient lighting systems and NAVAIDs.
- Continue to develop and implement policies and procedures will need to be developed to ensure safety and protect airspace.

AVIATION C

SOURCES

Federal Aviation Administration (FAA). (2023). Appendix A: National Plan of Integrated Airport Systems (NPIAS) 2023–2027. Retrieved from https://www.faa.gov/airports/planning_capacity/npias/current/2023_NPIAS_Appendix_A

Montana Department of Transportation (MDT). (2024). Aeronautics Division Overview. Retrieved from https://www.mdt.mt.gov/contact/organization/aeronautics.aspx

Federal Aviation Administration (FAA). (2023). Commercial Service Enplanements by Airport. Retrieved from https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/cy23_commercial_service_enplanements

Montana Department of Transportation (MDT). (2016). Economic Impact of Airports in Montana: Executive Summary. Retrieved from https://www.mdt.mt.gov/aviation/docs/2016/economic-impact/MT-Executive-Summary.pdf

Federal Aviation Administration (FAA). (2024). Airport Improvement Program (AIP) Grant Histories. Retrieved from https://www.faa.gov/airports/aip/grant_histories

Aircraft Owners and Pilots Association (AOPA). (2019). Montana Airport Funding Bill Passes. Retrieved from https://www.aopa.org/news-and-media/all-news/2019/may/02/montana-airport-funding-bill-passes

National Transportation Safety Board (NTSB). (2024). General Aviation Dashboard. Retrieved from https://www.ntsb.gov/safety/data/Pages/GeneralAviationDashboard.aspx

Federal Aviation Administration (FAA). (2024). Environmental and Airport Resiliency. Retrieved from https://www.faa.gov/airports/environmental/resiliency

Federal Aviation Administration (FAA). (2024). Runway Safety Statistics for 2022–2023. Retrieved from https://www.faa.gov/airports/runway_safety/statistics/year/?fy1=2023&fy2=2022

Federal Aviation Administration (FAA). (2021). National Plan of Integrated Airport Systems (NPIAS) 2021–2025 Narrative Report. Retrieved from https://www.faa.gov/sites/faa.gov/files/airports/planning_capacity/npias/current/NPIAS-2021-2025-Narrative.pdf

AVIATION C

Federal Aviation Administration (FAA). (2024). Pavement Condition Index (PCI) Overview. Retrieved from https://faapaveair.faa.gov/Help/index.html#!Documents/pavementconditionindexpci.htm

Montana Department of Transportation (MDT). (2021). Montana State Aviation System Plan. Retrieved from https://www.mdt.mt.gov/aviation/2021sasp.aspx

American Society of Civil Engineers (ASCE). (2024). Aviation Infrastructure Report Card. Retrieved from https://infrastructurereportcard.org/cat-item/aviation-infrastructure/

Federal Aviation Administration (FAA). (2024). FAA Flight Status Information. Retrieved from https://www.fly.faa.gov/flyfaa/nwmap.jsp

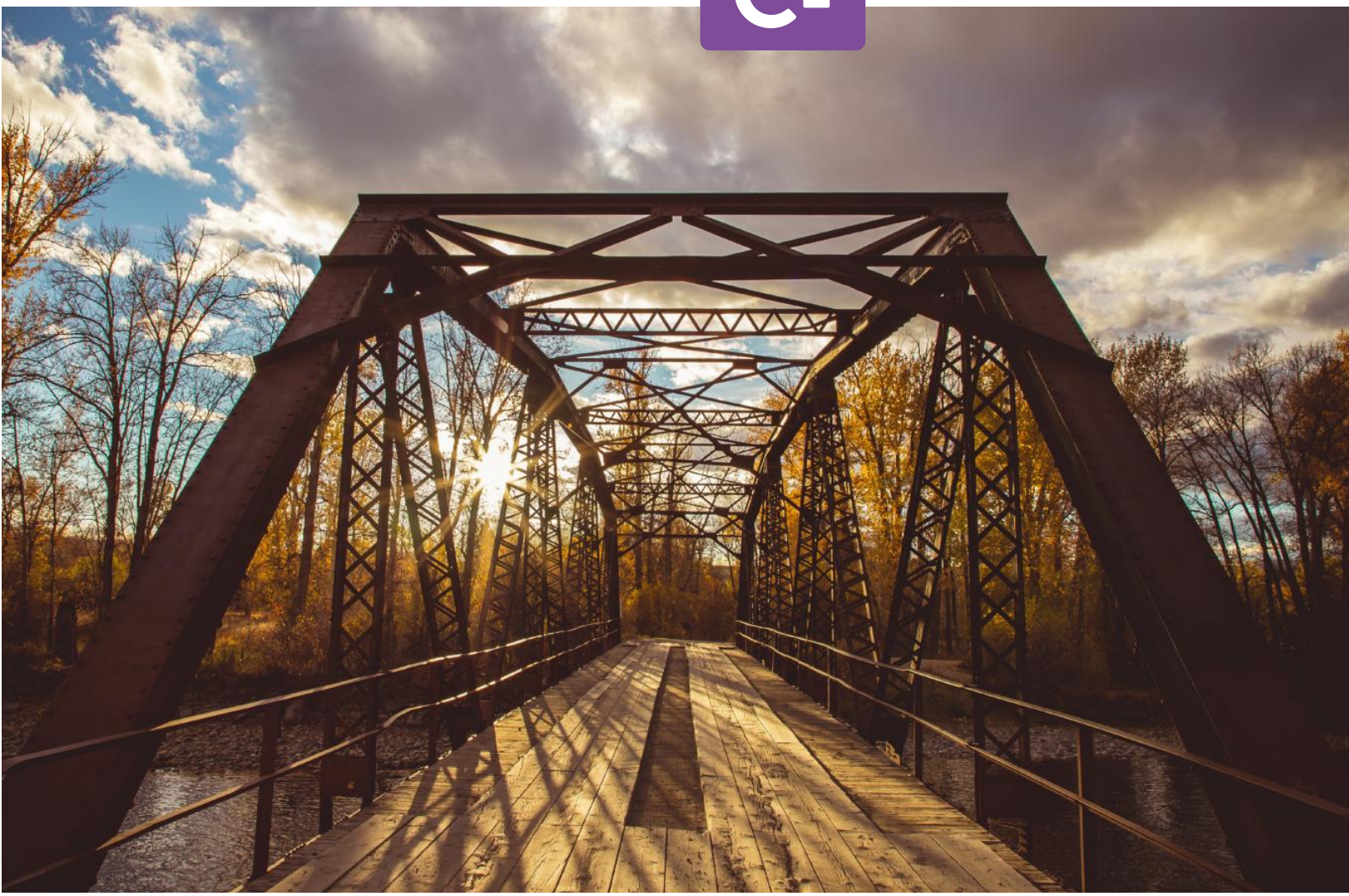
Federal Aviation Administration (FAA). (2024). Airport Operations Data. Retrieved from https://aspm.faa.gov/opsnet/sys/Airport.asp

Airsight GmbH. (2024). Design and Operations of eVTOL Vertiports. Retrieved from https://www.airsight.de/projects/item/evtol-vertiports-design-and-operations/

Avionics Magazine. (2022). Vertiports: Air Traffic Management and Infrastructure Requirements for eVTOL Aircraft. Retrieved from https://interactive.aviationtoday.com/avionicsmagazine/november-december-2022/vertiports-air-traffic-management-and-infrastructure-requirements-for-evtol-aircraft/

BRIDGES

2024 MONTANA C-



EXECUTIVE SUMMARY

Montana has over 5,200 bridges, with state-owned structures averaging 50 years in age. The overall condition of bridges – categorized as good, fair, or poor – remained relatively stable between 2019 and 2023, with 15% requiring immediate repairs in both analysis years. However, the number of load-posted or closed bridges has steadily increased, now totaling 600 and growing by 10% to 20% annually. In Montana's rural areas, detours for closed or restricted bridges, when available, can add substantial distances to trips. Ownership influences the severity of the issue: while only 2% of state-owned bridges are load-posted or closed, 20% of locally owned bridges face these restrictions. Recent federal investments and the 2023 Montana Legislature's passage of three bills to increase tax revenue for state and local bridge maintenance have provided some relief. Nevertheless, a significant funding gap remains. Over the next decade, anticipated funding of $535 million falls far short of the $4.4 billion needed to address Montana's bridge infrastructure needs.

CONDITIONS & CAPACITY

Based on information provided by the Federal Highway Administration (FHWA) for 2023, Montana has 5,218 total bridges, resulting in 22,203,891 square feet of bridge decks. MDT owned bridges (state-owned bridges) account for approximately 56% of the bridge inventory while county/municipal owned bridges (locally owned) account for the remaining 44% of bridge inventory.

On average, state-owned bridges are 50 years old with locally owned bridges averaging 45 years old. Historically, bridges were built with 50-year design lives before major overhaul or replacement would be required. However, this standard has changed, and new bridges are constructed with at least 75-year design lives.

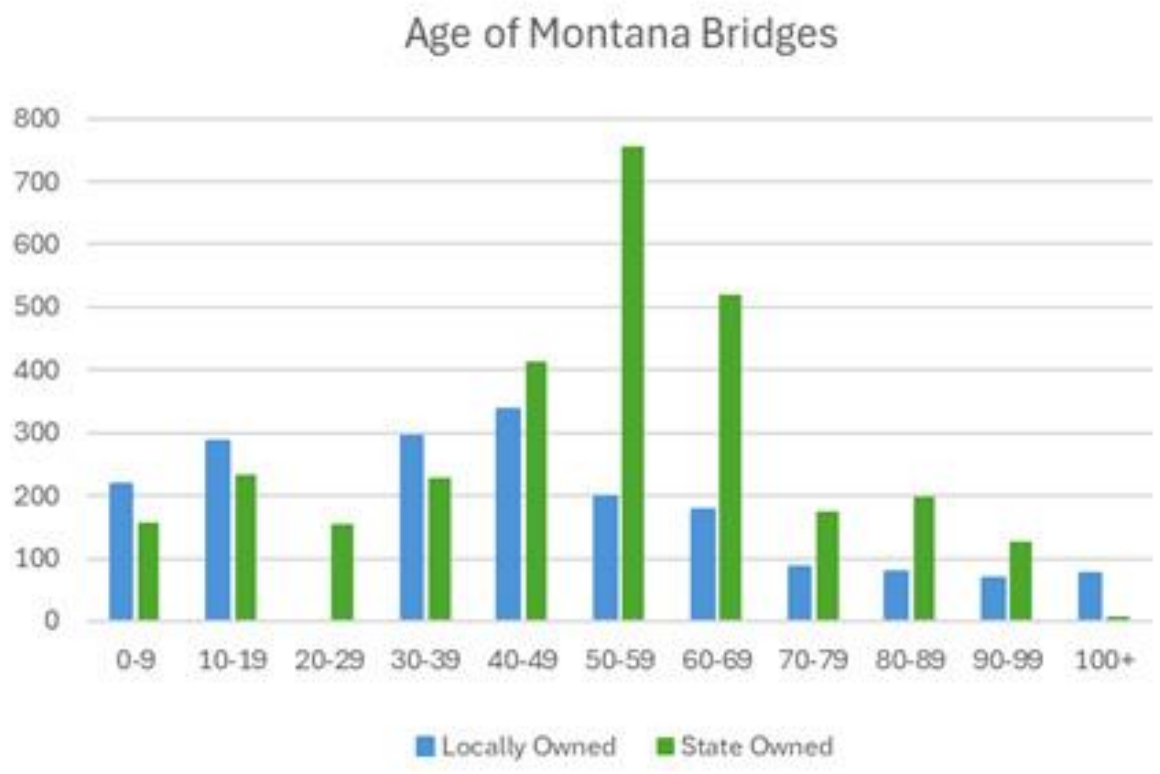


FIGURE 1. AGE OF MONTANA BRIDGES (MDT)

Of Montana's more than 5,000 bridges, approximately 900 or 15% need immediate repairs. This percentage has remained relatively steady since 2019, as shown in the following figure. Nearly 2% of state-owned bridges are currently load-posted or closed while 20% of the locally owned inventory is reported load-posted or closed. According to MDT, during the Great Depression the State built over 1,200 timber bridges, and roughly 440 of these timber bridges are still being used, primarily on secondary routes. With an average age of 90-years, it is no surprise that the majority of load-posted and closed bridges are timber structures.

FIGURE 2. TYPICAL TIMBER BRIDGE IN POOR CONDITION

FHWA defines bridges as being Good, Fair or Poor based on the lowest condition rating of the deck, superstructure or substructure. Load posted bridges are structures that are not able to safely carry standard, legal loads, which may be due to deterioration or damage of the structure or antiquated design standards for which the bridge was designed. It is possible for bridges in Good or Fair condition to be load posted, just as it is possible for bridges in Poor condition to not be load posted, depending on the condition of individual bridge elements and the specific vehicle loads being analyzed.

FIGURE 3. TYPICAL BRIDGE IN GOOD CONDITION

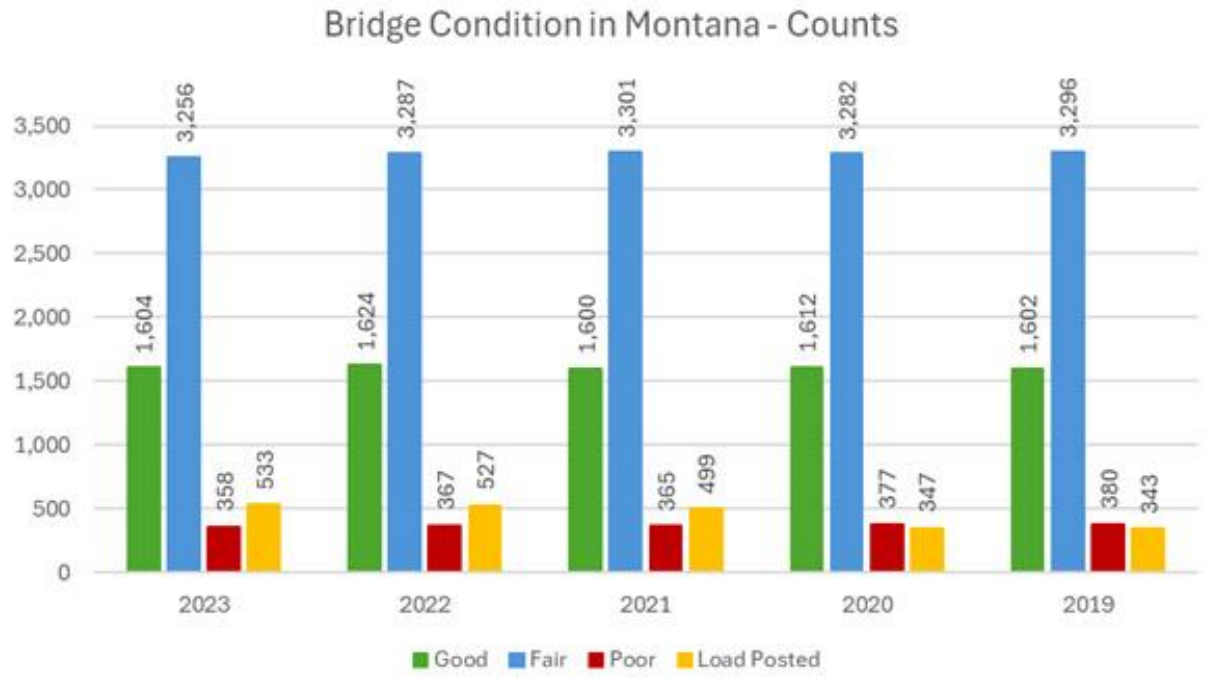


FIGURE 4. BRIDGE CONDITION IN MONTANA (MDT)

MDT has also analyzed bridge condition by separating state-owned and locally owned structures, which is shown in the figure to the right.

FUNDING

Historically, road and bridge infrastructure projects in Montana are funded by local, state, and federal governments. Most federal funds are provided by federal highway user fees, such as taxes on gasoline and diesel. In addition to federal funds, Montana special revenue funds are collected from fuel taxes and gross vehicle weight fees. Based on the MDT budget published by the Montana State Legislature's Legislative Fiscal Division, 66.6% of MDT's total revenue for Fiscal Year (FY) 2025 is from federal funds, while the remaining 33.4% is from State funds.

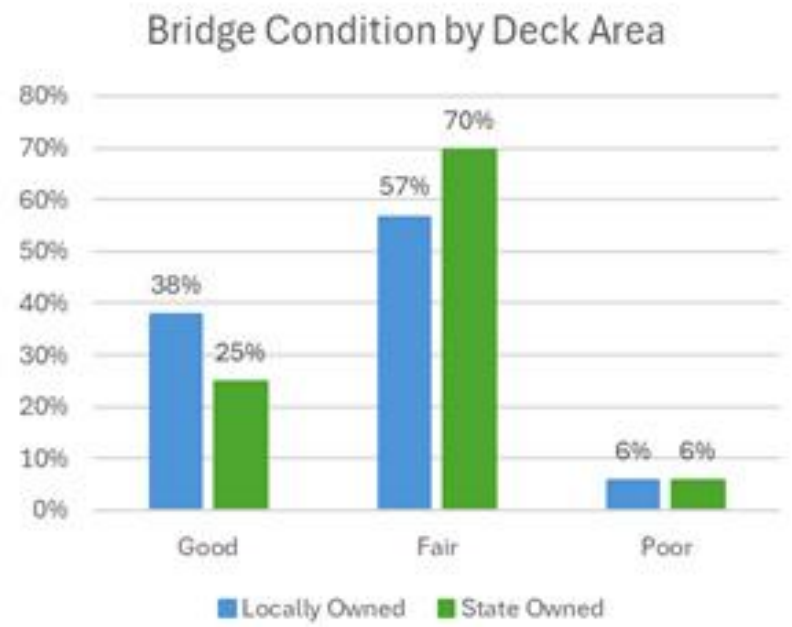


FIGURE 5. CONDITION BY DECK AREA (MDT)

In addition to established federal funding, the Bridge Formula Program (BFP) of the federal Infrastructure Investment and Jobs Act (IIJA) of 2021 will provide an additional $45 million in state funds for road and bridge projects through FY26, which results in a 7% overall funding increase.

The 2023 Montana Legislature passed three bills during the session that provided state funding for local infrastructure:

- House Bill (HB) 76 repealed the Bridge and Road Safety Accountability Act (BaRSAA) that was implemented in 2017, which increased the state gas tax to provide funding to MDT and Montana counties. HB 76 created one single fuel tax payment to Montana counties by combining the increased fuel tax created by BaRSAA and the traditional gas tax, paid to counties on a monthly basis.
- Senate Bill (SB) 536 transferred $100 million to MDT for the maintenance of county, city, and town roads. The funds were intended to be used as the state matching source for the reconstruction or repair of bridges or to provide a matching source for discretionary grants awarded to local governments for the repair or replacement of bridges.
- HB 267 created the Securing Access to Federal Expenditures to Repair (SAFER) Montana Roads and Bridges Account, which provided $100 million to MDT to match federal funding requirements for road and bridge projects. As a 13% match is typically required for federal funds, the SAFER Act will allow MDT to increase the number of road and bridge projects funded each year. In addition, the Act provides annual matching funds of $15 million to support MDT's state match for federal grants and redistribution requests.

In addition to gas tax revenue, local governments are eligible for a competitive grant program through the Montana Department of Commerce funded by state coal tax. The grant is available biennially and provides matching funds up to $750,000 for bridge replacement projects. In the 2023 grant cycle, twelve grant applications for bridge projects were submitted and eleven applications were funded, totaling $6.2 million in awards to Montana counties.

FUTURE NEEDS

Bridge infrastructure needs in Montana are outpacing available funding. Local governments and MDT have focused on bridge maintenance and rehabilitation as a means to lengthen the life span of existing infrastructure but have not addressed the need for new or increased capacity infrastructure. Between 2010 and 2020, the population in Montana grew by a staggering 7.4%, and is projected to grow another 7% in the next 20 years. As a result, the State is not keeping up with growing demands placed on its roads and bridges.

The FHWA's National Highway Construction Cost Index, which measures labor and materials cost, increased more than 56% between the first quarter of 2021 and the first quarter of 2024, further threatening the State's ability to keep up with growing transportation needs.

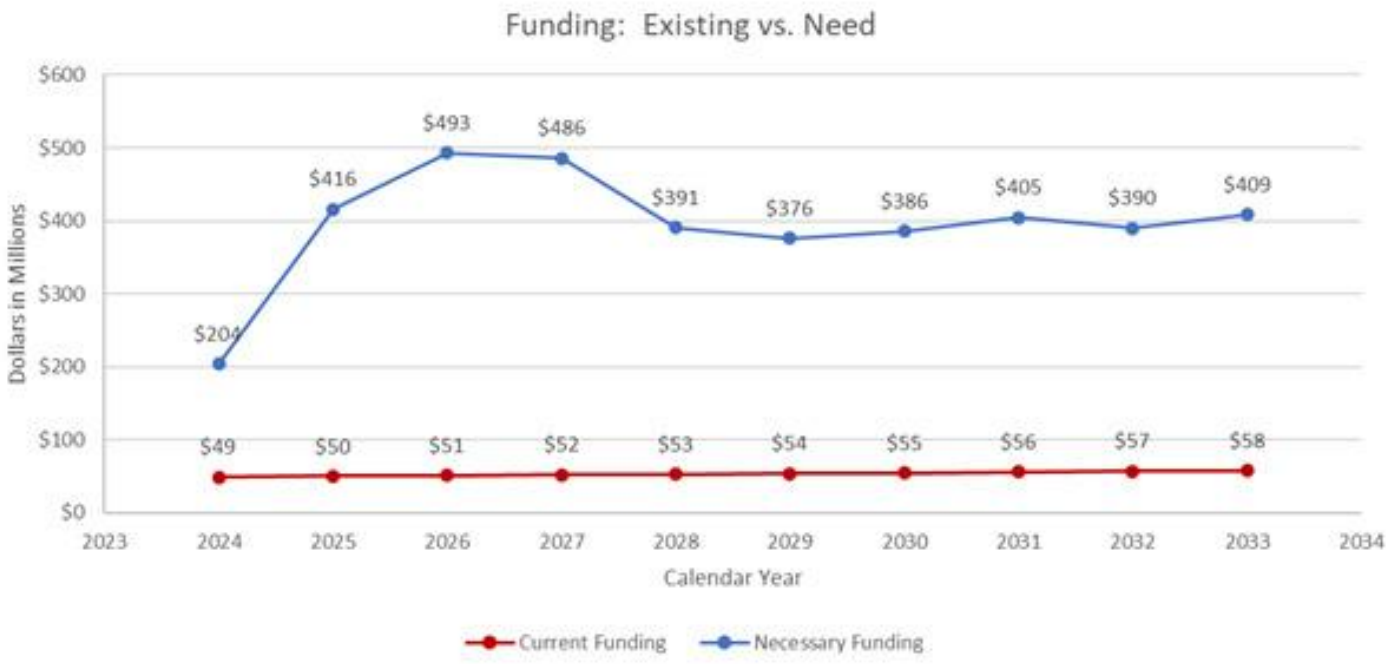


FIGURE 6. EXISTING VS. NEED OF FUNDING (MDT)

The current funding identified in Figure 4 relates to funding available to MDT for bridge replacements and major rehabilitation projects. Although the total federal funding available for bridges is greater than this, a portion of the funding is earmarked for maintenance, preservation, inspection and load rating efforts. The necessary funding identified in Figure 4 pertains to both state owned and locally owned bridges, and was calculated with consideration to efforts to maximize efficient project scope and delivery.

OPERATIONS & MAINTENANCE

Montana has developed a Transportation Asset Management Plan (TAMP), which outlines an approach for successfully managing transportation assets, and includes life-cycle planning, gap analysis, financial planning and investment strategies. Gap analysis examines the difference between current conditions and target condition of a particular asset, such as bridges. Pertaining to bridges, the TAMP identifies strategies for determining if a bridge is a candidate for repair or replacement, rehabilitation, or preservation, allowing projects to be appropriately scoped and funded.

MDT is currently working with county governments to implement quick-fix repairs on locally owned bridges, aimed at removing or improving posted load ratings on existing bridges. The identified repairs are being funded though SB 536, which was implemented by the 2023 Montana Legislature. The repairs are not a long-term solution but will allow for an improved transportation system that meets the needs of the traveling public, industries, and emergency services.

PUBLIC SAFETY

Montana performs regular and thorough bridge inspections to maintain safe infrastructure and prevent structural failures. Following the National Bridge Inspection Standards (NBIS), the assessment of bridge conditions and management of bridge inventories help Montana provide a reliable and effective transportation system. Information for every bridge is consolidated into a structure inspection report, which is used to identify bridges that need repair, track and report system-wide conditions, perform evaluations that support funding decisions, and satisfy federal requirements.

Within the structure inspection report, Montana provides load rating information to maintain a safe, resilient, and reliable transportation system. Routine inspection data is used to calculate and update the safe load carrying capacity of each bridge. Due to updated mandates from FHWA and the recent introduction of new vehicle types, which tend to be heavier and have more concentrated loads, new load posting signs are being used to identify weight restrictions on bridges. The load postings assist with preventing further damage to a bridge. This information also helps bridge owners prioritize bridge repair or replacement projects within their jurisdiction. Based on 2024 data, approximately 600 bridges are currently load posted or closed. This number is anticipated to increase to roughly 800 bridges by 2028 if current funding and project delivery practices are not changed.

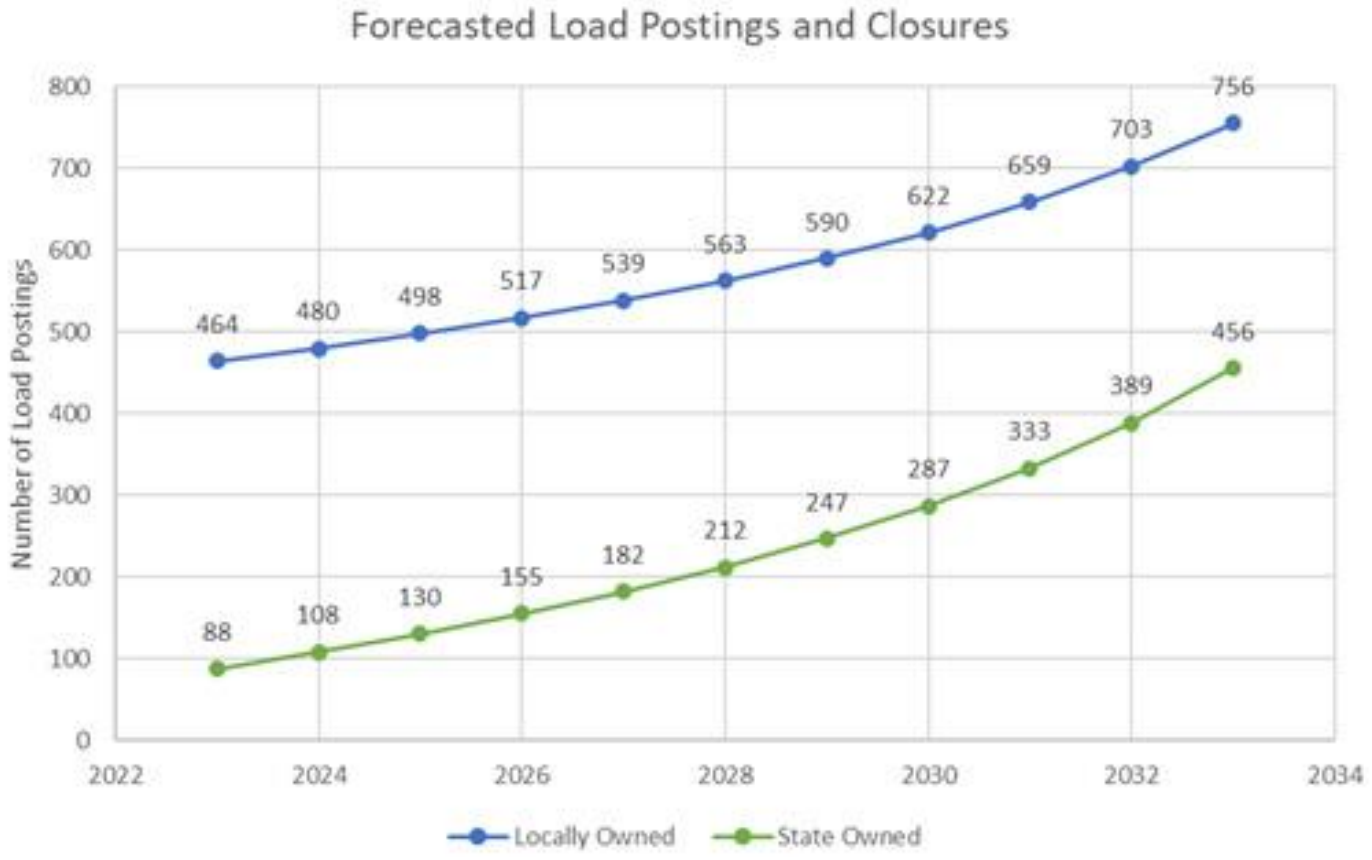


FIGURE 7. FORECASTED LOAD POSTINGS AND CLOSURES (MDT)

RESILIENCE

Resiliency is the capacity to plan for, withstand, or recover quickly from natural or manmade hazards. Montana's primary natural hazard is flooding during spring snow melt events. In 2022, heavy rain combined with melting snow resulted in record flows in the Yellowstone River, causing portions of Yellowstone National Park to be inaccessible and resulting in multiple road slides and bridge failures.

FIGURE 8. 2022 MONTANA FLOOD - CARBELLA BRIDGE OVER YELLOWSTONE RIVER

FIGURE 9: FLOOD WATERS ERODE BRIDGE BACKFILL

Because Montana is rural, detour routes that are needed when a bridge closes due to its poor condition, or a washout are usually long. MDT has identified 126 bridges that are classified as scour critical, meaning the structure is at risk of failure or collapse during a flood event. Scour critical bridges require a Plan of Action (POA) outlining when to monitor and/or close a bridge during and after flooding events to protect the traveling public. Designing new bridge abutments and realigning historical bridge abutments to be parallel to flood flows will reduce erosion and scouring during flood events. Implementing these measures will increase the overall resilience of Montana's infrastructure system.

Montana is also vulnerable to seismic forces due to the geological conditions of the region. While new bridges are designed to withstand seismic forces, existing bridges must be evaluated for seismic susceptibility and if found to be seismically vulnerable, retrofitted as necessary.

INNOVATION

MDT frequently uses alternative contracting methods to streamline and expedite the design and construction process for bridge replacement projects. Recently, MDT awarded its first progressive design build project which consisted of 11 structure replacements at an approximate$25-$30 million construction estimate. Benefits of a progressive design build approach include increased efficiency due to contractor and engineering collaboration, improved risk management and reduced project costs, among others.

Additionally, MDT is evaluating the use of fiber-reinforced polymer (FRP) composites for bridge repair projects as a way to increase the functionality of bridges. FRP has been used in several states to restore the original strength of damaged reinforced concrete bridge girders, strengthen concrete slab bridges, and seismically retrofit bridge columns. Though this is an ongoing study for MDT, there is hope for its application in Montana as FRP has been shown to be affordable, effective, and easy to implement.

Also under investigation is the use of ultra-high-performance concrete (UHPC) which has properties that significantly outperform those of conventional concrete. Historically cost prohibitive, Montana is researching the development and evaluation of UHPC mix designs that utilize materials readily available in Montana.

BRIDGES

SOLUTIONS TO RAISE THE GRADE

- Address resource availability gaps by focusing on recruitment, competitive wages, and leveraging private sector resources; attracting contractor competition through project bundling; and increasing the state and federal investment levels.
- Develop a sustainable funding plan to address aging infrastructure for the short and long term, including federal discretionary grants, shifting existing funding, and supporting grant efforts by local agencies.
- Increase funding from all levels of government to continue significant bridge repair, rehabilitation, and replacement.
- Prioritize rehabilitating and preserving bridges in fair condition, as these bridges can often be preserved at a fraction of the cost of replacement if the work is performed before it becomes critical. This approach can reduce the number of structurally deficient bridges, decrease the maintenance backlog, and address the large number of bridges that have passed or are approaching the end of their design lives.
- Develop a balanced approach for our current aging bridge inventory that emphasizes preservation, rehabilitation, and replacement where necessary, while also setting aside funding for critical operation and maintenance. State and local governments should consider the costs across a bridge's entire life cycle to make smart design decisions and prioritize maintenance and rehabilitation.
- Publicly advocate for the need and the benefits of investing in infrastructure. Properly educate the public to appropriately support elected officials to enact legislation that addresses funding shortfalls.
- Provide additional or long-term funding mechanisms for local governments.
- Continue to research and implement, as applicable, new techniques for design, new materials, and innovative construction methods for bridge preservation, rehabilitation, replacement, and new construction.

BRIDGES

C-

SOURCES

Federal Highway Administration (FHWA). (2023, December). National Highway Construction Cost Index. Retrieved from Transportation Policy Studies: https://www.fhwa.dot.gov/policy/otps/nhcci/

Federal Highway Administration (FHWA). (2024, June). Tables of Frequently Requested NBI Information. Retrieved from Bridges & Structures: https://www.fhwa.dot.gov/bridge/britab.cfm

Montana Department of Commerce. (2024, November). Montana Population Projection. Retrieved from Census and Economic Information Center: https://dataportal.mt.gov/t/DOC/views/CEIC_REMI_POPULATION_PROJECTION_COUNTY_AGE_RACE_SFE/Trend?%3Aorigin=card_share_link&%3Aembed=y

Montana Department of Transportation (MDT). (2022). 2022 Fact Book. Retrieved from https://www.mdt.mt.gov/fs/factbook/

Montana Department of Transportation (MDT). (2022). Transportation Asset Management Plan. Retrieved from https://www.mdt.mt.gov/publications/docs/plans/MDT-TAMP-2022.pdf

Montana Department of Transportation (MDT). (2024, May). Bridge Infrastructure and the 5-Year Plan. 2024 MDT Preconstruction Conference. Helena, Montana.

Montana Department of Transportation (MDT). (2024, June). State Funding for Local Infrastructure. Retrieved from Montana Department of Transportation: https://www.mdt.mt.gov/business/localsupport/state-funding.aspx

Montana State Legislature Legislative Fiscal Division. (2023). Department of Transportation Budget Fiscal Report. Retrieved from https://leg.mt.gov/content/Publications/fiscal/2025-Biennium/Fiscal-Reports-July-2023/Section-C-Agencies/DOT-Fiscal-Report-July23.pdf

TRIP. (2023). Keep Montana Moving Forward: Progress and Challenges in Achieving a 21st Century Transportation System. Retrieved from https://tripnet.org/wp-content/uploads/2023/01/TRIP_Moving_Montana_Forward_Report_January_2023.pdf

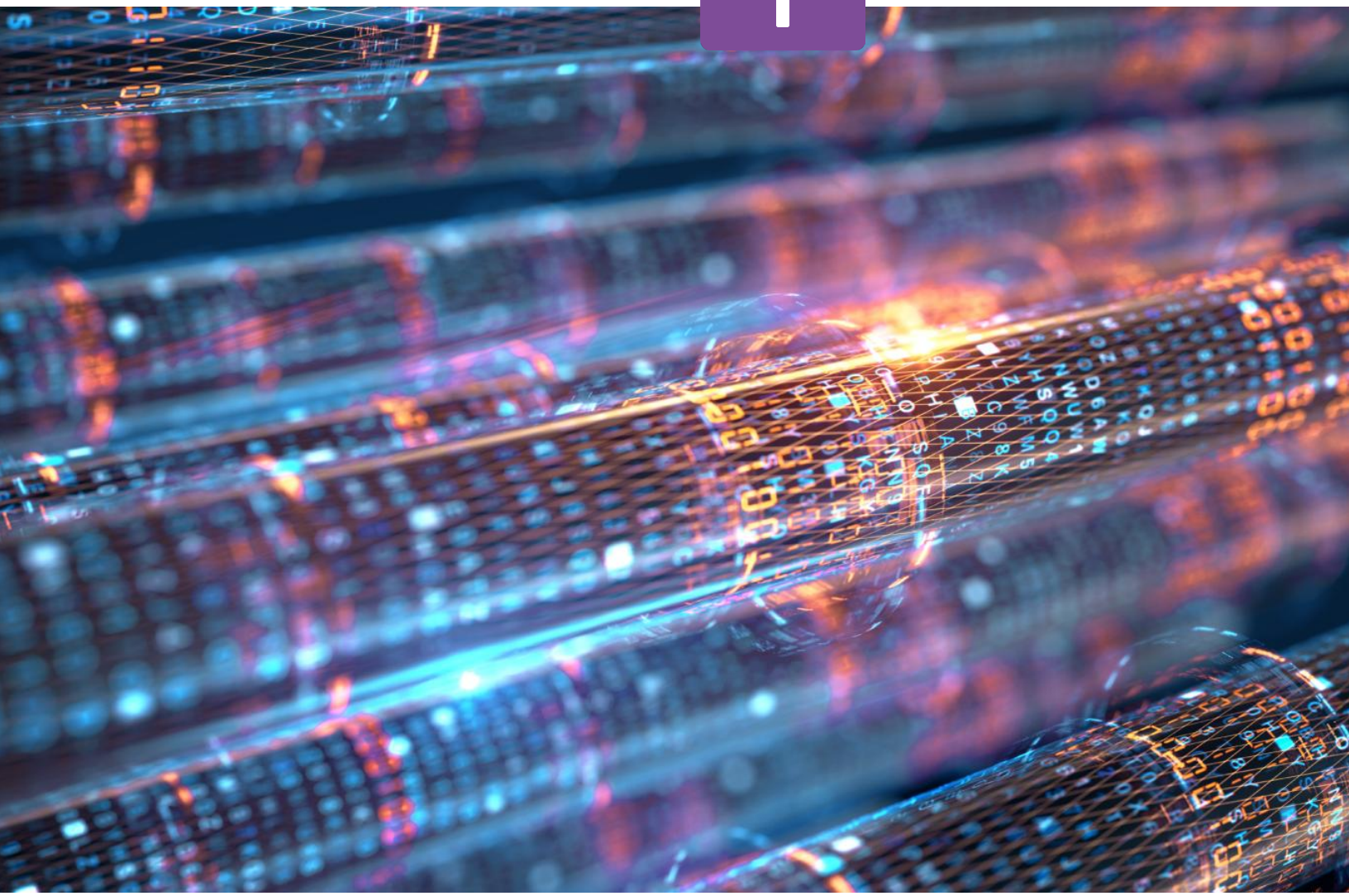
BRIDGES

U.S. Department of Transportation Federal Highway Administration. (2022). Estimated Highway Apportionments and Division J. Retrieved from https://www.fhwa.dot.gov/bipartisan-infrastructure-law/docs/Est_FY_2022_026_Formula_Programs_Infrastructure_Investment_State-by-State_Year-by-Year.pdf

BROADBAND

2024 MONTANA

I



EXECUTIVE SUMMARY

Montana has made considerable progress in the past several years to address deficiencies in broadband throughout the state, though it is ranked at the bottom nationally in overall access. Only 71% of locations served by internet service deliver today's speed standard of 100 MBps download and 20 MBps upload, compared to the national mark of 93%. In 2021, the Montana Legislature directed $275 million into broadband projects from 2021's American Rescue Plan Act. The Infrastructure Investment and Jobs Act passed by Congress that same year will deliver at least $775 million of broadband investments, including almost $100 million in Tribal communities. Montana's Governor and the Montana Broadband Office have enhanced planning efforts and have set a target to make broadband accessible statewide by 2030. Adoption of broadband connections lags accessibility, in some cases, because of affordability and computer literacy gaps. To complete the deployment of these federal and state investments and earn a letter grade, decision-makers should collect more data on broadband infrastructure condition, capacity, reliability, and resilience.

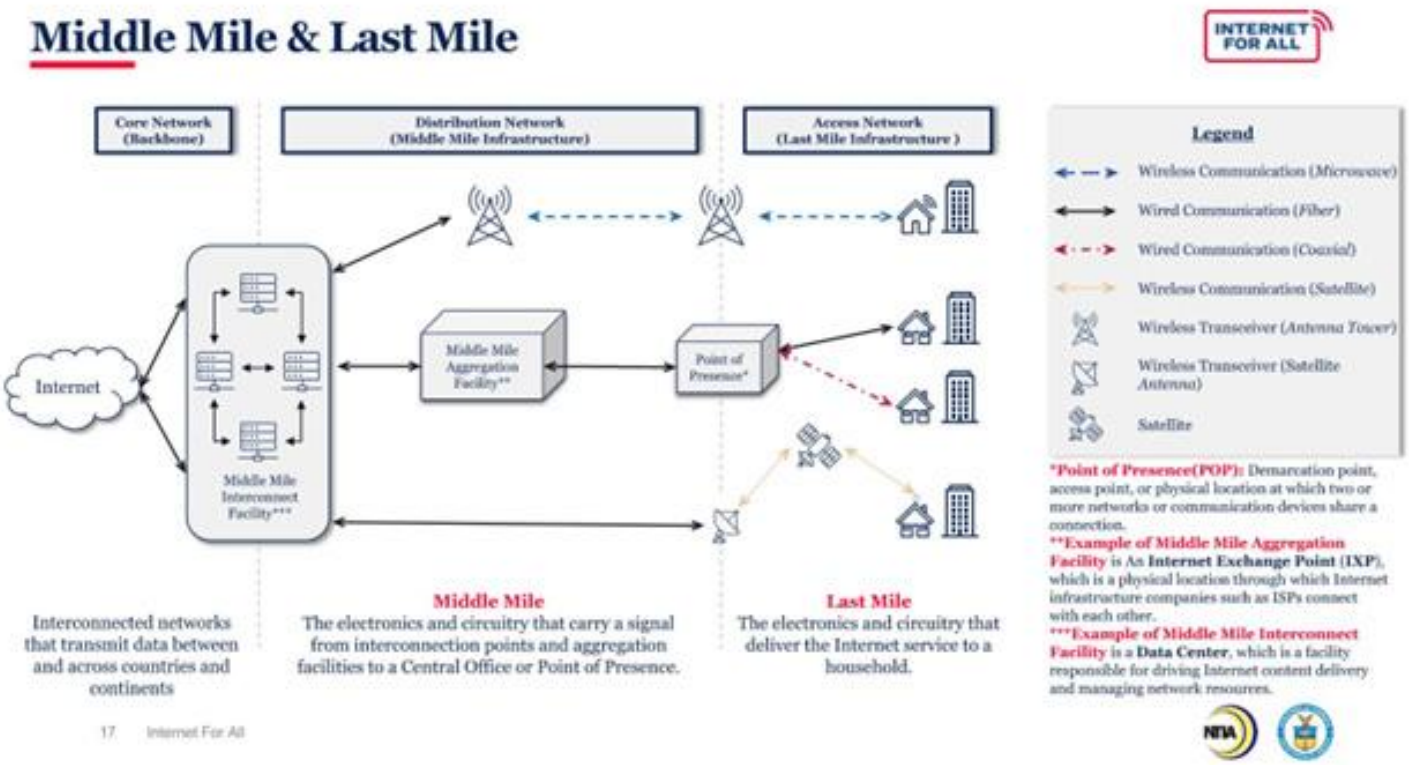


FIGURE 1. INTRODUCTION TO BROADBAND AND HIGH-SPEED INTERNET
Source: National Telecommunications and Information Administration, "Introduction to Broadband and High-Speed Internet P. 17. Available at https://broadbandusa.ntia.doc.gov/sites/default/files/2022-12/Introduction_to_Broadband_and_High_Speed_Internet_FINAL_0.pdf

BACKGROUND

As the fourth largest state by land in the country, Montana extends across 150,000 square miles. In terms of total population, Montana comes in 44th, with just over one million residents or 7.4 people per square mile. This low population density, coupled with topographic hurdles like vast plains and the Rocky Mountains, poses challenges to establishing broadband infrastructure, leaving many Montanans without access to adequate internet speeds.

Montana's two geographic regions, the Great Plains and Rocky Mountains, pose distinct challenges for ISPs, that often result in a higher cost for broadband deployment. The Great Plains are glaciated, frequently freezing in the winter, and sparsely populated. The Rockies feature high elevation and mountains in which it is challenging and expensive, if not impossible, to lay fiber optic cable. The eastern part of the state suffers from some of the lowest access to and adoption of high-speed internet, due to the challenges of the Great Plains region. This area is also remote and sparsely populated, and as a result, its residents lack adequate broadband infrastructure.

ISPs provide all internet services in Montana. Currently there are 58 broadband service providers in the state. Of the 58, there are 35 providers of fiber. The remaining providers consist of wireless, satellite and other facilities. Most of these providers are private for-profit companies, however there are several non-profit entities that also provide broadband services in areas currently not served by for-profit companies. Fiber is typically the preferred delivery system for both customers and providers due to its reliability and speeds of up to 1,000 megabits per second. Additionally, fiber has lower latency (lag time) than other technologies.

There are a total of 487,684 broadband serviceable locations in Montana. Approximately 71% of the state has adequate broadband service. According to BroadbandNow, in 2023, Montana ranked 50th in access to affordable high-speed internet plans, as only 62 percent of households had access to wired plans, including DSL, copper, cable, or fiber, of

25 Mbps download/3 Mbps upload or higher and a standalone broadband speed plan that is $60/month or less

In Montana, the Public Service Commission has jurisdiction over traditional landlines. However, it is specifically prohibited from regulating ISPs. The condition of Montana's existing broadband infrastructure is unknown and dependent on private companies to maintain those systems, report the condition and expand those systems to areas that are currently unserved or underserved.

The State of Montana created the Montana Broadband Office (MBO) in 2021 when the state legislature and Governor Greg Gianforte signed the ConnectMT Act (Senate Bill 297 and House Bill 632). According to the approved legislation, the MBO is tasked with:

- Conducting Research and data collection to build the Statewide Broadband Map, with input from Internet Service Providers (ISP's)
- Establishing and administering the broadband infrastructure deployment program to distribute grant funding to ISP's
- Monitoring projects to ensure compliance with the use of grant funds.
- Engaging stakeholders to ensure the broadband program will meet all Montanan's needs.

The ConnectMT Act also increased ARPA funding for broadband projects to $ 310 million (https://connectmt.mt.gov/). In June 2023, $629 million in appropriations under the 2021 Infrastructure Investment and Jobs Act (IIJA) were delivered for broadband projects in the State of Montana. To distribute the funds, BIL created the Broadband Equity, Access, and Deployment (BEAD) Program. This program is designed to eliminate the "digital divide" by addressing deployment challenges in rural areas and disadvantaged communities. The BEAD program provides funding for the deployment of "last mile" broadband connectivity to every unserved or underserved household and/or business in the country.

Unserved are households or businesses that lack download speeds of at least 25 megabits per second and upload speeds of 3 megabits per second.

Underserved are areas that have download speeds less than 100 megabits per second and upload speeds less than 25 megabits per second.

4G (Mobile Wireless) data streaming at approximate speeds between 12 and 36 megabytes per second. This equates to approximately six-minute download time for a feature-length movie.

5G (Mobile Wireless) data streaming as supporting up to 300 Mbps or greater. A feature-length movie can download in as little as 15 seconds. Designed for urban areas.

Digital divide is the gap between Americans that have access to broadband services and those that are either unserved or underserved.

SPOTLIGHT

Since 2018 the FCC has been tasked with preparing a comprehensive National Broadband Fabric Map which depicts the preparing a comprehensive broadband availability map across the United States, known as the FCC's National Broadband Map. This map was published in June 2023 and updated in December of 2023. For years, the FCC's maps relied on data that may have been incomplete or inaccurate, but recently, the accuracy of the map has improved. However, due to the number of ISPs, it is difficult to validate the information contained on the current map. It will probably take more years for the FCC to be updated to an extent that it can be reliably used to determine the actual condition of broadband. The map shows Montana with 87% access to broadband. Most of the areas that lack access to broadband are in the rural areas of Montana. However, there are several areas within municipalities that are either unserved or underserved. This map requires voluntary reporting by the ISPs.

The anticipated total costs to complete the broadband infrastructure in Montana is between $690 million and $830 million in total BEAD subsidies . This range is partly due to the technology mix used to provide broadband

service. Fiber optic cable for the last mile is the preferred method of providing broadband to everyone in the state. However, there are areas within the state where providing fiber is estimated to cost more than $100,000 per user. Installation of fiber can range from less than $20,000 per mile to more than $300,000 per mile. Fiber also requires middle mile infrastructure which is the physical mid-section of the infrastructure required to enable last mile internet connectivity to users. The state is trying to set a maximum user cost limit but has yet to settle on a final dollar amount. To serve these areas, the state is anticipating using satellite, fixed wireless, or a mix of technologies.

The Montana Legislature authorized $310 Million in American Rescue Plan Act (ARPA) grants to expand broadband service throughout the State of Montana. On December 14, 2022, the Governor approved 61 projects that will provide broadband service to 38,631 unserved and 21,956 underserved communities. Many of these projects started in the summer of 2024 are anticipated to be completed by the end of 2025 .

On June 26, 2023, the State of Montana was notified that it qualified for $629 million in BEAD Grants to expand broadband. To access this money, the state needed to complete a BEAD 5 year- Action plan, which was completed on July 27,2023, a Digital Opportunity Plan which was approved by the National Telecommunications and Information Administration (NTIA) on March 26, 2024, and an Internet for All proposal to distribute funding. The state has completed these requirements and is currently evaluating applications from ISPs in a competitive grant funding round.

Presently, the FCC does not consider wireless connections, e.g., smartphones and tablets, in its assessment of broadband access. However, lower-income residents, younger households, and those occupied by racial minority groups are more likely to use wireless data connections on mobile devices as their primary connectivity method. The Pew Research Center found in 2021 that only 57% of Americans of income below $30,000 had wireline broadband at home, and only 59% a home computer, while 76% of them had smartphones – a 27% gap. Only 11% of Americans between $30K and $100K rely on smartphones for internet connectivity and 6% of those earning six-figures. Modern mobile devices allow "hotspot" mode, allowing computers to piggy-back on smartphone data, but those are unreliable, expensive, and power-intensive connections. However, in many places in rural Montana, cellular service let alone 5G service is not available.

Understanding what infrastructure is required for the next generation (e.g., full 5G deployment, internet of things applications) needs to be part of planning and spending so that obsolescence is avoided. Focus on resilience is also crucial, as telecommunications are exposed to both cybersecurity and physical threats. Both new infrastructure construction and resilience are part of engineering solutions. Expanding and maintaining broadband infrastructure typically involves right-of-way issues for the location of new fiber optic lines.

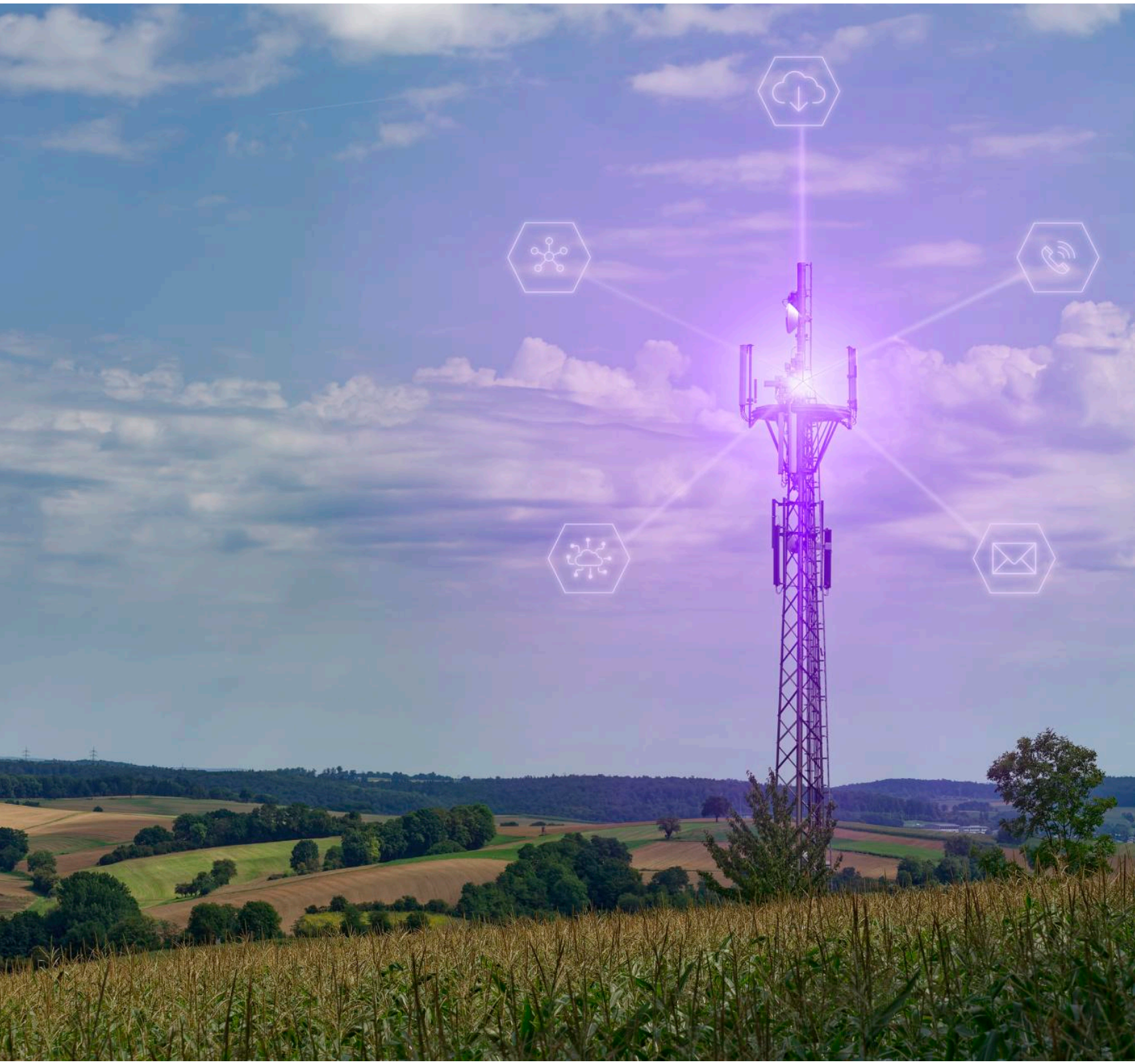
The Montana Legislature has passed a, "dig once" law that requires the Montana Department of Transportation to notify broadband companies when highways are under construction so broadband infrastructure can be installed at the same time. This law does not apply to tribal lands where access to right of way may take more than a year for ISPs to gain access.

Montana should also address its affordability issues. On June 1, 2024, the FCC's Affordability Connectivity Program (ACP) ended. This program provided up to $30 monthly discount for household broadband service (up to $75 monthly discount on tribal lands (and a one-time device discount of up to $100 for a laptop, tablet, or desktop computer. Congress did not authorize funds to continue this program. A second program called Lifeline provides a discount of $9.25 ($ 34.25 for residents on tribal lands) for telephone, internet, or bundled services. One of the most common reasons Montana households do not have broadband services is the costs of those services.

Another program that can help address affordability is the continued existence of a stable federal Universal Service Fund (USF). The USF is a key funding mechanism that for decades has provided operational expense support for rural networks, low-income subscribers, schools, libraries, and hospitals. Without

the USF, ISPs would be forced to cancel planned buildouts and potentially increase subscription rates. The future of the USF is uncertain due to a constitutional challenge pending in the Supreme Court.

Broadband infrastructure deployment also requires more public involvement and outreach on digital literacy. Many communities, like veterans, senior citizens, racial minorities, and others, do not understand the importance of broadband and/or require empathetic stewardship to utilize new and improved connectivity. Creative stakeholder groups and funding models can help close this gap of understanding with greater capacity from public funding.



BROADBAND

SOLUTIONS TO RAISE THE GRADE

Setting a grade for Montana's broadband infrastructure and improving its performance requires:

- Supporting diligent planning of wireline broadband deployment and greater public data disclosure from productive partnerships between all levels of public/government and the private sector.
- Updating rigorously verified as maps by the Montana Broadband Office.
- Co-location and co-building of broadband should be planned with existing and new infrastructure with private and public asset ownership. This includes managing below- and above-ground infrastructure, improvement in planning and permitting policies and processes. Counties and municipalities should follow the states "one dig" law and allow ISP access to road easements during street reconstruction.
- Reconsideration of state and local regulations for broadband infrastructure to maximize the value of public investment, close digital literacy gaps from new and existing connections, and ensure affordable access to disadvantaged communities.
- Facilitation of creative broadband deployment strategies and organizations with local-community buy-in and wraparound services for connectivity gaps before and after an operational wireline connection.
- Increase broadband resilience, providing areas with more than one ISP wherever feasible. Provide redundant services to the 3823-community anchor institutions.
- Montana should also address its affordability issues. Provide for and maximize the use of programs similar to the FCC's ACP to make broadband affordable for all.

BROADBAND

SOURCES

National Telecommunications and Information Administration. (n.d.). Introduction to broadband and high-speed internet (p. 17). Retrieved from https://broadbandusa.ntia.doc.gov/sites/default/files/2022-12/Introduction_to_Broadband_and_High_Speed_Internet_FINAL_0.pdf

United States Census Bureau. (2021, July 1). Land area and population estimates.

Montana Broadband Office, Montana Department of Administration. (2023, July). BEAD 5-Year Action Plan, State of Montana (Working draft).

Cooper, T., & Tanberk, J. (2021). 102 best and worst states for internet coverage, prices and speeds. BroadbandNow. Retrieved from https://broadbandnow.com/research/best-states-with-internet-coverage-and-speed

Montana Broadband Office, Montana Department of Administration. (2023, June). BEAD Digital Opportunity Plan (Working draft).

Montana Broadband Office, Montana Department of Administration. (2023, July). Digital Opportunity Plan (Working draft).

Congressional Research Service. (2022, December 27). FCC's National Broadband Map: Implications for the Broadband Equity, Access and Deployment (BEAD) Program.

Montana Broadband Office, Montana Department of Administration. (2023, July). BEAD 5-Year Action Plan, State of Montana (Working draft).

Montana Broadband Office, Montana Department of Administration. (2023, July). Digital Opportunity Plan (Working draft).

Federal Communications Commission (FCC). (n.d.). The Affordability Connectivity Program. Retrieved from https://www.fcc.gov/cap

Mahlum, B. (2024, October 30). Email correspondence. broadbandmt.com

DAMS

2024 MONTANA C-

EXECUTIVE SUMMARY

Montana's geography and varied climate mean the state's more than 3,000 dams represent an inventory 50% bigger than any other western state. 81% are privately owned, 10% are federally owned, and only 5% are state-owned, posing challenges to Montana leaders. 206 of the 3,000 are High-Hazard Potential (HHP), potentially threatening life should they fail. 81 of those 206 have federal owners, and 78 possess Emergency Action Plans (96%), compared to 91% of the HHP dams owned by Montana with those plans. Dams are aging in Montana, with an average age of 70 – beyond the common 50-year design life. Funding is limited to improve these structures. 2021 data showed that eleven state-owned HHP dams required work that could take more than a decade to be funded. Private owners managing the bulk of dam inventory have even less access to public funds. Montana decision-makers should prioritize and remedy the areas of greatest risk with increased funding and nurture the workforce necessary to deliver.

BACKGROUND

Montana is an arid state, with much of the average annual precipitation occurring in the form of snowfall during the winter months. Reservoirs store water for use throughout the year to many of Montana's most important industries. Montana's dams provide water for: municipal water supply, agricultural irrigation, flood risk reduction, power generation, aquatic habitat enhancement, recreation, and commercial/industrial applications.

There are over 64,000 [1] reservoirs in Montana. The vast majority of these reservoirs are small, storing well below 50 acre-feet of volume which is the permitting oversight threshold for the State of Montana Dam Safety Program. The DNRC has permitting authority over dams within the State that store greater than 50 acre-feet of volume, however, small dams (less than 50 acre-feet) are inventoried through the water right system.

According to the United States Army Corps of Engineers (USACE) National Inventory of Dams (NID), there are 3,007 inventory-sized dams in the State of Montana. Dams are included in the NID if they are classified as high hazard potential, significant hazard potential, or if the dam meets minimum height and reservoir volume requirements. According to the NID, dams that exceed 25 feet in height and 15 acre-feet of storage volume are included in the inventory, in addition to dams storing 50 acre-feet or more and exceeding six feet in height. Dams less than six feet in height are excluded from the NID, regardless of storage volume.

Dams are classified as either high hazard, significant hazard or low hazard, where hazard classification is a function of downstream consequence in the event of failure. A high hazard dam is a structure in which loss of human life is expected in the event of a failure. A significant-hazard dam is a structure in which failure or mis-operation is not expected to cause loss of life, but results in significant economic loss. A low-hazard dam is a structure where failure may cause minor property damage. According to the NID, there are 206 high-hazard dams, 193 significant-hazard dams, and 2,608 low-hazard dams throughout the State of Montana.

Ownership of the 3,007 dams listed in the NID [2] within the State of Montana are as follows:

- 2,450 are privately owned; (81%)
- 287 are federally owned; (10%)
- 151 are state owned; (5%)
- 84 are owned by local governments; (3%)
- 24 are owned by public utilities; (<1%)
- 11 are Unlisted owners (<1%)

It is important to note that the NID does not distinguish between Tribally owned dams. According to a DNRC [1] publication, in 2018, approximately 102 dams were Tribally owned. It is also important to note that Montana law does not distinguish between low and significant hazard dams.

The Montana Department of Natural Resources and Conservation (DNRC) Dam Safety Program provides regulatory oversight for dams owned by state, local governments, and private individuals/organizations. Dams owned or regulated by federal agencies are exempt from DNRC oversight. Note that the DNRC and USFS have entered a jurisdictional agreement for dams on USFS property. The Montana Department of Environmental Quality (DEQ) provides regulatory oversight for wastewater pond embankments meeting dam criteria and mining/tailings dams.

CAPACITY

In terms of primary purpose, the vast majority [2] of Montana's dams are used for livestock water or are small farm ponds, followed by irrigation, recreation, flood control and then water supply. Demand for water is increasing as the population and the economy of the state grow. According to the U.S. Census Bureau, Montana's population increased from approximately 799,000 in 1990 to approximately 1,084,000 in 2020.

Despite the growing demand for water, there has been very little construction of new impoundment facilities, as most construction associated with Montana dams is focused on rehabilitation of existing structures. Additionally, many of the river basins in Montana are closed to additional water right appropriations. Montana has a significant amount of water stored in its reservoir system, but the storage capacity is decreasing with time as reservoirs slowly accumulate and retain sediment. Currently, the DNRC is not actively dredging sediment behind existing DNRC owned structures, but measures are being taken to collect bathymetric data to quantify storage loss over time.

Currently, two reservoirs have significant mandatory water level restrictions due to dam safety concerns. These reservoir restrictions are impacting irrigation and recreation.

CONDITION

It is important to note that condition assessment data is publically available for very few dams within the State of Montana. The DNRC provided condition assessment data for the State regulated high hazard dams. Therefore, publicly available condition assessment data was not utilized due to lack of sufficient data to characterize the condition of dams across the state. According to the NID, the average age of dams in Montana is about 70 years old. Although rarely explicitly stated, the average design life of a structure is on the order of 50 years, implying that most of the dams in the State of Montana are operating well beyond their design life.

The primary deficiency associated with State owned high hazard dams is related to deterioration of principal outlet conduits. Another common deficiency in State owned high hazard dams is auxiliary spillway concrete degradation.

It is important to note that the hazard potential of a classified dam is based solely on the loss of life potential downstream of the dam to where the inundation area intercepts the 100-year floodplain, during a sunny day breach scenario. Hazard potential does not indicate the structural condition of a dam or its appurtenances. The condition of Montana's dams varies according to hazard classification and regulatory oversight:

HIGH HAZARD POTENTIAL DAMS—ALL JURISDICTIONS

All high hazard potential dams in Montana (under DNRC jurisdiction) must be inspected every five years by a licensed engineer according to stringent criteria. According to the DNRC, of the 119 State regulated high hazard potential dams, 74 are in satisfactory condition, and 11 are in fair condition, implying that the dams exhibit no existing major safety deficiencies. Note that 13 dams do not have a condition assessment rating; primarily the dams located on USFS property that have recently come under DNRC oversight. According to the DNRC, for the remaining 21 high hazard potential dams with an unsatisfactory or poor condition assessment, risk reduction measures are in place until the dam can be repaired or rehabilitated. Risk reduction measures typically include reservoir level restrictions, increased monitoring, and emergency preparedness.

Across the country, the number of dams classified as high hazard potential is growing, due to the development of areas downstream, also known as hazard creep. Hazard creep is occurring in Montana as the state's population increases.

SIGNIFICANT AND LOW HAZARD POTENTIAL DAMS—FEDERALLY REGULATED

Significant and low hazard potential dams with federal oversight typically have cursory annual inspections but are often exempted from intensive 5-year inspections by independent consultants. Significant and low hazard potential dams with deficiencies commonly have risk reduction measures in place imposed by the federal regulatory agency.

SIGNIFICANT AND LOW HAZARD DAMS—STATE REGULATED

Inspections are not required for State regulated dams that lack potential for loss of life downstream. As a result, many of these structures have not received significant maintenance or rehabilitation since their initial construction. Additionally, many of these structures were constructed to outdated design standards or with no engineering oversight. Very limited data describing this group of dams is available; however, potential exists for failure of dams in this category to present risk to life and property.

FUNDING

There are two primary categories associated with safety of dams funding; funds for rehabilitation/repair, and funds which support dam safety oversight and regulation.

1. REHABILITATION AND REPAIR FUNDING

Inspections are not required for State regulated dams that lack potential for loss of life downstream. As a result, many of these structures have not received significant maintenance or rehabilitation since their initial construction. Additionally, many of these structures were constructed to outdated design standards or with no engineering oversight. Very limited data describing this group of dams is available; however, potential exists for failure of dams in this category to present risk to life and property.

HIGH HAZARD POTENTIAL DAMS

High hazard dams owned and operated by governmental agencies have access to various funding options, including grants and loans, and budgetary or legislative funding from the State or Federal Government. Privately owned high hazard potential dams typically only have access to funding through loan programs. In some situations, a local government agency can sponsor a private high hazard dam owner to apply for grants. Note that for some federal grants, the sponsor is generally required to agree to maintain the sponsored dam for 50 years which is a commitment that sponsors are typically unwilling to do, or cannot legally make. This sponsorship approach can be done when the private dam also provides public benefit.

According to the Montana Dam Safety Program, irrigation reservoirs do not typically generate sufficient revenue to adequately fund rehabilitation expenses. Unlike public or hydropower facilities, user fees are not readily or easily adjusted to compensate for shortfalls in funding for operations, maintenance or rehabilitation projects. Volumetric rate assessments can only be raised a finite amount before the rate exceeds the water users' ability to absorb the cost. These rate increases then put the water users at risk of bankruptcy and the reservoir at risk of decommissioning which is in direct contradiction to Montana law, which supports water

SIGNIFICANT AND LOW HAZARD POTENTIAL DAMS

Federally owned significant and low hazard potential dams have resources available for repair and rehabilitation albeit at a lesser level than for high hazard dams. Occasionally, federally regulated dams are privately owned, but are located on federal property. These privately owned dams are typically responsible for procuring funding for repair and rehabilitation.

In Montana, significant and low hazard potential dams under state regulation are predominantly privately owned. The only funding sources available are loans. As described above, in rare situations, where a privately owned dam also provides public benefit, a local government agency may provide grant sponsorship.

2. FUNDING FOR REGULATORY OVERSIGHT PROGRAMS

Funding provided from the Bipartisan Infrastructure Law (BIL) has provided $893,000 (fiscal year 2024) in State Assistance Grant funding administered through FEMA's National Dam Safety Program. Although the 2025 fiscal year award will be comparable to the 2024 award, FEMA has cut this program and future appropriations are not expected. The funds from the FEMA State Assistance Grant Funding program were focused on dam safety projects that benefit dam owners and were specifically being administered for non-rehabilitation projects. However, FEMA has committed to providing money through an annual appropriation to support the Montana State Dam Safety

HIGH HAZARD POTENTIAL DAMS

According to the DNRC, the Dam Safety program budget for FY2024 is $734,600, which does not include FEMA grants. A 2023 report published by the Association of State Dam Safety Officials (ASDSO) [3] indicated that the state dam safety budget increased by approximately $100,000 from 2010 to 2022. The same ASDSO report indicates that the Montana Dam Safety Program's budget per regulated (high hazard) dam is slightly above the national average [3]. The dam safety regulatory program includes support for regional offices and engineers, who implement the dam safety program locally. Given the size of Montana, it is difficult for these regional engineers to adequately cover the large spatial area and task assignments, as they have several responsibilities in addition to dam safety. As a result of the limitations, the dam safety group primarily focuses on high hazard dams.

SIGNIFICANT AND LOW HAZARD POTENTIAL DAMS—FEDERALLY REGULATED

Federal funding for significant and low hazard potential dams depends on the agency and ownership. In general, federally owned dams are provided resources, depending on agency priorities.

SIGNIFICANT AND LOW HAZARD DAMS—STATE REGULATED

As mentioned above, the primary focus of Montana state dam safety engineers is on the high hazard potential dams. The state has limited resources to provide guidance and assistance to the significant number dams with other hazard classifications under state regulation. Thus, funding for program oversight and assistance to most significant and low hazard potential dams is low compared to the national average. According to the 2023 ASDSO Montana Dam Safety Program metrics, the state budgetary funding per regulated dam in Montana is approximately 25% of the national average. Note that much of Montana is sparsely populated with lower levels of associated infrastructure development that could be impacted by a dam failure.

FUTURE NEEDS

A pervasive future need for dams across the country is knowledge transfer and recruitment for a workforce capable of the continued design and maintenance of dams and hydroelectric facilities. This applies to regulatory personnel, consulting engineers, skilled trades workers and owners' engineers and technical staff. All segments of the dam safety industry express concern with staffing challenges and knowledge transfer. Addressing this future need will likely require long-term increased collaboration with university programs, trade groups, and labor organizations in order to highlight the need for and support the development of the workforce.

Montana's climate and topography is unique and varies widely across the state. Casual observations of snowpack and precipitation trends in recent years indicate that larger annual variations in runoff and streamflow in the future are to be expected in mountainous areas. In June of 2022 a rain on snow event created record high stream flows that caused catastrophic damage in Carbon, Stillwater, and Park Counties. But in the winter of 2023 – 2024 many basins in Montana experienced historically low snowpack levels for much of the winter. Improvements to the system of hydrologic data collection, analysis, and communication of the status and criticality of precipitation and snowpack conditions would surely yield a benefit to dam owners of all types.

FEDERALLY OWNED DAMS

Dams owned by federal agencies are typically more insulated from the types of needs common to other owners because of their longer-term and less variable funding sources, in addition to their self-regulation.

STATE OWNED DAMS

Montana DNRC State Water Projects data from 2021 indicates that twelve dams (eleven high hazard) require varying degrees of spillway or outlet repair, rehabilitation, or complete replacement. Some of these projects are likely in varying stages of feasibility studies or budgeting and design, but with the limitations of resources and funding it will likely be more than a decade before all these needs are met. It is unknown if any state-owned dams have undergone semi-quantitative risk assessment or if the state-owned dam fleet has been evaluated holistically using risk informed decision making tools. If not previously undertaken, risk-informed decision making could help inform budget decisions and priorities for future needs of the various dams.

Following the 2018 Oroville Dam Spillway Incident Independent Forensic Team Report release, the Montana DNRC contracted with an engineering firm to review the report and identify lessons applicable to Montana [7]. The DNRC is in the process of implementing those recommendations, as budget and staffing allow. For example, Dam Safety rules were recently modified to clarify the required level of engineering review for five year dam inspections.

PRIVATELY OWNED DAMS

In addition to the issues described above, private dam owners need greater access to funding sources for dam safety projects more so than the other dam owner types. This need is more critical for small and low hazard dams with public benefits and especially dams that do not generate significant revenue.

OPERATION & MAINTENANCE

The COVID-19 pandemic highlighted vulnerabilities in the supply chain for all market sectors, and the utility and construction markets were not immune to those impacts. Dams and hydroelectric facilities are perhaps more vulnerable to supply chain disruptions than other industries due to the generally higher reliance on international suppliers of specialized mechanical and electrical components. Significant increases in material and construction costs and supply lead times were experienced in early 2020, and many industries have not normalized. Dam owners cannot rely on a ready supply of specialized equipment and materials. Therefore, they should plan maintenance and repairs further in advance than in past practice.

Inflation and rising costs associated with materials, construction equipment, labor and engineering in recent years has reached as high as three times the long-term average. Operation and maintenance budgets and funding sources are generally not as resilient or easily adjusted for rapid increases in inflation, which in turn results in budget shortfalls in the near term and significant increases in operational costs in the long term. Dams and hydroelectric facilities must use conservatism and creative budgeting strategies to ensure maintenance isn't perpetually de-prioritized.

The dam industry continues to benefit from advances in control and automation technologies, and the continued deployment of remote sensing and operations. While these technologies provide a benefit in relation to operational efficiencies, they present new types of risks to facilities if those systems are disrupted or fail. Also, with increased technology comes increased risk related to cyber-security. The large federal agencies are recognizing these risks and incorporating mitigating regulations. State-owned and state-regulated dams may have to make progress in this regard.

Increasing saturation of intermittent renewable power generation sources and a decreasing role of legacy base-load plants in Montana has resulted in changing roles for Montana's hydroelectric facilities. Hydroelectric facilities are increasingly called upon by balancing authorities for ancillary services such as operating reserves, frequency control,

and voltage control. These changes to the operational schemes of hydro plants, particularly for older facilities not specifically designed for such, will inherently increase operation and maintenance needs over time.

Montana DNRC will be utilizing Bipartisan Infrastructure Funding to implement a program to assist high hazard potential dam owners to develop modernized operation and maintenance manuals and procedures.

PUBLIC SAFETY

Federally regulated high-hazard potential dams are required to have emergency action plans (EAP's) by federal law. Of the 81 federally regulated high-hazard dams in Montana, all but 3 have emergency action plans according to the NID. Of the three dams without a current EAP, one is owned by the forest service and is currently being rehabilitated, and the remaining two were constructed by the Natural Resources Conservation Service and have unknown status. EAPs for federally regulated dams typically follow FEMA 64 guidelines and are regularly updated and tested by tabletop or functional exercises every 5 years.

The State of Montana administrative rules require emergency action plans for all high-hazard dams. Of the 119 high-hazard potential dams regulated by the State of Montana currently 11 are listed in the NID as not having an emergency action plan. The requirements for EAPs in Montana for state-regulated dams are simplistic relative to FEMA 64 guidelines, and the required maintenance is simply an annual review and update with no requirements for tabletop or functional testing. Montana DNRC will be utilizing Bipartisan Infrastructure Funding to implement a program to assist high-hazard potential dam owners to develop modernized EAPs, which will include improved inundation mapping and tabletop exercises for dams with higher downstream consequences.

It is important to note that the State of Montana utilizes a risk-based standard for high-hazard potential dam spillway design criteria, with design inflow increasing as the estimated loss of life increases. Montana's risk-based spillway standard has allowed many dams with structural issues to be cost-effectively rehabilitated, substantially increasing public safety. [8]

RESILIENCE

The resilience of Montana's dams are highly variable depending on the owner type, size of facility, and revenue stream. For large federally owned or regulated dams with strong revenue streams, such as power generation facilities, the incentive for quick recovery from incidents compromising operation is high, and the financial backing is strong or adequately insured. For state- or privately-owned dams with lower revenue streams, such as irrigation facilities, resilience is marginally lower as the impact of incidents may be less immediate and funding for recovery is somewhat less secure. For privately owned high and low hazard dams with little to no revenue streams, overall resilience is likely poor as the funding for recovery is more likely to be insufficient.

INNOVATION

Aside from general innovations in science and technology, the following innovations from recent years have the potential to benefit dams and hydroelectric facilities:

- USGS Earthquake Notification Service & StreamStats
- USACE Risk Management Center LifeSim software
- USACE Dam Screening Tools (DST) for inundation mapping and risk identification
- USACE Hydrologic Engineering Center innovations (RAS, HMS, FIA, etc.)
- 2D flood mapping and GIS integration for EAP inundation maps
- NCCHE DSS-WISE software for dam owner inundation map development

- Semi-quantitative risk assessment adoption for dam safety
- Additional research, development, and publication on known and/or common failure modes (i.e. Wahl & Heiner, 2024 ASCE [5])
- Computation Fluid Dynamics (CFD) coupled with physical modeling
- Nation-wide Probable Maximum Precipitation depth updates (NOAA HMR)
- Dam Modeling Communication Guidelines (ASDSO)
- Dam Safety Toolbox (ASDSO) https://www.damtoolbox.org

The Montana DNRC dam safety program has revised or created many technical notes [6] in recent years, to provide uniform guidance and expectations for dam safety of state-regulated dams. The increase from Bipartisan Infrastructure Law (BIL) funding to the FEMA Assistance to State Dam Safety Assistance Grants also has potential to advance innovations in State dam safety.

With the help of BIL funding, NOAA is currently updating the nationwide probable maximum precipitation (PMP) estimates. The NOAA hydrometeorological reports (HMR's), which have provided dam owners, engineers and regulators with design precipitation depths for critical dam infrastructure, were (largely) developed in the 1960's and 1970's, and although antiquated, have provided a basis for design precipitation values for dam design and are in desperate need for updating. Specialty consultants have filled this gap over recent years by providing site-specific and state-wide PMP studies; however, these studies are costly and few dam owners have sufficient funding for this work.

DAMS

SOLUTIONS TO RAISE THE GRADE

- Completion of Emergency Action Plans (EAPs) for the 11 state-regulated high-hazard dams that currently do not have EAPs is recommended.
- Incorporate additional FEMA 64 guidelines for EAP requirements to the dam safety program, including some provision for selective or periodic testing at a minimum.
- Prioritize the thirteen existing state-regulated high-hazard dams without condition assessments.
- Prioritize the 21 state-regulated high hazard dams with a poor condition assessment to implement repair and/or rehabilitation projects, versus relying on risk mitigation measures. Advocate for increased and consistent funding for the High Hazard Potential Dam Grant program
- Increase collaboration between dam owners, regulators, and university programs, etc. It is recommended that dam owners and regulators increase collaboration with university programs, trade groups, and labor organizations to develop and maintain a sufficient and skilled workforce.
- Increase full-time-employees for Montana DNRC dedicated to dam safety. Advocate for salaries competitive with the private and federal sector to aid in recruitment and retention.
- Continue to incorporate Montana specific recommendations from the 2019 external review of the Oroville Incident Report [7]. The Oroville Dam incident and subsequent independent investigation present a unique opportunity to learn from various technical and organizational shortcomings, and the effects have already impacted the dam safety discipline.
- Develop an educational program targeted towards low and significant hazard dam owners focused on operation, maintenance and outlet works rehabilitation.

DAMS

SOURCES

[1] Montana Department of Natural Resources and Conservation. (2018). Dams in Montana.

[2] US Army Corps of Engineers National Inventory of Dams. (2024). National Inventory of Dams.

[3] Association of State Dam Safety Officials. (2023). Dam Safety Performance Report for the State of Montana.

[4] Independent Forensic Team. (2018). Oroville Dam Spillway Incident.

[5] Wu, W., & Heiner, T. (2024). Laboratory Measurements of Hydraulic Jacking Uplift Pressure at Offset Joints and Cracks. American Society of Civil Engineers.

[6] Montana Department of Natural Resources and Conservation. (2024). Montana Dam Safety Program Bulletin.

[7] DOWL. (2019). Montana Dam Safety Program Review Regarding the Oroville Independent Forensic Team Report.

[8] Thirty Years of Spillway Reconstruction: Impacts of Moving to a Risk-Based Spillway Standard. (2016).

DRINKING WATER

2024 MONTANA C

EXECUTIVE SUMMARY

Montana has nearly 2,300 water systems operated by public and private entities, including various water treatment, distribution, and storage facilities. These systems serve over one million residents and the state's vital tourism and recreation industries. While several of Montana's larger cities have recently significantly upgraded their water treatment plants and distribution systems, much work remains. The Environmental Protection Agency (EPA) estimates that Montana will need $2.3 billion for water infrastructure improvements, with the greatest needs being in treatment and storage. In recent years, the total annual funding for water and wastewater projects in Montana has averaged over $250 million, up from $160-$170 million annually due to increases in federal funding. These funding levels must be maintained to meet the EPA's goals for infrastructure improvements needed in Montana. Additionally, Montana faces challenges related to a decreasing number of certified water operators. There is a critical need for recruitment and training to fill the growing demand for these professionals. Furthermore, new regulations require Montana communities to conduct lead service line (LSL) assessments, remove lead in water lines, and comply with emerging contaminant limits (e.g., PFAS), which are expected to increase costs further.

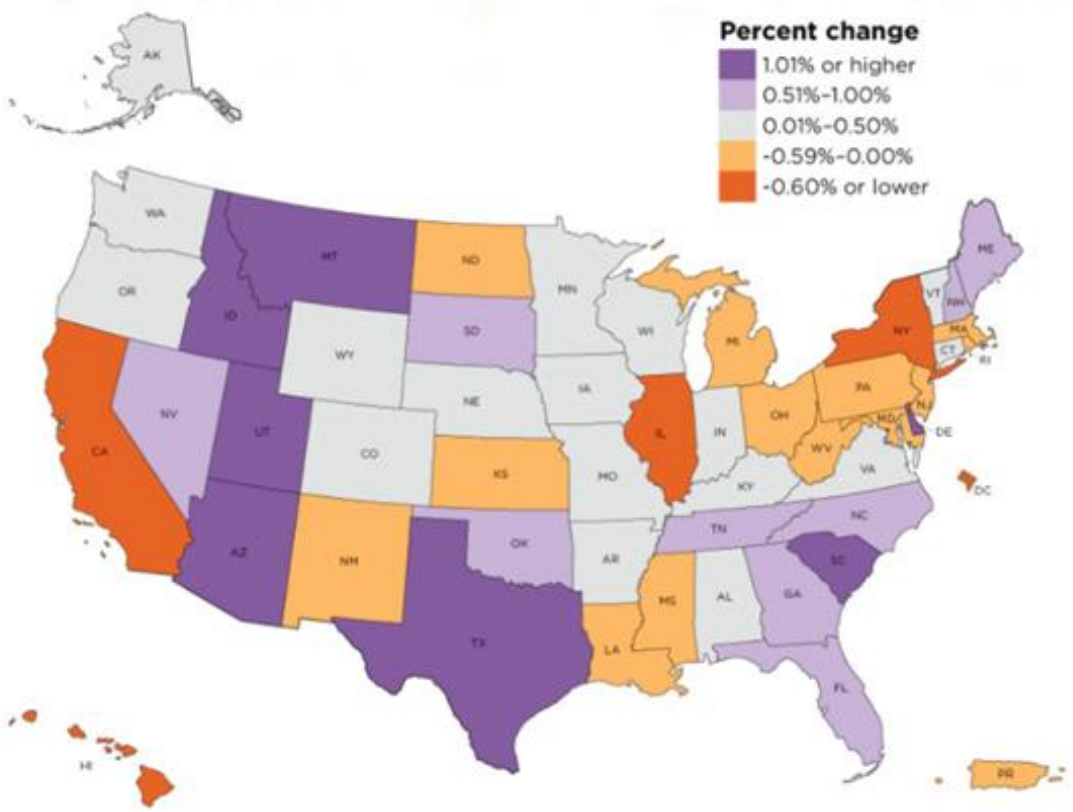


FIGURE 1. MONTANA'S POPULATION GROWTH
Source: Montana Public Radio. (2022, January 3). As the US population stayed relatively flat, Montana's GDP grew by 1.6% during the pandemic. Retrieved from https://www.mtpr.org/montana-news/2022-01-03/as-u-s-population-stayed-relatively-flat-montanas-grew-1-6-during-the-pandemic

CAPACITY

High-quality drinking water is critical to keeping the residents and visitors of Montana safe and healthy while supporting tourism, recreation, and local businesses. The Montana Department of Environmental Quality (DEQ) reports that 2,272 public water systems are in operation in the state. The breakdown of those systems is as follows;

- 34% are communities
- 52% are transient systems (e.g., restaurants, motels, campgrounds, etc.)
- 13% are non-community/non-transient systems (e.g. schools, offices, businesses, parks, etc.)

Though there are almost 2,300 systems in the State, 12 municipalities supply nearly half of the State's population by supporting approximately 440,000 people (41%). 100 smaller municipal systems serve another 210,000 people (20%). The remaining 39% of the population is served by smaller municipalities or privately owned small public water systems. Over 359,000 people (about 34%) rely on surface water as their primary source of drinking water, typically from the Yellowstone, Missouri, and Milk Rivers. The remaining population relies on groundwater sources for their drinking water.

Drought and water limitations concern many communities within north-central Montana (known as the Hi-Line). The Milk River provides source water for approximately 18,000 people living across several communities. The Milk River obtains water diverted from the St. Mary River using a 110-year-old siphon pipe near Babb, Montana. As recently as

June 2024, this pipe ruptured, putting water supply to many municipalities and irrigation needs for important farming areas at risk of surface water depletion. At the time of this report, upgrades to St. Mary's Siphon are in progress.

While many systems have an adequate water supply and associated water rights due to limited growth in the corresponding communities served, other areas have experienced high growth and face water supply constraints or legal appropriation, leading to immanent challenges. For example, the City of Bozeman is experiencing rapid growth; this area is located within the Upper Missouri River Basin, which has a Legislative Closure for new surface water rights. The city is studying its water supply closely and is working to implement water conservation measures and optimize existing water supplies to best use this limited resource.

CONDITION

Typically, the average water pipe age is 55-60 years in Montana communities, with inner core areas seeing ages of 75-100 years and newer outer system areas seeing ages of 30-60 years old on average. Many pipes have reached or exceeded their design lives and need replacement. While water treatment plants across the state vary in age, most have seen extensive upgrades in the last 10-15 years due to new regulations with water quality requirements. Nonetheless, these treatment facilities will need additional improvements in the coming years for general maintenance purposes and to meet new water quality regulations. While treatment systems need upgrades for equipment and replacement of failing components, most existing public treatment systems have additional capacity for growth.

The seven major cities in Montana (Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, and Missoula) have budgeted funds in their Capital Improvement Program (CIP) plans for regular pipe replacement of aging water mains. In recent years, most of the larger cities have invested major funds into their water treatment plants and are now incorporating more pipe replacements for aging systems. However, most smaller communities and municipalities do not have water main or LSL replacements built into their annual budget. These communities rely on replacing aging or noncompliant pipes upon failure and, in some cases, emergencies with unplanned water outages. The smaller communities also handle treatment upgrades similarly, only performing repairs/maintenance as needed or once problems or regulations arise.

According to DEQ, many Montana communities have LSLs in use. However, the quantity and cost to replace the LSL will not be fully known until the LSL assessments are completed in October 2024. According to DEQ, the City of Billings has replaced all LSL to the property lines, the City of Bozeman has replaced all LSL to the residences, with the City of Havre being the first to use available LSL funding to replace over 150 lines anticipated by the end of 2025. While some progress is being made for LSL replacements, the assessments completed in 2024 are anticipated to show a significant need for all state public water systems within ten years.

Montana has four regional water systems: Rocky Boy's North Central, Fort Peck Dry Prairie Rural, Dry-Redwater, and Musselshell-Judith Regional Water Systems. Considerable progress is being made to bring additional customers online to supply clean, reliable water to areas with limited quality and quantity. Additional customers for each regional water system are quantified below; the following graphic illustrates the service area for each system.

- Rocky Boy's - North Central Regional Water System: Service to 10,000 households and an estimated population of 28,000
- Fort Peck – Dry Prairie Regional Water System: Service to 20 community systems and 4000 rural residences
- The Central Montana Regional Water System: Service to 8 municipalities along with rural connections for an estimated population of 6,000
- Dry-Redwater Regional Water System: Service to 15,000 residents

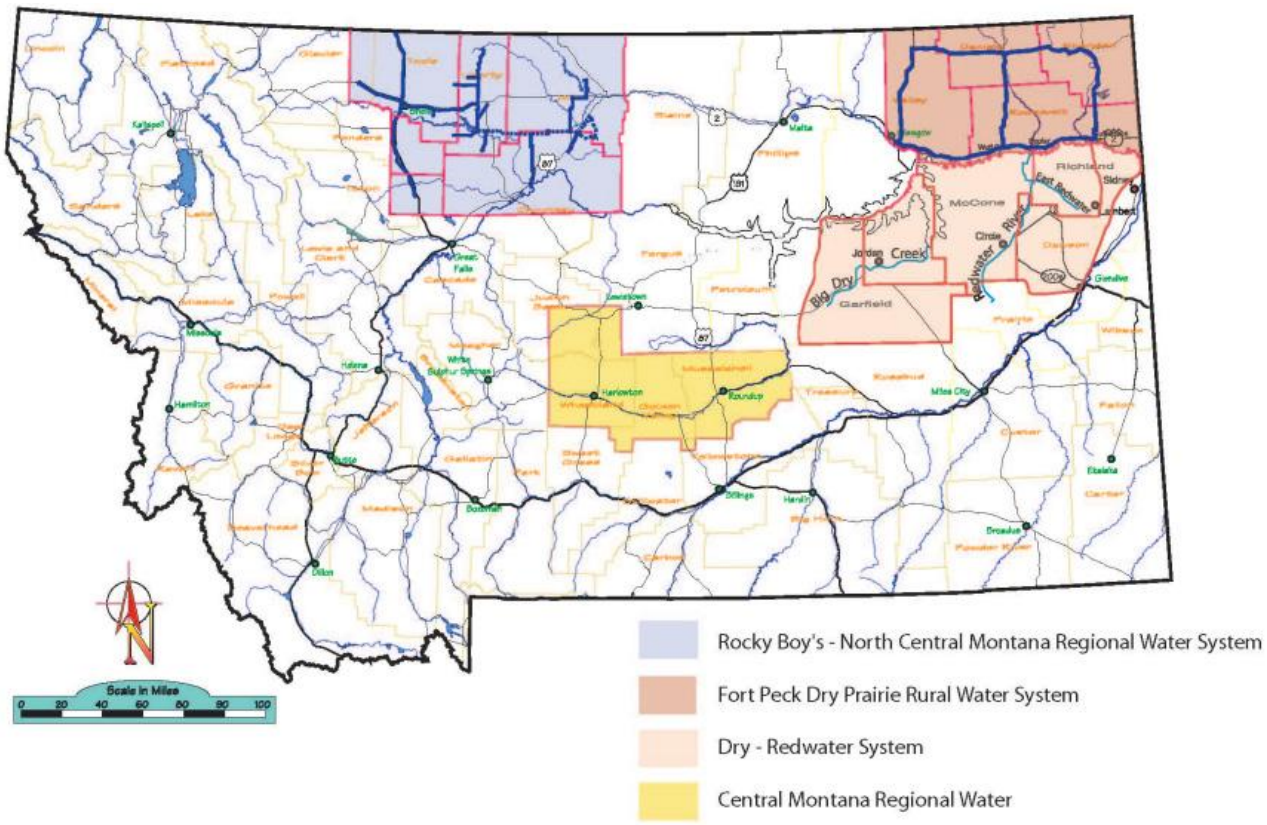


FIGURE 2. REGIONAL WATER SYSTEMS
Source: Montana Department of Natural Resources and Conservation. (n.d.). Regional water systems. Retrieved from https://dnrc.mt.gov/Conservation/Conservation-Programs/regional-water

FUNDING

In the State of Montana, water infrastructure is funded through the following means:

- User and Service charges; Revenue Bonds (debt serviced with user rates)
- Voter Approved General Obligation Bonds
- Federal or State Loan Program Bonds-State Revolving Fund (SRF) (debts serviced with user rates)
- State and Federal grants
- Reserve Funds
- Special Assessments (Special Improvement Districts, Tax Increment Financing Districts, etc.)

According to information provided by the major funding programs in Montana, the most recent total capital investment is approximately $250 million annually for both water and wastewater projects. Water system funding includes $101 million over three years for three important regional water projects. This increase in funding comes from programs such as ARPA and IIJA since 2021. This funding increase is only for the immediate future, with ARPA funding ending by 2026. While funding from grant and loan sources is important, it is recommended that communities of all sizes review their current user fees and increase rates where needed to cover the full cost of services, including operation, maintenance, and capital upgrade needs.

The Central Montana Regional Water project has been split into multiple phases, with over $100 million secured to date of the $135 million project to complete the first four of five phases. Two of the eight municipalities will be connected by the end of 2024, with the remaining within the next few years.

Since 2018, total annual capital investment has increased by over 69%. The growth in spending comes from additional loan financing, grants, and loan funding, with the portion of projects funded through grants increasing by over 161%. Capital improvement budgets for large cities have increased by approximately 17% since 2014. However, these increases have not kept up with inflation over the same period.

Most of the spending on water infrastructure is made at the local level, primarily through a rate-based system. The 2023 Montana Rate Study and Assessment shows an average monthly water rate of $52.46. Water rates vary across Montana from $17 to as high as $200 per month, indicating that many communities exceed the affordability "target rate" of 1.4% of MHI, as determined by the Montana Department of Commerce (MDOC). Regular rate increases must be implemented to cover the cost of general operation and maintenance. However, many small communities have populations on fixed incomes or a culture of maintaining low rates, making needed rate increases difficult without outside funding to limit rate increases.

OPERATION & MAINTENANCE

The 2023 DEQ Operator Certification Program Annual Report shows 2,599 certifications for distribution and treatment, recognizing that many individuals hold certifications for both classes. With this recognition of dual certification and the presumption that most operators indeed have dual certifications, there is the presumption that the number of certified operators has decreased since 2018. It was reported in 2018 that there were 1,605 certified operators (distribution and treatment). While operator age data is not readily available, it can be presumed that the average age of operators has increased with time, along with the population and number of systems increasing. Aging operators contain vital knowledge and experience of the systems operated that will need to be replaced on par with those retiring.

DEQ is aware of this workforce challenge, as are engineering consultants, municipalities, and utility districts. Montana Rural Water Systems offers an apprenticeship program to foster training toward operator certification. Montana State University – Northern also offers a one-year, hands-on curriculum to earn a Certificate of Applied Science in Water Distribution. These efforts and programs are intended to address the shortage of certified operators. However, the current labor market and ability to provide competitive compensation further the operator shortage in Montana. The 2018 report card reported that 50% of the operator workforce is over 55. Without significant improvements to the operator pool, programs like these should be supported and expanded to mitigate the challenges these systems will face losing operators. Municipalities and communities must also reevaluate compensation packages for these positions to match current market standards better.
and voltage control. These changes to the operational schemes of hydro plants, particularly for older facilities not specifically designed for such, will inherently increase operation and maintenance needs over time.

Montana DNRC will be utilizing Bipartisan Infrastructure Funding to implement a program to assist high hazard potential dam owners to develop modernized operation and maintenance manuals and procedures.

FUTURE NEEDS

Montana's population has seen double-digit growth in several counties/communities in recent years. This population growth is expected to continue, especially in Bozeman, Missoula, Kalispell, and Billings. The total combined population growth since the 2018 report card in the seven largest cities was 6.95% (28,592 people) compared to a total combined population growth of 4.56% (32,457 people) in rural Montana. Flathead County has seen the largest increase in residents, approximately 10,000 new people, since 2018, or approximately 16% of the overall population increase across the state. Within Flathead County, the City of Kalispell saw the most growth, with an increase in population of approximately 19%.

While the EPA reports that Montana will need $2.33 billion in funding for water infrastructure in the immediate future, the actual need is likely higher. The EPA's report is developed based on identified problems with infrastructure that require attention in the short term and is not a measure of long-term needs related to aging infrastructure, increased demand, and regulatory changes.

Communities across the state have been raising their utility rates to keep up with funding demands, but as shown in the funding section of this report, average rates have climbed above the state's median household income percentage goal. Further increases in utility rates to meet funding demands will strain the communities and the economic well-being of their populations.

PUBLIC SAFETY

Under the requirements of the federal drinking water regulations, the EPA uses an Enforcement Targeting Tool (ETT) to track systems in violation and to identify those systems that require formal enforcement actions. A point value is assigned depending on the type of violation. According to DEQ, the ETT list changes from quarter to quarter, and once a system comes back into compliance, those violations are removed from the ETT listing. Water systems on the ETT list that have accrued 11 ETT points or more are considered systems of interest. The state contacts these systems to bring them back into compliance, providing technical assistance and on-site training. Once at this stage, the system typically has six months to work with the state to come back into compliance or are referred to the DEQ Enforcement division for further legal outreach. As of April 2024, 23 public water systems score above 11 and are at risk of enforcement.

Only 23 of the 2,270 systems are at risk of enforcement, so most of Montana's water systems meet federal drinking water regulations and are in good standing. However, as systems continue to age and regulation requirements increase, additional funding will be needed to maintain these same levels of compliance.

Also, fire flows, and adequate system pressures will become a concern as systems and piping age. Corrosion in pipes can reduce flows and pressures. With low pressures, the systems will result in lower levels of service (showers, faucets, sprinklers, etc.). Reduced flows can limit fire protection and cause insurance rates to go up. Along with pressures and flows, aging pipes can cause more difficulty with chlorination and keeping residual disinfection in the system. This increases the chance of contamination and disinfection by-products if additional chlorine is needed to maintain the system.

RESILIENCE & INNOVATION

America's Water Infrastructure Act (AWIA) of 2018 placed EPA requirements on systems serving more than 3,300 people to assess the risks and resilience of their water system. Through a staggered deadline schedule, these risk and resilience assessments and accompanying emergency response plans were to be completed by June 2021. Assessed risks were multi-faceted and included both natural disasters and malevolent threats from a wide variety of internal and external sources. These risk and resilient assessments provided for a comprehensive self-review of water utilities and the level of resilience to the many threats posed by multiple sources. These assessments will be reviewed every five years to evaluate new threats and the degree to which previously identified risks have been mitigated.

The risk and resilience assessments addressed above have forced systems to be more innovative, reduce system risks, and provide a reliable and safe water supply with limited budgets.

DRINKING WATER

C

SOLUTIONS TO RAISE THE GRADE

- The current level of reinvestment to replace infrastructure needs to be maintained at the current levels, as provided with temporary funding through ARPA and IIJA programs, to provide the same level of public health and environmental protection as water infrastructure and to avoid higher costs in the future.
- Communities must evaluate current funding levels and revenues to cover the full cost of services, including operation, maintenance, and capital needs, and implement rate increases where needed.
- Increase public education and awareness of the public health and environmental value of water treatment and distribution systems and the long-term cost of avoiding timely rehabilitation to ease the way toward rate increases and increased financing.
- Provide public education on water conservation benefits and methods
- Promote additional state and federal funding of water infrastructure by better informing policy makers on the value of water and wastewater infrastructure investment.
- Increase grant funding for communities with demonstrated limitations in debt capacity (exceeding the target rate) to afford loan or capital funds to pay for infrastructure improvements.
- Improve operator recruitment, education, and certification efforts to bring more individuals into the operator occupation. Increase operator salaries to recruit and retain qualified operators
- Improve operator education through ongoing training opportunities to maintain a pool of highly skilled and trained operators.
- Continue and expand technical training programs that maximize the effective use of existing infrastructure through technical assistance and outreach.
- Promote training available through agencies such as Homeland Security, Montana Rural Water, AWWA, and the Midwest Assistance Program (MAP).

DRINKING WATER C

SOURCES

Montana Department of Natural Resources and Conservation. (2023). Rate Study and Assessment. Retrieved from https://dnrc.mt.gov/_docs/conservation/WASACT/DNRC-Rate-Study1.pdf

US Environmental Protection Agency. (2023). Drinking Water Needs Survey.

American Society of Civil Engineers. (2018). Montana Infrastructure Report Card.

Montana Department of Environmental Quality. (n.d.). Operator certification program.

US Department of the Interior. (n.d.). Regional Water System Announcement of $420 Million to Rural Water Systems Using Bipartisan Infrastructure Law.

Montana Department of Natural Resources and Conservation. (n.d.). Regional water systems. Retrieved from https://dnrc.mt.gov/Conservation/Conservation-Programs/regional-water

Central Montana Regional Water Authority. (n.d.). Central Montana Regional Water Program. Retrieved from https://www.centralmontanawater.com/

Bureau of Reclamation. (n.d.). St. Mary Diversion and Conveyance Works. Retrieved from https://www.usbr.gov/gp/mtao/stmary/index.html

City of Bozeman Public Works. (n.d.).

Montana Public Radio. (2022, January 3). As the US population stayed relatively flat, Montana's GDP grew by 1.6% during the pandemic. Retrieved from https://www.mtpr.org/montana-news/2022-01-03/as-u-s-population-stayed-relatively-flat-montanas-grew-1-6-during-the-pandemic

ENERGY

2024
MONTANA
C-

EXECUTIVE SUMMARY

Montana's energy infrastructure is a diverse mix of coal, petroleum, natural gas, hydro, and renewables like wind and solar. The state ranks 4th in the nation for per capita energy consumption due to its energy-intensive industries, long travel distances, and harsh winters. Montana exports approximately 40% of its electricity, primarily to neighboring western states, making it a key player in the regional energy market. Despite its resources, Montana faces challenges in modernizing its grid to support growing renewable energy projects, ensure reliability, and meet increasing demand driven by population and tourism growth. Grid modernization, renewable energy development, and careful policy planning are crucial to securing Montana's energy future. By investing in innovative technologies and leveraging federal and private funding, Montana can enhance its energy infrastructure's resilience, sustainability, and affordability.

ENERGY CONSUMPTION IN MONTANA: PER CAPITA VS. TOTAL RANKINGS

Per Capita Energy Consumption

- Montana ranks 4th highest in the nation for per capita energy consumption.
- Contributing Factors:
  - Energy-intensive industries like mining and agriculture.
  - A dispersed population requiring significant energy for heating, transportation, and electricity.

Total Energy Consumption

- Montana ranks 41st overall in total energy consumption.
- Contributing Factors:
  - A relatively small population compared to most other states.
  - Efficient energy use and significant renewable energy contributions.

Takeaway

Montana uses a lot of energy per person due to its unique geographic and industrial profile but ranks much lower in total energy use because of its small population size.

BACKGROUND

Montana's energy infrastructure includes a mix of traditional and renewable energy sources. Coal, hydro, and wind dominate the energy mix, comprising over 90% of the state's total energy resource composition. The Montana Department of Environmental Quality (DEQ) manages energy policy and regulation oversight. At the same time, investor-owned utilities like Northwestern Energy (NWE) and independent power producers own and operate much of the state's transmission and distribution systems.

Montana's geography and climate create unique energy needs. The state's dispersed population, vast distances, and cold winters drive high energy consumption per capita. Montana's energy exports to neighboring states emphasize the importance of a modern and efficient transmission grid to support economic and regional energy needs.

CONDITION & CAPACITY

Montana's energy infrastructure features a diverse mix of coal, hydro, wind, natural gas, and petroleum resources. Coal, historically the dominant source of energy, still generates approximately 45% of in-state electricity but has declined over the past decade due to plant retirements and competition from renewables and natural gas. Hydropower, a cornerstone of Montana's energy generation, contributes about 30% but faces challenges from drought conditions that reduce water availability. Wind energy has emerged as a strong contributor, accounting for 18% of electricity generation, with further growth anticipated. Despite this diversity, solar energy remains underutilized, and natural gas production has declined as energy companies prioritize oil drilling.

Montana's energy mix is diverse, with robust natural gas production, but there is also a growing interest in renewable energy sources. Despite the state's long winters, solar energy is slowly gaining traction, while wind energy has become a more substantial contributor to Montana's overall energy generation. The state's natural gas provides about 4% of in-state electricity generation. Montana produces about 48.4 billion cubic feet of natural gas but consumes almost

double this rate at approximately 81.1 billion cubic feet. The state's natural gas output is about one-third of its peak in 2007. In recent years, Montana's production from natural gas and coalbed methane wells has generally declined as energy companies have shifted their focus to drilling for oil. Approximately 75% of Montana's natural gas is produced from wells in the northern part of the state near the Canadian border, with most of the remaining production coming from wells in the Williston Basin in northeastern Montana near the North Dakota border.

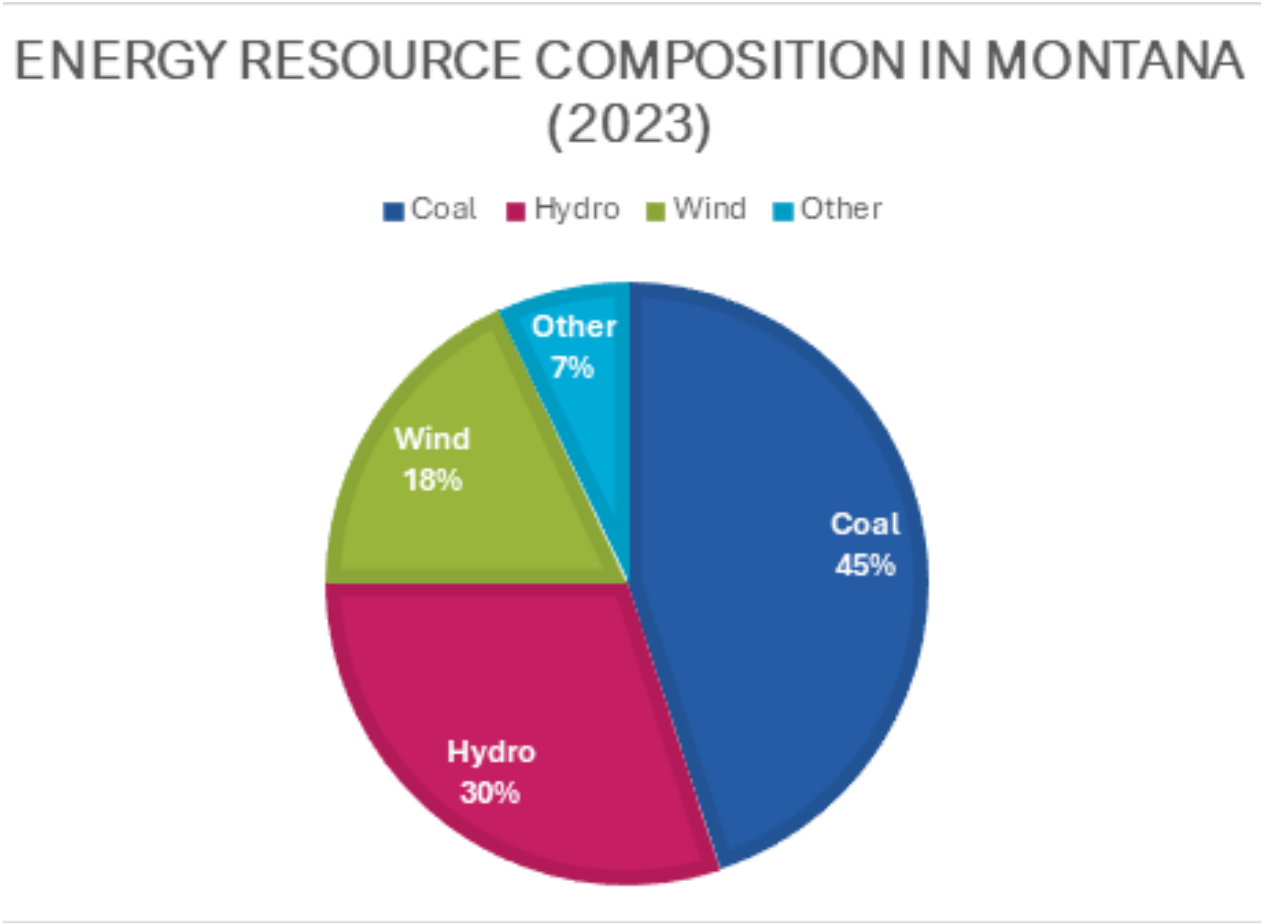


FIGURE 1. ENERGY RESOURCE COMPOSITION IN MONTANA—2023

Montana's energy transmission grid is aging and lacks modernization to support the integration of growing renewable energy projects. Most transmission infrastructure is owned by investor-owned utilities like NorthWestern Energy (NWE) or the Western Area Power Administration (WAPA), which distribute excess energy to other states, primarily Washington and Oregon. While Montana plays a critical role in regional energy exports, much of its grid infrastructure is not part of a Regional Transmission Organization (RTO) or Independent System Operator (ISO), limiting the coordination and efficiency of its energy distribution.

UNDERSTANDING MONTANA'S ENERGY LANDSCAPE

RTO (Regional Transmission Organization)

- An RTO is an independent entity that manages the movement of electricity over large areas spanning multiple states.
- Key Responsibilities:
  - Ensuring reliable electricity supply.
  - Overseeing wholesale electricity markets.
  - Coordinating long-distance electricity transmission

ISO (Independent System Operator)

- Similar to an RTO, an ISO operates power grids but typically covers a smaller region.
- Key Functions:
  - Balancing electricity supply and demand in real-time.
  - Managing electricity markets within its territory.
  - Promoting competition and efficiency in electricity transmission.

Montana Context

- Montana is not part of a formal RTO or ISO but coordinates with nearby energy markets for grid reliability and electricity trade.
- Joining an RTO or ISO could increase regional collaboration, enhance grid efficiency, and reduce consumer costs.

OPERATION & MAINTENANCE

Montana's aging energy infrastructure faces mounting pressures from increased demand and environmental challenges. Grid modernization is crucial, but Montana currently ranks near the bottom on the Grid Modernization Index (2nd to last), reflecting a lack of statewide planning and continued investment in advanced grid technologies. Most intrastate transmission infrastructure is owned and maintained by NWE or WAPA, with distribution systems often relying on these lines. This centralized ownership structure places significant responsibility on a few entities to address maintenance and upgrade needs.

The state's energy operations must contend with the advanced age of its infrastructure and the need to accommodate new renewable projects. Without significant investment in smart grid technologies and real-time monitoring systems, Montana risks falling behind in meeting the reliability and efficiency standards necessary for modern energy systems.

FUNDING

Federal programs have provided essential funding to support Montana's energy infrastructure, but challenges persist in meeting growing demand. The Infrastructure Investment and Jobs Act (IIJA) and Bipartisan Infrastructure Law (BIL) have allocated $35.14 million over five years through Preventing Outages and Enhancing the Resilience of the Electric Grid program, averaging $7.03 million per year. Additionally, the Energy Efficiency and Conservation Block Grant and the Energy Efficiency Revolving Loan Fund Capitalization Program provide annual allocations of $3.43 million and $5.11 million, respectively, from 2022 to 2026. These funds are intended to modernize power grids, improve data monitoring, advance technologies, and enhance the resilience of Montana's energy infrastructure against extreme weather events.

Despite these federal funds, private investments still fund much of the expansion, with investor-owned utilities contributing to modernization efforts. Recently approved rate increases by the Public Service Commission aim to generate additional resources for grid upgrades but could increase consumer electricity costs. Meanwhile, the Inflation Reduction Act (IRA) has created opportunities for tax-exempt entities, such as county and tribal governments, to access clean energy tax credits, helping to expand Montana's renewable energy portfolio. However, more equitable funding mechanisms are needed to ensure that underserved areas, particularly tribal lands, benefit from these investments.

Recent legislation has had a profound impact on Montana's energy sector. Laws enacted in recent years have altered how electricity costs are recovered, leading to changes in consumer prices. These legislative decisions have implications for the affordability and sustainability of energy in Montana, highlighting the need for careful consideration of policy effects on energy infrastructure.

FUTURE NEEDS

Montana's growing population and rising energy demand necessitate significant investments in infrastructure and capacity. Between 2010 and 2019, electricity consumption increased by 11%, with peak demand rising by 13%. This growth reflects the expansion of residential and commercial sectors and energy-intensive industries like mining and agriculture.

DID YOU KNOW?

The Fort Peck, Blackfeet, and Crow Nation reservations are among the 15 reservations in the nation with the greatest potential for wind-powered electricity generation, and the Fort Peck Reservation has some of the highest potential for solar power generation.

While Montana has not pursued solar energy on available land as aggressively as other nearby states, several sustainable energy production plants have been implemented across the state in recent years to increase overall generation. These include wind farms and small-scale solar projects contributing to the state's renewable energy portfolio. Traditional generation expansion, such as coal and natural gas plants, has remained stagnant, reflecting a broader shift towards cleaner energy sources.

Even though Montana's power generation development has slowed, the state continues to export approximately 40% of the power generated within its borders. This exported power primarily comes from traditional energy sources, with only a small portion being renewable energy. The state's reliance on exporting power underscores the importance of modernizing its energy infrastructure to accommodate the growing demand and integrate more renewable energy projects.

Montana needs to invest in grid modernization and expand its renewable energy capacity to address the increasing energy demand and ensure a reliable supply. This includes upgrading transmission and distribution systems, implementing smart grid technologies, and exploring opportunities for large-scale solar and wind projects. By doing so, Montana can meet the energy needs of its growing population while reducing its environmental impact and enhancing the resilience of its energy infrastructure.

PUBLIC SAFETY & RESILIENCE

Severe weather events, such as wildfires, floods, and droughts, pose significant risks to Montana's energy infrastructure. To ensure public safety and system resilience, Montana must invest in infrastructure that can withstand extreme weather conditions and quickly recover from disruptions caused by natural disasters. This requires a well-maintained and resilient system with advanced control systems that can adapt to changing conditions and threats, enabling quicker recovery from disruptions and minimizing outages.

Montana's energy infrastructure must be equipped to handle the challenges posed by severe weather events and climate change. By investing in resilient infrastructure and embracing innovative technologies, Montana can ensure a reliable and sustainable energy future for its residents.

INNOVATION

Innovation is crucial for addressing Montana's energy challenges and preparing for future demands. Adopting smart grid technologies, such as advanced control systems and real-time monitoring, can improve grid efficiency and reliability. These technologies allow for better integration of renewable energy projects and faster recovery from outages.

Montana is also expanding its electric vehicle (EV) infrastructure by increasing the number of charging stations statewide. This supports the transition to cleaner energy and reduces greenhouse gas emissions. Additionally, investments in wind farms, small-scale solar projects, and energy storage solutions enhance Montana's renewable energy portfolio, helping the state move toward a more sustainable energy future.

ENERGY

SOLUTIONS TO RAISE THE GRADE

Montana's abundant resources and location have uniquely positioned the state to become a leader in energy production. Currently, the state is underutilized in its ability to generate energy. To ensure a resilient energy future, Montana should:

- **Expand Renewable Energy Incentives:** Montana should increase financial incentives for renewable energy projects, particularly on rural and tribal lands, where significant wind and solar potential exists. These incentives can drive economic growth while diversifying the state's energy portfolio.
- **Modernize the Grid:** Investments in smart grid technologies, advanced monitoring systems, and transmission upgrades are critical for improving grid reliability and integrating renewable energy projects.
- **Increase Funding for Resilience:** Federal funding and private investments should be leveraged to address vulnerabilities in Montana's energy infrastructure, particularly those posed by severe weather events and aging systems.
- **Ensure Equitable Access to Funding:** Focus on underserved areas, including tribal lands, to maximize renewable energy opportunities and ensure all communities benefit from infrastructure improvements.
- **Enhance Energy Efficiency and Consumer Affordability:** Statewide programs promoting energy-efficient technologies and practices can reduce demand, lower costs, and free up capacity for renewable energy projects. Careful policy consideration and innovative funding mechanisms can prevent increasing consumer energy costs.
- **Support Regional Collaboration:** Joining a Regional Transmission Organization (RTO) would enhance Montana's ability to manage its grid efficiently and integrate its energy projects into the broader Western market.

ENERGY

SOURCES

US Energy Information Administration. (n.d.). Electricity Data Browser: Montana, Net Generation for all Sectors (thousand-megawatt hours), Annual, 2001–2023.

US Department of Energy. (n.d.). Retrieved from https://www.energy.gov

Western Area Power Administration. (2023, June 8). Miles City Converter Station.

Montana Department of Environmental Quality. (2023). Understanding Energy in Montana 2023. Retrieved from https://deq.mt.gov

Federal Energy Regulatory Commission. (n.d.). Home Page. Retrieved from https://www.ferc.gov

Montana Board of Oil and Gas Conservation. (n.d.). Online Data. Retrieved from https://www.bogc.dnrc.mt.gov

Montana Department of Transportation. (2024). The Elm Coulee Oil Field: Birthplace of the Bakken Oil Boom.

Bozeman Daily Chronicle. (n.d.). Colstrip Power Transmission Grid United North Plains Connector. Retrieved from https://www.bozemandailychronicle.com

Internal Revenue Service. (2022). Inflation Reduction Act of 2022. Retrieved from https://www.irs.gov

Milbrandt, A., & Heimiller, D. (2018, July). Techno-Economic Renewable Energy Potential on Tribal Lands. National Renewable Energy Laboratory.

US Environmental Protection Agency. (n.d.). Energy Resources. Retrieved from https://www.epa.gov/energy

HAZARDOUS WASTE

2024 MONTANA C-

EXECUTIVE SUMMARY

Montana has been increasingly active in managing and remediating hazardous waste sites in response to rising industrial activity, population growth, and stricter environmental regulations. The state is home to 18 Superfund sites listed on the National Priority List (NPL), hundreds of permitted hazardous materials sites and cleanup projects, thousands of underground storage tanks, and numerous brownfield sites. Montana has successfully leveraged funding from federal programs, including the Infrastructure Investment and Jobs Act (IIJA) and the Leaking Underground Storage Tank Fund (LUST), to support environmental cleanup and promote economic revitalization. State agencies are incorporating sustainability practices into infrastructure projects and adopting waste minimization strategies to address significant challenges posed by climate change. These challenges include increased storms, flooding, and rising temperatures, which threaten vulnerable hazardous waste sites. Despite these efforts, Montana faces ongoing difficulties in securing adequate funding and resources to address all hazardous waste management needs. New site identifications and evolving regulatory requirements further compound these challenges, emphasizing the need for continued investment and innovative solutions.

CONDITION & CAPACITY

In Montana, the agency responsible for monitoring and permitting hazardous waste sites is the Montana Department of Environmental Quality (MDEQ). As environmental awareness grows, the demand for hazardous waste management facilities has been trending upward, primarily due to increasing industrial activities, population growth, and stricter environmental regulations that necessitate proper waste disposal. Montana's historical industries have contributed to widespread contamination, as a result there are many sites in Montana designated as state or federal superfund sites. The Superfund program, established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1980, aims to identify and remediate contaminated sites across the United States. Montana is home to 27 sites currently being administered by the Federal Superfund and Construction Bureau (FSCB) with an additional 3 sites which are not currently on the National Priority List (NPL) but are under the jurisdiction of the FSCB, a state bureau which facilitates implementation of the Superfund program in consultation with the EPA. The NPL guides federal agencies (primarily the EPA) in determining which sites require further investigation, what remediation actions may be appropriate, how to communicate with the public, and how to notify potentially responsible parties that remedial action may be required. Montana currently has 18 sites on the NPL with an additional site proposed and pending. Four sites in Montana have received certificates of completion with the most recent completion dating back to 2001. A further seven sites are in the remedial design/remedial action phase while the remainder of listed sites have not yet entered the design or construction phase.

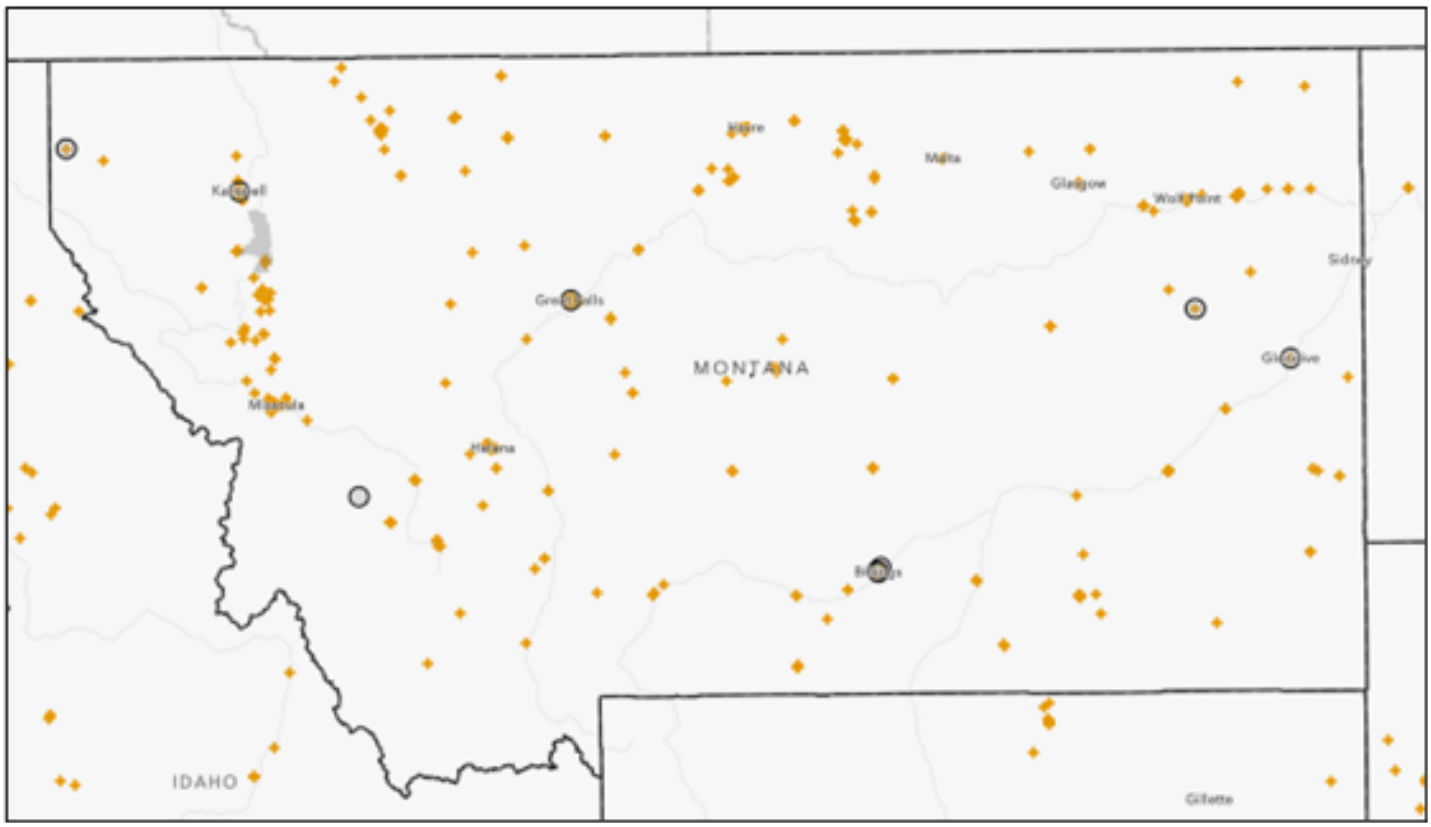


FIGURE 1. MONTANA BROWNFIELD PROPERTY LOCATIONS FROM EPA CLEANUPS IN MY COMMUNITY (CIMC) MAPPING TOOL

The federal Brownfields program focuses on the redevelopment of previously contaminated properties, promoting environmental cleanup and economic revitalization. Montana has a large number of brownfield properties. The EPA Cleanups in My Community tool lists over 771 cleanup sites as brownfields across the state at various stages of investigation, cleanup, and redevelopment, shown in the above figure. These sites are at various stages of investigation and cleanup, with some sites having been successfully redeveloped. Many sites have a completed Phase I and/or Phase II environmental assessment and are ready for anticipated use at the time of documentation or are awaiting/undergoing cleanup actions to remedy concerns onsite.

MDEQ's Hazardous Materials Section regulates sites which produce, handle, or store hazardous materials within the state. The Hazardous Materials Section currently administers 273 permitted sites and facilities and provides expertise in waste management and technical assistance while assuring compliance. MDEQ has documented 4,550 verified petroleum releases at facilities across Montana and regulates around 4,000 underground storage tanks (USTs) which are primarily used for storing petroleum-based fuels. MDEQ does not currently include data on above-ground storage tanks in its database of regulated storage tanks and has not made a separate data set for above-ground storage facilities available to the public. Data on active remediation and control of petroleum releases is not currently available from the MDEQ. The figures below shows the distribution of USTs and reported petroleum releases across the state.

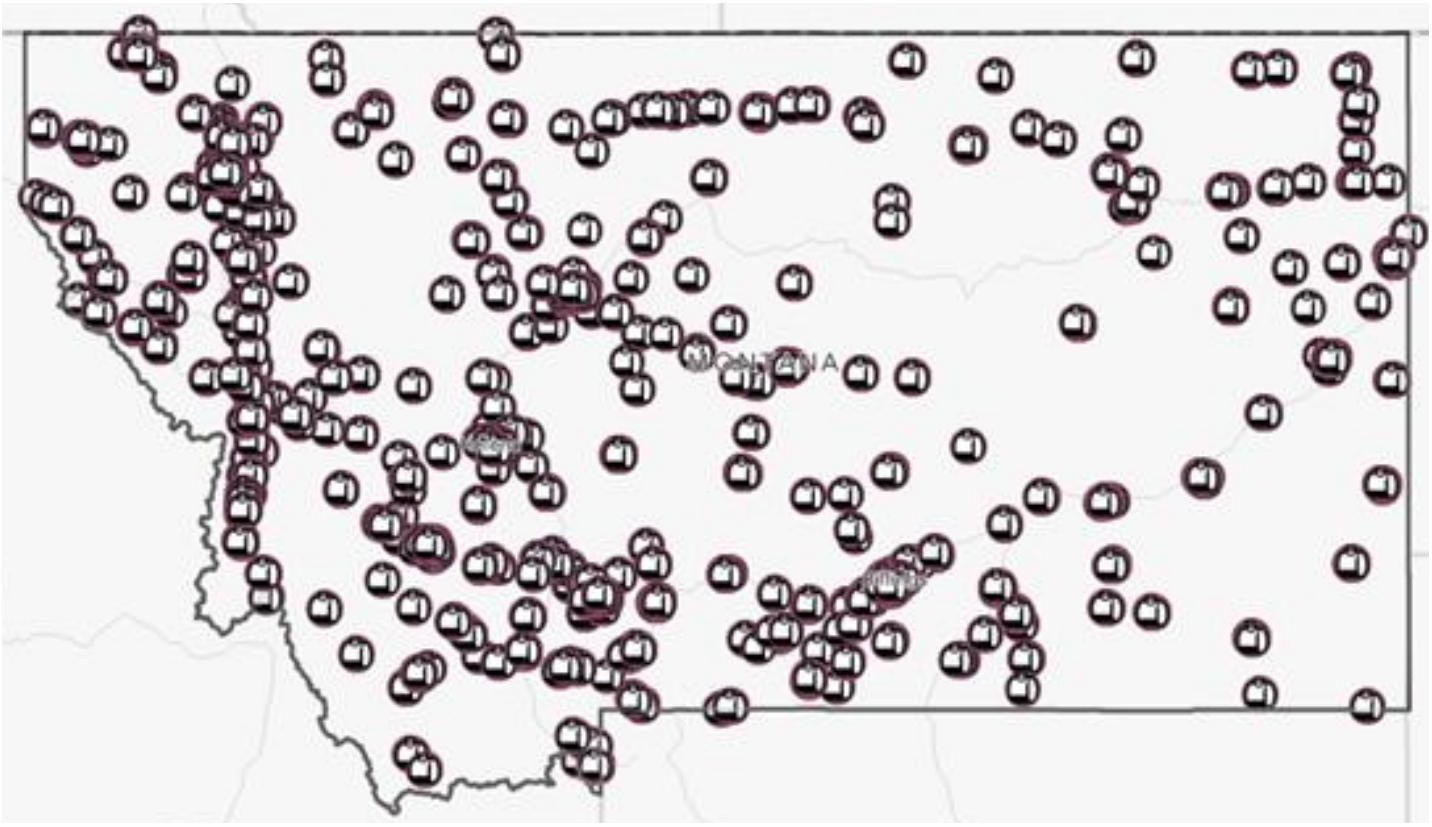


FIGURE 2. MONTANA REGULATED STORAGE TANK LOCATIONS FROM MDEQ DISCOVER DEQ MAPPING TOOL

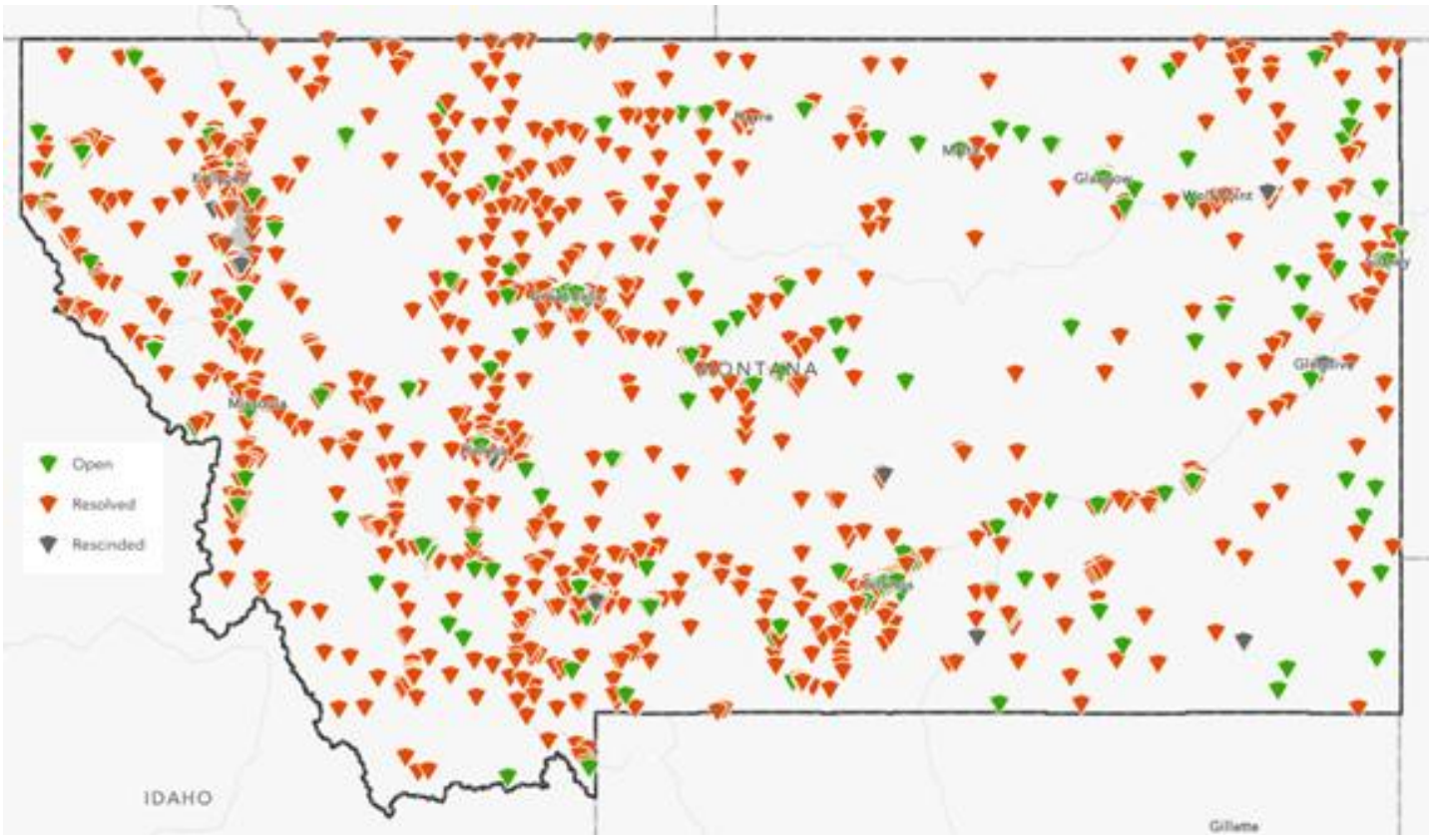


FIGURE 3. MONTANA REPORTED PETROLEUM RELEASES FROM MDEQ DISCOVER DEQ MAPPING TOOL

OPERATIONS & MAINTENANCE, FUNDING, & FUTURE NEEDS

In recent years, Montana has received significant funding assistance for its environmental conservation and cleanup efforts. In 2022, Montana received $26 million in federal funding to promote clean watersheds and to address water quality issues under the Bipartisan Infrastructure Law. MDEQ also receives additional funding and technical support through various EPA programs which include federally supported state Revolving Funds (SRFs). Utilizing these federal funding sources, Montana has had some success in recent years by funding local assessment and cleanup grants across the state. Successfully completed cleanup projects utilizing these funding mechanisms have provided opportunities for recreational amenities, commercial development, residential development (including affordable housing), and public facilities on former brownfield properties. In May of 2024 an additional $1 million in grant funding for cleanup and redevelopment projects in rural northern Montana was made available to address legacy contamination and spur revitalization efforts. Montana has also utilized the Leaking Underground Storage Tank Fund (LUST) to pay for assessments, cleanups, and monitoring.

In Montana, the DEQ has utilized federal funding from various sources, including the Bipartisan Infrastructure Law, to enhance remediation efforts at Superfund sites and improve environmental conditions. The funding helps address ongoing challenges related to hazardous waste and contamination, providing critical support for cleanup and restoration initiatives throughout the state. Local agencies can leverage these funds to expedite cleanup processes, protect public health, and restore affected ecosystems. Montana does implement a petroleum products tax that contributes to the funding of petroleum cleanup efforts. A portion of this tax revenue supports the state's efforts to address contamination from petroleum spills and leaks. While some portion of the state's general fund has occasionally been allocated to address hazardous waste sites, the general fund is not the primary source of funding.

Other funding sources available to address hazardous waste sites in Montana include federal grants, state-specific programs, and contributions from private entities involved in remediation. Despite these various funding mechanisms, there are ongoing concerns regarding the adequacy of funding to meet current and future hazardous waste management needs, particularly as new sites are identified and regulatory requirements become more stringent. Continuous advocacy for increased funding and resources will be essential to ensure effective remediation and environmental protection in Montana.

PUBLIC SAFETY, RESILIENCE, & INNOVATION

In Montana, the impacts of intense storms, increased flooding, and rising temperatures due to climate change pose significant challenges to hazardous waste sites, particularly those located in vulnerable areas. Several Superfund sites are situated within a 100-year floodplain, raising concerns about potential inundation and the risk of contaminants spreading during severe weather events. In response to these challenges, agencies of jurisdiction, including the MDEQ have begun incorporating sustainability requirements into infrastructure bids for design and construction projects, reflecting a commitment to resilient and environmentally friendly practices.

Additionally, these agencies have established stated policies on sustainability that guide their operations and project implementation, ensuring that environmental considerations are integrated into decision-making processes. While there have been initiatives to utilize sustainability design processes for ongoing projects addressing hazardous waste sites, such as the Envision framework, further adoption and standardization of these practices are still needed. Ongoing efforts to reduce waste generation from hazardous waste sites include promoting waste minimization strategies, recycling, and innovative cleanup techniques that lower overall waste production.

Various technologies are under development and in use with an aim to enhance the resilience of hazardous waste infrastructure, focusing on reducing energy consumption, minimizing chemical use, conserving water resources, and identifying contamination sources. These advancements are crucial for adapting to the increasing frequency of severe weather events while enabling redevelopment of brownfield sites and ensuring the long-term effectiveness and safety of hazardous waste management systems in Montana.

HAZARDOUS WASTE

SOLUTIONS TO RAISE THE GRADE

To address the challenges associated with hazardous waste management in Montana, the following recommendations are proposed:

- **Enhanced Flood Mitigation Planning:** Develop comprehensive flood risk assessments for Superfund sites and other hazardous waste locations, particularly those situated within 100-year floodplains. Implement strategies such as creating natural buffers, improving drainage systems, and investing in resilient infrastructure to minimize flooding impacts on these sites.
- **Integration of Sustainability in Cleanup Projects:** Mandate the incorporation of sustainability principles in the planning and execution of cleanup projects. Agencies should adopt frameworks like Envision, SITES, or LEED to evaluate and improve the environmental performance of remediation efforts. This can include using eco-friendly materials, energy-efficient technologies, and practices that promote long-term sustainability in waste management.
- **Investment in Innovative Technologies:** Allocate funding for research and development of innovative technologies that reduce the energy and resource intensity of hazardous waste management processes. Encourage partnerships between state agencies, universities, and private companies to advance technologies that minimize water usage, lower chemical consumption, and enhance the overall resilience of hazardous waste infrastructure.
- **Strengthening Waste Reduction Initiatives:** Enhance ongoing efforts to reduce waste generation by promoting waste minimization strategies among industries and stakeholders. This could involve developing educational programs, providing technical assistance, and incentivizing businesses to adopt greener practices that limit the creation of hazardous waste at the source.
- **Improved Stakeholder Engagement and Funding:** Foster collaboration among local communities, government agencies, and private stakeholders to ensure that hazardous waste management strategies are effectively communicated and implemented. Additionally, advocate for increased state and federal funding to support hazardous waste cleanup and resilience initiatives, ensuring that sufficient resources are available to address both current challenges and future needs related to climate change and environmental protection.
- **Conduct Statewide Assessments:** Montana has not produced a comprehensive assessment or report on the location, severity, contaminants of concern, and priorities for cleanup for brownfield sites across the state. Lack of easily accessible information makes it difficult for potential sites and cleanup projects to be prioritized and reduces the likelihood developers will target brownfields for redevelopment. Future efforts which can highlight opportunities for funding cleanups and steer developers towards recognizing the value of brownfields for redevelopment has the potential to revitalize and restore communities in Montana with a legacy of contamination from hazardous wastes.

HAZARDOUS WASTE

C-

SOURCES

Montana Department of Environmental Quality. (2024, June). CECRA Priority List—by Site. Retrieved from https://deq.mt.gov/Files/Land/StateSuperFund/Documents/WebPostingFolderSSU/CECRApriorityList_Name.pdf

United States Environmental Protection Agency. (2023, October). Construction Completions at NPL Sites—by State. Retrieved from https://www.epa.gov/superfund/construction-completions-npl-sites-state#MT

United States Environmental Protection Agency. (2024, May). EPA Awards $1 Million for Cleanup and Redevelopment Projects in Havre, Browning, and rural Montana Communities. Retrieved from https://www.epa.gov/newsreleases/epa-awards-1-million-cleanup-and-redevelopment-projects-havre-browning-and-rural

Montana Department of Environmental Quality. (n.d.). Federal Superfund. Retrieved from https://deq.mt.gov/cleanupandrec/Programs/superfundfed

Montana Department of Environmental Quality. (2020, August–Updated 2024, August). Hazardous Waste—NAIC. Retrieved from https://discover-mtdeq.hub.arcgis.com/datasets/MTDEQ::hazardous-waste-naic/explore

Environmental Defense Fund. (2017, June). Montana Quick Facts. Retrieved from https://www.edf.org/sites/default/files/MT_EPA_Cuts_Factsheet_6_22_17.pdf

United States Environmental Protection Agency. (2023, October). National Priorities List (NPL) sites—by State. Retrieved from https://www.epa.gov/superfund/national-priorities-list-npl-sites-state#MT

Montana Department of Environmental Quality. (2020, August–Updated 2024, August). Petroleum Releases. Retrieved from https://discover-mtdeq.hub.arcgis.com/datasets/MTDEQ::montana-petroleum-releases/explore?layer=0&location=47.553979%2C-108.156135%2C6.63

Montana Department of Environmental Quality. (2020, December–Updated 2024, August). Regulated Tanks. Retrieved from https://discover-mtdeq.hub.arcgis.com/datasets/MTDEQ::montana-regulated-storage-tanks/explore?layer=0&location=46.572783%2C-109.274100%2C6.98

United States Environmental Protection Agency. (2023, October). Superfund Sites in Region 8. Retrieved from https://www.epa.gov/superfund/superfund-sites-region-8#montana

United States Environmental Protection Agency. Office of Emergency and Remedial Response. (1993). This is Superfund. Retrieved from https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=2000A5GH.txt

Montana Department of Environmental Quality. (n.d.). What is Hazardous Waste—Transcript. Retrieved from https://deq.mt.gov/files/Public/HazWaste/What%20is%20Hazardous%20Waste%20Transcript.pdf

PUBLIC PARKS

2024 MONTANA C-

EXECUTIVE SUMMARY

Montana, renowned for its vast landscapes spanning over 30 million acres of state and federal lands, is a paradise for outdoor enthusiasts. The state is home to two national parks, Glacier and Yellowstone, with Glacier accounting for three million of the 5.7 million total national park visits in 2023. Montana's state parks also attracted three million visitors in 2022, marking a 19% increase since 2019. This surge in outdoor recreation has placed a significant strain on park facilities and infrastructure. A 2024 survey rated road conditions in state parks at seven out of 10 and water systems at six out of 10. Staffing shortages, driven in part by a lack of affordable housing for seasonal workers, have further hampered park operations and public safety efforts across local, state, and national parks. These challenges are compounded by budget constraints and rising costs for operations, maintenance, and capital improvement projects. Despite these hurdles, Montana remains committed to preserving its natural and cultural heritage while ensuring equitable access to outdoor recreation for both Montana residents and visitors alike.

CONDITION & CAPACITY

Nearly one third of Montana is state or federal land (Montana Fish, Wildlife & Parks, 2023). The state of Montana manages a variety of public lands and waters throughout the state. Lands administered by the state include:

- 6.7 million acres of land including Montana's state trust lands managed by the DNRC.
- 450,000 acres of wildlife management areas, over 41,000 acres of state parks, and over 21,000 acres at 350 fishing access sites managed by MFWP (Montana.gov, 2024).
- 55 State Parks (Montana Fish, Wildlife & Parks, 2023).

The Montana State Parks system is sub-divided into seven administrative regions with regional headquarter offices located in Kalispell (1), Missoula (2), Bozeman (3), Great Falls (4), Billings (5), Glasgow (6), and Miles City (7). (Montana Fish, Wildlife & Parks, 2023) The majority of the state parks are concentrated in the Western portion of the state.

According to the 2023 Montana State Parks Annual Visitation Report, the Montana State Parks system welcomed an estimated 3.1 million visitors in 2023. This number is up 2% from 2022 levels (3.04 million visitors) while 19% higher than pre-pandemic levels seen in 2019 (2.6 million visitors). This changing visitation is a trend being seen throughout parks and outdoor recreation as a market correction to the boom in visitation seen during 2020 and 2021. Over the last ten years, overall state park visitation has grown by 51.5%, or over one million visitors. In 2023, there were seven parks whose visitors exceeded 100,000 and two parks with attendance over 300,000 annual visitors (Giant Springs and Flathead State Parks). Some state parks are seeing an increase of up to 300% since 2019 while others have experienced a steady decline in visitors since 2019 with some parks seeing reductions in visitation of up to 88.6% (Greycliff Prairie Dog Town).

Montana is currently utilizing the 2020-2024 Statewide Comprehensive Outdoor Recreation Plan (Montana State Parks, 2019) with six high-level goals and recommendations:

- Promote outdoor recreation opportunities for all Montanans
- Enhance public access to outdoor recreation resources and facilities
- Support the economic vitality of communities and the state
- Improve quality of life through outdoor recreation experiences
- Adapt outdoor recreation for a changing environment
- Honor Montana's outdoor legacy

Montana Fish, Wildlife & Parks has seen steady growth in park and other site visitation over the past decade with lengthy operating seasons in which the agency's sites are open and used by visitors. Growth and evolution in the outdoor recreation industry has played a role in parlaying gear and equipment into the marketplace, and thereby converting year-round outdoor participation into a reality for many. This growth has important implications for the "outdoor recreation economy." The most current report from the Bureau of Economic Analysis shows that in 2022 Montana was second in the nation for the percentage that outdoor recreation value added to the state's gross domestic product at 4.3% (Bureau of Economic Analysis, 2023).

The change in visitation levels has also attracted many visitors that may or may not be familiar with responsible outdoor recreation, conservation, and preservation practices. Advancing the mission of the state's parks and public lands and educating the public and employees present challenges in a difficult job market when demand for recreation amenities is so high. Education of 'new' park visitors has become a critical focus of MFWP, echoed by the national "Recreate Responsibly" campaign.

Challenges facing the Montana park system, as outlined by MFWP, include:

- Meeting demands of increased use of sites and programs and mitigating/preventing resulting impacts on resources. State Park visitors increased from 1.98 million in 2010 to 3.1 million in 2023—up 19% between 2019 and 2023.
- Maintaining full staffing in the current hiring economy; hiring managers for Montana State Parks are outcompeted by the private marketplace for potential employees and the rapidly increasing cost of living and limited housing in Montana may make such positions difficult to fill in the current job market, especially seasonal and part-time positions where wages and benefits do not support the local cost of living. Hiring difficulties have placed a high burden on existing staff and mitigating/preventing staff burnout is a challenge. Montana's State Parks rely very heavily on contributions from volunteers and previous hiring freezes have left long periods where no new hires were made. During the surge in visitation observed in 2020 during the COVID-19 pandemic, a sizable portion of the staff was working 16-hour shifts and volunteers were relied on to fill the roles of 20 full-time staff.
- Decades of funding shortages; despite the surge in visitation budgeted funding for state parks has not kept pace. Increasing operations, maintenance, and capital project costs related to rising materials costs and shortages place severe strains on budgets. The majority of the agency's funding is derived from 4 separate tax funds (one of which, the Coal Tax Trust, has been in steady decline for years and is being supplemented by the Marijuana Tax). In FY2022 the agency began a restructuring of its maintenance and operations budgets to adjust how budgeted labor hours are distributed across all lands managed by MFWP.

In addition to state-run parks, there are eight National Parks in Montana with nearly three million visitors to Glacier National Park alone in 2023. National Parks Service data shows that in 2023 alone, more than five and a half million park visitors generated over $1.1 billion in economic benefits and over $714 million in consumer spending from tourism. These expenditures supported a total of 10,900 jobs, $362 million in labor income, and $551 million in value added (National Park Service, 2024).

At the local level there are hundreds of parks that are run by cities and municipalities. The largest city in Montana, Billings, manages approximately 2,580 acres (approximately four square miles) of parkland as well as offers over 270 recreation programs (Billings Parks and Recreation, 2024). The most recently adopted Parks Master Plan for Billings in 2017 found that the level of service for Billings residents was around 27.09 acres of parkland per 1,000 residents and recommendations at the time were to reduce this number to around 22.45 acres/1,000 residents to control costs and reduce overextension of available labor resources. The second most populated city in Montana, Missoula, is home to over 550 acres of city parks, 22 miles of commuter trails, 4,200 acres of protected conservation lands, and 40,000 trees (City of Missoula, 2024). Missoula is currently undergoing the planning process for its 2024 Parks, Recreation, Open Space, and Trails (PROST) Plan, which has not been updated since 2004. Great Falls, Montana, the third most populated city in the state, maintains 57 city parks with 775 acres of developed park land and 55 miles of recreation trails (City of Great Falls, 2024). The City of Great Falls' most current Parks and Recreation Master Plan (2016) found the level of service for total parkland to be 20.61 acres/1,000 residents.

OPERATIONS & MAINTENANCE

Through Montana State Parks (MSP), Montana Fish, Wildlife, and Parks (MFWP) currently manages 55 state parks on over 41,000 acres of land. MFWP is responsible for operations across 4142 total facilities and infrastructure components such as roads, water and wastewater systems, electrical systems, structures, irrigation systems, fueling and fuel storage, fire management systems, and communication systems (source: MSP). Beginning in FY2022, MFWP implemented a restructuring to consolidate all maintenance staff and budget from the existing Parks Division into the Parks and Outdoor Recreation Division (POR). Previously each division had its own staff and budget for maintenance of their facilities, but restructuring removed barriers related to funding of FTE (full-time equivalents)

and reduced limitations on how staff hours can be distributed across different divisions of state lands. Due to this consolidation, the budget for POR includes maintenance of facilities other than parks and which are not publicly accessible for recreation. The flexibility provided by this consolidation makes it easier for the agency, which is tasked with assisting in the management of millions of acres of land, to distribute budgeted labor hours to the areas where it is needed most. Prior to restructuring, excess budget hours could not be used to fill deficits in other divisions. This restructuring opens the potential for labor hours to be utilized across all lands managed by MFWP. FTE can be utilized for maintenance across multiple divisions instead of each division having a dedicated number of FTEs for maintenance which were not always sufficient to address needs at that division's facilities.

POR had a FY2022 budget of $22 million with $12 million for operations and equipment (Montana Fish, Wildlife & Parks, 2023). As early as 2018 reports indicate MSP has had issues related to funding necessary to sustain all the state's parks. Commissions tasked with addressing the challenges have identified efficient management systems and sufficient staffing as priorities. In 2018, then-Governor Steve Bullock established the Montana Parks in Focus Commission to address growing deficit in parks operations and maintenance funding and park demand, their 2018 report A New Day for Montana State Parks highlighted the struggles of MSP in the pre-pandemic period which included staffing and budget deficits with increasing demand. The commission found that Montana's state parks typically have around 2/3 the necessary staff and only 2/3 of the budget compared to other states which often have less parks and a smaller area to service (source: Montana Environmental Quality Council (EQC)). The Commission has not issued an update to their 2018 findings, and the state's 2020-2024 Statewide Comprehensive Outdoor Recreation Plan (SCORP) does not propose strategies to remedy these concerns. The SCORP does not address the budgetary and staffing corners raised by previous plans and reports. Decades of staff shortages have impacted access to park amenities and contributed to the degradation of lands and facilities. Since the surge in visitors experienced beginning in 2020 and 2021, volunteers have provided a large portion of the labor necessary to keep minimum services available at some sites. MSP's 2019 State of Montana State Parks Annual Report found that before the explosion in volunteer hours and visitation levels of COVID-19, in 2019, over 1,413 volunteers had provided 43,074 hours of service in 2018 alone. MFWP has not made an annual report on state parks publicly available since 2019.

Workforce shortages are projected to continue with a lack of affordable housing, especially for seasonal workers, identified as a key factor (source: MSP). Visitation levels in these shoulder seasons have steadily increased while the budget available to hire additional staff has not been made available. These shortages have impacted MSP's ability to ensure public health, safety, and concerns are addressed (source: MSP). Strategies to address these shortages require park managers to prioritize operations and maintenance in the height of the season at parks with the highest visitation leaving no funds available for multiple months of the year. This reduction has a disproportionate effect on visitors such as ice fisherman and other users that rely on offseason access and services (source: MSP).

Despite these challenges, MSP has completed several major infrastructure improvements totaling six million dollars in 2017, with over $22.7 million (in 2018 costs) still needed for improvements that were identified in 2018. A lack of access to current annual reports makes it difficult to understand how these conditions were impacted by COVID-19 and the department has not issued an updated Capital Improvements Projects plan since 2020. Initiatives to utilize programs such as AmeriCorps in recent years have taken some of the pressure off park staff and allowed them to address core operational requirements. Increased burdens from visitors and the rising costs of materials and construction will continue to increase the expense of needed infrastructure improvements, and the labor market is not likely to return to conditions which were previously more favorable to both full time and seasonal hiring.

Montana's National Parks attendance have also seen major challenges since the surges in visitation of the COVID-19 pandemic. Yellowstone National Park, with lands in Idaho, Montana, and Wyoming, has the highest levels of deferred maintenance with nearly $53 million in deferred maintenance in Montana alone. The cost of deferred maintenance

of national parks in Montana has significantly increased since the previous 2020 congressional report found around $22.1 million in deferred maintenance in the Montana portion of Yellowstone National Park. Montana was number 19 on the list of the top 20 states with the highest deferred maintenance in 2020 but did not appear on the list in 2024.

FUNDING & FUTURE NEEDS

For FY2023 MFWP funding (about $160 million total) was primarily generated through sales of hunting and fishing licenses with 45% ($71.8 million) of the annual budget funded though sales of these licenses. This funding is the primary source of the required state match necessary to receive federal monies. A further 14% ($21.9 million) is generated through the sales of these licenses with revenues earmarked for special purposes by Montana statutes such as land acquisition, conservation easements, maintenance of Wildlife Management Areas (WMAs), fishing site access maintenance, and river restoration as examples. Special state revenue funds such as a bed tax and vehicle registration fees contribute a further 15% ($23.9 million) to the budget with statutory limitations restricting potential uses of this portion of funding to specific programs such as the aquatic invasive species program and recreational grants. This special revenue portion of MFWP's budget provides most of the funding for operations and maintenance of state parks and non-game wildlife management. The U.S. Fish and Wildlife Service provides federal funds generated via excise taxes on the sale of firearms, ammunition, and fishing equipment in Montana. This federal funding constitutes 18% ($29 million) of MFWP funding and comes with a requirement for matching non-federal funds, typically at a ratio of 3:1. This funding contributes to operations and maintenance of all MFWP sites, not just state parks and funds the employment of fish and wildlife biologists among other uses. Further federal funding generates an additional 8% ($13.4 million) and funds grant programs, wildlife management, and additional operations and maintenance. Federal funding through the Bipartisan Infrastructure Law and Inflation Reduction Act has provided funding for improvements at National Parks in Montana as well as projects to expand urban canopy coverage in over 70 communities.

Attempts to modernize the management practices of MSP are ongoing, with funding identified as a major obstacle. Recently, MFWP restructured to simplify the budgeting of operations and maintenance across all departments. While these changes may simplify processes related to allocation of funding, the elimination of State Park-specific operations and maintenance budgets makes it possible for gaps in the budget for operations and maintenance of non-park facilities to be filled using budgeted hours which might otherwise have been available to park managers. The recent changes make it difficult to predict how they will impact MSP in the long term. MFWP has identified rising operations, maintenance, and capital projects costs as challenges to accomplishing the mission of its POR Division. Declining revenues from Montana's coal tax trust fund have been partially mitigated through recreational marijuana tax revenues, but this has come at the expense of being able to accomplish new work and address deferred maintenance needs and facility upgrades.

The governor's executive budget for FY2024-2025, published as part of the Montana Department of Administration's long-range building program identifies critical projects involving MSP with variability in funding. Upgrades and repairs to existing systems and development of new amenities at state parks sites have a projected cost of around $13.6 million with funding from state and federal sources. Aside from park-specific projects such as the Flathead Biological Station sewer treatment plant (just over 1 million dollars) and Makoshika State Park campsite and amenities expansion (five million dollars) the governor's budget also earmarks and additional seven and a half million dollars to address a backlog of site maintenance, upgrades, and improvements needs across all MFWP sites.

At the local level, municipal park facilities and funding vary drastically across the state. In Montana's larger cities such as Billings, Missoula, Great Falls, and Bozeman extensive park systems offer high levels of service to residents and access to visitors. While each municipality has a unique set of challenges and opportunities specific to their community, common challenges for local parks and recreation departments include staffing shortages and hiring difficulties, high

visitation and participation levels, increasing maintenance and construction costs, high community expectations, and shifting community priorities and values. In Montana's many small towns and communities, budgets for parks departments may be highly restrictive and the department may be operating with a very small number of employees that have to fill a diverse number of roles and obligations.

RESILIENCE

COVID-19 presented serious challenges to a system already known to be understaffed and underfunded. Even prior to the pandemic, in a report published in 2018, the Parks in Focus Commission declared: "It is no secret that Montana State Parks has a funding problem. There simply are not enough resources to sustain 55 state parks" (Parks in Focus Commission, 2018). An article titled "Overwhelmed" from November-December of 2020 published in Montana Outdoors, a bi-monthly magazine funded and published by MFWP, laid out the challenges experienced by MSP during the first year of the COVID-19 pandemic (Wilkinson, 2020). Staff and facilities were pushed to the breaking point by skyrocketing numbers of visitors and even volunteers were found to be working days up to 16 hours long for extended periods. Swelling attendance challenged the capacities of sanitation systems leading to issues with human waste and other health concerns while insufficient staffing resulted in degradation of state lands through improper use and vandalism.

Despite these challenges, MSP managed to emerge from the pandemic with new priorities for management of park assets. MSP's 2021-2022 Strategic Priories identified the development of asset management plans and tools as critical to the continued viability of state parks. At the time the report was published the state had well over $22 million in deferred maintenance needs and was in the process of developing a GIS-based asset management tool to locate and catalogue park assets and infrastructure statewide while park maintenance supervisors began collecting and storing essential park maintenance instructions and manuals in a centralized database. MSP also sought to develop and test a task tracking program to aid in operations and maintenance and allocation of resources. The department was aiming to continue developing its facility conditions inventory tool to manage and prioritize projects across the state.

MFWP's Statewide Comprehensive Outdoor Recreation Plan (SCORP) for 2020-2024 established a goal to "adapt outdoor recreation for a changing environment" (Montana State Parks, 2019). Wildfire, smoke, disruptions to river and stream flows and temperatures, and further climate-related impacts threaten a reduction in services and may necessitate the closing of some recreational facilities and access points. MSP is seeking to develop a cross-jurisdictional hazard preparedness plan and an interagency working group to establish best practices for adaptation and resiliency for outdoor recreation providers with a priority on addressing workforce needs and potential for conflict. The SCORP also promotes green building guidelines such as Leadership in Energy and Environmental Design (LEED) and smart growth principles.

With millions of dollars in deferred maintenance and a backlog of projects in various states of funding, there is no guarantee that all 55 state parks will be able to continue offering full services. This reduction in services and staffing, while visitation numbers remain high (despite levelling off somewhat in the aftermath of the COVID-19 pandemic) could pose threats to public health and safety and will interfere with necessary maintenance operations and improvements needed to prevent closures, reductions in service, and degradation of state lands.

Montana is at an early stage of this process and has many critical points left to address with most efforts currently in progress. Wildfire presents one of the most serious concerns for wildlife and recreation opportunities in Montana. Incident management teams aim to minimize impacts, avoid closures, promptly reopen areas subject to closure, and promote conversations on wildfire in a positive way. These incident management teams further assist forest and park managers in making informed decisions and in communicating with the public.

PUBLIC SAFETY & INNOVATION

MFWP's Law Enforcement Division has a mandate to "protect, perpetuate, enhance, and regulate the wise use of the state's natural and cultural resources" (source: MFWP). Game wardens enforce rules related to protection and preservation of wildlife, state parks resources, recreational facilities, and vehicular access. Like other divisions of MFWP, game wardens face challenges related to staffing and availability of resources. A performance audit of MFWP enforcement division presented to the Montana Legislature in 2023 found that at the time of the audit there were 106 game wardens across the state covering seven regions with individual warden districts sometimes exceeding 2,000 square miles in size.

Game wardens have reported an increase in the number of large-scale investigations and wildlife trafficking as well as an increase in the number of non-conservation related enforcement issues such as drug and alcohol use, disorderly conduct, and vandalism. The most currently available data shows that from 2019-2021 MFWP recorded 416,462 activity hours on over 383,072 contacts with the public. From 2017 to 2021 there were 13,156 citations issued in addition to 14,423 warnings with the greatest number of citations and warnings concentrated around the state's most populated cities. Officer safety is a concern with many people involved in hunting, fishing, and outdoor recreation in Montana being routinely armed. Despite these challenges, wardens have continued to issue more warnings than citations, opting to educate and inform the public.

Game wardens conduct proactive enforcement and engage in patrols of state park facilities while participating in public outreach and education. The division has made major accomplishments in recent years in response to the surge in visitors to state lands with upgrades to their equipment and improved support. The agency also offers site enforcement for aquatic invasive species and investigates fraud while handling tips from the public and managing social media outreach. MFWP game wardens are highly successful in cooperative law enforcement of DNRC lands.

Park rangers are responsible for controlling access to state parks and assessing fees for entry. Low staffing levels at some parks make strict enforcement of entry and use difficult or impossible. Entry fees and vehicle registrations provide the primary source of funding for MSP with the SCORP emphasizing the development of innovative funding strategies as critical for the financial sustainability of Montana's parks. Closures and reductions in service related to insufficient staffing and closures due to wildfire and smoke are the main threat to public safety in Montana's parks. Critical upgrades to sewage facilities like the pumping station at Flathead State Park aim to address health concerns related to human waste while providing the necessary capacity for increased visitation levels.

PUBLIC PARKS

SOLUTIONS TO RAISE THE GRADE

- **Increase Funding:** Address the maintenance backlog by allocating more state funds and pursuing federal resources.
- **Enhance Accessibility:** Prioritize ADA compliance and make parks more accessible to maximize recreational opportunities for all visitors.
- **Boost Workforce Capacity:** Hire and train more maintenance and support staff to handle increased park usage, investigate options for improved employee housing availability.
- **Invest in Resilience:** Prioritize infrastructure that can withstand climate change impacts, such as floods and wildfires with adequate capacity to serve the increasing number of visitors.
- **Expand Public-Private Partnerships:** Encourage more partnerships with private entities to fund park improvements and maintenance; improve volunteer programs to minimize burnout, improve visitor experience, and minimize closures or reductions in services due to insufficient staffing

SOURCES

Billings Parks and Recreation. (2024, February). Retrieved from https://www.billingsparks.org/

Bureau of Economic Analysis. (2023, November 17). Outdoor recreation satellite account, U.S. and states, 2022. Retrieved from https://www.bea.gov/news/2023/outdoor-recreation-satellite-account-us-and-states-2022

City of Great Falls. (2024, February). Retrieved from https://greatfallsmt.net/

City of Missoula. (2024, February). Retrieved from https://ci.missoula.mt.us/

Legislative Audit Committee. (2023, August). FWP Enforcement Division: Managing resources and culture. Montana Legislative Audit Division. Retrieved from https://archive.legmt.gov/content/Committees/Administration/Audit/2023-24/Meetings/October-2023/22P-02.pdf

Montana Fish, Wildlife & Parks. (2023, March 15). 2022 Montana State Parks Annual Visitation Report. Retrieved from https://fwp.mt.gov/binaries/content/assets/fwp/stateparks/2022-montana-state-parks-annual-visitation-estimates-final-report-5.1.2023.pdf

Montana Fish, Wildlife & Parks. (2023). Budget information and Guide. Montana.

Montana Fish, Wildlife & Parks. (n.d.). Montana State Parks Maintenance: Making Sense of a Complex World. Retrieved from https://fwp.mt.gov/binaries/content/assets/fwp/stateparks/documents/montana-state-parks-maintenance-making-sense-of-a-complex-world-poster.pdf

Montana Fish, Wildlife & Parks. (2019). State of Montana State Parks.

Montana State Parks. (2019). Sustaining Montana's Outdoor Recreation Legacy: Statewide Comprehensive Outdoor Recreation Plan.

Montana.gov. (2024, February). Retrieved from https://montana.gov/

National Park Service. (2024, February). Retrieved from https://www.nps.gov/index.htm

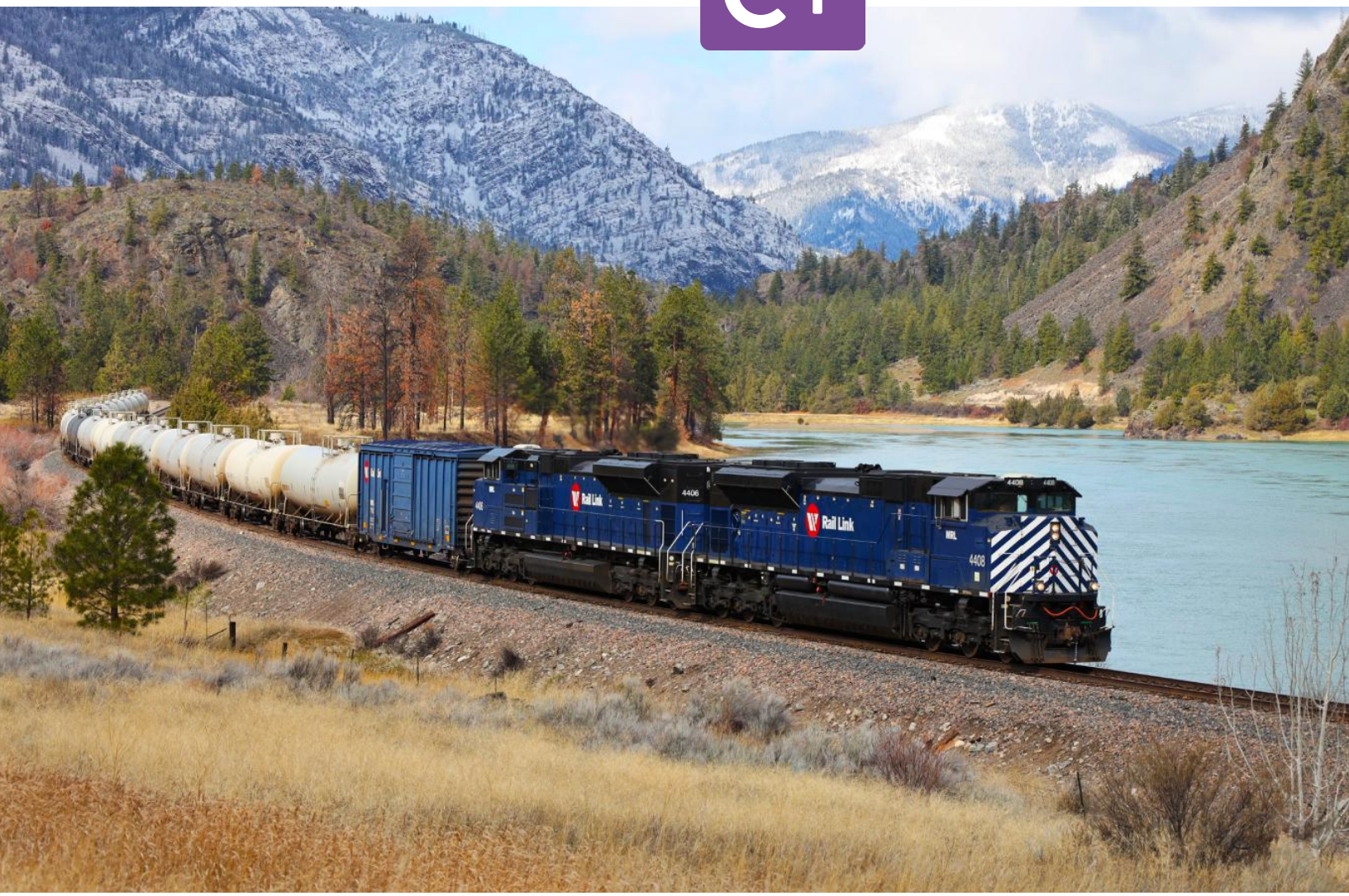
Parks in Focus Commission. (2018). A new day for Montana State Parks: Parks in Focus Commission final recommendation.

State of Montana: Architecture & Engineering Division. (2022). Long-range building program: Governor's executive budget fiscal years 2024-2025.

Wilkinson, T. (2020, November–December). Overwhelmed. Montana Outdoors, pp. 13–17.

RAIL

2024 MONTANA C+



EXECUTIVE SUMMARY

Montana's rail infrastructure serves as a crucial link in the transportation network, facilitating the movement of goods across the state and to international markets. With nearly 3,700 miles of track, Montana's rail system supports the state's agricultural, energy, and industrial sectors while connecting rural communities to larger economic hubs. Freight operations dominate, with Class I railroads owning over 70% of the track in the state and short-line and regional railroads providing essential first- and last-mile connections. Passenger rail is limited to Amtrak's Empire Builder, which traverses the Hi-Line region. While Montana's rail infrastructure plays a vital role in the economy, it faces significant challenges, including aging infrastructure, capacity limitations, insufficient safety measures, and vulnerabilities to extreme weather events. Federal funding and innovative technologies offer opportunities for modernization, but targeted investment and coordinated planning are essential to meet current and future demands. Without action, Montana's rail network risks losing its ability to sustain economic growth, ensure public safety, and adapt to evolving transportation needs.

The Surface Transportation Board categorizes rail carriers into three classes based on the carrier's annual operating revenues: Class I, Class II, and Class III.

To account for inflation, the Board calculates Deflator Factors each year to adjust railroad annual operating revenues to 2019 levels. The railroad revenue deflator formula is based on the Railroad Freight Price Index developed by the Bureau of Labor Statistics. The formula is as follows:

CURRENT YEAR'S REVENUES × (2019 AVERAGE INDEX/CURRENT YEAR'S AVERAGE INDEX)

Using the deflator factors, the Board can determine the annual revenue threshold for classification purposes. For 2023, the most recent year for which deflator factors have been calculated was 2023 with a factor of 0.8541.

Class I Carriers:

- More than $1,053,709,560 in 2023
- More than $504,803,294 in 2019

Class II Carriers (Regional Railroads):

- $47,299,851 to $1,053,709,560 in 2023
- $40,384,263 to $504,803,294 in 2019

Class III Carriers (Short-Line Railroads):

- Less than $47,299,851
- Less than $40,384,263 in 2019

BACKGROUND

Montana's rail network is one of the state's most significant transportation assets, driving economic activity and regional connectivity. Over the past 150 years, the state's rail mileage has fluctuated dramatically, peaking at over 5,000 miles in the early 20th century before declining to approximately 3,700 miles today due to shifts in transportation trends and industry demands. As of January 1, 2024, Montana Rail Link (MRL) was integrated into BNSF Railway, a transition that has redefined the state's rail operations. Before this merger, MRL operated roughly 25% of Montana's rail network, while BNSF controlled about 59%; BNSF now oversees an estimated 84% of Montana's rail infrastructure, solidifying its dominance in the state.

RAIL CARRIERS IN MONTANA

Butte, Anaconda, & Pacific (BA&P)
Burlington Northern Santa Fe (BNSF)
Central Montana Rail (CMR)
Dakota, Missouri Valley, & Western (DMV&W)
Global Rail Group (GRG)
Mission Mountain Railroad (MMR)
Union Pacific (UP)
Alder Gulch
Lincoln County Port Authority (LCPA)
Port of Montana (POM)
Transco

The rail network in Montana is primarily dominated by freight rail operations, with Class I railroads accounting for the majority of activity. BNSF Railway alone operates about a large majority of Montana's freight track mileage, including the vital Northern Corridor, which serves as a key route for exporting goods to Pacific ports. Union Pacific, the state's other Class I railroad, manages an additional 125 miles of track. The remaining rail infrastructure is operated by regional (Class II) railroads and short-line (Class III) railroads, which serve specific local and regional needs.

Short-line and regional railroads play a critical role in Montana's economy by connecting rural communities and industries to larger rail hubs. These smaller railroads are particularly important for agricultural producers, offering a reliable means of transporting commodities like wheat and barley to export markets. However, financial constraints often limit their ability to modernize infrastructure and expand operations, posing challenges to their long-term viability. Montana's passenger rail service is minimal, with Amtrak's Empire Builder being the sole intercity option. This train operates along the northern Hi-Line corridor, linking rural Montana communities to major cities such as Chicago and Seattle. However, its shared use of BNSF-owned tracks often results in delays, limiting its reliability and appeal to passengers.

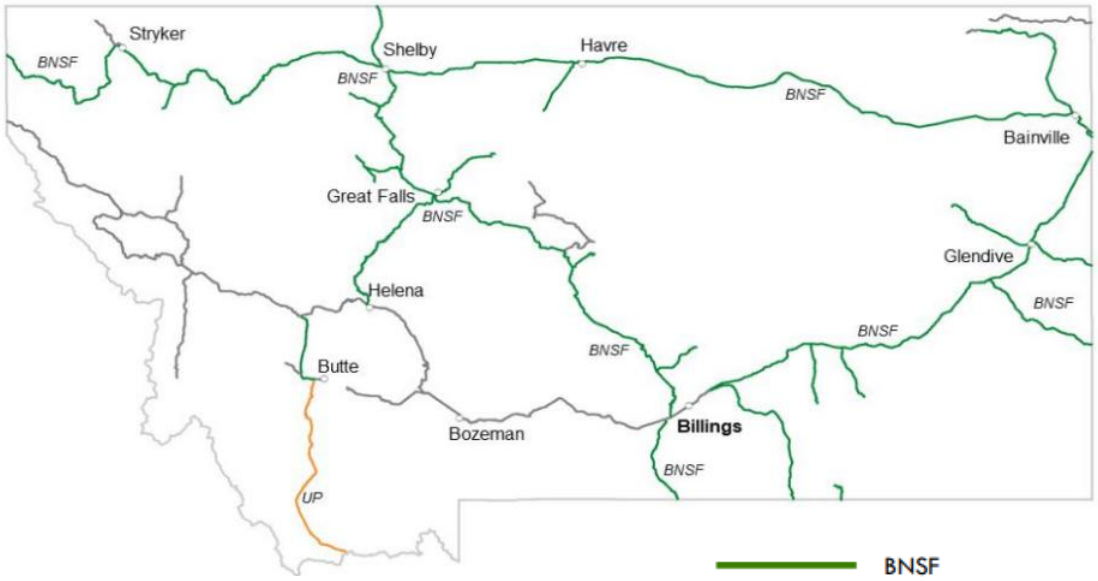
Oversight of Montana's rail network is shared among private operators, the Montana Department of Transportation (MDT), and federal agencies such as the Federal Railroad Administration (FRA). While private railroads are responsible for managing the majority of infrastructure, public agencies play a critical role in ensuring safety, allocating federal funds, and supporting the operation of short-line railroads. This collaborative oversight is essential to maintaining a functional and efficient rail network in Montana.

ASSOCIATION OF AMERICAN RAILROADS

Freight Railroads in Montana

	Miles Operated In Montana in 2021
Class I Railroads	
BNSF Railway Company	2,620
Union Pacific Railroad Co.	125
	2,745
Regional Railroads	
Dakota, Missouri Valley, & Western	57
Montana Rail Link	807
	864
Short Line Railroads	
Butte, Anaconda and Pacific Railroad	26
Central Montana Rail	55
Mission Mountain Railroad	26
	107

Montana 2021 Totals	Number of Freight Railroads	Miles Operated Excluding Trackage Rights	Miles Operated Including Trackage Rights
Class I	2	2,709	2,745
Regional	2	864	864
Short Line	3	107	107
Total	7	3,680	3,716



Map is based on the 2022 North American Rail Network published by the U.S.

Department of Transportation. Some mileage figures are AAR estimates.

FIGURE 1. FREIGHT RAILROADS IN MONTANA

CAPACITY

Montana's rail network plays a crucial role in supporting the state's economy, but its capacity is constrained in key areas. Freight rail dominates the system, with Class I railroads handling most of the traffic. BNSF's Northern Corridor, a primary freight route, operates near capacity due to high volumes of agricultural and energy exports. While these corridors are critical for Montana's economy, their limited capacity could lead to bottlenecks as demand increases.

Short-line and regional railroads also face capacity challenges. Many of these railroads operate on older infrastructure that restricts the use of modern, high-capacity railcars. This limits their ability to meet the needs of rural industries and reduces the overall efficiency of Montana's rail network.

Passenger rail capacity is minimal. The Empire Builder serves the Hi-Line corridor, providing a single daily round trip between Chicago and Seattle. This limited service often struggles with delays caused by the prioritization of freight traffic on shared tracks. Furthermore, the lack of additional passenger routes or expanded frequency leaves much of Montana without access to intercity rail options.

Expanding freight and passenger rail capacity will require significant investments in track upgrades, rolling stock, and station infrastructure. Addressing these capacity limitations is essential for meeting future transportation demands and supporting Montana's growing economy.

CONDITION

Montana's rail infrastructure is vital for freight transportation, moving over 100 million tons of goods annually. The state's agricultural sector depends heavily on rail to transport grains and other commodities, which represent a significant portion of freight traffic. Coal is another major product transported by rail, particularly from the Powder River Basin. Additionally, manufactured goods, lumber, and oil contribute to Montana's freight volume, with over 80% of rail shipments leaving the state for regional and international markets.

Class I railroads, such as BNSF Railway, are generally well-maintained thanks to substantial investments in track replacement, bridge repairs, and capacity upgrades. These improvements have enhanced the reliability of key corridors like the Northern Corridor, which plays a critical role in connecting Montana's economy to global markets. However, short-line and regional railroads face more pressing challenges. Many operate on aging infrastructure that was not designed to accommodate modern, heavier railcars. This increases the risk of service disruptions and limits their capacity to support rural industries and communities.

Passenger rail infrastructure also shows signs of wear. The Empire Builder operates on tracks owned by BNSF and provides essential connectivity for northern Montana communities. However, passenger stations along the route are outdated, lack modern amenities, and fail to meet accessibility standards, making rail travel less appealing for residents and tourists. In 2021, freight trains caused approximately 900,000 minutes of delay to Amtrak passengers, with only 38% of customers arriving at their destinations within 15 minutes of scheduled time.

OPERATIONS & MAINENANCE

Class I railroads in Montana, such as BNSF Railway, invest billions annually in maintaining and upgrading their national infrastructure. In Montana, these investments have focused on track replacements, bridge repairs, and signal system upgrades, particularly along major freight corridors. For example, BNSF has upgraded sections of the Northern Corridor to improve efficiency and reduce delays, ensuring the continued reliability of this critical route.

Short-line and regional railroads face greater operational and maintenance challenges due to limited financial resources. Many of these railroads rely on federal grants and state subsidies to fund essential maintenance and upgrades. Programs like the Consolidated Rail Infrastructure and Safety Improvements (CRISI) program have provided much-needed support, but demand for grants often exceeds available resources. Without additional funding, short-line railroads risk further degradation, which could isolate rural communities and industries from broader markets.

Amtrak's operations in Montana are constrained by aging infrastructure and limited maintenance budgets. Shared use of tracks with freight railroads often results in delays, further impacting the reliability of passenger service. Modernizing passenger rail facilities and tracks will require coordinated investment from Amtrak, freight operators, and federal funding programs.

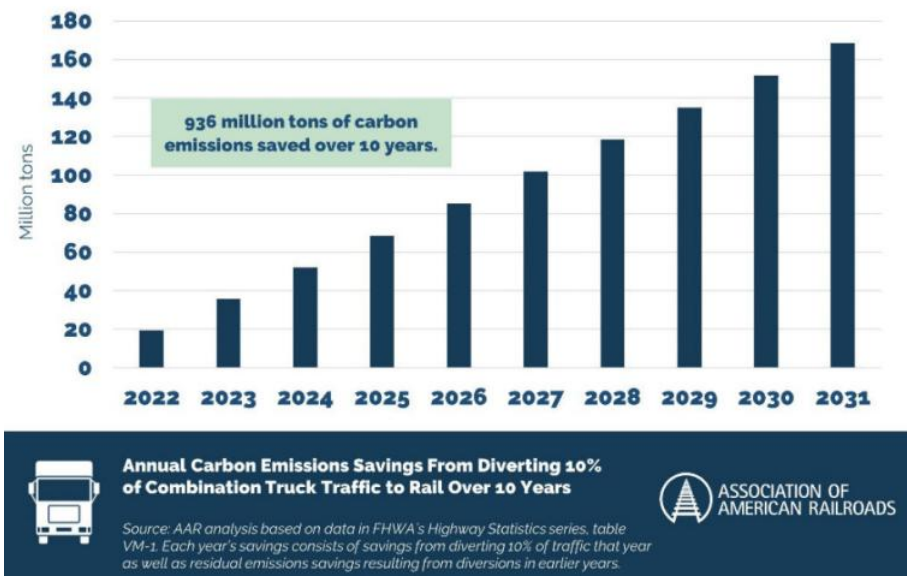


FIGURE 2. CARBON EMISSIONS

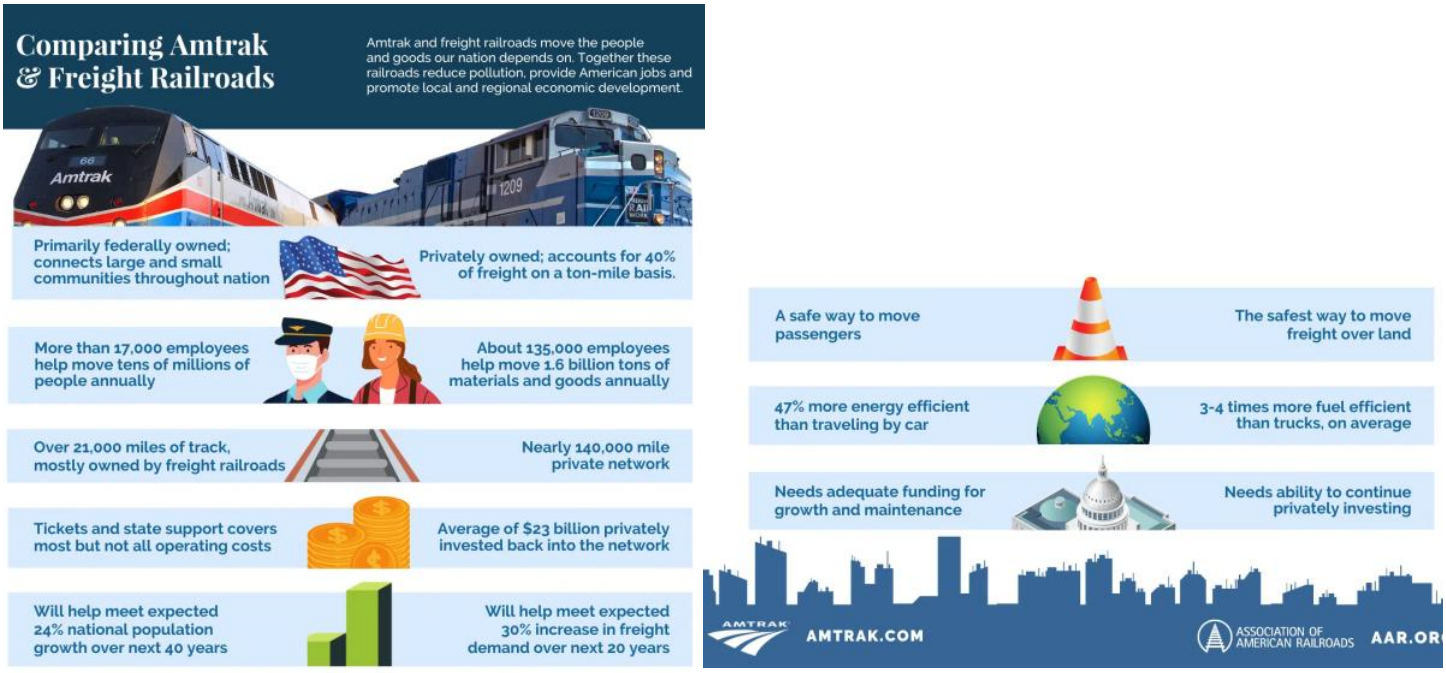


FIGURE 3. COMPARING AMTRAK AND FREIGHT RAILROADS

FUNDING & FUTURE NEEDS

Montana's rail network has benefited from federal funding through programs like the Infrastructure Investment and Jobs Act (IIJA) and the CRISI program. Recent allocations include CRISI Grants (2022) and IIJA Rail Programs (2022- 2026).

Despite these opportunities, significant funding gaps remain, particularly for short-line and regional railroads. The estimated cost to modernize short-line infrastructure and improve passenger rail facilities statewide exceeds $300 million. Additionally, expanding passenger rail services would require substantial investment in new routes, station upgrades, and rolling stock.

Meeting future rail needs will also involve addressing capacity constraints on freight corridors. With increasing demand for rail transportation, particularly for agricultural exports and energy products, Montana must invest in infrastructure upgrades to avoid bottlenecks and ensure efficient service.

RECENT RAIL FUNDING IN MONTANA

CRISI Grants:

- 2022: $15 million for grade crossing improvements and short-line infrastructure upgrades.
- 2023: $14.9 million to improve rail infrastructure near Malta, focusing on preventing bottlenecks and increasing safety for freight and passenger trains.

IIJA Rail Programs (2022-2026): Over $5 billion nationally for rail modernization and safety, with Montana eligible for competitive grants:

- 2023: Big Sky Passenger Rail Authority received $500,000 to support the development of the North Coast Hiawatha passenger rail route. This funding is intended to prepare for the long-term restoration of this service, enhancing connectivity across southern Montana.

PUBLIC SAFETY

Rail safety is a top concern in Montana, with efforts focused on reducing grade crossing accidents, derailments, and other incidents. In 2023, the state recorded 24 rail incidents, including three fatalities at grade crossings. Many crossings, especially in rural areas, lack modern safety features such as gates, warning signals, and barriers. These deficiencies increase the risk of accidents and highlight the need for targeted safety improvements.

Positive Train Control (PTC), a technology designed to prevent collisions and derailments, is operational on Class I railroads but is not required for short-line and regional railroads. Expanding PTC to additional lines and increasing investment in grade separation projects would significantly enhance safety across Montana's rail network.

RESILIENCE

Montana's rail network is increasingly vulnerable to climate-related disruptions, including flooding, wildfires, and extreme weather events. Recent flooding in the Yellowstone region caused significant damage to rail infrastructure, resulting in delays and costly repairs. Wildfires, which are becoming more frequent and severe, pose additional risks by damaging tracks and creating hazardous conditions for train crews.

Short-line railroads are particularly susceptible to climate-related disruptions, as they often lack the resources to recover quickly from such events. Building resilience into Montana's rail network will require investments in weather-resistant materials, advanced monitoring systems, and redundancy in critical corridors. Coordination between rail operators, state agencies, and federal partners will be essential for developing long-term strategies to mitigate the impacts of climate change and natural disasters.

INNOVATION

Innovation in Montana's rail industry has been limited compared to other states, but there are significant opportunities to adopt advanced technologies. Class I railroads have introduced monitoring systems for track inspections and automated equipment for maintenance, which have improved safety and efficiency. Expanding these technologies to short-line and regional railroads would provide similar benefits.

Potential innovations include drone inspections for hard-to-access infrastructure, predictive analytics for identifying maintenance needs, and electrification of rail lines to reduce emissions. Additionally, implementing dynamic scheduling and automated braking systems could enhance operational efficiency. Federal funding programs like the CRISI program could accelerate the adoption of these technologies in Montana.

RAIL

C+

SOLUTIONS TO RAISE THE GRADE

- **Update Funding Structures**
  The current transportation funding system in the U.S. disproportionately supports less environmentally sustainable modes of transportation. Adjusting this structure to ease the financial burden on railroads, particularly in funding competing infrastructure such as passenger rail, should be a priority. This shift would create a more balanced and sustainable approach to transportation funding.
- **Modernize and Expand Rail Infrastructure**
  Significant investment in Montana's rail infrastructure is essential to enhance competitiveness, improve freight movement, and expand passenger services. Freight rail upgrades should include modernizing tracks to Class 6 or higher, developing new routes to support Montana's economic growth, and building redundant capacity and backup systems to enhance network resilience and minimize service disruptions. Public-private partnerships (P3s) will be crucial to funding these enhancements. For passenger rail, modernizing Amtrak stations along the Empire Builder route with improved amenities, accessibility, and shared-use agreements with freight operators will increase reliability and appeal. Expanding service frequency and exploring new intercity routes can better connect Montana's communities, support tourism, and reduce highway congestion. Federal funding programs, such as the Infrastructure Investment and Jobs Act (IIJA) and the Bipartisan Infrastructure Law (BIL), can provide critical support for these upgrades, ensuring both freight and passenger rail networks meet the state's evolving transportation needs.
- **Adopt and Leverage Advanced Technology**
  Harness modern technologies to improve the safety, efficiency, and sustainability of Montana's rail infrastructure. Tools such as drone inspections, predictive maintenance systems, and digital shipment tracking can optimize operations and reduce costs. Advanced scheduling and passenger management platforms will enhance service reliability without requiring additional track mileage or capacity. Electrification and innovations in fuel efficiency technology can lower environmental impact and operating expenses. Investing in cutting-edge safety systems and real-time monitoring will bolster rail reliability while addressing sustainability goals. By fully integrating these technologies, Montana can build a smarter, more responsive rail network that meets both current and future demands.
- **Enhance Public Safety and Resilience**
  Improve safety by modernizing grade crossings with gates, warning systems, and grade separations in high-risk areas. Expand the implementation of Positive Train Control (PTC) and other advanced safety systems to mitigate accidents and derailments. Investments in weather-resistant materials, advanced monitoring systems, and contingency planning will strengthen the network's resilience to extreme weather events and other disruptions, ensuring reliable operations for freight and passenger services.

RAIL

By implementing these recommendations, Montana can transform its rail infrastructure into a modern, safe, and sustainable network. These improvements will enhance economic competitiveness, connect communities, and position the state as a leader in freight and passenger rail innovation.

RAIL

C+

SOURCES

Allen, C. (2024, March 11). Personal Telephone Interview with Carla Allen of Central Montana Rail.

American Association of Railroads. (n.d.). Retrieved from https://www.aar.org/

American Association of Railroads. (2021). Montana Freight Rail 2021 Data. Retrieved from https://www.aar.org/wp-content/uploads/2021/02/AAR-Montana-State-Fact-Sheet.pdf

American Rails. (n.d.). Retrieved from https://www.american-rails.com/

Amtrak. (n.d.). Reports on the Empire Builder. Retrieved from https://www.amtrak.com/

Amtrak. (2023, December 8). Amtrak and Partners Receive Federal Grants to Improve and Expand Passenger Rail Across America. Retrieved from https://media.amtrak.com/2023/12/amtrak-and-partners-receive-federal-grants-to-improve-and-expand-passenger-rail-across-america/

Amtrak. (2009). North Coast Hiawatha Passenger Rail Study. Retrieved from https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/statefactsheets/MONTANA10.pdf

Banks, R. L., & Associates, Inc., & Railroad Industries, Inc. (2004). Montana Branch Line Study, Phase II: Other At-Risk Lines. Prepared for Montana Department of Transportation. Retrieved from https://www.mdt.mt.gov/other/webdata/external/research/docs/research_proj/branchline/phase2/Final_Report.pdf

BNSF Railway Safety and Hazmat Overview. (2014). Retrieved from https://www.bnsf.com/about-bnsf/bnsf-review/2014/

Cotey, A. (2020, November 3). BNSF upgrades to Help Clear the Air in Montana Tunnel. Newswire. Retrieved from https://www.trains.com/trn/news-reviews/news-wire/bnsf-upgrades-to-help-clear-the-air-in-montana-tunnel/

Doyon, G. (2024, March 8). Letter to Federal Railroad Administration Regarding Amtrak Daily Long-Distance Service Study. City of Great Falls, Montana.

RAIL

Federal Railroad Administration. (n.d.). Reports. Retrieved from https://fralongdistancerailstudy.org/wp-content/uploads/2024/06/Regional-Working-Group-Meeting-4-Summary.pdf

Federal Railroad Administration, United States Department of Transportation. (2024, June). Federal Railroad Administration Long-Distance Service Study Regional Working Group Meeting 4.

Franz, J. (2023, July 27). NTSB Says, "Poor Track Conditions" Led to Fatal Amtrak Derailment. Montana Free Press. Retrieved from https://montanafreepress.org/2023/07/27/ntsb-says-poor-track-conditions-led-to-fatal-amtrak-derailment

Hanson, M. B., & Brown, M. (2023, February 21). Bent Tracks a Factor in Montana Amtrak Crash That Killed 3. Associated Press. Retrieved from https://apnews.com/article/amtrak-crash-montana-bent-track-3-killed-2023

Infrastructure Investment and Jobs Act. (n.d.). Funding Allocations.

Institute for Tourism & Recreation Research, University of Montana. (n.d.). Retrieved from https://itrr.umt.edu/

International Energy Agency. (2019). The Future of Rail: Opportunities for Energy and the Environment. Retrieved from https://www.iea.org/reports/the-future-of-rail

Kelly, B. (2023, August 7). BNSF Completes Double-Tracking at Sandpoint, Idaho. Trains. Retrieved from https://www.trains.com/trn/news-reviews/news-wire/bnsf-completes-double-tracking-at-sandpoint-idaho/

LRL Construction. (2010). Mullan Tunnel Enlargement Project. Retrieved from https://www.lrlconstruction.com/projects/mullan-tunnel-enlargement-project/

Luczak, M. (2023, July 24). Reports: MRL Reopens Railroad Bridge 28 Days After Collapse. Railway Age. Retrieved from https://www.railwayage.com/freight/short-lines-regionals/reports-mrl-reopens-railroad-bridge-28-days-after-collapse/

Montana Department of Transportation. (2010). Feasibility report on proposed Amtrak services in Southern Montana. Retrieved from https://www.mdt.mt.gov/other/webdata/external/research/docs/research_proj/amtrak/feasibility_report.pdf

RAIL

C+

Montana Department of Transportation. (n.d.). Rail Plan.

Montana Department of Transportation. (2022). Montana Freight Plan. Retrieved from https://www.mdt.mt.gov/publications/docs/brochures/freight-plan.pdf

National Transportation Safety Board. (2023). Derailment of Amtrak Passenger Train 7 on BNSF Railway Track, Joplin, Montana, September 25, 2021. Railroad Investigation Report RIR-23-08.

National Transportation Safety Board. (n.d.). Rail Safety Statistics.

O'Toole, R. (2021). The High-Speed Rail Money Sink. Policy Analysis, 915, 1–24. Cato Institute.

Payne, V. G. (2023). Sketch-Level Public-Private Partnership (P3) Service Development Plan for the Reinstatement of the Mainstreeter and North Coast Limited/Hiawatha Route Producing Freight and Passenger Mobility Benefits. Big Sky Passenger Rail Authority.

P.R.I.I.A. Section 224. (2009). Amtrak North Coast Hiawatha Passenger Rail Study. Amtrak. Primus, R. (2024, February). Guest comment: Déjà vu, All Over Again. Progressive Railroading.

Rail Passengers Association. (2023). Fact Sheet: Amtrak in Montana.

Sharma & Associates. (2013). Market Analysis: Validation of a 70-ton Higher Speed Freight Truck Design for Operations up to 125 mph. Federal Railroad Administration.

Stagl, J. (2024, February 8). Class I's Big Capex Spend Still a Trend in 2024. Progressive Railroading.

Stephens, B. (2023, July 18). Montana Rail Link Main Line, Severed by Bridge Collapse, Won't Reopen this Month. Trains.

Stephens, B. (2024, March 30). BNSF Railway Needed to End Montana Rail Link Lease—Analysis. Trains.

RAIL

Thyret, S., & Macklem, T. (2024). Alberta-Montana Passenger Rail Feasibility Report.

Union Pacific. (n.d.). [Media contacts and personal communication]. Retrieved from https://www.up.com/media/contacts.

United States Census. (2020). State-based metropolitan and micropolitan statistical areas maps.

United States Department of Agriculture. (n.d.).

United States Department of Defense. (2023). Strategic Rail Corridor Network (STRACNET) & Defense Connector Lines. Military Surface Deployment and Distribution Command.

United States Geological Survey. (n.d.).

Vantuono, W. C. (2023, October 30). Ending a 50-Year Embargo in the Federal Railroad Administration Amtrak Long-Distance Study. Railway Age.

ROADS

2024 MONTANA C-

EXECUTIVE SUMMARY

Montana's highway system is a critical asset that supports travel, recreation, and commerce, making it a cornerstone of the state's economic vitality. The road network includes almost 13,000 miles of state highways and interstates, managed by the Montana Department of Transportation (MDT), and over 63,000 miles of county, municipal, and tribal roads. Despite its importance, long-term funding levels fall short of the need, with needs outpacing available revenue by a ratio of 3:1, thus jeopardizing the future of Montana's transportation system. Population growth and increased vehicle miles traveled (VMT) further stress this infrastructure, underscoring the urgency of addressing systemic funding challenges. To secure the future of Montana's transportation network, increased funding from all levels of government, expanded preventative maintenance, and the adoption of advanced construction technologies are essential. Without decisive action, the state risks jeopardizing public safety, economic growth, and quality of life. A long-term commitment to investment will ensure a sustainable and resilient road system for future generations.

BACKGROUND

Reliable, well-maintained roads provide residents, businesses, and tourists mobility while connecting communities and fostering economic growth. They ensure access to essential services, facilitate trade, and support agriculture, tourism, and energy industries. Oversight of Montana's expansive transportation network is shared among the Montana Department of Transportation (MDT), counties, cities, and tribal governments, reflecting the collaborative nature of maintaining and managing this essential infrastructure.

This extensive system serves a state with a vast geographic area and low population density. Roads are critical for linking rural and urban areas, accessing national parks, and connecting to neighboring states. Maintaining this infrastructure presents unique challenges, particularly for non-MDT routes and tribal communities, where limited funding and resources often exacerbate road conditions. Snow removal is another significant burden, with Montana's long winters demanding continuous investment in plowing, sanding, and de-icing to keep roads open and safe.

CAPACITY

Montana's transportation network spans over 73,000 miles of public roadways, including nearly 13,000 miles maintained by MDT. While the network generally meets current traffic demands, seasonal surges during peak tourism periods strain routes to major attractions like Glacier and Yellowstone National Parks. Addressing these bottlenecks requires targeted investments in traffic management and infrastructure improvements.

Freight transportation is also a growing concern, with key arterial highways, such as I-90 and I-15, experiencing increased traffic from moving goods. These routes support over $100 billion in annual freight shipments, most of which are transported by truck. Reliable transportation is essential for Montana's economy, allowing businesses to access markets, materials, and workers. Additionally, population growth has led to increased commuter traffic in urban areas like Billings, Missoula, and Bozeman, further highlighting the need for strategic planning, expanded capacity, and improved connectivity.

WHAT IS A ROAD CENTERLINE?

A road centerline is a single line that runs down the middle of a road on a map. It shows the road's path, no matter how many lanes it has or how wide it is. This line is used to measure the total length of roads in an area and helps with mapping and planning.

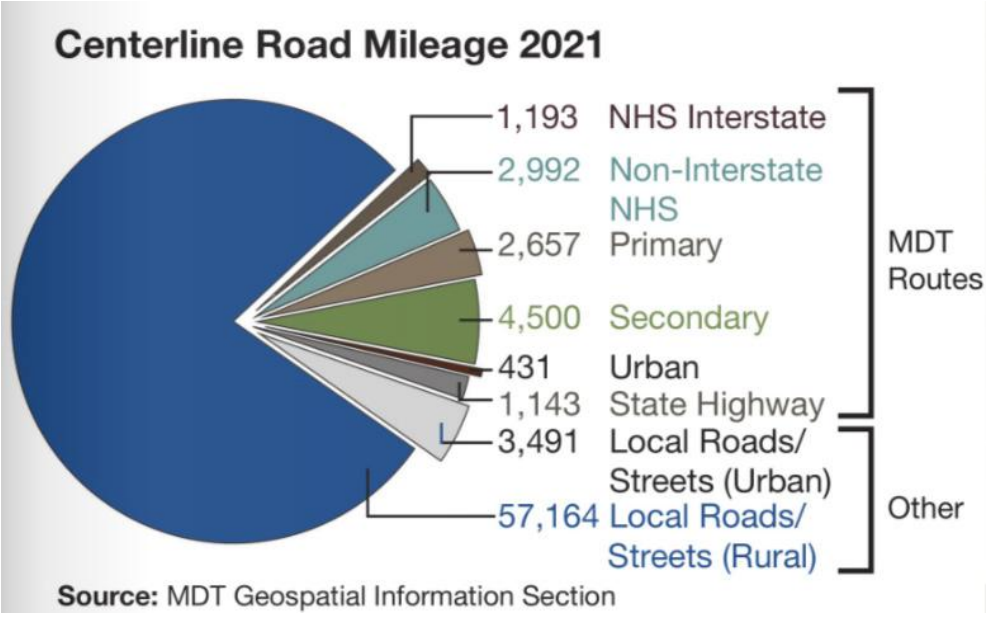


FIGURE 1. CENTERLINE ROAD MILEAGE IN 2021

CONDITION

The condition of Montana's roads is a growing concern. Decades of underfunding and harsh weather conditions have taken a toll on the state's transportation infrastructure. In 2023, 33% of urban roads and 20% of rural roads were classified as poor, up from 22.1% in 2018. Deterioration is particularly evident on non-MDT routes and roads within tribal communities, where resources for maintenance are often more limited. This, combined with urban population increases, has led to increased vehicle operating expenses that cost Montana motorists more than $425 million annually.

Harsh winters exacerbate these challenges, as snow, ice, and freeze-thaw cycles accelerate pavement degradation. Effective snow removal is critical for keeping roads passable during winter, but it significantly strains MDT and local government budgets and equipment. Tribal governments face unique difficulties in maintaining their roads during winter due to funding constraints and the remote locations of many tribal routes.

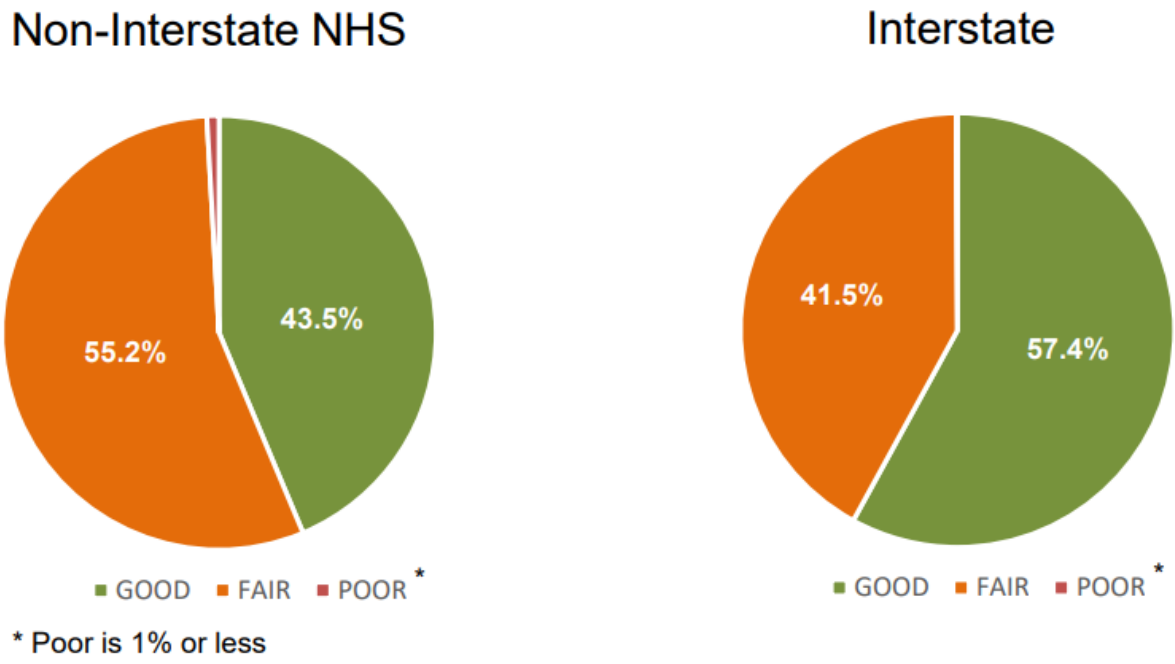


FIGURE 2. PAVEMENT CONDITIONS BY LANE MILES

WHAT ARE LANE MILES?

Lane miles measure the total length of all lanes on a road. For example, a one-mile road with two lanes counts as two lane miles. This helps show the full amount of road space available for traffic.

FUNDING

Montana's road funding heavily relies on federal assistance, supplemented by state revenues from gas taxes and vehicle registration fees. Despite these sources, the state faces a projected $1.2 billion shortfall over the next decade for maintaining and upgrading its road infrastructure. This gap highlights the urgent need for sustainable, long-term funding solutions that address Montana's growing transportation needs.

The Infrastructure Investment and Jobs Act (IIJA) has provided temporary relief. From FY 2022 to FY 2026, Montana is expected to receive approximately $3.33 billion in formula funding through IIJA. These funds are allocated to support various transportation initiatives, including highways, bridges, and public transit. In addition to formula funding, Montana has successfully secured nearly $300 million through competitive IIJA grants for key projects such as bridge repairs, rural transportation improvements, and airport infrastructure enhancements. The IIJA is set to expire in FY 2026, and without sustainable funding mechanisms to replace these allocations, Montana's road network will continue to experience maintenance, safety, and capacity challenges.

Recognizing the need for additional resources, Montana's Legislature approved an additional $100 million in 2023 to maintain county, city, and town roads. While this represents a substantial increase from the baseline funding of approximately $30 million annually, it is not a permanent solution to the systemic funding challenges faced across the state. Tribal communities, which rely on federal programs like the Tribal Transportation Program (TTP), face additional hurdles in accessing sufficient funding to maintain and improve their road networks. Strategic planning and innovation will be crucial in bridging the gap and ensuring resilient and efficient transportation infrastructure for the future of Montana.

FUNDING MECHANISMS AVAILABLE FOR ROADS IN MONTANA

Tax Increment Financing (TIF) Districts: Captures the increased property tax revenue generated by improvements within a designated area to fund infrastructure projects.

Special Improvement Districts (SID): Allows local governments to levy assessments on property owners within a district to fund specific road or infrastructure improvements.

Rural Improvement Districts (RID): Similar to SIDs but targeted at rural areas, funding local road improvements through assessments on benefiting properties.

Local Option Taxes: Counties or municipalities can impose local sales or fuel taxes to generate revenue for road and transportation projects.

State Fuel Taxes: Revenue from Montana's state gas and diesel taxes is allocated to road maintenance and construction.

Vehicle Registration Fees: Fees collected during vehicle registration are a significant source of state transportation funding.

Public-Private Partnerships (P3s): Partnerships with private investors to fund, build, and manage infrastructure projects, often repaid through tolls or revenue-sharing.

Federal Transportation Grants: Competitive and formula-based funding through programs like the Infrastructure Investment and Jobs Act (IIJA).

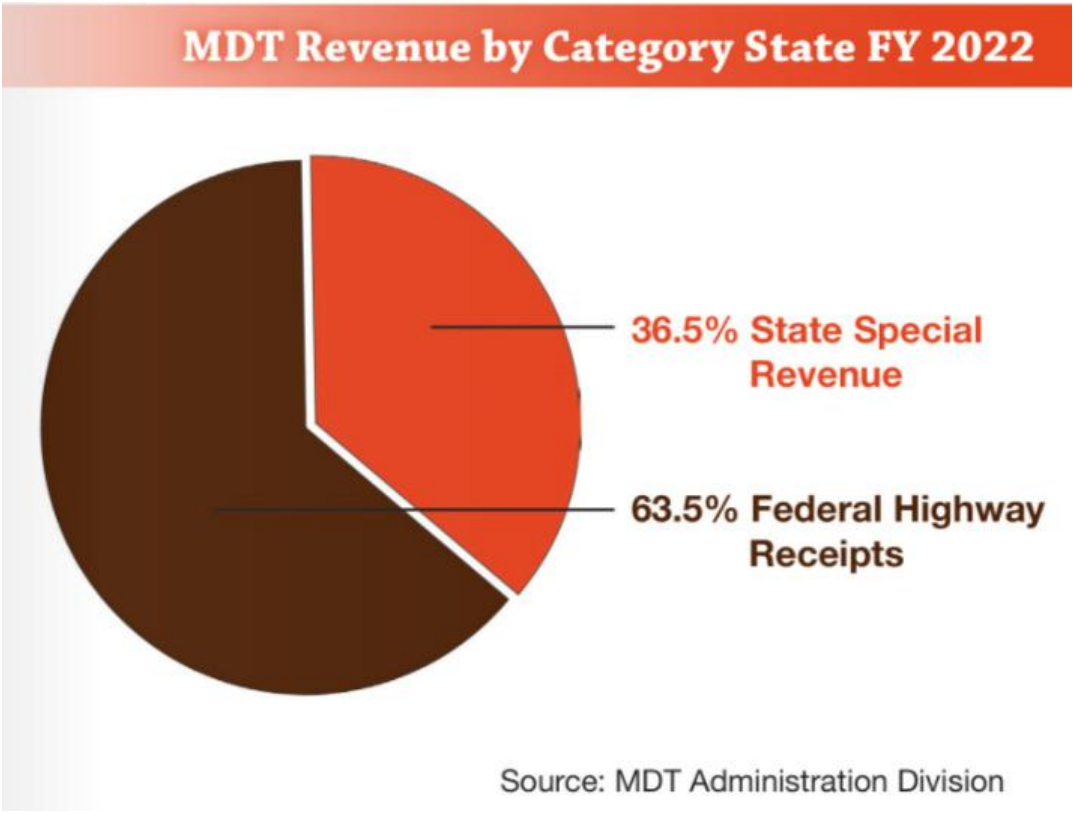


FIGURE 3. MDT REVENUE BY CATEGORY STATE FY 2022

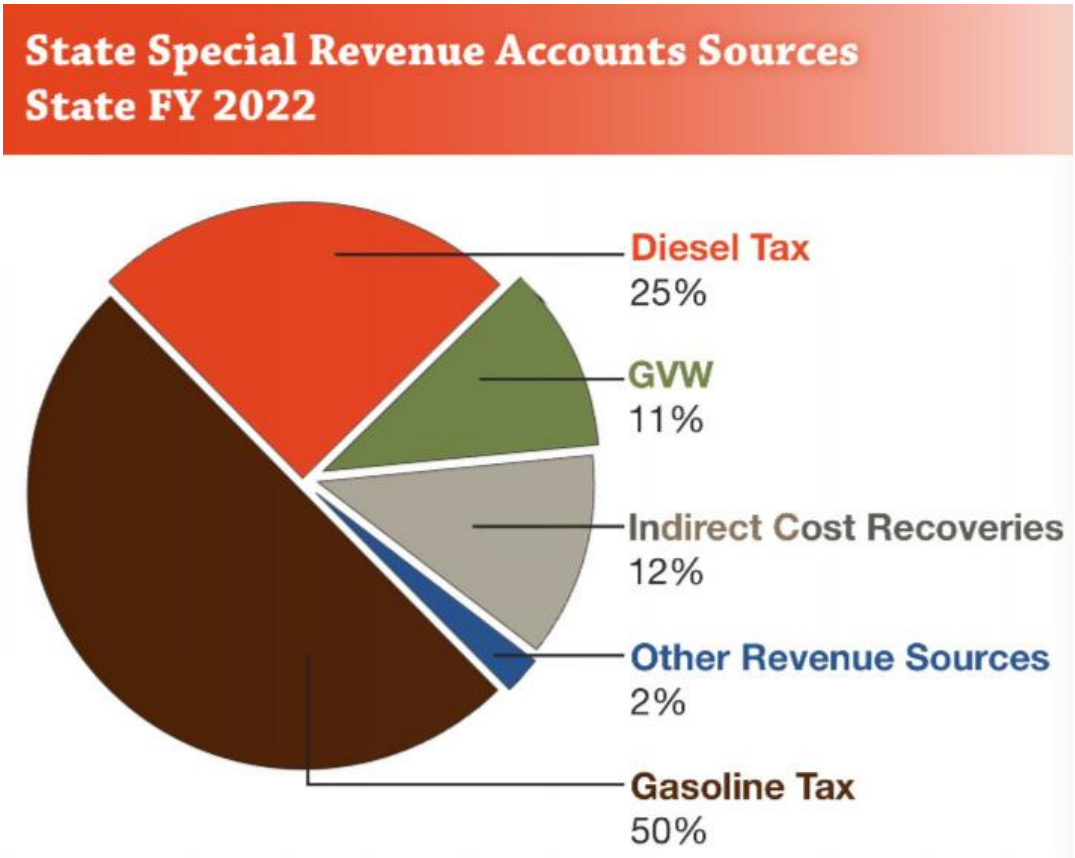


FIGURE 4. STATE SPECIAL REVENUE ACCOUNTS SOURCES STATE FY 2022

DEFINITIONS

GVW stands for Gross Vehicle Weight, which refers to the total weight of a vehicle, including its cargo and passengers. GVW fees are charges based on the weight of commercial vehicles that use Montana's roads. GVW fees help ensure that commercial vehicles contribute fairly to the costs of maintaining the roads they rely on.

Indirect Cost Recoveries refers to funds collected to cover the overhead or administrative costs associated with running transportation programs and projects. These costs include things like office expenses, employee benefits, and other general support services that are necessary for MDT to operate but are not directly tied to a specific project.

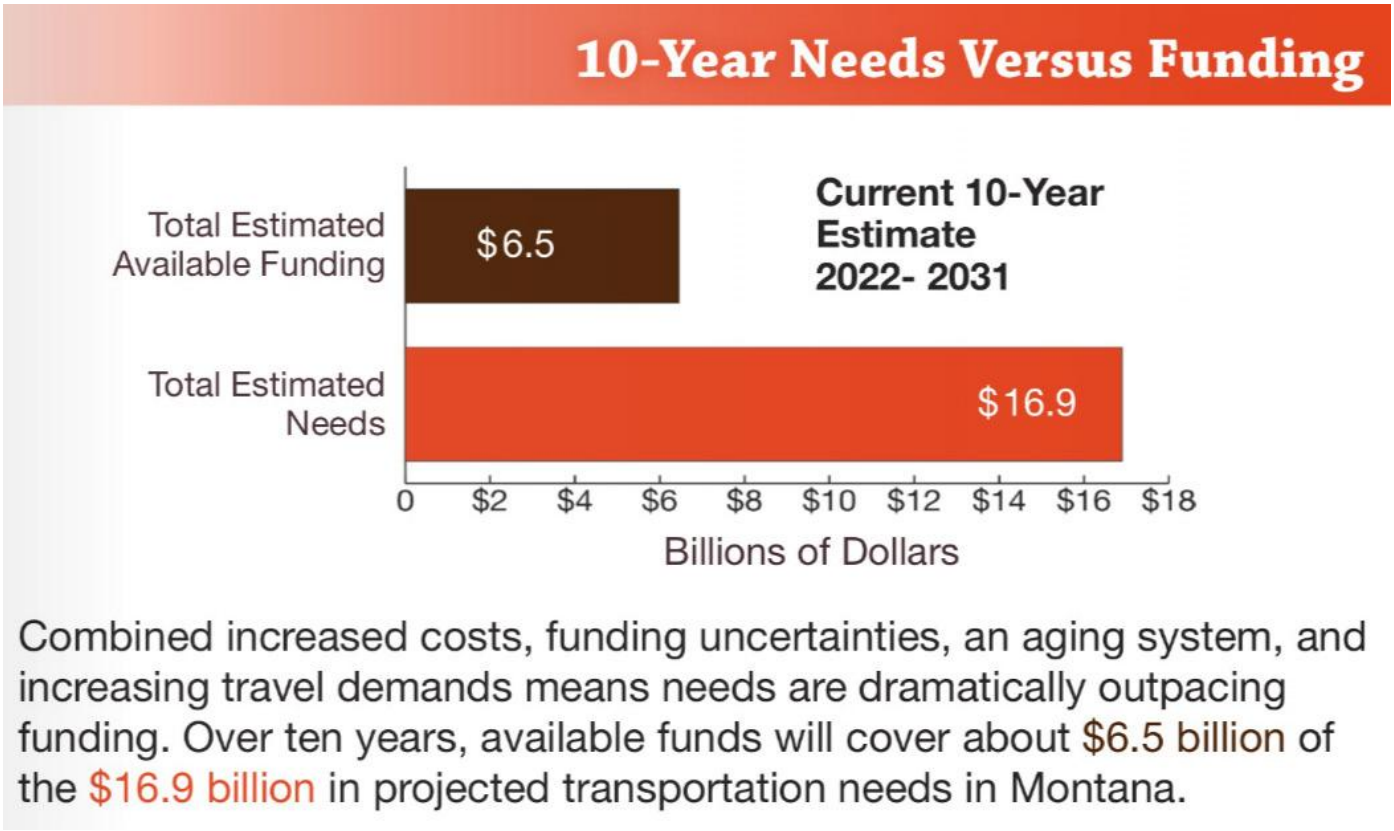


FIGURE 5. 10-YEAR NEEDS VERSUS FUNDING

FUTURE NEEDS

Over the next decade, Montana's transportation needs are projected to surpass available revenue by a ratio of 3:1. Construction costs rose more than 53% between 2020 and 2023, and inflation continues to erode the value of transportation funding. Despite federal funding increases, current levels are insufficient to meet the growing road maintenance and expansion demand. With annual vehicle miles traveled (VMT) increasing by 1.5% per year since 2013, the demand for maintenance and expansion continues to rise. Population growth requires proactive planning to expand road capacity and integrate modern technologies into transportation infrastructure.

OPERATION & MAINTENANCE

Protecting Montana's transportation infrastructure requires ongoing maintenance and efficient resource management. Over the next decade, an estimated $16.9 billion will be needed for road maintenance and improvements, yet projected revenue stands at just $6.5 billion—about one-third of the funding needed. This significant gap highlights the need for long-term funding solutions, preventative maintenance, and life cycle cost analysis, which can significantly reduce long-term expenses.

A critical strategy in managing limited resources is the application of preventative maintenance and life cycle cost analysis. Prioritizing preventative maintenance can significantly reduce the long-term costs associated with road infrastructure by addressing wear and tear before it escalates into expensive repairs or reconstruction. Studies show that every dollar spent on preventative maintenance can save $6 to $10 in future rehabilitation costs. Preventative maintenance stretches limited funds and can ensure that Montana's transportation network continues to support economic growth and mobility while maintaining road functionality and safety for longer periods.

WHAT IS LIFE CYCLE COST?

Life cycle cost analysis evaluates the total cost of owning and maintaining a roadway over its entire lifespan, from initial construction to eventual replacement.

WHAT IS A LOCAL OR OTHER ROUTE?

Roads primarily managed and maintained by local entities such as counties, cities, towns, or tribes. They provide direct access to residences, businesses, and other local destinations, facilitating short-distance travel within communities.

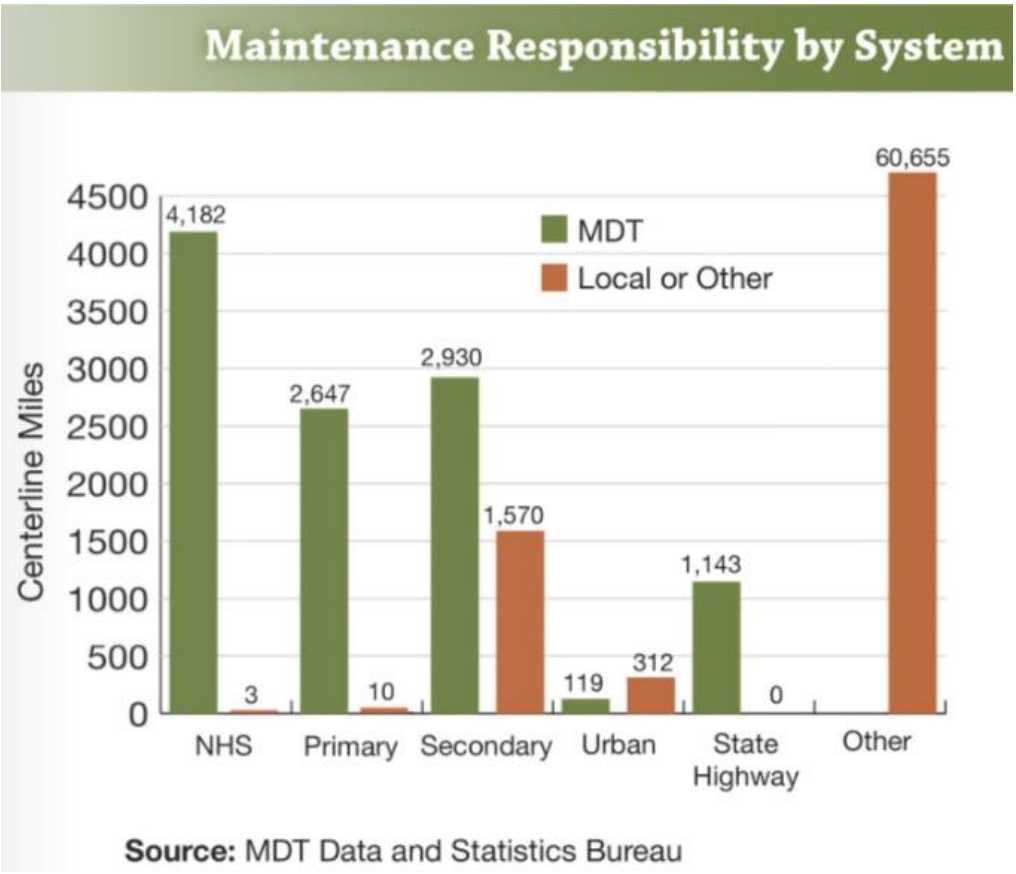


FIGURE 6. MAINTENANCE RESPONSIBILITY BY SYSTEM

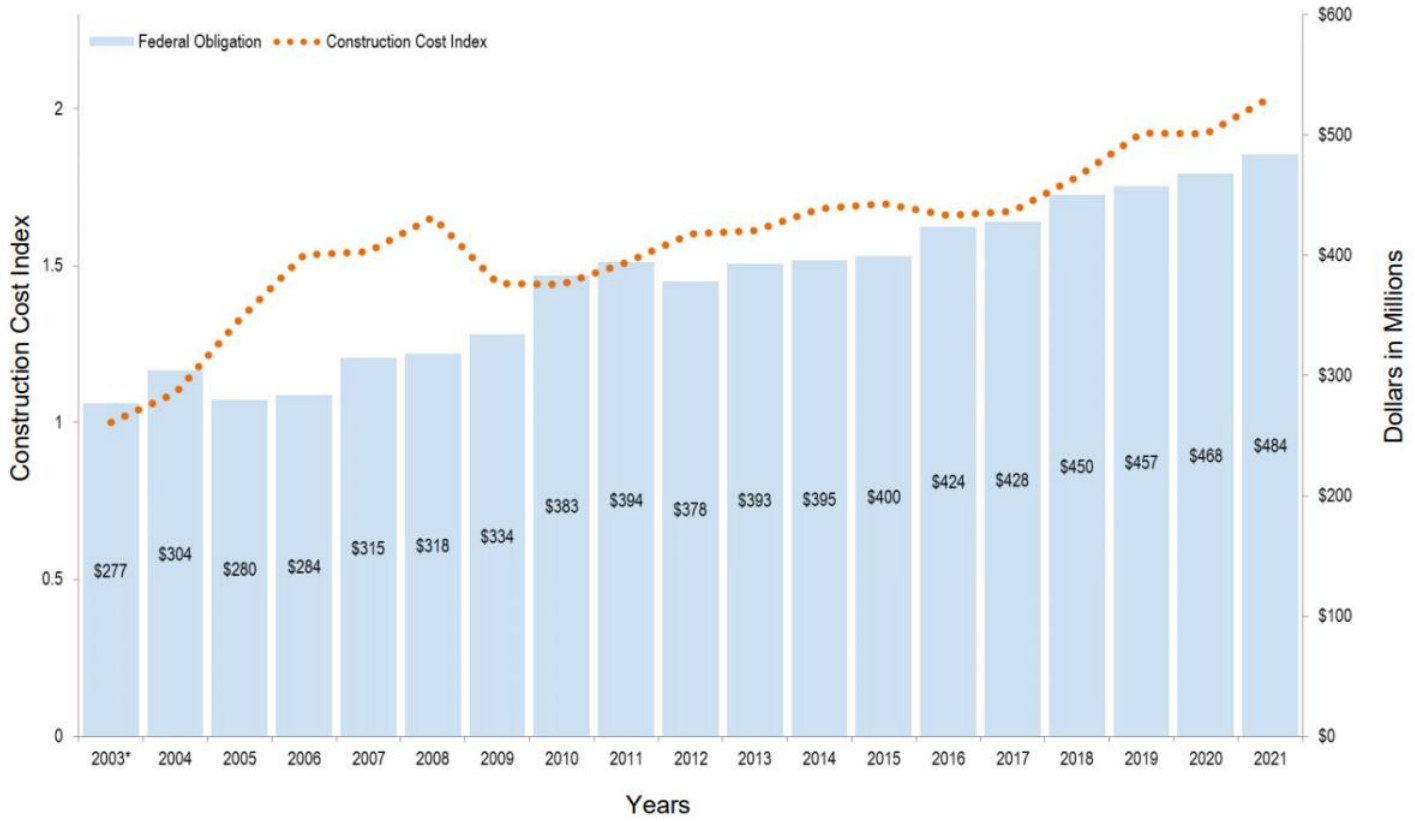


FIGURE 7. FEDERAL FUNDING FLOWS AND INFLATION INDICES

PUBLIC SAFETY

Improving public safety on Montana's roads is a top priority, as the state has the fifth highest traffic fatality rate in the nation. The Vision Zero highway safety initiative aims to reduce fatalities and serious injuries by half by 2030. This initiative focuses on education, enforcement, engineering, and emergency response. One successful Vision Zero measure has been the installation of centerline rumble strips on two-lane highways, which have reduced head-on collisions by approximately 50%. An area for progress to be made is decreasing wildlife-related collisions, which are reported to be 13% of total reported crashes in Montana and cost Montanans roughly $212.5 million annually. Wildlife accommodations such as bridges, underpasses, overpasses and exclusionary fencing can be highly effective (over 80%) at reducing wildlife-related vehicle collisions.

Rural and tribal communities face unique safety challenges, including long distances to medical facilities and roads that often lack modern safety features. Continued investment in safety improvements, such as modernizing road designs and installing safety features, will be critical to reducing accidents and saving lives across the state.

RESILIENCE

The resilience of Montana's transportation network is vital, as alternate routes for closed highways can involve hundreds of miles of detours. Natural disasters, such as floods and severe weather, cause the highest number of disruptions to transportation corridors in Montana, isolating communities and creating costly delays for trade routes.

MDT has developed a strong emergency response system in collaboration with federal and state agencies, ensuring that disruptions are addressed quickly and effectively. However, rural, tribal, and non-MDT routes are particularly vulnerable and often lack the resources for rapid repairs. Strengthening these roads and ensuring they are included in statewide resilience planning will be essential for maintaining connectivity.

WHAT MAJOR TRADE ROUTES RUN THROUGH MONTANA?

- Interstate 15, CANAMEX Corridor, connects Canada to Mexico
- Interstate 90, longest interstate highway in the US linking the Pacific Northwest and the Midwest
- Interstate 94, links to North Dakota and the Midwest
- US Highway 2 or the "Hi-Line", runs parallel to the Canadian border
- US Highway 93, connects to Canada and Idaho
- US Highway 89, provides access to Yellowstone and Glacier National Parks

INNOVATION

Innovation is key to addressing Montana's transportation challenges. In Montana, innovation in road infrastructure is increasingly focused on sustainability and safety. Recent initiatives include integrating smart technology, such as real-time traffic monitoring systems and adaptive traffic signals, which help manage congestion and improve travel efficiency. Additionally, using recycled materials in road construction is gaining traction, reducing environmental impact while enhancing durability. MDT is implementing new digital delivery standards and 3D design technologies to provide surface models that seek to improve construction efficiency and project delivery times. Embracing innovative solutions will help Montana maximize the impact of its transportation funding and improve the overall quality of its road network, not only improving the driving experience but also reflecting a commitment to maintaining Montana's beautiful landscapes while ensuring safe and efficient transportation for all residents and visitors.

SOLUTIONS TO RAISE THE GRADE

Addressing Montana's transportation challenges requires a multifaceted approach. Recommendations include increasing funding from all levels of government and exploring alternative financing options such as Tax Increment Financing (TIF) districts and state infrastructure banks. Additionally, developing and adhering to pavement maintenance schedules, adopting new technologies, and continuing to reduce traffic fatalities through initiatives like Vision Zero will help Montana improve its road infrastructure and meet the needs of its residents and economy.

- **Increase Funding for Maintenance and Expansion:** Secure additional revenue through State Legislation, public-private partnerships, improved financing mechanisms, or user taxes and fees to address the $10.4 billion funding gap over the next decade. Montana should consider implementing a state infrastructure bank to help increase the funding available for all infrastructure projects, including roadways. An infrastructure bank would be backed by the state and provide an avenue for lending money to agencies responsible for funding construction. FHWA estimated that state banks could leverage almost $4 of private investment for every $1 in taxpayer investment.
- **Expand the Use of Preventative Maintenance:** Prioritize proactive measures like crack sealing and resurfacing to save long-term costs and extend road lifespans.
- **Implement Advanced Design and Construction Technologies:** Use 3D modeling and smart construction tools to improve efficiency, reduce costs, and ensure durable road designs.
- **Prioritize Safety Improvements:** Install more centerline rumble strips and guardrails and upgrade outdated roads to reduce Montana's high traffic fatality rate.
- **Encourage Local and Regional Collaboration:** Support counties and municipalities with technical and financial resources to maintain consistent standards and connectivity. Montana cities and counties should consider all alternatives to funding roadway improvements, including Tax Increment Funding (TIF) districts, Special Improvement Districts/Rural Improvement Districts, and other local taxes.
- **Address Resilience and Climate Challenges:** Invest in weather-resistant materials, better drainage, and emergency response plans to reduce disruptions from severe weather and natural disasters.

ROADS

C-

SOURCES

Billings Parks and Recreation. (2024, February). Retrieved from https://www.billingsparks.org/

Bureau of Economic Analysis. (2023, November 17). Outdoor recreation satellite account, U.S. and states, 2022. Retrieved from https://www.bea.gov/news/2023/outdoor-recreation-satellite-account-us-and-states-2022

City of Great Falls. (2024, February). Retrieved from https://greatfallsmt.net/

City of Missoula. (2024, February). Retrieved from https://ci.missoula.mt.us/

Legislative Audit Committee. (2023, August). FWP Enforcement Division: Managing resources and culture. Montana Legislative Audit Division. Retrieved from https://archive.legmt.gov/content/Committees/Administration/Audit/2023-24/Meetings/October-2023/22P-02.pdf

Montana Fish, Wildlife & Parks. (2023, March 15). 2022 Montana State Parks Annual Visitation Report. Retrieved from https://fwp.mt.gov/binaries/content/assets/fwp/stateparks/2022-montana-state-parks-annual-visitation-estimates-final-report-5.1.2023.pdf

Montana Fish, Wildlife & Parks. (2023). Budget information and Guide. Montana.

Montana Fish, Wildlife & Parks. (n.d.). Montana State Parks Maintenance: Making Sense of a Complex World. Retrieved from https://fwp.mt.gov/binaries/content/assets/fwp/stateparks/documents/montana-state-parks-maintenance-making-sense-of-a-complex-world-poster.pdf

Montana Fish, Wildlife & Parks. (2019). State of Montana State Parks.

Montana State Parks. (2019). Sustaining Montana's Outdoor Recreation Legacy: Statewide Comprehensive Outdoor Recreation Plan.

Montana.gov. (2024, February). Retrieved from https://montana.gov/

National Park Service. (2024, February). Retrieved from https://www.nps.gov/index.htm

Parks in Focus Commission. (2018). A new day for Montana State Parks: Parks in Focus Commission final recommendation.

SCHOOLS

2024 MONTANA D

EXECUTIVE SUMMARY

Montana has 826 K-12 public schools that serve over 149,879 students, with facilities averaging 53 years of age. Two-thirds (68%) of these schools were built before 1970, highlighting a growing need for repairs and upgrades. While funding is available for critical safety issues, the Montana School Facility Reimbursement Program, which supports general maintenance, has experienced reduced revenue since 2010. This has created significant funding gaps for routine repairs, code compliance, and energy efficiency improvements. The challenges are further compounded by rising energy costs and declining student enrollment, placing additional strain on already tight school budgets. As a result, Montana's schools are struggling to meet the demands of their aging infrastructure while providing a safe and healthy learning environment for students. Addressing these issues requires sustained investment and innovative solutions to modernize facilities and support the long-term success of Montana's education system.

BACKGROUND

Of Montana's 826 public schools, there are 433 elementary schools, 220 middle schools, and 173 high schools. Many of these facilities have multiple buildings. The average age of Montana school facilities is 53 years. In 2005, House Bill No.1 of the 59th Legislature Special Session authorized a statewide facility condition inventory for all schools in Montana, summarized in the "State of Montana, K-12 Public Schools Facility Condition Assessment A/E Project #26-30-03" (Facility Assessment Report). This inventory was completed in 2008 by 42 trained professional architects and engineers. A follow-up assessment has not been conducted, and the state does not track this information. Additional revenue and expense information and interviews with school superintendents, facility managers, and financial administrators are available through the Montana Office of Public Instruction.

CAPACITY

While overall, Montana public school enrollment has a slight downward trend, the 2023-2024 school year had a total enrollment of 149,879 students in the state's 409 school districts. It is estimated that 92% of Montana's children attend public school. Enrollment for the 826 public schools breaks down as follows:

- 51 schools (6%) have more than 500 students and account for 31% of total public school enrollment
- 163 schools (20%) have 250-499 students and account for 41% of total public school enrollment
- 163 schools (20%) have 100-249 students and account for 18% of total public school enrollment
- 112 schools (14%) have 50-99 students and account for 5% of total public school enrollment
- 330 schools (40%) have fewer than 50 students and account for 5% of total public-school enrollment

No consistent pattern has emerged relating the number of students to school system capacity, and any trends identified are limited based on location. For example, Montana has several remote, one-room schoolhouses serving very small populations. By contrast, in some larger Montana communities, the number of students exceeds optimal capacity. Each year, the debate continues about whether specific schools should remain open or be closed due to local population trends. Local populations make these decisions, and each community faces unique circumstances that affect school capacity. These decisions are often based on local needs, resources, and population trends. Ultimately, it is up to local stakeholders to determine what is best for their schools and communities.

CONDITION

The 2008 Facility Assessment Report uses categories outlined in the Facility Condition Inventory (FCI) from Montana State University's Office of Facilities Services. The FCI was developed for facility condition assessment and is based on a national facility audit model. This system is now used in many state agencies. It was recognized for its value and impact by receiving the Leadership in Education Facilities 2008 Effective and Innovative Practices Award by APPA, the industry association for education facilities officers. The FCI is used to compare the cost of repairing a building to that of replacing a building. The worst and most pressing deficiencies identified for Montana schools were in the Damage/Wear Out and Environmental categories, where 66% of all schools had damaged or worn-out items, which include:

- 37% finish-related items, including ceilings, walls, and floors
- 15% electrical system damage, including outdated wiring and a shortage of outlets;
- 14% for other categories such as plumbing systems, roofs, building envelopes, and foundations. The top three environmental category deficiencies include
- 39% HVAC systems
- 28% roof systems

- 31% of envelope systems comprised of the roof, exterior walls, and windows.
- If uncorrected, a failure in any of the systems listed above could affect other systems within the schools and potentially impact the community, state, and overall economy.

FUNDING

Montana public schools currently face a $141 million budget shortfall, according to the Montana School Boards Association (Daily Montanan). A 2008 report, Building Minds, Minding Buildings, estimated that $903 million was needed to bring school facilities up to good condition at that time (GEMS). More than a decade later, the funding sources remain largely the same: 44% from the state, 9% from the county, 27% from local property taxes, 8% from local non-tax sources, and 12% from federal funds (GEMS). This static model relies heavily on local taxpayers to cover shortfalls, especially for infrastructure needs.

Additionally, the Montana Facility Reimbursement Program has faced cuts totaling about $24 million over the last several years. Specifically, during the 2023 legislative session, the program was cut by $2 million, continuing a trend of reductions that began with a significant $22 million cut in the 2021 budget. These funding cuts have significantly impacted the ability of schools to maintain and improve their facilities (https://montanabudget.org/report/budget-cuts-devastate-health-and-human-services)

The average per-student general fund budget for the 2022-2023 school year was $7,985, which dropped to $7,800 after a $19 million funding cut in August 2023 (Montana Free Press). Many school districts already operate with minimum staff required to meet federal accreditation standards, forcing them to cut supplies and maintenance while relying on local levies to fill gaps.

Recent levy requests in the 2024 school elections had mixed results. Superintendents attributed shortfalls to the expiration of federal COVID-19 relief funds, declining enrollment, and an outdated state funding formula. Bozeman and Missoula voters passed levies to raise funds for school operations and safety, but these efforts highlight ongoing dependence on local taxpayers to bridge funding gaps.

To address these issues, Montana needs a new funding formula to ensure adequate, stable school districts' funding. The current model leaves infrastructure maintenance and upgrades underfunded, disproportionately burdening local taxpayers. A reformed formula should provide dedicated funding for infrastructure and meet state and federal requirements, reducing reliance on temporary relief or local levies to maintain long-term school viability.

In April 2024, Montana received a $13.3 million grant from the U.S. Department of Agriculture's Secure Rural Schools Program (The Montana Independent). While this offers short-term relief, comprehensive funding reform is necessary to ensure that schools are adequately supported for the long term.

OPERATION & MAINTENANCE

The Facility Condition Inventory (FCI) report has highlighted the inadequacies in Montana's long-term planning for school infrastructure, indicating a critical need for an updated assessment. The last comprehensive evaluation was conducted in 2008, and revising this report is essential to gauge the current state of facilities accurately. Furthermore, systematic data collection on schools' operational and maintenance needs will help identify compliance issues and inform strategic planning. This approach will enhance the financial capability to address deferred maintenance and improve overall infrastructure quality, ultimately raising the grade for Montana's school facilities.

PUBLIC SAFETY

The FCI report reviewed the safety issues of each facility and found safety issues in two categories: (1) immediate threats to life safety and (2) building integrity. School site visits identified potential safety issues, and once school officials were notified, they responded quickly to eliminate any threats. Many additional issues beyond urgent public safety and structural integrity exist, most often due to the age of the infrastructure and building codes that have changed over time. Most (68%) of Montana's schools were built before 1970 when lead paint and asbestos insulation were common building materials. With funding a significant hurdle, removing these hazardous materials often gets deferred until renovations become necessary to meet current building codes. These safety issues go unresolved when grants are not awarded and bond levies are not passed.

RESILIENCE & INNOVATION

In Montana's vast landscape, schools serve a vital role beyond academics. They act as community centers, hosting meetings and events and transforming into emergency shelters during natural disasters. These facilities are essential for fostering a sense of community and providing a haven during times of crisis. Without proper maintenance, Montana's aging school infrastructure faces the inevitable risk of failure precisely when needed – during emergencies. Such a breakdown would be unacceptable, especially during a crisis when our infrastructure is under the most demanding strain.

SCHOOLS D

SOLUTIONS TO RAISE THE GRADE

Ultimately, undersupplying schools and deferring facility maintenance are not long-term solutions. We need to identify stable funding sources and develop facility plans to ensure the ongoing care of these important resources.

- **Develop New Funding Formulas for Montana's Schools:** The current and long-used funding formula is inadequate and relies on local taxpayers to fund any shortage regardless of the shortage area. Montana needs a funding formula that delivers the funding needed to meet all state and federal requirements and specifically identifies the funding for infrastructure maintenance, upgrades, or replacement. In times of shortage, infrastructure is the last place money is spent. Decades of funding shortages have led to our current infrastructure status.
- **Reauthorize and Increase Funding for the Facility Reimbursement Program:** The statewide Facility Reimbursement Program has seen drastic reductions in available funding. The state legislature should reauthorize the program and increase available funding. Additionally, localities should levy funding and financing for school facilities (Montana Free Press) .
- **Develop Long-Term Facility Plans**: The FCI report and K-12 Report were good starting points in identifying the needs of Montana schools. Based on those reports, it is recommended that long-term facility plans be created for each school and district to determine how to improve school facilities and offer guidance for spending their limited budgets. Each facility plan should develop an evaluation process to determine if renovation or replacement is appropriate.
- **Expand Grant Programs and Conduct Follow-Up Facility Condition Inventory Analysis:** Grant programs have been successful and helpful for some schools that received aid. However, these programs are not reliable or long-term solutions for necessary infrastructure maintenance, upgrades, or replacement.

SCHOOLS D

SOURCES

2015-2016 School Funding Interim Commission. (2016). K-12 School Funding: A 10-Year Review. Retrieved from http://leg.mt.gov/content/Committees/Interim/2015-2016/School-Funding/Meetings/Aug-2016/SFC-FINAL-REPORT.pdf

21st Century School Fund, Inc., US Green Building Council, Inc., & National Council on School Facilities. (2016). State of Our Schools: America's K-12 Facilities. Retrieved from https://kapost-files-prod.s3.amazonaws.com/published/56f02c3d626415b792000008/2016-state-of-our-schools-report.pdf

Graf, C. (2024). Now we Have to Choose: Do We Not Turn On the Lights, or do we Cut Teachers? Missoulian. Retrieved from https://missoulian.com/news/state-regional/education/school-funding-local-school-districts-public-education-montana/article_62bfcccc-e1d1-5684-b188-502c7fb75e43.html

Moe, M. S. (2024). Butterflies Aren't Free. Missoulian. Retrieved from https://missoulian.com/opinion/column/mary-sheehy-moe-butterflies-aren-t-free/article_ec1f7bcc-cb54-11ee-a3d5-07a6ca3e91f3.html

Montana Department of Administration, Architecture & Engineering Division. (2008). K-12 Public Schools Facility Conditions Assessment. Retrieved from https://leg.mt.gov/content/Committees/Interim/2007_2008/edu_local_gov/facilities_final_report_7_1_08.pdf

Montana Office of Public Instruction. (2014). Understanding Montana School Finance and School District Budgets. Retrieved from https://leg.mt.gov/content/Committees/Interim/2015-2016/School-Funding/Meetings/UnderstandSchoolFinance.pdf

Montana Office of Public Instruction. (2020). Understanding Montana School Finance and School District Budgets. Retrieved from https://opi.mt.gov/Portals/182/Page%20Files/School%20Finance/Accounting/About%20School%20Finance/Understanding%20%20School%20Finance/Understanding%20Montana%20School_Finance_%20FY%202020_DRAFT%20KF%20Edits.pdf

Montana Office of Public Instruction. (2021). Facts About Montana Education. Retrieved from https://opi.mt.gov/Portals/182/Superintendent-Docs-Images/Facts%20About%20Montana%20Education.pdf?ver=2021-06-10-162844-327

SCHOOLS D

Montana Office of Public Instruction. (2022). Facts About Montana Education. Retrieved from https://opi.mt.gov/Portals/182/Ed%20Facts/Facts%20About%20MT%20Education%20Brochure_FINAL.pdf

Montana Office of Public Instruction. (2024a). Elementary & Secondary School Emergency Relief. Retrieved from https://opi.mt.gov/COVID-19-Information/ESSER

Montana Office of Public Instruction. (2024b). Growth & Enhancement of Montana Students (GEMS). Retrieved from https://gems.opi.mt.gov/

Montana Quality Education Coalition. (2023). School Funding History. Retrieved from https://www.mqec.org/school-funding-history

Montana State Legislature. (n.d.). School Funding Interim Commission. Retrieved from https://leg.mt.gov/committees/interim/past-interim-committees/2015-2016/2015-2016-education-and-local-government-committee/school-funding-interim-commission/

Szpaller, K. (2024). Montana School Levies Put Spotlight on Budget Shortfalls, Pocketbooks, Funding Formulas. Daily Montanan. Retrieved from https://dailymontanan.com/2024/05/10/montana-school-levies-put-spotlight-on-budget-shortfalls-pocketbooks-funding-formulas/#:~:text=Inflation%20has%20left%20public%20schools,in%20levies%20%E2%80%94%20is%20drying%20up

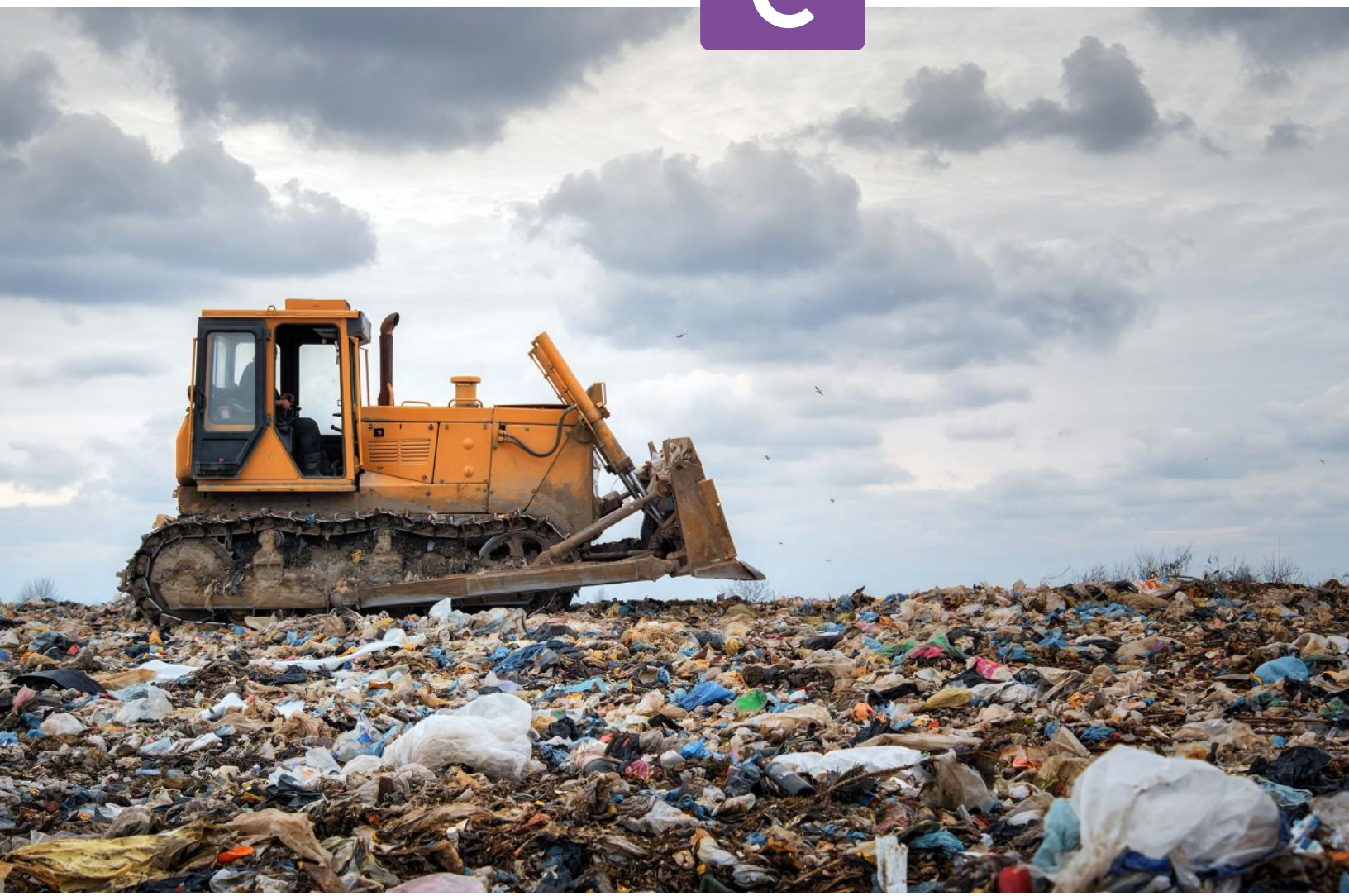
Sakariassen, A. (2022). Public Schools Report Second Year of Enrollment Gains. Montana Free Press. Retrieved from https://montanafreepress.org/2022/12/02/montana-public-schools-report-second-year-of-enrollment-gains/

Tester, J. (n.d.). Tester's Bipartisan Infrastructure Legislation is Signed Into Law. Retrieved from https://www.tester.senate.gov/newsroom/press-releases/pr-8721/

Willis, O. (2024). Montana Republicans Opposed Federal Legislation that is Now Helping to Fund Rural Schools. The Montana Independent. Retrieved from https://montanaindependentnews.com/education/montana-republicans-opposed-federal-legislation-that-is-now-helping-to-fund-rural-schools/

SOLID WASTE

2024 MONTANA C



EXECUTIVE SUMMARY

Montana residents generated approximately 1.5 million tons of municipal solid waste (MSW) last year, a per capita waste generation rate of 8.2 pounds per person per day, significantly higher than the national average. The state operates 31 landfills, with a total landfill capacity of about 30 million tons unevenly distributed. Some regions are nearing or at capacity, highlighting a need for expanded waste management solutions and infrastructure upgrades. Montana's recycling infrastructure is limited, with only around five material recovery facilities (MRFs) and a recycling rate of about 19%, well below the national average of 32%. Additionally, less than 1% of MSW is converted to energy, indicating a potential area for development in waste-to-energy practices. Funding gaps in the solid waste management system, such as insufficient resources for innovation and infrastructure development, highlight the need for improved investment and strategic planning to advance sustainable waste management practices.

BACKGROUND

Landfill operations in Montana are managed by a combination of local governments, private companies, and regional waste management districts. Funding varies between publicly owned facilities, which rely on local taxes and fees, and privately owned ones, which depend on service fees. Future planning for landfill capacity includes complying with Montana Department of Environmental Quality (DEQ) regulations, monitoring usage, and exploring alternative waste management strategies such as recycling and composting. DEQ also oversees abandoned landfills, ensuring post-closure care and monitoring to mitigate environmental and public health risks. Effective leachate management is crucial, involving collection, storage, treatment, and disposal to prevent environmental contamination.

CONDITION & CAPACITY

Montana residents generated approximately 1.5 million tons of municipal solid waste (MSW) last year, compared to the national total of about 292.4 million tons. Per capita, Montanans produce around 8.2 pounds of waste per person per day, higher than the national average of 4.9 pounds, indicating a higher waste generation rate. This figure has increased from previous years, showing a growing waste problem in the state. Montana has 31 landfills, 12 being Class II landfills that handle non-hazardous MSW. There are no Class I landfills in the state, and the number of non-permitted or closed landfills is not readily available. About 30% of Class II landfills are lined to prevent groundwater contamination, indicating a need for improved environmental protection measures in the state's waste facilities.

The total landfill capacity in Montana is approximately 30 million tons, with some regions nearing or at capacity, particularly in more populated areas. This highlights the need for expanded waste management solutions and infrastructure upgrades. A mix of public and private entities owns landfills in Montana. Local governments typically manage public landfills, while waste management companies own private landfills. Both landfills require permits and must comply with state regulations and environmental standards. Montana has around five material recovery facilities (MRFs), indicating a need for expanded recycling infrastructure to improve waste diversion and recycling rates. The state's recycling rate is approximately 19%, which has remained flat in recent years and is below the national average of 32%. Less than 1% of Montana's MSW is burned and converted to energy, reflecting limited waste-to-energy infrastructure. This low percentage suggests an area where the state could expand its waste management practices to include more energy conversion from waste.

OPERATION & MAINTENANCE, FUNDING, & FUTURE NEEDS

In Montana, landfills are operated by a mix of local governments, private companies, and regional waste management districts. Local governments often manage landfills within their jurisdictions, while private companies, such as Waste Management and Republic Services, may operate facilities under contract. Some regions have waste management districts formed by multiple municipalities to manage shared landfills. Funding varies by operator: publicly owned landfills rely on local taxes, disposal fees, and grants, whereas privately owned ones depend on service fees. Adequate financing is generally achieved, though rural areas may face challenges due to smaller tax bases and lower waste volumes.

Leachates from solid waste are managed through collection, storage, treatment, and disposal methods. Landfills with liners use leachate collection systems to capture and store liquid that percolates through the waste. This leachate is then treated using various methods—biological, chemical, or physical—to remove contaminants. Based on its composition and regulations, treated leachate is typically discharged into local wastewater facilities or managed through evaporation. Effective management is crucial to prevent environmental contamination and ensure regulatory compliance.

Planning for future landfill capacity involves compliance with state and federal regulations overseen by Montana DEQ. Operators, including local governments, private companies, and regional districts, must submit long-term management plans and monitor landfill usage and project future needs. Facilities often plan for expansions or new sites and explore alternative waste management strategies, such as recycling and composting. Rural areas may encounter challenges due to limited resources and stricter regulations, necessitating proactive and well-funded planning.

DEQ monitors abandoned landfills in Montana to mitigate environmental and public health risks. Post-closure typically lasts 30 years and involves maintaining the landfill's cap, managing leachate, and monitoring for contamination and gas emissions. While newer sites follow rigorous monitoring protocols, older landfills may receive less frequent oversight unless risks are identified. Monitoring practices vary by site history but are essential for managing potential hazards and ensuring compliance with environmental standards.

DEQ is responsible for permitting and regulating landfills in Montana. This includes issuing permits for construction, operation, and closure, requiring detailed plans and public input for larger projects. DEQ monitors landfill operations for compliance with environmental standards through inspections, data reviews, and enforcement actions. The agency sets design and operational standards, oversees ecological monitoring, and ensures active and closed landfills do not pose environmental or public health risks.

Montana's landfills must adhere to closure and post-closure requirements to protect health and the environment. Closure involves installing a final cap and cover, managing leachate and gas, and documenting activities with certification to DEQ. Post-closure care, typically lasting 30 years, requires maintaining landfill integrity, monitoring environmental impacts, and submitting annual reports. Operators must also provide financial assurance to cover closure and long-term care costs, ensuring ongoing compliance with environmental standards.

MSW facilities in Montana can be publicly or privately owned. Publicly owned facilities, managed by local governments or regional districts, are funded through fees collected from residents and businesses, supplemented by taxes or grants. Privately owned facilities generate revenue through service fees that cover operating costs and profit. Both types of facilities generally aim to be self-funding. Tipping fees, which range from $30 to $60 per ton, vary based on ownership and operational costs. Total revenue from tipping fees depends on the volume of waste processed. Publicly owned landfills use tipping fees to cover operational costs and support municipal services, while private landfills may include revenue-sharing in contracts with local governments.

Montana faces critical funding gaps in its solid waste management system, hindering the development of sustainable practices. Key gaps include insufficient funding for research and innovation, a lack of seed capital for developing markets for recyclable materials, and limited investment in transitioning to a resource-oriented waste management system. Additional gaps include the need for better public education and outreach to boost recycling participation and substantial infrastructure development funding to support advanced waste management practices. Addressing these gaps is crucial for achieving more effective and sustainable waste management solutions.

PUBLIC SAFETY, INNOVATION, & RESILIENCE

In Montana, solid waste facilities are overseen by state programs administered by the Montana Department of Environmental Quality (DEQ), which collaborates with federal requirements to ensure effective waste management. DEQ manages permitting, regulation, and compliance through issuing permits, conducting inspections, monitoring environmental data, and enforcing standards. Additionally, DEQ oversees post-closure care for landfills. State programs align with federal standards but may impose stricter requirements, ensuring comprehensive oversight and adherence to environmental protection guidelines.

Landfill regulations in Montana, governed by DEQ, encompass state-specific and federal standards. Key regulations include location restrictions to avoid high-risk areas, composite liner requirements to prevent groundwater contamination, and mandatory leachate collection and treatment systems. Landfills must install groundwater monitoring wells and perform regular testing to detect contamination. For closure and post-closure care, landfills must develop a closure plan, maintain the landfill cap, monitor environmental impacts for up to 30 years, and provide financial assurance for closure and post-closure costs.

DEQ does not typically mandate specific sustainability requirements for landfill infrastructure bids. However, landfill design must comply with environmental regulations that support sustainability by minimizing environmental impacts. Local governments and regional districts may integrate sustainability goals into their projects, such as energy-efficient designs or recycled materials. Grants and funding opportunities may encourage sustainable practices, although they are not generally required in bidding.

While DEQ does not have specific sustainability policies for solid waste management, it supports sustainability through broader environmental protection goals. This includes enforcing regulations for leachate collection and groundwater monitoring, promoting recycling and waste reduction, and encouraging energy-efficient practices through various programs and grants. Local governments and regional waste districts may also implement their sustainability initiatives.

Montana does not widely use standardized sustainability design processes for solid waste infrastructure. Instead, sustainability is integrated through DEQ regulations that enforce environmental protections such as leachate collection and groundwater monitoring. Local governments and waste management districts may adopt sustainability practices case-by-case, incorporating green technologies and advanced recycling methods as they see fit. Funding programs and grants support sustainability, encouraging eco-friendly practices even without formal design processes.

Asset management practices for solid waste infrastructure in Montana involve various entities, including DEQ and local government waste management departments. While DEQ provides regulatory oversight, local governments and waste management districts develop and implement asset management plans for infrastructure maintenance and future planning. Private waste management companies also utilize asset management practices to ensure operational efficiency and regulatory compliance. Facility operators primarily handle detailed asset management planning.

Montana employs a variety of programs and initiatives to reduce, reuse, and recycle solid waste. DEQ supports waste diversion programs and recycling grants and promotes the recycling of materials like paper and plastics. Local governments offer curbside recycling programs and drop-off centers, while regional waste management districts operate recycling facilities for multiple municipalities. Public education programs, community composting initiatives, and extended producer responsibility (EPR) programs further enhance sustainable waste management practices.

Natural disasters pose significant risks to solid waste management systems in Montana. Wildfires can ignite landfills, leading to hazardous smoke and contamination. Earthquakes may damage landfill infrastructure, causing leaks and operational disruptions. Floods can overwhelm leachate systems and erode landfill covers, leading to contamination of surface waters. Severe storms and tornadoes can damage infrastructure and spread waste. Effective planning, emergency response strategies, and resilient infrastructure are crucial for managing these risks and maintaining effective waste management during and after disasters.

SOLID WASTE C

SOLUTIONS TO RAISE THE GRADE

- Expand recycling infrastructure and increase Montana's recycling rate, which is currently below the national average. Invest in additional material recovery facilities (MRFs) and enhance public education on recycling to drive higher diversion rates.
- Develop waste-to-energy infrastructure to manage the low percentage of MSW converted to energy, reducing landfill pressures.
- Improve environmental protection measures, such as increasing the proportion of landfills with liners and enhancing leachate management systems to prevent groundwater contamination.
- Plan for future capacity by expanding landfill infrastructure and exploring alternative waste management strategies, including composting.
- Address funding gaps by increasing investment in research, innovation, and infrastructure development.
- Enhance resilience to natural disasters by upgrading landfill designs and emergency response plans to safeguard waste management systems.

SOLID WASTE C

SOURCES

US Environmental Protection Agency. (n.d.). Project and Landfill Data by State. Retrieved from https://www.epa.gov/lmop/project-and-landfill-data-state

Montana Department of Environmental Quality. (n.d.). MDEQ Solid Waste Program. Retrieved from https://deq.mt.gov/twr/Programs/solidwaste

Montana Department of Environmental Quality. (n.d.). MDEQ State Solid Waste Management Plan.

Billings Public Works. (n.d.). Billings Regional Landfill. Retrieved from https://www.billingsmtpublicworks.gov/236/Billings-Regional-Landfill

Montana State University. (n.d.). Waste Diversion Programs and Projects. Retrieved from https://www.montana.edu/sustainability/programs_and_projects/wastediversion.html

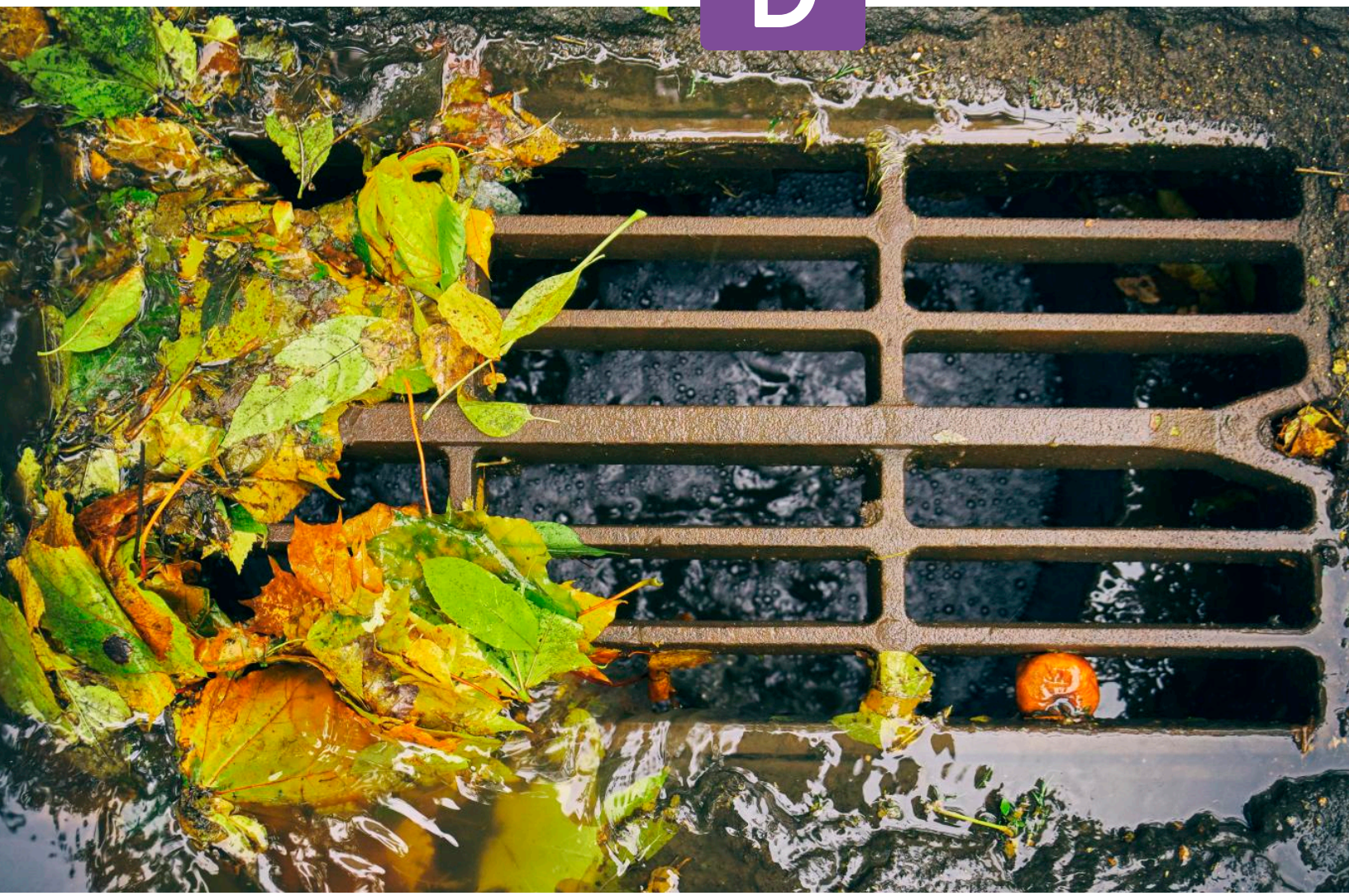
Government of Canada. (n.d.). Environmental Indicators: Solid Waste Diversion and Disposal. Retrieved December 4, 2024, from https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/solid-waste-diversion-disposal.html

Montana Code Annotated. (n.d.).

Administrative Rules of Montana. (n.d.).

STORMWATER

2024 MONTANA D



EXECUTIVE SUMMARY

Montana's rural character and diverse landscapes make managing stormwater runoff a significant concern. While local stormwater utilities help address these challenges, their effectiveness is limited as Montana's 14 permitted districts cover only the state's few urban areas. Many smaller communities lack the capacity and funding to address local stormwater issues effectively. The Montana state government works with these districts to ensure that construction sites, urban areas, and industrial operations implement pollution control measures. However, agricultural runoff—often containing fertilizers, pesticides, and sediments—remains unregulated mainly, posing a significant source of contamination. The entire cost of implementing more robust stormwater management remains unclear. In 2022, the Environmental Protection Agency (EPA) estimated Montana's stormwater infrastructure needs at $22 million, though state-reported data may underestimate the costs of addressing urban runoff and mitigating agricultural pollution. Compounding these challenges, Montana's 2017 Climate Assessment predicts more severe precipitation

events and increasingly unpredictable seasonal patterns, which existing systems—often designed with outdated data—cannot effectively manage. Addressing Montana's stormwater needs will require more significant funding, improved regulatory coordination, and enhanced infrastructure design to create resilient systems capable of withstanding these evolving challenges.

BACKGROUND

Stormwater infrastructure in Montana includes systems designed to manage and control rainwater and melted snow runoff. Conventional stormwater infrastructure (also referred to as "gray") employs systems such as storm drains, pipes, detention basins, and retention ponds to collect and convey surface runoff. In contrast "green" stormwater infrastructure (GSI) includes components like green roofs, rain gardens, bioswales, infiltration basins, and permeable pavement to collect runoff and promote infiltration as close to the source as possible. These systems benefit local communities by reducing flood risks, improving water quality, and protecting ecosystems while offering aesthetic and recreational value not associated with conventional stormwater infrastructure. Impervious surfaces, such as roads and buildings, prevent water from infiltrating the ground, increasing the rate and volume of runoff, which can lead to flooding, erosion, and water pollution. Local governments in Montana are responsible for stormwater management, planning, constructing, maintaining infrastructure, and implementing policies to reduce runoff. The National Pollutant Discharge Elimination System (NPDES) permits, mandated by the federal Clean Water Act (CWA), require applicable municipalities, industrial operations, and construction sites to regulate their stormwater discharges. Demands for municipal stormwater management in Montana are increasing due to urbanization and population growth, which creates more impervious surfaces. Climate change, projected to result in more frequent and intense rainfall events and less precipitation falling as snow, necessitates more robust and extensive stormwater infrastructure to compensate. As climate change-related disruptions increase into the future, the frequency of extreme weather events and an increase in the occurrence, severity, and duration of drought will make stormwater systems an essential tool in mitigating extreme precipitation events and protecting precious local water resources during drought.

CAPACITY

Montana has fewer stormwater utilities or districts than the 500 found throughout the United States, reflecting the state's lower population density and smaller urban areas. The Montana Department of Environmental Quality (MDEQ) manages 14 total Municipal Separate Storm Sewer Systems (MS4s) permits on non-reservation lands for seven cities and three counties as well as the University of Montana, Montana State University, Malmstrom Airforce Base, and the Montana Department of Transportation (MDT). MDT had been operating as a co-permittee with municipalities since 2010, but in 2016, municipalities were required to begin operating under their permits. All permits currently issued in Montana are "small MS4" authorizations for municipalities with populations between 10,000-100,000 and other qualifying organizations or institutions. The EPA is responsible for administering NPDES authorizations on tribal lands with seven reservations in Montana holding a further 25 active MS4 permits for in Montana.

This regulatory framework ensures that construction sites, urban areas, and industrial operations implement measures to control and reduce stormwater pollution, protecting water quality in the state. However, MDEQ does not regulate most agriculture-based pollutant sources, which can contribute significantly to stormwater contamination through runoff containing fertilizers, pesticides, and sediments. Additionally, communities with populations of less than 10,000 people are not subject to MDEQ stormwater regulations, meaning smaller municipalities may lack the oversight and resources to manage stormwater effectively. This regulatory gap underscores the importance of comprehensive stormwater management strategies, including regulated and unregulated sources, to safeguard Montana's water resources.

In its 2022 Clean Watersheds Needs Survey (CWNS), the EPA found that Montana had around $22 million in total reported funding needs specifically for stormwater infrastructure projects. Unlike many other states, Montana does not separate stormwater project needs into categories utilized by the EPA and, therefore, does not distinguish between infrastructure funding needs and funding needs related to general management and administration of stormwater programs. In Montana, much of this needed funding is for projects that aim to address deficiencies in existing capacity in growing urban areas, which are often insufficient to meet demand, necessitating expansions and upgrades. Local governments are increasingly assessing the need for increased capacity and improved treatment as allowable total maximum daily load (TMDL) values are adjusted to become more stringent over time for some contaminants. Municipalities must evaluate maintenance needs to ensure effective stormwater management in the long term. While existing infrastructure addresses some aspects of water quality, there are gaps, particularly in exempted activities such as agriculture and mining and in smaller communities. Further gaps exist in transportation funding mechanisms that do not fully consider the additional costs incurred in developing and maintaining drainage and conveyance systems that address water quality concerns instead of just compensating for stormwater volumes.

Existing capacity in many areas, particularly in unregulated communities, may not be sufficient to compensate for surges in stormwater runoff due to shifting climate and hydrologic conditions. Montana's 2017 Climate Assessment (MCA) found that extreme precipitation events resulting from climate change may increase severity while historical seasonal patterns become less predictable. Existing systems, especially older infrastructure, were designed utilizing hydrological data and precipitation models, which do not reflect shifting modern climate conditions. Reliance on conventional gray stormwater infrastructure with low implementation of GSI means that most stormwater runoff in Montana's developed areas is eventually discharged into local surface and subsurface water bodies. When untreated stormwater is discharged into local waterbodies, sediment can be transported, infiltration is reduced, and pollutants are highly mobilized. In parts of the country, extreme storm events can overwhelm aging sewer systems with combined sewer overflows (CSOs) and the discharge of stormwater runoff mixed with raw sewage into local receiving waters. In Montana, the threat from CSOs is low, with no CSO outfalls, according to data from the EPA's National Combined Sewer Overflow Inventory.

CONDITION

Montana's stormwater infrastructure consists of various conventional components and systems, including storm drains, pipes, ditches, detention, retention ponds, GSI-like rain gardens, bioswales, infiltration bases, and permeable pavements. Local governments often face challenges in maintaining pipes and structures due to funding constraints and antiquated infrastructure, which may still include components dating to the late 19th and early 20th centuries, such as pipes and drains constructed of wood, clay, and bricks. Materials for constructing conventional stormwater systems often include concrete, plastic, and metal, while GSI systems typically incorporate more durable and environmentally friendly materials. Maintenance of gray and green stormwater infrastructure is a significant concern in understanding the cost of implementing stormwater management components. Further comparisons of the post-construction maintenance and operating costs of one approach are required as the implementation of GSI increases. Older communities are much more likely to have outdated stormwater management infrastructure, requiring significant upgrades to meet current standards. In contrast, communities with new development may be designed with a combination of modern stormwater management practices from the outset to meet current zoning and development construction standards.

MS4 permitting has required local governments to approach stormwater management with more comprehensive planning and implementing best management practices to reduce pollution. Combined sewer systems, no longer commonly employed in Montana, were typically built in the late 19th or early to mid-20th century. In contrast, more recent developments include municipal storm drain systems, detention and retention ponds, and low-impact

development/GSI. There has been a significant push for the inclusion of GSI in stormwater management in the last two decades. Still, GSI and management practices are not yet widely employed in many of Montana's communities. The general adoption of GSI practices is limited primarily to Montana's larger cities and towns where low-impact development (LID) and GSI principles are sometimes encouraged or potentially even required by local ordinances. In some cases, local developers may have some level of pushback due to the perception that GSI and modern stormwater management practices increase the cost of development.

Local stormwater studies have highlighted the gaps in infrastructure and the need for enhanced management strategies. These studies often issue recommendations for increased funding, better planning, and the implementation of GSI. Most of Montana's larger communities have capital improvement plans to upgrade and expand stormwater infrastructure to meet current and future demands. The state of Montana has not established a statewide commission to study or assess the condition of stormwater infrastructure, and the state's most recent 2015 Montana Water Plan makes little mention of the role of stormwater infrastructure in the state's efforts to protect and enhance its water resources. Data collection regarding contamination from non-point source pollution and active monitoring in Montana is not available now, and a complete assessment of statewide pollutant sources and impacts is nonviable.

At the regional level, conservation organizations have made efforts to protect and improve water quality and the security of water resources. One such conservation organization, the Western Montana Conservation Commission (WMCC), was formed in the 2023 Montana Legislative Session and combines the roles and jurisdiction of the Flathead Basin Commission (FBC) and the Upper Columbia Conservation Commission (UC3) to improve organizational reach and management efficiency. In addition to assuming the roles of the FBC and UC3, WMCC works to fund and promote projects and programs that reduce the impacts of toxic pollution and runoff from stormwater as well as private and public septic systems and sanitary sewers in Montana west of the Continental Divide.

Montana has many thousands of miles of streams listed as impaired. The table above shows Montana's 2020 Integrated Water Quality Report data, which designates the total river mileage by impairment cause. Sediment and transportation of pollutants from stormwater runoff contribute to significant reductions in water quality in streams and lakes across the state, underscoring the need for improved management practices. The condition of receiving waters is monitored through NPDES data, EPA reports, and state data, which indicate varying levels of health across different water bodies. These data sets are crucial for assessing the impact of stormwater runoff and guiding future infrastructure improvements and policy decisions.

FUNDING

TABLE 1. CAUSE OF RIVER IMPAIRMENT

CAUSE OR CAUSE GROUP	TOTAL IMPAIRED RIVER MILEAGE	% OF ASSESSED RIVER MILES LISTED AS IMPAIRED
Habitat (4C)	10,226	49%
Metals	7,524	36%
Mercury	1,663	8%
Nutrients	7,231	35%
PCBs	75	0.36%
Salinity	2,919	14%
Sediment	8,220	40%
Temperature	2,717	13%

Funding for stormwater management in Montana is needed for upgrading and expanding infrastructure, maintaining existing systems, implementing and maintaining GSI, and ensuring compliance with regulatory requirements. Montana has relatively few stormwater utilities or districts compared to some western states, limited primarily to cities and counties where an MS4 is required. A Western Kentucky University study from 2022, which aimed to identify as many stormwater utilities as possible across the United States, found that seven stormwater utilities were operating in Montana at that time compared to 146 utilities operating in Washington, 5 in Idaho, 0 in Wyoming, and 5 in North Dakota. There is limited availability and distribution of funding sources. Funding sources include local government budgets, revenue from stormwater utilities, private property investments, revolving funds, and CWA grants. The Clean Water State Revolving Fund (CWSRF) provides loans for Montana stormwater projects, helping finance infrastructure improvements. Alternative funding methods, such as general obligation bonds and development impact fees, are also in place. User fees are in place in some areas and are considered a viable option for funding stormwater management. Recent studies or commissions have recommended forming utilities statewide to provide consistent and dedicated revenue streams for stormwater programs and recommendations on consistent fee structures, which vary by local stormwater utility. Municipalities are increasingly compiling spatial databases of stormwater infrastructure, although barriers such as overlapping city and county jurisdictions, separate tracking mechanisms, and lack of agency coordination persist.

In recent years, federal funding availability for infrastructure projects has increased due to changes in policy due to changes to federal programs. Programs like Investing in America Agenda, funded by changes made by the Bipartisan Infrastructure Law, prioritize projects in small and financially distressed communities. These funds, disbursed by the EPA, are intended to address growing needs due to urbanization and climate change and have been utilized to fund stormwater improvements. The CWNS does not distinguish between programmatic and hard costs at the state level. Funding requirements for Montana include the total costs of achieving comprehensive stormwater management and the costs of infrastructure upgrades, maintenance, administration, and implementation of best management practices.

FUTURE NEEDS

In Montana, the population in urban and rural areas is increasing; however, funding for stormwater management is not keeping pace with this growth. The need for increased funding is partly driven by MS4 permit requirements, which mandate municipalities to implement more comprehensive stormwater management practices. According to the EPA's 2022 CWNS, Montana has significant financial needs for stormwater infrastructure. There is a considerable gap between available funding at the local and state level and the economic needs for effective stormwater management, highlighting the urgency for additional resources with over $22 million in stormwater-specific projects requiring funding in Montana and over $347 million in reported needs for all water quality impact categories in the state. Montana's fiscal year 2024-2025 budget proposes $200 million for the expansion of water and sewer infrastructure, with some stormwater projects receiving a portion of those funds. Despite the increased funding for water and sewer-related projects, a significant gap exists between assessed needs and dedicated funds.

Climate data and models presented in the 2017 MCA predict at least a slight increase in precipitation that falls as rain and a reduction in the portion contributing to snowpack. Rain increases are projected to increase runoff volume into local surface waters. East of the Continental Divide, this significantly increases stream flows into the Missouri River Basin from January through April while the high-altitude snowpack is rapidly melting. However, it drastically reduces stream flows in July through September when the snowpack is entirely depleted. Headwaters west of the Divide, which contribute to the Clark Fork Watershed, have snowpack stored at lower elevations, and snow has historically melted off earlier in the season. These systems are likely to see a lower degree of disruption from earlier snowmelt. Statewide, the overall pattern is for more available water to leave the watersheds in the winter and spring months with significantly less water to support streamflow in summer and fall when needed.

Despite the potential for an increase in precipitation, the reduction in winter precipitation falling as snow is projected to significantly impact communities reliant on declining snowpack. Additionally, standard precipitation projections and models used to develop and size stormwater features will no longer remain accurate, and existing features may be insufficient to compensate for future storm events. As precipitation shifts from snow to rain in the winter and spring, existing stormwater features may not pay for increased precipitation rates and storm intensity. Shifts in seasonal precipitation are also likely to favor hotter, drier summers, with peak seasonal stream flows occurring weeks earlier in most of the state, straining water resources that support habitat and ecosystems, recreational uses, and landowners. Projected increases in the severity, frequency, and duration of droughts in the coming century highlight the importance of protecting local water resources, maintaining stormwaters as close to the sources as possible, and promoting groundwater recharge to reduce surface runoff in areas where treatment to protect water quality is not a concern. Supreme Court cases in recent years have presented challenges to the management of treated and untreated pollutants and have further muddied the role of government agencies in adopting and enforcing policies to protect natural resources.

OPERATIONS & MAINTENANCE

In Montana, stormwater infrastructure maintenance primarily falls on local municipalities, counties, and the Montana Department of Transportation (MDT). MS4 permits cover urbanized areas in Billings, Butte, Bozeman, Great Falls, Helena, Kalispell, and Missoula (as well as the entirety of Yellowstone, Missoula, and Cascade Counties) ensuring that municipalities within these regions implement and maintain appropriate stormwater management practices. Private sector owners also play a crucial role in maintaining stormwater infrastructure on their properties, such as parking lots and private roads. The state has numerous miles of storm drains, with ownership typically divided among municipalities, counties, and MDT.

Dedicated local funding for maintenance varies by municipality, with some areas having established stormwater utilities to provide consistent revenue streams to support maintenance and improvements. In contrast, others rely on general funds or specific allocations. The rate of infrastructure replacement is generally slow due to funding constraints, leading to a backlog of aging systems needing upgrade or replacement. Deferred maintenance is standard in cities and counties implementing stormwater management plans. In 2021, a Water & Sewer Infrastructure Advisory Commission report for the state of Montana recommended a minimum of $42 million in grants to be allocated for the upgrade and maintenance of storm, drinking, and wastewater systems across the state. Still, only about $3 million of that total was dedicated for projects which included stormwater system upgrades or improvements.

PUBLIC SAFETY

Montana has historically experienced significant flooding in some parts of the state due to various causes, but in recent years, severe floods have reoccurred in some counties. In 2022 and 2023, spring rains and rapid loss of snowpack caused widespread flooding across South-central Montana, including Carbon, Park, and Stillwater counties. Communities were inundated by storm events, resulting in damage to structures, washed-out roads, and bridges. In the 2022 event, the Yellowstone River swelled to historic levels, reaching a major flood stage in Billings. That year, Yellowstone National Park faced massive floodwaters, leading to road and bridge damage, power outages, and evacuations during the peak tourist season.

Major disaster declarations have been made across Montana in recent years due to severe storms and flooding. Since 2013, eight major flooding disasters have been declared, with causes ranging from severe storms and seasonal flooding and flooding related to ice jams in the state's waterways. Over that period, Montana received nearly $57 million in

federal emergency relief funding and support. Montana had no flooding-related disaster or emergency declarations that required federal funding between October of 1986 and July of 2013. While storms severe enough to generate significant threats to public safety are not common across the state, rapidly increasing development in Montana's few urbanized areas has resulted in significant increases to the extent of impervious surfaces, degradation of existing vegetation, and impacted soils. As a result, multiple major flooding events have threatened urbanized areas and overwhelmed existing infrastructure in recent years. Outdated stormwater systems in Montana's smaller communities with less funding and support may be in poor or unserviceable condition, impacting their ability to mitigate some flood risks.

RESILIENCE

Climate change has led to a gradual shift in seasonal precipitation and average temperatures across Montana. Montana's geographic size and diverse landscapes result in various regional impacts, with the state's mountainous west and eastern grassland plains subject to different local impacts from shifts to historical climate patterns. Precipitation in the winter is projected to increase over the next century. But instead of falling as snow and being stored for gradual release in mountain snowpack, rising average winter temperatures will mean precipitation is more likely to fall as rain at a time when frozen soils, low evapotranspiration potential, and low demands from vegetation will impede infiltration and encourage accumulation and runoff. Snowpack melting faster and earlier in the season results in elevated peak spring streamflows, which may coincide with spring rains. The overlap of peak snowmelt and spring rains threatens to overwhelm existing waterways and stormwater systems. In the 2022 and 2023 flood events, rapid melting of the spring snowpack coincided with heavy seasonal rains, overfilling streams and rivers and resulting in millions of dollars in damages while threatening thousands of homes and businesses in south-central Montana.

Montana released a statewide Multiple-Hazard Mitigation Plan in 2023. This statewide plan addresses goals intended to reduce the impact of future hazards by prioritizing strategies and improvements that promote resilience. Stormwater is recognized in this plan as having a significant potential impact on future disaster preparedness and conservation. An emphasis is placed on strategies that improve water retention and storage while improving water quality. For disaster planning purposes, Montana Disaster & Emergency Services has divided the state into three regions: Western, Central, and Eastern, with only the Eastern region currently having a published region-specific hazard mitigation plan. At the local scale, cities like Bozeman have engaged in major efforts to adopt and enforce new ordinances that protect water resources by reducing water consumption and encouraging collection, infiltration, and recycling of stormwater runoff, as well as measures to reduce total runoff and provide for permeable developed surfaces. Further adoption of GSI technologies can provide opportunities to develop decentralized stormwater management approaches less reliant on major infrastructure projects or expensive upgrades and retrofits.

INNOVATION

Communities in Montana have made significant progress in modernizing their stormwater infrastructure in recent years. Cities such as Bozeman have implemented sweeping stormwater and landscape ordinances to reduce the demand for irrigation and promote GSI as an effective stormwater management tool. Montana has made progress by initiating or funding programs to reduce runoff and pollution utilizing state and federal grant opportunities, revolving funds, and loans. Montana's 2020 Water Quality Integrated Report highlights the state's efforts to address point source and non-point source pollution threatening the state's water resources; improvements in recent years include upgrading, expanding, or replacing inadequate secondary treatment facilities, replacing leaky and faulty system components, initiating programs for improved nutrient removal and treatment, development of watershed restoration plans, restoration projects, and increasing quality monitoring and assessment in waters across the state.

Regional commissions, such as the former Flathead Basin Commission (now the Western Montana Conservation Commission), have undertaken projects to mitigate local stormwater impacts, inventory assets, and identify threats to water quality from stormwater. Their Phase I Final Report provides one of Montana's first regional assessments of stormwater infrastructure function and condition. Adopting GSI principles has provided another tool to augment local stormwater systems and statewide water quality examinations. Further adoption of sustainable stormwater practices and implementation of GSI offer an opportunity to improve stormwater capacity without needing large-scale conventional infrastructure.

STORMWATER D

SOLUTIONS TO RAISE THE GRADE

- Formalize a statewide stormwater commission to promote awareness and develop a comprehensive statewide plan for stormwater management to guide local and regional planning and management efforts.
- Complete a statewide condition assessment of stormwater infrastructure or develop additional regional studies to identify existing stormwater infrastructure and assess function to provide a comprehensive, accurate evaluation of existing capacity and treatment capabilities across the state.
- Identify or develop funding mechanisms to provide consistent financial support for stormwater infrastructure maintenance, replacement, and upgrades. Potential funding mechanisms include dedicated state and federal funds, state and federal grants, local user fees, taxes, revolving loan programs, and private sponsors.
- Further encourage the adoption of GSI technologies and management strategies to augment new and existing stormwater infrastructure. Implementation of GSI offers many co-benefits not associated with conventional stormwater management. Inclusion of GSI components may enable access to funding that otherwise might not be available to a conventional stormwater management project (e.g., native species restoration, habitat restoration, support for local pollinators, urban canopy development, remediation, etc.)
- Develop, promote, and distribute materials to encourage the adoption of voluntary BMPs and strategies in communities exempt from existing CWA regulations. Make funding available to otherwise exempt communities for the implementation of voluntary BMPs and increase incentives for exempt communities to develop stormwater and asset management strategies.
- Continue mitigation of non-point source pollution. Pollution generated by exempt municipalities or industries such as agriculture and mining is a significant contributor to stream and waterbody impairment. It is not likely that regulation will rescind the exemptions provided to certain industries, but state and local strategies to reduce inputs and impacts can provide opportunities to reduce the influence of pollutants at the source to protect water quality.
- Continue to develop and implement strategies to overcome operations and maintenance expense barriers for small communities and local stormwater utilities, improving community access to equipment and materials while reducing costs (e.g., equipment exchanges, rental equipment, diagnostic equipment, etc.). Encourage workforce development and training to close maintenance and operations procedures gaps between conventional and GSI systems.
- Develop and fund programs for data collection and monitoring of stormwater-related pollutants to provide an accurate understanding of stormwater runoff impacts on local surface and subsurface water supplies. The data collected can be utilized to determine management strategies, improve efficiency, reduce negative impacts, and identify pollutant sources affecting water quality.

SOURCES

Campbell, W. (2022). Western Kentucky University Stormwater Utility Survey 2022. SEAS Faculty Publications, Paper 6. Retrieved from https://digitalcommons.wku.edu/seas_faculty_pubs/6

US Environmental Protection Agency. (2024, April). Clean Watersheds Needs Survey (CWNS) – 2022 Report and Data. 2022 Clean Watersheds Needs Survey Report to Congress. Retrieved from https://www.epa.gov/cwns/clean-watersheds-needs-survey-cwns-2022-report-and-data

GeoWize. (2013, May). Combined Sewer System Cities [Online Geospatial Data Viewer]. Map access by Zach Heffernan; using ArcGIS Online. Retrieved from https://www.arcgis.com/home/item.html?id=004909c6679a4289b629a1c26278224c

US Environmental Protection Agency. (2016). Different Shades of Green. Retrieved from https://www.epa.gov/sites/default/files/2016-10/documents/green_infrastructure_brochure_final.pdf

Federal Emergency Management Agency. (n.d.). Disasters and Other Declarations. Retrieved from https://www.fema.gov/disaster/declarations?field_dv2_declaration_date_value%5Bmin%5D=1953&field_dv2_declaration_date_value%5Bmax%5D=2024&field_dv2_declaration_type_value=DR&field_dv2_incident_type_target_id_selective=49112&field_dv2_state_territory_tribal_value%5B%5D=MT

Federal Emergency Management Agency. (n.d.). Disaster Declarations for States and Counties. Retrieved from https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties

Montana Department of Environmental Quality. (2022, February). General Permit for Storm Water Discharges Associated with Small Municipal Separate Sewer Systems (MS4s). Retrieved from https://deq.mt.gov/files/Water/WQInfo/Documents/2021%20Public%20Notices/PN-MT-21-25/2022_FPER_MTR040000_S%20Sign.pdf

Henry, E. A. (2020, November). An Investigation into Stormwater Management, Pollution, and Monitoring in the Flathead Watershed, Montana: Phase I. Prepared for Flathead Basin Commission. Retrieved from https://westernmtwaters.com/wp-content/uploads/2024/01/Phase-I-Final-Report.pdf

STORMWATER D

Klapstein, B., & Gocksch, T. (2021, June). MDT MS4 Spatial Data Map [Webmap]. Montana Department of Transportation. Map access by Zach Heffernan; using ArcGIS Online. Retrieved from https://www.arcgis.com/apps/mapviewer/index.html?webmap=feee753b921b4104b696f2d4c26689ed

National Association of State Budget Officers. (2024). Montana. Proposed & Enacted Budgets. Retrieved from https://www.nasbo.org/mainsite/resources/proposed-enacted-budgets/montana-budget

Montana Department of Environmental Quality. (2021, February). Montana 2020 Final Water Quality Integrated Report. Retrieved from https://deq.mt.gov/files/Water/WQPB/CWAIC/Reports/IRs/2020/MT_2020_IR_Final.pdf

U.S. Environmental Protection Agency. (2024, July). Montana NPDES Permits. NPDES Permits Around the Nation. Retrieved from https://www.epa.gov/npdes-permits/montana-npdes-permits

Montana Department of Natural Resources and Conservation. (2015). Montana State Water Plan. Retrieved from https://dnrc.mt.gov/_docs/water/Planning_implementation_coor/2015_mt_water_plan.pdf

Montana Department of Transportation. (2023, November). Municipal Separate Storm Sewer System Stormwater Management Program. Retrieved from https://www.mdt.mt.gov/pubinvolve/stormwater/docs/ms4-program.pdf

Montana Public Service Commission, Legislative Services Division. (2018, March). Small Water and Sewer Utility Regulations in Montana. Retrieved from https://leg.mt.gov/content/Committees/Interim/2017-2018/Energy-and-Telecommunications/Meetings/Mar-2018/small-water-program-review-8060SLEA.pdf

Montana Department of Military Affairs, Montana Disaster and Emergency Services. (2023, September). State of Montana Multi-Hazard Mitigation Plan Statewide Hazard Assessment. Retrieved from https://des.mt.gov/Mitigation/FINAL_2023_MT_MHMP_20231003.pdf

Montana Department of Natural Resources & Conservation. (n.d.). State Revolving Fund Loans. Retrieved from https://dnrc.mt.gov/Conservation/Grant-and-Loan-Programs/Loans/State-Revolving-Fund-Loans

U.S. Environmental Protection Agency. (2024, February). Urbanization and Stormwater Runoff. Source Water Protection (SWP). Retrieved from https://www.epa.gov/sourcewaterprotection/urbanization-and-stormwater-runoff

Montana Infrastructure Advisory Commission. (2023, January). Water and Sewer Grant Application Summaries and Project Certifications. American Rescue Plan Act of 2021. Retrieved from https://dnrc.mt.gov/_docs/conservation/ARPA/CommissionMeetings/BudgetBook1.24.23.pdf

Whitlock, C., Cross, W., Maxwell, B., Silverman, N., & Wade, A. A. (2017). 2017 Montana Climate Assessment. Montana State University and University of Montana, Montana Institute on Ecosystems. Retrieved from https://montanaclimate.org/chapter/title-page

US Environmental Protection Agency. (2012, June). Who's Covered? Designation and Waivers of Regulated Small MS4s. Stormwater Phase II Final Rule. Retrieved from https://www3.epa.gov/npdes/pubs/fact2-1.pdf

WASTEWATER

2024 MONTANA C-

EXECUTIVE SUMMARY

Montana's wastewater infrastructure is a mix of public and private systems. Approximately 616,000 residents, or 58% of the state's population, are served by around 500 public wastewater systems, while private septic tanks and drain field systems serve the remainder. Although several of Montana's largest municipalities have completed significant upgrades benefiting about 25% of the population, many other systems—particularly those relying on lagoon treatment—have not been updated in over 30 years. The Environmental Protection Agency's (EPA) 2023 Clean Watersheds Needs Survey estimates that Montana requires $347 million in wastewater improvements, particularly in collection systems, lift stations, and advanced treatment upgrades. While recent federal legislation, including the American Rescue Plan Act (ARPA) and the Infrastructure Investment and Jobs Act (IIJA), has boosted funding, a substantial gap remains. Continued investment and innovative approaches are essential to meet the state's growing wastewater infrastructure needs and ensure environmental and public health protection.

BACKGROUND

The total investment for water and wastewater improvements from all federal and state grants, loans, and local funding has typically been around $160 to $170 million and has recently increased to an average of over $250 million, considering additional funding from the American Recovery Plan Act (ARPA) and IIJA.

The following information regarding the population served with public systems is provided by the Montana Department of Environmental Quality (DEQ).

TABLE 1. NUMBER OF MONTANA SYSTEMS AND POPULATION SERVED

NO. OF SYSTEMS	POPULATION SERVED	% OF STATE POPULATION
9	>7500	32%
104	500 – 7500	20%
100	<500	2%
Unknown	Varies	46%

A breakdown of the types of treatment systems in operations is listed below.

TABLE 2. TYPES OF MONTANA SYSTEMS AND POPULATION SERVED

TYPES OF SYSTEMS	POPULATION SERVED
Sequencing Batch Reactor (SBR)	10
Mechanical Biological Nutrient Removal (BNR)	45
Recirculating Sand Filter To Groundwater	36
Trickling Filter To Groundwater	18
Facultative Lagoons	89
Aerated Lagoons	55
Non-Discharging System	104
Accelerated /Alternate Lagon Systems	4
Other Lagoon Systems	26
Other Groundwater Discharge Systems	14

Approximately 54% of Montana's population is served by public wastewater systems owned and operated by municipalities and water and sewer districts, distributed per population groupings shown in the table. Other types of wastewater systems, mostly septic tanks and drain fields, serve the remaining 46% of Montana's population.

More specifically, the above wastewater systems comprise 213 public wastewater treatment and collection systems. They include 174 public lagoon systems, 45 public mechanical treatment plants, and 26 lagoon systems owned by tribal governments or other organizations not regulated by the state. Treatment can occur naturally, and lagoons should be lined with material to prevent leaks into the groundwater below.

CONDITION & CAPACITY

Montana has thousands of miles of collection system piping, some originally installed over 80 years ago. Sections of the older, most problematic pipeline have been replaced, but much of it remains. As a result, most Montana communities have very old sewer mains that need replacement.

Like the collection systems, treatment plants typically have adequate capacity, but many of the individual equipment components are approaching the end of their 20-year service life. Some of the high-growth areas and larger municipalities are currently or have upgraded their plants in the last five years; these include Missoula, Butte, Kalispell, Billings, and Great Falls, serving a combined population exceeding 25 percent of the State's population. However, many other plants have not been recently upgraded. Approximately 37 of these mechanical plants, comprising over 82%, have not been upgraded in the last 10 years. Approximately 62% of these plants have not been updated in 20 years, and equipment components are near the end of their service life. Because wastewater discharge permits have become increasingly more stringent, some plants need to address wastewater discharge permit compliance issues that may require plant enhancement. A review of EPA Enforcement & Compliance History Online (ECHO) data reveals that over 50% of the current discharge permits for treatment plants and lagoons have compliance issues, ranging from monitoring violations to permit limit exceedances, a 25% increase since the 2018 report card.

Like mechanical plants, most lagoons seem to have adequate capacity; however, many are old. Approximately 169 of the lagoon systems (97%) have not been upgraded in the last 10 years, and 157 lagoons (90%) have not been upgraded in 20 years. 141 lagoons (81%) have not been upgraded in 30 years. While the driver of many lagoon system upgrades is permitting conditions, several lagoon systems are in poor condition, including control valves, aeration systems, excessive sludge accumulation, embankment structural concerns, and leaking or no liners. Many lagoon systems have difficulty meeting the current Montana Pollution Discharge Elimination System (MPDES) permit limits. Montana DEQ and a Statewide Nutrient Work Group have been working for several years to implement new nutrient limit standards. Many MPDES permits have been administratively extended until the nutrient standards can be determined.

One notable impact of significant growth in some Montana counties is the increasing number of septic tanks. For example, due to Flathead County's continuing population growth and the increasing number of septic tanks countywide, there is a growing shortage of treatment options for the solid waste materials pumped from septic tanks and portable toilets. To resolve this health and environmental problem, Flathead County has been working on plans for a $23.5 million regional septage treatment facility that would accept and treat septage and portable restroom waste rather than spreading the untreated waste on local fields.

FUNDING

The total investment for water and wastewater improvements from all federal and state grants, loans, and local funding has typically been around $160 to $170 million . It has recently increased to an annual average of over $250 million, considering additional funding from ARPA and IIJA of 2021. According to the Montana DRNR ARPA website, over the lifespan of the Competitive and Minimum Allocation Grant Program, over $410 million was awarded to local governments for "necessary investments in water and sewer infrastructure." ARPA funding will terminate in Montana when funds need to be expended on projects by the end of 2025. While funding has increased for the immediate timeframe, there is still a deficit in wastewater funding to meet the projected needs, and the level of funding needs to be maintained.

FUTURE NEEDS

According to the EPA's Clean Watershed Needs Survey, Montana needs $347 million in funding for wastewater system improvements, with the highest identified needs being collection systems, lift stations, and advanced treatment. The actual need is likely higher. EPA's report is developed based on identified problems with infrastructure that require attention in the short term and is not a measure of long-term needs related to aging infrastructure, increased demand, and regulatory changes.

OPERATIONS & MAINTENANCE

The most common problems with older sewer collection systems include cracked or crushed pipe, leaking and offset joints, pipe sagging, root penetration, undersized pipe, lift station plugging, obsolete and failing lift station equipment, pipe and manhole wet weather infiltration, and groundwater inflow. These deficiencies in pipe condition result in sewer backups in homes, excessive operation and maintenance costs, odor, expensive emergency repair, service disruptions, human exposure to raw sewage due to sewer manhole overflows, excessive flows, and associated higher pumping and treatment costs. Training and certified operators must be secured and sufficient operating budgets be developed to handle these critical tasks.

Wastewater systems have become increasingly more complex as regulations have become more stringent, resulting in higher O&M costs. There is a need for highly skilled operators and more operators. It is commonly believed that the lack of operators is due to insufficient compensation. Other factors include the tight labor market and a general lack of interest in this field. The need to train new, younger operators is essential to the future of properly operated systems. According to the DEQ operator certification program, of the 1,690 certified wastewater operators in the state, the average operator age is 52, and nearly half of the operators are older than 55, meaning many operators will soon retire. This prompts the need to fill these positions soon. This backfill could be accomplished by increasing salaries, promoting the profession, and promoting the existing attractive training opportunities.

The Montana DEQ is aware of this workforce challenge, as are engineering consultants, municipalities, and utility districts. And is working with the Montana Environmental Training Center (METC). Montana Rural Water Systems offers an apprenticeship program to foster training toward operator certification. The tight labor market and compensation competition from the labor market are still challenging the operator shortage in Montana. With the potential shortages upcoming, programs like these should be supported and possibly expanded to other colleges and training centers. Efforts are also needed to increase compensation packages, especially with the labor market recently becoming tighter.

PUBLIC SAFETY

Approximately 70% of Montana's community wastewater systems have permits from the Montana Pollutant Discharge Elimination System (MPDES). EPA ECHO data indicates that over 50% of permit holders have had violations in the last three years. Violations result from a treatment facility's failure to comply with pollutant limits or monitoring requirements, which can result in poorly treated sewage and other pollutants leaking into surface water and groundwater.

The regulatory requirements for monitoring poly-fluoroalkyl substances (PFAS) in wastewater are uncertain, but municipalities with PFAS in their wastewater influent streams will need to consider potential treatment upgrades.

With over 42% of the population using private septic systems, the age, condition, and density of private septic and drainfield systems are a concern in some areas for groundwater protection. For example, Lewis and Clark County and the City of Helena are studying ways to centralize some of the existing and future sewer systems within the County surrounding the City. The City of Thompson Falls connects over 600 private septic services to the City's public system.

Pretreatment is a newer regulatory sector for Montana, although it has been implemented in Montana for some time. "The national pretreatment program is a component of the NPDES program. It is a cooperative effort of federal, state, and local environmental regulatory agencies established to protect water quality. For how EPA authorizes the NPDES permit program to state, tribal, and territorial governments to perform permitting, administrative, and enforcement tasks for discharges to surface waters (NPDES program), EPA and authorized NPDES state pretreatment programs approve local municipalities to perform permitting, administrative, and enforcement tasks for discharges into the municipalities' publicly owned treatment works (POTWs). Pretreatment programs have become prevalent in Montana cities" (US EPA). There are six municipalities in Montana with EPA-approved pretreatment programs – Missoula, Butte-Silver Bow, Helena, Great Falls, Billings, Kalispell, and Bozeman. EPA is currently evaluating Jordan and Big Timber for an approved program. The most common constituents of concern for these programs are pH, metals, cyanide, volatile and semi-volatile organics, BOD, TSS, oil and grease, and ammonia. Over the next six years, pretreatment in Montana will likely see PFAS requirements for metal finishers and increased regulatory requirements for nutrients in waste entering collection systems.

RESILIENCE

Resilience measures how well wastewater infrastructure performs and continues to provide its intended service in the face of threats such as floods, earthquakes, severe wind, extreme cold, ice jams, fire, and sabotage. Collection systems are buried infrastructure and generally less vulnerable to these effects than treatment and pumping facilities. However, collection systems could experience significant inflow during floods and breaks during an earthquake. Treatment and pumping facilities are vulnerable to all the above-mentioned threats.

In most cases, communities are aware of their vulnerabilities and have acted to mitigate threats. For example, communities have added sealed manhole lids and have developed backup pumping provisions for lift stations. Typically, new infrastructure designs include access during flooding events and generators for backup power.

New plants and retrofits are designed with cybersecurity, yet additional technical training is required. Security improvements are especially needed for small systems.

INNOVATION

There have been many technological advances in both collection and treatment. For example, smart pumps reduce pump plugging frequency, improve cast-in-place pipe (CIPP) lining systems, and closed-circuit television (CCTV) innovations to improve pipeline assessments. There have been many advances in treatment processes and controls as well.

Innovation is not limited to system operation, maintenance, and technology; it can also be considered concerning management, specifically service area management. There are regions in the State where two or more wastewater systems are adjacent, each with its own treatment facility. Consolidating such systems would increase efficiency and reduce costs. The latest innovative solution used in Montana is snow-effluent, which is used with success at Spanish Peaks and the Yellowstone Club. Other areas are considering this practice.

SOLUTIONS TO RAISE THE GRADE

- Maintain the current level of funding, including identifying funding sources beyond the temporary funds provided by the ARPA and IIJA programs for infrastructure upgrades and replacement. This funding should address immediate needs and maintain ongoing funding for continuous replacements. It should come from user rates, state funding, and federal funding.
- Communities need to evaluate current funding levels and revenues to cover the full cost of services, including operation, maintenance, and capital needs, and implement rate increases where needed.
- Increase public education and awareness of wastewater collection and treatment's public health and environmental value to ease the way toward rate increases.
- Increase public education and awareness of the long-term cost of avoiding timely rehabilitation to ease the way toward rate increases and increased financing.
- Promote additional state and federal wastewater funding by providing better information to policymakers on the value of water and wastewater infrastructure investment.
- Increase grant funding for communities with demonstrated limitations in debt capacity.
- Private systems should seriously consider consolidating with neighboring systems (centralized) and form Districts to qualify for funding options when it is cost-effective.
- Plan for operator transition as older operators retire. Increase interest and salaries in water/wastewater operator occupations.
- Improve operator education and ongoing training opportunities to maintain a pool of well-trained and highly skilled operators.
- Continue and expand programs that maximize the effective use of existing infrastructure through technical assistance and outreach.
- Increase security for wastewater facilities via security training.

SOURCES

Montana Department of Natural Resources and Conservation. (2023). Rate Study and Assessment. Retrieved from https://dnrc.mt.gov/_docs/conservation/WASACT/DNRC-Rate-Study1.pdf

Montana Department of Environmental Quality. State Revolving Fund Wastewater System Database.

US Environmental Protection Agency. (2023). EPA Clean Water Needs Survey. Retrieved from https://www.epa.gov/cwns

US Environmental Protection Agency. Enforcement and Compliance History Outline. Retrieved from https://echo.epa.gov

Montana Department of Environmental Quality. Montana ASCE 2018 Infrastructure Report Card.

Montana Department of Environmental Quality. Operator Certification Program.

Flathead County. Septage Receiving Article. Retrieved from https://flathead.mt.gov/department-directory/commissioners-office/project-and-engineering/septage-treatment

Montana ARPA Funding. Retrieved from https://arpa.mt.gov/

2024 REPORT CARD FOR MONTANA'S INFRASTRUCTURE

GET INVOLVED

FIND

Use your zip code to find your Elected Officials.

KNOW

Check the MT Legislative Tracker to find legislation that you care about (hint...infrastructure).

DISCUSS

Now that you know who your Elected Officials are, EMAIL THEM and let them know that you care about Montana's infrastructure.

BE SOCIAL

Use our hashtag #ASCEMTReportCard or tag us to show your support of Montana's infrastructure.

2024

REPORT CARD FOR MONTANA'S INFRASTRUCTURE

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

INFRASTRUCTUREREPORTCARD.ORG/MONTANA

2024 REPORT CARD FOR MONTANA'S INFRASTRUCTURE