DAMS

2023 VT GRADE: C
2019 VT GRADE: C
2021 NATIONAL GRADE: D

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2023 REPORT CARD FOR VERMONT'S INFRASTRUCTURE

Vermont Section of American Society of Civil Engineers

Members of the Vermont section of the American Society of Civil Engineers volunteered to produce the *2023 Report Card for Vermont's Infrastructure.* This report serves to educate the public on the status of the infrastructure in the state of Vermont. Residents, in conjunction with elected officials, can therefore better prioritize limited funding among competing, connected needs to improve the condition, capacity, operations, maintenance, safety, innovation, and resilience of infrastructure.

Contributors:

20 volunteer co-authors, experts in their field, practicing civil engineers from across the state, sector type, and employment type

Data collected with significant help from ASCE Infrastructure staff, VTANR, VTRANS

Dams co-author: Roy Schiff, Phd, PE, Water Resources Engineer and Scientist, SLR Consulting

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GRADING CRITERIA

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

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

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

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

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

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

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

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

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

VERMONT'S DAMS

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.

HOW DAMS FIT WITH OVERARCHING SOLUTIONS FOR INFRASTRUCTURE

IMPROVE RESILIENCE TO POTENTIAL CATASTROPHIC EVENTS

Our infrastructure requires improved conditions, redundancy, and resilience so weather related disasters, demand or supply shocks do not devastate the whole network.

ADDRESS WORKFORCE CHALLENGES

Agencies are struggling to retain younger engineers and other technical experts. This need includes adding more permanent FTEs to ensure enhanced dam safety.

ADAPT FUNDING OPPORTUNITES TO MEET FUTURE NEEDS

It's critical to implement federal funds while reconsidering methods of state and local funding. Strong revenue mechanisms aligned with planning goals can close investment gaps and provide long-term revenue certainty.

BALANCE THE NEEDS OF URBAN AND RURAL COMMUNITIES

Rural communities have limited resources to leverage available grant sources and may need continued technical assistance.

PROMOTE PEOPLE-FOCUSED, SUSTAINABLE INFRASTRUCTURE

Infrastructure is for people: efforts must be resilient, sustainable, and equitable. Include life-cycle costs to account for tomorrow's maintenance and resilience expense – in addition to today's construction cost – and the social benefits or costs of disruptive changes.

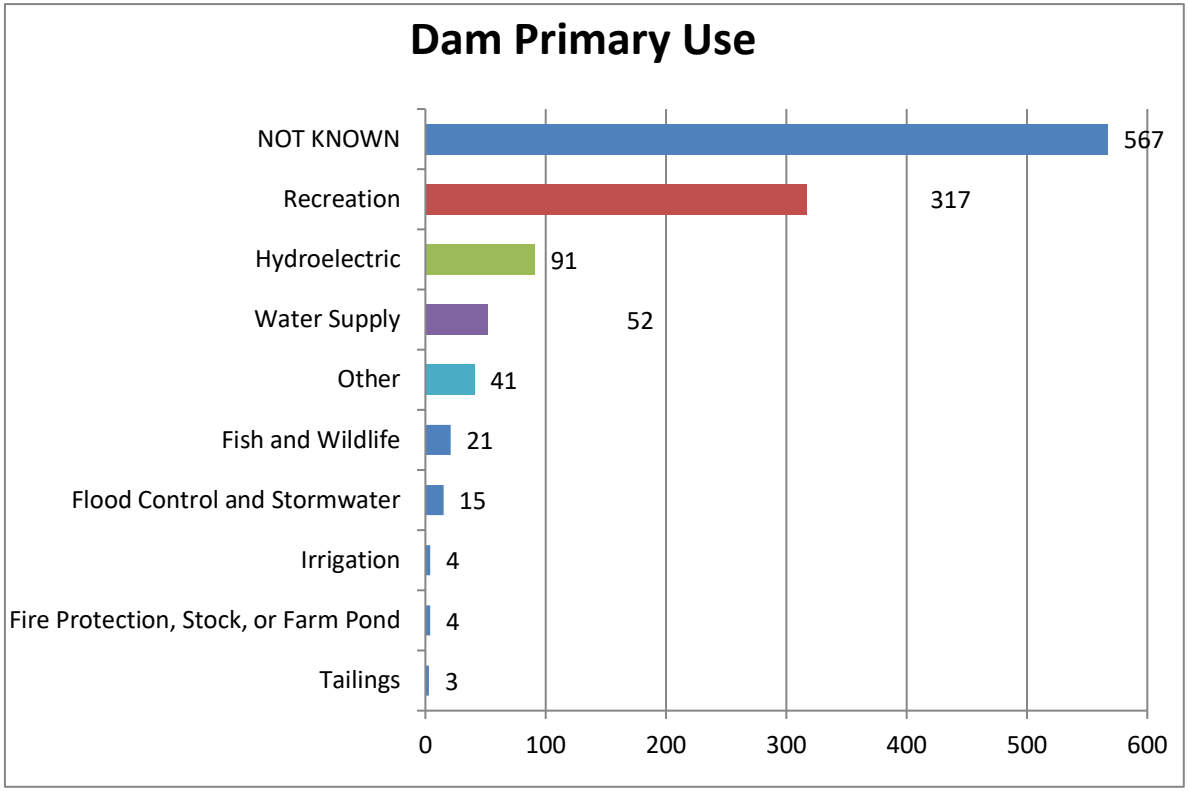
DAMS - INVENTORY

Vermont's 1,115 dams serve a variety of purposes

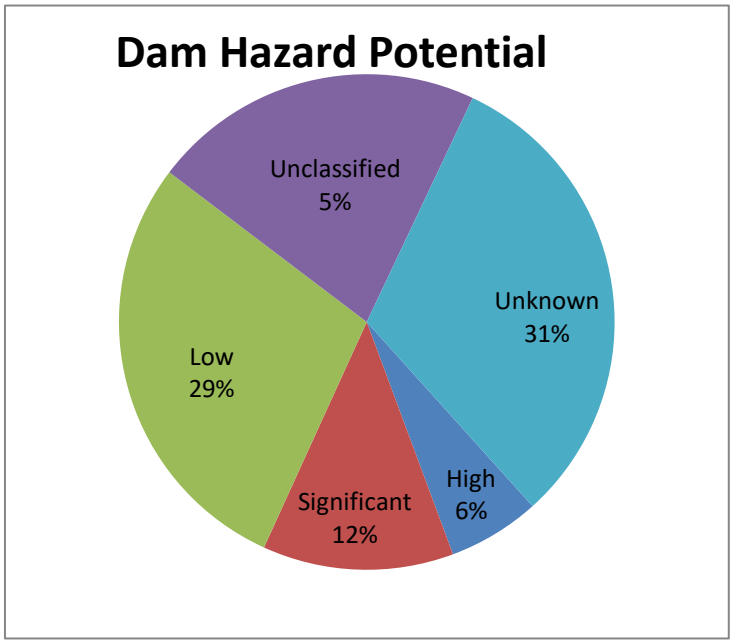
Only 1 new dam in last 10 years

19 removals in last 4 years

Dams without an active purpose are more likely to deteriorate and become safety problems



DAMS – HAZARD POTENTIAL



67 dams, 6% of Vermont dams are high hazard – if they fail - **loss of life is probable**, as are damages to property and the environment

New rules correctly set different inspection, maintenance, and design standards.

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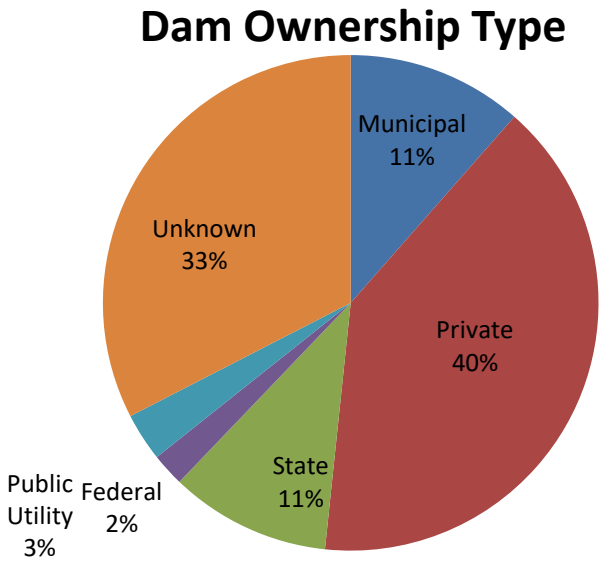
DAMS - OWNERSHIP

Dam owners are not typically "dam experts" unlike owners of other types of infrastructure.

Funding is not available in the case that a dam owner needs to complete repairs.

PUC does not have expertise to oversee dams at the same level as VTANR and FERC.



DAMS – IDENTIFIED SAFETY ISSUES

Poor condition dams make up 31% of inspected dams, including 8 poor condition high hazard dams.

Dams are aging infrastructure, many without current uses, over time dams deteriorate even with maintenance. Average age of 80 years old.

“Hazard Creep” is occurring with development being sited downstream of dams.

Emergency Action Plans - out of date, low detail, and lack emergency resources.

Rulemaking is expected to address changing design floods with climate change and the need for more in depth assessments throughout a dam’s lifespan.

Enforcement is difficult under currently cumbersome unsafe dam proceedings.

Staff is stretched beyond the current regulatory requirements of the program and need staff to adequately carry out current responsibilities. Some staff temporary.

DAMS – 2023 FLOODING

July 2023 flooding - safety needs were highlighted

Multiple failures and damages related to dams from the July 2023 flooding

Resources needed to identify and fix issues before floods to reduce damage that occurs during flood events

Emergency repair funding needed to stabilize issues post-flooding until a full fix is implemented either full repair/upgrade with maintenance plan or removal

2023 Emergency Repair at East Calais Dam

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DAMS – PROGRAM HIGHLIGHTS

Phase 1 of rules includes important changes

Quick, efficient flood recovery efforts in July

Prioritizing regulatory needs to focus on safety, using available staff

Updates to inspections, ipad reporting

Updates to dam inventory

Developed EAP templates

THE VERMONT DAM SAFETY PROGRAM
IS THE VERMONT ASCE
"2023 ENGINEER OF THE YEAR"

This honorary award is typically awarded to one engineer based on a lifetime achievement of service and contribution to the field of engineering.

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DAMS
Recommendations to Raise the Grade

- Increase the staffing for the VTDEC Dam Safety Program from 2.0 full-time equivalent (FTE) to 6.0 FTEs to meet statutory and program obligations.

  **This does not include new tasks included in S.213, which likely doubles this number

- Increase staff numbers and training in the VTDEC Rivers Program to assist with planning and implementing dam removals.

  **This does not include new river corridor related tasks included in S.213

- The PUC should coordinate with VTDEC Dam Safety to have similar inspection schedules and hazard classification definitions. PUC should hire a dam safety engineer on staff to manage its dams.

  **S.213 would transfer authority to VTDEC, more fully accomplishing this goal

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DAMS
Recommendations to Raise the Grade

- Continue projects to update hazard class and develop EAPs for HIGH and SIGNIFICANT hazard dams.
- Continue projects to inspect all HIGH hazard dams and confirm classification of all SIGNIFICANT hazard dams.
- Complete the second phase of the rulemaking process as part of Act 161 led by VTDEC and with participation of dam safety engineers around the state.
- Pursue the development of a state dam repair funding program accessible to private and municipal owners.

** Appropriation of staff and financial resources is critical to successful policy implementation with the significant work load increase needed and included in S.213

Full Document:

[Vermont Infrastructure Report Card]

https://infrastructurereportcard.org/state-item/vermont/

Questions:

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