

10-Year Capital Asset Need: Taking Care of What We Have



Ten-year Capital Asset Need: Taking Care of What We Have

KEY MESSAGE

The Department of Natural Resources (DNR) requires \$155 million annually over the next 10 years to maintain and renew the capital assets under its control. For every year this investment is not made, maintenance costs continue to increase.

GOAL

Bring all capital assets up to average or better condition within 10 years, while continually maintaining all assets.

OVERVIEW

Minnesota families enjoy biking on our 675 miles of paved state trails, cooking s'mores over a campfire at one of our 5,133 campsites, catching fish on one of our 10,000 lakes, and meeting friends in one of our visitor centers. Supporting these outdoor adventures and memories requires the DNR to keep the trails and bridges, state parks, water access sites, buildings, and other assets maintained, safe, and accessible to all.

DNR capital assets include anything built on DNR land that has a minimum 20-year lifecycle. The DNR first developed a comprehensive Capital Asset Plan in 2015. This is the January 2018 update.

This document presents a capital asset need that would support the DNR mission by providing recreation and economic opportunities. The funding detailed in this report would bring all DNR capital assets up to average or better condition within 10 years. The intent is for all capital assets to be safe, accessible, support employee productivity, and model environmental sustainability and smart energy use.

Note: The DNR will update this report in March of odd numbered years.

2017 DNR Capital Asset Facts

Current Replacement Value

\$3 billion

Deferred Maintenance

\$370 million



WHERE THE DNR IS TODAY.....

The Current Replacement Value (CRV) of DNR capital assets is nearly \$3 billion with a deferred maintenance backlog of \$370 million. Historically, funding has not been adequate to manage and maintain DNR capital assets.

It is not feasible to complete the entire deferred maintenance backlog at one time. A realistic goal would be to address the total Deferred Maintenance over a 10-year period. This Deferred Maintenance Catch Up would be \$37 million annually. Combined with the annual needs for Maintenance, and Renewal and Replacement, the total annual need is \$155 million.

NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance	Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
56,004 systems	\$2,972,291,585	\$369,658,515	\$13,123,930	\$104,919,118	\$36,965,852	\$155,008,899

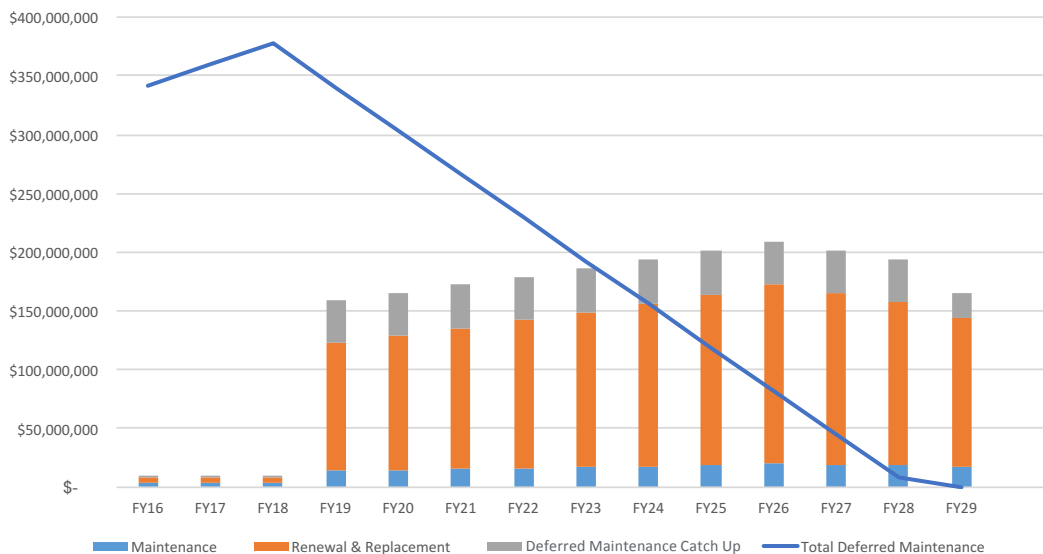
A detailed list of capital assets, CRV, percentages for Maintenance, Renewal and Replacement, Deferred Maintenance activities, and asset life cycles is provided in Appendix D. The priorities for funding are to address health and safety, ADA access, code violations, work conditions, environmental sustainability, and improve public use of DNR lands.

Adequate funding for maintenance needs will result in lower future obligations instead of more costly renewal and replacement.

Not maintaining facilities in a timely manner results in higher maintenance costs to address facility deterioration and emergency work.

The chart below shows current cost trends for Maintenance, Renewal and Replacement, and Deferred Maintenance, and how this trend can be reversed with appropriate investment in the DNR's assets.

Actual trending data for the last two years. Future prediction if Maintenance, Renewal and Replacement, and Deferred Maintenance Catch Up is fully funded annually over the next 10 years.



WHAT THE DNR IS ACCOMPLISHING.....

The Legislature established MS 84.946 for Natural Resources Asset Preservation (NRAP). The law pertains to all types of assets: buildings, water and sewer systems, roads, trails, bridges, culverts, water control structures, public water accesses and campgrounds. The Department of Administration's facility management program Archibus, is the database for the building information for state agencies. This data includes the current replacement value (CRV) and deferred maintenance estimates. Industry standard percentages are applied to the CRV for three categories: maintenance, renewal and replacement, and deferred maintenance. See Appendix D.

Legislature provided NRAP bonding appropriations:

- 2014 - \$10 million
- 2017 - \$15 million

Examples of current NRAP funding utilization includes:

- Addressing ADA compliance - \$1.5 million
- Design of new Itasca wastewater system - \$500,000
- Windom office repairs due to water intrusion - \$1.7 million
- Trail Rehabilitation - \$2.4 million
- Forestry roads and bridges - \$1.2 million
- Thief Lake WMA dam repairs - \$650,000
- Addressing unacceptable and poor building components (roofs, windows, etc.) - \$2.4 million
- Wildlife roads and bridges - \$935,000
- Design of future projects - \$1.3 million
- Blue Mounds State Park connect to rural water - \$1.2 million
- Split Rock Creek State Park septic system replacement - \$120,000



Even with recent bonding appropriations Deferred Maintenance is increasing by \$17 million per year or about 8% annually.

The DNR collects \$4.8 million annually from divisions based on the building space they occupy. The funds are used for smaller projects, nonbondable projects, and include basic building repairs such as furnace and water heater replacements, electrical upgrades to meet code, and health and safety upgrades.

TOTAL COST OF OWNERSHIP

Total Cost of Ownership (TCO) is industry standard terminology based on acquiring, operating, maintaining, and divesting a capital asset. It takes into account the full cost of the life cycle of an asset. The specific activities and goals differ among types of assets. Generally, life cycle management uses best practice methods to achieve the following objectives:

- Ensure asset availability where and when needed.
- Minimize the risk of failure or breakdown before the end of useful life.
- Maximize return on investment from the asset.
- Ensure assets are used productively throughout their useful life cycle.
- Sell or divest assets that are idle, unused, or unproductive.
- Set priorities for asset renewal and replacement, and plan for future expansion or reduction.

ASSET LIFE CYCLE

The asset life cycle can be divided into four main phases: develop, operate, maintain, and when renewal and replacement is no longer feasible—divest. The majority of DNR capital assets are in the operate and maintain phases.

Likewise, as shown below, operations and maintenance of an asset account for 80 percent of the total cost invested in an asset over its life cycle.



Contrary to general perception, most of an asset’s life cycle cost (80 percent) stems from operations and maintenance, not acquisition and construction.

% OF TOTAL LIFE CYCLE COST

Development	Operate	Maintain	Divest
15 percent	80 percent		5 percent

ASSET LIFE CYCLE DEFINITIONS

Operation of Assets—What it takes to “take care of” or operate the asset on a daily basis. These costs are covered by division appropriated funds. Janitorial, grounds, security, telecom, water, sewer, and utilities are some of the components. While this is a significant expense, these funds are not sufficient to do the maintenance, renewal and replacement, and deferred maintenance that is needed.

Maintenance—Predictive, preventive, and reactive maintenance performed as scheduled aims to retain or restore the asset to optimal condition. Estimates are based on a percentage of CRV using an average of industry standards.

Renewal and Replacement—Costs required to restore and modernize when the asset has reached the end of its life cycle. Largely a function of obsolescence, change in use, or changes to codes, and policies. Estimates are based on a percentage of current replacement value using average industry standards.

ASSET LIFE CYCLE DEFINITIONS

Deferred Maintenance—Costs accrued when Maintenance and Renewal and Replacement funds have not been sufficient to completed necessary maintenance.

Deferred Maintenance Catch Up—Total of the deferred maintenance divided by 10 years. Costs noted are the annual need.

BUILDINGS AND MISCELLANEOUS SITE INFRASTRUCTURE

The DNR owns and manages over 2,700 buildings of various age, construction, use, and life cycle located throughout the State of Minnesota. These include 262 buildings where DNR staff report to work, 164 interpretive and educational facilities, 746 vault toilets, 585 storage buildings for vehicles and equipment, 188 sanitation buildings at campgrounds providing showers and modern restroom facilities, 172 camper cabins and yurts at state park campgrounds, and numerous other buildings all focused on the DNR mission. The DNR conducts Facility Condition Assessments (FCA) on all buildings using the Department of Administration's statewide enterprise methodology. Each building assessment results in a Facility Condition Index (FCI). The FCI is calculated by the deferred maintenance costs divided by the current replacement value.

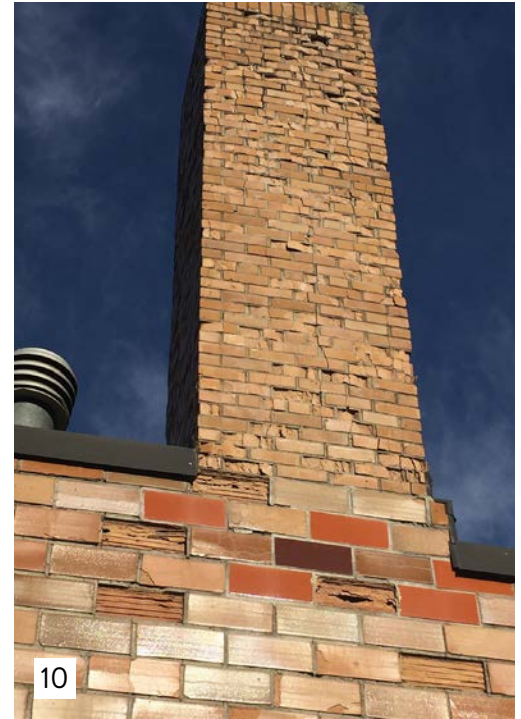
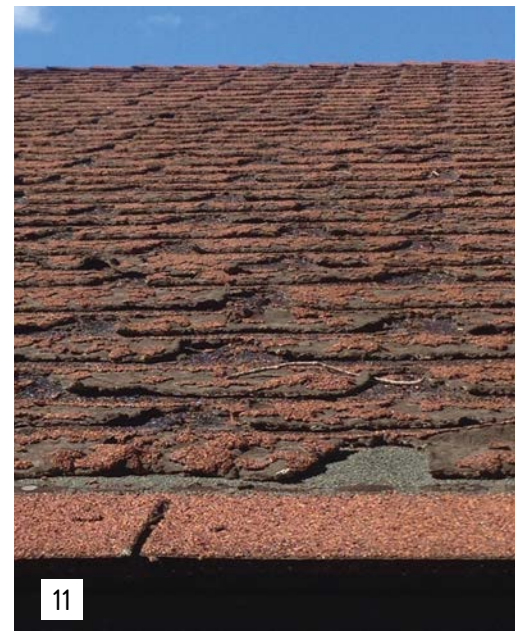


Photo Number 11: Over 673 DNR buildings have a rating of "Poor" or "Unacceptable" with a deferred maintenance backlog of almost \$45.6 million. Twenty-nine of these are report-to-work buildings that house 117 staff.



BUILDING ASSESSMENT RESULTS AS OF OCTOBER 26, 2017

The data below shows building assessment results as of October 26, 2017. This is only for buildings (does not include site amenities).

	Total	FCI Rating 0 - 0.05 Excellent	FCI Rating 0.05 - 0.15 Good	FCI Rating 0.15 - 0.30 Average	FCI Rating 0.30 - 0.50 Poor	FCI Rating 0.50 - above Unacceptable
Buildings Assessed	2,714	247	819	975	505	168
Gross Sq Ft	2,978,222	263,740	985,916	1,070,819	479,126	178,621
Current Replacement Value	\$605,474,345	\$59,936,890	\$215,371,469	\$217,394,429	\$88,641,431	\$24,130,126
Deferred Maintenance	\$119,157,351	\$1,780,216	\$24,257,096	\$46,540,795	\$31,567,667	\$14,993,578

Needed annual investment of about \$27.2 million shown below includes:

- Renewable energy systems (solar).
- Site amenities (parking lots, sidewalks, utilities).
- Buildings.



NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance
2,714 buildings + renewable energy systems & misc. site amenities	\$648,419,345	\$123,073,851

Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
\$4,021,263	\$10,869,050	\$12,307,385	\$27,197,699

BUILDING COMPONENTS

Facility Condition Assessments evaluate on average 20 different components in each building. Below is a chart showing building envelope components. The DNR currently has over \$1.1 million in unacceptable building envelope components and \$11.1 million that are rated poor.



Building Envelope Component	Number of buildings in Excellent Condition	Deferred Maintenance	Number of buildings in Good Condition	Deferred Maintenance	Number of buildings in Average Condition	Deferred Maintenance	Number of buildings in Poor Condition	Deferred Maintenance	Number of buildings in Unacceptable Condition	Deferred Maintenance
Exterior Walls	211	\$207,889	1091	\$3,534,832	975	\$9,256,478	229	\$6,041,379	23	\$326,603
Exterior Windows	133	\$37,699	311	\$349,841	494	\$1,184,434	213	\$1,206,491	19	\$65,141
Exterior Doors	250	\$43,304	798	\$454,406	1067	\$1,973,989	264	\$1,132,986	24	\$102,660
Roof Covering	435	\$112,242	842	\$1,302,044	969	\$2,851,312	296	\$2,693,782	35	\$625,334
Total		\$401,134	1642	\$5,641,123		\$15,266,213		\$11,074,638		\$1,119,738

SITE INFRASTRUCTURE

In addition to the building structure, site infrastructure must be included. This includes parking lots, sidewalks, renewable energy systems such as solar panel arrays, utility, potable water, and sewer systems directly tied to a building. Annual Maintenance, Renewal and Replacement, and Deferred Maintenance Catch Up needs are \$2.4 million for site infrastructure at DNR facilities.



WATER AND SEWER SYSTEMS

This is an often forgotten part of the infrastructure since it is out of sight. Many state parks and office buildings have water and sewer systems that are near or past their useful life and need attention. The average life cycle for a water or sewer system is 40 years.

The DNR currently has seven large septic systems which are required to have National Pollutant Discharge Elimination System (NPDES) waste water discharge permits. Six of the systems scored 40 or higher on the scoring system used by MPCA to evaluate municipal systems for Public Facilities Authority and State Revolving Loan funds. A waste water system with a score of 40 or higher has damaging environmental impacts that should be immediately addressed. Using the MPCA scoring system allows an “apples to apples” comparison of DNR systems to MPCA scored municipal systems. Myre Big Island scored a 68, making it one of DNR’s worst systems.

The DNR needs \$8.3 million annually for investments in DNR water and sewer systems.



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The DNR is currently working on 22 water and sewer system projects. Below are a few examples with cost estimates:

- Itasca State Park, sewage lagoon replacement is estimated at —\$4 million
- Myre Big Island State Park, connect park to city of Albert Lea waste water system due to a failing sewage lagoon and waste water treatment system—\$1.2 million
- Blue Mounds State Park, connect to rural water due to ground water contamination—\$1.2 million
- Jay Cooke State Park, water supply line failed November 2017—solution in design, estimate \$150,000

NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance
4,500 systems	\$202,500,000	\$20,250,000

Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
\$1,215,000	\$5,062,500	\$2,025,000	\$8,302,500



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Aging galvanized steel piping, concrete, and pumps at many DNR facilities are well past their lifecycles. In 2017 we conducted dozens of emergency repairs costing over \$350,000 due to failing water and sewer systems.



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ROADS AND BRIDGES

The DNR has over 3,300 miles of roads with 176 bridges and over 3,000 culverts. Forestry, Parks and Trails, and Wildlife are the primary divisions with road responsibilities. Roads typically have a 25-year life cycle, while bridges average 50 years. Annually, the DNR requires about \$53 million to replace an average of 85 miles (six paved and 79 gravel) of roads and an average of four bridges that have reached their life expectancy.

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance
150 miles paved, 3,157 miles gravel, 176 bridges, 3,000+ culverts	\$814,632,000	\$81,463,200



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NEEDED ANNUAL INVESTMENT

Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
\$1,654,704	\$34,850,470	\$8,146,320	\$44,651,494

The DNR inspects 125 to 150 bridges annually using MN Department of Transportation (DOT) bridge inspection protocol.



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TRAILS AND BRIDGES

The DNR has 675 miles of paved trails and over 1,500 miles of trails statewide. Over 100 miles of paved trails are in immediate need of rehabilitation. Rehab costs about \$200,000 per mile. Paved and gravel trails should be resurfaced on a 25-year cycle. There are over 350 trail bridges and over 3,000 trail culverts. Many of these trails are old railroad lines and the bridges are 100+ year old trestles. We have had to put weight restrictions on a number of bridges. Two Munger Trail bridges are being replaced with 2017 bonding at a cost of \$700,000.



Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance
675 miles paved, 1,500 miles gravel, 350 bridges, 3,000+ culverts	\$306,322,240	\$30,632,224

NEEDED ANNUAL INVESTMENT			
Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
\$527,121	\$12,787,047	\$3,063,222	\$16,377,390



PUBLIC WATER ACCESSES

The DNR maintains 1,674 state public water access sites and assists local government in rehabilitating many of their 1,315 water access sites. Accesses need to be improved to better address aquatic invasive species, shoreline buffers, ADA access, and storm water management. The typical life cycle for an asphalt access is 25 years and 15 years for a gravel access. Annually, the DNR requires \$22 million to rehabilitate and renew an average of 179 public water accesses that have passed their life expectancy. This does not include assistance provided to local government for over 1,300 water access sites.



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NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance	Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
273 Paved, 1,401 Gravel	\$289,885,000	\$28,988,500	\$1,829,078	\$17,328,770	\$2,898,850	\$22,056,698



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LAKE SUPERIOR SMALL CRAFT HARBORS, MARINAS, AND PROTECTED ACCESSSES

Small craft harbors, protected water accesses, and marinas provide safe access to Lake Superior for recreational watercraft and small commercial vessels. On the North Shore, water access sites are rare. By maintaining small craft harbors and marinas, the DNR provides public access to recreational opportunities on Lake Superior. Annually, Deferred Maintenance Catch Up is \$820,000 with a total annual investment needed of about \$4.6 million.



NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance	Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
10 sites	\$82,000,000	\$8,200,000	\$533,000	\$3,280,000	\$820,000	\$4,633,000

Boating has a \$5.5 billion annual economic impact in Minnesota.



CAMPSITES, GROUP CAMPS, RECREATION AREAS, AND DAY USE AREAS

The DNR has over 5,000 campsites at state parks and forest recreation areas, as well as 112 group camps and 95 day use areas. Many are more than 50 year’s old and are in need of major renovations to meet the changing recreational expectations of the public. Renewals and replacements focus on public safety, ADA accessibility, larger pullthru campsites, electrical upgrades, and modern sanitation facilities. The average lifecycle for a campsite is 25 years. Annually, the DNR requires \$15.2 million to rehabilitate and renew an average of 200 campsites that are past their life expectancy.



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NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance
4,000 park campsites, 112 group camps, 1021 forest campsites	\$212,943,000	\$35,491,740

Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
\$1,384,130	\$10,723,320	\$3,549,174	\$15,206,624



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More than one million people camped at state parks and forests in 2016.

HATCHERIES AND NURSERIES

The DNR operates four cold-and 11 warm-water fish hatcheries, along with one active nursery and one tree improvement facility. The 149 buildings on these sites are addressed in the Buildings Section. This section references the specialized equipment and infrastructure required for hatcheries and nurseries. In the last decade, bio-hazards have become a great concern to hatcheries, which, in turn, requires more sophisticated equipment and maintenance. Annual need for hatcheries and nurseries is \$4.6 million.



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NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance	Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
15 Hatcheries 2 Nurseries	\$81,000,000	\$8,100,000	\$526,500	\$3,240,000	\$810,000	\$4,576,500



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Fishing contributes \$2.4 billion to Minnesota’s economy annually.



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WATER CONTROL STRUCTURES

The DNR has over 1,000 structures that are used to control water levels on state land. These are small structures that don't meet the definition of dams managed by the Dam Safety Program. The average life cycle for a water control structure is 35 years. Annually, the DNR requires \$2.8 million to replace an average of 30 water control structures that have reached their life expectancy.

The DNR also owns 346 dams that meet the Dam Safety Program definition. These dams are not included in this plan. A summary of the Dam Safety Program is in Appendix C.



NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance	Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
1,019 WCS	\$112,090,000	\$11,209,000	\$168,135	\$1,365,460	\$1,120,900	\$2,791,041



MONITORING WELLS

Observation wells are placed in various aquifers across the state to monitor the groundwater levels and provide long term groundwater level data across the state. The data is used for water supply planning for communities, industry and agricultural uses. The information is key to permitting activities for these uses and helps determine the availability of water and assists in the mitigation of conflicts over water use. This network of wells will continue to expand and the maintenance of existing wells is critical. The cost is usually much less to repair and maintain these wells then to replace them. The typical life cycle for a monitoring well is 25 years. Annually, the DNR requires \$1 million to replace an average of 38 wells and repair hundreds.



NEEDED ANNUAL INVESTMENT

Number of Assets	Current Replacement Value (CRV)	Total Deferred Maintenance	Maintenance	Renewal and Replacement	Deferred Maintenance Catch Up (2018–2027)	Total
1,000+	\$20,000,000	\$2,000,000	\$50,000	\$800,000	\$200,000	\$1,050,000



Appendix A—Data Sources

BUILDINGS AND MISCELLANEOUS SITE INFRASTRUCTURE

Division: Operation Services

Contact: Ted Dehn, Facility Operation supervisor

Database: Archibus

WATER AND SEWER SYSTEMS

Division: Operation Services

Contact: David Johnson, Design and Construction manager

Database: Archibus

ROADS AND BRIDGES

Division: Forestry, Parks and Trails, Wildlife

Contact: Andrew Arends, Forestry Section manager, Peter Hark, Acquisition and Development manager, Bob Welsh, Habitat Program manager

Database: GIS, Cartegraphe

TRAILS AND BRIDGES

Division: Parks and Trails, Wildlife

Contact: Peter Hark, Acquisition and Development manager, Bob Welsh, Habitat Program manager

Database: GIS, Cartegraphe

PUBLIC WATER ACCESSES

Division: Parks and Trails, Wildlife, Forestry

Contact: Peter Hark, Acquisition and Development manager, Erik Wrede, Water Recreation coordinator, Bob Welsh, Habitat Program manager

Database: GIS

SMALL CRAFT HARBORS, MARINAS AND PROTECTED ACCESSES

Division: Parks and Trails

Contact: Peter Hark, Acquisition and Development manager Jason Peterson, Landscape Architecture supervisor

Database: Historical construction information, Recent assessment and feasibility studies

CAMPSITES, GROUP CAMPS, REC AREAS AND DAY USE AREAS

Division: Parks and Trails

Contact: Peter Hark, Acquisition and Development manager

Database: GIS

HATCHERIES AND NURSERIES

Division: Fisheries, Forestry

Contact: Don Pereira, Fisheries Program manager, Andrew Arends, Forestry Section manager

Data source: Hatcheries – MN State Fish Hatcheries Information document for 2009 legislation. Expert knowledge Nurseries – Historical construction information

WATER CONTROL STRUCTURES

Division: Wildlife, Ecological and Water Resources

Contact: Bob Welsh, Habitat Program manager, Jason Boyle, State Dam Safety Engineer

Database: ArcGIS

MONITORING WELLS

Division: Eco Water Resources

Contact: Greg Kruse, Monitoring and Database Management supervisor

Data system: Hydstra

Appendix B—Photo Identifications

1. Minneopa State Park historic bridge built in 1921 above the lower falls on Minneopa Creek
2. Goosberry State Park Lady Slipper Lodge
3. Blue Mounds State Park—bison
4. Tettegouche State Park Amphitheater
5. Silver Bay Marina and protected access, small craft harbor, Lake Superior
6. Root River State Trail
7. Itasca State Park Mississippi River Headwaters
8. Jay Cooke State Park, Historic Swing Bridge destroyed in June 2012 flooding
9. Jay Cooke State Park, Historic Swing Bridge rebuilt, construction completed October 2013
10. Waterville Fish Hatchery Office
11. Jay Cooke State Park—Oldenberg Sanitation building roof
12. Itasca State Park—Nicollet Court
13. William O'Brien State Park—Contact Station
14. Whitewater State Park—Camper Cabin #3
15. Interstate State Park—damaged light pole
16. Region 2 Headquarters, Grand Rapids,—entrance steps
17. Fort Ridgely State Park —failing concrete and support beam—historic picnic shelter
18. Blue Mounds State Park—well and pressure system
19. Itasca State Park— failing sewer line
20. Itasca State Park—corroded, galvanized steel water pipes
21. BR01570 APT005 severe pier deterioration
22. Stoney River Grade, Lake County
23. BR01523 County 1 crushed sill
24. BR01353 Moosehorn2 under deck spalling concrete
25. Promiseberger washout
26. BR01519 Old Mill North Swing Bridge bowed stringers
27. Willard Munger Trail—Mills Road washed out section
28. Douglas State Trail—segment in need of resurfacing
29. Willard Munger Trail—rusted out failed culverts
30. BR01019 ARR016 failing supports and structure
31. Lake Minnewaska Public Water Access
32. Grand Lake Public Water Access
33. Minnesota River—Jordan Public Water Access
34. Pickeral Lake Public Water Access
35. Round Lake Public Water Access
36. McQuade Small Craft Harbor—storm damage Oct. 2017
37. Knife River Marina—failing pier
38. Knife River Marina—damaged electrical panel
39. Knife River Marina— damaged pier
40. Knife River Marina—failing outdated electrical system
41. St. Croix Valley State Forest Horse Camp—water pump
42. Whitewater State Park Cedar Campground— flood damage
43. Frontenac State Park sink hole in campground
44. Nerstrand State Park damaged electrical hook-ups
45. Cascade River State Park - non-ADA accessible drinking fountain
46. French River Hatchery—electrical and fuel delivery upgrades needed.
47. Park Rapids Hatchery—water intake valve and piping in need of replacement.
48. Waterville Hatchery—erosion control, bank stabilization, and water control structure replacement needed
49. Waterville Hatchery—electrical upgrades needed
50. Silver Lake—water control structure and fish barrier
51. Eroded water control structure-in need of repair— location unknown
52. Sink hole / erosion of water control structure — location unknown
53. Aitkin—Hanging Kettle water control structure
54. Monitoring well in need of replacement
55. State Forest land in Aitkin County monitoring well in need of replacement.

Appendix C—Dam Safety Program

The State of Minnesota owns 346 dams. The dams are managed by the Department of Natural Resources. Minnesota Rules define a dam as an artificial barrier that impounds water and that must be greater than 6 feet high.

State owned dams have historically received funding for repairs, replacements, and removals through state general obligation bonding. Some of the appropriated bonding funds are also granted to local governments for their dams. The funds are distributed based on the Dam Safety Project priority list, which is developed by the DNR and submitted to the Legislature every other year.

Most of the dams the state owns were built in the 1930s under the Works Progress Administration and are now owned and maintained by the state. There is a growing need to rehabilitate dams in the state as the majority of the dams are beyond their expected service life. The upcoming Lake Bronson Dam rehabilitation could cost many millions of dollars. It is one of two high-hazard dams owned by the state. Smaller low-hazard potential dams that control the water level of some important lakes have not typically been funded in the past because the larger, higher-hazard dam projects involving human safety are the first priority.

Hazard Classification of State Owned Dam

Hazard classification is based on the potential consequences of a dam failure. It is not reflective of the condition of the dam or the likelihood of failure.

- 2 High Hazard - Failure would probably cause loss of life or serious economic loss
- 14 Significant Hazard - Failure would cause limited economic loss, but no loss of life
- 330 Low Hazard - Failure would cause only minor losses

Cost to Rehabilitate 346 State Owned Dams Over the Next 10 years:

Assume 70% require no work	242 @ \$0 each=	\$0
Assume 10% require minor repairs	34 @ \$25,000 each=	\$850,000
Assume 10% require reconstruction	34 @ \$125,000 each=	\$4,250,000
Assume 4% require removal	14 @ \$250,000 each=	\$3,500,000
Assume 5% require major repair	17 @ \$250,000 each=	\$4,250,000
Assume 1% require total reconstruction	4 @ \$800,000 each=	\$3,200,000
Lake Bronson Dam rehabilitation	1 @ \$7,000,000 each=	\$7,000,000
		\$23,050,000

(2015 dollars)

Assuming a 10 year cycle, this amounts to \$4.6 million per biennium.

Appendix D TEN YEAR CAPITAL ASSET PLAN • DATA AS OF: NOVEMBER 22, 2017

Asset	Asset Type	#/miles/etc.	\$/unit	Current Replacement Value (CRV)	% CRV	(COLUMN A) Maintenance - Predictive/ Preventative/Reactive	% CRV	(COLUMN B) Renewal & Replacement	Lifecycle	% CRV	Deferred Maintenance (DM)	(COLUMN C) DM / 10yrs	(COLUMNS A+B+C) Annual Total
Buildings	Buildings	2714	varies	\$605,474,345	0.65%	\$3,935,583	1.46%	\$8,839,925	varies	19.68%	\$119,157,351	\$11,915,735.11	\$24,691,244
Buildings	Renewable energy systems	1	varies	\$4,725,000	0.60%	\$28,350	2.50%	\$118,125	25	2.00%	\$94,500	\$9,450	\$155,925
Buildings	Misc site amenities - parking lot, fences, gates, sidewalks, etc.	1	varies	\$38,220,000	0.15%	\$57,330	5.00%	\$1,911,000	varies	10.00%	\$3,822,000	\$382,200	\$2,350,530
Buildings Total				\$648,419,345		\$4,021,263		\$10,869,050			\$123,073,851	\$12,307,385	\$27,197,699
Water	Water and sewer systems	4500	\$45,000	\$202,500,000	0.60%	\$1,215,000	2.50%	\$5,062,500	40	10.00%	\$20,250,000	\$2,025,000	\$8,302,500
Roads	Park Roads	150	\$550,000	\$82,500,000	0.15%	\$123,750	4.00%	\$3,300,000	25	10.00%	\$8,250,000	\$825,000	\$4,248,750
Roads	Park Bridges	85	\$385,000	\$32,725,000	0.15%	\$49,088	2.00%	\$654,500	50	10.00%	\$3,272,500	\$327,250	\$1,030,838
Roads	Forest Roads-one lane, gravel	2340	\$264,000	\$617,760,000	0.30%	\$1,853,280	4.00%	\$24,710,400	40	10.00%	\$61,776,000	\$6,177,600	\$32,741,280
Roads	Forest Bridges &	46	\$385,000	\$17,710,000	0.25%	\$44,275	4.00%	\$708,400	50	10.00%	\$1,771,000	\$177,100	\$929,775
Roads	Culverts	3179	\$10,000	\$31,790,000	0.30%	\$95,370	4.00%	\$1,271,600		10.00%	\$3,179,000	\$317,900	\$1,684,870
Roads	Bridges - wildlife	45	\$385,000	\$17,325,000	0.30%	\$51,975	3.32%	\$575,190	50	10.00%	\$1,732,500	\$173,250	\$800,415
Roads	Roads - wildlife	817	\$266,000	\$217,322,000	0.30%	\$651,966	4.00%	\$8,692,880	40	10.00%	\$21,732,200	\$2,173,220	\$11,518,066
Water/Roads Total				\$1,017,132,000		\$2,869,704		\$39,912,970			\$101,713,200	\$10,171,320	\$52,953,994
Trails	State Trails	675	\$200,000	\$135,000,000	0.15%	\$202,500	5.00%	\$6,750,000	25	10.00%	\$13,500,000	\$1,350,000	\$8,302,500
Trails	Trail Bridges	350	\$400,000	\$140,000,000	0.15%	\$210,000	3.32%	\$4,648,000	50	10.00%	\$14,000,000	\$1,400,000	\$6,258,000
Trails	Trail Trailheads	60	\$40,000	\$2,400,000	0.65%	\$15,600	4.00%	\$96,000	25	10.00%	\$240,000	\$24,000	\$135,600
Trails	Trail Culverts	3000	\$3,000	\$9,000,000	0.30%	\$27,000	4.00%	\$360,000	25	10.00%	\$900,000	\$90,000	\$477,000
Trails	Park Bike Trails	55	\$200,000	\$11,000,000	0.50%	\$55,000	4.24%	\$466,400	25	10.00%	\$1,100,000	\$110,000	\$631,400
Trails	Park Hiking Trails	1030	\$6,308	\$6,497,240	0.15%	\$9,746	5.54%	\$359,947	25	10.00%	\$649,724	\$64,972	\$434,665
Trails	Trails - Wildlife	485	\$2,000	\$970,000	0.30%	\$2,910	5.00%	\$48,500	25	10.00%	\$97,000	\$9,700	\$61,110
Trails	Culverts - Wildlife	485	\$3,000	\$1,455,000	0.30%	\$4,365	4.00%	\$58,200	25	10.00%	\$145,500	\$14,550	\$77,115
Trails Total				\$306,322,240		\$527,121		\$12,787,047			\$30,632,224	\$3,063,222	\$16,377,390
PWA	PWA - carry in-asphalt*	16	\$250,000	\$4,000,000	0.65%	\$26,000	4.00%	\$160,000	25	10.00%	\$400,000	\$40,000	\$226,000
PWA	PWA - carry in-gravel*	330	\$150,000	\$49,500,000	0.65%	\$321,750	6.67%	\$3,301,650	15	10.00%	\$4,950,000	\$495,000	\$4,118,400
PWA	PWA - trailer-asphalt*	257	\$250,000	\$64,250,000	0.65%	\$417,625	4.00%	\$2,570,000	25	10.00%	\$6,425,000	\$642,500	\$3,630,125
PWA	PWA - trailer-gravel*	1074	\$150,000	\$161,100,000	0.65%	\$1,047,150	6.67%	\$10,745,370	15	10.00%	\$16,110,000	\$1,611,000	\$13,403,520
PWA	Misc site amenities - fences, gates, sidewalks, etc.	1	varies	\$11,035,000	0.15%	\$16,553	5.00%	\$551,750	varies	10.00%	\$1,103,500	\$110,350	\$678,653
PWA Total				\$289,885,000		\$1,829,078		\$17,328,770			\$28,988,500	\$2,898,850	\$22,056,698
Marina	Small Craft Harbors, Marinas and Protected Accesses - less buildings	10	varies	\$82,000,000	0.65%	\$533,000	4.00%	\$3,280,000	varies	10.00%	\$8,200,000	\$820,000	\$4,633,000
Marina Total				\$82,000,000		\$533,000		\$3,280,000			\$8,200,000	\$820,000	\$4,633,000
PWA	PWA - carry in-asphalt*	16	\$250,000	\$4,000,000	0.65%	\$26,000	4.00%	\$160,000	25	10.00%	\$400,000	\$40,000	\$226,000
Camps	Park Campsites	4000	\$40,000	\$160,000,000	0.65%	\$1,040,000	4.00%	\$6,400,000	25	16.90%	\$27,040,000	\$2,704,000	\$10,144,000
Camps	Park Swimming Areas	34	\$440,000	\$14,960,000	0.65%	\$97,240	7.50%	\$1,122,000	25	16.90%	\$2,528,240	\$252,824	\$1,472,064
Camps	Park Group Camps	112	\$275,000	\$30,800,000	0.65%	\$200,200	8.00%	\$2,464,000	25	16.90%	\$5,205,200	\$520,520	\$3,184,720
Camps	Forest Rec Areas - campsites	1021	\$5,500	\$5,615,500	0.65%	\$36,501	4.00%	\$224,620	25	10.00%	\$561,550	\$56,155	\$317,276
Camps	Forest Rec day use areas	95	\$16,500	\$1,567,500	0.65%	\$10,189	4.00%	\$62,700	25	10.00%	\$156,750	\$15,675	\$88,564
Camps Total				\$212,943,000		\$1,384,130		\$10,273,320			\$35,491,740	\$3,549,174	\$15,206,624
Hatch	Nurseries (Equipment, Infrastructure)	2	\$3,000,000	\$6,000,000	0.65%	\$39,000	4.00%	\$240,000	varies	10.00%	\$600,000	\$60,000	\$339,000
Hatch	Hatcheries (Equipment, Infrastructure)	15	\$5,000,000	\$75,000,000	0.65%	\$487,500	4.00%	\$3,000,000	varies	10.00%	\$7,500,000	\$750,000	\$4,237,500
Hatch Total				\$81,000,000		\$526,500		\$3,240,000			\$8,100,000	\$810,000	\$4,576,500
WCS	Water Control Structures-non-wildlife	125	\$110,000	\$13,750,000	0.15%	\$20,625	1.34%	\$184,250	35	10.00%	\$1,375,000	\$137,500	\$342,375
WCS	Water Control Structures - wildlife	894	\$110,000	\$98,340,000	0.15%	\$147,510	1.34%	\$1,317,756	35	10.00%	\$9,834,000	\$983,400	\$2,448,666
WCS Total				\$112,090,000		\$168,135		\$1,365,460			\$11,209,000	\$1,120,900	\$2,791,041
Wells	Monitoring wells	1000	\$20,000	\$20,000,000	0.25%	\$50,000	4.00%	\$800,000	25	10.00%	\$2,000,000	\$200,000	\$1,050,000
Wells Total				\$20,000,000		\$50,000		\$800,000			\$2,000,000	\$200,000	\$1,050,000
DNR Totals:				\$2,972,291,585		\$13,123,930		\$104,919,118			\$369,658,515	\$36,965,852	\$155,008,899

*Number of PWA sites differs from “DNR By The Numbers” fact sheet and was generated by PAT databases.