



DNR 10-YEAR CAPITAL ASSET NEED:

TAKING CARE OF WHAT WE HAVE

January 2019

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KEY MESSAGE

The Department of Natural Resources (DNR) requires \$169,000,000 annually over the next 10 years from all funds in order to maintain and renew the capital assets under its custodial control. The condition of capital assets will continue to decline and maintenance costs will increase each year this amount is not invested.

GOAL

Restore and maintain all capital assets as “average” or better condition within 10 years.

OVERVIEW

DNR’s three-pronged mission to conserve and manage natural resources, to provide recreational opportunities, and to provide for commercial use of natural resources depends upon a wide range of facilities and infrastructure. There are obvious facilities, like campgrounds at state parks and boat ramps at popular fishing lakes. There is also less obvious infrastructure, like monitoring wells, which provide basic information on ground water. Minnesotans rely on the DNR buildings and infrastructure to support the quality of life they expect.

This is the third iteration of the DNR 10-Year Capital Asset Plan since 2015. DNR capital assets consist of any structure, with a useful life of at least 10 years, built on DNR administered land. A wide range of capital assets are addressed in this report, including buildings, roads, trails, bridges, water and sewer systems, fish hatcheries and water control structures. This document presents the capital asset need, which would support the DNR’s mission of providing recreation and economic opportunities, and 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, functional, accessible, support employee productivity, and model the way for environmental sustainability and energy use.

2018 DNR Capital Asset Facts

Current Replacement Value
\$3,043,871,862

Deferred Maintenance
\$445,794,798



Photo 1: Jay Cooke State Park—deteriorated roof on Oldenberg Sanitation building.



Photo 2: Windom Co-located renovated Area Office.



Photo 3: Windom Co-located Area Office exterior back of building before reconstruction.



Photo 4: Windom Co-located Office exterior water damage.



Photo 5: Windom Co-located Area Office exterior back of building after reconstruction.

WHERE THE DNR IS TODAY

The Current Replacement Value (CRV) of DNR capital assets is over \$3 Billion with a deferred maintenance backlog of \$446 million. Historically, funding has not been adequate to manage and maintain DNR capital assets. The deferred maintenance backlog has continued to grow and compound.

As described in previous reports, it is not feasible to complete the entire deferred maintenance backlog at one time. A realistic strategy is to address the total deferred maintenance over 10 years. This deferred maintenance catch-up would be \$45,000,000 annually. Combined with the annual needs for Preventative Maintenance and Renewal and Replacement, the total annual need is \$169,000,000. The 2017 and 2018 bonding bills provided \$45 million in Natural Resources Asset Preservation funds, funds for the Betterment of Buildings, and appropriations for specific Parks and Trails projects. These capital infusions have provided DNR with more resources to address deferred

maintenance than has been available in prior years. However, the need for investment continues to grow.

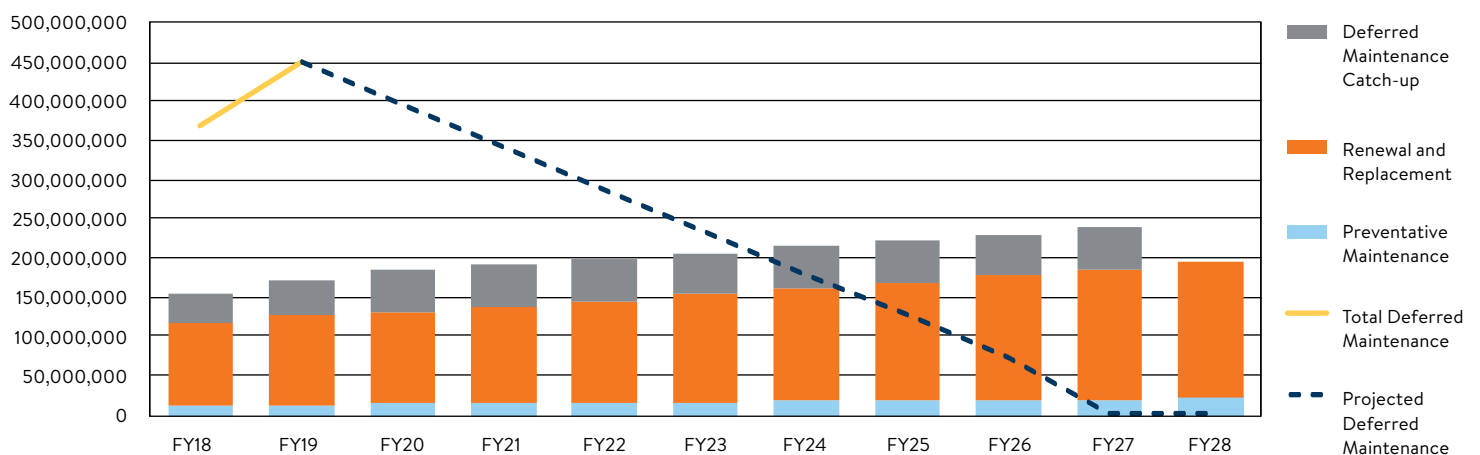
A detailed list of capital asset types, with CRV; percentages for Preventative Maintenance, Renewal and Replacement; Deferred Maintenance activities; and asset life cycles is provided in Appendix C. The priorities for funding are to address health and safety, building integrity, Americans with Disabilities Act compliance, code violations, improving work conditions, environmental sustainability, and improving public access to DNR lands and facilities.

Not maintaining facilities in a timely manner results in higher maintenance costs due to accelerated deterioration and increased proportion of work being completed on an emergency basis. Catching up with deferred maintenance and continuing adequate funding for maintenance needs will result in better service to the public and lower future obligations by reducing costlier renewal and replacement activities.

Figure 1: Total DNR Costs

CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2027)	ANNUAL TOTAL
\$3,043,871,862	\$445,794,798	\$12,887,707	\$111,006,082	\$44,579,480	\$168,691,742

Figure 2: Actual Trending Data for the last 2 years. Future prediction of Preventative Maintenance, Renewal and Replacement, and Deferred Maintenance Catch-up if fully funded annually over the next 10 years.



This graph shows projected deferred maintenance declining to zero in ten years and the annual investments needed to achieve the projected trend.

WHAT THE DNR IS ACCOMPLISHING

Minnesota Statute 84.946 established the Natural Resources Asset Preservation (NRAP) program to address the diverse capital assets managed by the DNR. This includes; buildings, water and sewer systems, roads, trails, bridges, culverts, water control structures, public water accesses, campgrounds, and other miscellaneous assets.

Recent NRAP bonding appropriations:

2014	\$10,000,000
2017	\$15,000,000
2018	\$30,000,000

Examples of 2017 and 2018 NRAP (Natural Resources Asset Preservation) funding utilization includes:

- Design of new Itasca State Park wastewater system—\$500,000
- Windom Co-located Area Office repairs due to water intrusion—\$3,000,000
- Forestry roads and bridges—\$1,190,000
- Thief Lake Wildlife management area dam reconstruction—\$750,000
- Sakatah State Trail rehabilitation—\$1,200,000
- Jay Cooke State Park waterline replacement and sanitation building—\$2,000,000
- Addressing unacceptable and poor building components (roofs, windows, etc.)—\$5,000,000
- Wildlife Roads and Bridges—\$935,000
- Blue Mounds State Park, connect to rural water—\$650,000
- Split Rock Creek State Park septic system replacement—\$120,000
- Badoura Tree Nursery reroofing—\$250,000
- Itasca State Park, Douglas Lodge membrane roof replacement—\$160,000

Even with recent bonding appropriations, Deferred Maintenance increased by \$75 million this year, or about 20% annually.

Many NRAP projects are multi-year efforts that involve phased completion including pre-design, design and construction.

In addition to NRAP funding, DNR invests \$4.9 million through the Facilities Management Account (FMA) annually. The FMA is established in Minnesota Statue 84.0857 to provide for buildings and infrastructure management. Divisions are assessed FMA fees based on the space they occupy. The funds are used for internal technical assistance, smaller projects and non-bondable projects. These projects include basic building repairs such as window replacement, interior finishes, floor coverings, furnace and water heater replacements, projects to meet accessibility or health and safety standards. Operation of facilities is the responsibility of the custodial divisions. FMA funds are also used for urgent, unexpected and unplanned repairs.

TOTAL COST OF OWNERSHIP

Total Cost of Ownership (TCO) is industry standard terminology that reflects the full life cycle costs of an asset, including acquiring, operating, maintaining, and divesting a capital asset. While the general elements are consistent, the specific life cycle activities differ among types of assets. Generally, life cycle management uses best practice methods to achieve the following objectives:

- Ensure asset availability and adequacy 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.

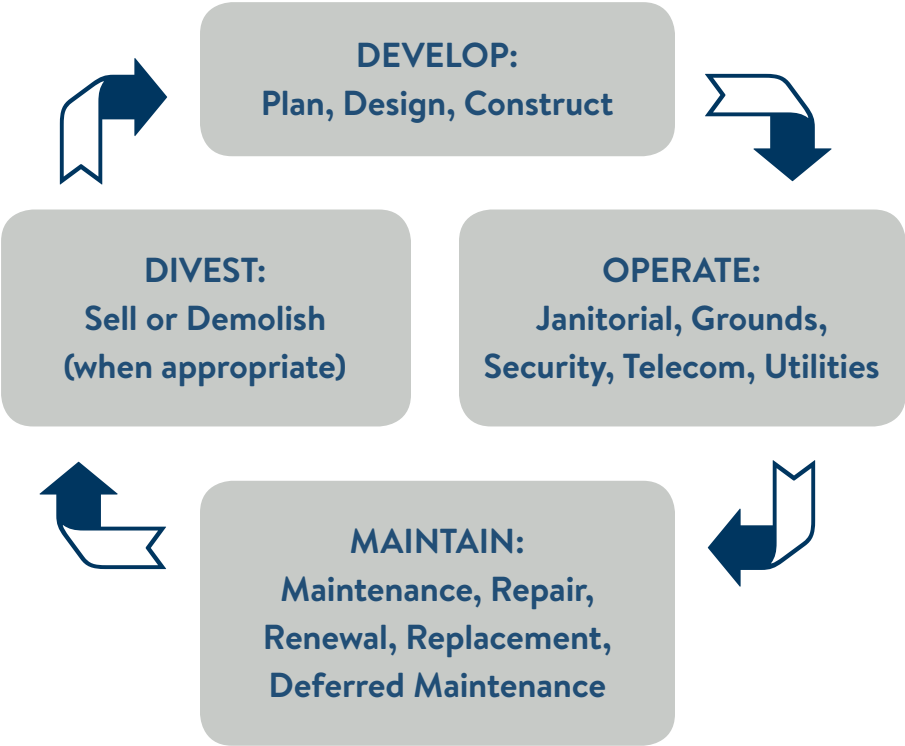
ASSET LIFE CYCLE

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 operation and maintenance phases.

Most of an asset’s life cycle cost (80%) stems from operations and maintenance, not acquisition and construction or divestment, as operations and maintenance expenses occur year in and year out. Attentive design and initial construction can contribute to significant long term operational cost savings.

Figure 3: Percent of Total Life Cycle Cost

Development	15%
Operate/Maintain	80%
Divest	5%



ASSET LIFE CYCLE DEFINITIONS

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

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

Facility Condition Index (FCI) Rating—As a measure of relative condition, FCI is calculated by the deferred maintenance costs divided by the current replacement value. This value is used to assign a FCI Rating of Crisis, Poor, Average, Good or Excellent.

Operation of Assets—What it takes to run or operate the asset on a daily basis. These costs are covered by division operating budgets. Operational expenses include janitorial, grounds maintenance, security, telecom, water, sewer, and utilities.

Preventative Maintenance—Maintenance activities performed before or as needed to restore or maintain the asset in satisfactory condition.

Renewal and Replacement—Costs required to restore and modernize when the asset has reached the end of its life cycle. Life cycle is 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. This typically involves demolition and replacement of facilities, or major renovation and reconstruction.



Photo 6: Itasca Fourplex storm damage.



Photo 7: Itasca State Park Fourplex building, storm damage repair.

BUILDINGS AND SITE INFRASTRUCTURE

The DNR currently owns and manages 2,858 buildings, which includes 96 inactive buildings. Buildings vary in age, construction, use, and life cycle and are located throughout the State of Minnesota. DNR owned buildings include 260 buildings where DNR staff report to work. DNR also leases buildings where staff report to work.

The DNR conducts Facility Condition Assessments (FCA) on all owned buildings using the Department of Administration's statewide enterprise methodology. Each building assessment results in a Facility Condition Index (FCI). Of the 2,858 owned buildings 2,852 have been assessed as per Figure 5.

Figure 4: DNR Owned building totals by building type

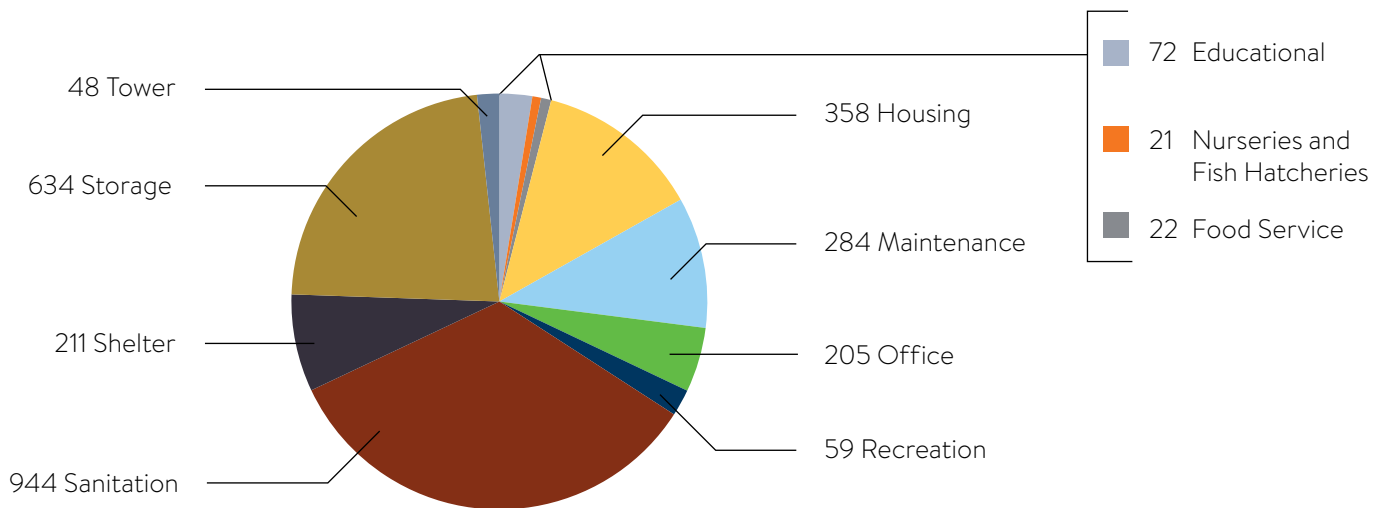


Figure 5: Building Assessment Facility Condition Index (FCI). Rating results as of December 31, 2018. This is only for buildings (does not include site infrastructure).

MEASURE	TOTAL	EXCELLENT (0.00 - 0.05)	GOOD (0.05 - 0.15)	AVERAGE (0.15 - 0.30)	POOR (0.30 - 0.50)	CRISIS (0.50 - 1.00)
Buildings Assessed	2,852	254	789	1,045	549	215
Gross Square Feet	3,328,101	190,793	872,470	1,240,772	501,563	522,503
Current Replacement Value	\$624,011,272	\$42,875,282	\$170,218,766	\$266,258,083	\$98,223,882	\$46,435,259
Deferred Maintenance	\$146,093,687	\$1,143,048	\$18,795,134	\$56,335,912	\$35,899,401	\$33,919,718

Figure 6: Buildings, renewable energy systems and related infrastructure (parking lots, fences, gates, sidewalks, utilities, etc.).

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2027)	ANNUAL TOTAL
2,882	\$662,231,272	\$149,915,687	\$4,111,703	\$11,056,920	\$14,991,569	\$30,160,192



Photo 8: Itasca State Park Douglas Lodge roof membrane in poor condition replaced in 2018.



Photo 9: Sibley Wildlife Office interior foundation and window.



Photo 10: Tettegouche State Park Camp Cabin B—exterior and roof.



Photo 11: Camden State Park, Redwood Lodge interior in poor condition.

Twenty-seven percent (764) of DNR buildings have a rating of “1-Crisis” or “2-Poor” with a deferred maintenance backlog of almost \$70 million. Thirty of these poor or crisis buildings are report-to-work buildings that house 88 full time staff and 189 seasonal staff. The needed annual investment for buildings and associated infrastructure is approximately \$30 million per year. Associated infrastructure includes parking lots, sidewalks, water, sewer, and energy utilities that support a building’s operation and use.

Building data is derived from Archibus, the State Enterprise wide facility management database program. Based on data inputted, Archibus calculates the current replacement value (CRV) and deferred maintenance estimates. Percentage factors applied to the CRV for Preventative Maintenance, Renewal and Replacement, and Deferred Maintenance are based on industry standards. It should be noted that the CRVs are based on general market surveys of construction costs. For a variety of reasons, State construction costs are higher than market averages. This results in underestimating building CRVs and costs of deferred maintenance. See Appendix C.

BUILDING COMPONENTS

Buildings include multiple components such as foundations, walls, roofs, doors, heating and cooling systems, plumbing and interior finishes. Each building component is evaluated in a periodic Facility Condition Assessment (FCA). The average assessment addresses 16 separate components. Below is a chart of building components and their condition. The DNR currently has 343 building components rated in crisis condition at a deferred maintenance cost of over \$19 million and has 1,958 building components rated in poor condition at a deferred maintenance cost of over \$32 million.

Figure 7: Building Component totals by condition and deferred maintenance

BUILDING COMPONENTS	EXCELLENT CONDITION	DEFERRED MAINTENANCE	GOOD CONDITION	DEFERRED MAINTENANCE	AVERAGE CONDITION	DEFERRED MAINTENANCE	POOR CONDITION	DEFERRED MAINTENANCE	CRISIS CONDITION	DEFERRED MAINTENANCE	BUILDING COMPONENTS TOTAL	DEFERRED MAINTENANCE TOTAL
Basement Construction	156	\$33,120	504	\$437,965	92	\$946,627	14	\$352,011	0	\$0	766	\$1,769,723
Conveying	2	\$746	4	\$83,014	4	\$307,141	0	\$0	0	\$0	10	\$390,901
Electrical	626	\$365,544	1,342	\$4,148,932	974	\$8,164,177	103	\$4,170,601	32	\$458,987	3,077	\$17,308,241
Equipment	61	\$46,062	161	\$453,260	233	\$2,749,098	33	\$763,521	5	\$2,600,429	493	\$6,612,370
Exterior Enclosure	533	\$201,402	2,176	\$4,283,539	2,592	\$13,521,097	705	\$9,329,220	94	\$3,061,655	6,100	\$30,396,913
Fire Protection	2	\$2,994	13	\$159,139	1	\$2,484	0	\$0	0	\$0	16	\$164,617
Foundation	723	\$418,125	1,189	\$3,487,251	633	\$5,077,080	77	\$2,630,946	42	\$4,530,032	2,664	\$16,143,434
HVAC	306	\$124,986	829	\$1,770,170	519	\$4,723,002	97	\$1,541,131	20	\$993,261	1,771	\$9,152,550
Interior Construction	228	\$100,021	646	\$1,332,838	797	\$5,007,015	108	\$2,250,882	4	\$36,813	1,783	\$8,727,569
Interior Finishes	412	\$179,525	1,556	\$2,539,991	1,991	\$6,724,865	256	\$4,065,918	29	\$339,795	4,244	\$13,850,094
Plumbing	200	\$111,811	696	\$1,332,558	917	\$5,181,608	126	\$2,538,719	20	\$581,634	1,959	\$9,746,330
Roofing	416	\$102,173	864	\$1,242,112	955	\$3,128,578	288	\$2,883,226	72	\$6,937,806	2,595	\$14,293,894
Solar Energy Supply	15	\$28,725	14	\$191,797	1	\$14,953	0	\$0	0	\$0	30	\$235,476
Special Construction	87	\$70,141	59	\$274,527	51	\$1,500,841	38	\$622,624	2	\$62,126	237	\$2,530,260
Stairs	26	\$14,035	64	\$121,232	121	\$416,927	17	\$53,714	2	\$22,823	230	\$628,730
Super Structure	491	\$252,611	1,524	\$3,876,722	950	\$8,088,769	96	\$1,574,289	21	\$350,195	3,082	\$14,142,585
Grand Total	4,284	\$2,052,020	11,641	\$25,735,047	10,831	\$65,554,262	1,958	\$32,776,802	343	\$19,975,556	29,057	\$146,093,687

SITE INFRASTRUCTURE

Buildings rarely stand alone. A functional building typically requires additional site infrastructure. This includes parking lots, fences, gates, sidewalks and utilities. Current estimates of annual Preventative Maintenance, Renewal and Replacement, and Deferred Maintenance Catch-up needs are \$2.4 million for site infrastructure at DNR facilities. Much of this infrastructure is not yet included in Archibus and cost estimates likely underestimate existing needs.



Photo 12: Peterson Hatchery Residence driveway railing.



Photo 13: Minneopa Ecological and Water Resources Division Office walkway and building. Poor condition of building and infrastructure has resulted in moving to a leased space.

WATER AND SEWER SYSTEMS

DNR buildings are often located outside of municipal service areas, making water wells and on-site waste water treatment systems crucial for site safety and usability. Many of these systems 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 operates seven large septic systems that are required to have National Pollutant Discharge Elimination System (NPDES) waste water discharge permits. All systems scored 40 or higher on the Minnesota Pollution Control Agency's (MPCA's) scoring system used for prioritizing funding assistance. A waste water system with a score of 40 or higher has potential for 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 State Park scored a 68, making it one of DNR's worst systems.

The DNR needs \$2.1 million annually for investments in DNR water and sewer systems.

The DNR is currently working on 12 water and sewer system projects. Below are a few examples with cost estimates:

- Itasca State Park—Waste water ponds replacement is estimated at \$4.5 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—In 2018 Blue Mounds State Park was connected to rural water at a cost of \$650,000. However, the park is still in need of an in-park water distribution system to ensure safe water for park users estimated at \$500,000.
- Jay Cooke State Park—In November of 2017, the water supply line failed. A new water line was connected in 2018—\$260,000.

Aging galvanized steel piping, concrete, and pumps at many DNR facilities are well past their life cycles. In 2018, we conducted dozens of emergency repairs costing over \$350,000 due to failing water and sewer systems.

Figure 8: Water and Sewer Systems

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
1,000 (approximately)	\$50,000,000	\$6,000,000	\$300,000	\$1,250,000	\$600,000	\$2,150,000



Photo 14: Jay Cooke State Park—water main break.



Photo 15: Itasca State Park—manhole in crisis condition.



Photo 16: Itasca State Park—corroded steel water pipe.

ROADS, TRAILS AND BRIDGES

Forestry, Parks and Trails, and Fish and Wildlife are the primary divisions operating roads, trails and bridges.

ROADS—DNR is responsible for over 3,300 miles of roads to provide access within state forests, state parks and major unit Wildlife Management Areas. Roads typically have a 25-year life cycle, suggesting a need to rebuild about 130 miles per year. Currently, the need is to replace an average of 85 miles of road (6 paved and 79 gravel) per year at approximately \$6.4 million per year.

TRAILS—Statewide, DNR is responsible for 1,500 miles of trails, of which 675 are paved. Over 100 miles of paved trails are in immediate need of rehabilitation. Rehabilitation costs about \$200,000 per mile. Paved and gravel trails should be resurfaced on a 25-year cycle.

BRIDGES—DNR is responsible for 468 bridges and over 3,000 culverts. The average life expectancy of a bridge is 50 years. In 2018 we completed 143 bridge inspections using the American Association of State Highway and Transportation Officials (AASHTO) bridge inspection protocol and spent over \$3.5 million in bridge replacement, rehabilitations, and repairs.

Figure 9: Roads, Trails and Bridges (150 miles paved, 3,157 miles of gravel, 1,500 of trails, 468 bridges and over 3,000 culverts)

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
12,802	\$1,472,652,990	\$176,718,359	\$3,622,779	\$59,932,237	\$17,671,836	\$81,226,851



Photo 17: Wild River Road.



Photo 18: DNR trail damage.



Photo 19: Lake Maria State Park Trail Bridge.



Photo 20: Alborn Pengilly State Trail Bridge.



Photo 21: C.J. Ramstad North Shore State Trail and Bridge.

PUBLIC WATER ACCESSES (PWA)

Boating has a \$5.5 billion annual economic impact in Minnesota. This economic and recreational opportunity is largely enabled by public water accesses maintained by DNR and local units of government.

The DNR maintains 1,678 state public water access sites and assists local governments in rehabilitating many of their 1,300 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 is 25 years for an asphalt access and 15 years for a gravel access. Consequently, total annual investment needed is \$24 million to maintain public water accesses that have passed their life expectancy. This does not include assistance provided to local governments.

Figure 10: Public Water Accesses (273 paved and 1,405 gravel PWAs)

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
1,678	\$307,840,600	\$36,940,872	\$1,945,789	\$18,328,145	\$3,694,087	\$23,968,021



Photo 22: Minnesota River—Jordan Public Water Access in crisis condition.



Photo 23: Round Lake Public Water Access in crisis condition.



Photo 24: Green Lake Public Water Access after construction, Spicer Minnesota.



Photo 25: DNR Public Water Access—gravel.

LAKE SUPERIOR SMALL CRAFT HARBORS, MARINAS, AND PROTECTED ACCESSES

Small craft harbors, protected water accesses, and marinas provide safe access to Lake Superior for recreational watercraft and small commercial vessels. Deferred Maintenance Catch-up is \$1 million, with a total annual investment needed of \$4.8 million.

Figure 11: Marinas, small craft harbors and protected accesses

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
10	\$82,000,000	\$9,840,000	\$533,000	\$3,280,000	\$984,000	\$4,797,000



Photo 26: McQuade Small Craft Harbor—storm damage from October 2017.



Photo 27: Knife River Marina—failing pier.

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 years old and are in need of major renovations to address deferred maintenance and to meet the changing recreational expectations of the public. Renewals and replacements focus on public safety, ADA accessibility, providing pull through campsites, electrical upgrades, and modern sanitation facilities. The average life cycle for a campsite is 25 years. Total annual investment needed is \$15.2 million to maintain an average of 200 campsites that are past their life expectancy.

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

Figure 12: Campsites (4,000 park campsites, 112 group camps, 1021 forest campsites and 129 park swimming and day-use areas).

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
5,262	\$212,943,000	\$35,635,400	\$1,384,130	\$10,273,320	\$3,563,540	\$15,220,990



Photo 28: Cuyuna County State Recreation Area—Portsmouth campground shower.



Photo 29: Fort Ridgely State Park Day-use Area shelter—ceiling wood truss rot.



Photo 30: Drinking fountain at campgrounds.



Photo 31: Campground electrical.

HATCHERIES AND NURSERIES

The DNR operates four cold-and 11 warm-water fish hatcheries, along with one active tree nursery and one tree improvement facility. This section references the specialized equipment and infrastructure required for hatcheries and nurseries. In the last decade, disease and invasive species have become a much greater concern. Annual need for hatcheries and nurseries is \$6.8 million. In 2018, Design and Construction used technical assistance resources to initiate systematic evaluations of hatchery systems in order to drive strategic investment in hatchery improvement and modernization. This will move the program away from simple replacement of older system components and lead to more productive and efficient operations.

Figure 13: Hatcheries and Nurseries (17 Hatcheries and 2 Nurseries)

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
17	\$117,000,000	\$14,040,000	\$760,500	\$4,680,000	\$1,404,000	\$6,844,500



Photo 32: Crystal Springs Fish Hatchery—interior fish raceway.



Photo 33: Crystal Springs Fish Hatchery—fish holding tanks.

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

Forestry industry contributes
\$17.6 billion to Minnesota’s
economy annually.

WATER CONTROL STRUCTURES (WCS)

The DNR manages over 1,000 structures that are used to control water levels on state land and public waters. 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. Total annual investment needed is \$3.2 million to replace an average of 30 water control structures that have reached their life expectancy.

The DNR also owns 311 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 B.

Figure 14: Water Control Structures

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
1,019	\$118,204,000	\$14,184,480	\$177,306	\$1,365,460	\$1,418,448	\$3,179,688



Photo 34: Wolf Lake Water Management Area Ponds—control valve.



Photo 35: Wolf Lake Wildlife Management Area—water outlet rehabilitation.



Photo 36: Collinwood Lake Dam (rehabilitated in 2018).

MONITORING WELLS

Monitoring wells (also called observation wells) are placed in various aquifers across the state to monitor the groundwater levels and provide long term groundwater level data. The data is used for water supply planning for communities, industry and agricultural users. 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. Total annual investment needed is \$1.1 million to replace an average of 38 wells and repair hundreds more.

Figure 15: Wells

NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE (CRV)	DEFERRED MAINTENANCE	ANNUAL PREVENTATIVE MAINTENANCE	ANNUAL RENEWAL AND REPLACEMENT	ANNUAL DEFERRED MAINTENANCE CATCH-UP (2018 - 2028)	ANNUAL TOTAL
1,000	\$21,000,000	\$2,520,000	\$52,500	\$840,000	\$252,000	\$1,144,500



Photo 37: State Forest Land in Aitkin County—monitoring well.



Photo 38: Monitoring well in need of replacement.

APPENDIX A: DATA SOURCES

BUILDINGS AND MISCELLANEOUS SITE INFRASTRUCTURE

Division: Operations Services
Contact: Mark Lindquist, Buildings and Sustainability Maintenance Manager
Database: Archibus

WATER AND SEWER SYSTEMS

Division: Operations Services
Contact: David Johnson, Design and Construction Manager
Database: Archibus

ROADS AND BRIDGES

Division: Forestry, Parks and Trails, Fish and Wildlife
Contact: Andrew Arends, Forestry Section Manager, Peter Hark, Acquisition and Development Manager, Bob Welsh, Habitat Program Manager
Database: GIS, Cartegraph

TRAILS AND TRAIL BRIDGES

Division: Parks and Trails, Fish and Wildlife
Contact: Peter Hark, Acquisition and Development Manager, Bob Welsh, Habitat Program Manager
Database: GIS, Cartegraph

PUBLIC WATER ACCESSES

Division: Parks and Trails, Fish and 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, RECREATION AREAS AND DAY-USE AREAS

Division: Parks and Trails
Contact: Peter Hark, Acquisition and Development Manager
Database: GIS

HATCHERIES AND NURSERIES

Division: Fish and Wildlife, Forestry
Contact: Paula Phelps, Hatchery Program Manager, Andrew Arends, Forestry Section Manager
Data source: Hatcheries—MN State Fish Hatcheries Information document for 2009 legislation. Hatchery Feasibility Study 2018. Expert knowledge Nurseries—Historical construction information.

WATER CONTROL STRUCTURES

Division: Fish and Wildlife, Ecological and Water Resources
Contact: Bob Welsh, Habitat Program Manager, Jason Boyle, State Dam Safety Engineer
Database: ArcGIS

MONITORING WELLS

Division: Ecological and Water Resources
Contact: Greg Kruse, Monitoring and Database Management Supervisor
Data system: Hydstra

APPENDIX B: DAM SAFETY PROGRAM

The State of Minnesota owns 311 dams. Nearly all of these dams are managed by the Department of Natural Resources. Minnesota Rules define a dam as an artificial barrier that impounds more than 15 acre-feet water and is greater than 6 feet high. The State also owns hundreds of water level control structures that are too small to be a “dam.”

State owned dams have historically received funding for repairs, replacements, and removals through state general obligation bonding. Some of the appropriated dam safety bonding funds are also granted to local government units. The funds are distributed based on the dam safety project priority list, which is developed by the DNR and submitted to the legislature every odd-numbered year.

Most state owned dams were built in the 1930s under the Works Progress Administration and are maintained by the State. There is a growing need to rehabilitate these dams, as the majority are beyond their expected service life. New London Dam and Lake Bronson Dam are the two high hazard dams owned by the state. In 2011, the New London Dam was rehabilitated at a cost of \$3.6 Million. The upcoming Lake Bronson Dam rehabilitation is estimated to cost \$15 million. Smaller low-hazard potential dams that control the water level of some important lakes have not typically been funded in the past because the first priority is to fund the large, higher-hazard dam projects involving public safety.

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
12 Significant Hazard	Failure would cause limited economic loss, but no loss of life
297 Low Hazard	Failure would cause only minor losses



Photo 39: Lake Bronson State Park—Lake Bronson Dam.

Figure 16: Cost to Rehabilitate 311 State Owned Dams Over the Next 10 years.
Assuming a 10-year cycle, this amounts to \$5,810,000 per biennium.

ASSUME 70% REQUIRE NO WORK	217 @ \$0 each=	\$0
ASSUME 10% REQUIRE MINOR REPAIRS	31 @ \$25,000 each=	\$775,000
ASSUME 10% REQUIRE RECONSTRUCTION	31 @ \$125,000 each=	\$3,875,000
ASSUME 4% REQUIRE REMOVAL	12 @ \$250,000 each=	\$3,000,000
ASSUME 5% REQUIRE MAJOR REPAIR	16 @ \$250,000 each=	\$4,000,000
ASSUME 1% REQUIRE TOTAL RECONSTRUCTION	3 @ \$800,000 each=	\$2,400,000
LAKE BRONSON DAM REHABILITATION	1 @ \$15,000,000 each=	\$15,000,000
TOTAL		\$29,050,000

APPENDIX C: TEN YEAR CAPITAL ASSET PLAN—DATA AS OF DECEMBER 12, 2018

ASSET	ASSET TYPE	NUMBER/ MILES/ETC.	DOLLARS/ UNIT	CURRENT REPLACEMENT VALUE (CRV)	% CRV	(COLUMN A) ANNUAL PREVENTATIVE MAINTENANCE	% CRV	(COLUMN B) ANNUAL RENEWAL AND REPLACEMENT	LIFE CYCLE	% CRV	TOTAL DEFERRED MAINTENANCE (DM)	(COLUMN C) DM/10 YEARS (ANNUAL)	(COLUMN A + B + C) ANNUAL TOTAL
Buildings	Buildings	2,852	varies	\$620,611,712	0.65%	\$4,033,976	1.46%	\$9,060,931	varies	23.53%	\$146,025,696	\$14,602,569.60	\$27,697,477
Buildings	Renewable energy systems	30	varies	\$3,399,560	0.60%	\$20,397	2.50%	\$84,989	25	2.00%	\$67,991	\$6,799	\$112,185
Buildings	Site infrastructure—parking lot, fences, gates, sidewalks, utilities, 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		2,882		\$662,231,272		\$4,111,703		\$11,056,920			\$149,915,687	\$14,991,569	\$30,160,192
Water	Water and sewer systems	1,000	\$50,000	\$50,000,000	0.60%	\$300,000	2.50%	\$1,250,000	40	12.00%	\$6,000,000	\$600,000	\$2,150,000
Water Total		1,000		\$50,000,000		\$300,000		\$1,250,000			\$6,000,000	\$600,000	\$2,150,000
Roads/Trails/Bridges	Park Roads	150	\$577,500	\$86,625,000	0.15%	\$129,938	4.00%	\$3,465,000	25	12.00%	\$10,395,000	\$1,039,500	\$4,634,438
Roads/Trails/Bridges	Park Bridges	85	\$404,250	\$34,361,250	0.15%	\$51,542	2.00%	\$687,225	50	12.00%	\$4,123,350	\$412,335	\$1,151,102
Roads/Trails/Bridges	Forest Roads—one lane, gravel	2,340	\$264,000	\$617,760,000	0.30%	\$1,853,280	4.00%	\$24,710,400	40	12.00%	\$74,131,200	\$7,413,120	\$33,976,800
Roads/Trails/Bridges	Forest Bridges	46	\$385,000	\$17,710,000	0.25%	\$44,275	4.00%	\$708,400	50	12.00%	\$2,125,200	\$212,520	\$965,195
Roads/Trails/Bridges	Culverts	3,179	\$10,000	\$31,790,000	0.30%	\$95,370	4.00%	\$1,271,600		12.00%	\$3,814,800	\$381,480	\$1,748,450
Roads/Trails/Bridges	Wildlife—Bridges	45	\$404,250	\$18,191,250	0.30%	\$54,574	3.32%	\$603,950	50	12.00%	\$2,182,950	\$218,295	\$876,818
Roads/Trails/Bridges	Wildlife—Roads	817	\$266,000	\$217,322,000	0.30%	\$651,966	4.00%	\$8,692,880	40	12.00%	\$26,078,640	\$2,607,864	\$11,952,710
Roads/Trails/Bridges	State Trails	675	\$400,000	\$270,000,000	0.15%	\$405,000	5.00%	\$13,500,000	25	12.00%	\$32,400,000	\$3,240,000	\$17,145,000
Roads/Trails/Bridges	Trail Bridges	350	\$420,000	\$147,000,000	0.15%	\$220,500	3.32%	\$4,880,400	50	12.00%	\$17,640,000	\$1,764,000	\$6,864,900
Roads/Trails/Bridges	Trail Trailheads	60	\$40,000	\$2,400,000	0.65%	\$15,600	4.00%	\$96,000	25	12.00%	\$288,000	\$28,800	\$140,400
Roads/Trails/Bridges	Trail Culverts	3,000	\$3,150	\$9,450,000	0.30%	\$28,350	4.00%	\$378,000	25	12.00%	\$1,134,000	\$113,400	\$519,750
Roads/Trails/Bridges	Park Bike Trails	55	\$200,000	\$11,000,000	0.50%	\$55,000	4.24%	\$466,400	25	12.00%	\$1,320,000	\$132,000	\$653,400
Roads/Trails/Bridges	Park Hiking Trails	1,030	\$6,308	\$6,497,240	0.15%	\$9,746	5.54%	\$359,947	25	12.00%	\$779,669	\$77,967	\$447,660
Roads/Trails/Bridges	Trails—Wildlife	485	\$2,100	\$1,018,500	0.30%	\$3,056	5.00%	\$50,925	25	12.00%	\$122,220	\$12,222	\$66,203
Roads/Trails/Bridges	Culverts—Wildife	485	\$3,150	\$1,527,750	0.30%	\$4,583	4.00%	\$61,110	25	12.00%	\$183,330	\$18,333	\$84,026
Roads/Trails/Bridges Total		12,802		\$1,472,652,990		\$3,622,779		\$59,932,237			\$176,718,359	\$17,671,836	\$81,226,851
Public Water Access (PWA)	PWA—carry in—asphalt	16	\$277,200	\$4,435,200	0.65%	\$28,829	4.00%	\$177,408	25	12.00%	\$532,224	\$53,222	\$259,459
Public Water Access	PWA—carry in—gravel	330	\$157,500	\$51,975,000	0.65%	\$337,838	6.67%	\$3,466,733	15	12.00%	\$6,237,000	\$623,700	\$4,428,270
Public Water Access	PWA—trailer—asphalt	257	\$277,200	\$71,240,400	0.65%	\$463,063	4.00%	\$2,849,616	25	12.00%	\$8,548,848	\$854,885	\$4,167,563
Public Water Access	PWA—trailer—gravel	1,074	\$157,500	\$169,155,000	0.65%	\$1,099,508	6.67%	\$11,282,639	15	12.00%	\$20,298,600	\$2,029,860	\$14,412,006
Public Water Access	Miscellaneous site amenities—fences, gates, sidewalks, etc.	1	varies	\$11,035,000	0.15%	\$16,553	5.00%	\$551,750	varies	12.00%	\$1,324,200	\$132,420	\$700,723
Public Water Access Total		1,678		\$307,840,600		\$1,945,789		\$18,328,145			\$36,940,872	\$3,694,087	\$23,968,021
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	12.00%	\$9,840,000	\$984,000	\$4,797,000
Marina Total		10		\$82,000,000		\$533,000		\$3,280,000			\$9,840,000	\$984,000	\$4,797,000
Camps	Park Campsites	4,000	\$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 Recreation Areas—campsites	1,021	\$5,500	\$5,615,500	0.65%	\$36,501	4.00%	\$224,620	25	12.00%	\$673,860	\$67,386	\$328,507
Camps	Forest Recreation day-use areas	95	\$16,500	\$1,567,500	0.65%	\$10,189	4.00%	\$62,700	25	12.00%	\$188,100	\$18,810	\$91,699
Camps Total		5,262		\$212,943,000		\$1,384,130		\$10,273,320			\$35,635,400	\$3,563,540	\$15,220,990
Nurseries	Nurseries (equipment, infrastructure)	2	\$3,000,000	\$6,000,000	0.65%	\$39,000	4.00%	\$240,000	varies	12.00%	\$720,000	\$72,000	\$351,000
Fish Hatcheries	Hatcheries (equipment, infrastructure)	15	\$7,400,000	\$111,000,000	0.65%	\$721,500	4.00%	\$4,440,000	varies	12.00%	\$13,320,000	\$1,332,000	\$6,493,500
Nurseries and Fish Hatcheries Total		17		\$117,000,000		\$760,500		\$4,680,000			\$14,040,000	\$1,404,000	\$6,844,500
Water Control Structures	Water Control Structures—non-wildlife	125	\$116,000	\$14,500,000	0.15%	\$21,750	1.34%	\$194,300	35	12.00%	\$1,740,000	\$174,000	\$390,050
Water Control Structures	Water Control Structures—wildlife	894	\$116,000	\$103,704,000	0.15%	\$155,556	1.34%	\$1,389,634	35	12.00%	\$12,444,480	\$1,244,448	\$2,789,638
Water Control Structures Totals		1,019		\$118,204,000		\$177,306		\$1,365,460			\$14,184,480	\$1,418,448	\$3,179,688
Wells	Monitoring wells	1,000	\$21,000	\$21,000,000	0.25%	\$52,500	4.00%	\$840,000	25	12.00%	\$2,520,000	\$252,000	\$1,144,500
Wells Total		1,000		\$21,000,000		\$52,500		\$840,000			\$2,520,000	\$252,000	\$1,144,500
DNR Totals:		25,670		\$3,043,871,862		\$12,887,707		\$111,006,082		12.41%	\$445,794,798	\$44,579,480	\$168,691,742



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