VIRGINIA GRADES

Bridges	Dams	Drinking Water
B	D-	C+
Public Parks	**Rail**	**Roads**
C	C-	C-
Schools	**Solid Waste**	**Stormwater**
C-	B-	C-
Transit	**Wastewater**	**GPA**
C-	D+	C-

About the Grades

The 2022 Report Card for Virginia's Infrastructure was written by a committee of more than 75 civil engineers across Virginia who volunteered their time to collect and analyze data, prepare and review their findings and present their conclusions. The committee worked with staff from ASCE National and ASCE's Committee on America's Infrastructure to provide a snapshot of our state's infrastructure, as it relates to us locally and on a national level. The Report Card Sections are graded based on the following eight criteria: capacity, condition, funding, future need, operation and maintenance, public safety, resilience and innovation. ASCE defines these grades as follows:

- **A** – Exceptional, Fit for the Future
- **B** – Good, Adequate for Now
- **C** – Mediocre, Requires Attention
- **D** – Poor, At Risk
- **F** – Failing/Critical, Unfit for Purpose

SOLUTIONS TO RAISE THE GRADE

As Virginia seeks to continue improving our infrastructure, ASCE in Virginia offers some suggestions to raise the grade:

1. **AMBITIOUSLY SEEK FEDERAL FUNDING AVAILABLE FROM RECENT FEDERAL LEGISLATION**
   The Bipartisan Infrastructure Law and American Rescue Plan Acts of 2021, plus the Inflation Reduction Act and CHIPS+ laws from 2022, provide limited time opportunities to close the infrastructure gaps identified in this report: 1,800 dams without safety identification, deferred parks maintenance scoring $111 million annually, 52% of school buildings in the Commonwealth over 50 years old.

2. **FOLLOW THROUGH ON PLANS TO ADVANCE TRANSPORTATION AND WATER PROJECTS**
   Virginia's authorized plans at the state and metropolitan level feature actions to raise the grade of every infrastructure category. However, plans to spend money in the next few years won't amount to positive change unless decision-makers at those state and local levels appropriate and allocate the funds during a likely upcoming economic downturn.

3. **UTILIZE EQUITY AND CLIMATE CHANGE AS CORE CONSIDERATIONS WHEN IMPLEMENTING INVESTMENT**
   Many projects are "shovel ready," but a smaller group is "shovel-worthy." When making that judgement, historical and present-day equity data – as well as the threats from climate change – should be centered. This begins with technical assistance and cross-jurisdictional collaboration. A central constraint to improving Virginia's infrastructure are the resource and staffing levels at smaller and disadvantaged communities.

About ASCE-VIRGINIA

ASCE Virginia Section was founded in 1922. Our objective shall be the advancement of the science and profession of Civil Engineering. The ASCE Virginia Section has seven branches: Blue Ridge Branch (1967); Bull Run Branch (1969): Counties of Frederick, Clarke, Warren, Loundoun, Fauquier, Prince William, Stafford, Spotsylvania, Culpeper, and Rappahanock; Lynchburg Branch (1975); Norfolk Branch (1955): Counties of Accomack, Greensville, Isle of Wight, Nansemond, Northampton, Southampton, Surry, and Sussex. Cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach; Peninsula Branch (1966); Richmond Branch (1955); Roanoke Branch (1955).

Five Student Chapters are located within the Virginia Section. Student Chapters are located at University of Virginia, Virginia Military Institute, Virginia Polytechnic Institute and State University (Virginia Tech), Old Dominion University, and Liberty University.

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REPORT CARD FOR
VIRGINIA
INFRASTRUCTURE
2022

INFRASTRUCTURE MATTERS

Virginia's infrastructure forms the foundation for health, wealth, and safety for 8.6 million residents, more than 200,000 businesses, and over 100 million annual visitors. The Commonwealth moves people and goods along the critical I-95 corridor. It boasts expanding rail service connecting 127 million pounds of freight and 1.5 million passengers annually between the Northeast Corridor and mid-American transportation nodes. The Port of Virginia shuttles increasing volumes of goods on tracks, rather than trucks, with improved dockside infrastructure. Water systems for collecting rainfall and reducing floods are improving faster than national benchmarks.

Infrastructure in the Commonwealth struggles from challenges like other growing states. Northern Virginia's job creation and workforce clustering provide synergy to the economy and increased tax revenue. But those trends increase the complexity of operations and maintenance, plus the hassle of full-scale replacements of giant structures folks depend on every day. Virginia's roads are increasingly clogged with drivers who lack feasible transit and bike alternatives for essential trips. The Tidewater region is growing fast as well, but the proximity of inland water, increasingly severe weather, and agricultural or industrial land uses pose contamination risks. Relatively less technical and resourced communities in rural Southwestern Virginia struggle to expand infrastructure systems when funding awards require more rigorous planning processes. Across the Commonwealth, inflation, workforce struggles, and political gridlock threaten infrastructure stewardship.

Virginia, however, has a lot to celebrate on infrastructure. The Commonwealth is sticking to its ambitious plans for passenger rail expansion drawn up before COVID-19 and they can be further enhanced using historically large funding from 2021's Bipartisan Infrastructure Law. Transit systems in urban, suburban, and rural areas of Virginia lost customers due to the pandemic – and rail transit struggles to pull ridership back up to normal. But bus systems like the Virginia Breeze have already attracted riders more numerous than before COVID. AMTRAK passenger rail routes in the state are breaking records. An innovative treatment facility in Hampton Roads treats wastewater to drinking water quality standards for injection into the aquifer to control saltwater intrusion and land subsidence – a process sparsely attempted in even the most advanced countries. Traffic deaths in the Commonwealth are disturbingly high, but decision-makers at the Commonwealth Transportation Board are putting safety high on the priority list with their cornerstone budget and planning documents.

How You Can Get Involved

1. **Get the full story behind this Report Card at www.infrastructurereportcard.org/virginia.**
2. **Ask your elected leaders what they're doing to keep up with your neighborhood's infrastructure. Use your zip code to get your list of elected officials' at www.infrastructurereportcard.org/take-action.**

2022 REPORT CARD FOR VIRGINIA'S INFRASTRUCTURE

The 2022 Report Card on Virginia's Infrastructure gave the state an overall g.p.a. of C-. Virginia's civil engineers studied eleven infrastructure categories. Of those eleven, two infrastructure categories are in good condition, eight are in mediocre condition, and two are in poor condition.

The good news is there are solutions to all these challenges, and we can raise the grades of Virginia's infrastructure. By learning more today about the conditions of the infrastructure you use every day, you too can help raise the grade.

BRIDGES — B

In 2015, the Virginia Legislature enacted a series of reforms and increased available revenue for its surface transportation program. It also enacted the State of Good Repair (SGR) program that mandates 30% of construction funding be provided for deteriorated pavements and structurally deficient bridges maintained and owned by VDOT and localities. The condition of Virginia's bridges improved significantly since those reforms and thanks to the additional revenue. Of the 21,250 bridges in the Commonwealth, 698 – or about 3% – are considered structurally deficient (SD, or "poor"), much better than the national average of 7.5%. This also marks a dramatic improvement from 2015, in which 1,550 SD bridges – about 7.5% - were structurally deficient. Looking forward, Virginia should emphasize preservation projects that keep aging bridges from falling into a state of disrepair.

DAMS — D-

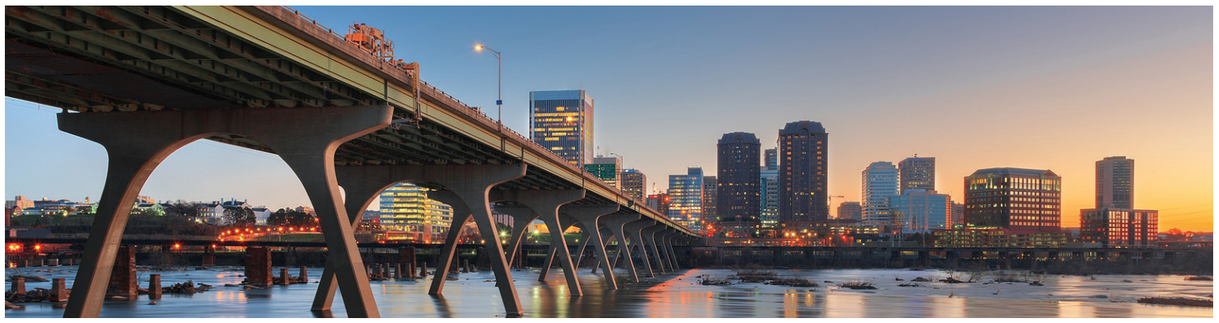
There are 2,634 state-regulated dams in the Commonwealth of Virginia. They're pillars of water supply, flood control, irrigation, and recreation. Inspection of and emergency planning for these structures – particularly the 359 high hazard potential dams – is crucial. Over 50% of all state regulated high hazard dams have been inspected annually since 2017, a significant improvement from 2008 to 2012, when just 25% of high hazard potential dams were inspected each year. Ninety seven percent of the high hazard inventory have Emergency Action Plans, higher than the national average of 81%. Additionally, funding for state dam safety inspections has increased over the past decade. However, the average age of Virginia's dams as of 2020 is 74 years old, significantly older than the national average of 57 years. We don't have age data for most Virginia dams, meaning the problem could be much worse than known. Meanwhile, there are 1,842 dams in the state that report an undetermined hazard classification.

DRINKING WATER — C+

Over the last six years, increased funding and an emphasis on operation and maintenance by the Commonwealth of Virginia's drinking water infrastructure owners have resulted in improved physical conditions. Accelerating improvements, the General Assembly allocated $100 million from the federal COVID-19 American Rescue Plan to improve drinking water infrastructure in the Commonwealth. State funds are available for lead service line replacement, and since 2017, the City of Richmond, Washington County, Henry County, and the City of Chesapeake have received funding for these projects. The City of Alexandria has reduced lead pipes by 25% over the last four years. As populations grow, particularly in Northern Virginia and along the coast, municipalities are building new treatment plants and up-grading distribution networks. However, legacy systems are aging, and there are anecdotal reports of some pipes being over 100 years old. These systems require robust maintenance and regular funding for modernizations

PUBLIC PARKS — C

Almost all of Virginia's 95 counties and 38 cities contain park facilities, and visitors to these parks generate significant economic benefits to the Commonwealth's economy. According to the Virginia Department of Conservation and Recreation (DCR), Virginia state parks saw 7.9 million visitors in 2021, a 15% increase over 2019 and a 1.5% increase over 2020. Despite growing numbers of visitors, park maintenance at facilities is underfunded. Deferred maintenance at Virginia state parks is estimated at $111 million annually. DCR and localities are also challenged to hire sufficient staff to operate equipment and manage resources.



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RAIL — C-

Virginia's rail system consists of 3,037 miles of active lines served by two Class I and nine Class III freight railroads, up to 26 national and regional Amtrak passenger routes, and Virginia Railway Express intercity rail. Annually, over 127 million tons of freight and nearly 1.5 million passengers travel through Virginia. Inadequate capacity in the Richmond to Northern Virginia corridor is a constraint to Commonwealth rail infrastructure. This includes the dangerously old two-track Long Bridge; it operates at 98% capacity during peak times on weekdays. Public-private partnerships, such as the Transforming Rail in Virginia program, can increase and expand passenger service while improving freight performance on tracks they share. Meanwhile, the Port of Virginia is expanding rail capacity, and new federal and state funding is available to enhance the condition of passenger rail infrastructure and improve service.

ROADS — C-

The Virginia Department of Transportation (VDOT) is responsible for the third-largest state-maintained highway system in the country. VDOT is a national leader in transportation asset management and has fully integrated the practice into its budgeting process and investment strategies. This has garnered positive results; the percentage of pavement condition that was in good condition rose from 48% to 51% from 2018 to 2022. 968 road users were killed in crashes on Virginia roads in 2021, a large jump from 796 in 2020 and nearing Virginia's previous peak of 1,026 in 2007. Roadway engineering to prioritize safety over speed is the most effective countermeasure. A 2020 Omnibus Transportation Bill mandates new funding for safety projects, including hundreds within the $672 million Commonwealth Transportation Board investment plan for FY2023-2028.

SCHOOLS — C-

Beginning the 2021-2022 school year there were a total of 2,381 public schools operating in the Commonwealth of Virginia serving over 1.25 million students. Many of those students spend their days in older, outdated buildings that need replacement. The most recent assessment of schools, performed in 2021, determined that 52% of Virginia's public school buildings are over 50 years old and estimated renovation costs exceed $24 billion. Virginia is currently faced with aging school infrastructure, shortfalls in funding for repairs/maintenance and operation of existing school facilities, a shrinking tax base in rural areas, and overcrowding in metropolitan areas. The Covid-19 pandemic has exacerbated the situation, making it more difficult for school systems across Virginia to properly maintain, repair, or upgrade school infrastructure.

SOLID WASTE — B-

There are 202 permitted waste facilities in Virginia that manage municipal solid waste and several other waste streams. Existing capacity is generally sufficient and due to open real estate for landfill operations, Virginia can maintain competitive disposal fees. Per capita solid waste generation rates in Virginia exceeded the national average by some 44 percent which was an increase of 11% from the amount reported in the 2015 Report Card. However, Virginians recycling rates are very high; in 2018, communities with populations over 100,000 achieved a recycling rate of 46%, approximately 11% higher than the national average of 34.7%. The grade for Solid Waste infrastructure in Virginia is a grade of B-, which was the grade assigned in the 2015 ASCE Virginia Infrastructure Report Card. This reflects the balance between concerns for an 11% increase in per capita waste generation rate with the continued improvement in the per capita recycling rate which exceeded the national average by nearly 11 percent.

STORMWATER — C-

Increased development, aging infrastructure, more intense rainstorm events, and rising sea levels are all placing demands on the Commonwealth's stormwater infrastructure systems. Fortunately, there is some limited funding available for infrastructure capacity and condition improvements. Richmond, Portsmouth, Norfolk, Virginia Beach, Hampton, Chesapeake, Newport News, Lynchburg, Roanoke and Alexandria have stormwater user fees paid by residents. These fees serve as dedicated funding source for existing stormwater management services and new capital projects. In FY 2021, Virginia financed approximately $205 million in project loans targeted at 14 projects through the Virginia Clean Water Revolving Loan Fund, however, future needs are significant. More than 70% of the commonwealth's population lives in coastal areas. Meanwhile, it is estimated that 1 inch of water in a home can cause upwards of $25,000 in damages

TRANSIT — C-

The Commonwealth's 41 transit agencies provided almost 172 million trips in FY 2019, the last year before the COVID-19 pandemic. That year, the Commonwealth's 16 commuter assistance programs removed almost 3.3 million automobile trips and 937 vanpools provided almost 2 million trips. Nineteen transit agencies reported ridership increases. Since the onset of the pandemic, transit agencies are fighting to win back riders with investments in capacity and condition. In FY21, the Commonwealth Transportation Board provided funding for 137 replacement revenue vehicles, 17 expansion vehicles, and the rehabilitation of 42 buses. The second phase of the Silver Line extension from Falls Church to Dulles Airport is nearly complete, which adds high-quality transit options to locations where concentrations of residents work, live, access essential services, and recreate. While this is encouraging, the 2022 Virginia Department of Rail and Public Transportation (VDRPT) needs assessment shows a 5-year, $208 million gap between projected available funds and what is needed to deliver transit services and modernize the existing system.

WASTEWATER — D+

There are an estimated 584 municipal wastewater treatment facilities in Virginia serving a population of over 8.5 million. Virginia's three cities with combined sewer systems – Richmond, Lynchburg, and Alexandria – have made considerable progress in reducing combined sewer overflows, but remaining remediation will cost an estimated $700 million to $900 million. A 2012 survey estimated Virginia's wastewater infrastructure needs exceeded $6.4 billion, probably much higher today due to inflation, aging physical infrastructure, and worsened threats from climate change such as infiltration and inflow. Utilities are raising their rates to meet this challenge: $44.70 was the Commonwealth average in 2018, compared to $42 nationally. Virginia water utilities continues to innovate, including AlexRenew, the North American utility to implement mainstream deammonification: systems that pump drinking water quality out of wastewater treatment plants directly into the Potomac Aquifer.