



I BLUEPRINT FOR AMERICA

An infrastructure plan to make our families and communities safer, healthier and more resilient

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WRITTEN BY:
GIDEON WEISSMAN, JAMES HORROX, BRYN HUXLEY-REICHER,
JAMIE FRIEDMAN AND ADRIAN PFORZHEIMER
FRONTIER GROUP

MATT CASALE
U.S. PIRG EDUCATION FUND

JOHN RUMPLER
ENVIRONMENT AMERICA RESEARCH & POLICY CENTER

NOVEMBER 2020

ACKNOWLEDGMENTS

The authors wish to thank Emma Searson, Morgan Folger and Steve Blackledge of Environment America Research & Policy Center, Alex Truelove of U.S. PIRG Education Fund and Luke Metzger of Environment Texas Research & Policy Center for their review of drafts of this document. Thanks also to Susan Rakov, Tony Dutzik and David Lippeatt of Frontier Group for editorial support.

The authors bear responsibility for any factual errors. Policy recommendations are those of NJ-PIRG Law & Policy Center and Environment New Jersey Research & Policy Center. The views expressed in this report are those of the authors and do not necessarily reflect the views of our funders or those who provided review.

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EXECUTIVE SUMMARY

AMERICANS AGREE: OUR NATION'S INFRASTRUCTURE NEEDS WORK.

Republicans, Democrats and independents alike all support boosting federal investment in infrastructure.¹ A transpartisan effort to rebuild the nation's infrastructure can help to bring Americans together at a time of increasing polarization and help heal the economic wounds caused by the COVID-19 pandemic.

Throwing money at the problem, however, is not the solution. Nor is rebuilding the same old infrastructure in the same old ways.

A transformative infrastructure plan for the United States must focus on the nation's key 21st century priorities and use taxpayer resources wisely. It should focus infrastructure investment in ways that will make us healthier and safer, prioritize infrastructure repair, avoid investing in infrastructure likely to become "stranded assets," and get the most out of every dollar invested by using our infrastructure efficiently.

The following proposals in the areas of **energy, transportation, water, solid waste and natural infrastructure** should form the basis of an infrastructure plan that will make America stronger today and lay the foundation for a brighter future. (A full list of infrastructure proposals is provided on page 4.)

Energy: Renewable energy is on the rise across America. But to take full advantage of our enormous potential for clean energy, the nation should prioritize investments and infrastructure including:

- **Invest in renewable energy infrastructure** by expanding tax credits for wind, solar, and energy storage projects, and by providing at least \$7 billion toward Energy Efficiency and Conservation Block Grants to help communities reduce energy use and deploy clean energy projects.²
- **Modernize and strengthen the electric grid** by funding and incentivizing the deployment of energy storage systems and providing federal loan guarantees for the construction of high-voltage transmission lines. To ensure a resilient grid able to withstand climate change-fueled storms, the federal government should develop strong grid resilience standards, and provide states and communities with resources to strengthen physical grid infrastructure and deploy technologies to respond to grid disruptions.
- **Promote domestic manufacturing of clean energy technologies** through tax credits for expanding or building manufacturing facilities, as well as for production of clean energy products. The federal government should also develop a national strategy to ensure sufficient

and ethical supply of minerals and materials necessary for supporting clean energy manufacturing.

Transportation: America's roads, bridges and transit systems are in dire need of repair, and the nation's transportation needs were changing, even before the disruption caused by COVID-19. Infrastructure projects to help build a 21st century transportation system include:

- **Repair crumbling roads and bridges and require states to "fix it first"** by reorienting transportation funding away from the construction of new and wider highways and toward repair of existing roads and associated infrastructure. States should be required to focus National Highway Performance Program funds on repair and rehabilitation until existing roads and bridges are in a state of good repair.³
- **Expand and electrify public transportation** beginning with the immediate provision of at least \$32 billion in emergency operating support for transit to maintain service in the wake of COVID-related budget shortfalls.⁴ Then, Congress should address the \$98 billion backlog in needed transit repairs, expand transit by increasing funding for Capital Investment Grants, and support community deployment of electric buses with new funding for the Low or No Emissions Vehicle program.⁵
- **Build a national network for electric vehicle charging** by providing funds to build out state and regional EV charging networks and corridors, including at rest stops and park-and-rides. Funding should be contingent on stations being publicly accessible, using open and interoperable charging standards, and providing open data so that drivers can find available chargers.

Water: Aging water infrastructure threatens public health and the environment and wastes valuable drinking water. Infrastructure projects to protect our water include:

- **Invest in sewage treatment and in "green infrastructure" that limits the flow of polluted runoff into rivers and streams.** Congress should provide \$6 billion a year in wastewater infrastructure grants, primarily through the Clean Water State Revolving Fund, and should allocate 20% of those funds for green and natural infrastructure projects the U.S. Environmental Protection Agency (EPA) Green Project Reserve.⁶
- **Replace lead service lines** to protect Americans, particularly children, from the damaging lifelong health impacts caused by lead exposure. To do so, Congress should invest \$4.5 billion per year in drinking water infrastructure grants to fund full lead service line replacement, along with \$1 billion per year to help schools replace lead-bearing water fountains and faucets.
- **Repair and replace leaky pipes to conserve water** by increasing funding for the Drinking Water State Revolving Fund, and ensuring that funds go to projects that conserve water rather than those that increase use by expanding reservoirs or building pipelines to untapped sources.

Solid waste: America faces a waste crisis, with China and other nations rejecting imports of our garbage, recycling systems on the ropes, and plastic pollution piling up in our forests, parks, rivers and ocean waters.⁷ Federal projects to help communities get on top of the crisis include:

- **Support community efforts to reduce waste generation and move toward "zero waste"** by providing \$250 mil-

lion in funding for composting infrastructure for food and yard waste, programs to reduce waste, and efforts to promote recycling.

- **Help cities and states improve waste infrastructure** by ensuring full funding for current programs, such as the U.S. Department of Agriculture's Solid Waste Management Grants for rural areas and EPA's Tribal Waste Management Program. Congress should also create new funding opportunities for cities and states to improve their solid waste systems.
- **Encourage the purchase of recycled material through incentives and "lead by example" measures.** The federal government, which spends more than \$500 billion on goods and services each year, can strengthen and expand the market for recycled material by making sustainable purchasing decisions whenever possible.⁸

Natural infrastructure: America's wetlands, forests and rivers – our natural infrastructure – provide invaluable benefits like flood protection and cleaner air and water, and are worthy of protection for their own sake. Projects to protect and enhance the value of our natural land include:

- **Protect 30% of America's land area and waterways by 2030** by establishing this goal in Congress and prioritizing the protection of areas with high ecological, biodiversity, and carbon sequestration value.⁹ The federal government should also build on existing rules, such as the Roadless Area Conservation Rule, to guard against destructive infrastructure on public and undeveloped land.

- **Increase climate resilience through a re-established Civilian Conservation Corps**, which employed 3 million Americans in the 1930s doing work such as forest management, flood control, and planting more than 3 billion trees.¹⁰ A new Corps should be established with a focus on making the nation more resilient in the face of climate change, doing work such as reforestation and restoring other natural areas, and wildfire prevention and response.
- **Increase support for watershed and coastal restoration and protection** with full funding for programs including the National Oceanic and Atmospheric Administration's National Estuarine Research Reserve Program, EPA's National Estuary Program, and the U.S. Fish and Wildlife Service's Coastal Program.¹¹ Congress should also provide additional resources for states to manage their own watersheds and coastal areas by strengthening the National Coastal Zone Management Program.¹²

America can also improve all areas of infrastructure by ensuring that future funding goes to projects that align with public goals, and that proposed projects will not hurt more than they help. In support of this aim, the federal government should restore full environmental review under the National Environmental Policy Act.

The coming decade presents an opportunity to forge a bold approach that addresses the nation's most important challenges while using taxpayer money wisely. Federal policymakers should take advantage of this opportunity to prioritize projects and approaches that deliver lasting benefits for the American people and future generations.

Full list of infrastructure proposals

Energy

1. Invest in renewable energy infrastructure
2. Modernize and strengthen the electric grid
3. Promote domestic manufacturing of clean energy technologies
4. Accelerate the development of offshore wind energy
5. Retrofit U.S. homes and commercial buildings to improve energy efficiency, shift to electric heating, and incorporate renewable energy
6. Establish a rebate program for electrifying industrial technology
7. Maximize the use of renewable energy and energy efficiency at federal facilities
8. Encourage adoption of strong building energy codes to promote energy efficiency and clean energy
9. Establish a grant program for energy efficiency and renewable energy projects in public schools
10. Plug abandoned oil and gas wells

Transportation

1. Repair crumbling roads and bridges and require states to “fix it first”
2. Expand and electrify public transportation
3. Build a national network for electric vehicle charging
4. Expand and improve intercity rail transportation
5. Improve school transportation
6. Help communities make their streets safer for walking and biking
7. Convert unnecessary or damaging transportation infrastructure into new community assets
8. Allow states to manage traffic congestion on interstate highways using modern tools such as congestion pricing
9. Transition federal fleets to electric vehicles
10. Electrify port infrastructure

Water

1. Boost investment in sewage treatment and in “green infrastructure” that limits the flow of polluted runoff into rivers and streams
2. Replace lead service lines
3. Repair and replace leaky pipes to conserve water
4. Protect drinking water sources

Solid waste

1. Support community efforts to reduce waste generation and move toward zero waste
2. Help cities and states improve waste infrastructure
3. Encourage the purchase of recycled material through incentives and “lead by example” measures
4. Support state and local composting programs
5. Provide public water refill stations

Natural infrastructure

1. Protect 30% of America’s land area and waterways by 2030
2. Increase climate resilience through a re-established Civilian Conservation Corps
3. Increase support for watershed and coastal restoration and protection
4. Incentivize sustainable agriculture

| Introduction

IN 2020, AMERICA SUFFERED THROUGH a brutal year of disease, economic disruption and political division.

The transition to new leadership in Washington, D.C., creates the opportunity for the nation to turn the page in 2021. Not just to heal the wounds of the past year, but also to position the nation for a healthy and sustainable future.

Infrastructure investment is a key tool in that process of recovery and renewal.

The federal government can play a critical role in unlocking new investment in infrastructure – especially at a time when local and state governments are in dire financial straits. But it's not enough to launch projects that are "shovel ready." The infrastructure we build must also be "shovel worthy."

COVID-19 has been a stark reminder that our infrastructure choices matter. The air pollution that results from our heavy reliance on fossil fuels made COVID-19 outcomes worse.¹³ Our shortage of park facilities and safe places to walk or bike in our cities and towns made outdoor recre-

ation challenging at a time when indoor gatherings were dangerous. Lack of broadband coverage, poor ventilation in schools, strained medical facilities – all of them were critical infrastructure weaknesses exposed by the pandemic.

America's long-term challenges also reveal the failures of our previous infrastructure policies. The urgent need to address climate change demands that we prioritize new infrastructure that takes advantage of the nation's incredible potential for clean energy. Yet, we often continue to invest in infrastructure that cements our current dangerous dependence on fossil fuels.

America cannot simply build the same old infrastructure in the same old ways. Instead, we must undertake a bold, modern infrastructure plan designed to take on today's challenges. The recommendations included in this report consist of infrastructure projects that can be taken on immediately, and that will not only help the country get back on its feet in the wake of a challenging year, but also position us for a better future.

| An infrastructure plan for America

THE MOMENT IS RIPE FOR A MAJOR, transformative investment in American infrastructure.

Infrastructure investment is broadly supported by Americans of both parties, is critically necessary, and can help repair some of the economic damage caused by COVID-19.

To make the biggest impact, any infrastructure plan must be aimed at addressing the nation's 21st century challenges.

The following projects can help revitalize America's energy, transportation, water, solid waste and natural infrastructure.

Energy

Over just the last decade, America quadrupled its production of clean, renewable energy from the sun and wind.¹⁴ The growth of renewable energy is key to solving many of our most pressing environmental and public health challenges. For the nation to meet its biggest environmental challenges, the federal government must work to accelerate the transition to clean energy.

The following infrastructure projects can help America transition toward a clean, renewable energy system.

Invest in renewable energy infrastructure

The nation needs a visionary and well-funded effort to tap the nation's abundant potential for clean and renewable energy, one that can be realized using a variety of tools including grants and tax credits.

Tax incentives have been key drivers in developing the United States' clean energy sector. As proposed in the GREEN Act of

2020, Congress should extend the wind and solar investment tax credits and wind production tax credit and provide additional tax credit support for offshore wind and energy storage.¹⁵ And, as proposed in the Driving America Forward Act in the 116th Congress, Congress should raise the cap on consumer tax credits for electric vehicles to at least 600,000 vehicles sold per manufacturer.¹⁶ Tax credits for investments in energy efficiency, solar, wind, energy storage and electric vehicles should be extended for a decade to ensure stability and continued growth in this industry.

To help communities deploy clean energy projects, Congress should allocate at least \$7 billion toward U.S. Department of Energy (DOE) Energy Efficiency and Conservation Block Grants.¹⁷ The block grant program, which was funded with \$2.7 billion through the 2009 American Recovery and Reinvestment Act, helped spur a rapid increase in the number of "programs that increased renewable energy capacity, technical knowledge, and deployment of energy efficiency projects at the local level," according to DOE, and created a lifetime cost savings of more than \$5 billion.¹⁸

Congress should also create a program similar to the U.S. Department of Transportation (DOT) Smart Cities Challenge, which funds innovative solutions and transportation systems in mid-size cities.¹⁹ Specifically, the government should offer competitive grants for states, cities and rural communities to implement renewable energy solutions, including solar arrays, wind farms, residential solar deployment, energy storage systems and modernized grid technologies.

Modernize and strengthen the electric grid

America's electricity grid was built to carry electricity from large, central power stations – most of them burning fossil fuels – to customers across a wide area. But a country powered by renewable energy will have generation distributed across wide areas, with a mix of small and large generators that produce energy at different times and in different ways. The nation will need an interconnected, smart grid to manage the supply and demand for clean energy.

The federal government should fund and incentivize the deployment of energy storage systems, which will help balance load on the grid and help renewable energy sources like solar and wind power to serve Americans reliably. Congress should increase support for the Energy Storage Technology Advancement Project, which is a cooperative funding and information-sharing program between DOE and interested states.²⁰ Congress should also ensure the availability of tax credits for energy storage projects for another decade.

Federal loan guarantees can aid in the construction of high-voltage transmission lines, which will be needed to connect renewable energy generation sites to the grid and to the places where power is needed. In 2011, a \$343 million DOE loan guarantee financed the One Nevada Transmission Line, which today helps transmit wind and solar energy from rural to high-load areas.²¹ Congress should expand the availability of loan guarantees for such transmission projects, and should also increase funding programs that invest in grid innovation and improvement projects, such as those operated by DOE's Office of Electricity.²²

A modern electric grid must also be resilient, able to withstand the damage of climate change-fueled storms and able to provide power even when a section is damaged. Investments in grid resilience can provide this reliability, while also helping to create a more modern grid able to quickly integrate energy from renewable sources.

To begin with, Congress should direct DOE and the Federal Energy Regulatory Commission (FERC), in conjunction with the North American Electric Reliability Corporation, to develop grid resilience standards.²³ These standards should incorporate threats to the grid from climate change and climate change-related disasters like wildfires, floods and hurricanes, and should be updated as DOE identifies new threats.²⁴

Congress should provide grant funding to states and communities to strengthen physical grid infrastructure and to deploy grid technology to detect and report disruptions in real time.²⁵ Grid resilience improvement could be funded by grants through DOE's Grid Modernization Initiative, such as the Resilient Electricity Delivery Infrastructure Initiative, which helps fund the deployment of advanced technologies that protect the grid from climate change-related threats.²⁶ As proposed by the House Select Committee on the Climate Crisis, Congress also should direct DOE to establish a demonstration program to develop microgrids, which can utilize distributed and local energy generation to power critical or remote infrastructure even when there is a power outage on the centralized grid.²⁷

Promote domestic manufacturing of clean energy technologies

Incentivizing domestic manufacturing of clean energy technologies can help ensure that America can sustain access to the wind turbines, solar panels, and other technologies necessary for a rapid transition to 100% clean energy.

The federal government should introduce a tax credit for retrofitting, expanding or creating facilities that manufacture such products. Congress should establish a tax credit for the production of clean energy and energy efficiency technologies.²⁸ Congress also should expand DOE grant and loan programs to help American electric vehicle manufacturers start, retrofit or expand production facilities.

The federal government should also develop a national strategy to ensure sufficient and ethical supply of minerals and materials necessary for supporting clean energy manufacturing.

Finally, federal support for manufacturing innovation, including in existing DOE programs, should be increased and directed toward the production of truly clean energy and other sustainable technologies.

Accelerate the development of offshore wind energy

According to DOE, the U.S. has the technical capacity to provide almost double the current U.S. energy demand with current offshore wind technology.²⁹ While many projects are currently in development, as of late 2020 there was only one currently operational offshore wind farm in the country.³⁰

To help grow the industry, Congress should extend and increase the production and investment tax credits for wind. These credits help make offshore wind production more cost competitive and lower the bar-

riers to development.³¹ Additionally, siting and leasing procedures with the Bureau of Ocean Energy Management (BOEM) should be streamlined and coordinated to support offshore wind development and accelerate the pace of construction and implementation. The federal government also should allow continued development of offshore wind in the Southeast and Gulf regions of the U.S.³²

Retrofit U.S. homes and commercial buildings to improve energy efficiency, shift to electric heating, and incorporate renewable energy

The nation's 128.5 million households and 5.6 million commercial buildings account for nearly 40 percent of all energy consumption.³³ Making buildings more energy efficient can significantly reduce national energy use while also saving many consumers money. At the same time, electrifying buildings – switching to electricity for applications like heating and cooking – can help put the nation on a path to eliminating our dependence on polluting fossil fuels.

Congress should invest in federal programs to fund city and state efforts to undertake energy efficiency retrofits and electrification of public and private buildings. For example, the Weatherization Assistance Program used \$5 billion received in the American Recovery and Reinvestment Act in 2009 to weatherize one million homes in just a three-year period.³⁴ Congress should increase funding for this program, and also for the State Energy Program to fund state and local initiatives for electrification and energy efficiency improvements.³⁵

To encourage individual homeowners and businesses to take action, Congress should extend and increase the value of the Section 25C tax credit and the Section 179D tax deduction for investments in energy efficiency.³⁶

Establish a rebate program for electrifying industrial technology

In 2018, direct emissions from the industrial sector - from fuel burned on-site, chemical processes, and leaks - accounted for 22% of total U.S. greenhouse gas emissions.³⁷ Electrifying industrial processes would reduce direct emissions significantly and allow industrial processes to have fewer indirect emissions over time as electricity production transitions to cleaner technologies.

As proposed by the Moving Forward Act in the 116th Congress, Congress should establish a rebate program, administered by the Secretary of Energy, to help businesses cover the cost of switching from fuel-burning machinery and equipment to electric substitutes, and fund the program with at least \$100 million per year for at least four years.³⁸ This rebate program would have immediate and prolonged emissions reduction benefits.

Maximize the use of renewable energy and energy efficiency at federal facilities

The federal government, with more than 350,000 buildings and 600,000 vehicles, is an enormous energy consumer.³⁹ In 2019, federal government buildings used 353 trillion Btu of energy – almost 2% of the total energy used in buildings in the U.S.⁴⁰ Upgrading federal facilities by improving energy efficiency, installing on-site clean energy systems, and electrifying oil- and gas-powered appliances and systems, can reduce the use of fossil fuels, reduce pollution, support the growth of clean energy, and save taxpayers money over the long run.

The process of greening federal facilities can begin by setting a national goal of retrofitting all federally owned and controlled buildings to use electric heating, hot water systems and appliances by 2030 and reducing energy consumption of federal facilities by 50%. As proposed by the House

Committee on the Climate Crisis, Congress should ensure that by 2030 any new, leased or heavily renovated buildings achieve net-zero emissions.⁴¹ Much of this work can be done at no cost to taxpayers, as agencies can enter contracts that pay for upgrades using future energy cost savings created by the project.⁴² Additionally, starting immediately, new federal government buildings should be constructed as zero net energy buildings, a requirement which could come through the Federal Energy Management Program.⁴³

The federal government should also move to ensure that federal facilities are powered by 100% clean energy by 2040. This can be achieved both through renewable generation on site or on federal land – such as solar panels, wind turbines, or geothermal systems – or through renewable energy power purchase agreements or renewable energy credits.

Encourage adoption of strong building energy codes to promote energy efficiency and clean energy

Building energy codes have long been an effective tool to drive energy efficiency improvements in new building. The federal government can use its power to incentivize the adoption of strong building energy codes by local and state governments, including codes to ensure that all newly constructed buildings are zero net energy, and are ready for installation of solar panels and electric vehicle chargers.

According to a U.S. Department of Energy analysis, adoption of energy codes with even modest updates could, from 2010 to 2040, reduce carbon dioxide pollution by 841 million metric tons, an amount the Natural Resources Defense Council calculated as “equivalent to the greenhouse gases emitted by 177 million passenger vehicles driven for one year or the carbon dioxide emissions from 245 coal power plants for one year.”⁴⁴

As recommended by the House Select Committee on the Climate Crisis in its Climate Crisis Action Plan, Congress should provide incentives through the Department of Energy's State Energy Program for state and city governments to update building codes to ensure that new buildings are highly efficient or net zero energy, and are built ready to support on-site clean energy and electric vehicle charging whenever feasible.⁴⁵ Congress should also establish tax incentives for the construction of zero net energy buildings, with the goal of making all new residential and commercial buildings zero net energy by 2030.

Establish a grant program for energy efficiency and renewable energy projects in public schools

School buildings are often large and energy intensive, and helping schools to reduce their power consumption and install on-site renewable energy generation capacity would lower their environmental impact while providing the opportunity to educate students about science and environmental leadership.

Congress should fund a grant program administered by the Secretary of Energy to help schools complete energy efficiency renovations or install renewable energy generation.⁴⁶ An EPA report found that such projects could cut energy use significantly, save school districts money, improve student performance, improve air quality, increase safety and security, provide educational opportunities, and inspire similar changes in the local community.⁴⁷

Plug abandoned oil and gas wells

There are millions of abandoned oil and gas wells across the country, posing continued threats to public health and the environment.⁴⁸ Abandoned wells can contaminate groundwater threatening public health, and also leak significant quantities of methane, a potent global warming pollutant.

For abandoned wells where drilling companies cannot be held responsible for cleanup costs, Congress should create a fund for well plugging and site remediation, with funds available both for states and federal land management agencies.

Provision of funding for states should be contingent on states meeting minimum standards for financial assurance requirements for drilling operations, to ensure that future well plugging and remediation is paid for by the private companies that operate the sites, not taxpayers. Similarly, for drilling on federal lands, the federal government should require private companies to pay for cleanup costs and post adequate financial assurance for well plugging and remediation before drilling starts. Federal officials should also end the practice of "blanket bonding" that provides an unjustified bulk discount on financial assurance.

Transportation

America's transportation infrastructure is in rough shape: Our roads and bridges are in poor repair, and most Americans have no options to get around beyond driving, resulting in pollution, costly crashes, and endless traffic. These problems are in large part due to decades of prioritizing building new roads and other car-centric infrastructure, while failing to properly invest in maintenance and other travel options. Since 1956, nearly nine of every 10 capital dollars spent on transportation has gone toward highways or aviation, leaving low-carbon transportation options such as public transit, walking and biking underfunded.⁴⁹

The following transportation infrastructure projects can give Americans safer, healthier ways to get around, while creating a transportation future that leaves fewer people stuck in traffic.

Repair crumbling roads and bridges and require states to “fix it first”

As many of the roads and bridges built in the mid-20th century near the end of their useful lives, local and state governments are struggling to meet day-to-day infrastructure maintenance needs and often defer necessary repairs, even as they continue to build newer and wider roads. This has led to a roughly half trillion-dollar backlog of highway and bridge repair and rehabilitation.⁵⁰

Congress should incentivize policymakers at all levels of government to adopt “fix-it-first” policies that reorient transportation funding away from the construction of new and wider highways and toward repair of existing roads and associated infrastructure. Specifically, states should be required to focus their National Highway Performance Program funds on repair and rehabilitation until existing roads and bridges are in a state of good repair.⁵¹ States also should be required to set a performance target mandating maintaining or improving the condition of existing assets.

Expand and electrify public transportation

Ensuring that public transit is a viable alternative to automobile travel is one of the most effective ways of reducing air pollution and greenhouse gas emissions. This means enabling cities and transit agencies to add transit routes, build better platforms and stations, dedicate lanes to buses, reduce the cost of riding, and improve the frequency, safety and reliability of transit.⁵²

COVID-19 has put transit agencies that serve essential workers in dire financial peril.⁵³ The first step in any infrastructure plan for transit must be to ensure that transit agencies remain solvent and able to use their existing infrastructure to carry passengers. As recommended by Transportation for America, Congress should provide at

least \$32 billion in immediate emergency operating support for transit.⁵⁴ Agencies also should permanently retain the ability, granted under the CARES Act, to use federal assistance for transit operations as well as capital improvements, encouraging transit agencies to increase service on the bus and rail lines that already exist.

Improving public transit should begin with ensuring maintenance of existing systems. Congress should increase funding to the FTA’s “State of Good Repair” program to address the \$98 billion backlog in needed transit repairs.⁵⁵ To expand transit systems, Congress should increase funding for grant and loan assistance programs, including Capital Investment Grants and Better Utilizing Investments to Leverage Development (BUILD) grants.

Congress also should expedite the allocation of federal grant money for transit projects by easing federal red tape for small-scale transit projects with clear environmental benefits. Funding programs should include requirements that hold state departments of transportation accountable for setting and meeting goals that reduce per capita miles driven. The allocation of federal funding should favor direct financial support to local governments pursuing innovative land-use and demand management transportation programs.

Expansion of American transit should coincide with the replacement of diesel-powered transit and school buses with electric ones, to ensure that public transit contributes to a healthy, zero-emissions transportation system. Electrifying the nation’s bus fleet and powering those buses with clean, renewable energy would improve air quality and public health, eliminating harmful street-level emissions from diesel combustion in buses as well as the approximately 17 million metric tons of greenhouse gas emissions that transit and school buses emit each year.⁵⁶

To electrify transit vehicles, Congress should invest \$400 million in municipal buses by funding the Federal Transit Administration's Low or No Emission Vehicle Program, which helps transit agencies looking to adopt electric buses and install infrastructure. The federal government also should explore opportunities to encourage the electrification of commuter and intercity rail lines where feasible.

Build a national network for electric vehicle charging

To meet its climate goals and shift to a renewable energy future, the U.S. must end the use of fossil fuel-powered vehicles and shift to electric vehicles (EVs). Because they can be powered by clean energy, produce no exhaust and are efficient, adoption of EVs can reduce energy use, greenhouse gas emissions, and emissions of many of the toxic pollutants that fossil-fuel-powered vehicles release into the atmosphere.⁵⁷

Widespread EV adoption will be far slower and more difficult without adequate charging infrastructure. Congress should invest in 21st-century transportation solutions by funding the expansion of EV charging infrastructure. Just as gas stations were ubiquitous in the 20th century, EV charging infrastructure should be now.

Congress should dedicate funding to building out state and regional EV charging networks and corridors, including at rest stops and park-and-rides. Funding should incentivize charging stations to include on-site renewable energy and energy storage, and should be contingent on stations being publicly accessible, using open and interoperable charging standards, and providing open data so that drivers can find available chargers.

Expand and improve intercity rail transportation

America deserves a high-quality intercity rail system. Not only is rail travel convenient and comfortable, but passenger rail is also three times more energy efficient than a car on a passenger-mile basis and uses approximately a third of the energy of air travel.⁵⁸ Passenger rail also promotes walkable, transit-oriented development near rail stations.⁵⁹

Congress should act to improve intercity rail passenger transportation. Specifically, Congress should allocate at least \$19 billion toward a federal grant program for rail improvement and expansion projects, including high-speed rail.⁶⁰ Among other things, these funds should be used for planning, construction, procurement and technological improvements, in particular for electric trains, which emit up to 35% less carbon than their diesel counterparts, and can provide carbon-free transit when powered by renewable energy.⁶¹ Federal officials should help Amtrak to surmount the budgetary challenges posed by COVID-19 without cutting service.

Improve school transportation

Every child should be able to get to school safely and be free from the physical danger and air pollution of heavy traffic near schools.

Congress should provide funding for local investments in programs to improve transportation to and around schools, including Safe Routes to School programs that encourage students to walk or bike to school by improving infrastructure, traffic enforcement and education, and by providing incentives.

Ensuring healthy school transportation requires transitioning away from school buses powered by polluting diesel. As pro-

posed in the Clean School Bus Act of 2019, Congress should allocate \$1 billion over five years for a new Clean School Bus Program, which would provide funding for replacing diesel school buses with electric ones, installing school bus charging infrastructure, and workforce training for maintenance and operation of electric buses.⁶²

Help communities make their streets safer for walking and biking

Walking and biking are healthy and emission-free ways to get around. Yet in far too many places, these travel modes can be difficult, dangerous or simply impossible. In 2018, nearly 6,300 pedestrians and more than 800 cyclists were killed in traffic-related accidents, and these numbers have been on an upward trajectory over the last decade.⁶³

To make walking and biking easier and safer, Congress should establish a \$4.5 billion fund for investing in sidewalks, bike lanes and other features of “complete streets,” as recommended by Smart Growth America.⁶⁴ Congress also should initiate a federal challenge grant program, like the federal Smart City Challenge, for innovative local or state programs to encourage carpooling, transit use, biking and policy strategies to reduce travel demand.

The federal government should pursue lifting limitations and hurdles to the conversion of street space to transit or bike lanes, and should require the adoption of complete street policies as a condition for receiving federal transportation funding. In addition, highway projects should be required to include improvements to pedestrian and cyclist infrastructure and expand access to transit connections. New federally funded road projects should be required to include sidewalk improvements and protected bike lanes where applicable, and transit facilities should be pedestrian- and cyclist-accessible.

Convert unnecessary or damaging transportation infrastructure into new community assets

The highway-building boom of the mid-20th century included the construction of freeways directly through the middle of American cities that uprooted communities, divided neighborhoods, and smothered cities in air pollution. With many of those highways now reaching the end of their useful lives or no longer justified by demand, Americans could be put to work removing those highways and reconnecting communities with parks, “complete streets,” and new housing and public amenities. Cities such as Akron, Ohio; Rochester, New York; Milwaukee and San Francisco have all retired former urban freeways in an effort to revitalize urban neighborhoods.

Congress should provide funding to enable cities and municipalities to convert such highways into connected streets that create space for public transit, walking and cycling, as well as other public amenities. As proposed by the Center for American Progress, Congress should establish a highways-to-boulevards pilot program with \$300 million annually to fund the identification and removal of outmoded highways including funding for planning grants, a technical assistance program, and capital construction grants.⁶⁵ Municipalities, metropolitan planning organizations and local community non-profits should be eligible to apply for this funding, and grants should be conditioned on being able to demonstrate that the streets that replace a highway are capable of supporting transit-oriented, pedestrian-scaled mixed-use development and multimodal connectivity.

Allow states to manage traffic congestion on Interstate highways using modern tools such as congestion pricing

State and local governments often propose highway widening projects to address traffic congestion – even as other, better solutions exist. Congestion pricing – in which tolls are assessed on highways during periods of heavy traffic – is one such tool to clear congestion and encourage more sustainable modes of travel.

The federal government should lift the ban on tolling of Interstate highways and instead encourage and support states and localities in adopting decongestion fees, such as cordon pricing, zone-based pricing and similar policies. Congress should remove jurisdictional hurdles for cities attempting to institute local congestion pricing programs in instances where state and federal highways intersect with local transportation grids. In addition, Congress should incentivize congestion pricing by allocating funds to match local revenues raised through such programs.⁶⁶

To further reduce rush hour traffic, the federal government should encourage or require employers to reduce employee commute trips in single-occupancy vehicles. Congress should repeal the commuter tax benefit that encourages employees to drive to work, a source of revenue that could alleviate some of the costs of infrastructure expansion.

Transition federal fleets to electric vehicles

The federal government operates more than 600,000 vehicles, which consumed more than 370 million gallons of gasoline and diesel in 2019.⁶⁷ By greening federal fleets and installing EV charging, the federal government can both reduce emissions and drive large-scale adoption of clean vehicle technology.

The law currently requires that 75% of all new light-duty vehicles purchased by the

federal government be “alternative fuel” vehicles.⁶⁸ This includes hybrid electric vehicles, fuel cell vehicles and others. Plug-in electric vehicles, however – the cleanest of all alternative fuel technologies – currently make up less than 1% of the total federal fleet, and in FY2018 accounted for a tiny fraction of new vehicle acquisitions.⁶⁹

The federal government should require that by 2025 all new purchases of federal vehicles be plug-in electric vehicles (with exceptions where necessary for military or emergency vehicles). Congress should provide funding for the federal government to ensure the availability of EV charging infrastructure at or near all federal facilities for both federal employees and the public.

Electrify port infrastructure

The nation’s commercial ports are a major source of greenhouse gas emissions and other air pollutants, including fine particulate matter, nitrogen oxides and other toxic emissions that endanger the millions of Americans living or working near these facilities. Significant reductions in emissions can be made if ports replace their older, diesel-powered equipment and infrastructure, such as drayage trucks, rail infrastructure, cargo handling equipment and harbor craft, with electric alternatives.⁷⁰

Congress should take steps to advance port electrification, providing direct funding and incentives through the Departments of Energy and Transportation to cut emissions of greenhouse gases and other pollutants from ports and their associated infrastructure. Congress should increase federal funding for existing sources of assistance such as the EPA’s Diesel Emissions Reduction Act (DERA) grant program, DOT’s BUILD Transportation Discretionary Grant program and Congestion Mitigation and Air Quality Improvement (CMAQ) program, and DOE’s Clean Cities program.

Water

America badly needs to invest in water infrastructure. The drinking water of millions of Americans is threatened by water pipes made from lead. Sewage overflows and runoff pollution from sprawling development harm our waterways and public health. Leaking pipes waste a significant amount of clean, treated drinking water, straining precious resources and wasting money. Water is a critical resource, but too often the nation's aging water infrastructure system wastes it, pollutes it, or fails to deliver it safely to our homes, schools and businesses.

The following infrastructure projects can help ensure that water is safely and efficiently delivered to our homes, and that our sewage systems perform as they should.

Boost investment in sewage treatment and in “green infrastructure” that limits the flow of polluted runoff into rivers and streams

Nearly 860 municipalities in the U.S. continue to use combined sewage systems that are designed to overflow during heavy precipitation, and the EPA estimates that as many as 75,000 sanitary sewer systems overflow each year.⁷¹ According to the EPA, these overflows contribute to “beach closures, contamination of drinking water supplies, and other environmental and public health concerns.”⁷²

Congress can dramatically improve America's aging sewage infrastructure by investing \$6 billion a year in wastewater infrastructure grants, primarily through the Clean Water State Revolving Fund.⁷³ This fund can provide assistance to states to fund their highest priority water quality needs, including wastewater infrastructure.⁷⁴ As much as possible, Congress should designate this funding as grants rather than loans to ensure that our nation's most urgent pollution problems are ad-

dressed, regardless of the state of municipal finances. In addition, at least 20% of those funds should be prioritized for green and natural infrastructure projects through the EPA's Green Project Reserve.⁷⁵ Green infrastructure projects like tree plantings or rain gardens, and natural infrastructure projects like wetland restoration, not only help stop sewage overflows but also prevent runoff pollution from flowing directly into local rivers and streams.⁷⁶

Replace lead service lines

Many water lines across the U.S. are nearly 100 years old and still contain lead, and there are approximately 9.3 million lead service lines (pipes that connect buildings to a main water line) still in use in the U.S.⁷⁷ Exposure to even low levels of lead has negative impacts on human health – especially the health of children – including slowed growth, learning disabilities, problems with hearing, lower IQ, and seizures.⁷⁸ In addition, most public schools have at least some lead in their pipes, plumbing, or other fixtures.⁷⁹ While federal regulations only require remediation when testing confirms lead concentrations above 15 parts per billion, no level of lead is safe for children.⁸⁰

Congress should invest \$4.5 billion per year in drinking water infrastructure grants to fund full lead service line replacement. The grants should also be used to provide point-of-use filters in all homes and childcare centers that have lead service lines. This can be done through the Drinking Water State Revolving Fund or a separate grant program. Since children are particularly vulnerable to lead poisoning, Congress also should invest \$1 billion over five years to help schools replace lead-bearing water fountains and faucets with water hydration stations with certified filters. In addition, grants should be used to conduct mandatory lead testing and to address any lead contamination problems that are identified.⁸¹

Repair and replace leaky pipes to conserve water

Underinvestment in the maintenance of water pipes results in leaks that lose 6 billion gallons of treated drinking water every day.⁸² When coupled with the amount of water lost from the estimated 240,000 water main breaks that occur annually, the amount of treated drinking water wasted by under-maintained water pipes every day could serve 15 million households.⁸³ According to the EPA, the nation's water pipes need \$312.6 billion in investment over the next 20 years to replace or refurbish aging and leaking infrastructure.⁸⁴

To provide communities with the resources to undertake crucial drinking water infrastructure projects, Congress should increase funding for the Drinking Water State Revolving Fund, which aids with projects including the replacement of old pipes. Funding must be provided only to the right projects. For example, projects seeking funding to bring more water into a drinking water system by expanding reservoirs or building pipelines to deliver water from a river should instead be diverted towards increasing efficiency of existing water infrastructure by repairing leaking pipes.

Congress also should support and expand alternative financing methods, such as the Water Infrastructure Finance and Innovation Act (WIFIA), which allows for communities to package up loans for larger water projects.⁸⁵ Establishing other funding sources, such as a clean water trust fund to provide a permanent funding source, can help ensure continued progress in providing safe, clean drinking water for all Americans while minimizing waste. In addition, the federal government should

support other means of reducing water waste, such as improved irrigation and transitioning to wind and solar energy for electricity generation.

Protect drinking water sources

Many rivers, lakes and streams that help provide drinking water are at risk from facilities such as toxic chemical storage locations, factory farm manure lagoons, pipelines and coal ash ponds. Protecting our drinking water sources from risky facilities and operations not only safeguards against leaks and catastrophic spills, but also helps keep water clean and reduces the cost and complexity of water treatment.⁸⁶

To protect drinking water sources, the federal government should enhance safeguards to protect all bodies of water located in source water protection areas. Congress should increase funding for water utilities to acquire land or establish conservation easements near drinking water sources, including through the Drinking Water State Revolving Fund.⁸⁷ The federal government also should use its existing powers under the Safe Drinking Water Act, anti-degradation provisions of the Clean Water Act, and other laws to prevent the location of dangerous facilities and operations near drinking water sources. The EPA should require water utilities to implement robust source water protection plans with such policies.

Other critical safeguards for water sources include requiring industry to use safer alternatives to toxic chemicals, placing a moratorium on large-scale livestock operations, especially those with manure lagoons, and prohibiting open waste pits and other oil and gas operations that put water at risk.

Solid waste

The United States accounts for 12% of the world's trash, despite having only 4% of the world's population.⁸⁸ And in 2018, Americans produced 292 million tons of waste, only a third of which was recycled or composted.⁸⁹

America's waste problem results both from a shortage of modern recycling and composting facilities, as well as continued policies that make it difficult to reduce the amount of waste created in the first place. Many Americans lack access to recycling programs, and many recycling facilities are out of date and unable to process common materials such as glass, cardboard and e-waste. Few Americans have access to composting programs, leading to the disposal of organic material in landfills where decomposition of the material can contribute to climate change.

Moving toward a zero-waste society would reduce the demand for virgin materials – reducing pressure to log forests or drill for oil – while also curbing litter and pollution.

The following solid waste infrastructure projects can help build a future in which less waste is created, and more waste is handled sustainably:

Support community efforts to reduce waste generation and move toward zero waste

To address our growing waste crisis, the U.S. must look not only to improve the handling of waste, but also to decrease the amount of waste generated in the first place. Doing so can help the nation get on a path to a circular, zero-waste economy in which less is consumed, all products are built to last and are easy to reuse and repair, and all materials are reused, recycled and composted in a continuous cycle.

Congress can dramatically improve U.S. waste reduction capability by providing

\$250 million in funding to help communities get on the path to zero waste, as proposed in the Zero Waste Act of 2019.⁹⁰ Competitive grants would fund composting infrastructure and programs to reduce waste and promote recycling through better access, sorting, and end market development for proven recycled materials like metals, glass, and paper. Grants should exclude incineration and waste-to-fuel or feedstock technologies, often known as “chemical recycling,” activities that create pollution and maintain incentives for creating waste. Funding could be administered through the EPA, which is well-suited to solicit bids and provide program oversight.

Help cities and states improve waste infrastructure

As the coronavirus pandemic has reduced local government revenue, recycling and waste pickup programs have been cut, even as people are creating more household waste than ever before.⁹¹

To ensure that communities around the country can effectively deal with waste, Congress should ensure full funding for current programs, such as USDA's Solid Waste Management Grants for rural areas and EPA's Tribal Waste Management Program. Congress also should create new funding opportunities for cities and states to improve their solid waste systems. These programs should be fully funded and expanded until all communities have easy and sanitary ways to sustainably dispose of household waste.

In addition, the federal government should set ambitious national recycling rate targets and dedicate funds to cities and states to improve their educational outreach. Funding should also be made available to recycling companies looking to expand their operations and upgrade to modern technology.

Encourage the purchase of recycled material through incentives and “lead by example” measures

A strong market for recycled materials provides a natural incentive for recyclers to expand and reduces the environmental impact of a wide range of products.

The federal government, which spends more than \$500 billion on goods and services each year, can strengthen and expand the market for recycled material by leading by example and making sustainable purchasing decisions whenever possible.⁹² For example, the federal government should strengthen its existing “buy recycled” policies, which require federal agencies to purchase recycled materials whenever possible. Federal officials also should implement minimum recycled content standards for government procurement of items that can be made of certified recycled material and include recycled content in procurement bid specifications.

Beyond procurement, the federal government also should designate minimum recycled content standards to encourage companies to purchase recycled materials. As proposed in the Break Free from Plastic Pollution Act of 2020, Congress should require a certain percentage of recycled content, increasing over time, to be used in the manufacturing of new PET plastic bottles and containers.

Congress also should create tax credits for the purchase of certified recycled materials, especially where standards may not yet apply. For example, the state of Montana allows an income tax deduction for recycled materials purchased as a business expense.⁹³ By expanding the market for certified recycled materials, a similar federal tax credit would give recyclers and re-manufacturers the stability to invest in advanced technologies and materials.

Support state and local composting programs

Compost can replenish and stabilize soil, helping to boost and sustain food production in the future while reducing dependence on chemical fertilizers. Composting reduces the landfilling of organic waste and can help pull carbon out of the atmosphere, helping to tackle global warming.⁹⁴ By diverting material away from the waste stream, composting also reduces the burden on trash collectors, haulers and landfills.⁹⁵ And the infrastructure investments to get composting programs started are often far cheaper and simpler than those needed to create recycling programs.⁹⁶ Currently, however, only a third of total compostable waste each year is composted, and only 6% of food waste is composted.⁹⁷

To give more Americans access to local composting, Congress should increase federal funding for state and local composting programs and necessary infrastructure, including for existing USDA programs that help develop and test municipal composting. Municipal composting programs have been successful — San Francisco mandated composting in 2009 and now composts more material than it recycles.⁹⁸

The USDA and leading cities should collaborate and develop best practices for curbside composting, including for educational messaging and collection logistics. These resources can help cities implement curbside composting programs efficiently and successfully as funding and grants become available.

Congress should strengthen and increase support for food waste reduction programs, such as the U.S. Food Loss and Waste 2030 Champions program, a joint effort of the USDA and EPA.⁹⁹

Provide public water refill stations

Every day, Americans drink 70 million disposable plastic bottles of water, which wind up as litter or in a landfill.¹⁰⁰ The U.S. spends billions of dollars cleaning our tap water to high standards, and reusable water bottles are increasingly popular and commonplace. But many public locations lack water fountains that make it easy to refill water bottles.

The federal government should commit to expanding the number of public water refill stations in national parks, on public lands and in federal buildings. Congress should offer grants to local governments and school districts to build more public water refill stations. These efforts will reduce plastic pollution and encourage more sustainable consumer habits.

Natural infrastructure

The term “infrastructure” may conjure images of concrete and steel, but America’s open, wild and green spaces are a form of infrastructure, too. America’s natural places provide incredible benefits. Forests improve air quality and serve as valuable carbon sinks, mitigating over 11% of the U.S.’s total carbon emissions in 2017.¹⁰¹ Wetlands can help prevent flooding and remove excessive nutrients from water before it ever enters a treatment plant. In one example, the EPA found that a single wetland in South Carolina removed the same amount of pollutants from the watershed naturally as would a \$5 million treatment plant.¹⁰²

Yet America’s natural areas are at risk. From 2001 to 2016, the lower 48 states lost more than 11,000 square miles of undeveloped land, more than the area of Massachusetts.¹⁰³ Coastal zones have lost thousands of acres of critical natural areas, including 640,000 acres of wetland between 1996 and 2016.¹⁰⁴ Our public lands are increasingly threatened by resource extraction activi-

ties. For example, over the last decade, oil production on publicly owned lands has increased by 60%.¹⁰⁵ Recent federal actions have eroded protections for natural lands and ocean waters, with the Trump administration having moved to open up previously protected ocean areas to offshore drilling and commercial fishing.¹⁰⁶

The following projects and policies can help protect and restore America’s natural infrastructure.

Protect 30% of America’s land area and waterways by 2030

To protect and restore America’s land and water, Congress should establish a goal of protecting 30% of the nation’s land and ocean areas by 2030, prioritizing areas with high ecological, biodiversity, and carbon sequestration value.¹⁰⁷ This aligns with the goal of an international effort to protect 30% of the planet by 2030.¹⁰⁸

The federal government should also protect and build on existing rules to guard against destructive infrastructure, such as the Roadless Area Conservation rule and the Clean Water Act. New protections should be adopted to prohibit harmful infrastructure on public lands, such as banning the auction of vulnerable public lands for oil and gas exploration by the Department of Interior.

Increase climate resilience through a re-established Civilian Conservation Corps

The Civilian Conservation Corps, established in 1933, employed 3 million Americans doing work such as forest management, flood control, and planting more than 3 billion trees.¹⁰⁹ Now in 2020, a similar effort can help restore America’s natural infrastructure with a focus on responding to the threat of climate change.¹¹⁰

Congress should re-establish the Civilian Conservation Corps with a focus on making

the nation more resilient in the face of climate change, doing work such as resource restoration, reforestation, and wildfire prevention and response. A similar effort could also be established through the Corporation for National and Community Service. As described by the House Select Committee on the Climate Crisis, a new AmeriCorps program called the Climate Resilience Service Corps could “harness the power of students and volunteers” to carry out service projects focused on climate resilience as well as climate impacts education.¹¹¹

Increase support for watershed and coastal restoration and protection

Watersheds and wetlands provide wildlife habitats, mitigate flooding, and protect drinking water by filtering water pollutants.¹¹² Ocean and coastal ecosystems, for example, protect shorelines from flooding during storms and act as carbon sinks, helping slow the process of climate change.¹¹³

To restore and protect watersheds, wetlands, and ocean and coastal areas, Congress should fully fund programs including NOAA’s National Estuarine Research Reserve Program, EPA’s National Estuary Program, and the U.S. Fish and Wildlife Service’s Coastal

Program.¹¹⁴ Congress also should provide additional resources for states to manage their own watersheds and coastal areas, including by strengthening the National Coastal Zone Management Program.¹¹⁵

Incentivize sustainable agriculture

American agricultural practices threaten public health and the environment in a variety of ways, from aquifer and topsoil depletion, to pollution of rivers and streams, to the misuse of antibiotics. While the current farm bill includes funding for farmers to adopt more sustainable agricultural practices, the current system of direct payments has not been enough to drive significant improvements.¹¹⁶

To create a more sustainable agricultural system, Congress should increase funding to USDA conservation programs that send funds directly to farmers and boost a range of on-farm conservation programs, placing a priority on payment rates for resource-conserving crop rotations and cover crops. Congress also should expand the Conservation Reserve Program, which incentivizes farmers to preserve environmentally sensitive areas. And Congress should incentivize the incorporation of energy efficiency and renewable energy on farms.

| Making smart infrastructure choices: Four principles for future investment

AN IMMEDIATE PROGRAM OF

infrastructure investment – such as the one proposed in this paper – could play an important role in bringing the nation together across partisan divides, help the nation emerge stronger from the COVID-19 pandemic, and make a down payment on the critical investments needed to build a healthy, sustainable future in the 21st century.

But improving America's infrastructure is a long-term task. To ensure that all infrastructure spending – whether it comes in the form of COVID recovery spending or permanent changes to infrastructure policies – serves the public interest, public officials should adhere to four key principles:

Principle 1: Only build infrastructure that accomplishes the goal of creating safer, healthier and more sustainable communities.

Infrastructure projects can be used to accomplish a number of outcomes. Often, discussions of why we should build infrastructure hinge on temporary job creation, the potential to attract investment, or spurring economic growth.

Infrastructure investments, however, last 20, 50, even 100 years. Responsible infrastructure serves long-term purposes, and solves our most pressing problems so as to make future generations better off.

America has neither the money nor the time to waste on infrastructure investments that do not advance public interest goals, or worse, run counter to them. The obligation to protect public health, enhance safety and ensure sustainability is a commitment not only to today's communities, but also to the future wellbeing of the nation as a whole.

RESTORE FULL ENVIRONMENTAL REVIEWS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

One important way to ensure infrastructure spending follows the principle of creating safer, healthier and more sustainable communities is to require adequate review of infrastructure projects. In support of this aim, Congress should reverse the recent rule change to the National Environmental Policy Act, or NEPA, which eliminated the requirement to assess climate impacts of federal projects and narrowed the range of projects that required review. Only with detailed reviews and extensive publicly available information on project impacts can the public be sure that proposed infrastructure spending will serve the public interest.

Principle 2: Fix it first.

America has spent trillions of dollars building infrastructure that we have allowed to fall into disrepair.

Government investment has long favored new construction over maintenance projects. For example, between 2009 and 2017, the nation's public road network grew by nearly 225,000 lane-miles, even as the percentage of the nation's roads in poor condition grew from 14% to 20%.¹¹⁷ These decisions not only put the safety of the citizens who use this infrastructure at risk, but also waste taxpayer dollars. A recent study found that when it comes to the nation's roads, preventive maintenance – that is, investing in maintenance when a road's condition drops from "satisfactory" to "fair" –

can save money down the line. For every \$1 spent on preventative road maintenance, as much as \$10 is saved on rehabilitation once the road's condition becomes serious.¹¹⁸

Deferred maintenance has resulted in significant waste of resources and maintenance backlogs across all categories of infrastructure. **Repairing existing, useful infrastructure should be the first step in addressing the nation's infrastructure needs.** Decision-makers should prioritize repair, rehabilitation and maintenance of current infrastructure. This policy is referred to as "fix-it-first."

Adopting a "fix-it-first" policy not only helps to ensure the safety of the citizens that utilize the infrastructure that's already present in their communities, but also ensures that we get the most value out of what we have already built.

Principle 3: Avoid building infrastructure that will need to be abandoned before the end of its useful life.

The United States is undergoing rapid change – in technology, public opinion and even the climate itself. While some changes are unpredictable, others can be easily foreseen.

Failing to foresee upcoming changes leads to the creation of stranded assets – those that become worthless or counterproductive before the end of their useful lives.

Policymakers should identify classes of assets that are likely to become stranded and minimize investment in those areas.

The most pressing change shaping how government needs to shift its infrastructure investments is the threat of global warming. Stranding already existing assets such as coal and gas-fired power plants, fracking wells, and oil and gas pipelines over time is a responsible and necessary decision, one that requires policy attention. Continuing to invest in maintenance and upgrades to these

facilities could divert resources from needed investments in clean, renewable energy.

Investing in new fossil fuel infrastructure that will soon be made irrelevant by the urgent need to respond to the threat of global warming is also unjustifiable.

While some important changes cannot be anticipated, decision-makers must do what they can to ensure that all infrastructure investments will be as useful as possible for as long as possible.

Principle 4: Get the most out of our existing infrastructure.

New infrastructure investment is often exciting. From sweeping promises of job creation and economic revitalization to ribbon-cutting ceremonies, building something new is often attractive for politicians and compelling to the public. However, new construction is not always the best, most efficient answer to solving critical problems.

For example, too often our approach to highway construction has been to widen, expand and build new in order to lessen congestion for the few hours of rush hour traffic a day, leaving the road to sit near empty all other hours. We've built sprawling developments, constructed miles of highways, water pipes and power lines to service the suburbs while we fail to reinvest in our existing cities and towns.

Building the biggest, most expensive infrastructure is rarely the most deliberate approach available to meeting a community's needs. Using our existing infrastructure more efficiently can often reduce the amount we need to spend to build more with the same results.

Since the early 1990s, New York City has invested \$1.7 billion in preserving the "natural infrastructure" of forested land

in the Catskill Mountains. The lakes and reservoirs provide 90 percent of drinking water to the nation's largest city, almost entirely unfiltered, saving the city over \$10 billion on the construction of a water filtration plant, and additional maintenance and operational costs each year.¹¹⁹

Policies that alter the public's use of infrastructure can also help avoid unnecessary construction. Highway widening has long been known to be an ineffective solution to congestion, as the additional lanes simply

draw new cars to the road that cause traffic to reemerge.¹²⁰ Pricing of travel on busy highways, on the other hand (see page 14), can address congestion by encouraging people to share rides or to shift travel to less congested periods of the day when congestion fees are lower.

It is time for a new approach to federal investment in infrastructure – one that doesn't build more than we have to and that actively seeks ways to get the most out every dollar spent.

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