



SEEC Sustainable Infrastructure Principles

As members of the Sustainable Energy and Environment Coalition (SEEC), we believe Congress has a major opportunity to develop an infrastructure package that charts a sustainable, prosperous path forward for our country. A sustainable infrastructure package would enhance the well-being of our communities through investments that improve the health and safety of both people and the planet while creating family-sustaining jobs and economic opportunities.

While the President seeks to advance a broad infrastructure proposal for America, Congress must ensure that it reflects principles that promote sustainability, healthy communities, and environmental protection. We believe that any such infrastructure investment must be:

- **Environmentally sustainable.** We all need clean air, water and soil for a healthy life, and our country's natural beauty and wildlife are a point of pride that we must preserve for future generations. It is unnecessary and untenable to ask Americans to sacrifice clean water, soil, and air, or healthy communities and wildlife, as a cost of infrastructure improvements. On the contrary our infrastructure should improve the health and resilience of our communities and our wildlife; it should ensure that controls are in place to mitigate or avoid contamination, and promote resilience in the face of flooding, severe storms, erosion, and future development patterns. Infrastructure should, where possible, utilize resilient and renewable materials that reduce waste and long-term costs. Planning must also incorporate natural infrastructure solutions and ways to harness the economic benefits of ecological services provided by natural systems. Coastal wetlands, for example, help filter pollutants out of drinking water and provide a flood buffer against storms and floodwaters. Protecting wetlands and restoring those that have been degraded can be an infrastructure investment with low costs but high pay-off.
- **Consistent with environmental justice principles that protect a clean environment and economic opportunity for everyone.** Infrastructure should strengthen not harm our communities. Project planning must look to reduce pollution everywhere, and should be particularly mindful of protecting communities of working people with historically less political power and wealth and more exposure to environmental hazards. It's only fair that we ensure equal access to clean air and water and a healthy environment. Planning

should also promote improvements and economic development in communities most affected by the construction of new infrastructure. Local stakeholders must be involved in infrastructure project development, and access to the courts and the judicial process must be protected. Infrastructure investment should prioritize the improvement of systems that are currently failing vulnerable populations, for example, water pipes associated with lead contamination, and it should help ensure affordability of critical services.

- **Economically sustainable.** Smart infrastructure investments today can spur innovation, create jobs, and strengthen local economies for decades to come. Investing in infrastructure to support wind and solar power, for example, will not only immediately create important jobs in infrastructure construction, but it will also support long-term economic development through job creation in these industries, increased landowner revenue, and a higher local tax base. And investments in clean infrastructure will save Americans money on healthcare as we reduce exposure to hazardous pollution. To further encourage economically sustainable development that supports working families, a sustainable infrastructure plan should also ensure strong labor and procurement standards and support project labor and community benefit agreements. Any infrastructure proposal should protect working people while they are on the job and the paycheck they bring home. Rolling back workplace protections, wage protections under the Davis-Bacon Act, and infringing on the right of workers to organize have no place in an infrastructure plan. We should look to support projects with maximum benefit for our communities.
- **Focused on Building Resilient Communities.** Additionally, any infrastructure proposal must also plan for the long-term cost and maintenance of new infrastructure. Projects should incorporate sustainable design principles, such as low-impact development, and resiliency to anticipated weather and climate conditions, including flooding, storm surge, and high temperatures. Communities cannot afford to rebuild after every storm, nor can they afford the disruption to lives and livelihood that happens when poorly planned projects fail to withstand severe conditions. The federal government must promote smart planning and investment to help communities build in ways that will weather future conditions and it should also help ensure that local communities have adequate resources to maintain and operate new assets for years to come.

We are alarmed by proposals that include rollbacks of core environmental safeguards. In most cases, this means excluding projects from public input and important environmental review under the National Environmental Policy Act (NEPA), the Clean Water Act and the Safe Drinking Water Act, weakening the Endangered Species Act, or blocking the public's ability to hold the government accountable to these laws in the courts. Too often, these laws have been treated as scapegoats for the long timelines of major infrastructure projects when in fact, lack of adequate funding is by far the biggest barrier to project completion. The vast majority of transportation projects—96%—do not even require a full Environmental Impact Statement (EIS) under NEPA. In these rare cases where an EIS is required, it provides a critical opportunity to

evaluate and mitigate environmental impacts, solicit public participation, and, ultimately, improve projects. Our foundational environmental laws, and the processes they have set in place, are key to making sure we properly assess a project's benefits and costs to our communities and the natural world.

Gutting these foundational laws will not promote a sustainable or economically efficient approach to infrastructure, but will instead exact higher costs on our communities and environment in the future. Americans support the notion that strong environmental protections produce better infrastructure, which protects communities and the environment while saving taxpayer money. We don't have to choose between a safe, clean environment and job-creating infrastructure investments – we can and must have both. Therefore, our coalition opposes efforts to undermine these laws in an infrastructure package, and urges the exclusion of any provisions that damage or weaken environmental and public health protections.

Federal investment in infrastructure has been declining for decades, from about 4.2% of GDP in the 1930's, to 2.9% in the 1960's, to 1.5% in 2016. While we support the goal of incentivizing state, local, and private investment in infrastructure, we believe these efforts should not justify or excuse major reductions in related federal investments - such as the cuts that the Trump Administration earlier proposed to transit and passenger rail - or result in burdensome responsibilities for state and local communities with fewer financial resources. New investment sources should supplement, not replace, federal investments. Strong federal investment can ensure that projects are completed on-time and support family-sustaining jobs in local communities.

We believe the United States can lead the world in ushering in the next generation of sustainable infrastructure that will allow us to remain a global economic leader. Many of the challenges our nation confronts today can be addressed at least in part by smart planning and investments in sustainable infrastructure. To that end, we present a forward-thinking infrastructure proposal that embraces proactive policies that advance the best interests of American families and our position as a world leader. Enclosed for review are a series of policy proposals across infrastructure categories that provide specific examples of how we could achieve a truly sustainable infrastructure plan.*

The Sustainable Energy and Environment Coalition (SEEC) is a group of 55 Members of Congress who have joined together to promote policies that encourage responsible environmental stewardship and innovative clean energy strategies.

*Please note that the bills cited in this document are not necessarily SEEC endorsed bills, but were included because of their relevance to the topics and their inclusion of at least some components SEEC's above outlined principles.

Policy Proposals - Table of Contents

Sustainable Grid Infrastructure & Modernization	5
Drinking Water Infrastructure	7
Wastewater and Stormwater Systems	10
Brownfields and Superfund Reclamation	14
Building Efficiency	16
Waste Infrastructure	19
Passenger Surface Transportation	21
Freight Infrastructure	25
Public Lands	27
Natural Infrastructure	29
Broadband Infrastructure	32
Ports and Waterways	34

Sustainable Grid Infrastructure & Modernization

Current Situation & Challenges

Americans depend on a resilient, reliable, and affordable electric grid because it touches every part of our lives. However, our aging electrical grid is in desperate need of modernization. The American Society of Civil Engineers assigned America's energy infrastructure a D+ grade, citing aging equipment, maxed-out capacity of transmission lines, and a need to deploy new forms of energy and establish climate and storm resilient systems [1]. Rapidly emerging clean energy technologies, population growth in cities, the burgeoning electrification of transportation, and the introduction of new electrical devices have elevated the need for modernization and upgrades [2]. Despite significant growth in clean energy generating capacity, efforts to match this growth on the electrical grid have fallen short, wasting valuable energy resources because of a lack of sufficient and updated transmission, storage, and distribution. All of this further contributes to higher rates of "significant outages" across the country, posing threats to families, businesses, water treatment facilities, hospitals, educational institutions, and others who depend upon reliable and resilient power [3].

Opportunities & Innovations

A reliable, resilient, and flexible electric infrastructure that improves efficiency, lowers emissions, allows for greater penetration of low carbon sources, and can withstand climate impacts will benefit our society long-term and mitigate the threat of climate change. It will improve our ability to protect and maintain the health and safety of our communities, particularly in times of emergency. However, additional work and investment on the federal level is needed to ensure a modernized grid that is capable of transitioning the United States to a sustainable energy future. A national grid modernization effort must prioritize strengthening grid reliability and resiliency through integration of clean energy resources, expansion of long-distance, high-voltage transmission, and enhanced system operations. New technology such as smart grid projects, energy storage, local microgrids, efficiency, water-energy nexus projects, advanced transmission technologies, and new building materials can all serve to achieve these ends. The investments necessary to bring the power and electrical grid to a B grade are estimated to create nearly 1.1 million job-years across the U.S. economy over the next 10 years [4]. There is also tremendous potential in engaging consumers and expanding their choices for power consumption and production, including demand response, smart thermostats, distributed energy resources, and other technologies. Inclusion of these technologies will ultimately lead to consumer savings, job creation, cleaner air and healthier communities, and increased grid resilience in the wake of natural disasters and human threats to our electricity infrastructure.

Policy Solutions

We believe that the path to a more sustainable, reliable, and resilient grid can be achieved by:

- 1) Increased deployment of clean energy sources, in part through continued transmission and distribution development
- 2) Integration of storage technologies that enhance system flexibility;
- 3) Smart grid technology that contains meters, transducers, and synchphasers and frequency control, which allow for increased transmission and distribution efficiency; and
- 4) Assimilation of

microgrids, which help in the event of outages or disruptions and ease the integration of different sources of energy. Specific examples of some existing policy proposals may be found in the appendix.

Examples of innovative solutions can already be found across the country. The state of Texas has implemented a new transmission system that better integrates its wind energy resources [5]. The effort built approximately 3,600 miles of new transmission lines that can send 18,500 megawatts of wind power across the state [6]. Additionally, Southern California Edison has engaged in replacing traditional electric meters with next-generation smart devices that allow customers with smart, communicating thermostats and appliances to set them to respond automatically to periods of peak pricing and grid emergencies, reducing overall peak demand on their grid [7]. While we find it encouraging that entities at the state and utility level have begun modernization efforts, the patchwork of successes is not ultimately conducive to resilient, reliable, clean-energy electrical systems. Federal investment is necessary to ensure that we are developing a grid infrastructure that is safe, clean, resilient to future conditions, supportive of emerging technologies, and works for American families and businesses, and it should be a central part of any serious infrastructure proposal.

Congressional Proposals

- 1) H.R. 2507, the 21st Century Power Grid Act (Rep. Sarbanes)
- 2) H.R. 3314, 100 by '50 Act (Rep. Polis)
- 3) H.R. 3290, to require the Secretary of Energy to initiate the development of voluntary model pathways for modernizing the electric grid (Rep. McNerney)

[1] <https://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Energy-Final.pdf>

[2] DOE Final Report: "The Future of the Grid: Evolving to Meet America's Needs".

https://www.smartgrid.gov/files/Future_of_the_Grid_web_final_v2.pdf

[3] <http://www.npr.org/2016/08/22/490932307/aging-and-unstable-the-nations-electrical-grid-is-the-weakest-link>

[4] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[5] <https://www.texastribune.org/2013/10/14/7-billion-crez-project-nears-finish-aiding-wind-po/>

[6] Ibid.

[7] <https://www.edison.com/home/innovation/grid-modernization-at-southern-california-edison.html>

Drinking Water Infrastructure

Current Situation & Challenges

Aging and failing drinking water infrastructure poses a significant risk to the health of millions of Americans that depend on public water systems. In 2013, EPA estimated \$384.2 billion needed in the next 20 years to keep systems in working order. That represents a real increase of about \$157 billion dollars since EPA's first assessment was released in 1995, making it clear that investment has not kept pace with need.[1]

This growing need is the result of decades of neglect of water infrastructure by the federal government. In 2014, the Congressional Budget Office estimated total government spending on water infrastructure, both drinking and wastewater, at \$108.9 billion. However, the federal share of public investments in water infrastructure has fallen steadily, from 6-7% in the early 2000s to just 4% in 2014.[2]

Today, many pipes are at or beyond their expected useful life, resulting in the loss of an estimated 7 billion gallons of clean drinking water through leaks every day. On top of leaks, an estimated 240,000 water breaks occur annually. In 2017, the American Society of Civil Engineers gave America's water infrastructure a D grade.[3]

In addition to concerns over the conditions of the infrastructure, EPA has also failed to set contaminant standards which are needed to protect public health. These include emerging contaminants, such as perfluorinated compounds and perchlorate, as well as inadequately regulated threats such as lead. There may be as many as 10 million lead service lines in use. Lead lines and components have caused health crises across the country. Flint, Michigan is a notable and tragic example, and a recent Reuters investigation found nearly 3,000 U.S. locales with elevated rates of lead poisoning due to lead water lines, lead-paint and industrial waste. As infrastructure ages and corrodes, more lead can leach into drinking water. Natural Resources Defense Council estimated that in 2015 more than 18 million Americans were served by water systems that violated the Lead and Copper Rule.[4]

Many systems and local governments operate on a limited budget, and their small budgets are often used to conduct emergency repairs. Few opportunities exist for preventative maintenance, including projects to make systems more efficient or more resilient to climate change and other threats.

Opportunities & Goals

Families and businesses need safe, reliable, and affordable drinking water. In addition to protecting public health, investing in drinking water systems provides a tremendous economic opportunity. Improving our drinking and clean water systems to a B grade over the next 10 years could create about 654,000 jobs [5]. Businesses choose to invest in areas with modern water systems over places where water safety, reliability, or affordability is a concern.

Emergency repairs can be significantly more expensive than planned replacement. Emergency breaks can cause service outages and may even result in property damage. Federal investment can help support cash-strapped local governments operating water systems, allowing for system upgrades and more preventative maintenance.

The federal government has the opportunity to address the growing needs of communities and relieve local government's fiscal burdens by increasing appropriations through a number of existing programs that support drinking water systems.

Policy Solutions

The need for additional federal investment in drinking water systems is clear. Local and state governments cannot close the growing backlog of projects without greater federal assistance. Aging pipes, along with inadequate safeguards to deal with corrosion and contaminants, have proven to be a threat to human health and economic growth. While these problems are serious, there are a number of concrete actions that could be taken by Congress to improve our nation's drinking water infrastructure.

1) Congress must reauthorize the Drinking Water State Revolving Fund (SRF), the primary source of federal funding for drinking water infrastructure. This program has not been reauthorized since its inception in 1996. Funding has remained relatively flat despite the growing needs. **H.R. 1071, the Assistance, Quality, and Affordability (AQUA) Act of 2017**, introduced by Rep. Paul Tonko, makes critical investments in our nation's drinking water systems. The bill reauthorizes the Drinking Water SRF at higher levels that increase annually. It also expands the definition of a disadvantaged community, improves sustainability by prioritizing projects that provide long-term safe and affordable water, and includes Buy America and Davis-Bacon labor requirements.

2) In addition to necessary investments in infrastructure, **H.R. 1068, the Safe Drinking Water Act Amendments of 2017**, introduced by Rep. Frank Pallone, would make it possible for EPA to implement new national drinking water standards to deal with contaminants, including lead. In the 22 years since the last major Safe Drinking Water Act amendments, EPA has not set one new drinking water standard without an act of Congress. Emerging contaminants like perfluorinated compounds and perchlorate have been studied but have proven impossible to regulate without Congressional action. Among other critical provisions, the bill provides grants to reduce the risk of lead in schools and other facilities that serve vulnerable populations. Rep. Gottheimer has also introduced **H.R. 2094, the Lead Free School Act**, which seeks to increase testing for lead and contaminants in water at schools and provide grants for replacing aging water infrastructure that poses threats to schoolchildren.

3) In an effort to improve systems' sustainability and resiliency, Congress should support water systems' efforts to assess the risks posed by climate change, extreme weather, and other vulnerabilities. **H.R. 1579, the Secure and Resilient Water Systems Act**, introduced by Rep. Scott Peters, would require systems to submit protection plans to the EPA that mitigate threats to source water and infrastructure.

4) In addition to the Drinking Water SRF, Congress should continue appropriating funding for programs that help meet the unique needs of small and large systems. These include USDA's Rural Utilities program and EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program.

5) In 2016, Congress passed the Water Infrastructure Improvements for the Nation (WIIN) Act, which created a new EPA grant program to support small and disadvantaged communities. These communities often cannot afford to take out Drinking Water SRF loans. The WIIN Act also included a second new grant program to help communities replace lead service lines. Congress should fully fund these programs.

[1] Environmental Protection Agency, "Drinking Water Infrastructure Needs Survey and Assessment Fifth Report to Congress." <https://www.epa.gov/sites/production/files/2015-07/documents/epa816r13006.pdf>

[2] Congressional Budget Office, "Public Spending on Transportation and Water Infrastructure, 1956 to 2014." <https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/49910-infrastructure.pdf>

[3] American Society of Civil Engineers, "2017 Infrastructure Report Card: Drinking Water." <https://www.infrastructurereportcard.org/wp-content/uploads/2017/01/Drinking-Water-Final.pdf>

[4] Natural Resources Defense Council, "What's in Your Water? Flint and Beyond." <https://www.nrdc.org/sites/default/files/whats-in-your-water-flint-beyond-report.pdf>

[5] BlueGreen Alliance, "Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment." <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

Wastewater and Stormwater Systems

Current Situation & Challenges

Managing polluted wastewater is vital to protecting the health and wellbeing of all communities. 240 million Americans rely on our nation's 14,748 wastewater treatment plants to reduce toxins that harm human health and pollute our waters. Additionally, there are over 800,000 miles of public sewers and 500,000 miles of private connections to public lines in the U.S. However, these systems can and do fail to handle flows as they age and take on new users. The EPA estimates there are between 23,000 and 75,000 sanitary sewer overflow events in the U.S. each year, and 532 new systems will need to be constructed by 2032 to meet future growth. Additionally, approximately 25% of the U.S. and over 50% of residents in some states rely on decentralized wastewater systems like septic tanks. Finally, sea level rise poses a direct threat to coastal states' wastewater systems. A recent study found that by 2030, 1.5 million people in California, New York, and Virginia could lose wastewater treatment services due to inundation of coastal facilities.[1]

Stormwater runoff from rain and snow melt also presents a threat to environmental health if not properly managed. Urban stormwater runoff is the leading source of water pollution across much of the nation. An estimated 10 trillion gallons of untreated stormwater per year spills into waterways that often serve as drinking water sources [2]. In about 722 communities, wastewater and stormwater drain into the same treatment system. Following heavy rain events, these combined sewer systems can exceed their capacity and overflow, sending untreated human and industrial waste, toxic substances, and other pollutants into our waterways. These pollutants represent a crucial water quality threat in vitally important waterways like the Chesapeake Bay, the Great Lakes, and the Mississippi River [3]. Roughly 43,000 overflow events occur per year, discharging 850 billion gallons of raw sewage and stormwater every year [4]. In all, the EPA estimates \$271 billion is needed for wastewater infrastructure over the next 25 years. Additionally, stormwater runoff can also be a contributor to damaging urban flooding that can cost homes, businesses and communities more money in repairs.

Opportunities & Goals

The federal programs that assist communities with wastewater projects have been consistently underfunded relative to the existing need (see Figure 1), and there is a need to reform policies to allow for innovative financing methods and emerging green infrastructure techniques. Congress has previously authorized programs like the Clean Water State Revolving Fund (CWSRF), Water Infrastructure Finance and Innovation Act (WIFIA), and EPA Nonpoint Source Management Program (Sec. 319) grants to assist communities with building wastewater and stormwater infrastructure, but these programs remain consistently underfunded. Congress can also create new, innovative financing models to incentivize state, local, and private investment in wastewater and stormwater infrastructure. Regardless, federal funding should also do more to support low impact development (LID) to help better manage stormwater runoff while also lowering management costs. LID involves the incorporation of systems that use or mimic natural

hydrologic conditions and allow stormwater to infiltrate into the ground, rather than through streets and into overflowing sewer systems and waterways. This is also sometimes referred to as Green Infrastructure. LID projects have been shown to significantly reduce Clean Water Act compliance costs for municipalities over the long-term, but the federal government can assist communities by helping with funding for required upfront costs.

Investing in sustainable wastewater and stormwater infrastructure can reap benefits for our environment and economy. Widespread incorporation of green wastewater infrastructure/low-impact development (LID) techniques could create roughly 84,000 jobs over 10 years, according to research done by the BlueGreen Alliance, the Natural Resources Defense Council, and the Duke University Center for Globalization, Governance and Competitiveness [5].

Policy Solutions

An infrastructure proposal that addresses the full needs of communities should substantially increase funding for federal programs such as CWSRF, WIFIA, and EPA's Nonpoint Source Management Program to allow growing communities to manage and maintain these systems that are vital to human and environmental health.

Through its wastewater programs, the federal government should promote low impact development (LID) techniques like permeable pavements, vegetated roadside swales, and rain gardens that can reduce stormwater pollution while also lowering management costs and enhancing aesthetic character. LID has a proven track record of reducing runoff and sedimentation in rain-prone communities like Portland, Seattle and Philadelphia. The federal government could better support LID projects by providing them with priority funding under federal programs, or by increasing CWSRF's Green Project Reserve to boost the percentage of CWSRF funds used on low-impact infrastructure projects.

Nashville's Green Infrastructure Master Plan serves as an additional source of ideas for local green wastewater planning [6]. Nashville's citywide green infrastructure plan identified potential runoff reductions of 3.5 billion gallons of water a year, and the city initiated pilots projects across the community, including grey water harvesting and a green roof a local school and incorporation of permeable pavement and tree planting at a local farmers market [7]. Other cities across the country, such as Seattle, Chicago, New York City, and Philadelphia have also utilized LID techniques for their stormwater infrastructure programs. A federal infrastructure plan could review success stories in these and other communities to help identify the type of projects that federal funding and policies should aim to better support.

Finally, any infrastructure proposal should also provide robust funding for maintaining and repairing decentralized waste systems, which can reduce chemical impacts, reduce usage of other storm drains and pipe systems, and provide organic matter to local water tables. Specific policy proposals implementing some of these systems may be viewed below.

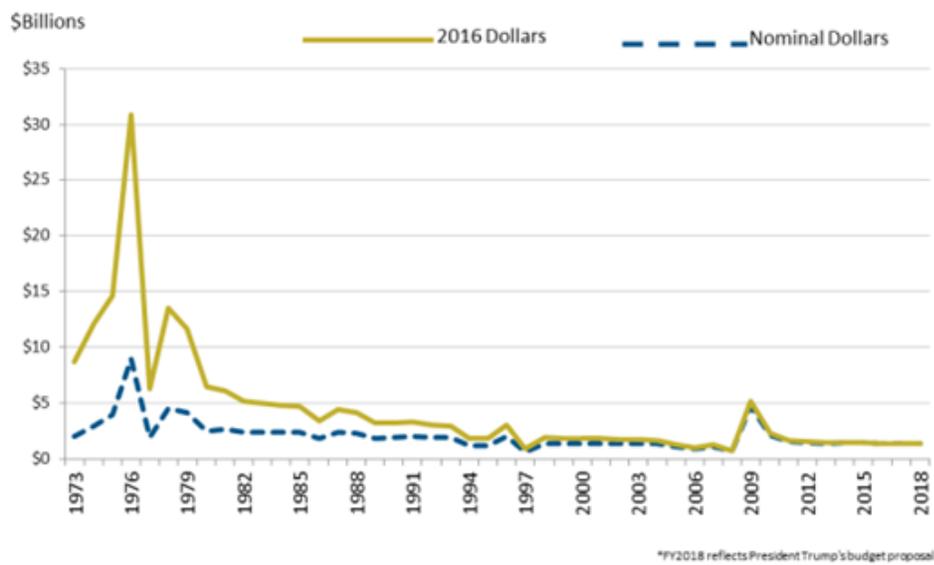
Congressional Proposals

- 1) H.R. 3906/S. 1695, Innovative Stormwater Infrastructure Act (Rep. Heck/ Sen. Udall)

- 2) H.R. 2355, Water Infrastructure Flexibility Act (Reps. Latta, Bustos, Joyce, Fudge, Napolitano, Smucker)
- 3) H.R. 3009, Sustainable Water Infrastructure Investment Act of 2017 (Reps. Duncan, Pascrell, Rothfus, Huffman, Zeldin, Barletta, Blumenauer, Costello)
- 4) S. 518, Small and Rural Community Clean Water Technical Assistance Act (Sen. Wicker)
- 5) S. 1137, Clean Safe Reliable Water Infrastructure Act (Sen. Cardin)

Figure 1: EPA Wastewater Infrastructure Annual Appropriations

(Source: Congressional Research Service)



[1] Fox, A. (2017), Sea level rise may swamp many coastal U.S. sewage plants, Eos, 98, <https://doi.org/10.1029/2017EO088905>. Published on 13 December 2017.

[2] BlueGreen Alliance, "Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment." <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[3] http://cbf.typepad.com/chesapeake_bay_foundation/baltimore-sewage-overflow/;
[http://greatlakesmapping.org/great_lake_stressors/7/combined-sewer-overflows](http://greatlakesmapping.org/great_lake_stressors/7/combined-sewer-overflows;);
<https://www.politico.com/magazine/story/2017/04/20/st-louis-infrastructure-sewer-tunnel-water-system-215056>

[4] BlueGreen Alliance, "Making the Grade 2.0: Investing in America's Infrastructure to Create High-Quality Jobs and Protect the Environment." <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[5] Ibid.

[6] The Metropolitan Government of Nashville and Davidson County, "Green Infrastructure Master Plan." <https://www.nashville.gov/Portals/0/SiteContent/WaterServices/Stormwater/docs/reports/GreenInfrastructureRpt101120.pdf>

[7] Ibid.; BlueGreen Alliance, “Making the Grade 2.0: Investing in America’s Infrastructure to Create High-Quality Jobs and Protect the Environment.” <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

Brownfields and Superfund Reclamation

Current situation & Challenges

The United States has an estimated 450,000 contaminated land sites scattered across the country. Of that number, over 1,300 have been placed on the Superfund National Priorities List (NPL) for high-priority cleanup by the EPA [1]. Brownfield and Superfund sites, many of which are former industrial facilities, are typically undeveloped or unused due to the possible presence of toxins. These sites are more likely to be located in or near low-income communities and communities of color. About 53% of Americans live within three miles of a hazardous waste site. This unused land is not only a burden on local communities but can also pose a health threat to residents and local ecosystems [2].

Ensuring the health and well-being of America's residents and natural environment requires addressing the thousands of potentially toxic sites across the country. This is especially true as extreme weather events such as flooding and severe storms increase the risk of community exposure to toxic contaminants from these sites.

Opportunities & Goals

The more than 450,000 contaminated sites nationwide represent a massive untapped economic opportunity. Various studies have calculated that remediation of these sites can lead to a 5 to 32% increase in the property value of nearby residences [3]. In addition, turning contaminated, unusable, and potentially dangerous land into productive spaces, particularly in urban areas, can help protect residents from dangerous toxins, help planners reduce urban sprawl, increase outdoor green areas, and create more efficient, livable, and welcoming communities. Returning degraded land to its pristine state can also open up opportunities for native plants and animals, including crucial local pollinators, to repopulate.

The process of remediation is an economic driver. According to EPA, each EPA Brownfields dollar spent leverages \$16.11 and every \$100,000 spent on assessment and cleanup creates 8.5 jobs [4]. Similarly, a study of 458 Superfund sites found businesses on formerly vacant lots employ over 131,000 people and have annual sales revenues of around \$34 billion, which is nearly four times the cost of cleanup by the EPA [5]. Low-income communities or municipalities with difficult budget situations can also benefit from the sale of remediated sites to private developers. On the other hand, in an un-remediated state, brownfields and superfund sites represent a threat to public safety and the communities in which they exist. Efforts to get our solid and hazardous waste systems to a B grade would create approximately 26,000 jobs a year over 10 years [6].

States, tribes, and the federal government have cumulatively prepared more than 1 million acres of previously degraded land for reuse, yet thousands more sites remain [7]. Increased funding to deal with existing sites, coupled with smart, sensible policies designed to prevent more sites from requiring remediation, would dramatically reduce the number of locations requiring attention and unlock the economic potential of even more of America's unutilized land.

Policy Solutions

While the complexity and time demands of many cleanups are important factors in determining which sites can be effectively remediated, the primary challenge facing federal, state, local, and tribal authorities when it comes to addressing brownfields is funding. Through the mid-1990s, EPA's Superfund program was funded in large part by taxes and fees levied on polluting industries [8]. This 'polluter pays' model ensured that the program was given the resources it needed and encouraged industrial accountability. A return to 'polluter pays' would take the onus for funding cleanups off of taxpayers and help guarantee a level of funding sufficient to continue current cleanups and take on new ones at an increased rate. We believe it would be wise to reinstate this tax as part of a broader infrastructure package in order to fund remediation projects at these sites that will create jobs, economic opportunities and better health outcomes for neighboring communities.

In addition, Congress should appropriate adequate or expanded funding to existing programs within the EPA, Department of Housing and Urban Affairs, and Economic Development Administration that all address brownfield remediation through grants, technical assistance, and direct investment.

Congressional proposals

- 1) H.R. 1524, Superfund Polluter Pays Act of 2017 (Rep. Pallone)
- 2) H.R. 1758, Brownfields Reauthorization Act of 2017 (Rep. Esty)
- 3) H.R. 1747, Brownfields Authorization Increase Act of 2017 (Rep. Pallone)

[1] <https://www.epa.gov/superfund/superfund-national-priorities-list-npl>

[2] <https://www.epa.gov/sites/production/files/2015-09/documents/brownfields-federal-programs-guide-2013.pdf>; <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[3] <https://www.epa.gov/brownfields/brownfields-program-accomplishments-and-benefits>

[4] <https://www.epa.gov/brownfields/overview-brownfields-program>

[5] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[6] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[7] <https://www.epa.gov/brownfields/brownfields-program-accomplishments-and-benefits>

[8] <http://www.gao.gov/assets/100/95632.pdf>

Building Efficiency

Current Situation & Challenges

Commercial and residential buildings consume 74% of electricity in the United States, and are responsible for nearly 40% of national CO₂ emissions [1]. Improving building energy efficiency will lead to significant savings for families and businesses alike, while cutting greenhouse gas pollution.

Opportunities & Goals

New technologies, such as advances in insulation, window and door construction, appliances, and lighting, can contribute to significantly improve energy efficiency in commercial and residential buildings. These technologies can be integrated into the planning and building process through energy consumption simulations and energy efficient building materials, as well as into the building's operation by installing efficient HVAC systems, improving sensors and control systems, and installing systems for storing thermal energy

Implementing energy efficiency measures in buildings and appliances is projected to eliminate 710 to 870 million tons of greenhouse gas emissions and can be a significant economic driver. For every \$1 spent on building efficiency, \$2 is saved in new power generation and distribution infrastructure. Commercial LEED certified buildings consume 25% less energy, use 11% less water, produce 34% less CO₂ emissions, and owners reported 20% lower maintenance costs [2].

Moreover, tax incentives for energy efficient commercial buildings have lapsed while innovative grant program ideas remain untapped. The biggest opportunity for energy retrofits lies in the residential market where projected spending needs are 2 ½ times that of commercial buildings [3]. In addition to saving consumers money, improvements in energy efficiency will improve air quality, create local jobs, and increase grid reliability.

Investing in energy efficiency opens up jobs in sectors such as manufacturing, construction, building operations, and maintenance. Currently, there are roughly 1.9 million U.S. jobs in the energy efficiency sector, which is expected to grow [4]. Of these jobs, there are 289,000 workers at over 1,600 facilities employed in the manufacturing of energy efficient products [5].

The economic benefits of energy efficiency help give the U.S. a competitive edge while continually developing and implementing innovative technology. For this to continue, strong investment is key. Research and development funding is important to help manufacturers develop these technologies and to help the sector expand and remain competitive.

Policy Solutions

Below are some policy solutions that could be incorporated into a larger infrastructure package to help improve building efficiency and spur job creation in this sector. Additionally, legislation such as S. 1798, the Federal Flood Management Act of 2017 (introduced by Senator Van

Hollen), would direct executive agencies to reduce the risk of flood impacts and losses when planning new buildings, proactively ensuring that federal buildings are resilient and prepared for unpredictable weather patterns that result from climate change.

Smart Tax Incentives

In 2005, Congress created the Section 179D Energy Efficient Commercial Building Tax Deduction to defray the costs of making buildings more energy efficient. Section 179D provides a deduction of up to \$1.80/sqft for energy efficient buildings, applying to nearly all commercial high-rise multifamily residential, health care, institutional, public, and educational facilities. The deduction also allows public building owners to allocate the deduction to the designer of energy efficient properties. Congress extended the deduction in 2016 and 2017, but it expired at the end of 2017. Reps. Reichert, Blumenauer, and Reed have introduced **H.R. 3507**, which makes section 179D permanent and expands the deduction to nonprofit and tribal building owners.

Grants for Sustainable Improvements

Rather than always building new, the federal government should incentivize upgrading existing buildings. Introduced by Rep. Cartwright, **H.R. 2197** is a bipartisan bill that would create an Energy Efficient Materials Pilot Program at the Department of Energy that would provide grants of up to \$200,000 to nonprofit organizations unable to take advantage of existing tax credits and incentives. These grants would finance purchases of energy efficient materials, enabling our hospitals, youth centers, and houses of worship to cut operating costs, reduce their environmental impacts, and better serve their communities. It is also critical that we maintain our current building stock by protecting and enhancing the Historic Tax Credit, which supports the rehabilitation and maintenance of our most treasured properties while contributing to communities' character and sense of place. Finally, we should prioritize efficient energy usage in public buildings such as schools: H.R. 2536, the Renew America's Schools Act introduced by Rep. Loeb sack, would award competitive grants for improvements, repairs, or renovations at schools that reduce energy costs, improve air quality, or install renewable energy technologies.

Just Investments

Energy efficient upgrades and building new are often out of reach for low-income families, and low-income programs cost utility administrators significantly more per kWh of energy saved than other residential programs [6]. Further, these families often live in older construction that uses proportionally more energy per square foot, leading to increased energy costs [7]. The federal government should seek to address this inequality by providing grants and tax incentives to utilities to make energy efficient upgrades accessible to low-income communities, including multi-family buildings, while also providing direct assistance to individual families. For example, Rep. Ellison has introduced **H.R. 515**, which would authorize the Department of Housing and Urban Development to provide grants and loans to owners to replace dated mobile and manufactured homes with ENERGY STAR-qualified homes.

Improved Building Codes

The federal government should establish a more strategic, interagency, and intergovernmental approach to building policies. Improving the codes and policies behind building materials,

parking minimums, and mixed-use development could lead to more efficient buildings and more livable communities. Building codes developed by the Department of Energy Building Energy Codes Program should make sure to include regional-specific suggestions that integrate disaster resilience standards, such as placing generators on upper levels and using building materials and techniques that are both more energy efficient and resistant to wind, water, and fire damage. The federal government can provide matching funds for energy efficient improvements to states that upgrade their minimum building codes. The federal government could also create an information-sharing clearinghouse so states that have adopted policies to encourage energy efficiency can share data and results to avoid unnecessary and expensive duplication of efforts.

Maintaining Existing Federal Programs

Congress must continue to fund and support the EPA's voluntary ENERGY STAR program, WaterSense program, and the Department of Energy's Better Building program. These programs utilize federal technical expertise to support cost-savings and energy efficiency in the private sector. Rep. Cartwright has introduced **H.R. 3248, The WATER Use Act**, which would permanently authorize the popular WaterSense program. This program has already saved over 1.5 trillion gallons of water. The federal government must also continue to support section 433 of the Energy Independence and Security Act of 2007, which sets targets for reduction in fossil fuel-generated energy consumption in newly constructed and majorly renovated federal buildings. Finally, Congress should provide robust funding for the Office of Energy Efficiency and Renewable Energy, ARPA-E, and the Department of Energy National Labs, all of which focus on bridging the gap between research, technology, and marketable products in energy efficiency.

[1] <https://energy.gov/eere/buildings/about-building-technologies-office>;

<http://www.eesi.org/files/climate.pdf>

[2] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[3] <https://assets.rockefellerfoundation.org/app/uploads/20120301221532/United-States-Building-Energy-Efficiency-Retrofits.pdf>

[4] <https://www.nrdc.org/experts/sheryl-carter/energy-efficiency-jobs-nearly-19-million-and-growing>

[5] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[6] <https://emp.lbl.gov/sites/all/files/total-cost-of-saved-energy.pdf>

[7] <https://www.eia.gov/todayinenergy/detail.php?id=9951>,

https://www1.eere.energy.gov/buildings/publications/pdfs/corporate/bt_stateindustry.pdf

Waste Infrastructure

Current Situation & Challenges

Every year, Americans throw away nearly 170 million tons of material that they deem to be garbage, sending them to landfills and trash incinerators across the country.^[1] Up to 90% of our solid waste could be reused, recycled, or composted, but currently only about one-third is recovered or diverted.^[2] Once added to a landfill or incinerated, these resources are lost forever. Landfills consume valuable space and pollute our waters. Incinerators produce toxic ash, emit greenhouse gases, and pollute our air. Landfills are the third largest source of methane emissions in the United States, which has at least 25 times the climate change impact on a pound-for-pound basis compared to CO₂.^[3]

As much as 50% of household, curbside municipal solid waste (MSW) is compostable, but less than 9% is composted.^[4] The biggest barrier to increasing municipal composting is a lack of composting facilities, and the vast majority of Americans do not have access to composting facilities.^[5]

Opportunities & Goals

With smart investments in infrastructure for our communities, we can strive toward a national goal of zero waste. Zero waste is an ethical, economical, and efficient goal that will guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. State and local governments should coordinate with the federal government to develop community outreach and public education programs to increase knowledge about effective waste prevention to change consumer and commercial behavior to create a culture dedicated to reducing waste.

Recycling and composting are not just good for our environment; they are good for our economy. On a per person basis, composting employs 4 times as many workers as incineration, and 2 times as many as landfills. Nearly 2.5 million direct jobs—and millions more indirect jobs—could be created if we reach a national 75% recycling and composting rate by 2030. Further, compost is itself a product and a resource that can be used as mulch and fertilizer, and as green infrastructure in rain gardens, green roofs, retaining walls, and on embankments to control soil erosion.

Instead of building new incinerators or expanding overflowing landfills, the federal government should provide incentives for communities to build new recycling and composting facilities. Investing in composting and recycling facilities in our communities will generate more jobs and cleaner products, resulting in healthier communities. Composting also reduces greenhouse gas emissions from landfills and incinerators, returns carbon to the ground, and reduces the need for chemical fertilizers for crops.^[6]

Policy Solutions

A sustainable infrastructure plan would invest in the technologies and practices that will create a culture focused on reusing, recycling, and composting to eliminate the generation of new MSW. Representative Ellison introduced the **Zero Waste Development and Expansion Act, H.R. 1034**, which would provide funding, support, and incentives for communities to transition to a zero waste future. It would authorize the EPA Administrator to award up to \$100,000,000 in funding for MSW prevention and the development of recycling and composting programs that will bring communities closer to zero waste. The bill would also establish an annual conference for federal, state, tribal, and local stakeholders, grantees, and decision makers to share information and learn from each other's experiences in moving toward zero waste.

In addition to expanding recycling and composting of existing waste, we need to reduce the amount of materials that can become waste in the first place. The federal government should invest in public-private partnerships to research and develop alternatives to plastics, styrofoam, and other non-biodegradable products, and create new minimal, compostable packaging. Working together, the federal government and States should incentivize rapid adoption of these new technologies and products, and support the small businesses that incorporate them. **H.R. 3444, the Food Recovery Act (Rep. Pingree)** would also address the importance of reducing food waste by incentivizing public entities to purchase fruits and vegetables that do not meet retailer shelf beauty standards; standardizing confusing food date labels; and requiring companies that contract with the federal government to donate their food surpluses.

Lastly, the USDA Rural Development office has many programs that are integral to rural communities regarding waste disposal, which faced budgetary attacks in the Administration's first proposed budget.. For example, the Water and Waste Disposal Loan & Grant Program provides funding for extending or improving waste disposal systems in rural communities, which can save tax dollars and improve the natural environment. Congress should continue to support these programs to ensure that rural communities have the resources they need to execute greener, more sustainable waste disposal practices.

[1] In 2014, the last year for which figures are available, 258 million tons of municipal solid waste (MSW) was generated, 169 million tons were landfilled or incinerated, and 89 million tons were recycled or composted. <https://www.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures>.

[2] https://www.epa.gov/sites/production/files/2016-11/documents/2014_smmfactsheet_508.pdf

[3] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[4] Materials that can be composted include food scraps (21% of curbside MSW), paper and paperboard (14%), yard trimmings (8%), and wood waste (8%). https://www.epa.gov/sites/production/files/2016-11/documents/2014_smmfactsheet_508.pdf.

[5] <http://ilsr.org/wp-content/uploads/2014/07/state-of-composting-in-us.pdf>.

[6] <https://www.epa.gov/recycle/composting-home>.

Passenger Surface Transportation

Current Situation & Challenges

The United States relies on a vast network of roads, bridges, railways and highways for passenger transportation. Today, though, these networks that connect Americans with their schools, work sites, and other destinations are in dire need of repair and reinvestment.

State and local governments are investing heavily in public transportation, but too often they face budgetary constraints that hamper their ability to undertake large transit projects, making a strong federal partnership and funding all the more necessary. Asking states and localities to pay more while cutting back federal investment would only exacerbate our current predicament and represent an abdication of the longstanding federal role in infrastructure and interstate commerce.

In order to bring all transit systems up to good state, the ASCE estimates a maintenance backlog of nearly \$90 billion in funding. This funding gap could reach \$122 billion by 2032 [1]. By contrast, a national investment in getting our road and transit systems to a “B” grade over the next 10 years could support or create over 6.6 million job-years across the U.S. economy [2].

Opportunities & Goals

A sustainable passenger surface transportation plan not only supports a more efficient economy and improved quality of life for all citizens, but also reduces pollution, improves public health, and mitigates the threat of climate change.

Such an infrastructure plan should respond to increasing demand for affordable, accessible public transportation. Millennials and baby boomers in particular are moving to neighborhoods close to public transit so they can spend less time driving and in traffic. Public transportation ridership grew 37.2% from 1995-2013 [2] and by 2014, transit ridership was at its highest rate in 40 years [3]. While demand for alternative forms of transportation is higher than ever, public transportation ridership has declined in each of the past three years in part because of unreliable transit systems. This trend can be reversed by increasing investment in major transit projects and encouraging transit agencies to construct public transportation networks that reflect shifting population patterns and demand and provide access throughout communities.

According to the U.S. Environmental Protection Agency, in 2015 the transportation sector accounted for 27 % of all U.S. greenhouse gas emissions, of which 60 % resulted from light-duty vehicles.[4] Today’s fuel economy and greenhouse gas standards are rapidly reducing the emissions from these vehicles, but we must continue this progress.

At the same time, people are demanding more walkable, bikeable cities with increased public mass-transit options. Investing in pedestrian and bicycle pathways, as well as greater access to

public transportation will help further reduce emissions, produce healthier communities, and increase the transportation options available to Americans.

A sustainable infrastructure plan should also help ensure access to cleaner and more efficient vehicle transportation options for all communities. In addition to continuing to support increased fuel efficiency for all combustion engine vehicles, an infrastructure plan should also help communities gain access to cleaner vehicle technologies and support zero-emission and electric vehicle infrastructure nationwide. As we mention below, access to high speed broadband in all communities can also help Americans take advantage of economic opportunities locally without requiring a long commute.

The federal government should also expand its support for intercity passenger rail, including Amtrak's Northeast Corridor and national routes, and the many state-supported rail routes that provide competitive transportation alternatives in both rural and urban areas. Amtrak ridership reached a record high last year, and many states and localities including Texas and Florida have partnered with private entities to build new passenger rail lines. More than \$10 billion in strategic intercity passenger rail investments from the 2009 Recovery Act have laid the groundwork for an overdue expansion of these services. Passenger rail represents an environmentally friendly, efficient, and economically attractive transportation option that is already cost-competitive with air travel for short and some medium-range flights.

Policy Solutions

Transit: Congress needs to make big investments in transit infrastructure through programs like Transportation Investment Generating Economic Recovery (TIGER), Capital Investment Grants, and the Transportation Infrastructure Finance and Innovation Act (TIFIA). Congress should also provide increased funding that can be used specifically for decarbonizing and electrifying public transportation, such as the Low or No Emission Vehicle Program. In addition, Congress should reject proposals that eliminate or cut core public transportation investment programs, including New Starts and Small Starts transit grants.

Bike & Pedestrian Pathways: With 850,000 bike commuters, and Americans moving to communities with robust bike and pedestrian connections, it is critical Congress continues to support this efficient form of human transportation. While the Fixing America's Surface Transportation Act (FAST Act) created long-term certainty for this transportation community, funding levels are still well below their 2011 peak, and a portion of that funding is eligible for transfer to other programs. Congress should restore 2011 funding levels and end the transferability of transportation alternative funds. Finally, pedestrians and bicyclists account for a disproportionate number of deaths on our roadways. Congress should commit to policies that encourage smarter planning and a more balanced, equitable transportation system across modes.

High Speed Rail: Congress should seek to build on Amtrak's increasing passenger volume and make targeted investments to repair and upgrade rail infrastructure. This will help expand

conventional and high-speed rail links between our cities and towns. What the country needs are not only major upgrades associated with the critical Gateway Project on the Northeast Corridor, but also other rail corridors in the Southeast, Midwest, and in California that are already under construction or have completed environmental reviews. These investments can reduce emissions from car and plane travel, alleviate congestion on our highways, and spur tourism and economic growth. Sustained Amtrak funding, as well as additional discretionary grant funding for rail infrastructure programs established by the FAST Act, will be critical in these efforts.

Alternative Fuel Infrastructure: We need to fix America’s roads and bridges, using innovative clean technology, and invest in transportation infrastructure of the future, for example by jumpstarting electric and zero emission vehicle infrastructure. Congress ought to incentivize the use of zero-emission and electric vehicles through its taxing and spending powers. For example, it may provide tax credits for installing electric vehicle charging technology or for buying zero-emission vehicles. Existing funding sources such as CMAQ grants and TIFIA loans have helped states and cities expand electric and natural gas vehicle infrastructure. Congress should build upon the success of these programs to further build out our alternative fuel corridors.

Fuel Economy: Additionally, the federal government must continue to enforce the fuel economy and greenhouse gas emission standards developed by the previous Administration and affirm California’s related waiver allowing it to implement stricter standards. These standards will help clean up our air, save consumers money, and create more jobs.

Resilience: Members of Congress should also support competitive grant programs to encourage states and localities to assess the resilience of their transportation infrastructure and ensure it is “climate proofed,” by designing and constructing them to minimize the impacts of flooding, sea-level rise, and extreme temperatures.

Wildlife: Congress can improve passenger surface transportation by supporting the implementation of wildlife overpass and underpass infrastructure. Wildlife crossings make passenger transportation safer by avoiding vehicle-wildlife collisions and help protect wildlife populations by providing pathways for species to move across lands.

Congressional Proposals

- 1) Increase appropriations for CMAQ program
- 2) H.R. 3858, Increase funding for TIGER discretionary grant programs (Rep. Waters)
- 3) Address the Highway Trust Fund shortfall: H.R. 1458 (Rep. Blumenauer), H.R. 1664 (Rep. DeFazio)
- 4) H.R. 3305, Bikeshare Transit Act (Rep. Blumenauer)
- 5) H.R. 6448 (114th Congress), Wildlife Corridors Conservation Act (Rep. Beyer)

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- [1] <https://www.infrastructurereportcard.org/cat-item/transit/>
- [2] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>
- [3] <http://www.apta.com/mediacenter/ptbenefits/Pages/Public-Transportation-Use-is-Growing-.aspx>
- [4] <http://www.apta.com/resources/statistics/Documents/FactBook/2016-APTA-Fact-Book.pdf>
- [5] <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100S7NK.pdf>

Freight Infrastructure

Current Situation & Challenges

Freight transportation drives our economy, but the sector is also a major contributor to congestion and smog in our communities. Our freight gateways and networks are adjacent to areas where we live, work and play. Thirteen million Americans live near a major port or rail yard, and up to 45 million live less than 300 feet from a freeway.[1] This proximity means policies around our freight network weigh heavily on local air quality, health indicators, and roadway safety.

Truck volume is projected to grow at 1.45 % per year (in vehicle miles travelled), double the rate of cars.[2] These trucks—which move two-thirds of the goods in our country—are major sources of pollution in dense, urban areas, and exact a heavy toll on our aging roads and bridges [3].

In addition, because most goods come to our country through seaports, our freight network is uniquely vulnerable to the effects of sea level rise and coastal flooding. Just in 2017, Hurricanes Harvey and Irma shut down major US container and energy-transfer ports, and delays rippled across the entire country.

Opportunities & Goals

A forward-thinking infrastructure plan will harness innovative low-emission technology and make key investments to accelerate trends in the freight industry that reduce congestion and pollution. Encouraging the adoption of alternative fuel technology, including compressed natural gas (CNG) and electric trucks for short-haul service, can mitigate the environmental and public health toll of goods movement.

We know that alternative modes including freight rail and barges are both more energy efficient than trucks and reduce congestion on our roads and highways [4]. Freight trains are becoming more efficient through lighter freight cars, improved systems and logistics, and increased individual car capacity. Federal investment can address key bottlenecks to spur growth in these transportation modes. Improving intermodal connections at freight hubs and inland ports can reduce transit times for goods moving between commercial centers and encourage shippers to use lower-emission rail links between our ports of entry and distribution centers. Investment targeted at these commercial corridors can benefit the entire country through a more efficient freight network.

Policy Solutions

Technologies to reduce freight emissions and improve efficiency continue to advance, but often take years to achieve significant market penetration. As part of infrastructure investment, Congress should incentivize the adoption of the cleanest available technology through grants or tax credits that can offset the higher cost of these low- or zero-emissions technologies. For example, replacing older diesel locomotives with diesel-electric Tier 4 locomotives can reduce carbon emissions by 80 to 90 %.[5]

In addition, an infrastructure plan should make investments that can address both pollution *and* congestion. A program to support regional marine highways demonstrated that targeted federal investment can reduce freight emissions, remove traffic from congested highways, and drive economic activity to smaller ports. For example, the M-580 pilot program between the ports of Oakland and Stockton eliminated over 24,000 truck trips on one of the Bay Area's most heavily trafficked corridors.[6]

Connected vehicles and “big data” present a significant opportunity to maximize the efficiency of our existing network. Digital infrastructure, like innovations that share information throughout the freight supply chain, can help identify low-traffic periods, reduce idle times, and otherwise reduce both congestion and emissions. Federal investment should support these low-cost interventions that can use our existing infrastructure more efficiently.

Congressional proposals

- 1) H.R. 3107, Reauthorize the Diesel Emissions Reduction Act (Reps. Matsui, Poe, Lowenthal, Barragan, Reed, Messer)
- 2) H.R. 3858, Increase funding for TIGER discretionary grant programs (Rep. Waters)
- 3) H.R. 3001, Target investment in low and zero-emissions freight corridors (Rep. Lowenthal)

[1] <https://www.nrdc.org/sites/default/files/nepa-toolkit.pdf>

[2] VMT projections from FHWA

(https://www.fhwa.dot.gov/policyinformation/tables/vmt/vmt_forecast_sum.pdf)

[3] https://www.brookings.edu/wp-content/uploads/2015/06/srvy_gcifreightmodes_june12.pdf

[4] <https://www.c2es.org/technology/factsheet/FreightTransportation>

[5] https://www.arb.ca.gov/railyard/docs/uo_i_rpt_06222016.pdf

[6] <http://www.dot.ca.gov/hq/tpp/offices/ogm/CSFAP/PilotProjects/sfpp-035.pdf>

Public Lands

Current situation & Challenges

Public lands enrich the lives of Americans by protecting wildlife, bolstering local economies, filtering millions of gallons of drinking water, and providing respite from the bustle of modern life. In 2016, there were over 331 million visits to national parks and 791 million to state parks. Public parks support roughly 7.6 million jobs and are responsible for \$65.3 billion in federal revenue. Unfortunately, many of our most treasured natural and historic spaces are in disrepair, which limits access, enjoyment, and economic opportunity in and around these sites. The four agencies managing the majority of U.S. Federal Lands reported a total deferred maintenance backlog of \$18.62 billion dollars in Fiscal Year 2016 [1]. The current state of funding for fighting wildfires in the Western United States often leaves considerable budgetary shortfalls that contribute to the growing maintenance backlog. The ASCE gave our parks and recreation facilities a D+ grade.

Opportunities & Goals

The Federal Lands Policy and Management Act (FLPMA) stipulates that federal lands must be managed for “multiple use and sustained yield.” This framework promotes management strategies that support the long-term stewardship of cultural, recreational, and natural resources of our public lands. Any infrastructure proposal should provide adequate support for the management of these shared resources in line with the policies of FLPMA. Healthy, well-managed public lands will promote the long-term conservation of wildlife habitat and natural resources and provide for lasting economic opportunities such as sustainable timber harvest, renewable energy development projects, outdoor recreation businesses that utilize public lands, and sustained fishing yields. Investments in healthy, accessible public lands promote social, cultural, educational, and health benefits. Addressing the maintenance backlog will also provide economic opportunities because environmental restoration projects are labor intensive, and will promote local economic growth through increased visitation via better accessibility. An estimated 632,000 job-years could be added over 10 years just by bringing our public lands infrastructure to a B grade [2].

Policy Solutions

Managing public lands sustainably and in line with each agency of jurisdiction’s mandate requires working through existing laws that protect public input and evaluate the social, economic, and environmental impacts of proposed projects. Congress should resist the temptation to allow broad categorical exclusions under NEPA and exemptions from Endangered Species Act consultations, which undermine the ability of federal land managers to manage and update public lands infrastructure in a way that is sustainable and responsive to public input. Similarly, authorizing exemptions to the Wilderness Act and Antiquities Act protections of certain public lands undermines the historic intent to preserve those lands in a sustainable way for generations to come.

Instead, Congress should focus on permanently reauthorizing popular programs that promote access and upkeep of our treasured places, such as the Land and Water Conservation Fund, the National Wetland Conservation Act, and the Historic Preservation Fund. The \$11.3 billion maintenance backlog at our National Parks is of special concern since our parks not only protect the nation's most spectacular landscapes, but also honor war heroes and preserve sites important to our nation's history. Congress should invest in and create programs that will create jobs for individuals such as veterans and youth who can gain valuable life and work skills as they clear the deferred maintenance backlog. Policies that promote specific types of access on public lands, such as the deployment of broadband in and around public lands and free annual passes for fourth graders and their families, can help Americans utilize and benefit these public spaces. Congress should also support existing efforts such as the Department of Interior's climate change and resilience strategies [3]. Most critically, Congress must adequately fund maintenance programs and fix wildfire disaster funding.

Congressional Proposals

- 1) H.R. 502, LWCF Permanent Reauthorization (Rep. Grijalva)
- 2) H.R. 2425, Public Lands Telecommunications Act (Rep. Huffman)
- 3) H.R. 2584, National Park Service Legacy Act (Reps. Hurd, Kilmer, Reichert, Hanabusa)
- 4) H.R. 2862, Wildfire Disaster Funding Act,(Reps. Simpson, Schrader)
- 5) Sec. 5101 of S. 1460, National Park Service Critical Maintenance and Revitalization Conservation Fund (Sens. Murkowski, Cantwell)
- 6) H.R. 3186, Every Kid Outdoors Act (Rep. Tsongas)
- 7) H.R. 2943, Outdoor Recreation Legacy Partnership Grant Program Act (Rep. Barragan)
- 8) H.R. 4363, Veterans Conservation Corps Act (Rep. Polis)

[1] 4 agencies (BLM, FWS, NPS, FS) FY16 Deferred Maintenance Backlog: \$18.62 Billion (10.93- NPS, 5.49- FS, 0.81- BLM, 1.39 -FWS) [CRS Report -<https://fas.org/sgp/crs/misc/R43997.pdf>

[2] <https://www.bluegreenalliance.org/wp-content/uploads/2017/09/MakingTheGrade-2.pdf>

[3] <https://www.doi.gov/ppa/ppaclimate-change-adaptation>

Natural Infrastructure

Current Situation & Challenges

The term infrastructure often brings to mind large, man-made projects like dams and levees, but a cost-effective, sustainable plan must also institute policies to protect natural ecosystems that can provide services like water filtration and flood mitigation at lower cost. Our infrastructure also includes forests, coral reefs, dunes, grasslands, wetlands, floodplains, rivers and lakes: a diverse array of natural systems that provide numerous services to communities. Forests, for example, support water filtration and clean water at a much lower cost than built infrastructure, while also providing recreational opportunities, carbon storage to offset climate change, and local economic opportunity through sustainable forestry [1]. Wetlands' services include protecting and improving water quality, providing fish and wildlife habitat, and acting as giant sponges that store floodwaters and maintain surface water flow during dry periods [2]. Research has shown that restricting wetland drainage and restoring wetlands where necessary can help reduce infrastructure costs associated with flooding, such as washed-out roads and flooded communities [3]. Currently, however, many of these natural systems are at risk of destruction.

Opportunities & Goals

One practical step to help reduce infrastructure costs and save local communities money is to develop an infrastructure plan that protects existing natural infrastructure and where appropriate, restore damaged ecosystems. As just one example, a study published in the journal *nature* in 2017 found that coastal wetlands in the Northeast avoided \$625 million in direct flood damages during Hurricane Sandy [4]. We have a tremendous opportunity to protect our neighborhoods and man-made infrastructure upland by protecting and restoring wetlands along our coasts.

Smart planning also involves incorporating more park land and other green spaces in urban communities, where miles of impermeable surfaces can lead to problems with stormwater runoff and flash flooding. Incorporating more parks and green space creates more permeable surfaces to absorb runoff, reduces the urban heat island effect, and plays an important role in supporting community health. Nearly 40 years of research has found that proximity to nature, including parks, gardens, and urban forests, support human health and wellness [5].

Policy Solutions

Congress should look to increase funding for programs that help protect and restore vital ecosystems. For example, Congress could increase funding for the **Coastal Wetlands Trust Fund** managed by the U.S. Fish & Wildlife Service and the **programs under the Estuary Habitat Restoration Act of 2000** administered by the Army Corps of Engineers. Additionally, Representative Frank Pallone's **Living Shoreline Act, H.R. 4525**, would provide grants for states and local communities to stabilize shorelines using natural materials. Congress should also increase funding for programs that support increased green spaces and natural lands in urban areas. Representative Nanette Diaz Barragán's bipartisan **Outdoor Recreation Legacy Partnership (ORLP) Grant Program Act, H.R. 2943** would create a dedicated source of

funding for projects that expand outdoor recreational opportunities in cities across the country, particularly in underserved areas.

The federal government also should look to local success stories for guidance. A federal infrastructure project could include funding to states and local governments to support more projects like these:

- New York City provides clean water to its citizens without use of a water filtration plant. The city invests \$100 million a year in upstate New York to preserve forests in the Catskill Mountains. The cost of a water treatment plant would be 10 times that cost. This investment provides the necessary clean water resources at a fraction of the cost all while preserving the natural environment. The Catskill Mountain forests also capture carbon, reducing emissions, and the State Park is an important contributor to the state's \$42 billion per year outdoor recreation economy [6].
- Medford, Oregon is planting vegetation along the Rogue river to cool wastewater. The other options were storing the water in a lagoon and mechanical chillers. The river vegetation project costs \$8 million less than the lagoon and \$12 million less than the chiller [7].
- Philadelphia, Pennsylvania, has worked with natural infrastructure since the 1800s when it purchased land to help filter its drinking water. More recently, the city has been working to enact its 'Green City, Clean Waters' plan to reduce stormwater pollution with public green spaces and targeted vegetation. They expect to reduce stormwater and sewage pollution by 85% when the project is complete. While accomplishing their stormwater goals, Philadelphia is becoming more environmentally sustainable and beautiful.
- In South Florida, local communities and the state are restoring natural coastal barriers, like mangroves and sand dunes, to protect coastlines. A major driver of these projects was Hurricane Charley, which in 2004 caused more than \$15 billion in property damage and wreaked havoc on the state's citrus industry. The communities that lacked mangrove buffers suffered some of the worst impacts from the storm [8]. Not far inland, efforts are also underway to restore the everglades, the largest wetland in North America and critical in the fight to protect Florida from the impacts of climate change. Both federal and state funding is helping to restore the flow of freshwater into the wetlands to save the ecosystem. If successful, this restoration will help protect Southern Florida from sea level rise and more extreme storm surges. It is also critical to protecting the drinking water source for 8 million South Florida residents.

In 2016, the state of California passed AB-2480, which declared that "source watersheds are recognized and defined as integral components of California's water infrastructure." This allows the state's infrastructure funding to go towards restoring forests, meadows, streams, and rivers that serve California's water supply. Ecosystem Marketplace's State of Watershed Investments

2016 report identified 107 projects in the US, worth at least \$3.8 billion, that are working on conservation of watersheds. The state legislation could serve as a model for federal infrastructure planning and legislation.

The Obama administration released a memorandum directing federal agencies to consider the value of ecosystem services during federal planning and decision-making. This memorandum pointed out several examples of natural infrastructure's use in projects and directed that solutions like those be considered for federal projects [9]. This is another way the federal government can encourage the use of natural infrastructure.

[1] <https://blog.nature.org/science/2015/10/16/natural-infrastructure-its-not-an-oxymoron/>

[2] <https://www.epa.gov/wetlands/why-are-wetlands-important>

[3] <http://stormwater.wef.org/2014/09/wetlands-reduce-flooding/>

[4] <https://www.nature.com/articles/s41598-017-09269-z>

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[8] <https://oceanactionagenda.org/story/mangrove-restoration-benefits-florida-communities/>

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Broadband Infrastructure

Current Situation and Challenges

As the backbone of the Information and Communications Technology (ICT) sector, broadband infrastructure is, in some measure, responsible for 2.5% of national greenhouse gas emissions. The pervasiveness of smart devices and cloud computing, and their links to the internet, guarantee that energy consumption and emissions of the ICT sector will likely increase. This increase could happen at a rate three times faster than those of other sectors. Meanwhile, in other sectors like transportation, broadband infrastructure has the force to drive sustainability by reducing more than 440 million metric tons of greenhouse gas by 2020 and beyond.[1]

Opportunities and Innovation

Applying broadband-based innovations can lead to more connected, sustainable cities with little environmental impact. Significant opportunities exist in this space that can achieve these goals:

Smart Transportation – Broadband technologies such as networked sensors that capture valuable data can collect real-time traffic data and coordinate traffic signals. Additionally, with the goal of reducing congestion and improving traffic safety for commuters and commercial operators, we will see broadband contribute to the ability of many workers to telework and significantly cut our emissions.[2,3]

Smart Grid and Smart Homes – Our electric utility grid is increasingly vulnerable to natural disasters and terrorist attacks. The ability for broadband technology to help increase resiliency and reduce emissions from electricity generation could reach as high as 12% by 2030. This is the equivalent of taking 65 million vehicles off our roads. Additionally, broadband technology can provide real-time energy information from smart meters, historical consumption, price, and bill data over the Internet. It has been shown that better information to consumers about their energy usage helps facilitate energy conservation. Some states have already begun adopting this technology: in California, the Public Utilities Commission ruled that its main investor-owned utilities must provide consumers real-time access to their usage and price data.[4]

Climate Change Adaptation – A sustainable infrastructure plan should use all technologies at our disposal for climate monitoring and early warning systems. In the fall of 2017, broadband-enabled technologies provided people with necessary alerts and information about hurricanes, floods, and other extreme weather events. To date, there are still weaknesses in our public safety communications that can be addressed by upgrading the public safety communication networks at the local level. A nationwide public safety broadband network based on coast-to-coast network architecture would be an important first step in increasing resiliency.[5]

Policy Solutions

Broadband is the core of information and communications technologies – a resilient broadband infrastructure is necessary to sustaining our nation and environment.

Some policy solutions that should be considered are ones that would:[6]

- 1) Fund build-out to high-cost, unserved and underserved areas while lowering prices and improving service;
- 2) Free up and/or repurpose federal spectrum while using spectrum auctions to allocate to necessary applications such as wireless 5G applications rather than to only raise revenue;
- 3) Coordinate with other infrastructure projects by enabling access to conduit, rights-of-way, and utility poles;
- 4) Standardize and streamline the process for wireless equipment installation on federal lands;
- 5) Spur digital literacy and adoption that is implemented by a coalition of for-profit and nonprofit organizations, state and local government, and federal agencies.

Congressional Proposals

- 1) H.R. 3895, Title 1, Smart Cities and Communities Act of 2017 (Rep. DelBene)
- 2) H.R. 2479, Title 1 Subtitle C, Leading Infrastructure For Tomorrow's (LIFT) America Act (Rep. Pallone)
- 3) S.19, MOBILE NOW Act (Sens. Thune and Nelson)
- 4) H.R. 4847, Broadband Deployment Streamlining Act (Reps. Matsui and Brooks)

[1] Federal Communications Commission. Connecting America: The National Broadband Plan, Chapter 12: Energy and the Environment (2010), <https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf>.

[2] <http://www.broadband.gov/issues/energy-and-the-environment.html>.

[3] http://www.cetfund.org/files/BB_GREEN_STRATEGY_Summary%20Report_05092014.pdf.

[4] Federal Communications Commission. Connecting America: The National Broadband Plan, Chapter 12: Energy and the Environment (2010), <https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf>.

[5] https://energy.gov/sites/prod/files/2017/09/f36/EIS-0527_FEIS_ES.pdf.

[6] <http://www2.itif.org/2015-itif-boc-filing.pdf>.

Ports and Waterways

Current Situation & Challenges

Ports and waterways facilitate freight movement and drive our economy. There are 920 coastal and inland ports in the United States, and in 2015 these ports handled 99 % of overseas trade. But these commercial corridors are often a region's largest source of air pollution. Thirty-nine million Americans live close to ports and are exposed to significant air pollution from diesel-powered ships, trucks, and equipment.[1]

Opportunities & Goals

Currently available technology and practices can substantially reduce emissions from ports and waterways (which affect more than 87 million of the Americans living in port communities) while creating up to 169,000 jobs for American workers. Examples of technology investments include cargo storage facility temperature control systems, electric and fuel-powered cargo handling equipment, harbor craft, and new aging locks. On land, the Georgia Ports Authority has converted all of its ship-to-shore cranes to electric power, saving nearly 2 million gallons of fuel each year.[2] However, these upgrades require significant upfront investment.

In our harbors, billions of dollars sit unused in the Harbor Maintenance Trust Fund, or are diverted away from their intended use. Congress should make sure that these funds—financed by user fees at our ports—are used to improve our harbors and ports.

Policy Solutions

The federal Diesel Emissions Reduction Act (DERA) has spurred the adoption of cleaner, more fuel-efficient diesel engines. EPA has focused these grants on areas with significant air quality challenges, including port communities, and leveraged federal funds by as much as 3-to-1.[3] In Virginia, grant funds helped the Virginia Maritime Association replace two tug boat engines, and DERA funds helped the Port of Houston institute a Drayage Truck Bridge Loan Program to replace aging diesel trucks [4]. However, this program has been oversubscribed, meaning thousands of inefficient engines remain in service. Congress should reauthorize DERA and ensure it receives full funding.

At the local level, several ports have taken significant steps to reduce emissions. Since 2005, the Port of Long Beach has granted incentives to vessels that slow to 12 knots within a 40 nm zone from the port. This program has achieved over 90 % adoption, and substantially reduced air pollution [5]. And the Port Authority of New York/New Jersey used federal Congestion Mitigation and Air Quality Improvement (CMAQ) grant funds to set up a program to offset its tenants' purchases of new, more-efficient cargo handling equipment.[6]

Congress should increase resources and incentives for the adoption of zero-emissions cargo handling technology, as well as operational changes that decrease air pollution like vessel speed reduction.

Congressional Proposals

- 6) H.R. 3107, Reauthorize the Diesel Emissions Reduction Act, (Reps. Matsui, Poe, Lowenthal, Barragan, Reed, Messer)
- 7) H.R. 3682, Incentivize vessel speed reduction, (Rep. Lowenthal)
- 8) Increase appropriations for CMAQ program
- 9) Make full use of the Harbor Maintenance Trust Fund, H.R. 1908 (Rep. DeFazio); H.R. 3152 (Reps. Reichert, Barragán)

[1] <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100PGT0.pdf>

[2] <http://www.gaports.com/About/Sustainability/ReducingEmissions.aspx>

[3] <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OHMK.pdf>

[4] <http://porthouston.com/environment/air-quality/>

[5] <http://www.polb.com/environment/air/greenflag.asp>

[6] <https://www.panynj.gov/about/cargo-handling-equipment-program.html>