About America 2050

Rebuilding and Renewing America: Toward a 21st Century Infrastructure Investment Plan is a forum of America 2050, a joint venture of the Regional Plan Association and the Lincoln Institute of Land Policy, to examine new strategies for investing in vital transportation, water, and energy infrastructure systems to position America for equitable, sustainable and prosperous economic growth. The forum coincides with the bicentennial and centennial of plans during the Thomas Jefferson (1808) and Theodore Roosevelt (1908) administrations that led to investments in railways, environmental restoration and power generation projects. America 2050 is a national initiative to develop a framework for America’s future growth and development in face of rapid population growth, demographic change and infrastructure needs in the 21st century. A major focus of America 2050 is the emergence of megaregions - large networks of metropolitan areas, where most of the projected population growth by mid-century will take place - and how to organize governance, infrastructure investments and land use planning at this new urban scale. America 2050 is an initiative of the Regional Plan Association (www.rpa.org), the nation’s oldest independent metropolitan planning group, and the Lincoln Institute of Land Policy (www.lincolninst.edu), a leading international research organization.

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INTRODUCTION

America faces a host of challenges in the coming century, all of which will have profound impacts on the nation’s future growth and development. Global economic restructuring, rising fuel and household costs, climate change, deteriorating infrastructure, all require strategies to maximize the nation’s continued prosperity, opportunity and quality of life.

In the face of these challenges, though, America is flying blind. No national strategy exists to build and manage the infrastructure systems needed to sustain inclusive economic growth and our competitive position in the global economy, and to secure a healthy environment for our children and grandchildren.

Our global competitors are now racing ahead to build the infrastructure to ensure their full participation in a 21st century economy. While America spends about 2.4 percent of its Gross Domestic Product (GDP) on infrastructure, China and India are spending 9 percent and 4.6 percent of their GDPs, respectively. Every American lives with the consequences of decades of underinvestment, including congested and deteriorating highways, unsafe bridges, inadequate transit and inter-city rail systems, delayed flights and bottle-necked seaports. Delayed shipments and the costs of congestion place every business in the country at a disadvantage compared with overseas competitors.

This was not always the case. The growth of this nation is due in part to far-sighted investments that built the nation’s canals, railroads, power generation projects, bridges and roads, and protected the nation’s environmental heritage, including its forests, wetlands, coastlines, parks, drinking water and clean air. America has a history of national plans that shaped development: the Gallatin Plan in 1808; Theodore Roosevelt’s conservation plans in 1908; and the work of the New Deal-era National Resources Planning Board, which led to the Interstate System in 1956. It’s time to do it again.

This forum is dedicated to advancing a new vision for the future of America’s infrastructure. Just as the Interstate Highway system provided a road map for the country’s growth fifty years ago, we now need a similarly ambitious vision, but one that responds to the challenge of increased foreign competition while cutting greenhouse gases and reducing our over-reliance on imported oil. The United States continues to have great potential to compete and lead in the 21st century economy because of its vast human, natural, and technological resources, but to do so effectively and efficiently, it must respond to four central challenges.

The Challenges we Face

1. Global Competitiveness – There has been an outpouring of studies in the past several years documenting the challenges facing the United States as an economic, cultural, moral, and political world leader in the 21st century. For all their differences, three critical themes emerge. First, the United States as a mature industrial society and leader of the post-WWII free world is losing its competitive edge in the global economy. Second, the vast infrastructure systems created throughout the 20th century are at the end of their useful life, require major reconstruction or are overcrowded and congested, undercutting America’s ability to compete in both its traditional fields of dominance and in emerging areas of importance. Third, recognition of the problem is not the challenge; rather it is the lack of imagination, creativity, and most of all, political will and leadership to re-think the fundamental principles and institutional design of our policy-making and governing processes of the nation. To do so will require harnessing the resources and capacities of both the public and private sectors to fashion 21st century strategies for sustained and sustainable growth.

2. Infrastructure – Over the past two centuries we built systems of transportation, water supply and protection, and energy production and transmission that supported our growth and were the envy of the world. Recently we have not created the new capacity needed to underpin the next generation of economic development, let alone maintain what we have built. An astonishing series of bridge collapses and levee failures have underscored America’s dangerous infrastructure deficit, estimated by the American Society of Civil Engineers (ASCE) at $1.6 trillion. In the nation’s transportation system alone, the recent National Surface Transportation Commission estimated that $225 billion a year is needed over 50 years to bring the transportation system to a good repair and make needed improvements for economic growth. From transportation to water and energy systems, we need investment and innovation to develop a more sustainable framework to reduce our reliance on fossil fuels, create capacity for economic growth, and make better use of our natural resources.

3. Fairness and Opportunity – The global economic transformation is deepening economic and social stratification as working- and middle-families find it increasingly difficult to cover rapidly rising transportation, housing and fuel expenses. At the regional level, access to economic opportunity is often segmented by geography. In many places, the best jobs have moved out from central cities, accessible only by car, while poverty remains concentrated in inner cities and inner suburbs. At the national level, the transformation is also leaving vast regions of the nation lagging in job growth and income levels. Predominantly manufacturing and resource-based economies, including the older industrial cities of the Northeast and Midwest and rural farming communities in the Great Plains and Deep South, as a result of decades of declining population and income.

4. Climate Change and Energy Security – With the price of oil reaching a new high of $120 a barrel, it is safe to say the era of cheap gasoline has passed. Meanwhile, the evidence of human impact on global climate change is becoming increasingly evident and the likely impacts will significantly change our lives. Climate change will impose huge costs on local communities across America, affecting agriculture, tourism, insurance rates, safety, and homeowners’ investments. It will have a significant impact on hydrological cycles, producing more frequent droughts and flooding, and other effects. At the national and global scale, climate change will cause disproportionate impacts on developing countries including vulnerable coastal regions in the Global South, contributing to competition for resources and instability in already volatile regions. The IPCC estimates that the United States must reduce its greenhouse gas emissions by 60 – 80 percent of current levels by 2050 to avert the worst impacts of climate change, with every year of delay driving up the cost of making change.

In face of these challenges, American population is anticipated to grow rapidly. According to the U.S. Census Bureau, from 2000 – 2050, America will grow by about 130 million additional people—the same number that was added from 1950 – 2000, during which time America’s GDP...
increased almost six fold. By making new investments in the physical fabric of the nation we can create needed capacity for growth, in the same way that the Interstate Highway System fueled two generations of development in the last half of the 20th century, and a system of canals, roads and railroads supported growth in the nation’s first 150 years. The challenge for our generation of Americans is to make these investments in the nation’s physical infrastructure, including transportation and energy infrastructure, the natural environment and water resources, and the next generation of commercial, residential and government buildings. With equally bold strategies for investing in people skills, these investments will provide the foundation for a new generation of more fair and sustainable development.

A HISTORY OF NATIONAL PLANNING

Throughout the nation’s history, Americans have met challenges even more difficult than those facing us today. Two centuries ago the United States faced the challenge of building a continental-scaled economy and mobility systems, while at the same time creating strong physical links between the nation’s diverse regions. And at the turn of the last century, the nation faced the challenge of building great cities to accommodate rapid immigration and industrialization, and the infrastructure systems needed to service what was becoming the world’s largest manufacturing economy. Simultaneously, they needed to take bold action to preserve the nation’s dwindling natural resources and provide clean air and water to an increasingly urbanized society.

To address these needs, in every era since the founding of the Republic, Americans have developed and implemented national infrastructure investment plans that have had a profound impact on the nation’s growth and development. Historian Robert Fishman has documented three important national plans, which profoundly influenced the shape of national development, often via indirect means. A brief history is in order to set the context for the ambitious proposals that are needed for the century before us.

1808: At the request of President Thomas Jefferson, Treasury Secretary Albert Gallatin created a national plan of ports, roads, and inland waterways to encourage settlement of the nation and facilitate trade among independent farmers scattered across the land. This plan was inspired by visions of George Washington and Thomas Jefferson of an egalitarian society – the “homestead vision” first made possible by the Land Ordinance of 1785. While the plan’s implementation was slowed by growing north-south divisions between slave and free states, several states moved aggressively to implement Gallatin’s vision. New York State, for example, built the Erie Canal, changing the geography of commerce in the nation. Other key elements of the Gallatin plan were realized under Abraham Lincoln’s leadership in 1862 when Congress enacted the Homestead Act, granting 160 free acres to each family that could farm them; and the Pacific Railway Act, which launched the first transcontinental railroad. Through this alliance with private interests – the railroads and the homesteaders – a national transportation system was realized in rapid pace, at enormous scale, and resulting in dramatic (but uneven) generation of wealth. The same year, inspired by the land grant principle underpinning the Gallatin Plan, Congress adopted the Morrill Land Grant Colleges Act, creating the nation-wide system of state universities, which dramatically expanded and democratized the nation’s higher education system.

1908: Theodore Roosevelt convened a Conference of Governors at the White House to launch a series of conservation plans drafted by the Inland Waterways Commission that would target underperforming regions of the South and West with irrigation, river restoration and dam projects. The plans responded to a generation of railroad development that had consolidated power and wealth in the hands of private interests concentrated in the Northeast and
Midwest cities. The conservation programs sought to restore ravished farmland and clogged river corridors and create cheap power with hydroelectric dams, resulting in successful projects including the Roosevelt Dam near Phoenix (1911), the Colorado Compact (1922) and the Hoover Dam (1931). Twenty-five years later, the ideas of the Inland Waterways Commission were taken up under the New Deal by the Tennessee Valley Authority, Bonneville Power Administration and other conservation and economic development programs under President Franklin Roosevelt.

**1930s and 1940s:** The National Resources Board (later renamed The National Resources Planning Board or NRPB) was established by President Franklin Roosevelt in 1933 to guide infrastructure investments promoted by the economic stimulus programs of his Depression-era New Deal. Led by a distinguished board chaired by Roosevelt’s uncle, Frederick Delano, the Board’s assignment was to take full account of “the distribution and trends of population, land uses, industry, housing, and natural resources” across regions, river basins, and entire ecosystems, to assure that federal expenditures would deliver “comprehensive and coordinated” consequences. The Board performed crucial services throughout the 1930s in coordinating public works and forming policy for land use, forests, parks, hydrology, and government-sponsored defense-plant location. Perhaps the Board’s most important contribution to the nation’s infrastructure system was its plans for a National Toll Road and Free Road System, which became the basis for the post-War development of the Interstate Highway system advanced by President Dwight Eisenhower.

The impact of the Interstate System was immense. Coinciding with the return of WWII veterans and federal programs that encouraged home ownership, it spawned patterns of suburban development that define the nation’s character today. As in the railroad era, the convergence of federal incentives and private investment resulted in the completion of an astonishing transportation network, the unification of the country, and uneven costs and benefits, in this case between urban and suburban areas.

**Sustainable Economic Growth**

In the past, national plans and the infrastructure investments they inspired resulted in dramatic economic growth. In many places, however, this growth was accompanied by unanticipated consequences, including damage to the environment and often unfair and inequitable distribution of economic benefits. In 21st century American society, however, these trade offs should not be accepted as the inevitable consequence of economic growth. As in the past, the federal government should provide leadership in setting goals for national-scale infrastructure investments that will shape the quality and direction of the nation’s infrastructure investments they inspired. Adapting in the completion of an astonishing transportation network, the unification of the country, and uneven costs and benefits, in this case between urban and suburban areas, and entire ecosystems, to assure that federal expenditures would deliver “comprehensive and coordinated” consequences. The Board performed crucial services throughout the 1930s in coordinating public works and forming policy for land use, forests, parks, hydrology, and government-sponsored defense-plant location. Perhaps the Board’s most important contribution to the nation’s infrastructure system was its plans for a National Toll Road and Free Road System, which became the basis for the post-War development of the Interstate Highway system advanced by President Dwight Eisenhower.

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**REBUILDING AND RENEWING AMERICA IN THE 21ST CENTURY**

The transformative infrastructure investments of our first two centuries shared a number of key characteristics. They inspired public investments that enabled private citizens to better access economic opportunity. They were built in cooperation with the private sector. They were national in scale. They relied on state and local actions to implement their national visions. They responded to the most urgent challenges of their time. Jefferson and Washington’s Homestead vision of using land and infrastructure enabled Americans to pursue their economic interests and at the same time build a nation. The visions of the Roosevelts and Eisenhower for nationwide programs of conservation, infrastructure investment, and personal mobility opened up access to the American Dream and built an industrial powerhouse.

**Infrastructure Investment as the Framework for Equitable, Sustainable Economic Growth**

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The concept of the “triple bottom line,” introduced in the 1990s as an accounting method to capture the economic, ecological, and social impacts of investments, captures the same values that should be considered in weighing major public infrastructure investments and policies. Instead of an after-the-fact accounting, however, the federal...
government should set out performance standards that measure progress toward meeting economic, environmental, and social equity goals and can be used in the project decision-making process.

Looking at one of the nation’s largest historic infrastructure investments, the Interstate highway system, one could imagine an alternative form that would have resulted had each individual segment of the broader vision been subject to performance standards related to environmental sustainability and fairness. While the system as a whole would have largely the same scope and positive impact on national economic growth, individual components may very well have looked dramatically different than they do today. The Cross-Bronx Expressway, as an example, is clearly integral to the highway network of the eastern seaboard yet it has had a pronounced negative impact on the health, economic vitality, and environmental quality of the local community through which it passes. A stronger consideration of avoiding adverse environmental and social impacts would have identified strategies including a slightly different course, decking, local parkland, housing replacement, and other elements which would have enabled the same level of regional and national economic development while mitigating many of the local negative externalities.

**The Role of the Federal Government in a National Infrastructure Plan**

While many land use decisions and infrastructure investments in the United States are made at the state and local levels, historically, federal policy and resources have had an unseen hand in shaping the development of the national landscape. For example, the combination of the Interstate highway system and the lending practices of the Federal Home Loan Mortgage agency in the post World War II era transformed American to a more suburban nation. Today, federal policies and funding programs continue to shape America’s growth, and not always in ways that help America respond to the key challenges of the 21st century.

With the urgent need to reduce America’s reliance on foreign oil and mitigate and adapt to climate change, national policies should be aligned to support the type of development that will make the most of the nation’s existing infrastructure systems and built areas and provide increased mobility options. The national role in infrastructure investment, development, and environmental protection should be that sets the direction of goals and objectives expressed as outcomes, e.g., livability, mobility, accessibility that meets our “triple bottom line” of economic prosperity, fairness, and sustainability. These outcomes expressed as standards and performance measures, would provide a framework for challenging states and local levels of governments to meet these goals with financial incentives and technical support.

The national infrastructure investment plan could play a constructive role in national development in the following ways:

1. Establishing a vision and priorities for the nation’s infrastructure needs by setting goals to align departmental policies, ensure best value from government spending, reduce duplication, and show how investments can reinforce one another. This framework would avoid the enormous time delays and costs in delivering major projects that arise because of the lack of agreed upon national priorities, and set the context within which decisions are taken at the state and local levels (and by the private sector) with confidence and evidence.

2. Setting standards for efficiency and safety: examples include CAFE standards for automobiles and light trucks, efficiency standards for appliances. In safety, the federal government plays an important role in many areas including federal aviation, the food and drug administration, OSHA, etc. The federal government should set a high bar for minimum standards of safety, efficiency and health, and yet individual states should not be discouraged from aiming higher.

3. Promoting federal objectives with “conditionality.” The promise of federal funding and financial tools for states and regions that take action to meet federal objectives can act as a powerful motivating force. Equally compelling is withholding federal funds or financing for not meeting federal objectives. For example, Congress used both the carrot and stick approach in the 1991 highway bill, to promote state laws mandating seat belts and motorcycle helmets.

4. Convening multi-state partnerships. To address issues of a multi-state nature, the federal government can provide the incentive and the legal basis for states to finance multi-state transportation projects or regulate and protect multi-state environmental resources. Entities like the Port Authority of New York and New Jersey, the Alameda Corridor Authority, the Tennessee Valley Authority and the Bay Delta Commission were created through federal actions.

5. Measuring performance and collecting data. The federal government should collect data to measure and rate the performance of states and regions toward meeting the outcomes of federal programs for which they receive funding, such as been done in education with the No Child Left Behind Act. Rigorous evaluation of performance should be extended to other federal programs, particularly transportation, to increase transparency of how federal funding is used and provide the tools to make better decisions about the effectiveness of federal programs.

**Interactions with States, Regions and Local levels of government**

States and local government will continue to play the important role of planning, developing and maintaining much of the nation’s infrastructure investments within the context of a national vision and clear federal priorities and performance standards. Across the country, states have been leading the way in adopting climate change policies that are more ambitious than those of the federal government. For example, California’s AB 32 legislation, which requires CO2 reductions to 1990 levels by 2020, has already begun to foster innovation and investments in new technologies that will help the rest of the nation respond to the climate change challenge. To date, 29 U.S. states have also adopted Renewable Portfolio Standards (27 of them mandatory), which set varying targets for the states’ use of renewable energy.

Metropolitan regions will also play an important role in transportation policy and in coordinating transportation and land use investments to promote greater energy efficiency, sustainability and quality of life. Measured by the geographic extent of integrated labor markets, metropolitan regions function as the basic units of the nation’s economy. In transportation policy in particular, the case for strengthening the decision making power and direct funding to regional authorities, such as Metropolitan Planning Organizations and regional transit authorities, is compelling. According to the Brookings Institution, America’s top 100 metros alone account for over three-quarters of the nation’s air cargo tonnage, seaport tonnage, and rail passengers, yet they struggle to receive adequate funding and
tools from their state governments, despite contributing disproportionately to state and federal gas tax revenues.

Cities and local government have an important role to play in concentrating jobs, housing, and activities in central places, where transportation options are plentiful. After enduring a long era of decline from the 1960s through the early 1990s, many of the nation’s urban places have undergone radical transformations to become more stable, prosperous places, while others are just beginning to turn around. The nationwide decline in crime and sustained national economic growth has played a role in this transformation, as have demographic and market forces that are leading more young people, immigrants, and “empty nesters” to seek homes in urban places.

Megaregions – A Framework for Meeting Cross-Border Challenges

In addition to states, regions, and local levels of government, a new urban scale has emerged that presents a framework for responding to large scale challenges. Megaregions are networks of metropolitan areas, connected by travel patterns, economic links, shared natural resources, and social and historical commonalities. Ten or more emerging megaregions have been identified in the U.S., where the majority of the nation’s growth will take place by 2050.

The connections between the component metropolitan areas of megaregions are growing stronger as technological and global economic factors enable the movement of goods, people, and information at lower costs, more frequency, and at greater speeds. These megaregions are America’s gateways to the global economy where our global ports, airports, communication centers, financial and marketing centers are located.

While megaregions present a new scale to consider and plan for, it is not necessary to form megaregion “governments” to address emerging megaregional issues. Rather, adjacent states, cities, or metropolitan areas should recognize the issues taking place at this scale and form partnerships to address them. For this to occur the federal government will need to undertake the leadership role described above.

Increasing interactions between the metropolitan areas that make up megaregions also present the opportunity to expand regional agglomeration economies to a larger scale. With better transportation connections, firms can take advantage of lower-cost labor and start-up costs in rural or older industrial communities that are distant from the economic core but still within the megaregion, as an alternative to international outsourcing. A megaregion can potentially take advantage of a wide range of economic functions (from headquarter locations to low-skilled manufacturing) within a single geographic “megazone.”

Supporting collective megaregion-scale actions could achieve the following:

1. Development of intercity and high-speed rail corridors that move people and goods that are linked to our global facilities and other multi-state or interregional transportation networks requiring coordinated planning, investment and management across local, state and international borders.

2. Protection, restoration, and management of large environmental systems and resources such as watersheds, farmland, forests and coastal areas.

3. Developing economic revitalization strategies for underperforming regions such as the Midwest and the Gulf Coast.

Emerging Megaregions in the United States. Regional Plan Association

Saskia Sassen, 2007.
THREE COMPONENTS OF A NATIONAL INFRASTRUCTURE INVESTMENT PLAN – WATER, ENERGY, TRANSPORTATION

Water – Making Integrated Management a Strategic Asset

Despite, and perhaps because of, their many successes, the water resource policies of the last thirty years must be recast to the new century. Population growth, changing settlement patterns, aging infrastructure, unmet environmental goals, climate change, and global markets for agricultural commodities are posing distinct new challenges. America’s water infrastructure was once an unrivaled advantage for our country. If it is to remain so, water policy must change with the times, in ways that decisively address the above challenges and that make clean water a central element of a sustainable future.

Water resource management now crosses many political, economic, institutional and disciplinary boundaries. Creating guiding principles that work across them and turn these overlaps into a synergistic asset must be must be a top priority for a national infrastructure plan. Water resource managers increasingly understand that the heavily engineered, capital intensive, facility construction solutions that characterized 20th century approaches to water supply, wastewater treatment, storm water management, and flood control problems are no longer sufficient. Now, an increasing complex set of water problems requires a policy framework that encourages innovation and efficiency, understands resource optimization, promotes creative uses of market tools, eliminates perverse incentives and subsidies, aggressively promotes watershed management and links water resource management to land use decisions.

The landmark 1972 Clean Water Act and subsequent federal and state policies allowed the United States to make enormous strides in reducing pollution from municipal and industrial point sources. According to EPA, pollutant discharges are half of what they were in 1970, despite waste loads that grew by a third. Cleaner water has benefited public health, created new recreational opportunities, improved fisheries and wildlife habitat, and subsidized urban growth and development. These achievements are directly tied to the level of investment in water resource infrastructure and water resource management since 1970. EPA estimates that public spending on water systems has doubled since then and spending on wastewater systems has tripled.

Despite these accomplishments and expenditures, the Clean Water Act goals of fishable and swimmable waters have not been universally met. The most serious remaining problems occur in the bays and estuaries where older combined sewers, diffuse non-point urban storm water, and growing agricultural runoff have remained largely uncontrolled by traditional capital investment approaches. It is now generally recognized that restoration of these water bodies, such as Puget Sound, San Francisco Bay-Delta, the Everglades, Chesapeake Bay and the Gulf of Mexico, require complex multi stakeholder strategies and investments.

Population growth and migration are also changing the priorities of water resource management in ways that national water infrastructure policy needs to recognize and address. Emerging megaregions and growing metropolitan areas will significantly increase demands for water in these urbanized areas. Physical scarcity of water is a growing concern in Southern California, the Arizona Sunbelt, and the Texas Triangle. The Piedmont and Front Range region have adequate water but experience economic scarcity caused by lack of institutional, financial, and human capital. Even in seemingly water-rich locations like the Northeast, exurban sprawl into water supply watersheds is requiring new infrastructure upstream, while degrading quality for downstream urban areas.

Climate change is expected to strongly alter hydrologic cycles and the dynamics of this debate. The reliability of water supplies will be reduced, especially in areas dependent on seasonal precipitation cycles. Warmer temperatures and changing precipitation patterns will reduce annual snow packs and increase evapo-transpiration, lowering natural storage capacity. Weather extremes will occur with greater frequency, stressing not only humans but also wildlife and natural systems. Sea level rise and higher intensity storms, increase risks on the coasts and inland. Flooding will incur even greater costs above the billions of dollars of damage this nation experiences each year, compounded by land use decisions that allow construction in flood-prone areas and a reliance on levees and other engineering structures built in opposition to, rather than as a complement of, natural hydrological dynamics. Federal and state flood insurance and disaster relief policies have allowed developers to avoid the financial consequences of such unwise decisions.

The nation’s water infrastructure is also aging. Many urban areas still rely on distribution systems installed in 19th and early 20th century. The massive infrastructure investments of the 1970s are beginning to wear out; the end of their useful life and will soon require renovation or replacement. Addressing these needs will be expensive. While federal, state, and local sources have invested about $18 – 20 billion a year towards these capital needs since 1970, the US EPA has projected a gap of $224 billion, or about $11 billion a year, to meet replacement costs and unmet goals over the next 20 years. The relative role of different levels of government, utilities, and developers in closing this gap, and the affordability for ratepayers and taxpayers are key questions.

Addressing all these challenges will require a more integrated set of solutions. EPA has outlined a “four pillars” approach that incorporates principles of better management, full cost pricing, efficiency, and watershed approaches. Two recent reports by the National Academy of Public Administration have also proposed that the EPA and the Army Corps of Engineers develop outcome-orientated policies and integrated strategies that connect land use and investment actions.

The rationale for promoting non-structural solutions to water resource problems is clear. Pollution prevention, water conservation, appropriate pricing, resource optimization, improving management efficiency can provide the same benefits at a far lower cost than capital intensive facilities. These approaches have also been proven to have the added advantage of providing important secondary benefits including saving energy, protecting and restoring ecosystem services, lowering liability associated with flooding, and creating local jobs by relying on labor management intensive activities.

To be effective, a national infrastructure investment plan must outline how traditional federal mandates and on-going capital investments in water management will be linked to non-structural alternatives. It should provide incentives for smarter, systematic approaches that link upstream and downstream investments, and match relative effectiveness to relative cost. Perhaps most critically, it should break down traditional sector responsibilities and deliver the coordination needed for water managers to engage land use decision makers.

The national water policy choices that will be made over the next several years will determine whether America’s water resource managers, in the face of growing challenges and complexity, can produce safe drinking water for over 300 million Americans, dispose of their sewage safely, provide industry and agriculture with the water it needs, and do all of this and much more in a way that
is both environmentally sustainable and economically affordable. The task will be to use the successes of the past and the many promising initiatives of the present to create the integrated, multi-dimensional, goal-oriented policies the future will need to do so.

Energy – Technologies, Climate Change, & Governance

America’s response to the dual challenge of meeting its growing energy needs and responding to the threat of global climate change will define its ability to compete globally in the 21st century. Generating and delivering electricity to meet the demand of America’s growing “hi-tech” society is a critical component of our national infrastructure. Without the capabilities to provide an adequate supply of energy to meet demand, our economy will stagnate or contract as businesses move to where their energy intensive needs can be met. And yet, with the nation’s energy demand growing at a faster rate than its population, attention to managing demand by promoting greater efficiency in new and existing buildings, industry, and transportation must be at the core of national policy. To meet this challenge, America must holistically examine our existing electrical power generation, transmission and distribution infrastructure, much of which still relies on antiqued 19th century technology. We must identify areas for investment, assign priorities, and clearly define the roles and responsibilities of both the private and public sectors.

As the world’s largest economy, the United States also has the responsibility to provide global leadership in reducing greenhouse gases through the adoption of renewable sources of generation. The nation currently emits approximately 24 tons of greenhouse gases per capita compared to China’s three tons per capita. With China looking to emulate America’s post-WWII growth patterns and automobile culture as it embarks on a period of unprecedented economic and population growth, the need for America to show leadership in climate change responsibility is clear. China, as the United States, also relies heavily on coal-fired power plants for electricity generation, a major source of greenhouse gas emissions. Domestically, electricity production is responsible for 40 percent of U.S. carbon emissions – a direct result of our heavy reliance on coal as a fuel source. The share of U.S. electricity generation from coal fired power plants is projected to grow from 50 to 57 percent by 2030.

Over the next decade, energy efficiency offers the most immediate large-scale payback from investments. Retrofitting commercial, industrial and government buildings and home weatherization will stop waste and cut demand. These programs require a clear commitment by the federal government to act on its own properties and practices, as well as tools and incentives for homeowners, businesses and state and local governments.

Renewable energy, such as wind and solar, is seen as the wave of the future, but without sustained government investment, these technologies will be unable to compete with fossil fuels. When Congress passed the U.S. Energy Independence and Security Act of 2007, though it extended tax credits for oil and gas production, it failed to find the funding to extend credits for wind and solar, which will expire at the end of this year. Some of the challenges associated with bringing wind and solar online involve building up transmission lines to get power from the rural windy areas to urban areas where it’s used and also the intermittent nature of wind (it doesn’t blow all the time). Transmission will also have to be altered to be able to handle the distributed generation nature of small-scale solar.

Finally, there are a number of technologies, if implemented that will have the potential to mitigate some of the environmental impacts of the legacy power plants. Advancements in “clean coal” and carbon capture and sequester (CSS) technologies could substantially reduce the damaging emissions from these plants, and create new marketable technologies to China and other developing counties. Investments in renewable energy sources like solar, wind, and geothermal, as well as a greater role for nuclear and natural gas power generation, could also be a part of a comprehensive package of improvements contributing to the reduction of our national carbon footprint. In the near term we must build the infrastructure necessary to secure an adequate supply of natural gas as a bridge to future technologies. Concurrently, we must look at our existing electricity grid, the delivery system for our nation’s power, as a means to increase efficiency, reduce pollutants, and conserve energy.

The 2007 energy bill has begun to address these concerns by advancing research on the “Smart Grid.” This next generation grid would integrate broadband telecommunications technologies and sensing devices that would be installed in our homes and appliances, permitting bi-directional communication between the customer and energy supplier. These technologies would allow for real-time monitoring and pricing, and provide for automatic load adjustment on the supplier and consumer ends, which would increase throughput, conserve energy and prevent blackouts.

The Smart Grid would significantly improve the transmission system’s ability to respond to and recover from an unforeseen crisis through its ability to “self heal,” preventing a reoccurrence of large scale outages like the one experienced in the Northeast in summer 2003. Perhaps the greatest advancement of this new grid is that it will be designed to both distribute and store energy. Everyone would be able to draw or purchase power from the grid and feed or sell any surplus back to it. This surplus power could then be allocated to meet other demands. This model improves the economics of cogeneration - the simultaneous production of heat and electricity - and promotes the use of renewable energy. This innovative program was funded at $100 million dollars each year from 2008 to 2012.

Private sector corporations play a dominant role in the U.S. energy sector, which provides 75 percent of net power generation and owns almost 80 percent of transmission lines. The remaining generation and transmission is provided by government power marketing authorities such as the Tennessee Valley Authority (TVA) and other cooperatives. Because the private sector is positioned as the principal provider and owner of our nation’s energy infrastructure, market forces tend to dictate whether infrastructure investments are promoted. To get around this issue, the government could further incentivize industry investments in renewable energy sources and in improvements like the “smart grid.”

We must today start the process of creating a national framework that ensures the stability of our future energy supply, the adequate generation of electrical power to meet demand, a robust infrastructure to deliver electricity, and an ability to lead in fighting global climate change. By actively engaging both private and public sectors, we can systematically and comprehensively plan for the long-term health and efficiency of these critical systems.

Transportation – The Role of a National Plan

Meeting the needs of America’s deteriorating transportation infrastructure and providing capacity for future, sustainable growth, must be at the core of an infrastructure plan for America. In anticipation of the expiration of the current surface transportation bill, SAFETEA-LU in 2009, industry associations, policy makers, and advocates are now focusing on shaping the next bill. Common among recent reports and state-
ments by groups like the National Surface Transportation Policy and Revenue Study Commission, AASHTO, ARTBA, APTA, the U.S. Chamber of Commerce, and the Brookings Institution, are three themes: the recognition that the current policy framework is not meeting the nation’s transportation needs, the incredible funding gap to repair and expand the system, and the call for a clear “vision” to guide transportation investment and the federal role in the 21st century.

In addition to these broad points of agreement, calls for real reform of transportation policy are growing. The need for a “new beginning” was clearly stated in Transportation for Tomorrow, the final report of the National Surface Transportation Policy and Revenue Study Commission, which recommended against “re-authorizing” the current transportation bill in favor of crafting transportation policy anew. Its characterization of the nation’s transportation program since completing the Interstate system, as “pursuing no discernable national interests other than the political imperative of ‘donor states’ rights and congressional earmarking,” makes clear the failure of today’s policies to achieve national goals. In fact, the Commission charged that today’s transportation policies work against national goals, by perpetuating oil dependency, raising greenhouse gas emissions, undermining economic competitiveness, national security, public health and safety.

Despite the clarity of the Commission’s criticism, engaging Americans and politicians in a debate about the minutia of transportation policy reform is a challenge. The media frenzy inspired by $4 a gallon gasoline has done little to promote a substantive debate about how the highway trust fund is spent, for example. Instead, it has garnered short-term proposals for a gas tax “holiday,” which clearly would do nothing to address the more fundamental problem that most Americans have no other choice in getting around but to drive their cars. The trouble is that in response to rising congestion and high gas prices, national transportation policy is engineered to promote a single solution above others, which does little to address either problem: build more roads.

Clearly more investment is needed. But to use the same example, the transportation investments of tomorrow should proceed on a balanced playing field where communities are offered the same tools and resources to invest in public transportation, transit-oriented development, biking and walking, as they are offered to build roads. More importantly, this new approach should be integrated in federal goals and performance objectives that add up to a vision for national transportation policy. With broad strokes and illustrative examples, a national transportation vision for investment has the power to capture the general public’s imagination in the way that detailed reform proposals may not.

The precedent of the federal government’s leadership in planning and building the nation’s Interstate system in the 20th century is frequently cited as a model for planning the bold, national-purpose transportation investments of the 21st century. The challenges of the 21st century will call for a new, more active role of the federal government in establishing principles, priorities and plans to guide transportation investment in the dawning century.

Foremost among these is the growing role of foreign trade in the nation’s economy and its growing impact on international ports, key trade corridors, and intermodal chokepoints. Currently, states and local governments lack the resources, multimodal scope, and ability to coordinate across jurisdictions to make effective and prioritized investments in key global gateways and critical trade corridors. Moreover, with the growing imperative to reduce greenhouse gas emissions, polluting port facilities and their transportation connections must begin to make the transition to low-carbon practices, which will require federal performance standards and investments.

Another trend is the emergence of megaregions – linked networks of metropolitan regions that are experiencing increased international trade, interregional goods movement and intercity passenger travel. Without an intermediary level of government between states and the federal level, megaregions are relying on ad-hoc collaborations to strategize and prioritize projects in key multi-state corridors. A stronger federal role in convening megaregion partnerships to plan goods movement corridors and high-speed rail networks, for example, could begin to fill this gap and is a logical focus of a national infrastructure plan.

Third are the converging concerns about climate change, dependence on foreign oil, and growing household costs attributable to transportation. The federal government should require greater coordination among transportation and land use planning to promote more transportation choices for Americans, in response to the growing pressures of rising gas prices and congestion.

A national infrastructure plan that responds to the three challenges above could provide an organizing framework for the actions at the federal level that are needed to leverage state, local and private investments. This plan could take shape in a variety of ways, including through a commission-led process, as proposed in legislation to create a U.S. Commission on Renewing and Rebuilding America, or a civic-led initiative of national outreach and regional forums in collaboration with government and industry leaders. No matter the process, the end result should include the strategic priorities of the federal government to guide another generation of growth that can be shared by every community and every region in the country.

CONCLUSION

This report opens with an account of the enormous challenges now facing the United States, including growing global competition, climate change and the urgent need to rebuild economic opportunity in underperforming communities and regions across the country. As we mobilize to meet these challenges, we can be inspired by plans and actions taken by earlier generations of Americans, who time after time, when faced with even more daunting tests, met them with foresight and courage. Over the coming year we will have the opportunity, under the leadership of a new President and a new Congress, to take bold steps to invest in the nation’s infrastructure – our future depends on it.

This paper is designed to be the beginning, not the end of a national dialogue on the America’s infrastructure needs and the components of a national vision for sustainable, equitable and prosperous growth. It provides a basis for discussion on May 9 and will be modified in the coming months with input from a broad range of stakeholders and the public.

3 The Strategic Vision Study process of the I-95 Corridor Coalition in the Northeast, Southeast and Florida, and the coordination among regional agencies and ports in Northern California around freight movement project prioritization convened by the Bay Area Council, present two current examples of ad-hoc collaborations.
References


