The Business Council of Fairfield County

Strengthening Businesses. Strengthening Communities.

A Stronger Recovery
A Competitive Future

Meeting Our Infrastucture Financing Needs

A Report from
The Business Council of Fairfield County

Table of Contents

About The Business Council

The Business Council of Fairfield County is a nationally-recognized, private, non-profit corporation headquartered in Stamford, serving businesses in Fairfield County, Connecticut. It is governed by a volunteer Board of Directors and served by a professional staff. The corporation was formed by the merger of three organizations in 1970, the oldest of which had been founded in 1890. Today, The Business Council's membership includes more than 230 corporations, 40 non-profit institutions, and 1,700 professional and affiliate members. It serves as a catalyst for private sector involvement in public policy and is the vehicle for a network of business leaders to address key issues facing their businesses and their communities.

www.BusinessFairfield.com

Acknowledgments

Infrastructure, in today's United States, is not glamorous. It is difficult to imagine a contemporary version of the excitement that gripped the nation when the Golden Spike was pounded into the rail in Promontory Summit, Utah, in 1869 as the First Transcontinental Railroad was completed or the passerby's sense of wonderment in 1882 when the Edison Illuminating Company activated the first commercial electric power distribution system, serving 55 customers and lighting streets in lower Manhattan.

The World Economic Forum now ranks the United States 23rd among nations for the quality and efficiency of its infrastructure. If infrastructure is the foundation for economic activity, our ranking may be better understood as an unpleasant predictor of our future place in the global economy.

As this report shows, we need investment across a broad range of assets – from the more traditional, like bridges, roads, ports, and school facilities - to newer digital systems for energy, broadband, and intelligent transportation. Yet, all levels of American government – national, state, county and municipal – are deferring or outright cutting, not increasing, infrastructure spending.

The Board of the Directors of The Business Council of Fairfield County responded to this collision of growing needs and shrinking resources by forming the Infrastructure Investment Task Force. The Task Force was charged with gathering data, understanding issues and trends, developing recommendations for state and national action, and preparing the organization for a sustained engagement in infrastructure policy development and advocacy.

The findings and recommendations are detailed in this report. As our conclusion states, "This will be a long journey; the first steps must be taken today." I have had the honor of serving as the team's chair and the pleasure of working with them over the past seven months. I thank them all, named below, for their energy, diligence and insights. The entire team joins me in expressing our gratitude to the scores of experts and leaders who have generously shared their knowledge with us. Among this distinguished group, we must note the contributions of Stanton Hazelroth**,** CEO,California Infrastructure and Economic Development Bank; Michael Likosky, Senior Fellow, NYU Institute for Public Knowledge; Benjamin Cheatham, McKinsey & Company's Americas Infrastructure Practice Leader; U.S. Representatives Rosa DeLauro (CT-3rd District) and Jim Himes (CT-4th District); Daniel Zeitlin of Rep. DeLauro's staff; Christopher Ward, Executive Director, and Gerry Stoughton, Director of Finance, Port Authority of New York and New Jersey; Jeffrey Gaudiosi, Connecticut Energy Advisory Board; Richard Strauss, Executive Director of the Connecticut Academy of Science and Engineering; Howard Rifkin, former Deputy Treasurer, State of Connecticut; and Janet Kavinoky of the U.S. Chamber of Commerce. We are especially appreciative of the involvement of Terex Corporation throughout our process, in particular the role of its Chairman and CEO Ron DeFeo in hosting our stakeholder working summit in July, 2011.

Special, warm thanks go to our professional Project Leader Joseph Ercolano. His hard work, thoughtful analysis and determination have been instrumental to the effectiveness of the group and the value of our work product.

Harry Hurvitz, Deloitte, Chair
The Business Council Infrastructure Investment Task Force
Matthew Nemerson, Connecticut Technology Council
Brian Scanlon, McKinsey & Company
Garrett Sheehan, United Illuminating
Chris Swann, CT Light & Power

Executive Summary

Investment in public infrastructure in the United States has failed to keep pace with need. Today, the World Economic Forum ranks the U.S. 23rd for the quality and efficiency of its infrastructure. The investment needed across a broad range of assets – from the more traditional, like bridges, roads, ports, and school facilities, to newer digital systems for energy, broadband, and intelligent transportation – is estimated to reach as high as $2.2 trillion over the next five years. There is a broad consensus that the failure to make this investment will jeopardize the global competitiveness of the nation and individual states by adding cost to economic transactions and making productivity gains more difficult to achieve.

The Business Council of Fairfield County seeks in this report to present Connecticut's infrastructure needs in the dual context of national and state financial capacity and a range of existing and proposed investment options. We estimate that over the next twenty years, Connecticut must invest as much as $85 billion in six critical infrastructure areas – transportation, energy, broadband, water quality, economic and community development, and public school facilities – in order to rebuild, enhance and, in some cases, transform, these systems. These investments are necessary to provide adequate capacity and sustainable levels of service, safety, and connectivity. If guided by a vision which integrates opportunity for growth and responsible stewardship of investments made by prior generations, they will also generate significant, immediate job creation and economic activity while fundamentally improving the state's competitiveness.

The Business Council is, by mission, focused on the needs of a specific geographic region. Yet, we believe that islands of local prosperity cannot survive in a state and nation that have entered decline. We also believe that our work must be conducted in a way that meets the standards of national peer best practices and can serve as a model for others. Therefore, this document reviews options that would increase financing for infrastructure on both a national and state level. It puts forth policy recommendations that will help Connecticut access currently available and future funding resources on a federal level, while doing a better job developing, prioritizing, financing, and delivering infrastructure at home.

The uncertainty of current fiscal policy debates in Washington and our state capital make short term public sector investment projections difficult. However, longer term projections based on equally long term past policies and investment history can provide a meaningful framework. If Connecticut relies solely on the resumption of pre-ARRA (stimulus) Federal funding levels and the state bonding goals announced by the current Administration, it will have a shortfall of at least $35 – 45 billion over the next two decades. Recently proposed infrastructure financing mechanisms, such as national and state infrastructure investment banks, could be critically important to helping fill this gap. Other proposals, such as privatization, public sector pension fund participation, and dedicated taxes or user fees must also be understood. We are particularly interested in approaches such as U.S. Representative Rosa DeLauro's proposal for a national bank based on European models, which would help states like Connecticut access private capital and its expertise in creative financing techniques. We also support a feasibility assessment of creating a state infrastructure investment bank with similar functionality, scaled to a range of project types and sizes.

Private investment firms and equity managers have raised billions globally to invest in infrastructure. Without suitably structured projects and adequate know-how on the part of national and state agencies, much of this capital will continue to be invested outside the U.S. With or without a national infrastructure bank, we in Connecticut must act to leverage this private capital and increase the role of the private sector in meeting our infrastructure needs.

The Business Council of Fairfield County is committed to working with state and national partners and other interested parties to advance the prospects for a national infrastructure investment mechanism and to help Connecticut develop appropriate policies and methods to meet the challenge of creating and maintaining a 21st century infrastructure.

I. Introduction

Financing public infrastructure in the United States is at a critical juncture. Historically dependent on Federal tax revenue to fund appropriations to states and support various grant, loan, and loan guarantee programs, the country's fiscal condition makes clear that these resources will not expand in the near term. With concern about growing Federal deficits, entitlement programs with their own challenges, and a vigorous debate over tax policy, there is little chance the entire $2.2 trillion estimated needed investment over the next five years will be available. Recognizing this, in recent years legislators and others have advocated for new Federal financing mechanisms and a greater role for private capital in public infrastructure.

It is equally clear that the states will not fill this gap. Most states are facing budget deficits and projections of weak revenues for the next several years. Their ability to increase tax revenues to fund infrastructure investment is limited. States also need to find ways to attract private capital and utilize new financing techniques.

> ***"Infrastructure – both physical like transportation and virtual such as broadband connection – drives productivity directly and by acting as a platform for other productivity- enhancing innovations to build scale."***
>
> ***- McKinsey Global Institute***

While this paper addresses infrastructure needs in Connecticut in some detail, it also highlights the importance of national funding policies and mechanisms. The need in Connecticut is similar to that of the other 49 states, and addressing this need will by necessity include a significant Federal role. Advocates for increased infrastructure investment understand they must work for initiatives at both a Federal and state level. The need is just too large for one level of government to address on its own.

Connecticut's Infrastructure Needs

Connecticut's critical infrastructure is the physical, and increasingly the digital, components of its economy, the foundation that enables economic and social connections and thus wealth and well-being. For this report, this infrastructure encompasses six areas traditionally funded by federal funding and state bonding: transportation, energy, broadband, water quality, community and economic development, and k-12 public schools. This infrastructure enables residents to get to work and get educated, and businesses to reach customers and suppliers locally and across the globe. It makes it possible for a world-class health system to deliver timely, high-quality care, and for individuals to live in an environment that enhances, not threatens, their lives. In short, Connecticut's quality of life and economic vitality require this infrastructure to function in a safe, efficient manner.

> ***According to the American Society of Civil Engineers:***
>
> ***Connecticut has $2.6b in wastewater infrastructure needs***
>
> ***34% of state bridges are structurally deficient or functionally obsolete***
>
> ***45% of major roads are in poor or mediocre condition***
>
> ***58% of state urban highways are congested***

The state does many things well, but financing and planning infrastructure investment is not among its strengths. The latest Pew state rankings graded Connecticut C+ in infrastructure and identified the state's capital planning processes as a weakness. The American Society of Civil Engineers identified several state infrastructure areas requiring significant attention and funding.

The Business Council of Fairfield County estimates that $75 to $85 billion must be invested in these six critical infrastructure categories over the next twenty years. This investment will assure the state meets its ongoing need for reliability and safety, and enhances its competitiveness in the global economy. Properly financed and built, this infrastructure will also help address the high cost of doing business and living in Connecticut.

Other states have similar challenges. New York's Comptroller estimates state and local infrastructure needs will reach $250b over the next twenty years, with a funding gap of $80b. The Massachusetts Transportation Financing Commission identified an unfunded need of $15 to $19b over 20 years. According to the US EPA, Massachusetts' drinking water infrastructure needs require $8.5b in new investment over the same timeframe.

The paper focuses on how Connecticut's infrastructure will be financed. Current and near term Federal and state fiscal conditions and existing financing mechanisms will not enable investment of this magnitude without a significant role for private investment. However, Connecticut has a historically low level of private participation in infrastructure and lacks the policy and practical tools to tap this funding. This places the state at a disadvantage to other states that are actively pursuing private investment. Failure to compete for private investment and involvement in delivering infrastructure means that at best, these needs will be met long after other states invest in new infrastructure.

Increasing the level of private investment in and financing of the state's infrastructure should be a priority for state policymakers. To leverage the effectiveness of both public and private investment, the state should have a coherent, strategic plan encompassing these critical infrastructure categories. This plan should include improving the state's capability to identify, prioritize, and implement infrastructure projects.

The Imperative to Act

Several near to longer term challenges are driving the need to enhance and upgrade the state's infrastructure beyond ordinary maintenance and improvements:

- Even in a slow or no growth economy, congestion and deteriorated roads, highways, and bridges threaten safety, impede commercial activity, and add cost through delay and disruption.

- Increased Federal environmental mandates and growing public recognition of the impact of environmental degradation on health and quality of life require systems that emit less toxic material into the state's air, water, and soil.

- Inadequate energy generation and transmission systems and the need to use more environmentally beneficial energy sources will drive the need for a major re-focus of the state's current energy system.

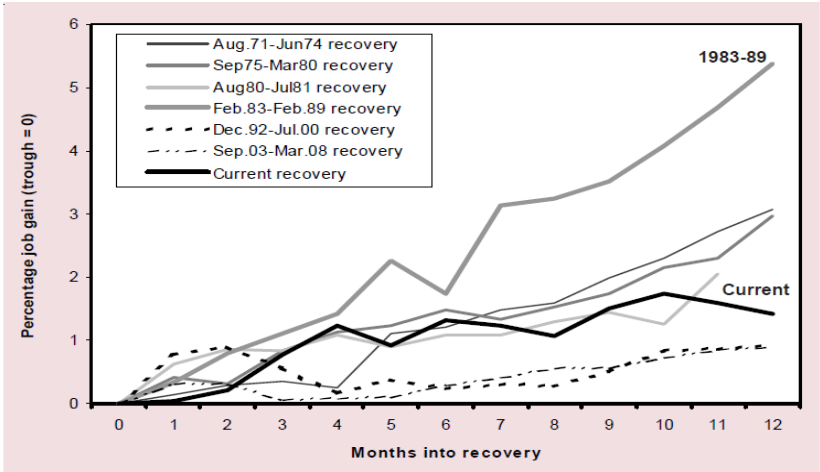
- Growing reliance on electronic communication for commerce, government services, and social interaction requires universal broadband access at speeds that meet or exceed international standards.

- Closing the public education achievement gap between affluent and less affluent students and helping all localities expand resources for the growing numbers of Adult Education and ESL learners will continue to place fiscal stress on many localities.

The Importance of Infrastructure to the State Economy

Connecticut's economic performance over the past twenty years has been disappointing, placing the state near the bottom of all states in economic performance. As the chart below illustrates, following the last three recessions, state job gains were 1% or less one year into recovery. It took 23 months to recover jobs lost in the 1990-91 Recession and 39 months for the 2001-02 Recession. For the 2008-09 Recession, the Connecticut Center for Economic Analysis (CCEA), as of February 2011 offers no projection for a recovery of lost jobs. Nationally, McKinsey projects a 60 month recovery to pre-recession job levels.

Since the early 1980s recessions have hit Connecticut hard. Recoveries have taken longer and have left the state worse off than prior to the recession. CCEA notes that the state's overall employment in early 2011 is lower than in January, 2000, and that "the state has lost large numbers of high-skill, high-wage jobs in manufacturing and financial services, and seen vigorous growth in mostly low-skill, low wage jobs".



Source: Connecticut Economic Digest March 2011

This track record suggests Connecticut businesses and consumers may be slow to increase their consumption of locally produced goods and services. State businesses will therefore rely more on markets outside the state, including adjoining metro areas like New York and Boston, the close-by Middle Atlantic, and global markets.

One bright spot in Connecticut's generally dismal economic growth supports this conclusion, state global exports, which reached a high of $16b in 2010. Sustaining growth in exports requires less congested and more reliable air, highway, rail, and port systems.

Connecticut's anemic economic performance appears to parallel a diminishment of some of its traditional strengths, particularly relative to lower cost, high growth areas in the South and West. A highly educated, skilled workforce, a favorable cost-benefit equation that encourages investment and job growth, an enviable quality of life, which includes high quality public educational, recreational, and cultural assets, quality health care, and a strategic location between two major metropolitan areas and their transportation and commercial assets, will continue to be important factors for economic vitality. However, it is important to understand the effect of deteriorating and unsafe infrastructure on these attributes, and the level of frustration and disincentive businesses and residents face from delayed infrastructure investment.

There has been no significant progress in improving Connecticut's access to national and global markets since 1999, when a report by the Connecticut Institute for the 21st Century said the state was at risk of becoming a cul de sac, or dead end, in the global network. An improved Bradley International Airport has helped, and advances in electronic communications and commerce have provided new linkages. However,

the corridors that link Connecticut to New York and Boston and beyond remain congested and growth-stifling. Investment in education and quality of life assets, particularly in urban areas, has not been leveraged at a level necessary to enable the state to keep pace with global economic competitors. And the growth of broadband for media, social networking, and entertainment purposes places burdens on service providers and significant challenges to meet commercial and consumer demand and assure universal access.

An aging infrastructure that relies on carbon emissions also contributes to a lower quality of life and higher costs, particularly in health care. Taken in total, congested, deteriorating, and polluting systems do not stand to help Connecticut achieve its job creation and economy vitality objectives over the next twenty years and beyond.

A Way Forward

Since the start of the most recent recession the need to rebuild America's infrastructure has garnered more attention and support. Rebuilding the country's crumbling bridges and roads, and adding capacity to its airports, energy grids, and telecommunications networks, always critical to America's competitiveness in world markets, is increasingly seen as a smart job-creation strategy. It can also leverage investment in new technologies that will themselves generate growth and jobs.

As the McKinsey Global Institute notes in its report, *Growth and Renewal in the United States: Retooling America's Economic Engine*, physical and digital infrastructure platforms enable lower interaction costs, which in turn result in positive impacts on productivity and competitiveness. High-cost environments such as Connecticut need to seize every opportunity to maintain or lower these costs.

This growing recognition of the importance of rebuilding infrastructure to short and long term growth suggests an opportune time to re-think the way Connecticut and the Federal government identify and prioritize key projects and make resource allocation decisions based on strategic economic growth objectives.

There is a danger in thinking that investing at the same pace as the state has through its bond programs – about $1.8b per year goes to these infrastructure categories – will be enough to build the competitive infrastructure for the 21st century. This ignores two key concerns. One, relying on state bonding reinforces an incremental approach to infrastructure development that makes it difficult to create "next generation" transformational infrastructure systems. Two, it extends the time it takes to deliver this infrastructure – and may actually result in new infrastructure being obsolete by the time it is built.

The state must develop a vision of an economically competitive infrastructure for the next 50 years, updated as business and societal needs evolve and technology becomes available. It must develop the capacity to plan, initiate, and complete complex infrastructure investments. Above all, it should make a priority the completion of systems that nurture and support its traditional strengths, while recognizing that some systems must be completely rebuilt to meet 21st century needs

The Opportunity to Transform Connecticut's Infrastructure

A report prepared by the London School of Economics and Political Science and the Information Technology Innovation Foundation concludes that investment in the United Kingdom's digital infrastructure - broadband networks, intelligent transportation systems, and smart power grids – will generate significant short term job creation and long term growth. This is because investment in certain types of information and communication technology yields greater benefits than other investments due to significant "network

multiplier" effects, which include new consumer and business behaviors, functionalities, and downstream industries that arise from this new infrastructure. This digital infrastructure also creates a foundation for other benefits such as efficiency and productivity enhancement in both the public and private sectors.

Broadband in particular is a vital short term asset. According to a Brookings Institution 2007 study, every 1 percent increase in broadband penetration leads to annual employment increases between .2 and .3 percent. Increased broadband access benefits both manufacturing and services and in particular finance, education, and health care. The study authors conclude that government should encourage and incent competition in the broadband market to reduce prices and increase its use, but they caution that increased use will mean more investment in an infrastructure already facing constraints.

As more countries and US states reach similar conclusions and provide policy and financial incentives for transformational and digital infrastructure, doing so in Connecticut quickly shifts from the aspirational to the vital. However, it is important to remember that developing plans, educating the public, building consensus, and structuring financing strategies will require years of focused attention and effort.

II. Connecticut's Infrastructure Needs

The investment needed for Connecticut's infrastructure generally falls into three categories:

- Maintenance and upkeep of the existing infrastructure
- Preservation of major assets or system components that cannot be allowed to fail, which could include enhancement of these assets
- Significant new or expanded assets or systems in order to meet projected needs or to provide new systems required for future economic competitiveness.

This section summarizes the principal areas of need in six infrastructure areas.

1. Transportation

The Connecticut Strategic Economic Framework (also known as the "Gallis Report") defined issues, relationships, and resources required to compete in the global economy. Twelve years later, the report's central focus – the transportation corridors linking the state to the New York, Boston, and Metro Atlantic regions, and through them other domestic and global markets, are as important as ever. Yet their capacity to fill this critical role remains diminished. The job loss from the recent recession has not significantly lessened congestion within these corridors. Projections call for increased demand for highway, transit, rail, and freight assets over the next twenty years.

According to the Transportation Strategy Board, Connecticut's transportation infrastructure consists of 3,700 miles of highway, 3,900 highway bridges, 230 miles of rail track, 200 rail bridges, 270 rail cars, 650 buses, 6 airports, a state pier, two ferries, and numerous buildings such as transit stations, highway garages, and rest stops. In addition, cities and towns maintain 17,265 miles of local roads and 1,241 local bridges. There are privately owned freight rail yards and port facilities which are not included in these totals. This is a significant infrastructure to maintain in a densely populated, heavily travelled state.

A major focus of the TSB report is the cost of congestion to Connecticut residents and businesses. It notes that congestion is widespread in this highly urbanized state, affecting major corridors like Stamford to Bridgeport and Hartford to New Haven, but also smaller metro areas like Danbury, Waterbury, and New London. Citing the Texas Transportation Institute's *Urban Mobility Report of 2009* that put the cost of

congestion in the state's three largest urban areas at $670m per year, the TSB notes that the UMR report does not cover smaller urban areas, does not take into account congestion beyond morning and afternoon rush hour, and does not reflect local wage rates, which exceed the national rates used in study. The TSB suggests that the full impact of congestion on business is more severe given the duration of congestion in Connecticut's major corridors. For example, a 2010 study by the South Western Regional Planning Agency found that traffic delays exceed 10 miles of I-95's 23 miles between Fairfield and the New York state line from 6:45 to 10:00 am each weekday, well beyond typical "rush hour" times.

Twelve years and two recessions after the Gallis Report, Connecticut remains at risk of becoming an economic cul de sac due to its inadequate investments in its mobility and accessibility challenges.

The TSB draws a strong correlation between the cost of congestion and the condition and layout of existing infrastructure. Connecticut's climate and the heavy use of highways, bridges, and rail infrastructure exacerbate wear and accelerate the need to repair and replace its varied components. Adding to the challenge of preserving these assets is the complexity of working on critical components of systems that must maintain operations, or cause tremendous impact on people, business, and other institutions.

Despite Connecticut's relatively slow population and economic growth over the past 10 years, not enough capacity has been added or operational improvements made to improve mobility. Both Connecticut DOT and the TSB recognize the need to add highway capacity to relieve major bottlenecks in Hartford and along I-95 in southwestern Connecticut. In many instances, however, repair and replacement occurs without new capacity being added, either due to inadequate funds or inadequate planning.

The TSB identifies three categories of investment required in Connecticut's system.

Category	***Purpose***	***Twenty Year Cost (billions)***
Programmatic Preservation	Restore or replace existing infrastructure	$3
Major Preservation Projects of Strategic Importance	Highway interchanges, moveable rail bridges	$7
Major System Enhancements	Identified projects that will expand system capacity or performance	$9
Total Twenty Year Cost: $19		

Transportation Needs beyond Those Identified

The TSB estimates costs based primarily on projects identified as components of a system as currently configured. Its report alludes to systemic changes that would alter the form and function of the state's highway, road, and transit systems, but does not attempt to assign a cost to such changes. These may include, for example, significantly expanded transit service, either heavy or light rail or bus, or all three; significantly expanded high-speed rail service to complete the Northeast Corridor service (Washington to Boston), and additional capacity at bottlenecks along I-95.

The South Western Regional Planning Agency's Congestion Mitigation 2020 study recommended significant enhancements to rail and bus service and infrastructure between Greenwich and New Haven. The study also identified using the right-of-way on I-95 for operational lanes, potentially with a pricing mechanism, additional bottleneck improvements on I-95, and enhancements to Route 7, largely not included in the Connecticut DOT or TSB cost estimates. Also not included are projects in other areas of the state, like the New Britain to Hartford bus way, estimated at over $500m.

Creating this additional capacity and service will make a significant difference in reducing congestion and improving mobility and access. However, it does not address the need to fundamentally transform Connecticut's major transportation arteries – its interstate highways and rail system – since for the most part, they are obsolete and will continue to be a drain on economic vitality.

Transformational Infrastructure: "Smart highway" technology will be commonplace across the county within the next 10 to 15 years. As more vehicles are equipped with sensors, transponders, and other technologies, the ability to manage speed, volume, and usage of highways increases. This technology holds the promise of increasing the carrying capacity of I-95 or I-84 without adding lanes, and reducing delay by providing real time data to motorists. It will help better manage the conflict between interstate and intrastate traffic that is endemic to Connecticut, bookended as it is between New York and Boston.

Similarly, high speed rail is high on many lists as an important competitiveness factor. The reality is that the enormous cost of building and operating such a system will exceed the Federal government's ability to fund. Connecticut, which has much to gain from such service, should be prepared to fund whatever the Federal government cannot.

To transform Connecticut's transportation systems, in additional to maintaining and enhancing them, The Business Council estimates a $25 to $30b investment is needed over the next twenty years. This is not an insurmountable amount, but it will not be met under current financing plans.

Transportation Funding Challenges

The state covers its transportation capital and operating costs through the Special Transportation Fund, which is comprised of dedicated taxes, fees, and other revenues to fund bonds and operating expenses. At current funding rates, there will not be enough revenue to cover the costs outlined above. There are three issues impacting short and long term fund solvency: rising capital and operating needs, including additional planned rail service operations, a drop in gas tax revenues as vehicles get more efficient and rising gas prices curb consumption, and regular attempts to divert funds to other, non-transportation uses.

The Governor's budget proposal in February, 2011 projected a gap of $83m beginning in Fiscal Year 2012, with a cumulative deficit of nearly $400m by FY 2016. To offset this, the Governor proposed a 3 cent gas tax and 2 cent diesel tax increase, an increase in the amount of oil companies tax transferred to the fund, and increases in various fees. These increases would have resulted in fund surpluses through FY 2015 and a cumulative excess of $215 million by FY2016. They were not included in the final budget approved by the General Assembly.

Meeting the Fund gap with additional Federal funds is unlikely. A divided Congress is reluctant to raise gas taxes to bring the US Highway Trust fund to solvency, and is focused on deficit reduction through spending cuts, not increased taxes. A Federal infrastructure investment bank can help, but to a limited extent.

2. Energy

Connecticut's energy system – the generation, transmission, and distribution of power – is a critical factor in economic growth. It also directly impacts state residents and institutions. Every user ("ratepayer") faces costs that are among the highest in the US. The drivers for these costs are primarily:

- Increased demand due to growth, lifestyle, and climate changes.
- The need to ensure reliable and secure generation and transmission
- Environmental-related goals and mandates
- The need to manage costs and demand, and increase conservation and efficiency

Infrastructure costs for energy transmission and distribution are typically covered by rate increases approved by the state's regulatory agency. Costs that address reliability of energy transmission may qualify to be shared by ratepayers throughout New England, because the regional regulatory authority, ISO New England, considers unreliable energy transmission to be a significant risk for the rest of the region. Any costs that are not considered to enhance reliability including energy generation for Connecticut only would be borne solely by Connecticut ratepayers.

Because energy costs in Connecticut are already among the nation's highest, further rate increases must be carefully considered in light of their impact on the economy. Large scale projects may thus be candidates for alternative financing in order to minimize as much as possible significant rate increases.

One such considerable transmission cost is linking sources of renewable energy to the main grid. This need stems from a State mandate that 20% of energy usage in Connecticut be satisfied by renewable sources by 2020. The economic viability and technological feasibility of renewable energy generation and transmission proposals will be analyzed over the coming months and will shed more light on expected costs.

Another large cost category is the cost of replacing aging fossil fuel generation plants, including coal, oil and combination fueled plants. Recently announced stricter federal emission standards and the anticipated exhaustion of cap and trade –driven compliance methods will mean ratepayers will face higher costs as private operators invest huge sums to comply.

The third large category of cost – and potentially the largest – is the replacement of Connecticut's two nuclear power generators, expected sometime after 2025. Connecticut relies heavily on nuclear power generation - at certain times up to 45% of its power comes from nuclear plants, so creating a replacement, nuclear or not - is a significant cost issue. Although this is a long term issue and a decision to replace these generators may not be made for several years, since nuclear plants take 10 or more years to design and construct, their financing cannot be ignored, even in the short term. A related issue is the cost of disposing spent nuclear fuel, currently stored on site at Connecticut's generators.

***Connecticut's energy infrastructure will be driven primarily by the need to meet requirements for renewable generation, the need to reduce carbon emissions, and the need to retire, and possibly replace, aging nuclear generators that currently provide 50% of the state's energy* generation.**

There is also the potential to finance the extension of natural gas distribution lines to reach more customers, and expand the availability of this energy source without placing the burden entirely on users.

The table below summarizes the infrastructure cost challenges identified by the Connecticut Energy Advisory Board in its *Electric Sector Procurement Plan 2010 Report*, presented to a state legislative committee in January of this year.

Category	***Purpose***	***Twenty Year Cost (billions)***
Steam Based Generation	Replace and expand existing generation capacity	$ 2.5
Nuclear Generation	Decommission and replace existing facilities	$20.0
Renewable	Connecticut's share of new regional capacity	$ 4.5
Renewable Transmission	Connecticut's share of new regional transmission systems	$ 3.5
	Total Twenty Year Cost:	$30.5

As stated earlier, typically much of the cost of providing infrastructure is included in the price consumers pay for their energy. As Governor Malloy acknowledges, Connecticut's high energy costs place a substantial burden on residents, business, and others. How the state addresses this cost and the financing of needed infrastructure will be determined by the Governor, the General Assembly, and the DPUC. The comprehensive energy market legislation passed by the General Assembly in June, 2011 and signed by Governor Malloy has the potential to identify new financing methods for renewable power. Direct state financing of energy infrastructure is not likely to be an option, but providing financing mechanisms to reduce rates must be considered in order to reduce the impact of these costs on the state's businesses, residents, and others.

Transformational infrastructure: Application of "smart grid" technology which will enable better management of energy demand and supply, greater transparency of the cost of energy for certain uses and time periods, and other benefits will accrue to both ratepayers and providers of energy. It holds the promise of helping to stabilize costs and improve Connecticut's position relative to other locations.

3. Broadband/Telecom

Broadband is typically defined as Internet access service that uses DSL, cable modem, fiber optics, mobile broadband, and other high-speed Internet access services. Connecticut business, academic and research institutions, medical and public services entities, and residents, require reliable, affordable, and speedy connection for communications and data delivery. As more aspects of life and commerce become digitized and demand for electronic delivery increases, enormous burden will be placed on the existing infrastructure that stores and transmits data. As much as highways and bridges, power generation and transmission, and buildings to educate its future workforce, the state's broadband infrastructure will determine its future economic vitality.

Goals for Connecticut's broadband systems may mirror the National Broadband Plan's six long-term goals:

- At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.
- The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
- Every American should have affordable access to robust broadband service and the means and skills to subscribe if they so choose.
- Every American community should have affordable access to at least one gigabit per second broadband service to anchor institutions such as schools, hospitals and government buildings.
- To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.
- To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

Current State

The U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) released a map in February of this year to illustrate Americans' access to broadband service at various speeds. According to NITA: "5 - 10 percent of Americans lack access to broadband at speeds that support a basic set of applications, including downloading Web pages, photos and video, and using simple video conferencing."

NITA also identified these additional findings:

Speeds for community anchor institutions: The data show that community anchor institutions are largely underserved. For example, based on studies by state education technology directors, most schools need a connection of 50 to 100 Mbps per 1,000 students. The data show that two-thirds of surveyed schools subscribe to speeds lower than 25 Mbps, however. In addition, only four percent of libraries reported subscribing to speeds greater than 25 Mbps.

Wireless speeds: Approximately 36 percent of Americans have access to wireless (fixed, mobile, licensed, and unlicensed) Internet service at maximum advertised download speeds of 6 Mbps or greater, which some consider the minimum speed associated with "4G" wireless broadband service. Ninety-five percent of Americans have access to wireless Internet service speeds of at least 768 kbps, which corresponds roughly to "3G" wireless service.

Connecticut's existing broadband coverage appears to largely meet "a basic set of applications" requirement of NITA, according to maps published by the Connecticut Department of Public Utility Control (DPUC), funded by NTIA State Broadband Data and Development grant.

Future Needs

Household adoption of digital delivery of entertainment and communication will, according to Ericsson, require speeds of 55 Mbps by 2015 and 120 to 130 Mbps by 2020. Businesses, hospitals and physicians, educational institutions, and government will need even higher speeds – perhaps 1Gbps - as they move and store much higher levels of data.

The infrastructure to provide these increased levels of service may consist of fiber networks, cable, or existing power lines, or a combination of all three. Installation of new fiber networks will be costly, and fiber connections to homes may not be achievable for some time. Additional study is needed to determine what Connecticut's economic drivers will need, and how best to deliver and finance it. As the picture becomes clearer on needs and options to meet needs, the state must identify an agency or entity that can lead its efforts to assure coverage goals. California's Broadband Task Force, whose final report, "The State of Connectivity," released in 2008, included comprehensive recommendations based on input from a variety of public and private-sector partners, may be an effort worth exploring for Connecticut.

Whatever system is ultimately built, it is important to do so efficiency, to save time and speed delivery of infrastructure. The Connecticut Academy of Science and Engineering, for example, encourages planners to identify opportunities to combine fiber installation with other utilities whenever trenches are opened.

Transformational Infrastructure*:* Efficiencies may be gained by providing incentives to building owners to add fiber service in conjunction with renovations for energy efficiency. Fiber can deliver 100 mps download speeds and according to the FTTH Council, can be upgraded to boost transmission without the need to replace installed cable.

Because telecommunications and broadband infrastructure has largely been provided by private operators and paid for by their customers, it is not clear to what extend public financing will be required. However, Connecticut has much to gain from having the fastest, most reliable data and communications systems possible. When viewed as a cornerstone of a 21st century globally linked economy, some form of public support is warranted. Additionally, assuring universal access for all state residences, businesses, schools, and health providers is an economic necessity that may not be addressed by private providers and investors. An example of helping to assure this is California's Advanced Services Fund, which promotes broadband in unserved and underserved areas through financial awards to providers.

4. Water

Connecticut funds clean water projects through its Clean Water Fund program, which provides grants and low interest loans to municipalities for wastewater infrastructure improvement projects. The state provided appropriations to support an average annual bond authorization of $48m between 1986 and 2002, and about $40m between 2003 and 2007.

A Connecticut Department of Environmental Protection Clean Water Fund Advisory Group study completed in 2007 found the major challenge facing the state's Clean Water Fund program to be the lack of adequate Federal and state financing. It noted that during the drop in bond authorizations from 2003 to 2007, a backlog of $300m in designed and construction ready projects developed.

The Advisory Group also projected infrastructure needs for a twenty year period. The needs fall into the following categories:

Combined Sewer Overflow Correction: Five cities still have combined sewers, which carry sanitary sewage and storm water in a single pipe. During times of heavy rainfall, this leads to water quality and public health threats. The estimated cost of correcting these five systems exceeds $2b, a cost which the Federal EPA deems unaffordable based on median household income in the five cities. Therefore, to complete this work will require grants and low interest loans.

Long Island Sound Hypoxia: Connecticut has to reduce nearly 5,000 pounds of nitrogen entering Long Island Sound on a daily basis by 2014, a target date set by Connecticut, New York, and the US EPA. The cost of doing so is estimated at just over $600m. If the state fails to meet this deadline, the EPA may compel municipalities to install treatment immediately or face fines and penalties.

Connecticut's wastewater treatment infrastructure needs will cost nearly $5b over the next twenty years.

To assure quality drinking water, another $1.4b is needed.

Phosphorus Removal: The Advisory Group report estimates of the cost of reducing phosphorus emanating from sewage treatment plants at $55m. However, this is an issue the state DEP has identified as the "next emerging municipal waste water issue to be addressed", so this cost is likely to increase. The Advisory Group also notes that other pollutants such as pharmaceuticals and personal care products will emerge as targets for reduction over the next decade.

Rehabilitation of Existing Infrastructure: Sewage conveyance systems, defined as sewer lines and pump stations have a design life of 40 years, while treatment plants have a design life of 20 years. Upgrading this infrastructure to assure reliable service is estimated to cost $2.14b.

The total costs identified by the Advisory Group are approach $5b over the next twenty years. It notes that deferral of addressing these needs, largely due to inadequate financing, has fiscal and environmental impacts, especially on Connecticut's largest cities.

Drinking Water

According to the US Environmental Protection Agency report, Drinking Water Needs Survey and Assessment, 2007, Connecticut's twenty year required investment to assure an acceptable quality and quantity of drinking water is nearly $1.4b. Nationally, the figure approaches $325b. The state's infrastructure need includes $807m for transmission/distribution; $135m for source treatment; $281 for treatment; $151m for storage; and $20m for other needs.

5. Economic and Community Development

This category of infrastructure includes state funded or financed investment in housing development and housing subsidy programs, community renewal projects, business expansion, and supportive infrastructure, including contaminated site remediation. It is of vital importance to the state's job creation strategies as well as its urban revitalization efforts. Although the Governor's proposed budget includes $260m in bonding over two years, it is difficult to estimate the unmet needs in this category. However, the following suggest a much larger investment need:

Job creation: It is critical that the state have adequate and reliable funding if it will actively seek to attract and retain job-creating businesses. Additional funding will also permit greater support for innovative businesses deemed strategically important to Connecticut's economic growth.
Urban revitalization: Connecticut's cities will continue to struggle to provide needed public investment in neighborhoods, necessary to improve their attractiveness as places to live and work. The state will be the principle source of funding for this investment.
Affordable housing: The continued housing foreclosure crisis, coupled with high unemployment, exacerbates the already considerable need for affordable housing (estimated at 9,000 units per year),
Brownfield remediation: Sites with marketable potential in older cities and suburbs typically require assistance to make development financially feasible. Many of the sites that remain undeveloped in urban areas face some degree of environmental degradation.
Transit-oriented development: Incenting development in proximity to transit assets yields significant economic and environmental benefits. Its use as an economic development strategy is becoming more widespread, representing a strategic investment opportunity best supported by the state.

Given Connecticut's poor job creation record, it is fair to say these programs have been underfunded for many years. It is reasonable to assume needs three to four times the amount of annual funding. Over twenty years, infrastructure needs in this category could total $10b to $15b.

6. Public K-12 Schools

Public education is a foundation of economic vitality and innovation. It is critical to Connecticut businesses seeking to access talent and learning for all types of occupations. Many school districts cannot afford to replace aged facilities with modern ones that provide a healthier, safer, and more supportive learning and teaching environment. It is particularly important they be equipped for digital and other learning systems. This need is most pressing inn Connecticut's urban areas, where closing the education achievement gap is most challenging.

From FY 2000 to FY 2008, the state has provided grants to municipalities totaling about $4.9 billion. Assuming a similar level of need, over the next 20 years, state municipalities will face $10 billion in school construction costs.

Other Bond- Funded Spending Not Addressed in this Paper

Other areas of state bonding for capital related spending include parks and recreation facilities and maintenance, dams and flood control, open space acquisition, hospital and health systems financing, Information Technology systems for state agencies, and solid waste and recycling facilities. These areas tend to be more project-specific and therefore may have changing needs according to project cycles. However, they represent vital needs that will require at least several billion dollars in investment over the next twenty years.

III. Financing Issues and Opportunities

National

The need for more funding for America's infrastructure is well documented by numerous think tanks, trade associations, business, and public leaders. Rebuilding the country's crumbling bridges and roads, and adding capacity to its airports, energy grids, and telecommunications networks, is vital to maintaining the country's competitiveness in world markets, assuring economic stability, and fostering job creation. The World Economic Forum ranked the US 23rd out of 139 countries on the overall quality of infrastructure in a 2010 report. In a world of finite resources, the US will be competing more intensely for private capital, and will face higher costs of commodities, if it delays acting on this need.

As noted, the amount required to rebuild existing infrastructure and add new capacity in the US could be as high as $2.2 trillion over the next five years. Globally, infrastructure is expected to require $53 trillion over the next 25 years. In comparison, $34 billion was raised globally for infrastructure in 2007. Just over half that amount was raised in 2006, and only $5.2 billion in 2005. (Global infrastructure financing needs are important because financing this amount will influence the availability and cost of capital available for US infrastructure investment.)

Currently, Federal and state governments are considering how to generate additional infrastructure investment given significant budget deficits and weak tax revenue. Congress and the Administration have both expressed reducing the country's growing debt as a priority. Both the Administration and leaders in the House have ruled out increasing the Federal gas tax to generate more transportation funding for states. For the foreseeable future, Connecticut and the other states cannot rely on increased funding from traditional Federal sources.

Recognizing the need to expand financing and leverage private investment, there are currently three proposals in Washington to expand financing. Each would create an infrastructure fund or bank, two of which are modeled on infrastructure banks have existed in Europe and elsewhere for some time. They share a goal of increasing the amount of public and private capital available for infrastructure, and differ on the size of public capitalization and the type of infrastructure the funds will support.

As private funds are raised and invested, will the US – and Connecticut - be able to leverage their fair share?

National Infrastructure Investment Bank Proposals

The Obama Administration has proposed an Investment Bank (I-Bank) to fund transportation and transport-related infrastructure, funded with an annual $5b appropriation for six years (and assuming reauthorization after that). The I-Bank would make grants, loans, and loan guarantees and fund feasibility and capacity building studies. It would be housed within the US Department of Transportation, and the DOT Secretary has final project approval.

Legislation proposed by Senator Kerry and others would fund a broader range of projects in transportation, energy, and water infrastructure through an American Infrastructure Funding Authority. The Authority would be capitalized with an initial $10b appropriation and by attracting private capital and through loan repayments would be self-sustaining beyond year one. The Authority has a governing body which approves or rejections applications for funding, and is ultimately responsible to Congress and the Administration.

In the House, Rep. Rosa DeLauro has for several years proposed a National Infrastructure Investment Bank, which has attracted support from a number of public and private infrastructure advocates including organized Labor and the US Chamber of Commerce. Her legislation would create a government-owned bank, modeled after other US government financing entities like the FDIC and the European Investment Bank. The bank would finance projects across a broad range of infrastructure needs including transportation, energy, communications, and water quality projects.

The Bank would operate with $250 billion in total subscribed capital, including $25 billion authorized to be appropriated over 5 years as paid-in-capital. The bill allows an aggregate amount of outstanding loans and guarantees of up 250 percent (2.5:1 leverage) of the Bank's total subscribed capital, leading to up to $625 billion in infrastructure investment capability.

The Bank would conduct analyses of projects that take into account the economic, environmental, social benefits, and costs of each project, prioritizing projects that are of regional or national significance. The Bank would also use criteria specific to the type of infrastructure project-transportation, environment, energy or telecommunications-such as job creation, including for women and minorities, reduction in carbon emissions and public health benefits.

The Bank's key functions include:

- The Bank would include a Board of Directors with authority to consider projects based on objective criteria and provide financial assistance to qualified infrastructure projects, as well as an Executive Committee, Risk Management Committee and Audit Committee to oversee bank activities.
- Bank activities include making senior and subordinated loans; purchasing senior and subordinated debt securities; making loan guarantees; and issuing Federal "public benefit" bonds using the proceeds to help finance projects.
- The 9 member Executive Committee would establish disclosure and application procedures for entities nominating projects for assistance; accept project proposals; place approved projects on a list for consideration for financial assistance from the Board; and provide technical assistance to entities receiving financing from the Bank.
- The 5 member Risk Management Committee would create financial, credit, and operational risk management guidelines; and ensure diversification of lending activities by both region and infrastructure project type.

The bank could help states in several ways, including providing loan guarantees to state or local governments and to "qualified project sponsors for qualified projects, in order to leverage resources and stimulate public and private investment in infrastructure". It could encourage and assist states in creating or structuring financing that they have not yet used.

All three proposals merit further consideration and discussion, and all are likely to be included in the debate over spending and deficit reduction. Adoption of any will be challenging, particularly as national elections approach in late 2012.

Connecticut Financing Issues

In Connecticut, funding for these infrastructure categories comes either from public bond proceeds or ratepayer assessments (as in energy, broadband, and wastewater fees paid by users of these services). The large majority of public funds come from state bonded debt. Other sources of funds include Federal appropriations and State General Fund appropriations, municipal government bonding and appropriations, and to small degree dedicated taxes.

The Business Council has identified infrastructure needs that may reach $35b over the next ten years and $45-50b over the following ten years, or as much as $85b over twenty years. The Business Council further estimates that Connecticut may be able to finance through bonded debt between $38 and $45b of this amount, leaving a gap of $35 to $42b. On the surface, this looks achievable, if the state can achieve a small increase in bonding over current amounts for the next twenty years.

Connecticut's ability to finance these needs bears on three areas: the state's ability to afford principal and interest payments in general; the impact of debt service on the cost of operating the state –run systems which some of this infrastructure comprises; and the impact of debt service on fees and costs borne by the users of systems not operated by the state.

State Bonding

The budget proposed by Governor Malloy in February includes about $1.9b in capital spending for each of the 2011/12 and 2012/13 Fiscal Years. This does not include the UConn 21st century and Connecticut State University System 2020 programs, funded by dedicated bonding. The $3.8b two-year expense is funded by $2.19b of General Obligation, $473m in Revenue, and $1.08 in Special Tax Obligation (Transportation Fund) bonds. The overwhelming use of this funding is for infrastructure as defined for this report.

The amount of bonded debt is subject to two limitations: a statutory limit on total state indebtedness and the need to pass a balanced budget. Section 3-21 of Connecticut General Statutes sets a limit on indebtedness supported by tax receipts from the General Fund equal to 1.6 times state revenues for the year the bond authorization becomes effective. This limit includes bonds authorized by the General Assembly but not yet issued, and bonds issued and still outstanding. It does not include bonds supported by dedicated revenue sources, such as the Special Transportation, Clean Water Revenue, and Unemployment Revenue bonds and Tax Increment Financing bonds.

The Governor's proposed budget calculated the limit on bonding, based on revenue projections, to be $22b in 2011-12 and $23.1b in 2012-13. The amount of outstanding bonds subject to statutory limit for 2011-12 is $15.2b and for 2012-13 is $16b. The difference between outstanding bonding and the statutory limit (the "debt incurring margin") for each fiscal year is $6.9b and $7b, respectively.

Although this suggests the ability to support an additional $7b in annual bonding, the reality is that increasing debt payments for these additional bonds will put pressure on the overall budget balance, likely leading to a diversion of funds from other expense categories, as opposed to increasing revenues through tax or other means. With significant expenditure cuts already proposed, increased debt spending is not foreseeable over the next several years.

There is also a current of concern about how much debt the state should take on. When bonding debt not subject to the statutory limit is included, Connecticut's outstanding debt as of June 30, 2010 was nearly $26b. According to Moody's Investor Services, Connecticut ranked first among all states with $4,859 in debt per state resident. Calculated as a percentage of personal income in Connecticut, the state ranks 3rd behind Hawaii and Massachusetts, at 8.7%. Connecticut is also 3rd in the ratio of debt to State Gross Domestic Product. When total debt issued by state and local governments is calculated, Connecticut ranked 4th in 2008 at $8,710 per capita, and 21st in state and local debt as a percent of 2004 personal income.

The message from Washington: States should not count on additional dollars to fund their current and future infrastructure needs.

Additional Issues

There are several factors that can place this bonding goal at risk.

Inflation, particularly in infrastructure commodities: Cost projections are largely based on estimates developed over the past three to five years, and do not factor in inflation. At this time, commodity prices have risen faster than the general rate of inflation. It is impossible to say whether or for how long this will continue, but it is prudent to assume actual costs will be higher than those presented in this analysis.

Unidentified needs and changes in conditions and mandates: Additional needs will likely be identified over the planning horizon. New demands in commerce, health, and society in general may develop into new infrastructure requirements not currently contemplated. New technologies may give rise to transformative decisions beyond those mentioned in this report. And new environmental and conservation measures may create costly investment needs.

Limited state, local, and federal financing capability: Achieving an increase in investment and in bonding to finance it will continually strain state and local fiscal capacity. Higher debt service on bonds will also challenge state and local operating budgets for scarce dollars, placing service quality and frequency at risk. Conflicts over scarce resources will invariably lead to decisions to fund projects for political, rather than reasons of merit.

The impact of financing costs for system users: For investment not financed by state bonds, debt service is largely borne by users of the infrastructure system. So for energy systems, ratepayers - commercial, residential, and public – pay the cost of debt. The same is true of broadband, drinking water, solid waste and recycling, and to some degree sewage and wastewater treatment investment. These fees and charges fall on all socio-economic levels of the state's population and across for-profit and non-profit institutions equally, generally adding to the cost of living and operating in the state. As much as the lack of viable infrastructure diminishes economic competitiveness, the high cost of financing it does as well.

Funding availability that is inconsistent with need. Proceeds from a uniform bond issuance, as is current practice, may jeopardize larger projects and may make transformational projects difficult to plan and implement. This will delay completion of necessary systems and place Connecticut at a disadvantage relative to other states that will fund projects more aggressively or through innovative means.

Filling the Gap: The Need to Leverage Private Capital

Additional bonding through higher taxes is one option to meeting the infrastructure funding gap, but one that will face considerable challenge given the projected increases in non-capital spending facing the state. Equally important, a "bonding only" strategy does not provide the opportunity to explore more efficient project delivery methods, inherent in a market-driven financing approach. Some have observed that simply handing more money to state agencies which lack the motivation and capability to identify, design, and prioritize projects based on financial considerations will fall short in three ways: large projects will be funded in segments, adding cost and delay in their completion; the opportunity to gain the non-financial benefits of user fees as a tool to manage demand for a public asset (such as a congested highway) maybe overlooked or made more difficult due to political influences; and the ability to tap private operators' experience to reduce asset lifecycle costs will be missed.

As McKinsey & Company points out, private infrastructure investors, facing competition for financially viable projects and under pressure to invest large sums of money, will need to improve the operations of public assets they fund in order to extract more value. This benefits the public in two ways. One, it results in higher levels of service at the same or lower cost, than if publically-operated. Two, it builds private sector capability to take on more complex public infrastructure projects. McKinsey identifies complex existing infrastructure deals that require a substantial reconstruction or refurbishment and wholly privatized projects (no public

partners) as two areas where private investors might identify profitable opportunity – meaning, in effect, that is where private equity will be invested. Examples in Connecticut might include the rebuilding of I-95 to include a High Occupancy Toll lane or "Smart Vehicle" technology (or both), and new or expanded privately-owned energy transmission systems.

The Business Council concludes that Connecticut must leverage private capital if it is to fund its infrastructure needs in a timely manner. Attracting the money needed to fill the gap between public bonding and identified need – as much as $42b – will require the state to adopt new policies and new tools and upgrade its capability to analyze financing options and structure deals. It will also require a broader view of user fees and revenue sources tied to public infrastructure. This is a political consideration that will necessarily balance the concept of higher taxes versus user fees to pay for infrastructure. Public acceptance of new and higher fees will be more likely if an efficient planning and project selection process, with appropriate mechanisms to assure accountability, were put in place.

Financing Options for Connecticut

Historically, Connecticut has made little use of public private partnerships to finance, design, and build infrastructure. The state has also underutilized existing Federal programs designed to increase financing or enhance credit for lenders for transportation projects.

Increasingly, other states and metro regions are taking a more strategic view and are developing complex project finance and delivery models: for example, Massachusetts with the expansion and improvement of Route 3 North in the Boston area, financed through bonds paid for by lease payments from a private builder/operator; the Chicago CREATE project which leverages $212 million equity from six private freight rail operators; and the Denver Union Station project, which includes light rail and commuter rail station construction, a regional bus facility, and extension of shuttle services, financed by a combination of Federal grants, loans, and other innovative financing programs.

As the level of knowledge and experience with creative financing and complex project delivery grows at both the Federal and state level, as well as within the private sector, Connecticut can be more confident in its ability to take on such challenges. The key is to recognize the skills gap within state agencies, both project and financing related, and make the investment to secure what is needed.

As a starting point, Connecticut should make greater use of Federal programs such as these, to expand its scarce resources:

TIFIA Loans

Named for the Transportation Infrastructure Finance and Innovation Act which created them, TIFIA currently provides 35 year secured direct loans at a 4.25% interest rate. These loans are available to both public agencies and private operators. For each dollar of Federal funds can provide up to $10 in TIFIA credit assistance and support up to $30 in transportation infrastructure investment.

Private Activity Bonds

Issued by states or localities in amounts allocated by the Federal Department of Transportation, PABs are often used to fill gaps in financing packages. PABs are tax exempt bonds that are eligible to be used for private projects.

Build America Bonds

Build America Bonds (BABs) were authorized in the American Recovery and Reinvestment Act of 2009, and expired at the end of 2010. However, their popularity has generated interest in reauthorizing the program. (CHECK) BABs are taxable bonds, which extends their appeal to a wider investment audience. Rates are subsidized by the Federal government – state and local governments are reimbursed for 35% of interest costs. Connecticut has taken advantage of this program.

DOT State Investment Banks

A provision in the legislation reauthorizing the National Highway Safety Act in 1995 enabled states to create their own State Investment Banks (SIBs) seeded with some federal funds, and nearly 40 have done so. A few capitalize their SIBs with state money and therefore do not have cooperative agreements with the US DOT. Those that do can offer "innovative" financing tools like subsidized loans, grant anticipation loans, security for bond or debt instruments, and letters and lines of credit. According to the American Association of State Highway and Transportation Officials, as of December 2008, 32 states and one territory had entered into 579 SIB loan agreements with a total dollar value of $5.56 billion. The level of participation varies, with Pennsylvania having 104 agreements and California, two. Connecticut does not have a SIB. SIBs have been criticized as being not more than bonding mechanisms for transportation projects.

State Infrastructure Banks

At least one state, California, took a differently tact and organized an investment vehicle more closely in line with the DeLauro bank proposal. It created the Infrastructure and Economic Development Bank (I-Bank) in 1994 to provide additional access to capital for state infrastructure projects. It is housed in the Business, Transportation, and Housing Agency and is overseen by a five member Board.

The California I-Bank has its limits, for example, it has not been able to help private investors who have requested it's assistance in accessing the bond market at favorable rates to finance P3 projects. The I-Bank's operating statutes (the I-Bank Act) limit the I-Bank's ability to provide this type of assistance, which may be important to help finance current and future pipeline projects. Accordingly, the I-Bank has developed proposed legislation intended to facilitate further investment in public infrastructure by: (1) authorizing the I-Bank to loan the proceeds of conduit revenue bonds to private entities; (2) authorizing the issuance of conduit revenue bonds for the benefit of private entities or public entities able to repay the loan of bond funds; and (3) eliminating the current cap on the amount of bonds that can be issued to finance public infrastructure.

Similarly, Virginia's Department of Transportation proposed last fall to create a state Transportation Infrastructure Bank which would supplement or replace a SIB created in 1995 through the Federal highway reauthorization. The Bank would leverage revenue bonds, supported by project revenues, special assessments, tax increment financing, and local taxes and fees to make low interest loans to government entities and private sector companies on a revolving basis. It would have some capitalization provided by the state.

Public Private Partnerships

One of the key attributes of the proposed national infrastructure investment bank is the ability to lend to or purchase debt of a public-private partnership (P3) sponsored project. P3s differ from straight public projects in that a private entity will design, build, and operate a public infrastructure asset. For example, a typical P3 project is a privately constructed and operated toll road on public lands leased to the operator. In exchange for building and operating the road, the private entity receives the lion share or all of the revenue the road will generate over the term of the lease of the asset. Airports are another asset often built and operated in this manner.

Proponents of P3s say they bring more speed and efficiency in completing a project, a stronger focus on project lifecycle, and easier and quicker access to resources during both construction and operation of the assets, over typical public projects. P3s have a clear significant benefit: they are a means to leverage private investment capital to fund projects, rather than using public funding, which must rely on the availability of adequate tax revenues or federal appropriations to finance capital bonds. By providing an adequate and predictable revenue stream, P3s make it possible to supplant public investment dollars with private funds.

The policy implications of using P3s are summed up by the Federal Reserve Bank of Atlanta, which notes, *"In the end, taxpayers and policymakers must confront some basic limitations of the market and of the local political economy. Roads, pipes, and sewers are natural monopolies that can, in many cases, command substantial economic rents. Governments must decide to either regulate them or own them outright. Elected officials, with one eye on the election calendar, may choose the high profile of new construction at the expense of long-term maintenance of existing works. But this same tendency may also lead them to sell off valuable assets at fire-sale prices. On the other hand, given the huge backlog of deferred maintenance and great uncertainty about future needs, the chance to share capital and risks with private investors may be too appealing to resist."*

P3s are not without controversy. As the California Public Infrastructure Advisory Commission has noted, *"while public agencies at all levels of government are considering ways to co-invest with the private sector, there continues to be pockets of public and political resistance to P3s owing to concerns regarding private sector profit motives, the potential loss of control over public infrastructure assets, and the perceived threats to public sector jobs, among others. In addition, many public agencies do not seriously consider the use of private capital based solely on historical reliance on government grants and public bond finance, and differences in the cost of public and private capital. Many agencies continue to rely on public bonding capacity to build infrastructure without any consideration of the full life cycle costs of an asset – the cost of capital being simply one element -- and whether such costs can be reduced or better managed with private sector capital, innovation or efficiencies."*

The California PIAC believes that the evolving form of P3s away from long-term leasing of existing operating assets to construction of new assets is helping to address some concerns. It notes that *"capital structures and resulting cost of capital are also changing. Generally speaking, the mix of debt and equity is generally more balanced, and financing now comes from a combination of private and public sources. Combining public and private debt financing can produce capital structures with a significantly reduced weighted average cost of capital, which underscores the importance of undertaking project level business case analyses."*

Connecticut lacks a significant history of P3s and apparently the statutory foundation for more aggressive use of such mechanisms. More research is needed on what state law currently allows and what changes would be required if a national infrastructure investment bank would make P3s a more viable financing tool.

Leveraging public pension fund investment in infrastructure

A concept that is gaining more traction in the US is the use of public pension fund investment in public infrastructure. As with the national infrastructure investment bank concept, this practice is more prevalent in Canada, Australia, and Europe than in the US. To the extent they invest in infrastructure, US funds are far more likely to invest in privately managed funds that selected and structured deals.

Pension funds may be attracted to infrastructure for these reasons: the long duration of such investments; protection against volatility; protection against inflation; and diversification.

Historically, US pension funds shied away from infrastructure primarily because of concern about risk and return, but also because they lacked the knowledge and expertise to select and structure such investments. Equally important, the prevalence of tax-exempt bond financing for US infrastructure meant there was little demand from governments for pension capital. Tellingly, one of the California Public Employees Retirement System's early direct infrastructure investments was an equity position in Gatwick Airport in the UK.

Canadian and European pensions have been much more aggressive infrastructure investors. According to one study, Australian pensions invest on average 5% of their assets in infrastructure, with larger funds committing more, and five large Canadian funds committed as much as 15% to infrastructure. As reported in one article, the $52 billion Ontario Municipal Employee Retirement System saw a 12.4 percent return last year on a $5 billion infrastructure investment pool, above the benchmark 9.9 percent though down from 14 percent in 2006. Foreign pension funds often compete with each other over prime opportunities.

US public pension funds have invested in home-based (within their state) companies, dedicated a small percentage of total funds for this purpose. Infrastructure is only beginning to appear on their radar screens, as they seek alternative investments to achieve return objectives, and perhaps driven by the realization that foreign investors are taking some highly visible equity positions in US infrastructure, such as the Indiana toll road and the HOT lanes in northern Virginia.

California may be a leader in US pension infrastructure investment. CalPERS, the nation's largest public fund, announced in 2007 it set aside $7b for infrastructure, while the California State Teachers Retirement System dedicated $800m for infrastructure.

The trend in pension investing appears to be toward direct investment, rather than through managed funds, at least partly to avoid the fees and profit sharing fund managers require. However, direct investing presupposes a fairly high level of expertise and knowledge of infrastructure investment, which most US pension funds lack.

Another significant ingredient for increased US pension fund infrastructure investment is the supply of suitable deals. Many observers point to the need for more deals with a private investor or operator component that will make project returns and risk management more attractive. Some believe a national infrastructure investment bank is one way of creating not just more P3 deals, but also other forms of investment for pension funds. This could include national infrastructure investment bank financed loans that are re-bundled or resold to investors.

This need to create more P3 deals raises a concern about the level of knowledge and experience among public pension funds in assessing and structuring deals of this type. The California Public Infrastructure Advisory Commission (PIAC) notes that *"multi-party financing that includes public and private capital is increasingly common, but inherently complex, requiring a high level of contractual, legal, financial and operational competency"*. As noted, beyond the capability question, PIAC also recognizes that the P3 approach itself needs further development: "*From an institutional investor's perspective, however, public sector indifference or resistance to P3s, and fledgling P3 procurement models can result in long, expensive transaction lead times with highly uncertain outcomes. It seems likely, therefore, that the role of California pension funds will remain uncertain until the State's P3 programs become more stable and predictable. There should be further outreach and engagement with pension funds to better understand and overcome the barriers to their further investment in California's public infrastructure."*

The implication is that Connecticut, already lagging California in use of P3s, must move decisively to develop staff capacity and a policy and regulatory framework for P3s, if it wants to leverage pension fund investment in infrastructure.

Policy Considerations

Given Connecticut's weak track record in using public-private partnerships to fund and develop public infrastructure, it will be necessary to identify legislative and regulatory roadblocks to greater use of P3s. As Deloitte Research notes, governments need to put a legislative and regulatory framework in place to guide these deals, before attempting to pull such deals together. Connecticut does not appear to have such a framework in place.

In its 2009 report, *Driven by Dollars*, the PEW Center on the States suggests policy makers develop data-driven answers to these questions:

- Does the government have a clear sense of the funding gap in its infrastructure needs?
- Have all revenue options been examined and compared, both with and without private sector involvement?
- Is there understanding and agreement about the goals of raising revenue and the ways in which dollars will be distributed among projects or needs?
- Has the legislature adopted enabling legislation to signal its willingness to consider a concession agreement with the private sector?

It should be made clear to policy makers, state and local agencies, and the general public that the use of public private partnerships, and the goal of attracting private capital to public infrastructure, requires an honest discussion of user fees and other new revenue sources tied to the use of public assets, as well as new tax and assessment strategies. Private capital requires a financial return, and if significant private funds are to be raised, sources other than existing public funds (i.e., appropriations, existing tax revenues) must be found.

IV. Efficient Infrastructure Delivery

The urgency to complete vital infrastructure projects to assure economic competitiveness, and the need to develop new financing sources and project delivery methods, require a deliberate approach across all six critical infrastructure areas. Several states and localities have adopted processes and policies that are worth review for best practices.

This starts with project selection and prioritization. Too often, projects get funded and bid based on a "path of least resistance" – political support, or lack of political opposition, the ability to fit the project in an available funding category, or a programmed incremental approach – "we did project A last year, we'll do project B this year, etc". This often means more complex and controversial but vitally needed, projects are put off, leading to continued cost of congestion or inadequate services, safety risks, and higher construction costs, if and when the project is actually built.

One appeal of the proposed national infrastructure investment bank, and of some state initiatives like California's PIAC, is the attempt to minimize politics as major factors in project selection, while maintaining accountability to public goals and fiscal concerns.

There is significant room for improvement in how state agencies let bids for project design and construction. Typically, agencies issue separate design and construction bids, or do planning and design work in-house and bid out construction. There are numerous examples of time and money savings possible through joint design-build bids let to private vendors. Adopting this approach requires an agency culture that encourages design-build as the preferred method, not an afterthought.

Incorporating private builders and operators into design-build-operate contracts can help lower the cost of maintaining and operating assets over their useful life. Private operators may have greater financial incentive to operate efficiently, or may simply have greater expertise and experience based on longevity and activity in the market. This should be leveraged appropriately.

Connecticut's weak record in public-private partnerships does not reflect a lack of interest in P3s nationally. According to the National Council for Public-Private Partnerships, the average US city uses private vendors to provide 23 of 65 basic municipal services.

To be effective in utilizing public-private partnerships and creative financing mechanisms, state agencies need to develop internal knowledgeable and experienced experts or have access to outside resources, which appears to be lacking at present.

Connecticut has an opportunity to become a leader in the finance and reconstruction of infrastructure in highly urbanized areas, which face significant challenges such as maintaining operations during construction, little room for maneuvering, and higher costs of land, labor, and commodities. The state should consider building this expertise into the University of Connecticut engineering program that would be "exportable" to other urbanized areas in the US and around the world.

Connecticut should consider a process that elevates infrastructure investment decisions in the six areas discussed in this report to a strategic body with input from the executive and legislative branches of state government, private and public equity managers, and the state's business community.

V. Recommendations

The Business Council of Fairfield County continues to actively review options and best practices in infrastructure financing that may be appropriate to adopt in Connecticut. It will also actively support national and state initiatives that expand financing and improve the state's ability to delivery critical infrastructure in a timely manner. Following are areas of recommended actions that will be addressed by the Council on an ongoing basis:

1. **Actively work to create a national infrastructure investment bank to fund major projects.**
   Establishing new sources of financing on a national level is critical to helping fiscally constrained states to make the investment they require. Of the current infrastructure investment bank proposals, Rep. DeLauro's appears to have the ability to raise the most funding and could provide needed guidance and support to help states be more effective in structuring deals. However, all three proposals have merit and could help address this critical need if enacted.

   The Business Council will actively engage with partners within and outside Connecticut to push for the establishment of an infrastructure investment bank, and adequate capitalization of such a bank. It will encourage others in Connecticut to do the same.

2. **Create a coherent Connecticut investment strategy, in support of an integrated infrastructure program that incorporates state and private sector objectives for economic vibrancy and growth, based on the realities of the 21st century global economy.**
   Connecticut must adopt a visionary, integrated strategy which recognizes infrastructure needs as interdependent, rather than competing activities. Nationally, there is a growing recognition among policymakers that adopting project selection criteria focused more on the economic costs and

benefits of the project, opportunities for synergy among infrastructure categories and a project's ability to leverage private investment is fundamental to attracting private investment in an era of scarce public resources. This is a component of all three leading national infrastructure bank proposals, but will be easier to accomplish on a state level.

3. **Create a mechanism that enables Connecticut to leverage private capital and public pension investment along the lines of the national investment bank proposals.**
   Connecticut should explore creation of a state bank with the ability to finance projects across a broad spectrum of need, along the lines of California's I-Bank, or the proposed national infrastructure banks. This will require some level of capitalization and an initial investment to staff the bank with appropriately experienced staff and management.

4. **Expand the state's capacity to issue revenue bonds and expand private investment by exploring how existing and future infrastructure assets can generate revenue.**
   Revenue bonds are issued with a pledge of revenue dedicated to repay debt service. Examples include revenue bonds issued for projects at Bradley International Airport and to fund deficits in the state's Unemployment Compensation Fund. Payments from airport vendors and operators in the first case and state employer unemployment taxes in the latter cover debt service expenses. Revenue bonds also finance low cost loans to municipalities for water treatment and drinking water projects.

   This will require the state and its agencies, and municipalities to explore more aggressively, with input from the private sector, opportunities to increase or create new project-related revenue streams. It is important to remember that these revenue sources cannot be diverted to the state's General Fund but must be tied to a project until the bonds are paid off.

5. **Expand the use of public-private partnerships to finance, design, and build infrastructure.**
   The term "public-private partnerships" describes a range of private sector involvement in the creation, financing, and operation of infrastructure. Done correctly, P3s can leverage private sector investment to complement public investment, enhance capability and know-how, and speed-up completion of projects.
   Connecticut should enact the necessary legislative and regulatory framework to assure state agencies can engage in P3s and to assure the private sector understands the terms of engagement.

6. **Expand the state's ability to provide lower cost financing to qualified infrastructure projects.**
   Lower cost financing may be possible through a blending of different funding sources including Federal and/or state loan guarantee mechanisms to achieve favorable rates in the market. Whether through state investment banks or on an individual project basis, agencies should consider immediate actions to tap into currently and potentially available financing tools.

7. **Build the state's professional capacity to develop and manage innovative financing approaches.**
   The state, perhaps through its Office of Policy and Management, should develop internal capacity to structure, assess, and deliver innovative financing for a range of investment types. This centrally-based expertise should be made available to all state and local agencies and quasi-governmental entities that may need it.

   The state should also consider organizing and supporting an effort to create within in-state public and private universities a "center of excellence" covering design, engineering, and delivery of infrastructure improvements in older, highly trafficked, densely populated areas like the Northeast.

Becoming a leader in this growing field will attract talent and investment, nurture a market, and help Connecticut address its own needs with local resources.

8. **Establish a quasi-independent state infrastructure board that develops strategic infrastructure plans, assesses projects, and identifies and supports financing methods.**

   Connecticut should create an advisory board, with a degree of independence, yet accountable to the Governor and General Assembly. The board will develop analyses, plans, and cost-benefit assessments of infrastructure strategies, with a focus on complex, multi-year investments. It must have sufficient authority to ensure its work with be incorporated in state agency plans. Business and other stakeholder input is critical to its success.

   Much can be learned (to do and to avoid) from the California I-Bank experience. In 2009, California joined the growing number of states expanding models for leveraging private sector capital, innovation and efficiencies to accelerate transportation projects that might otherwise be deferred indefinitely. In addition to authorizing public-private partnerships (P3s), SBX2 4 (codified as Streets & Highways Code section 143 et. seq.) required the State's Business, Transportation and Housing Agency (BTH) to establish the "Public Infrastructure Advisory Commission" (PIAC) to, among other things, identify transportation project opportunities for P3s and advise the Department of Transportation (Caltrans) and regional transportation agencies regarding infrastructure partnership suitability and best practices.

   Since the enactment of SBX2 4, the State has moved quickly to establish procedural and review guidelines, identify candidate projects, convene the PIAC, conduct outreach to government and industry stakeholders, and take other steps to implement the new authority. There is now an emerging "pipeline" of potential P3 opportunities that may require more than $20 billion of capital.

VI. Conclusion: A Call to Action

Glamorous or not, without immediate, intensified national commitment to visionary infrastructure investment and plain vanilla, responsible maintenance, our nation and our state of Connecticut are at risk of losing so much more ground that our competitive recovery will take generations rather than decades.

The Business Council of Fairfield County is committed to working with state and national partners and other interested parties to advance the prospects for a national infrastructure investment mechanism and to help Connecticut develop appropriate policies and methods to meet the challenge of creating and maintaining a 21st century infrastructure. This will be a long journey; the first steps must be taken today.