A Strategic Framework for Investing in CT's Transportation:

Economic Growth - Infrastructure Preservation – Sustainable Communities

DRAFT – for discussion at 8-19-2010 TSB meeting

Connecticut is at a critical but difficult juncture regarding the future of its transportation system. We have begun to develop a multi-modal transportation network that reaches beyond the highway system. But, the cost of developing that network and preserving the existing transportation infrastructure clearly exceeds the state's current resources.

These needs do not exist in a vacuum, and how we address them can directly affect the state's quality of life, its communities, its environment, and its economy. In 1999, the Gallis report[1] warned that we need to make major improvements to our transportation system to sustain growth in our economy. That report led to the creation of the Transportation Strategy Board and many of the improvements undertaken over the past decade. But, more work remains to be done, and completing it will require more funding than is currently available.

The ongoing national recession makes it difficult to consider raising new revenues to support new or expanded transportation investment programs. While our fiscal and economic challenges seem overwhelming, a program of increased but strategic investments can yield large economic benefits. More importantly, the risks of not acting are even greater. Delaying action threatens Connecticut's long-term economic growth. Acting now allows us to build on the momentum from recent transportation investments in critical projects, the growing state and national emphasis on multi-modalism, and the changing managerial structure at DOT that is improving efficiency and responsiveness.

The State has set the stage for rapid progress on major improvements to our transportation system if we can find the funding to continue ongoing projects and advance new projects. We are also in the midst in a major shift in our transportation planning paradigm that recognizes the importance of linking transportation planning to economic development, responsible growth, and sustainable development. Acting now will allow us to take advantage of this groundwork. Connecticut needs to invest more in our transportation system, but to do so wisely and strategically. We need to support improvements that promote state strategic goals of economic growth, sustainable development, and improved quality of life while assuring a safe and well maintained transportation system.

Over the past 6 months, the TSB reviewed the state of our transportation system and examined how congestion and transportation deficiencies are adversely affecting our economy. The Board also considered whether our transportation system is adequately serving the mobility needs of residents and business, and how it can support broader state goals of economic growth, sustainable development, and livable communities. This discussion paper provides a summary of our major findings and conclusions. It also calls for increased but more strategic investments in our transportation system. The investment is required to address critical infrastructure preservation and repair needs, but more importantly it is needed to restore and sustain economic growth. It also calls for making transportation investments a manner that also supports state goals of improving quality of life, promoting responsible growth, and improving our environment.

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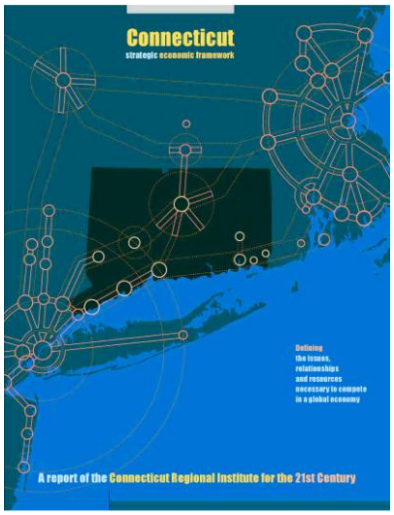
[1] *Connecticut: A Strategic Economic Framework*, 1999, prepared by Michael Gallis for the CT Regional Institute for the 21st Century

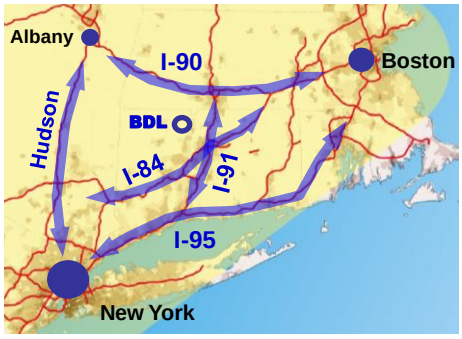
I. The Economic Costs, Risks, & Opportunities



Connection's economic future and its transportation future are inextricably linked. Without major improvements to important transportation linkages our economy will stagnate even as neighboring economic centers grow. With sufficient and strategically focused transportation improvements we can position the state to share in the economic growth that will eventually return to the nation, and we can realize the full benefit of being in such close proximity to the world's financial and economic center. Maintaining good access to New York is also important because it is at the center of national and global transportation networks – air (cargo and passenger), maritime (freight) , and highways (including trucking). Strategic transportation investments will not guarantee economic growth, but they are necessary to support and sustain growth.

Gallis was not the first to note the importance of transportation for economic growth, but he did surprise many people when – as part of a study of the state's economy – he observed the degree to which transportation problems were impeding Connecticut's ability to grow its economy. He suggested that if the transportation problems were not fixed, Connecticut's economy would lag well behind that of neighboring economic power centers in New York and Boston.

Gallis emphasized the importance of maintaining strong linkages to New York's economy, access to its markets, and to its national and international transportation hubs. He observed that access was weakening as congestion made transportation more difficult and costly, and as new and evolving national and global transport systems gave better access to areas west of the Hudson. Three transport corridors within Connecticut were highlighted for the critical role they play in the state's economy:



I-95 Corridor: This is a multi-modal corridor that is our most critical link to New York. Its key facilities are I-95, the Merritt Parkway, and the New Haven Rail Line. The two highways serve an important role for general travel, but I-95 serves as also a critical goods movement route for trucks. I-95 is especially critical for truck freight since trucks are not allowed on the Parkway. This results in an unusually high percentage of trucks on I-95.

The New Haven Line provides an exceptionally high level of commuter service to New York as well as to employment centers like Stamford, Norwalk, and New Haven. Amtrak provides good intercity service linking Connecticut to New York and points south as well to Providence and Boston to the north. Over the past decade or so, the New Haven Line played an increasingly important role in sustaining economic growth as severe congestion restricted the highway system's ability to support growth.

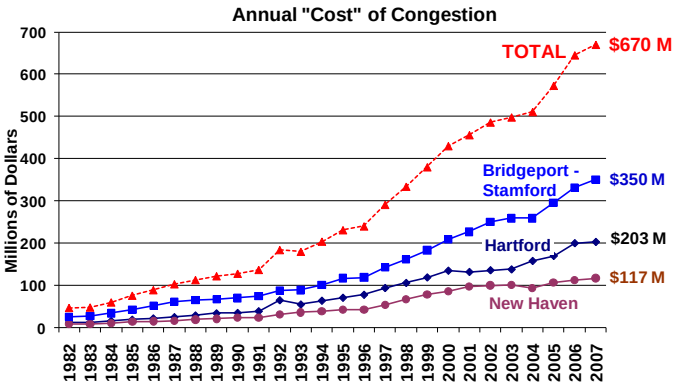
I-84 Corridor: I-84 is an important highway corridor to New York and to areas west of New York. Like I-95 it is an important truck route in a state that relies on trucking for 98% of its freight needs. I-84 is a major truck access route into CT and New England for shipments from the Midwest and West. It is also a key route for containers from the ports of New York and New Jersey that are destined for CT.

I-91 Corridor: I-91 is an essential north-south corridor linking three east-west corridors: I-95, I-84, and I-90 in Massachusetts.. It is a multi-modal corridor served by I-91 and the New Haven-Hartford-Springfield (NHHS) rail line. The NHHS line is primarily a passenger rail corridor, but also serves a freight rail function. This multi-modal transportation corridor is vital to the economy of the Hartford-Springfield region, but is also the state's primary access to **Bradley Airport**. Bradley is a critical transportation hub for the state and an economic engine as well.

Congestion. Gallis was concerned about the growth of congestion. Congestion reduced the ability of these corridors to provide effective access to New York and their ability to support economic activity within the state. Of greatest concern was the deterioration of service on I-95 and the Merritt Parkway. The high level of congestion in the I-95 corridor is reducing access to New York and increasing the cost of interacting with New York.

The Cost of Congestion *(over $670 million annually)*

Congestion impacts virtually every urban area in Connecticut, but it is particularly severe in the Bridgeport-Stamford area. It is also a serious problem in the Hartford and New Haven areas, and a regular occurrence in the Danbury, Waterbury, and New London areas. The Urban Mobility Report (UMR) estimates that congestion causes over **32 million hours of delay** annually in our three largest urban areas. A daily problem that can range from an inconvenience to a major impediment to travel, congestion imposes a enormous cost on state residents and businesses. A very conservative estimate is that the **annual cost of congestion exceeds $670 million**.



The estimate of $670 million should be viewed as a very conservative estimate, and the actual cost is probably much higher. The $670 million estimate is based on the Urban Mobility Report (UMR), which is a national program that has tracked congestion and congestion costs for metropolitan areas across the country for over 20 years.[2] It does not include smaller urban areas such as Danbury, Waterbury, and New London. It uses assumptions and national averages that do not reflect the higher wage rates in Connecticut or the fact the congestion in Connecticut often extends beyond the traditional morning and afternoon peak periods. A study conducted for the Southwestern CT RPA, found that when local wages rates are used and a more complete accounting of congestion is done, congestion costs in Southwestern CT far exceed the costs suggested by the UMR study.[3]

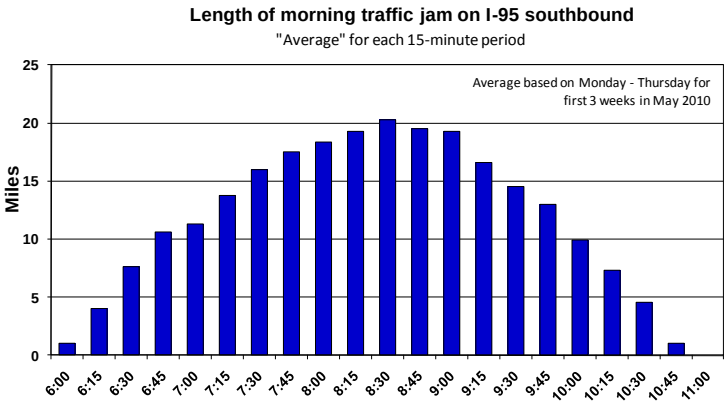
Even if we accept the conservative estimate of $670 million, the impact is enormous and undoubtedly affects business growth in the state. The Southwestern CT RPA study pointed out that in tight labor markets like the I-95 corridor, the congestion costs are almost totally translated into higher operating costs or lower productivity for businesses. Thus, businesses in our most congested areas are at a competitive disadvantage with those in less congested states.

[2] *Urban Mobility Report*, 2009, Texas Transportation Institute

[3] *Measuring the Costs of Congestion: SWRPA Region & Westchester County*, 2010, prepared by Urbanomics for South Western Regional Planning Agency & Westchester county Dept. of Planning.

The impacts on businesses can take many forms. For example, businesses might need to offer higher wage rates to attract employees, and recruiting can become more difficult. Productivity is reduced when employees arrive late, time needed for travel to business meetings increases, or meetings in certain parts of the state are avoided entirely. Inventory costs increase if deliveries become less reliable or require longer lead times. Delivery services become more expensive when delivery companies increase fleet size and hire more drivers to cope with increased traffic delays that directly reduce driver productivity by reducing the number of deliveries they can make over the course of a day.

To fully appreciate the potential impact on businesses, you need to consider the duration as well as the extent and severity of congestion in the I-95 corridor. Congestion has become pervasive and affects much of the corridor over an extended portion of the day. Planning deliveries and travel to meetings requires building in lots of extra travel time, or taking advantages of relatively small windows of opportunity during the day when congestion is normally absent. As seen in Figure xx, traffic back-ups begin shortly after 6:00 am on a typical morning and last until almost 11:00 am. The length of the back-up reaches over 20 miles around 8:30, but is still 10 miles in length at 10:00 am. This means that if you choose to travel I-95 at 10:00 am on a weekday morning, you should expect to encounter stop-and-go conditions in at least 10 miles of the corridor.



The extent and duration of such severe congestion (stop-and-go conditions) makes it very difficult for commuters to reach jobs, for residents to conduct normal household travel such as trips to medical appointments, and for companies to conduct normal business activities.

Such severe congestion currently exists primarily in the Bridgeport-Stamford area, but its impact is felt throughout all of Connecticut. As the state's primary link to New York markets, economy, and transportation hubs, congestion in the I-95 corridor reduces the entire state's access to this global economic and transportation center. Gallis noted that severe congestion was not only restricting the Bridgeport-Stamford area's ability to grow, it was also restricting the ability to grow the economy in the New Haven-Hartford-Springfield economic region and in the Southeastern CT economic region. I-95 corridor congestion threatens to choke off economic growth throughout the state.

Add?: brief discussion of congestion in Hartford, New Haven, etc.

Add?: projected growth in congestion statewide could increase 'costs' by xx%

The Importance of Transportation Investment to Business Growth

Business leaders in all parts of the state believe that improving our transportation system is important for economic growth. In surveys of business leaders in different regions of the state, the CBIA found the support for transportation investment almost universal. Fairfield

County businesses expressed the strongest support with 96% of business leaders surveyed responding that "modernizing the current transportation infrastructure somewhat or extremely important to the region's economic growth. Similar but slightly lower levels of support were found in all regions surveyed.

While support for transportation investment is almost universal, the reasons for the support differ by region. Fairfield County businesses are most concerned about congestion and its impact on access to New York. As expressed in the survey report:

> *"F*airfield County's *proximity to the financial capital of the world is relevant only if residents, employees, clients, products, investors, and service providers are mobile and accessible. Even in a global marketplace connected as much by the Internet as by interstates, reliable access to customers and workers is essential. Record growth in Metro North Commuter Railroad ridership (both in-state and out-of-state) is evidence of the importance of geographic connectivity even in a technologically linked society and economy." Fairfield County Business Survey, CBIA, 2009, p. 7*

New Haven Line service helped sustain economic growth.

This quote from the 2009 survey report highlights one way in which some economic growth in the I-95 corridor was continued even as congestion brought traffic on I-95 and the Merritt Parkway to a crawl. While highway capacity was exhausted, capacity still existed on Connecticut's New Haven Line. With frequent service throughout the business day and well into the evening, the New Haven Line was able to support some business growth in the corridor that would not have been possible otherwise. Businesses and commuters turned to rail options as highway access and mobility was restricted.

In other parts of the state the reasons for support for transportation investment reflects the nature of the respective regional economies as well as the status of the regional transportation systems. For example, in Southeastern CT congestion is not a major concern, but good transportation links are considered important to supporting and growing the area's tourism industry. In the Hartford-Springfield region, congestion is an important reason for supporting transportation investment, but so is the perceived need for more transit service.

II. The Challenge of Preserving Our Transportation Infrastructure

Connecticut faces an enormous infrastructure preservation challenge. Our highway and transit systems are some of the most intensely used in the country, but our infrastructure is among the oldest and is subject to some of the harshest weather conditions. Maintaining what we have under such intense use and demanding conditions is straining our financial resources. Over the last three decades we were able to make progress toward improving the state of repair of our assets, but that progress has largely ceased, and in some cases begun to reverse itself. This section provides an overview of the challenge of maintaining our infrastructure, our level of need, and future trends.

Operating and maintaining a transportation infrastructure as large and complex as Connecticut's is a difficult and demanding task. The state owns approximately 3700 miles of highways, 3900 highway bridges, 230 miles of rail track, 200 railroad bridges, 270 rail cars, 650 buses, 6 airports, a state pier, two ferries, and numerous buildings such transit stations, highway garages, and highway rest stops. Many individual elements of the infrastructure are complex and expensive to operate, maintain, and replace.

Connecticut's coastal environment poses special challenges that often require expensive solutions. Both highway and rail networks require more bridges – and often specialized bridges. Rail

bridges over 'navigable' waterways pose a special challenge.. Often, the only viable the only viable solution is a 'movable' bridge that can be raised or swung out of the way when a boat needs to pass. Movable rail bridges are expensive to build, maintain, and operate. DOT owns six of these movable rail bridges and five of them are over 100 years. This means much of our state commerce is dependent on the safe and reliable operation of 100-year old bridges. For example, if the New Haven Line's moveable in Westport and Norwalk were to fail to close properly, the New Haven Line would be shut down – and so would a lot of commuters and business activity.

In addition to the size and complexity of our transportation infrastructure, the management of Connecticut's transportation system must account for the extra burden of the very intense use, harsh climate, and advanced age of our highway and rail systems.

- Many of our freeways serve 100,000 – 170,000 vehicles per day with truck volumes that typically comprise about 10-15 percent of that amount.
- The New Haven Line is one of the nation's busiest rail lines with over 36 million riders per year.
- Harsh winters cause pavements, structures, and vehicles to deteriorate faster. Salt applications and freeze-thaw cycles, cause more rapid deterioration of pavements and structures alike.
- Like many northeastern states our infrastructure is old. The average age of our highway bridges is 50, and five of our major rail bridges are 100 years old.

In summary, Connecticut's transportation system is a large complex multimodal system that is intensely used, but aging and subject to harsh environmental conditions. It has served Connecticut well, but its ability to continue to do so in the future is threatened by increasing demands and reduced resources to maintain and improve it.

Level of Effort Needed to Restore & Maintain State of Good Repair

In 2008, CT DOT conducted an assessment of the level of resources needed to maintain, restore, and reconstruct or replace our infrastructure. The assessment included: (1) maintenance needs, (2) restoration needs, and (3) reconstruction or replacement needs.

The maintenance needs analysis determined the types of treatment needed to maintain systems in a state of good repair and estimated the annual cost of the treatments. It identified the level of *minor repair* and *preventive maintenance* needed to keep the overall condition from worsening over time. It is estimated that we need $50 million/year to maintain our roads, and about $25 million/year to maintain our highway bridges. The maintenance needs for other components are: rail tracks ($2.5 million/yr), rail bridges ($4 million/yr), rail equipment ($55 million/yr), and buses ($2 million/yr). An estimate for maritime was not available, and airports were excluded for reasons previously cited.

The restoration needs assessment evaluated existing conditions, treatments needed to restore conditions to an acceptable level, and costs for the treatments. It looked at the needs over the next decade, and laid out a 10-year treatment plan and budget. It estimated that we need $75 million/year to restore about 350 miles of road annually[4], and about $129 million/year to restore 50 highway bridges annually. This type of assessment was also done for rail tracks ($20 million/yr), rail bridges ($16 million/yr), rail equipment ($66 million/yr), buses ($2.6 million/yr), and maritime facilities and harbor dredging ($3 million/yr). Airports were excluded from the analysis since they have separate funding sources that currently meet existing needs.

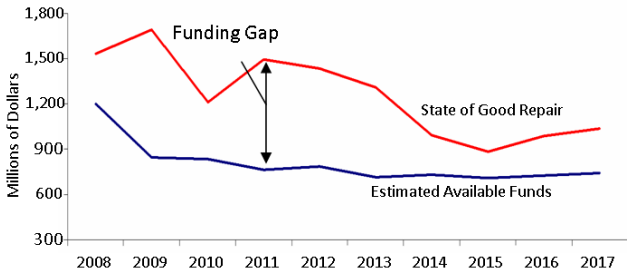
[4] Highway restoration includes the major resurfacing projects typically done through the VIP or Vendor In Place program that is largely funded through federal funds.

The 2008 study also included an assessment of reconstruction and replacement needs. Once a facility exceeds its design life restoration is often no longer economically feasible, and the most cost-effective option is to fully reconstruct or replace it. To assess these needs the study reviewed of all projects in the Department's major capital programs and plans.[5] These individual projects can be small or large, but are more substantial capital improvements than the maintenance and restoration projects discussed in the previous paragraphs.

Level of Resources Needed to Preserve Our Infrastructure

The total cost of maintaining, restoring, and reconstructing or replacing the state's transportation infrastructure was estimated and projected over the next 10 years. The 10-year cost projection was then compared to the estimate of available federal and state funds over the 10-year period. This provided a rough estimate of our level of need versus our financial capacity to meet that need.

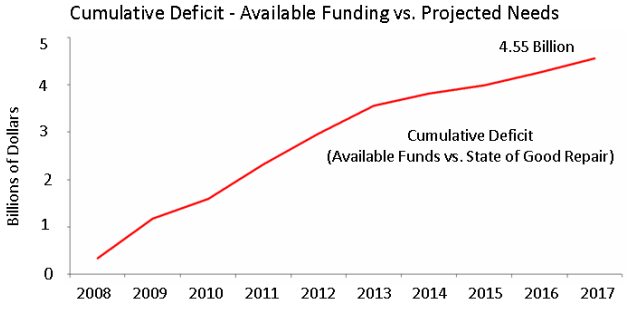
Figure 5. Available Funding vs. Projected Needs



The conclusion of 2008 assessment is that the cost of the projected 10-year program greatly exceeds anticipated revenues. The analysis is summarized in Figure 5. The lower line in Figure 5 represents the anticipated revenue from 2008 through 2017 for transportation projects and programs (highways and public transportation.) The red line represents the projected level of funds needed to preserve existing infrastructure (maintain, repair, reconstruct, and replace). The difference between the two lower lines is termed the '**state of good repair funding gap**' and indicates the anticipated funding shortfall to preserve the existing network.

The state of good repair funding gap shown in Figure xx is a function of two trends. First, projected revenues are expected to decrease in the next few years as bonding capacity in the STF diminishes and as we wind down the 10-year special funding programs authorized by the Legislature in 2005 and 2006. Those two special programs provided an infusion of bonding capacity ($1.3 billion in 2005 and $1.0 billion in 2006) that helped reduced some of the backlog of the major capital projects in Connecticut. Second, the maintenance and preservation needs are increasing over the near term. The combination of increasing needs and decreasing revenues creates a gap of $300 – $500 million per year that does not diminish significantly until 2013 or 2014.

Cumulative Deficit - Available Funding vs. Projected Needs



The cumulative effect of this state of good repair funding gap is illustrated in Figure xx. The line in Figure xx is the cumulative unfunded need for state of good repair improvements. The gap today is about $2 billion, but it grows to over $4.5 billion in 2017.

[5] The 2008 assessment of programmed and planned projects included both major preservation and system enhancement projects (new facilities, adding capacity to existing facilities, or enhancements to existing facilities improve performance). However, only preservation projects are included in this section of the discussion paper.

The Hidden Cost of Deferred Maintenance.

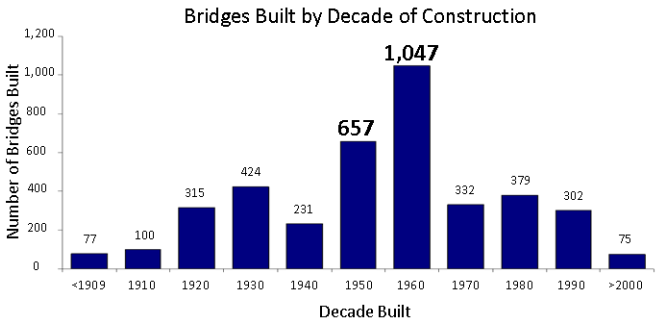
Deferring maintenance and repair work is appealing in the short term because annual budgets can be reduced for several years with no immediate or obvious effect on the condition of the infrastructure. However, in the long term such postponements can be very expensive. Preventative maintenance and regular scheduled preservation treatments are typically done to extend the useful life assets and increase the length of time between major repair or reconstruction. When these treatments are missed, a price will be paid due to shortened repair and replacement cycles. These costs were not assessed for this discussion paper, but they are substantial.

Interstate Building Era Poses Special Problem.

Our Interstate highway system poses special problem by virtue of the fact that most of our Interstate system was built in the 1950s and 1960s. Bridges and other structures built in that time period are 40-60 years old and nearing or at the end of their design life. With so many expensive structures reaching the end of their expected life span at the same time, we are facing a major financial challenge.

The challenge is complicated by the need to rebuild or replace some major bridge facilities. For example, replacing major structures like the I-84 viaduct in Hartford and the I-84/Route 8 interchange in Waterbury will cost in excess of $1 billion each.

Some evidence of the potential scale of this problem can be seen in Figure xx. The chart shows the age profile of Connecticut's bridge inventory. Note that Connecticut built 657 bridges in the 1950s and 1047 bridges in the 1960s. The sum represents almost half of our highway bridge inventory. Many of the bridges built in these two decades were part of the Interstate highway building surge that began in the 1950s and peaked in the 1960s. The federal government financed much of the development of the Interstate system. However, it has shown little interest in financing its renewal, and states must now bear that cost.



III. The Fiscal Challenge

The challenge is made more difficult by the financial conditions in which we are operating. For over a decade, our usual transportation funding programs have been inadequate to support our transportation infrastructure needs. Reductions in the state gas tax, unfavorable changes in federal funding programs, and the inability of either the state or federal gas tax to keep pace with inflation has left us with without the financial capacity to either maintain or expand our systems. The result is a large backlog of repair, reconstruction, and replacement projects. Insufficient financing has also prevented us from improving and expanding our transportation systems to keep pace with the growing needs of residents and businesses. The economic recession that has gripped the nation for the last two years has further reduced our ability to finance transportation programs. However, continuing to defer needed repairs and improvements will only increase the backlog of projects and will threaten future economic growth in the state.

While Connecticut's primary state and federal revenue streams for transportation have failed to keep pace with inflation or provide the capacity to meet growing needs and demand, there are two major exceptions to overall diminishing revenue trends. In 2005 and 2006 state leaders enacted special one-time funding infusions to facilitate a major new capital investment program that was partly defined in the new legislation. This legislation was partially a response to the 1999 Gallis report as well as the strategic plan first adopted by the TSB in 200?. It also reflected a growing sentiment to shift transportation investments toward a more balanced multi-modal system. While some important highway improvements were funded through these acts, the emphasis was clearly on transit initiatives such as rail car replacements, the New Britain-Hartford Busway, the New Haven-Hartford-Springfield rail project, and branch line improvements. The $2.3 billion in new revenues these programs provided facilitated a major improvement and expansion of our transportation system. But, both of these programs were of limited duration and the authorized funding will be fully expended in the next few years.

Add brief discussion?

- *shift in federal funding policy no longer favors CT*
- *status of TSB and its reduced capacity to meet needs*

IV. The Way Forward: Increased & More Strategic Investments

This section is deliberately presented in outline form so that TSB discussions can help elaborate on which policy directions to pursue..

The role of the Transportation Strategy Board is to offer guidance on the strategic directions that Connecticut should pursue to improve its transportation system. That role was defined for the TSB partly in recognition of the need for Connecticut to broaden its transportation goals to address more than just transportation safety, capacity, and mobility. The TSB's charge was to assure that transportation investments also supported other state strategic goals such as growing a strong economy, promoting sustainable development, and protecting our environment and our quality of life. It is in that spirit that the recommendations presented below are made. We have chosen not to recommend individual projects, but rather to suggest strategic directions that we need to pursue to assure a strong and sustainable future for our state.

1. Policies to guide overall investment strategy.

a. *Continue to emphasize more balanced multi-modal approach.*

b. *Link transportation to economic growth, sustainable development, & environmental goals.*

c. *Develop and integrate economic assessment tools into planning process.*

d. *Develop BDL as strategically important transportation hub & economic resource.*

e. *Improve & unify bus service.*

2. Increase the Level of Transportation Investment.

The primary conclusion drawn from the past year of reviewing the status of our transportation systems, programs, and policies is that we need to increase our level of transportation investment. Our current investment levels are inadequate to improve our transportation in order to advance

strategic goals such as economic growth. In fact, current investment levels will not support maintenance of our current infrastructure in a good state of repair. Over the last 10-15 years, maintenance needs increased and construction costs escalated as federal funds lagged and state gas tax revenues dropped. Special state transportation bonding authorizations in 2005 and 2006 provided a large ($2.3 billion) but temporary boost to offset the prevailing trends. Unfortunately, those programs are now terminating and we are left to rely on just the diminished annual federal and state revenue programs. ***It is essential that we restore sufficient fiscal capacity to support both a program of system preservation that maintains a state of good repair, and a program of system enhancement that allows us to address strategic needs*.**

a. *Increase investments sufficient to meet system preservation needs.*

b. *Increase investments for strategically important system enhancements.*

3. Define Strategically Important 'Programs' Rather than Individual Projects.

Attempting to identify individual enhancement projects to include in a list of priorities is not an effective approach to adopt at this juncture. However, we believe that the general nature of these strategically important investments can be defined and we have done so below.

a. *Continue enhancement of rail network.*

The most cost-effective way to counter the threat that growing congestion on I-95 poses to all of Connecticut, is to enhance and expand the state's passenger rail system. The existing New Haven Line has helped foster economic growth between New Haven and Greenwich for decades, and recently proved critical to sustaining growth even as severe highway congestion reduced highway access to New York. This potential for fostering growth can be maximize by strategic improvements to the mainline itself, but more importantly to other rail lines that connect to the mainline: the 3 branch lines, Shoreline East, and the New Haven-Hartford-Springfield Line.

b. *Improve & better manage critical highway corridors.*