

**Testimony of Astrid C. Glynn, Commissioner
New York State Department of Transportation
Capitol Budget Hearing
Albany, New York
October 30, 2007**

Introduction

My name is Astrid Glynn and I am Commissioner of the New York State Department of Transportation (NYSDOT). This testimony will discuss the transportation challenges facing New York State over the next several decades and our recommendations for new capital investment strategies to better meet these challenges.

Transportation System

The New York State transportation system is a truly multimodal transportation system - a vast network of highways, local roads, rail lines (both passenger and freight), public transit systems, pedestrian and bicycle facilities, airports, ports, waterways, as well as intermodal facilities that connect the various parts of the network. Some of this system is privately owned and operated (e.g. rail freight, intercity bus, airlines); much of it is publicly owned and maintained (e.g. roads, bridges, public transit). The system provides mobility to its travelers and supports the State and national economies. This network includes more than 113,616 miles of highways and 17,227 highway bridges over which more than 141 billion vehicle miles are driven annually. Five hundred thirteen public and private aviation facilities provide service to 84 million passengers annually. Four port authorities (NY/NJ, Albany, Oswego, Ogdensburg), the Port of Buffalo and numerous private ports handle more than 150 million tons of freight each year. There also are 3,500 miles of railroads in the State, moving 73.5 million tons of freight annually. Approximately 1.5 million riders use Amtrak's Empire and Adirondack services, and more than 7.5 million rail passengers pass through Penn Station using Amtrak service with an origin or destination within New York State. More than 130 public transit operators serve in excess of 7.1 million passengers daily.

A direct result of New York's extensive support for public transportation is the fact that the State has the lowest per capita use of energy for transportation by any state in the nation. Energy consumption per capita for transportation purposes in New York is roughly two-thirds of the national average.

In 2007-08, NYSDOT is delivering the third year of an \$18.8 billion five year capital program that, along with MTA's \$18.0 billion capital program, comprises the State's \$36.8 billion Five Year State Transportation Plan (the Plan). The Plan is primarily supported by State and Federal funds, user fees and fares, and a \$2.9 billion Transportation Bond Act that was approved by voters in 2005. The NYSDOT program includes over \$10 billion in State and local highway and bridge projects; \$235 million for freight and passenger rail projects; over \$116 million to advance general aviation security, business-use airport development, and capital improvement projects for public-use airports; \$235 million for capital programs of non-MTA transit systems and more than \$2 billion to fund transportation capital grant programs for localities (such as

CHIPS and the Marchiselli program). Clearly, New York State is committed to multimodal transportation systems.

Importance to New Yorkers

Historically, New York has demonstrated leadership in transportation, from the Erie Canal through the State's long-standing success at building and maintaining complex systems for every mode of transportation. New York State's transportation system provides mobility to its travelers and can contribute to energy conservation and environmental protection. Transportation influences quality of life, is a prerequisite to job creation, and supports the State and national economies. The transportation system is what connects New Yorkers - connects them to health care, education, jobs, tourism and recreational activities, each other, and the world.

A Time for Action

In accordance with Chapter 384 of the Laws of 2007, the Department is required to develop goals and objectives for a new multimodal capital program spanning the 2009 – 2014 period and to submit that to the Governor and the Legislature by March 31, 2008. The development of this new program is occurring at a time when our transportation systems are under stress from age, heavy use and deferred maintenance due to underfunding. The condition of the system's infrastructure is deteriorating and reversing this downward trend will require new investment strategies and a dedicated, sustained, long-term effort.

The cost of addressing the developing problems of the transportation system seems high, but will only increase if we delay action. New York State must either pay now for prudent and effective infrastructure treatments or pay a much higher price later when decay has made matters much worse.

Our challenge is significant, since pressures from increased demand for travel and rapid inflation in construction costs threaten to far exceed expected growth in transportation resources. We face a structural problem in making sustainable investments at the right level for our transportation system. We must take action now to ensure that the State remains competitive in the global economy during the 21st century.

Federal Partnership is Essential

The dilemma facing our transportation infrastructure is not limited to New York State. It is being replicated across the country. This is a national issue and requires a strong Federal role in the solution. Current Federal funding programs will expire in September 2009, and a new Federal transportation program must be developed. The authorization of a new Federal transportation act provides an opportunity to redefine, revitalize, and expand the Federal role in funding transportation. In particular, the Federal government created the Interstate Highway system and should be responsible for the reconstruction of this system that is reaching the end of its useful life. A strong Federal role in funding the nation's bridges should continue as states across the country struggle with bridge deficiencies. Increased Federal investment to maintain

and expand transit services is needed to reduce growing traffic congestion. The Federal government must also establish a stronger role in national rail policy.

As the nation faces the challenge of a growing energy crisis, Federal leadership is needed to ensure that transportation systems are part of the solution and not part of the problem. The next Federal Transportation Act should provide incentives for transportation systems that are transit friendly and energy efficient, an area in which New York is a national leader. The current disconnect between our energy policy and the Federal transportation funding structure should be remedied.

One of the most important first steps to a successful Federal advocacy is to begin the effort with a clear picture of what we need. We believe that the needs assessment we present today puts us on the right path to maintaining and strengthening an effective Federal partnership.

State of the Transportation System – A System Under Stress

Our transportation system is under stress, from age, heavy use, and the lack of adequate investment. The system is safe, but the conditions of many parts of our infrastructure are worsening. Unfortunately, we cannot reverse these trends in a year or two; it will take a dedicated, sustained long-term effort. To understand and explain the magnitude of this infrastructure problem, we conducted a review of the condition of our multimodal transportation assets.

What we found was a system in decline. After improvement in the 1990's, the condition of the highway system is deteriorating. In 2006, the Interstate system reached the 50 year milestone and many components are nearing the end of their useful life. Much of the highway infrastructure in New York State predates the completion of the Interstate system and is even older. Most of the state's railroad routes were built in the 19th century and many are in need of repair and cannot accommodate modern rail cars. Transit buses are not consistently being replaced at the end of their 12 year life and smaller airports around the state need updated equipment and rehabilitated terminals and support facilities.

As the transportation system ages and conditions decline, the demands on that system are increasing. Between 1990 and 2000, the State's population increased by almost 1 million people. Automobile travel in New York State has steadily increased from 293 million vehicle miles of travel in 1990 to 382 million vehicle miles of travel in 2005. Transit ridership has reached levels not seen in several generations and New York State continues to be the nation's heaviest user of public transportation.

In addition to the physical aspects, construction inflation is undermining the buying power of current funding. Over the past 3 years, construction inflation in New York State has averaged 10 percent annually, well above the increase in the Consumer Price Index. The impact of construction inflation in the transportation program is described in more detail below.

Major portions of transportation funding are being used on core preservation. This concentrated use of resources will need to be considered even as NYSDOT and other transportation operators

work to address capacity expansion and economic development needs such as those pivotal projects identified in Governor Spitzer's "City by City" strategy.

Failure to invest in New York State's transportation system could lead to a return of the infrastructure crisis of the 1970s. Impacts on the system itself could foreseeably include vastly increased numbers of deficient bridges and rough pavements, transit assets that fail to support service needs, unmet freight and passenger rail demands, and airport infrastructure ill-suited to spur economic activity. Impacts to the State would be even more significant as economic growth would be stifled, opportunities for energy conservation would be lost, quality of life would diminish, and the costs of deferral would mount.

System Trends and Conditions

Bridges

New York State has more than 17,000 highway bridges, about 44 percent of them owned by the State Department of Transportation (NYSDOT), roughly 50 percent owned by municipalities, and the rest owned by state and local authorities (such as the State Thruway Authority) and railroads. Of the approximately 17,000 highway bridges in the State, over 6,400 are more than 50 years old. New York State owns 7,580 bridges and a large number of them - approximately 2,100 - are more than 50 years old. An additional 756 State bridges will reach the 50 year mark between 2007 and 2011 and slightly more than 1,000 will turn 50 between 2012 and 2016. Locally owned bridges in New York State total 8,534, of which 3,639 are currently more than 50 years old. Between 2006 and 2016 an additional 935 local bridges reach the 50 year milestone. Fifty years is a benchmark of when many bridges need either major rehabilitation or replacement.

The NYSDOT bridge condition rating scale ranges from 1 to 7, with 7 being in new condition and a rating of 5 or greater considered as good condition. NYSDOT defines a deficient bridge as one with a State condition rating less than 5.0. More than 1,600 State bridges are in the marginally good category, rated between 5 and 5.3 and could move to the deficient category within 10 years, absent additional investment. For locally owned bridges, more than 1,300 are in the marginally good category and could move to deficient within 10 years.

It is important to reduce deficiencies not only on heavily traveled bridges, but also key lower volume bridges. Many smaller state and local bridges are important travel links for heavier vehicles such as school buses and fire trucks, but may have posted weight limits that impact the routes of these vehicles. To avoid wasted fuel and inefficient detours the weight limits on many of these key bridges should be addressed. The Department has one of the best bridge inspection programs in the nation, according to the FHWA, with all inspections overseen by a professional engineer. We strive to fix any problems discovered during bridge inspections as quickly as possible to avoid undo impacts on the traveling public. As exemplified in the recent I-35 bridge collapse in Minnesota, preventive maintenance is important and identified bridge deficiencies need to be addressed in a timely manner. This is even more critical for bridges that provide the only connection for travelers within a reasonable distance.

Pavement

NYSDOT made good progress in the 1980's and 1990's improving pavement conditions, showing a steady increase in the percent of pavement rated good and excellent. However, starting in 2000, a sharp decline in pavement condition occurred, reflective of the sharp drop off in lane miles paved. In order to address fiscal constraints, the pavement cycle (the average time between resurfacing of pavement) was lengthened from 12 years to 14 years (12 years is considered the industry standard). The pavement treatments selected were not always optimum to preserve pavement life. The Department's goal is to re-establish the paving cycle of 12 years or less. Currently about 44 percent of state's pavements are rated marginally good, but almost 20 percent of those could fall into fair category in the next year. Returning to the 12 year paving cycle will help reduce the amount of fair and poor pavement. It will also help improve the ride quality (smoothness) of the state's pavements and move us closer to the average of other states on this measure. Today, New York ranks 48th in pavement smoothness as measured by the Federal Highway Administration, well below the national average

Transit

As of 2007, for systems other than the Metropolitan Transportation Authority (MTA), 15 percent of the Statewide transit fleet has exceeded the Federally rated useful life for a bus. Over the period of the next five-year transportation plan, an additional 36 percent of the fleet is expected to reach and pass the Federally rated useful life. Factors influencing the age of the public transit fleet include replacement cycles; availability of Federal, State and local funding; and the redirection of Federal funds for capital replenishment to address preventive maintenance needs.

At current investment levels, the average fleet age will continue to increase by 14 percent (from 7.4 years in 2010 to 8.4 years in 2030). Without additional investment, an additional 2,000 buses (40 percent of the fleet) would need to be replaced in 2030 to achieve an optimal fleet age distribution of six-years. Continuing to operate buses beyond their useful life increases maintenance costs and reduces reliability through increased likelihood of vehicle breakdowns, which can affect ridership growth. Reduced vehicle reliability or lack of bus service can impact those segments of the population such as the elderly, disabled, and other people who rely more heavily on transit service to get to work, medical appointments or other vital services. As an example, 62 percent of the 800 people interviewed for the Homeless Alliance of Western New York's 10 Year Prism Plan said that they had no job due to transportation issues.

Freight Rail & Ports

The Class 1 railroads lack the capacity to handle the projected growth in freight volumes in New York State. By 2030, the major rail corridors through New York State will be congested and unable to accommodate the anticipated freight diversion from trucks. A recent report from the Association of American Railroads (AAR) indicates that smaller railroads have the same capacity problem and, in addition, lack the infrastructure to handle today's heavier rail cars capable of carrying 286,000 lb loads. These heavier rail cars can improve the efficiency of rail travel and lower the cost to move goods, making rail even more cost-effective relative to trucks.

In addition, the freight rail network in New York State is limited in certain areas by height and width restrictions, especially on many rail lines in the New York Metropolitan area constructed a century or more ago when the rail industry standard was smaller rail cars. Shippers and businesses in New York State would benefit from improved access to the rail network including additional sidings, yards, and transload facilities. For example, in Plattsburgh, the multimodal program has helped with the redevelopment of the former Air Force Base by providing the rail infrastructure necessary for Bombardier to locate their manufacturing facility and has provided a new transload facility, providing rail access to local industries that are not located adjacent to the railroad. In Utica/Rome East Coast Olive Oil recently used a combination of rail bond and multimodal funds to support a move to nearby Griffiss Air Force base, keeping this manufacturer in New York.

Aviation

The Downstate Airports comprised of the three major New York area airports - JFK, LaGuardia and Newark- operate under severe pressures as the hub of the world's economy. Flight delays and air traffic congestion issues here not only affect New York; but, at times, affect the entire national aviation system.

Upstate, the commercial service airports are constantly seeking to preserve access to commercial service and connections to major cities. Service to airports like Elmira-Corning and Ithaca-Tompkins has been reduced, and service to Massena, Ogdensburg, Watertown, Jamestown, Saranac Lake, and Plattsburgh would already be lost except for the Federal Essential Air Service (EAS) program providing subsidies for air service to these communities. Over the last ten years, these smaller airports have seen their enplanements (passenger boardings) decreasing at a slow, but relatively constant rate

Our general aviation airports that do not have scheduled airline service, but play a key role in regional business must rely upon State funding for revenue producing projects like hangers and fuel farms. Many of these aviation facilities face a daily struggle just to continue.

Inflation Impact on Construction Dollars

Recent rapid inflation in the construction industry is severely impacting the buying power of existing financial resources, not only in New York, but nationally. Our current State Five Year Transportation Plan was formulated in late 2004, at a time when construction inflation (as measured by the Federal Highway Administration Bid Price Index or BPI) had averaged 3.4 percent over the previous 10 years. With that history as a guide, it was assumed that the \$10 billion the plan provided for State and local infrastructure projects would represent a real program increase well in excess of the pace of inflation. However, in the two years after the plan was formulated, global and regional factors increased the prices for construction commodities and a glut of regional construction activity drove rapid cost escalation. In 2005, the BPI increased by 19 percent from 2004; and then another 21 percent in 2006. Over the last 12 months (9/30/06 to 9/30/07) cost increases for individual commodities are continuing to run at accelerated rates, with the cost for concrete increasing by 10.8 percent, steel by 14.3 percent and asphalt by 7.7 percent.

These factors greatly diminished the buying power that had been programmed into the Five Year Plan. In fact, we have lost ground. If inflation were to continue at the same average rate as the last five years (9.2 percent), by the time the Plan ends in 2010 the value of the \$10 billion originally programmed for construction will be worth only an estimated \$8 billion in comparable project value. Such a loss in value compounds the difficulty we face in finding needed funding.

Congestion

The increased usage of our transportation system as the economy grows is causing more congestion on many parts of the system. Congestion may be most apparent to the public on the highway network, due to the growth in car and truck traffic, but it is also evident on parts of the transit, rail and aviation systems. Use of our urban and rural transit systems is increasing, not only in major cities, but also in the suburbs, and the aviation system in the New York metro area is regularly suffering delays. The major rail line across the State is nearing capacity and cannot accommodate the estimated demand for rail freight projected for the next 20 years according to a recent study conducted for the railroad industry. As New York's population and economy grow, so will the need for travel. Without additional capacity to accommodate this growth (through more efficiently operating the system at first, but also through strategic capacity expansion and diversion to other modes of travel) our economic growth will be severely constrained.

Traffic congestion in New York State is estimated to cost over \$9 billion annually in lost time and wasted fuel by highway users. Congestion also affects the reliability of the transportation system. By 2030, New York's population will grow to 20.6 million, an increase of almost 1 million people. Highway traffic is estimated to grow at a rate of 1.1 percent annually between 2005 and 2030. Aviation delays at the New York City airports affect air travel throughout the country, including service to upstate communities. The growth of freight on the CSX line from Albany to Buffalo results in delays to Amtrak trains traveling between these cities, and the growth in Metro North service can reduce the reliability of intercity passenger trains traveling from Albany to NYC. These trends will strain the existing transportation network, increasing the geographic extent of traffic congestion, its duration, and the cost to the economy. Congestion in one part of the system can also rebound onto another. Because of this, it is important to address chokepoints and assure a balanced system of travel modes with adequate capacity

Past efforts to combat congestion have made only a small reduction in the growth of congestion. Any significant reduction in the growth of traffic congestion will require new policies that emphasize solutions other than building new highway capacity. These new policies need to focus efforts on managing the entire transportation system - including improving operations, managing demand, and considering pricing strategies. Increased investments in more efficient modes such as transit should also be considered. The new policy should facilitate sustainable land use patterns that incorporate transit use and reduce sprawl. Strategic expansion of highway capacity will also be needed, but should be implemented in the context of a full range of options and should be supported with appropriate system management and land use strategies.

Over one half of all traffic delay is due to the effects of accidents, incidents, and highway construction. While we have used new traffic monitoring technology to help operate the system

more efficiently, there is more that needs to be done. We will implement new strategies to improve incident detection and coordinated, timely response. We will also work to reduce construction delay with incentives in contracts, night work where appropriate and improved scheduling and coordination. To reduce freight delay, we will address bottlenecks, access to ports and airports, border delay, and participate in multi state efforts to enhance freight mobility. Increased ITS strategies include providing real time traffic and transit information to users to allow them to make intelligent travel choices. We are currently implementing the national 511 traveler information system in New York State to provide travel information to the public over the phone, internet and other media

A full range of potential congestion management techniques should be considered in the future including HOV lanes, HOT lanes, truck only lanes, congestion pricing systems, and demand management strategies. Research, testing and deployment of new technologies may also help combat congestion. An example is the Vehicle Infrastructure Initiative – an emerging set of technologies that includes vehicle-to-infrastructure, as well as vehicle-to-vehicle communications that offer a variety of vehicle safety applications and transportation operations functions with the potential to significantly increase highway safety and capacity.

Policies and Strategies to Improve the State of the Transportation System

A New Policy Framework is Needed

The current approach to investing in transportation is no longer enough. Out of necessity, our limited resources are being invested in projects that address safety issues, maintenance activities to address immediate physical problems with assets, and restoration of critical deficient facilities. We have implemented few strategies to perform the most cost-effective preventive maintenance or utilize longer-lasting treatments. As a result, overall system conditions are deteriorating. In addition, a chronic lack of resources does not allow the State to address secondary assets such as culverts, drainage, traffic signals and guiderail. This is leading to a decline in the condition of this supporting infrastructure. Finally, there should be greater focus on transportation investments that support economic growth, energy conservation and sustainable development.

A new policy framework for investing in our transportation infrastructure is needed now to not only preserve the vital transportation network we have, but also to improve it to meet the new demands of competing in the global economy. This new policy framework should provide the tools that will allow us to overcome the existing deficiencies in our transportation assets and, more importantly, to make cost-effective investments, that will support our transportation system for the future. This new framework reflects the importance of transportation to the State's economy. It should also recognize the need for targeted growth in parts of the transportation system to spur the economy. In addition, this new framework must build on the relationship between transportation, energy use, and the quality of life in our State. Transportation planning must be better integrated with local land use and lead to transportation decisions that are environmentally responsible and that result in sustainable communities. We must create and sustain a balanced transportation system that provides the necessary redundancy and choice for the efficient movement of people and goods.

New Investment Strategies for Transportation

In order to create a viable multimodal transportation system that will allow New York State to prosper and grow in the global economy, the State's investment strategy should:

- Make choices consistent with policies.
- Reverse the current declining conditions of existing transportation assets;
- Preserve the existing multimodal transportation system and services through balanced investment in maintenance, capital and operations;
- Identify realistic and measurable goals for the performance of the system;
- Pursue innovative project delivery strategies that can complete projects faster and avoid the cost of inflation
- Ensure long-term system safety and security; and,
- Include adequate, predictable, and reliable resources dedicated to transportation improvements.

Without this new investment strategy, we will be unable to reverse the deteriorating conditions of our transportation assets and provide the reliable transportation network that meets the mobility needs of today and tomorrow.

Twenty Year Investment Needs Analysis – A Multimodal View

A preliminary long term needs analysis was completed to determine the magnitude and impact of future infrastructure needs for the period 2010-2030. All of the modes of transportation that are part of the Department's fiscal plan were considered. The needs of the Metropolitan Transportation Authority (MTA), the Thruway Authority or the Bridge Authority were not included in the needs assessment.

The needs assessment consisted of a comprehensive process to review all multimodal assets. The process included establishing goals and analyzing the level of investment required to reach sustainable infrastructure conditions or a state of good repair through proper asset management strategies and continued maintenance. While the needs assessment includes many currently known capacity expansion and economic growth projects, it does not anticipate such projects that may emerge from the local and statewide planning processes over the next 20 years.

Activities needed to maintain infrastructure in a good, serviceable condition include normal replacement (assets or components are replaced at the end of its useful life); overcoming the current backlog of past deferred maintenance; and replacing assets that have exceeded their useful life. For highways and bridges, funding needed to maintain infrastructure in a good, serviceable condition includes operations funding to maintain the system at an acceptable level. Illustrative major projects are separately described. Non-MTA public transit's needs include capital costs only. The needs for Freight Rail, Water Port, and Aviation include total capital costs, while the needs for Passenger Rail include existing Amtrak subsidies.

State and Local Bridge Investment Goals and Needs

The scope of the bridge assets covered in the 20 year long term needs analysis include 7,602 State highway bridges and 8,551 local highway bridges. The analysis excludes Authority bridges. Performance is measured for State and local bridges based on the percent of bridges that are in good and excellent condition. During the 1990s, the number of State and local bridges in good and excellent condition was improving. The recent trend is a decline in overall bridge conditions. At current program funding levels, overall bridge conditions will continue to deteriorate.

The proposed bridge strategy will employ the Department's new approach to emphasize maintenance to keep bridges from falling into the deficient category. An early focus will be to build both an organizational capacity to perform the necessary maintenance and to provide support resources for it such as necessary equipment. This strategy will help overcome the deterioration of bridges as they age to assure that we get the full life out of the materials we have used. Simple maintenance such as washing salt off of bridges to avoid premature failure of the paint and rusting of the steel components can help extend the life these assets. The bridge strategy will also include the major reconstruction or replacement of critically deficient bridges. We will continue to focus on those bridges that need corrective work but are not so deteriorated that they need major reconstruction. Addressing bridge preventive maintenance before these facilities need more extensive rehabilitation will reduce the overall life cycle cost of the assets.

To reverse the recent trend and return to similar bridge condition improvement levels as the 1990's will require an investment level of \$17.4 billion over 20 years. This funding scenario will result in a net decrease of 24 deteriorated bridges per year.

While Local bridge conditions experienced dramatic improvements in the 1990's, the recent trend is a decline in overall bridge conditions. To reverse the recent trend and improve local bridge conditions at a rate comparable to State bridges, an investment level of \$13.2 billion over 20 years will be required. This funding scenario will result in a net decrease of 30 deteriorated bridges per year.

The total amount the Department will need to achieve its bridge goals over the next 20 years is \$30.6 billion.

State and Local Highway Pavement Investment Goals and Needs

New York State's highway pavement includes 41,189 lane miles of pavement of which 15,462 miles are in fair and poor condition. Note that this mileage excludes most local roads and the Thruway system. At current program funding levels, overall pavement conditions will continue to deteriorate. Sustainable preservation of assets requires reversal of the current trend of declining pavement conditions and maintaining higher volume roads such as Interstate highways at a higher condition level.

The proposed strategy for investing in pavements on the State's highways will be a balanced program of preventive maintenance and cost-effective rehabilitation/replacement. These activities range from sealing of cracks to applying a thin preservation overlay to protect pavement from weather conditions including UV light and heating and cooling damage that would otherwise more rapidly deteriorate the top pavement layer. Thicker pavement overlays are needed to overcome the stresses imposed on the pavement by heavy loads (e.g. from heavy trucks). Eventually, once pavements deteriorate beyond what can be addressed by overlays, major reconstruction will be needed to remove the existing materials and reconstruct the roadway to keep the necessary clearance available when vehicles pass under bridges.

The current paving cycle of 14 years is inadequate to improve pavement conditions. By restoring a 12 year paving cycle, overall pavement conditions, as well as ride quality, will be improved.

A portion of the State highway system extends into major cities and the responsibility to maintain these roadways within the City boundaries often falls to local government. The need to maintain and improve these pavements to the same standards as the adjacent State maintained highway will require an investment level of \$3.9 billion.

The total amount the Department will need to achieve its goals for pavements over the next 20 years is \$43.9 billion.

Investment Goals and Needs for Other Highway Assets

There are many other important infrastructure assets that often have lacked adequate investment or have been overlooked. These assets are vital to maintaining the integrity of roadways and for safety. Maintenance and replacement cycles for these assets are as urgently needed as they are for bridges and highway pavement. The new investment strategies outlined above are a necessary part of improving the condition of smaller assets. What follows is a description of these assets that require increase investment to maintain the condition and performance of the overall highway system.

Drainage -- NYSDOT maintains 7,500 large culverts, 75,000 small culverts, 42,800 miles of ditches, gutters, and curbs, 3.8 million feet of drainage structures, 700 stormwater storage facilities and sediment basins. Drainage protects bridges, pavements, rights-of-way and other assets by directing water through or off an asset in the best controlled manner possible. New York State has a large number of culverts that will need major repairs or replacement in the needs study period. Because funding has been constrained we have only been able to maintain 1/3 of the needed productivity for cycle cleaning and reshaping ditches. New environmental mandates to address stormwater management will require an increased effort. The drainage goal is to replace all corrugated steel culverts that are older than 40 years, and all concrete culverts older than 70 years with a General Recommendation rating less than 5, over the next ten years. By 2017, all corrugated steel culverts constructed before 1978 will be replaced. By 2027, all corrugated steel culverts constructed before 1988 will be replaced. After 2027, corrugated steel culvert replacements will no longer be as significant a factor for the DOT maintained network as the technology is being phased out. All culvert replacements and new culvert construction in

fish bearing streams will be designed for wildlife passage as mandated by the Army Corps of Engineers March 2007 Nationwide Permit revisions.

Traffic Control Devices and Intelligent Transportation Systems to provide safety, reliability and mobility -- NYSDOT maintains more than 6,000 traffic signals; 3,000 overhead sign structures; 675,000 ground mounted signs; 38,000 lane miles of pavement markings; 260 large Variable Message Signs (VMS); 310 traffic cameras (CCTV); 1,100 detector monitoring stations; and 90 ramp meters. The busiest commuter corridors and the largest metropolitan areas also have Highway Emergency Local Patrols (HELP trucks) that patrol over 450 miles of congested highway in six urban areas of the State, and extensive traffic monitoring to detect incidents such as crashes that impact reliability of highways. Several regions have Transportation Management Centers (TMCs) to communicate and coordinate incident response. Responding quickly to accidents and incidents on the highway and providing travelers with real time information to make route decisions can shorten the duration of traffic congestion, resulting in lower vehicle emissions and less gas consumption. The traffic signal goal includes: periodic retiming to conserve energy resources and minimize customer stops and delays; upgrading pedestrian indications to have countdown timers; and, providing back-up energy systems to keep signals operating during power failures at 3,000 of the busiest intersections. The goal for overhead and ground-mounted traffic signs is replacement on a 12 year cycle to assure higher levels of night-time reflectivity required by the increasing share of older customers. The goal for investment in traffic monitoring devices, traffic management centers, HELP motorist assistance patrols and managed lanes is to expand the extent of the system that is actively operated where it is cost effective to do so.

Guide Rail and Highway Lighting for Highway Safety -- NYSDOT maintains over 23 million feet of guide rail on State highways and repairs it as necessary when damage occurs. Guide rail lasts 20 years on average and all guide rail will need to be replaced during the next 20 year period. In environmentally sensitive areas such as the Adirondack and Catskill parks, we will replace the existing rustic guide rail and maintain the visual context. The goal for guiderail is to reduce the replacement cycle to 20 years. The goal for impact attenuators is to maintain a 20 year replacement cycle. Guiderail and impact attenuators damaged by traffic crashes will be promptly replaced or repaired.

Pedestrian/Bicycle/Americans with Disabilities Act (ADA) Compliance -- The Department maintains approximately 24,000 crosswalks, 48,000 ramps, 7,213 lane miles of narrow shoulders, 2,885 lane miles of sidewalks. The estimate for pedestrian, bicycle and ADA needs include costs for maintaining crosswalk markings for crosswalks, replacing pedestrian indicators, reconstructing existing sidewalks, constructing new sidewalks, building ADA compliant ramps, and widening narrow shoulders to accommodate bicycles. There are approximately 48,000 ramps at signalized intersections; however it is estimated that only 55 percent are presently ADA compliant. The sidewalk goal is to reconstruct 14 miles per year and add 72 miles annually. ADA compliant crosswalk ramps at intersections would be constructed as a rate of 1,080 ramps per year, and 264 deteriorated ramps will be replaced annually. The State would be ADA compliant following these 20 year investments. The bicycle goal is to widen 360 miles of shoulders per year to the four foot minimum required for bicycle use.

Highway Rest Areas -- NYSDOT owns 42 rest areas on State highways and is responsible for the operation of 38 of them (the Thruway Authority operates the other four). More than half are over 30 years old and more than 70 percent are not large enough for the numbers of customers utilizing the facilities based on DOT surveys. The availability of sufficient truck parking is a significant concern at many rest areas, and presents a potential safety issue. We are examining opportunities to reduce idling at those rest areas with heavy truck use through truck stop electrification projects. Our needs assessment is based on bringing over 30 rest areas into a state of good repair through replacements or upgrades by 2030. A rest area study is underway to develop long-term policies and strategies for our rest area assets.

Fleet and Facilities -- The Department is responsible for replacement, repair, and fuel for 9,400 pieces of equipment including 1,500 large dump trucks; 1,300 pick-up trucks; 1,000 medium duty trucks; 350 large loaders; and 300 mowers. NYSDOT maintains over 290 buildings housing personnel and equipment. A recent study of the Department's equipment replacement cycle, concluded that the Department's current cycle (16.5 years) exceeds the industry recommended cycle (9.2 years) by 79 percent. The study also described the Department's equipment funding as "capital deprivation," that has resulted in a current replacement needs backlog of \$215 million. This backlog will continue to increase by \$24 million annually without additional investment, and eventually force the Department into a situation where immediate and substantial equipment resources will be required to ensure public safety and continue core services. The Department is also required to retrofit diesel equipment to reduce emissions in accordance with State law. The Department's goal is to manage the fleet to achieve a minimum life cycle cost by replacing assets at the end of their useful lives as reliability diminishes. The facilities goal is to perform capital upgrade of facilities in the short-term to reduce operational costs in the long-term. Energy conservation improvements are also a high priority and will be incorporated into facilities as they are upgraded or replaced.

Petroleum Bulk Storage -- The Department is responsible for the maintenance and operation of 200 petroleum fuel storage and compressed natural gas fueling sites. Historically, maintenance of tanks has been deferred, resulting in substantial fines from the New York State Department of Environmental Conservation for environmental regulation violations. There is a backlog of corrective projects costing more than \$3 million. The goal for petroleum bulk storage is to replace tanks before they fail and to remediate sites previously contaminated by leaking fuel tanks. The goal also includes reducing equipment failure occurrences and durations.

Mobility -- This assessment continues our current level of mobility investment from the highway program through the 20 year period. The net result of these mobility investments would be to slow the growth of congestion related delay by approximately 10 percent, saving 500,000 person hours of delay per year.

The highway program mobility components would encompass operational improvements including projects such as signal timing, HELP truck deployment, ride sharing programs, and park and ride lots. In addition highway mobility improvements include turning lanes at intersections, interchange ramp improvements and added highway lanes. The investment required to continue these strategies is estimated at \$2.7 billion. This highway mobility effort

would be supplemented by transit and rail capital investments described elsewhere in this presentation.

Additional multimodal investments would be required to make significant progress toward further reductions in the growth of congestion. New strategies that integrate transit, rail freight and improved passenger rail will need to be employed to divert passenger and freight travel from congested highways.

The amount the Department will need to achieve its goals for these other highway assets over the next 20 years is \$21.6 billion.

Transit Investment Goals and Needs

An efficient, safe and environmentally sound public transit system is essential to moving people in both urban and more rural areas. It is a fundamental part of the State's multimodal transportation infrastructure. The State's extensive support for public transit provides mobility alternatives for citizens in the State's urban areas which are essential to the health of the economy of New York. In the State's small towns and villages, public transit also provides mobility choices for elderly residents and others who may otherwise be without access to employment, education, medical, social service, and other necessary services. The availability of convenient, reliable, and safe transit service is a basic part of supporting Smart Growth communities.

In order to preserve and enhance the State's public transit network, it is essential that the public transit fleet return to a state-of-good-repair and expand to accommodate increased ridership.

The magnitude of transit capital needs will depend in large part on ridership growth and on policy decisions regarding the desired physical condition and service performance for systems other than the MTA. NYSDOT estimates that \$6.5 billion through 2030 will be required from Federal, State and local governments to address state-of-good-repair and normal replacement needs as well as to expand service to accommodate ridership growth. To address this growth in ridership, investments are also required to replace buses as they meet their Federally-rated useful-life of 12 years and increase the size of the current fleet by 30 percent. In addition to address energy and environmental standards, this investment level will replace 40 percent of the current fleet with hybrid-electric and other low/zero emissions (with the balance of the fleet being replaced with clean-diesel).

The amount the Department will need to reach its capital goals for Public Transit over the next 20 years is \$6.5 billion.

Rail & Port Investment Goals and Needs

The freight and passenger rail system consists of 3,532 railroad route miles statewide. Rail infrastructure investments are needed to preserve safe and reliable operations and provide sufficient capacity to offer a cost-effective alternative to moving freight by truck. Increased rail investments are needed to safely accommodate hazardous material movements; meet rail

capacity needs for projected growth in freight; accommodate changes in rail car size and weight; improve on-time performance for Amtrak passenger services; and facilitate economic development opportunities.

Over the last 3 decades there has been limited public investment in the rail infrastructure, a steady reduction in rail track miles, a doubling in ton miles of rail freight carried since 1980, and the constant pressure to increase passenger capacity and reliability on the same lines. According to AASHTO's Bottom Line Freight Report, total freight demand is anticipated to grow by 67 percent by 2020 and the Association of American Railroads (AAR) recently reported that rail freight traffic is estimated to double in the next 30 years. Public funding for freight rail has been limited over the last 30 years, although private railroads spend over 18 percent of gross income on capital infrastructure investments while the average industry spends only 3 percent. Failure to find public private investment strategies to enhance rail freight capacity will add additional burdens to demands on highways.

The demand for intercity passenger rail is growing across the country. In NY, service on corridors such as the Empire between Albany, NY and NYC can offer a fuel efficient option for business travelers, tourists, and commuters. Recent research by the Oak Ridge National Laboratory (Energy Data Book) concluded that intercity rail was 17 percent more energy efficient than automobiles. Intercity passenger rail also offers an important alternative to airport congestion, especially downstate. Approximately 20 percent of the total traffic at New York's three major airports now goes to other points in the Northeast. Moving this traffic to rail would open capacity to serve flights from other locations. However, like freight rail infrastructure needs, intercity passenger rail can only meet the goal of providing a reliable and efficient choice if adequate capital is available and Federal funding for this purpose has been consistently constrained.

The freight rail goals are to address the expected freight growth in the next twenty years and increase our freight rail capacity to meet that demand. Additionally, our goal is to initiate a program for the targeted replacement of track and ties across the State. In at least one instance such safety improvements resulted in derailments going from an average of 37 per year down to zero (0) per year after the project. We look to mirror these results across the State.

The passenger rail goals include improving reliability and ridership and long term travel time reductions. Over the next 20 years the goal is to double ridership between Albany and New York City. The improvement of On Time Performance (OTP) to at least 85 percent and improved travel time will offer an automobile competitive option.

The amount the Department will need to meet its goals for Rail & Ports over the next 20 years is \$5.2 billion

Aviation Investment Goals and Needs

Aviation investment needs include commercial service airports in the major upstate cities and public use general aviation airports statewide, but do not include PANYNJ airports.

New York State currently provides matching grants to airport sponsors to cover one half of the non-Federal share of FAA Airport Improvement Program (AIP) grants. FAA provides 95 percent capital project funding to the local airport owner for selected projects in the Airport Capital Improvement Plans (ACIP). FAA's current level of AIP funding requires it to direct the funds only to its highest priority airport safety projects. The needed State investment is predicated upon the assumption that FAA funding levels will remain relatively constant while capital project needs will expand significantly due to aging infrastructure and new demand, calling for more investment by the State.

Because of the crucial role aviation plays in attracting job generators and supporting growth, the preservation and enhancement of airport assets should be an important part of the State's economic development strategy, both upstate and downstate. State investments in commercial and general aviation airports will continue to leverage Federal funding needed to maintain the system in a state of good repair. Greater investment will be needed to rehabilitate and replace key components of airports such as runways, pavement, terminals and hangars. Based on analysis of FAA-approved documents – such as Airport Capital Improvement Plans, Airport Master Plans and Airport Layout Plans – the Department has estimated that the total needs for the 20-year period between 2010 and 2030 to be \$4.3 billion. This investment will be necessary to preserve the system and allow airports to respond to increased demand for passenger, cargo, and general aviation services.

The amount the Department will need to support its Aviation goals over the next 20 years is \$4.3 billion.

Local Capital Aid Programs

The State provides funding to assist local governments in maintaining and improving local highway infrastructure through the Consolidated Highway Improvement Program (CHIPS) and the Marchiselli program (which provides State matching funds for local Federal aid projects). In addition, the current capital program provides funding for certain other local projects. While this needs analysis did not attempt to estimate the total investment requirement for local highways over the next 20 years, clearly the local highway system suffers from many of the same problems as described above for the State system. The CHIPS and Marchiselli programs will require increased investment in the future, in combination with increased investment from local governments, in order to address local highway needs.

The minimum amount the Department will need for local highway programs over the next 20 years is \$8.6 billion

NYSDOT Other

This category includes all other investments that are necessary to deliver an effective transportation capital program including bridge inspection, emergency repairs, capital program management and other miscellaneous program expenses.

The amount the Department will need to meet its goals for capital program management and other expenses over the next 20 years is \$4.5 billion

Major Transportation Projects

Beyond maintaining the existing infrastructure, there is also a need to provide additional transportation facilities and services to allow the State to grow and to solve problems that have existed for too long. There are a number of major capital projects that add strategic capacity to the transportation system or solve a major transportation problem. These projects exist across the State; some are in design, but most are still in the early planning process. Examples of major projects include the Tappan Zee Bridge/I-287 Corridor, Peace Bridge expansion, completion of I-86 across the Southern Tier and Route 219 in western New York, and improved intercity passenger rail service in the Empire Corridor. Other major projects that address other problems now under study include rebuilding the Gowanus Expressway in Brooklyn and replacing the Kosciusko Bridge.

The exact cost and timing of each of these projects is not certain at this time, but many are likely to advance to construction over the next 20 year period, and several within the next 5 years. The need for financing these expensive projects and potentially others developed through the State/local transportation planning process must be considered in developing a transportation funding program for the future.

The amount the Department currently estimates it will need for such illustrative Major Projects over the next 20 years is \$50 billion.

Summary of Needs

20 Year Transportation Capital Needs (2007 \$ in billions)

Asset Class / Program Area	Investment Level
State Highway Bridges	\$ 17.4
Local Highway Bridges	\$ 13.2
State Pavements	\$ 40.0
Selected Local Pavements	\$ 3.9
Traffic & Safety	\$ 1.2
Mobility	\$ 2.7
Pedestrian / Bicycle / ADA	\$ 2.0
Drainage / ITS / Guide Rail / Rest Areas / Fleet & Facilities	\$ 15.7
Public Transit Capital	\$ 6.5
Freight Rail, Passenger Rail, and Ports	\$ 5.2
Aviation	\$ 4.3
Local Capital Aid	\$ 8.6
NYSDOT Other *	\$ 4.5
NYSDOT Capital Program Subtotal	\$ 125.2
Illustrative Major Projects	\$ 50.0
20 Year Total	\$ 175.2

* NYSDOT Other includes Capital Program Management, Bridge Inspection, Emergency Repairs, and Miscellaneous

The preliminary estimate of total transportation capital needs for the 20 year period from 2010 to 2029 is \$175 billion. These needs are reported in 2007 dollars and do not include any adjustments for inflation. As a comparison to existing investment levels, simply extending our current NYSDOT 5-year plan commitment levels through the 20 year period would result in an approximately \$75 billion investment. The more than doubling of our current investment that would be required to achieve the goals of this assessment will clearly challenge the capacity of Federal, State and local governments to keep pace. The Department is committed to working very closely with the Federal government, the Governor's Office, the Division of the Budget, the State Legislature, local governments and the State's Metropolitan Planning Organizations to devise a workable strategy and plan to address our future transportation needs.

Summary

Increasing future travel demand for freight and passengers, coupled with the current level of deteriorated infrastructure conditions, will require a substantial increase in transportation investment over the next 20 years. This investment is needed not only to maintain the transportation system in a good, serviceable condition, but also to accommodate growth to

support our economy. Investments will be required to replace assets or components at the end of their useful life as well as one time expenditures to correct critical deficiencies and overcome the current backlog of past deferred maintenance. Balanced investment is needed to allow the proper modal solution to be implemented. Strategic capacity expansion will also be needed.

The infrastructure needs are significant due to the deteriorated conditions caused by deferred maintenance and increasing demand on the transportation system. Allowing assets to deteriorate past their useful life is not an efficient investment strategy, as more financial resources will be required to rehabilitate the system at a later date. Maintaining our transportation infrastructure in a good, serviceable condition is vital, not only for securing the confidence and safety of the public, but also for enhancing economic growth in our communities.

Undertaking the new investment strategies described in this document will preserve the existing multimodal transportation system and avoid unnecessary growth in future costs. It will allow the transportation system to change to meet existing and future needs. Most importantly, future system condition improvements will provide a safe and reliable transportation system to keep New York competitive well into the future.