Reauthorization of Federal Highways and Transit Programs

What are the needs, and how to meet those needs

Testimony to the

U.S. House of Representatives

Committee on Transportation and Infrastructure

Subcommittee on Highways, Transit and Pipelines

by
Alan E. Pisarski

independent consultant

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Alan E. Pisarski 6501 Waterway Drive, Falls Church, Va. (703) 941-4257

Mr. Chairman, members of the Committee. It is has always been my great pleasure to appear before this Committee and an honor to have the opportunity to present my views. It is a responsibility that I take very seriously. The opinions expressed here are my own.

Let me begin this testimony by congratulating this committee's leadership on its judgment in endorsing a $50 billion highway and transit program in 2004 rising to $75 billion by 2009 and for identifying the fiscal modifications that can finance it.

Today I will be addressing the scale and scope of national highway investment needs as input to your reauthorization deliberations. My colleague, Mr. Arlee Reno, with whom I collaborated on the AASHTO Bottomline work, will address transit needs. I have in past testimony before this Committee referred to the DOT's Condition and Performance Report as this Committee's "operating manual" for the US highway and transit system. In this most recent cycle we have seen further progress toward a more comprehensive and technically sound analytical process. Congratulations are due to FHWA/FTA, AASHTO and the TRB for the work done in expanding and improving the highway investment technical process as evidenced in the new C&P and in AASHTO's Bottom Line reports. It is a process second to none in substance and breadth. This Committee is well served by these efforts to continuously bring new technology and more comprehensive analysis to bear on the process.

In preparing for the needs analyses, we identified, through the TRB, both short and longer term research needed to support the process, and the short-term research advancements we made paid off in a richer and sounder estimate of needs – not yet the perfect C&P that AASHTO Director John Horsley exhorted us to create – but getting there. We must now embark on the long term research needs identified in that process to assure that our needs estimating power in the future will be even stronger.

The present C&P report bears out my faith in that document's history and the process that produces it. Today I want to extend on the great work of the FHWA/FTA C&P and the AASHTO Bottom Line Report and focus on just four additional points that need recognition in your deliberations.

1. *The C&P and the Bottom Line documents estimates of needs are basically identical*
2. *While soundly based there are further needs than what appears in those summary numbers – safety, economic development, etc.*
3. *The existence of a major backlog that drives investment*
4. *Addressing the appropriate share between the fed program and state/local investments*

1. ***For your purposes you should consider the C&P and the Bottom Line document's estimates of needs to maintain and to improve the system as basically identical.***

The AASHTO Bottom Line estimate of needs is roughly 20% higher than that of the C&P, but recognizing that the FHWA value is an average annual figure for a 20 year program starting in the year 2000, it is clear that adjustment to reach the six year program starting in 2004, envisioned by the Bottom Line, explains the difference in the numbers [Other differences in method and estimated values are trivial]. So the committee can accept the AASHTO numbers as representing the correct adjusted values for the period 2004-2009 emanating originally from the C&P work. A further adjustment to bring these numbers forward for inflation would yield an estimated $100 billion to maintain and $136 billion to improve conditions for the total highway program.

NEEDS ESTIMATES (billions of dollars annually)

	FHWA	AASHTO	% Difference	Inflation To 2004
Maintain Conditions	75.9	92.0	21% more	100
Improve Conditions	106.9	125.6	17% more	136

The program's reaching something very close to the "Maintain" level, after decades of being well below that level, is cause for considerable relief it not celebration. This does not mean that we will have reached a steady state of the condition of the system. Even were we to reach the maintain level of funding, we would have to operate at that level for years to overcome present deficiencies and finally fill the gap between present and needed spending. There are years of accumulated backlog of needs that will have to be addressed. For example, since ISTEA the bridge program has received rising expenditures beyond that needed to simply maintain bridges at present condition levels; as a result the bridge backlog has actually declined almost 20% as the number of bridges defined as functionally obsolete or structurally deficient has been reduced. The American public is both safer and more efficient as a result. Present levels of spending on bridges should reduce the backlog in bridge needs to half of its present level by the end of a six year T-3.

2. ***While the investment needs given are soundly based, there are further needs than that appearing in those summary numbers including safety, broader economic benefits, etc.***

The analytical processes used to provide investment needs estimates is as sound as we currently can make it. There are recognized gaps however that we must work to improve. Some of these are very important and the Committee may wish to address them separately.

a. The main one of these is safety. The present process is inadequate regarding the ability to estimate safety-based investment needs. We are accustomed to using the statistic that about a third of accidents are road-related, suggesting that road investments can significantly address those accidents. When I asked European colleagues to corroborate this percentage they told me that that was the wrong question. The right question they said is what investments can we make in the road system to alleviate accidents and deaths no matter what their cause. They are of course right.

We must fully consider the potential life-saving and injury-preventing powers of roadway investments. We do not have the comprehensive set of analytical tools to make those assessments definitively at present. AASHTO recognized this and included in its Bottom Line the preliminary results of a TRB study, based on its Strategic Highway Safety Plan, that provided estimates of investment needs of approximately $3 billion dollars a year over the six year reauthorization period. I believe that AASHTO would agree with me that this is a minimum estimate. The final estimates from that excellent work will be closer to a range of from $4.5 – $5 billion per year.

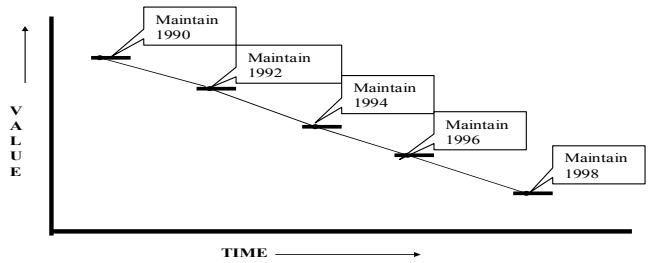
b. A key separate gap is the need to address fully the needs of the Interstate system. The 1999 C&P report put that need at more than $10 billion over a 10 year period just to maintain conditions. In order to address some of the gaps in our knowledge, I designed, and AASHTO sponsored TRB research identifying reinvestment needs to respond to obsolescence and insufficient capacity in major interchanges usually where two Interstates meet. This research among 12 representative states showed sharply rising spending on interchanges – from about 10% of spending in previous decades to expected spending that would rise to over 20% of total capital spending on Interstates; and in some states above 30%. This was estimated to add as much as $3 billion per year to overall estimates.

c. One serious gap in the analytical process is the adjustment of theoretical capacity values to adopt as normal the current behavior by the American public that has learned to drive faster closer together in congested conditions. The safety of this behavior has not changed just because of our willingness to risk it. But present engineering procedures now accept that 20% more throughput is possible than previously estimated. This has direct bearing on our estimates of our definition of potential congestion. Some of our "success" in dealing with congestion stems from this.

It is as if we had estimated that 100 people could fit into a bus and then found due to lack of vehicles that we saw that 115 and even 120 people sometimes crammed into the buses; and then we blessed this disaster by shifting the standard to 120 as the new base for judging adequacy of space on buses.

But its far more serious than that; the safety effects of assuming that more vehicles can traverse a lane in an hour at high speeds is a real threat. As a result we have artificially defined away part of the problem. Maybe if we can just get Americans to go even faster even closer together we can define away the rest of the problem as well.

THE DEATH SPIRAL !



d. Another way in which we have dumbed down the system relates to the scenario we employ called "maintain conditions." Each cycle of analysis shows that the system is worse – as it has over the last 20 years or so – so we end up with a new, less-effective system that becomes the basis for the new goal to "maintain." Thus our next investment cycle will have as a goal maintaining a system that is not as good as the last time we made the estimate. This has led to our goals declining over time – I call it the death spiral – eventually we will be down to a point where our goal meets our abilities. We need to recognize that and adopt goals that are absolute standards to which we can aspire, not, as at present, accept a goal that aspires to having things get worse slower. Not exactly the way to stirs men's blood. Further, as our economy grows, present levels of service will be seen as even more inadequate by future populations with higher values of time and higher values of goods to be moved.

e. For the first time the new analytical process recognizes investing in increased reliability as a benefit to the system. There are other benefits produced by the system investment we make that we do not now recognize in our benefit-cost trade-offs that need to be incorporated more fully. The most important of these is the long term economic benefit from highway investment that permits more efficient locations for factories and warehouses, better access to suppliers and customers. These effects generate extraordinary benefits that are not fully appreciated and are certainly not incorporated in our analyses.

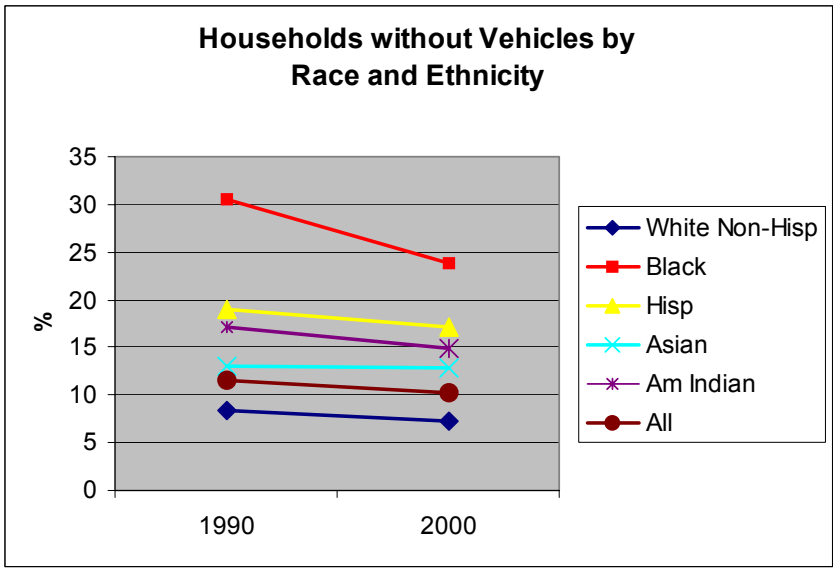
- Research has shown levels of return on the order of 16-17% from our investments just from the reordering of economic activities made possible.
- The Federal Reserve of Chicago in studies of the Midwestern economy showed that it was the very effective transportation and communications capabilities of the region that permitted it to overcome high labor costs and compete effectively in the world.
- Recent analyses have shown that highway investment has constituted upwards of 25% of all the productivity improvement enjoyed by the economy over the last decades.
- The World Bank has found that road development had higher payoffs than the average for all forms of investment made by the Bank throughout the world.

While in our present economic situation the job-generating power of highway construction investment is a very real consideration, the real pay-offs come from <u>after</u> the road is built

providing continuing economic reductions in costs, and improvements in access for passengers and goods.

Building and operating schools and hospitals creates jobs but we would never think of justifying education on those grounds. It is all about the very positive things that happens to the society after the school is built that matters. It is the same with the road system. Recent research has shown that public investment in highways stimulates new private investment in new plant and equipment.

As the value of time for both our citizens and our goods increases, the speed and control of highway activity will be even more central to our economy. I have defined c*ongestion as people with the economic means to act on their social and economic interests - getting in the way of other people with the means to act on theirs!* That will be even more true in the future than it is today. For example, the recent census shows extraordinary growth in African-American car ownership.



f. In our work we tend to emphasize the economic benefits of these investments; but there are immense social pay-offs as well. Increased access to health care, emergency medical services, access to broader housing and job opportunities, greater recreation and cultural opportunities, are immense sources of social interaction and cohesion. Does anyone seriously believe that without the access to low cost land provided by highways that we would have two-thirds of our households owning their own homes?

3. It is the existence of a major investment backlog that drives investment needs, which says that it is not just the needs dollar number it is all about timing as well!

One area that has not been treated as fully as it might is the challenge presented by the present investment "backlog." In the current C&P report the backlog of investment needs is estimated to be $272 billion, having grown over a 100 billion from the investment level of $166.7 billion since

the 1999 report, despite the fact that the bridge portion of the backlog has actually declined. The AASHTO value is at least that level and perhaps considerably higher.

> *The backlog concept perhaps needs some explaining.*
>
> *While most investment needs require the passage of time, either by the increase in traffic volumes over the years or just the actions of time and weather, The backlog is that level of investment that can be justified right now; without the further passage of time. In one sense, it is a measure of the adequacy of past investment.*
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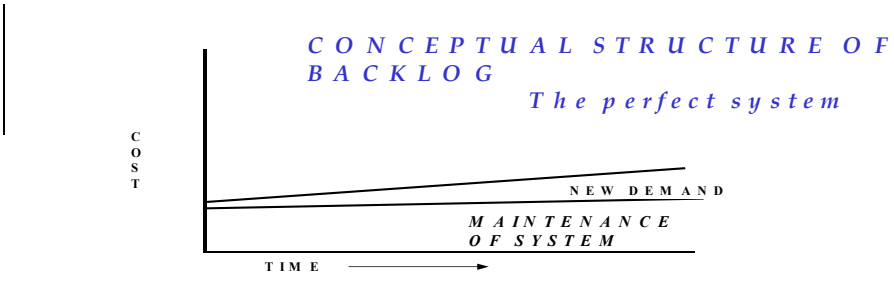
> *The backlog represents much more than simply a measure of past effort. It represents all of the benefits foregone, the lives lost, time wasted, fuel consumed, pollution generated that could have been reduced or eliminated by timely investment. If our investment program can be accelerated these backlog needs can be addressed and the benefits obtained immediately instead of some day in the future. While we cannot expect to fully draw down the entire backlog over the next cycle of reauthorization we should commit to a meaningful effort to at least make progress in reducing the backlog so that when we approach the next reauthorization cycle we will proudly have made a substantial down payment on the nation's backlog of needs.*

I am convinced that one of the most productive ways to address transportation-related pollution in America would be to improve free flow conditions by addressing the capacity backlog on our road system. The improvement in fuel economy would be enormous. TTI research suggests that almost 6 billion gallons of fuel would not be burned per year in congestion; that and the reduction in stop and go traffic would make the most significant contribution to air quality of any investment we could make.

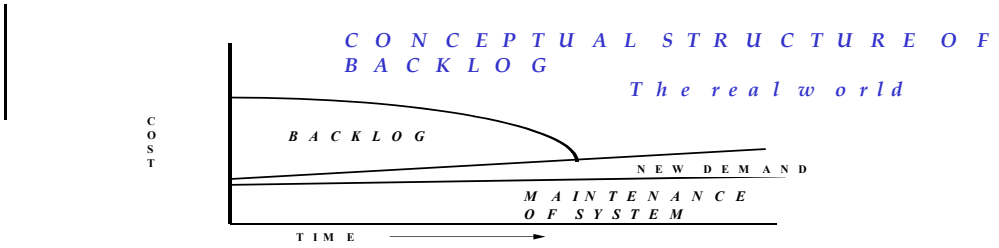
We can construe the program as follows:

The Perfect System

If the Highway system were in perfect condition today – both in terms of physical condition and performance – then future investment needs would consist of timely annual maintenance costs and the costs of expansion of the system to meet future needs as travel activity expanded. (see Figure – the perfect system) Most of us would agree that this would sound quite doable financially, with all costs to be borne by users.



But the present Highway system is not perfect. It has unmet needs in physical maintenance and in capacity to respond to past growth. The overlay of those investment needs can in fact burden spending levels and may appear to be more than we can afford at any given time. (see Figure – the present system)

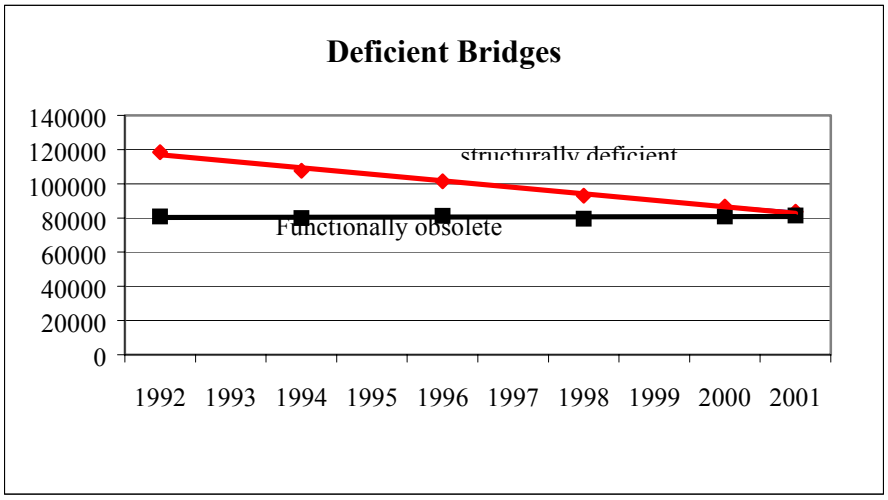


The C&P does not address reauthorization needs; The program funding levels derived from the C&P describe a program over a 20-year period not for the 6-year reauthorization time frame. The AASHTO approach shows investment requirements presented in the form of a fixed level per year over the 6-year period, based on a 20-year time frame.

If the same amount of funds to be spent over 20 years were to be made available to the computer models with no constraint on annual spending the model would spend a far greater share of the total in the first 6 years of the 20-year period than that permitted by an amount constrained to a fixed average annual rate. This is because the investment analysis would address backlog needs immediately in the 20-year cycle in order to keep the total 20-year program cost as low as possible. It would stop deteriorating conditions and introduce investments early that produce continuing future benefits and reduce future costs. Spending in this way would reduce overall costs, or said another way increase benefits for the same amount of funds.

An approach that recognizes this and addresses the backlog will bring a greater share of the 20-year program into the six year reauthorization period than the amount attained by using a 20-year annual average. In both the Maintain Conditions and Improved Conditions scenarios the backlog treatment that permits the model to invest as much as needed to assure the most efficient use of funds spends roughly 40% of the total 20-year program over the first six years in contrast to the nominal 30% under an average annual assumption. This represents on the order of a 33% increase in annual spending for the period. The proportion of total funds spent in the first six years is in effect a measure of the scale of the backlog and the rewards for addressing that backlog early.

The 1999 FHWA Condition and Performance Report placed the 1997 highway backlog at a minimum of approximately $167 billion, with 72% of that backlog in urban areas. While both the C&P and the AASHTO studies place the backlog at $100 billion more in highway investments, the bridge backlog, , which was reported to be $87 billion in 1997 had dropped to approximately $52 billion; the result of spending above the level needed to maintain bridges at current levels, that has reduced the outstanding backlog, particularly with regard to structural deficiencies; and also the result of new economic analysis tools that perform more stringent tests of economic viability. The safety and service benefits to the American public have been substantial.



When the investment analysis is conducted with an increase in funds to address the heavy backlog it produces the best measures of success of all approaches. The benefits of addressing the backlog early are huge:

Backlog Response Scenario

	2000	2004
MEASURE	Base Value	Growth Support
Avg. International Roughness Index	125	86
Avg. Speed	40.6	44.54
Total hours of Delay/1000 VMT	4.3	3.46
Total User Costs $/1000 Veh. Miles	$937	$877

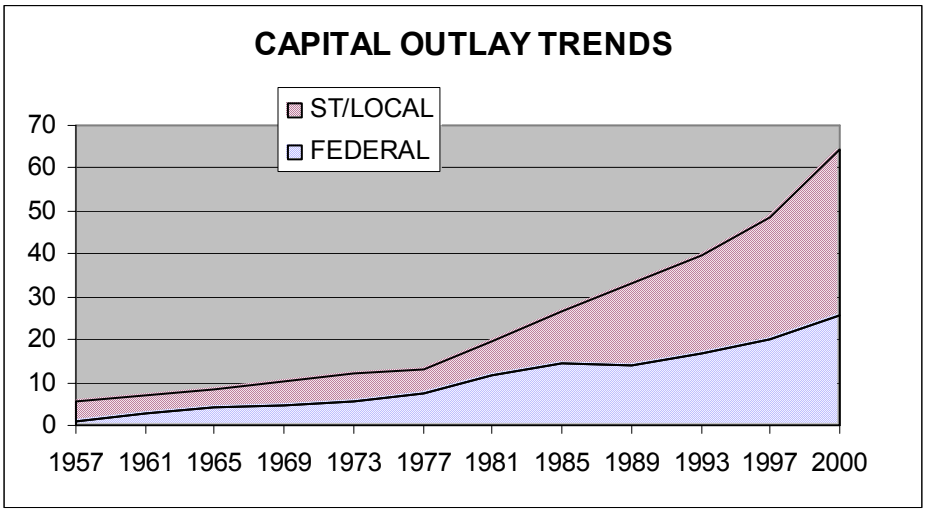
At this level of funding, the levels of success are extraordinary: pavement improves by almost a third; average speeds improve by 10%; and delay is reduced by 20%.

Most notable is a reduction in user costs of 6.5%; that level of savings equates to well over $200 billion a year in cost savings. Urban cost savings reach more than 10 cents per mile of travel.

On the order of $300-$400 billion in benefits are forgone in the reauthorization period by failing to invest at this level. Given these backlog levels of need we might say that the present program could almost absorb any level of spending the Committee could envision over the short term. The real upper level constraint on how fast we could make progress against the backlog would come from the skills and resources of industry and the negative effects of too rapid a scaling up of overall programs that would impact on construction costs and performance.

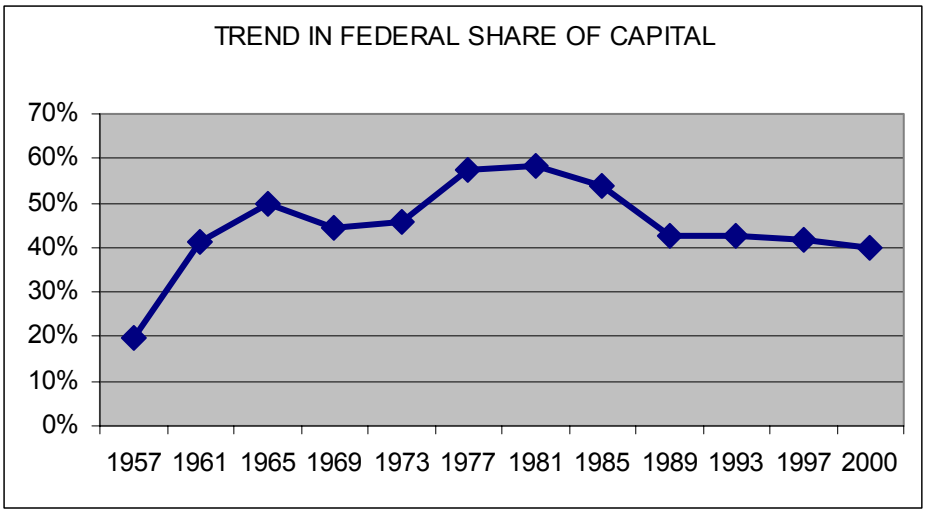
4. What is the appropriate share between the fed program and state/local investments

There is no better expression of the real partnership between state and local governments and the federal government than the fact that while federal expenditures for capital grew by 28% from 1997 to 2000, the federal share of all capital spending actually declined because state and local investment spending increased even faster (37%). Nothing makes the point better that this is not a program driven by the availability of federal funds than that. Overall federal funding has grown dramatically but has been outpaced by state and local funding (Capital Outlay Trends Figure)



The rise in federal funds brought the federal share of capital spending to just under 40%. Given that capital spending in recent years has risen back to about half of the total program this makes the federal program 40% of half the program.

This is inconsistent with the long term history of the program (Trends in Federal Share Figure). Since the start-up years of the program in 1956 the federal share had never dropped below 40% until just recently. Its typical pattern for thirty years was to be or well over 50 percent, or at least in the high 40 percent levels, peaking at 58.3% in 1981. The decline in share thereafter is in large part attributable to the start of transfers to the mass transit account in 1983. With the lower values seen in the 90's the typical value of the federal share has been in the range of 44-45%. I would propose that the federal share target should be half of the program's capital costs; which at present works out to 25% of the total program.



We have identified total investment needs levels, even at the AASHTO "maintain" level, of $100 billion, including some safety and an inflation adjustment. At that level it is straightforward to see what various percentages of federal sharing would require in terms of total federal program funding.

- The present share level of 40% would yield a program in the range of 40 billion.
- A federal share based on past average federal shares of 44% would work out to 44 billion.
- A goal of 50/50 sharing of capital investments with state and local governments would put the program at $50 billion. At that level we begin to draw down the backlog and obtain for the American public the benefits that are there to be had.

Closing thoughts:

A final thought on making it all happen. Many relatively small changes have been identified to expand revenues going into the program. The list is long and all are desirable, including specifically the gasohol adjustments and the attack on evasion. But the one I would single out for strongest support is the indexing of the fuel taxes. This would have relatively minor effect in the new reauthorization period, but in the long term it would be serve to guarantee the fiscal integrity of the program and permit us to begin to attack the backlog the American people deserve.

I would summarize our situation like this:

- The Congress made available a substantial increase in funding via TEA-21.
- The states have spent that money expeditiously and conscientiously with significant positive effect, demonstrating that the Congress's faith was well founded.
- The result has been a very substantial improvement in the physical condition of the system and a working down of the maintenance backlog, especially visible in the improvement in bridge conditions.
- It now remains for further expansion of funding to permit the attack on the performance of the system and seeing the immense capacity needs backlog meaningfully addressed.

America is a nation defined by transportation:

- Few nations have been challenged as greatly as we have been by "The Tyranny of Distance."

- No other nation has succeeded as we have in reducing the influence of distance on its economic future.

I believe in the continued great economic and social power of highway investment. Why? Because transportation is all about reducing the time and cost penalties of distance on our economic and social interactions. To the extent that nations succeed in that function they enable tremendous forces of economic opportunity, social cohesion and national unity.

Thank you very much for the opportunity to put my views before you. I would be delighted to respond to your questions.

Alan E. Pisarski