

Public Hearing on Transportation Funding Crisis

Friday, June 18, 2010

Gateway High School

Southwestern Pennsylvania Commission (SPC)

Commissioner Charlie Camp – SPC's Chairman

SPC Written Testimony on the Transportation Funding Crisis

Hello, I am Charlie Camp, Beaver County Commissioner and Chairman of the Southwestern Pennsylvania Commission. I am pleased to offer testimony today on behalf of my Commissioner colleagues and the SPC.

We recognize that the State TAC Transportation Funding Study from this May provides details on the extensive needs of roads, bridges and transit statewide and the growing backlog. Testimony by the region's PennDOT Districts, local governments, our transit authorities and other interested parties provide valuable local perspectives on transportation needs in the region.

Local roads are also a significant part of the crisis and need to be addressed on two levels. As noted in the TAC report, local road maintenance, which is funded through liquid fuels tax, is an important part of the system. Local government members of SPC own more major roads and bridges on the Federal Aid system than anywhere else in the state--all of which requires continuing maintenance.

Transit agencies also have a bridge maintenance problem similar to the PennDOT and locally-owned bridge problems. For example, the Port Authority of Allegheny County owns and maintains 80 bridges, many of which are major structures, and more than half of which are more than 50 years old.

Other programs, such as the State Rail Freight Assistance Program, that receive state transportation funds, also need to receive continued support. The rail system is integral to the southwestern Pennsylvania economy, moving large volumes of freight by rail, which lessens highway congestion and saves the roads from additional wear and tear.

As we all know, there's a funding gap. It shouldn't be a surprise to anyone. Past, present and future, the money that is being provided falls short of the overall needs using the current system of replacement. The backlog of deficiencies started in the 1960s and has continued to grow. Multiple attempts have been made to close the funding gap, but until the state or federal governments agree on sizable revenue increases, the backlog of deficiencies will continue to grow. Past revenue measures haven't measured up.

Transportation revenue has been static or declining for many years now, and is losing ground to inflation. Al Biehler, Pennsylvania's Secretary of Transportation, noted in a May 2010 newsletter that the Construction Bid Index increased by 80% from 2003 to 2008. Flat revenues eroded by inflation translate into about half the projects or maintenance work for the money that is being provided.

Current funding levels, on paper at least, have the capacity to adequately fund our preservation programs, the work that is needed to keep "good" roadways or bridges in good condition. Preservation work ensures that these facilities will safely reach their intended "old age". However, the next two most important funding priorities are not being met: to replace roads and bridges when they reach "old age" and fixing the accumulated backlog of deficient facilities. Significantly more solutions are required each year just to stay even with the aging and crumbling roads, bridges, buses and transit facilities. But the biggest need of all in terms of the amount of money required is now the backlog of deficient roads and

bridges – the ones that were patched instead of rebuilt because there wasn't enough money at the time.

SPC estimates using current replacement /repair methods show preservation needs for roads and bridges in the SPC region is about \$232 million annually. Rebuilding facilities as they wear out each year requires another \$276 million. To fix the backlog in twenty years requires another \$402 million a year, for a total of \$910 million. But, current spending averages about \$450 million each year in the TIP, which is only about half of the identified maintenance needs (excluding transit).

Attacking this accumulated maintenance burden with a budget that is short on resources compromises each of these three maintenance areas and leads to faulty outcomes. When preservation is short-changed, roads and bridges deteriorate sooner than their design life. Roads and bridges that are patched instead of replaced accumulate a growing backlog of deficient roads and bridges. The high cost of putting patches on patches, year after year, takes away from the money that could and should be used to address the basic problem. **State estimates for fixing the backlog now take the form of "reaching the national average" of "bad" bridges over a period of twenty years with current resources.**

Beyond the highly visible problems of road and bridge maintenance and transit operations and capital programs, the TAC report and the realities of the overall transportation system also draw attention to needs for new construction to address growing congestion like the Freedom Road Project, safety improvements like Route 28, local roads and bridges like Veterans Bridge in Beaver county, and traffic signal upgrades such as the Ohio River Boulevard , to name just a few of the additional areas that require increased transportation funding to achieve our vision of a system that supports the region's economy and the communities within it.

Overall, the number representing overall statewide transportation needs is enormous. The May 2010 TAC report update mentions \$3.5 billion per year. Because this is such a huge number, a series of smaller funding steps and changes to the current system are probably going to be required to reach the overall total.

The TAC report offers many revenue ideas, all of them useful in particular circumstances. From the report it appears that gas taxes and registration/license fees appear to be the only revenue sources that will produce sufficient revenues, that are fair in sharing the costs, and can generally be applied to the multiple areas of need. An effective solution will probably require a look at both of these sources. A local option tax may be a possible option for addressing the problem of purely local roads, bridges and transit but we cannot do anything alone. We need the state's leadership and help for such an extensive problem. We all know that most people don't distinguish who owns a particular road or bridge - they just want to know that they are being planned and maintained responsibly in the most cost efficient way possible.

Regardless what the state chooses to do, the report from the state TAC itself shows the need is extensive and urgent. The state may be the only government in a position to address a problem of this magnitude that has such widespread public impacts. A recent American Society of Civil Engineers report

shows that the transportation crisis affects all 50 states. We need to be mindful that the federal government hasn't done anything about revenues in twenty years. The burdensome federal regulations cause pointless delays while adding little or no value to many projects and/or their eco-systems. Lack of action at the federal level is forcing every state to begin to answer the same funding questions as Pennsylvania. Waiting for the federal government to act may just make the problem harder and more expensive to solve.

Because of political and economic realities, the state (or federal) government will probably need to act multiple times in steps before transportation needs can be adequately funded. Providing \$472 million a year in revenues, if the transportation needs are \$3.5 billion, is the equivalent of providing only 1.3 cents where a dime is needed. It may be that an increase of \$472 million a year is the best that is attainable at this time. If so, then it is clear that similar fund-raising efforts will have to be repeated over multiple years with regular discipline.

We recognize that hand in hand with raising revenues there is a need to change the current system to one that uses more common sense and local trust than triple federal review and oversight. Monitoring and grading systems need to be developed and used to demonstrate accountability for the funding being provided. The collection, distribution and use of this money must be transparent to the taxpayer so that they can see what their dollars are buying. We need to show the public that the projects being built are the best projects - and that projects are moving efficiently from planning to construction, demonstrating on an ongoing basis that maintenance and replacement programs are using best practices and are cost effective. In short, we need to add performance measurements that show the money is being well spent.

We want to recognize PennDOT for their efforts on the administrative processes that guide the programs: Focusing on Maintenance, Building Asset Management Tools, Increasing Project Accountability, Speedier Environmental Reviews (Linking Planning and NEPA), Improved Contract Management, Innovative Maintenance Practices, Project Right-sizing and many others. These behind-the-scenes improvements are less visible than the projects themselves, but are just as important in maintaining appropriate accountability for the vast sums of money that are needed. PennDOT and the regional planning organizations such as SPC have made a good start, but more must be done.

SPC thanks and recognizes the Commonwealth for its ongoing work in highlighting these transportation issues.

SPC also joins with the STC and PennDOT in bringing this serious problem to the attention of the public and other local elected officials. We value their input in a public discussion of possible solutions. We recognize that this discussion will be extensive and complicated, but we are committing ourselves to work together with you over the long haul to resolve these issues.

REPLACING COUNTY BRIDGES WITH A SPAN OF LESS THAN 20'
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Replacing county bridges that have a deck span of less than 20' costs too much money and takes too long to complete by the current system in place. The status quo system in place can take decades; it over engineers and over builds bridges that don't need that amount of attention. Many of these bridges are in rural areas that have less than 70 cars per day. The owners of these bridges may be the state, counties, boroughs, or townships. With modern construction products and design-build contracting, bridges could be replaced in record speed and at a lower cost compared to the current system.

Beaver County, Pennsylvania has 60 active bridges. I will be referring to one recently replaced bridge, J C. Aten Bridge number 31, as an example of the current system of replacement. These bridge replacement projects followed PennDOT guidelines and were approved and recommended by PennDOT each step of the way. Beaver County is typical of many counties in the state and nation. It has a need for improved infrastructure competing with funding for social services and economic development.

Many of the bridge replacement projects are entirely funded with federal and state dollars. While counties welcome the money there are many strings attached before the money can be spent. The review process can be drawn out over years and even into decades. Design and construction has to be approved by both higher branches of government. The federal and state departments of transportation are resistant to innovative new construction products like precast concrete products that snap together in place a wall or bridge like Lego toys. Contracting procedures which fast track construction such as design-build are well established and accepted in private industry is only now beginning to be used by government on a limited basis. Currently replacements come slow and are expensive.

Pennsylvania has the largest number of structurally deficient bridges in the nation around 6,000 despite a record level of investment since 2003(PennDOT). The number of structurally deficient bridges has actually grown recently despite record bridge rehab and replacement of bridges; a large number are becoming unsafe at the same time as the average age is 50 years old. The consequences are that in a time when the competition for tax dollars is high, construction products prices are at record level, previously unheard of needs for international terrorist security, and social spending needs growing at a fast rate; infrastructure must be undertaken with a more for less approach. When small rural bridges can be built just as safe and structurally just as sound for half the price as the current system of building, this cannot be overlooked. This paper will attempt to show that by changing current bridge replacement methods and instead using culvert pipe, precast concrete and design-build contracting could save money and expedite the design, construction and completion. My goals in this policy paper are to suggest proposals to create efficiencies and hasten the period to replace such bridges.



J. C. Aten Bridge

CURRENT REPLACEMENT POLICY

The current system of bridge replacement is more suited for extremely large bridge construction projects where multiple millions of dollars are to be spent and various contractors are needed to deal with complex issues. In situations like these, design hurdles alone could be numerous such as linkage to a system of existing highways, traffic flow and safety, railroad crossings, utilities in the project boundaries, navigational concerns, demolition of an existing bridge and lead paint containment, right of way acquisitions, archeological and environmental impacts. Construction issues can be complex too. However, the scope of this paper is dealing with small bridge replacement projects where a typical bridge is of a short height above a stream, two lanes in width (often replacing a 1&1/2 lane bridge), and a span of less than 20' between the piers. Most bridges are located in rural settings and get less than 70 cars per day of traffic. Today they may be labeled as structurally deficient or unsafe due to deterioration and outdated design features. Repairs made to a bridge in this condition typically are cost ineffective due to the scope of work needed and the labor costs required to have them comply with Federal Highway Administration standards. They are usually over 70 years old and were paid for originally by the county that owns them. Many county bridges of this condition are eligible for replacement using federal and state dollars in an 80% 20% ratio contingent upon money being available.

The current replacement process usually involves the recipient county to begin by getting bid proposals from engineering companies to design, specify, and oversee the replacement construction of the new bridge. After an engineering company is chosen by the county who will own the completed bridge, the engineers start with measurements, studies, and recommendations. This is to be sent for review and approval to the state department of transportation in order to comply with the federal and state bridge guidelines. After making modifications, addressing department of transportation comments and corrections it can be put out to bid for construction. This beginning of the replacement process can be an onerous period that can take decades per bridge. Problems that must be overcome are constant changes in Federal and state highway/bridge safety standards and untrained personnel on behalf of the county due to the infrequency of bridge replacements. Typically the state does not prioritize these smaller projects and they become lost orphans. Also, an ill-defined and unevenly applied environmental and archeological review processes make for ambiguous standards. The department of

transportation employees can be understaffed, undertrained, and lack coordination in the review processes resulting in custom-designed and over-built replacement bridges that are very cost ineffective for a very low volume traffic rural bridge and take too long to complete and waste precious resources.

I want to show an example of how costs for the current system of replacement are much higher than some of the policy proposals I am presenting by focusing on a recently built Beaver County replacement bridge called J.C. Aten Bridge #31 in Hanover Township, Pennsylvania. It began with an Act of the Pennsylvania state legislature in 1982. Act number 26 was to fund county bridge replacements at 100% cost to the state. J. C. Aten Bridge was approved for funding in subsequent years after the act. The county of Beaver awarded the engineering design contract to Mazza Engineers of Center Township, Pa in 1996 for a contract of \$76,912.32. They began the design work for the 17' long bridge. Years of submittal, review, comment, correction, resubmittal, comment and correction went on between Mazza Engineers and PennDOT District 11. When final design was approved and the project put out to bid and award to Jet Excavating Company in Oct. 2002 for a contract of \$266,022.62 (BC).

POLICY OPTION 1 DESIGN-BUILD CONTRACTING

Build-design is a concept of construction bidding that is of ancient origin. It is said to be the oldest known procurement concept known to man. Thousands of years ago the "master builder" was responsible for both design and construction. The world's oldest building code (the code of Hammurabi, the King of Babylonia) was written approximately 2200 BC, and literally promulgated an eye for an eye. The master builder just could not afford to make a mistake in either design or construction. The evidence of endurance and reliability is the fact that some of those ancient buildings are still standing today and admired by mankind. It was not until the Renaissance did design and construction separate. Design became a professional occupation (architects and engineers), while the actual construction was the domain of craftsmen and businessmen (Grobler 2002).

Design-build can lead to shorter project duration, reduction in cost, enhanced constructability of the design, better relations and fewer disputes and claims. The concept has the advantage of single-point of responsibility (ASCE). This is a much improved way to replace small county bridges. I have seen too many times where an engineer's outdated drawings or has designed poor construction plans that required redesign and then the wait for approval from PennDOT; the changes that could take up to a year. The cost of delays are inflating eroding project dollars, a decrease in the value of a project and unsafe bridges being used or detours lasting longer than necessary. This single-point design-build has profit incentives and knowhow to make a project work, be delivered on time, and keep the cost to a minimum.

Some design-builds are turnkey systems where the financing is done by the contractor and the owner takes over the payment when the project is finished in construction, sometimes as a lease to own project. This too can move a project along and minimize costs as contractors can find lowest cost financing and are not restricted by government bidding procedures.

The downside of design-build is that it is too expensive for a contractor to bid on a project competitively. Subsequently, owners of the project can't get a true cost estimate from a design builder until they are fairly well into the project and have sunk costs which are due to the builder and make it difficult to back out once the project is underway. Design-builders are incentivized to make as much profit as possible on a project and therefore a level of trust must be established before entering into a contract and clear scope of the project must be established (Ritter).



POLICY OPTION TWO

CULVERT PIPE AND PRECAST CONCRETE

Today there are many new bridge products that are made in factories and shipped to the new bridge site and can be assembled in days. These prefabricated technologies bring the cost savings of manufacturing in a controlled environment and work well with mobile heavy equipment that can match the work of crews of men in a fraction of the time they would need. These products are built with high testing and manufacturing standards. They can be custom designed for individual projects or come in standard sizes that bring the price benefits of economies of scale (Hybrid).

Manufacturers have borne the cost of the engineering and testing to meet federal and state highway and safety standards. Applications of these bridge factory-made products can be a perfect fit for many small county bridge replacement projects. Then cost and time savings can be transferred into more replacement projects to bring rural equity and help attack the major bridge replacement that needs to take place in Pennsylvania.

Culvert pipe made from steel or aluminum is faster and easier to install than traditional cast-in-place concrete. There are no forms to set or remove. No need for laborers to spend weeks wiring reinforcement steel bars to fortify the concrete. They are light in weight and corrosion resistant. Job site unloading is lower in cost due to the lighter weight and fewer products. Assembly costs are lower as the pipe is usually one piece. In the past engineers were hampered by the limitations of shipping large culvert pipes to job sites; today arches can arrive to the bridge replacement location unassembled. They are then bolted together to form a full round pipe, pipe-arch, ellipse, arch, and underpass

structures (ASCE). Public traveler's detours and unsafe conditions are minimized due to the speed in completion of the culvert pipe.

AVERAGE TOTAL COST PER BRIDGE	CURRENT SYSTEM (J. C. Aten) Actual	DESIGN-BUILD (Proposed)	CULVERT PIPE AND PRECAST CONCRETE (Bridgetek) Actual bids est. const. data
RANKING	WORST	INTERMEDIATE	BEST
COST	\$342,934.00 (actual)		\$205,760.00 (est.)
ENGINEERING	Worst \$46,000 (design only)	Intermediate Savings on time Incentive based for fast results (L. Holt, Baker Eng.)	Best included in product price
MATERIAL	Worst \$141,000	Intermediate Large quantity buyer discounts	Best \$82,700 (BRIDGETEK)actual))
CONSTRUCTION	Worst \$90,000	Intermediate Designer/builder team know efficiencies	Best \$40,000 (est.) (Martino)
AVERAGE TIME TO COMPLETE			
APPROVAL AND DESIGN	Worst 7 years	Unknown Should improve Profit driven to get results	Unknown/Best Product already approved by Am. Soc. Civil Eng. little review needs
CONSTRUCTION	Worst 1 to 2 months	Intermediate Profit driven to get results	Best 2 to 3 weeks (est.)
EQUITY	Worst Infrastructure money is idle, devalued and safety is delayed	Intermediate Results could be derived sooner some abuse can occur	Best Fast rebuilds Rural community gets safe bridges
FEASIBILITY	Intermediate Current system is status quo Few formal complaints	Intermediate Represents new approach; Change is slow to the bureaucracy	Best Easy solution To stretching transportation dollars

COMPARISON OF POLICY OPTIONS

Comparing the three policies it is easy to see the two proposed policies represent a more effective way of replacing small bridges. They are faster in design, quicker to construct and save from 30 to 50% of the entire cost for a new bridge. Factory made bridge products like precast concrete and aluminum culvert pipe could have saved 40% of the engineering cost on the J.C. Aten Bridge. The cost of materials to build the J.C. Aten Bridge would have been 40% less as confirmed by actual precast concrete bid documentation and an independent bridge contractor (Martino). Construction too, would have had a similar reduction. My contention is confirmed by comparing the contracts for the J.C. Aten Bridge and then comparing them to an actual bid for the same project. Precast and culvert pipe products will make bridge replacement dollars go twice as far. It is a no-brainer; the products are approved by the American Society of Civil Engineers and have been in use throughout the world for decades of use.

Design-build is also worth trying as it has a well accepted and successful track record of effective performance (Partnering). It features a sole source of responsibility for all aspects of design and construction for projects that is a great match for small county bridge replacement projects. The approval of design time also could be decreased due to the design-build contractor having profit incentive to expedite approval time which does not exist in the current independent engineer system. Its downside is that it needs trust between the parties as both are spending money to build a solution. The current system due to past abuses unrelated to design-builders, is one that has to measure apples to apples in bidding to attempt get the lowest price.

This obstacle is one that will be difficult for PennDOT bureaucrats to risk their careers in order to save money for the state. There are no incentives in place for PennDOT employees to expedite projects or to save money on them. But, that is part of the problem between the two systems; design-builders have profit motives to create efficiencies to save cost and create profit; government employees have no such incentives only job promotion to increase their pay rate. It is for that reason that I think the most politically feasible policy to implement is the more extensive use of precast concrete and culvert pipe products in replacement bridges of small size.

PLANS FOR PROMOTING ADOPTION OF RECOMMENDATIONS

The changes to the current system I have written of need to be seen by top level PennDOT and state government officials in order for them to become aware of the need for change and a relatively simple solution. I have had the pleasure of serving the public for 10 years as a county commissioner, the Beaver County Bridge Chairman, and the Southwest Pennsylvania Commission (the region's transportation planning organization) as an executive member and now as its Chair. I have replaced 13 county bridges (and have 4 more under construction) some of which fit the small span category and have used the type of design and construction current system methods I propose to change. I will have the staff at SPC review my policy paper along with some recognized experts from the American Society of Highway Engineers (of which I am a member) to comment on my proposals feasibility. Then I would seek support from key influential county commissioners who have also experienced the inefficiencies of replacing small county bridges to endorse my proposal. Then, I intend to ask the Secretary of Transportation of Pennsylvania for the honor of an appointment to give him my policy paper and to brief

him on my findings. I have spoken to the Secretary in the past of my suspicions and possible solutions. In this dire time of revenue shortages and infrastructure needs, I think I will be granted an audience and given serious consideration to my policy proposal by top decision makers in the Pennsylvania Department of Transportation.

CONCLUSION

One of our country's greatest challenges is to repair and replace aging, unsafe infrastructure. Doing more with less has to be a priority due growing federal and state deficits and the increasing list of needs of communities. President-Elect Barak Obama has stated recently he plans to implement an infrastructure economic stimulation program. He also has stated he wants the money used by individual states in the year it is given or it would revert back to Washington; a use it or lose it proposition. This makes my proposal on simplifying the design and construction of these small rural, but vital to the user, bridges in a more common sense and effective way. Social justice and equity would be served if rural communities got some of the jump-start infrastructure repair dollars and my proposed bridges plans would be a vehicle to serve those rural communities. Construction on these projects is done using building trades skilled labor rates that are set by Federal pay standards; this behooves getting the project done as soon as possible because the pay rates are high and increase every year. Compounding the labor cost is building materials inflationary costs. Many of these bridge projects have a cost allocated to them for construction when they first go into the planning process and by the time they go into construction, inflation can make the total cost double or more; further jeopardizing other highway improvement projects.

Building bridges is as old as history. The technology has changed in many ways, but in many ways it has stayed the same; a set of piers and a span to rest on them. Let's keep it simple and get things done.

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