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February 8, 2017

Secretary Christy Hall
South Carolina Department of Transportation
955 Park Street
Columbia, SC 29201

Dear Secretary Hall,

The Strategic Planning Committee of the South Carolina Transportation Infrastructure Bank continues to refine its investment strategy in light of the Bank's existing and anticipated resources, new parameters imposed by Act 275, and 2016 recommendations made by the Legislative Audit Commission. As a steward of taxpayer money, the Bank aims to create value for its shareholders – all South Carolina citizens.

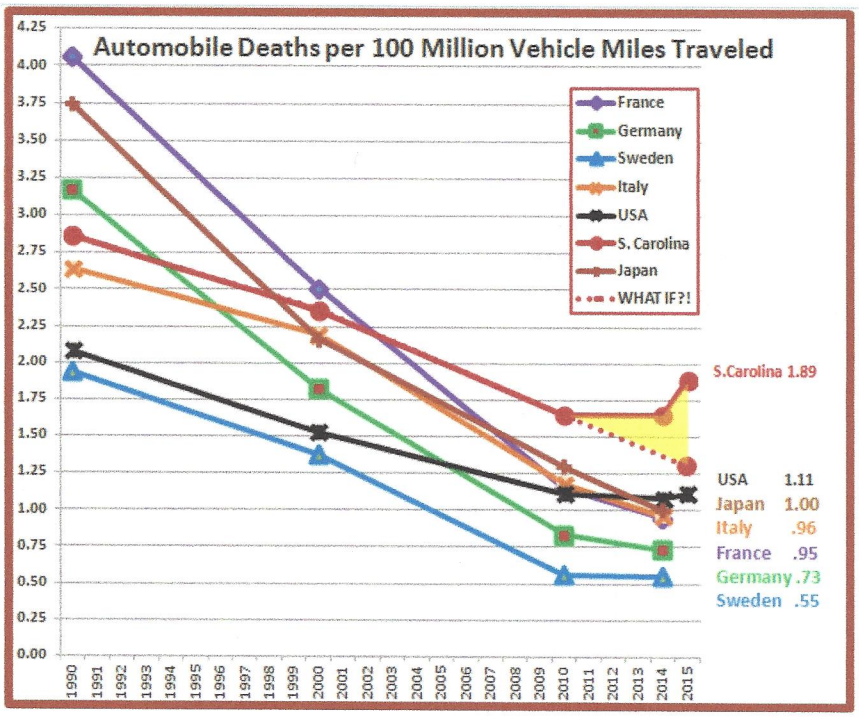
Among items studied as part of developing the Bank's investment strategy is the SCDOT's own *2015-2017 Strategic Plan*, which lists as its #1 Goal to "Improve Safety." In this regard, the Department's top objective is to "reduce the number of fatalities and serious injuries on the state highway system" by incorporating a strategy to "develop, implement and manage a ***data-driven*** highway safety program."

Your recent presentation - *Rural Road Safety Program* – is in line with SCDOT's Strategic Plan. Candidly acknowledging that the Department's Roads "are the deadliest in the nation" cannot have been an easy admission to make. Nevertheless, it is an important reality to face. It is also a testament to your constructive leadership. In my experience, awareness of a problem is a necessary first step in being able to respond thoughtfully to a problem.

Slide 4 of *Rural Road Safety Program* asserts "SC's fatality rate is the highest in the Nation. Georgia and NC are closer to the national average, but SC is 53% above the national average. I understand there are numerous fatality rate metrics, such as the number of deaths per 100,000 population, the number of deaths per automobile registration, and the number of deaths per mile of road. Can you tell me which rate Slide 4 references?

As established by the legislature 20 years ago, the corporate purpose of the Infrastructure Bank includes providing assistance to government units for improving transportation facilities necessary for public purposes including economic development. Like "general welfare" and "quality of life", "economic development" is an elusive term that different groups will define in different ways. Our aim is to invest taxpayer resources in a manner that yields a positive return on investment for its shareholders. "Improving transportation facilities" could well mean saving South Carolina lives, and the tremendous costs associated with injury and property damage. A return on investment worthy of pursuit.

Therefore, in support of your Department's goal and data-driven strategy, the Bank's Strategic Planning Committee has been studying SCDOT road inventory, our State's non-SCDOT public road inventory, and corresponding safety statistics of those roads. For example, the graph below shows the rate of automobile deaths per 100 million vehicle miles traveled (VMT) between 1990 and 2015 in South Carolina, the United States, and five foreign countries.



The five foreign countries shown in the graph at left were selected because they are the home bases for automotive-related companies with significant investments in South Carolina.

For example, the global headquarters for Bridgestone Tires is in Japan. The home country of Trelleborg Wheel Systems is in Italy. Michelin is home based in France. Germany is the international headquarters of Bosch, BMW, Continental Tire, and Mercedes Benz. And Sweden, the champion of safe roads, is home to Volvo.

A few things worth pointing out:

1. South Carolina's death rate per 100 million VMT is 70% higher than the US average. It is 160% higher than that of Germany, and 244% higher than that of Sweden.
2. From 1990 to 2010 remarkable progress was made in reducing South Carolina's fatality rate. Over this 20-year period the rate dropped 42% from 2.86 to 1.65 deaths per 100 million VMT. It then flatlined through 2014 before jumping back to 1.89 in 2015. Had South Carolina sustained the same trajectory of improvement between 2000 and 2010, its rate would have followed the dotted red line to 1.3 deaths per 100 million VMT - 30% lower than the current rate. 687 lives might have been saved!
3. In 1990, France and Japan had higher death rates than South Carolina, and that of Italy's was comparable to our own. As late as 2000, death rates in Japan and Italy were comparable to that of South Carolina, with France's still higher. But since that time, those countries have been able to lower their rates to less than or equal to 1 Death per 100 million VMT.
4. Over the 25-year period between 1990-2014, Germany achieved the heroic feat of reducing its Deaths per 100 million VMT rate from 3.17 to .73. Meanwhile, Sweden, which in 1990 had a rate near South Carolina's 1.89, had by 2015 reduced this rate to .55!

How did these countries achieve such dramatic improvement? Much of it can be attributed to auto manufacturers incorporating safety devices like air bags into their products. But road design also had a part to play. For example, an article entitled *Why Sweden has the World's Safest Roads* cited a policy to "prioritize safety over speed," and quoted government safety strategist Matts-Åke Belin as saying "We are going much more for engineering than enforcement."

In addition to contributing know-how for building high quality and safe automotive products, perhaps our foreign friends can contribute to our knowledge base for constructing high quality and safe transportation infrastructure.

Drilling down further, of the 76,250 centerline miles of public roads in South Carolina, 41,377, or 54% of the total, are in the SCDOT system. In contrast the average percentage of centerline miles in DOT systems for the 11 southern states is 31%. The average road mileage percentage in DOTs for all 50 states is 23%, less than half of SCDOT's 54%.

SCDOT's 54% (41,377 miles) of roads handle 95% of the total daily VMT in South Carolina, meaning the 46% (34,872 miles) of non-SCDOT public roads only handle 5% of the total daily VMT. In 2015, a death rate per 100 million VMT of 1.89 was recorded for SCDOT's roads, slightly below the 1.92 rate recorded for non-SCDOT roads.

However, SCDOT's slightly lower death rate is entirely due to the fact that our 851 miles of Interstate, which handled 29% of the total daily miles traveled on SC roads in 2015, are the safest of any road category. Leaving Interstates out of the equation, SCDOT roads are 23% more dangerous than those in the State's county and municipal systems. The death rate on SCDOT Secondary roads is 2.83, a full ***47% more dangerous*** than that of roads in local systems.

Sticking with the deaths per VMT measurement, Edgefield, Saluda, and York Counties were the safest in 2015, and Chesterfield, Darlington, and Horry were the most dangerous. Of the three most populous counties in South Carolina, Greenville, Richland, and Charleston respectively, Richland has consistently had the safest roads over the last ten years with a death per VMT rate closer to the national average.

The State System

System	Centerline Miles	Lane Miles	DVMT	
Interstate	851	3,795	41,186,787	30%
Non-Interstate NHS	2,747	9,281	35,306,967	26%
Non-NHS Primary	6,764	14,843	27,215,218	20%
Federal Aid Secondary[1]	10,370	21,286	22,004,945	17%
Non-Federal Aid Secondary	20,645	41,393	9,003,242	7%
TOTAL	41,377	90,598	134,717,159	

All numbers rounded to nearest whole number.
[1] Excludes NHS Secondary routes
December 31, 2015 Data

Studying System Data for 2015 in the context of the *Rural Road Safety Program* presentation, raised the following questions:

1. What is the "Urban" and "Rural" split between mileages and DVMT for each of the five categories?
2. What is the Death Rate per 100 million VMT for the urban and rural designations of each category?
3. Deaths on Non-Interstate NHS vs. Non-NHS Primaries?
4. Deaths on Federal Aid Secondaries vs Non-Federal Aid Secondaries?

As previously noted, economic development is an elusive term that is not defined in the Bank's enabling legislation. One way to think about it is with a conservation oriented mindset of "a penny saved is a penny earned." For example, though it may be unseemly grim, the U.S. Department of Transportation uses actuarial data in quantifying the average economic value of a statistical life at $9.2 million. Using this figure as a basis, the annual savings to South Carolina if the death rate per 100 million VMT were reduced from the 2015 rate of 1.89 to that of the following countries would be:

Country	Rate	Lives Saved	Annual Savings*	Annual Savings per SC Citizen**
USA (50-state avg.)	1.11	405	$3.72 Billion	$760
France	.95	488	$4.49 Billion	$916
Germany	.73	601	$5.53 Billion	$1,129
Sweden	.55	695	$6.39 Billion	$1,304

***Based on USDOT average economic value of a statistical life.**
****Annual savings per citizen calculation based on SC 2015 estimated population of 4,900,000 persons.**

One can easily make an argument that it's impossible to place a value on a loved one's life. Nevertheless, using USDOT figures allows us to quantify the economics of safety. In addition to calculating the total number and value of lives that might potentially be saved, safer roads would translate into additional billions in "economic development" resulting from reduced medical costs for injuries, lower insurance premiums, and property damage avoidance. These are significant amounts, especially when viewed in the context of SCDOT's 2016/17 budget of $1.7 billion.

In closing, I would like to thank you for advancing the Department's data-driven approach to highway safety. Economic analysis of this issue is worthy of further exploration, and I look forward to your response.

Sincerely,

Signature Redacted

Vincent G. Graham, Chairman

Cc: SCTIB Board Members
SCDOT Commission Members
Mr. Leroy Smith, Director, SC Department of Public Safety