



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

**North Carolina Board of Transportation  
Environmental Planning and Policy Committee  
Meeting Minutes for September 2, 2009**

A meeting of the Environmental Planning and Policy Committee (EPPC) was held September 2, 2009 at 10:00 AM in the Board Room (Room 150) of the Transportation Building. Nina Szlosberg chaired the meeting. Other Board of Transportation members that attended were:

Bob Collier	Tony Dennis	Hugh Overholt
Andy Perkins	Conrad Burrell	Stan White
Arnold Lakey	Gus Tulloss	Chuck Watts
John Collett	Ralph Womble	

Other attendees included:

Angela Person	Jerry Jennings	Beth Neely
Ricky Greene	Beth McKay	Ted Vaden
Wally Bowman	Delbert Roddenberry	Jennifer Garifo
Tom Norman	Jim Humphrey	Phil Harris
Greg Thorpe	Phillip Ayscue	Tad Boggs
Mike Bruff	Jay Stem	Amy Simes
Bob Andrews	Berry Jenkins	Don Lee
Bill Carstarphen		

Ms. Szlosberg called the meeting to order at 10:00 AM and accepted a motion to approve the meeting minutes from the July committee meeting. The minutes were approved as presented.

Ms. Szlosberg began the meeting by introducing the topic of sustainability and what that means to people. Recently with the new Administration there has been a lot of focus within the United States Department of Transportation on sustainability. President Obama has instructed three agencies – the US Department of Transportation, the US Department of Housing and Urban Development and the US Environmental Protection Agency (EPA) to join together and create some kind of effort around sustainability that blends transportation planning with how we develop our land and the protection of our environment to protect the health of the public. Discussion was started on how to position ourselves within the Department on the federal level dealing with money and funding. There was a presentation from one of the younger secretaries that mentioned a grant cycle being put together that will flow to state DOT's. When that money

comes from DC to the States, NC will need to be ready to accept the grant money that might be applicable to our state to help in the sustainability effort. The Board will be hearing a briefing today about some of the work that is being done by the staff. Julie Hunkins, of the Environmental Planning and Policy Committee, has been leading the charge with Lacy Love, Director of Asset Management, on a comprehensive sustainability initiative for the department.

Mr. Love's presentation was based on issues by the federal government and the American Association of State Highway and Transportation Officials (AASHTO) to promote the idea of sustainability within Transportation. In May 2009, Rodger Rochelle, Miriam Perry, Mike Bruff and Lacy Love attended a Peer Exchange in Washington, DC to have a conversation about sustainability and what it means in the transportation sector. The purpose was to come back and educate North Carolina DOT and share the information on sustainability.

The Peer Exchange in Washington, DC represented eight states that were considered the lead states in this area. Oregon, Washington, New York, Colorado, Illinois, Maryland, Pennsylvania and Southeastern Pennsylvania DOT's. Other attendees were the Federal Transit Authority, Federal Highway Administration, American Public Transportation Association, Transit Authority of River City, Transportation Research Board, North Carolina Department of Transportation and AASHTO.

The agenda from the meeting covered the national perspective and framing of issues, DOT case studies on what other DOT states are doing, transit perspectives as part of the sustainability effort, best practices, defining sustainability, and measuring and tracking sustainability, as well as the challenges and goals. One thing recognized at the meeting with sustainability is that there needs to be a common language in order to be able to converse. State DOT's have certain things that they are responsible for doing, but there are certain things outside of their responsibility authority that they cannot do. However, they can help to influence and change other people's ideas. Definitions should reflect a diverse transportation agency, like there is in North Carolina. It includes multi-modalism -- ferry's in the east, bikes, pedestrian pathways, aviation efforts, transit, rail and highways. How do you define sustainability within all of those modes of transportation and still make sense of it all? How do you converse with the Board of Transportation, other stakeholders and the public about sustainability so they understand what is being talked about -- so there is a common language?

Mr. Love referred to the following definition of sustainability: "meeting the needs of the present without compromising the ability of future generations to meet their own needs." This excerpt comes from a 1987 commission in Europe, called the Brundtland Commission, about what sustainability is. Other terms, such as the "Triple Bottom Line," is the concept that you don't isolate any one part of the "three legged stool," -- environment, society and the economy. It is all three wrapped together to make decisions. In our case, it's considering all three of these when faced with transportation decision-making.

Challenges talked about at the peer exchange included defining what sustainability is in society and determining whether it is project level or program level. Again, there needs to be a common language to be able to talk to resource agencies and the public so that they understand what is being discussed. As an agency, DOT tends to focus on projects. They look at the projects'

impact on the environment – the natural and human environment. Another challenge is evaluating economic sustainability. For example, we need to consider the overall cost of a project. Sometimes a project with the lowest construction cost may be the most expensive overall if we were to consider the long-term maintenance costs over the expected life of a project. North Carolina does a fairly good job in evaluating life cycle costs in pavements and bridges, but there are other areas where the evaluation of life cycle cost are instrumental in selecting the “best” alternative and best return on investment.

There are a multitude of environmental regulations that a transportation agency must comply with; these regulations are intended to result in environmental protection. From an environmental standpoint, the key challenge in the future for North Carolina will be climate change. What does that mean? Do we bury our heads in sand or do we start looking around to see what other States are doing? Another challenge is creating multi-modal thinking in transportation projects. When doing a highway project, are transit and rail being considered as the transportation system for an area is being developed?

There has to be a way of measuring the impact or success of sustainability efforts. This is another challenge that lies before us. As an organization, NCDOT is working hard to develop metrics as a way of measuring our success. A main components of sustainability is being able to measure the success of efforts in meeting the objectives of a transportation facility.

Advancing sustainability voluntarily without regulatory authority or requirements is also a key challenge. How can transportation agencies do the right thing without additional bureaucracy and rulemaking through EPA or other organizations? How do we integrate land use planning and environmental considerations into programs and decisions? Jim Westmoreland has been working hard to figure it out for DOT.

One of the things discussed at the peer exchange is the importance of developing a set of best management practices (BMP’s) through sharing knowledge amongst yourselves and across other states. At the workshop, participants were divided into three group: Planning and Multi-modal, Design and Construction, and Operations and Maintenance to talk about how to develop management practices to share across the nation so that if a state is interested in getting into sustainability, they won’t have to start from the beginning. The Planning and Multi-modal group identified BMP’s were the mitigation of climate change (reducing the amount of greenhouse gases). In the case of transportation demand management, how do you develop BMP’s around that, such as IT devices and message boards? There also needs to be early coordination across modes and departments for projects. There need to be a sustainability plan in place, as well as innovations in transit. There was a term used called Transit Oriented Development (TOD), which refers to placing transit hubs near heavy develop so you have riders for your transit system.

With the Design and Construction BMP’s, you have climate change (adapting to a changing climate), construction practices and adjusting to regulatory frameworks. DOT uses a tremendous amount of recycled material in construction projects. We use recycled asphalt in pavements, and concrete and scrap tires are being placed in embankment sections of roads in order to divert these from the landfill.

Operations and Maintenance BMP's are based on how much and what kind of fuel is being used like bio-diesel or flex fuel. Management systems would be used to help determine the best investment with limited dollars. We have to be more strategic in how we operate and handle the network. We have typically been "firefighters" on the maintenance side. There is a fire that breaks out, and we put it out without a lot of logic or a strategic thought process. However, we need to be thinking more strategically – thinking about the long run. For example, we should consider the life cycle cost of our actions. Life cycle cost analysis is not necessarily the lowest cost up front.

One of the BMP'S identified in the Operations and Management group is pavement preservation. If you take care of pavement early and put continuing seals on it, then the pavement can last a long time. If ignored, it will fail on you.

We need to continue these kind of conversations and peer exchanges with not only the eight states, but expand to all 50 states, because these problems are common to us all. In New York there was a problem with pigeons in bridges near their coastal areas. One of the things they were trying was to put a box for falcons to nest and that alone eliminated the pigeon problem because that kept the pigeons away. It was low cost by spending around \$100 to build a nest and put it up. That is one example of sharing and learning from other States about sustainable practices.

Washington State produces a yearly sustainability progress report. The Governor for the State of Washington issued an Executive Order directing agencies, including their state DOT, to develop sustainability plans, track progress and issues reports on their sustainability practices. Their report includes examples of what they are going to measure, how they measured it and what success they've had with measuring it.

Defining sustainability can also be found at WSDOT. They define what "sustainability" means to them and what their expectations are for themselves and their employees. They have a target to replace their standard diesel with 20% bio-diesel blend. Their target was September 1, 2009, but North Carolina has already been at that stage for a number of months.

Some of the things that can be done in North Carolina to move forward with sustainability in transportation is to educate people about what we've learned from other States, talking with the senior level management at DOT that chart the direction of the Department, and continually learn what other agencies, states, and countries are doing. North Carolina is already doing, but they are not talked about a lot nor shared with others. It would be good to share that information. NCDOT already has many initiatives related to sustainability, such as the use of bio-diesel and use of incorporating warm mix asphalt into our operations, which requires less energy to produce because you don't heat it up as much. There is a 50 degree difference between warm-mixed asphalt and hot-mixed asphalt. Also, it uses less fuel. Our chip seal program is a preservation effort that is done to keep good roads in good condition, which saves the state a lot of money and provides a good level of service to the citizens.

Warm season grasses like centipede or Bermuda are used in the eastern part of the state. You don't have to mow this grass as often. Often times the reason you do have to mow these grasses

is because of the weeds that grow up in the grass. Grass, such as fescue, requires more mowing throughout the year depending on what your growing season is and how wet it is. If you establish centipede in a turf, particularly in the eastern part of the state, then a lot of money can be saved on mowing time and there is reduced energy consumption by mowers and tractors. It's economic and environmental win-win.

Pavement and bridge preservation is the same concept of maintaining your car or your house. If you take care of it, it will last a long time or it will rot. If North Carolina doesn't maintain its transportation system, it will rot. The use of context sensitive solutions on paving secondary roads is not a new concept. This is something the Division Engineers have been doing when paving dirt roads. They have been following a practical design of curves and using the right design for the road and not taking a hill or half a mountain down to build a road. The "fit for purpose" design is also called the "goldilocks design," which means it's not too big or too small – it's just right. This recently came out of the TMT effort on bridge design for low volume secondary roads.

The Signal Management Program is an effort that the Board has supported for a number of years which involved the maintenance, operation and management of re-timed signals so that you are not waiting in traffic for a light to change. The signals have been re-timed so that the progression of traffic moves and you are not sitting at the light idling.

One award-winning effort are the waterless urinals, which have already been placed in Division 1 and Division 4. There are also some at the Crestville rest stop.

NCDOT has been using LED's in traffic signals over the past couple of years. LED's are "light-emitting diodes" that have a current that passes through them to light them up. These lights are used on transit buses, digital displays, the speedometer and odometer in your car, cell phones and traffic signals. LED's are used because they are efficient and take a lot less energy to produce light than incandescent bulbs. The color is more clear and you don't have to do any tinting or painting to get a good color. The size can be very small and easily populated onto printed circuit boards. They light up very quickly, unlike incandescent bulbs, the cycling and dimming are very good, they are cooler to operate because they radiate very little heat, they don't leave you in the dark but fade away, they have a long useful life and are difficult to damage with external shock. They also do not contain mercury, unlike florescent bulbs.

North Carolina's experience with LED's started about 1999 with the installation of LED's where there were incandescent bulbs. The incandescent bulbs typically lasted about 12 to 18 months and when they fail, the display goes dark. When they go dark, they have to be re-lamped and the traffic service people were spending a lot of time putting in bulbs. The bulbs were cheap but cost a lot of labor to install. NCDOT started with the color red in bulbs and arrows, which was the more affordable color. As technology changed and LED technology was further developed, they used the color green and then yellow. Based on experience in 1999 and 2000 with LED's, in 2001 all new installations required LEDs. At present, ninety-five percent of the 8,800 signals in North Carolina now have LED's in them. The next step is to focus on pedestrian displays and crosswalk count-down indicators.

There are also economic benefits from using LED's. There have been instances when the power company will call people to say that something is wrong with there signal because it is not using power like it used to. Some states report the life of the bulbs to be around 7-10 years depending on where the bulb is being used. The warranty is 5 years on the bulb. There is low energy consumption, and other states have reported up to 93% of energy savings. There is also a low maintenance cost. There is not a lot of re-lamping unless they are red lights, and it doesn't go dark at failure -- it fades away. The display is brighter, except for the color yellow. It may cost a lot more initially, but the payback is approximately a year which make it worth the investment. It uses 93% less energy and the cost savings is good. There is less disruption to traffic and reduces idling of traffic signal trucks used to change the incandescent bulbs. The reduction of vehicle and pedestrian accidents could be reduced at 25%.

The next steps would be to continue educating NCDOT and senior management about sustainability and the benefits that can be derived. NCDOT should also continue dialog with AASHTO and other states. There are local communities and federal and state resource agencies and partners like US Army Corps of Engineers, the NC Department of Environment and Natural Resources, NC Wildlife Resources Commission, that NCDOT can work with and learn from.

Mr. Womble stated that LED technology is moving quickly with a one-year payback; however, he suggested there needs to be more attention paid to the obsolescent factor if the LED does not work or there is something else new and the LED becomes obsolete. In that event, you would have to replace them all again and there won't be replacement bulbs for the next level.

Mr. Love stated that technology is constantly changing and before there were diodes in signal heads of 8 to 12 inches. Now there is one bulb for that instead of the little pixels of diodes. The price of LED's have gone down over the last five years since the use of LED's started and the prices continually drop. The payback used to be 3 years, but now, in most cases, it is a year.

Ms. Szlosberg asked, "Does moving from multiple diodes make the light heads obsolete?"

Mr. Love answered, "No, they would not be obsolete. It is just a different way of working."

Mr. Overholt stated that this was great work and that the Department of the Army said that they use an environmental friendly program called "SURPASS" which is very active in North Carolina. They would be interested to interface with DOT. They have modified the program to where they are saving millions of dollars a year in various off-post and on-post energy saving efforts. The people to contact about the program are Carl Jenson and Paul Friday.

Mr. Love again stated that there are a lot of partners that have not been identified or made contact with by DOT.

Ms. Szlosberg mentioned that one of the things being done at Fort Bragg and Camp Lejeune is the digestive project.

Mr. Overholt stated that they have had a good deal of funding to do the Surpass program, so they have scientific data that they are willing to share.

Mr. Watts asked, “ How smart are the LED’s in terms of when they are not working?”

Mr. Love answered, “As far as he knows, there is no smart linkage back to the home office to indicate that the light is burned out. They just fade away and just observing that signal lets you know that it is approaching the time to change the light.

Mr. Watts asked was solar on the horizon?

Mr. Love stated that solar was in fact on the horizon and that there was a solar-generated overhead light fixture for roadway lighting on I-540.

Ms. Szlosberg stated that there is a whole solar movement in the Country. Oregon actually has a big study area where there is a big clover leaf intersection using solar panels to power that intersection. NCDOT is looking at a potential pilot program where they would basically put a little power company on the side of a rest stop and use the solar panels to generate electricity for the rest stop. We have almost 80,000miles of state-maintained highway, which means we have over 160,000 miles of right of way on both sides. That is a huge opportunity to use solar panels in some of those areas.

Ms. Szlosberg adjourned the meeting at 11:00 A.M. The next meeting of the Environmental Planning and Policy Committee is scheduled for Wednesday, October 7, 2009.

AJP/jh