

New Mexico ITS: Planning, Deployment & Integration

*Joe Maestas, Planning & Program Management Engineer
FHWA, New Mexico Division*

Terry Doyle, with the New Mexico DOT, will make a presentation this afternoon and focus on specific urban applications in Albuquerque. This is really going to be the foundation for the freeway management system in Albuquerque so I invite you to attend his presentation as well.

Just to give you an overview of my presentation, I'm going to go over a few state pictures. For those of you that are not familiar with our state, I will talk about some transportation facts and then I will focus again on the program. As I mentioned before, I am going to discuss a little bit of the ITS training that we've provided over the last several years to give you an idea what the baseline is. We've focused on the statewide and rural aspect of our program. I am also going to tell you a little bit about what we are doing in coordination with adjoining states, and am going to discuss a little bit of some of the urban ITS applications that we have on the way. Lastly, I will finish with some efforts that we have underway in the commercial vehicle operations area.

How many of you have been to New Mexico? So quite a few of you have been there. It is the fifth largest state by landmass. In the 2000 Census we had just over 1.8 million people. Over the last ten years we didn't change, we are still the 36th most populous state in the country and one third of the total population actually resides in Albuquerque. We have three urban areas, Santa Fe being the Capital - situated in the north-central part of the state, Albuquerque in the central part, and Las Cruces down south south. We are a very diverse state with 23 Native American tribes. As I mentioned in the previous session, this has presented a lot of challenges in coordinating transportation with the tribes as they are sprinkled all across the state. Some have been in central planning areas, some in the fringe, and some within certain cities. So that has been a challenge for us. Federal Highways has been in a position to help

moderate some of these topics between the DOT and the tribes.

We have high elevation, three quarters of the state is between elevations of 4500 and 6500 feet so snow and ice control is a big issue. Many people associate New Mexico with the dessert, but it is the high dessert so we get some extreme weather to these areas. We also have the main economic sectors of New Mexico of mining, farming, ranching and tourism. This is where traveler information will play a key part in our economy in helping to attract tourists to our state.

I wanted to show you a map real quick, just to give you an idea of what the major facilities are that we have in the State. We have Interstate 40 is basically east to west and I-25 is north to south. I-25 is a primary commercial route as well as I-10, which is from the Arizona state line to Los Cruces. This just gives you an idea of what the state is like. I'll be talking about a major rural ITS project that we have underway in the northeast part of the state. In the way of CVO, we are really focusing on a port-of-entry just west of El Paso. It is an international port-of-entry and I will be speaking to that, but I just wanted to show you the location to give you an idea of where its at. So obviously again, we are a very diverse state, very large and we do have some transportation challenges.

Just a few facts, we do have quite a large road mileage system – about 1000 miles of Interstate as part of the national highway system, over 5000 miles in Indian Reservations which again makes transportation planning and coordination a challenge, total VMT (vehicle miles traveled) is just over 22 billion in the year 2000 and it is growing reasonably at the rate of five percent. The only international airport that we have is situated in Albuquerque. Our federal program is just under ¼ billion dollars this last federal year, which ended September 30th. In the IT bill our

program averaged \$150-170 million so we have had an increase in our program.

To give you an idea of what kind of baseline training that we provide our ITS Stakeholders in the state: we have provided an ITS Awareness Seminar and Architecture Development Course. There was also an interest in ITS software acquisition in Albuquerque (this was in preparation for the design of their freeway management system). We've provided all the free training courses in the CVO/Commercial Vehicle area as well as having a group of individuals who have participated in all the CVISN Level One Workshops that come across the Southwest for New Mexico. We've also provided courses in telecommunications.

[The state is still in the preliminary stages in working with a company to lay fiber optics along Interstate 10. In fact, I think the Bureau of Land Management is the lead federal agency in that and we are hope to build on that project and begin installing fiber optics along the other Interstate rights-of-way of I-25 and I-40. One of the impediments to this is land ownership. We have a lot of federal land ownership and tribal land ownership that has created some incredible barriers to overcome. So we are having a lot of difficulty in that area.]

We just recently had a sweep of ITS Standard Courses that were held in Albuquerque. We were one of the first cities in the country to have the Standards Overview Course, the Standards Dynamic Message Sign and Automated Traffic Control Courses.

One of the recent, and I think all of our projects that can be road mapped for ITS communications across the state, entails the development of the Strategic Plan that was just recently completed. Kimley-Horn and Associates, Inc. was supposed to develop that and I am going to go through just the basic elements of the process that was done by Kimley-Horn in developing this plan. Basically stakeholders were identified and consulted and through that the stakeholder outreach, ITS inventory, and identification of priority needs [took place]. Overall goals were set for this plan

and were tied in with the prioritized needs. One of the key aspects was integrating this strategic planning process with on-going efforts in Districts 3 and 4. District 3 basically encompasses the Albuquerque metropolitan area and District 4 in the northwest part of the state is where we have our hallmark, or pilot, rural ITS project. A statewide architecture was also developed. Out of the 60+ market packages available 35 were developed for New Mexico's statewide architecture.

To give you an idea of what the top prioritized needs, in order were:

- 1) incident management and coordination;
- 2) traffic congestion mitigation;
- 3) providing real-time information on roadway, traffic and weather conditions; and
- 4) improving roadway closures/detour information.

We have a very archaic process to close the roads. We have a state police officer put up a barricade and that is it. Obviously travelers and customers demand more accurate real-time information to plan their trips, especially in inclement weather.

The deployment plan that was developed was basically in the 20-year time frame. The projects were prioritized by short, mid, and long-term time frames. Budget estimates were also provided as part of the Deployment Plan. There were basic three elements of the budget:

- planning, design and construction;
- implementation or initial product/capital cost; and
- operations and maintenance.

To just give you an idea of what the deployment plan consisted of...In the **short term (2002-2006)** we had maintenance, incidents and road closure systems that were recommended: RWIS (road-weather information systems); installation of CCTV (closed circuit television) and DMS (dynamic message signs); highway advisory radio; advanced metropolitan travel management system primarily in the Albuquerque area; 511 traveler information system; and a statewide emergency response radio system. The total

estimated cost for just the short-term projects in the deployment plan was \$70+ million.

In the **mid-term (2007-2011)**, it was recommended that the statewide signal system be upgraded. Additional recommendations included: installation of automatic vehicle locators in emergency vehicles; installation of weigh-in-motion scales at ports-of-entry, which is already starting to be done; and installation of tourist information kiosks (obviously the state relies heavily on tourism and information from kiosks would help greatly in providing information and planning for our tourists). We also have large deer and elk populations and I believe that came out in one of the stakeholder meetings. The recommendation in the mid-term was to install animal crossing warning devices. The total estimated cost for the mid-term, almost \$60 million dollars.

The **long-term (2012-2021)** recommended projects is taking and building on some of the previous projects in the short and mid-term areas including:

- expand the network of closed CCTV and DMS;
- installation of AVL on school buses and commercial vehicles;
- automated construction and maintenance operations;
- develop special events plan; and
- develop traffic control and information systems.

The total estimated cost for the long-term plan is about \$86 million dollars.

Our hallmark rural ITS project that we have started is in District 4, in the northeast part of the state. That area contains both key commercial and tourist corridors. It encompasses the northern portion of Interstate 25 and the eastern portion of I-40, but there is only 4% of New Mexico's population in that area. The reason why that region was selected is mainly because we had a key ITS champion in the District Engineer who saw the benefits of ITS and who wanted to be the first to implement this project in hopes of eventually implementing this rural

ITS aspect across the entire state. Some key aspects, we do have a consultant (Castlerock) on board and they just recently completed Phase I. They completed an inventory and ITS needs assessment, and regional architecture. Phase I end with an implementation report. Cost, approximately \$190,000.

We are getting Phase II underway which is a little more specific and includes much more work. It involves development of plans, specifications and estimates for:

- a traffic operations center, which would be more of a virtual center;
- gate closure/closed circuit TVs – we have a major pass in the northeast part of the state and we really want to have the best road closure system;
- highway advisory radio network – we do have highway advisory radio on all four points outside of Albuquerque, but we do hope to expand that network across the state;
- pager activated school crossing warning;
- variable speed advisory system; and
- mobile smart traffic trailers.

Estimated cost, about half a million dollars.

What are we doing in coordination with adjoining states? You heard the discussion by Mr. Bower this morning about the need to be talking to neighboring states about ITS projects and integration. Well, we have heard that message and with the help of Castlerock, New Mexico convened a meeting in December of last year and we invited all the adjoining states. We had Arizona, Colorado, Oklahoma and Texas come to Albuquerque, New Mexico to talk about sharing information and coordinating all of our integration efforts that we have in common. A report was also developed as a result of this initial meeting. It contained a series of recommendations of how these states can work together. Again the dialogue has been opened and we continue to coordinate with all our adjoining states on ITS.

Rural ITS. What are we actually doing? The state of New Mexico is going to participate in a Pooled Fund project with the Idaho

Transportation Department and it will be on the Condition Acquisition and Reporting System (CARS). New Mexico also intends to establish a 511 Traveler Information system and integrate that into CARS. In the way of rural transit initiative, we have a statewide welfare-to-work effort. This initiative, which is still in the pre-implementation stage, is called the Ridership and Financial Tracking (RFT) System. It is basically a system in the beta testing stage right now. It is to be integrated with ITS card technology and would provide a lot of the ridership report requirements and financial accounting tracking. In a lot of the Job Access grants there is a heavy reporting requirement required by the Feds so I think that this system will help that. We hope to have it online by next year.

What are we doing in urban areas? I guess one of the long-standing projects in the Albuquerque area is the Traffic Signal Interconnect. I think that it is one of our best partnerships that we have in ITS. It is a partnership between the New Mexico DOT and the county urban wheel, which includes Albuquerque. So we are very proud of that. It is a seamless ITS project and we just continue to expand it. We also have an incident management program in the City of Albuquerque that has been online for a few years. We have a fleet of courtesy patrols that primarily patrol the Interstate, especially Interstate 25 and Interstate 40. We had a coordination meeting, I'd say about 2 years ago, with all the emergency management personnel in the Albuquerque area. So now we have actually integrated our courtesy patrol with a lot of the emergency management folks out there.

Albuquerque was one of the first urban areas to develop an ITS architecture in the country. In fact they hired the instructor who put on the ITS architecture development course – so I think that was one of the key reasons why we're so successful in getting that done. It has already undergone one revision. It has also created (and this is in the way of overcoming institutional barriers and bringing multiple jurisdictions together to coordinate ITS) or established an ITS subcommittee within the MPO. It has been

operation in for a couple of years now and it is going very well.

What else are we doing in Albuquerque? As we mentioned earlier, Kimley-Horn & Associates is developing the plans, specifications and estimates for the Advanced Metropolitan Travel Management System (AMTMS). The AMTMS is being designed for the City of Albuquerque and you can see the primary elements of it. Again, this afternoon's speaker (Terry Doyle) presentation on *ITS and the Big "I" Construction* is key. That ITS deployment is really going to be the foundation for the AMTMS within the City of Albuquerque.

We do have some transit tracking management systems. About three/four years ago, the City of Albuquerque's paratransit system was equipped with software for online registration and scheduling for their paratransit customers. They installed automatic vehicle locators and mobile data terminals (MDTs) on their paratransit fleet. Phase II has yet to be done, but will involve installing automatic vehicle locators in their fixed route buses. Recently they installed some annunciators, which basically announce key locations along the fixed routes. They announce key locations and stops to help position the rider and tell them when to get out.

We also have Smart Corridors that have been established. So we have all the jurisdictions very much involved in taking the lead in some of their own efforts and the Smart Corridors is one of those things that the County is doing. Rio Bravo is a major north-south arterial in the southwest part of the City of Albuquerque.

Santa Fe, the capital of New Mexico. About three/four years ago there was a special expose' on the traffic congestion in Santa Fe. Santa Fe is very anti-road widening and we decided a few years ago to do a comprehensive review of operations on the City of Santa Fe's major arterial highways. We did that through the Peer-to-Peer program. What has come of that are the following recommendations: (1) traffic signal interconnect and the need for optimization of key intersections within the City of Santa Fe along their major arterials; and (2) future traffic

operations center. Also, Cerrillos Road, which is a key east-west arterial system is going to undergo reconstruction and we are planning on installing conduit for fiber optics and basically create a Smart Corridor. This reconstruction project is not going to add capacity to Cerrillos Road so the key is to really optimize efficiency as much as possible.

Las Cruces is our urban area to the south. They also have a signal interconnect system. Their police, fire and transit have signal free entry installed at 94 intersections and they basically have the same paratransit/transit management system in their community.

CVO. Through CVO we have many partners, the Alliance of Transportation Research, which is the research arm of the University of New Mexico, New Mexico's Department of Public Safety, Federal Motor Carrier Safety Administration and as well as our office (our office partners in the implementation of new technology). New Mexico was one of the first states to develop a Business Plan within CVISN. It was developed and approved by Motor Carriers in 1998. The state is participating in the HELP, Inc. program as well as expanding the PrePass Credentialing System. They are interested in the utilization of ASPEN as well as SAFER Data to assist in inspections. They just recently went through the CVISN deployment workshops and completed their improvement plan with the overall goal being CVISN Level 1 deployment by September 2003. For those of you who aren't familiar with the overall goal that Congress set, Congress basically wanted half the states to reach CVISN Level 1 by September 2003.

I mentioned the Santa Teresa International Boarder Crossing, which sits at the New Mexico/Mexico boarder about ten miles west of El Paso. There are stakeholders and others who want to make that international border crossing a model in CVISN – a model of transportation technology. What we have done is a brand new federal point of entry, the state is going to build a separate point of entry (they opted not to co-locate with the Feds) about a mile downstream. So we still have a lot of time to really develop

and design the best technology for CVISN. We will have electronic credentials and automatic trip permit issuing.

There is also a proposal to develop a Border Technology Deployment Center. What would this Deployment Center actually do? The objectives of this Border Technology Deployment Center would be to provide evaluation, testing, integration, verification and validation of New Border Crossing Technologies; as well as refining technologies and operational concepts and training personnel to apply the technologies. Right now we are just starting the feasibility study. We are going to get the study done probably within a month at an estimated cost of \$500,000. The lead organization for that is the Physical Science Laboratory at New Mexico State University in Las Cruces. We have high hopes that this technology center will be a model for the nation in leading edge technology for commercial vehicle use. This project, while still in the concept stage, has received a lot of money from ITS Earmarks (FY 2000-\$781,000, FY 2001-\$397,000). I believe that in the Senate FY 2002 appropriations they have tagged an additional \$1.5 million to this.

In summary, there is a lot of planning underway. Obviously we are still doing a lot of planning, but what I think has come from all this planning is overcoming a lot of the institutional barriers to ITS – allowing us to make progress in deployment and implementation. Also, the decision makers are becoming more informed. You saw all of the courses that we had in the state. We were, in many cases, targeting a lot of policy makers, board members, etc. They are the ones that need to be aware of the benefits that ITS can offer. Partnerships – I spoke about some of the meetings we had in coordination with adjoining states and I think we are making a lot of progress with that. Urban ITS Applications have been the proving ground for ITS. I think they have been the most successful in changing the minds of a lot of people that were skeptical of ITS.