

## **VIPER (Voice Interoperability Plan for Emergency Responders)**

Interoperable communications is the ability of public safety agencies to communicate with one another on a single radio.

### **Need**

- There exists a need in North Carolina for public safety officials, regardless of discipline to communicate with one another without having to relay the message through a communications center.
- Interoperable communications helps make public safety agencies more efficient and effective and thereby better serving the citizens of North Carolina.
- Interoperable communications is a benefit for all public safety agencies whether dealing with daily emergency calls or large scale disasters.
- Interoperable communications was identified in the 911 Commission report and the NC Legislative CJIN report of 1995 as a critical need for public safety agencies when responding to emergencies.
- Most public safety officials in North Carolina cannot talk directly with other public safety officials.

### **Current efforts and plans**

- The Highway Patrol has been charged with developing and implementing two communications strategies; a short-term (Tactical) and long-term (Strategic) plan.
- Tactical communications solution is the implementation of 17 communications gateways across North Carolina to link disparate radio systems together as a temporary solution until the statewide Strategic plan can be implemented.
- Strategic communications solution is the construction of a statewide 800 MHz radio system that will provide interoperable communications for all public safety agencies in North Carolina.

### **Cost**

- Statewide infrastructure is estimated at \$189m. These estimates are hard numbers compiled by members of the State Highway Patrol during their planning efforts. 238 transmitter sites statewide.
- In an effort to reduce the overall cost of construction, the State Highway Patrol is acting as prime contractor and will manage the subcontractors.
- Approximately \$33m has been provided for VIPER through partnerships with local agencies using Homeland Security and other grants leaving a balance of \$156m.

## Cost avoidance opportunities for local agencies

As an example of opportunities for local agencies to upgrade their communications without major outlay for infrastructure; Granville County had obtained quotes to build a new county 800 MHz communications system prior to participating in VIPER. The estimate was \$3.2m for the infrastructure alone. Now, by partnering with VIPER, they only need to purchase the radios. **Cost savings \$3.2m.**

## VIPER Partnerships

The following localities have partnered with VIPER:

Granville County	Pitt County
Chowan County	Orange County
City of Asheville	City of Chapel Hill
Lincoln County	Cherokee County
City of Mooresville	Sampson County
Cleveland County	Wake County
Duplin County	Lenoir County
Harnett County	Surry County
Craven County	Charlotte/Mecklenburg
Carteret County	

These localities have recently contacted us expressing interest in participating in VIPER:

Rockingham County	Bladen County
Lee County	Catawba County
Caswell County	Alamance County
Hoke County	Davie County
Union County	Pender County
Halifax County	

## Possible Alternatives

### Leased commercially owned private radio system

This involves a vendor building a statewide radio system for public safety and charging a user fee for each and every user. Too expensive. The estimated fee for each radio on the network would exceed \$75.00 per month.

### Public Radio Systems

Another alternative is Nextel. However, the estimated number of towers needed to cover ALL NC could exceed 600. Return on investment for vendors would not be reasonably realized for rural areas. Not compliant with public safety APCO 25 Standards.

### Satellite

Satellite technology does have one advantage over typical trunked radio systems in that it is not terrestrial based. However, the primary drawback to satellite systems is that the radio must be in constant view of the sky. This would eliminate operation inside buildings or in areas of dense foliage or during heavy rainfall or intense cloud cover.

## VIPER Frequently Asked Questions

There have been several questions asked and concerns expressed about using 800 MHz as our radio frequencies for the VIPER network, and about the VIPER Network in general. Below are listed some of the most common.

- **Will 800 MHz will not work in the mountains?**

*800 MHz radios have been proven to work in mountainous areas across the United States, and in fact the current CJIN mobile data network is operating on 800 MHz frequencies. The states of Utah, Colorado, West Virginia and Pennsylvania are using 800 MHz radios for their radio systems.*

- **Is this radio network is simply a new radio system for the State Highway Patrol?**

*The State Highway Patrol was identified by the Legislative CJIN Report to be the managing agency of the 800 MHz statewide voice and the statewide data system. The Secretary of Crime Control and Public Safety through the Division of the State Highway Patrol is statutorily required to maintain a statewide radio system. The State Highway Patrol, as with the Mobile Data Network, will be a small user in comparison to the number of local users on the network.*

- **The cost of construction will be expensive.**

*As with all new technologies, there is an expense to implement and maintain this new statewide network. However, when compared to modern radio systems installed in the states of Michigan, Pennsylvania and Ohio our estimates for North Carolina are not unreasonable. It should be noted that the state of New York has recently received a bid for a statewide radio system that is estimated to cost one billion dollars.*

- **Will there be voice and text pager capabilities with VIPER?**

*No. Unfortunately, the technology used for 800 MHz trunked radio systems does not allow for a paging solution. Agencies requiring paging will have to continue to support their existing paging system. However, where available, tower space will be offered to VIPER participants on State Highway Patrol owned towers for local agency paging antennas.*

- **What about satellite communications?**

*Satellite technology does have one advantage over typical trunked radio systems in that it is not terrestrial based. This essentially means that a satellite based communications system would be relatively free from harm as related to most natural or manmade disasters. However, the primary drawback to satellite based systems is that in order to function, the subscriber handset or radio unit must be in constant view of the sky. This would eliminate operation inside buildings or in areas of dense foliage or during heavy rainfall or intense cloud cover. Satellite communications often don't work well in "urban canyons" (in streets and alleyways between tall buildings) because there is no line of sight to the satellites on the horizon. All of these detractions far outweigh the benefit of the system being somewhat impervious to being dependant on easily damaged infrastructure on earth. Satellite systems also suffer from lengthy delays as the conversation is routed up into the sky many hundreds of miles and back down again to the receiving radio or handset. Furthermore, satellite based technology will have to be refreshed as the orbit of the satellite can only be sustained for a finite number of years. However, satellite communications would be a viable option in areas where terrestrial infrastructure would be too costly to serve the population; such as the desert southwest of the US or the Middle East.*

- **Do I have to buy a certain brand of radio to operate on the VIPER network?**

*No. VIPER is the expansion of an existing Motorola radio system owned by the State, so obviously Motorola radios will work on the network. We have demonstrated the successful operation of EF Johnson radios on the VIPER network. So if a user prefers to use radios other than Motorola, they have the option of using EF Johnson radios.*

- **Will there be a cost to use the VIPER network?**

*The success of VIPER depends on our partnerships with state and local agencies, and the sharing of existing resources which may range from property to build the towers on to re-use of existing towers. These in-kind contributions will help keep the overall cost of construction lower than if we had to buy property and build new towers where state owned towers are not available. It was those partnerships that allowed the state to build the statewide mobile data network for less than \$20m as compared to the estimate in 1993 of more than \$100m for the state to build the infrastructure. Our goal is not to ask the locals for free use of their land and/or towers and then require them to pay to use the system. We don't want to find ourselves in a situation where all our partners demand that we pay them for their resources so they can pay a users' fee. Additionally, there are many rural area departments that would not be able to pay a user fee and therefore would not be able to participate in VIPER at all.*

- **Will local agencies continue to dispatch their own personnel or will that be taken over by the Highway Patrol?**

*Local agencies will continue to dispatch and control their personnel as they do today. However, they will need to incorporate 800 MHz radios into their dispatch center consoles so they can communicate with their personnel.*

- **Is this project going to be awarded to a single vendor?**

*This is an expensive project and there will be large amounts of funds spent. However, with the Patrol acting as prime contractor, there is not a single vendor profiting from the total project funds. There are many products that will be purchased from different vendors who will be required to compete in the competitive bid process and many pieces purchased of the State's standing convenience contracts. However, there may be circumstances such as product integration with existing infrastructure and compatibility where a single or fewer vendors may be selected, but those vendors will not profit from other infrastructure equipment. These products include, but are not limited to, equipment buildings, towers and tower work, generators, microwave equipment, intellirepeaters and network routers.*

- **Can VIPER use cell towers?**

*Most cell towers are not high enough to get the desired coverage for the each site. However, in cases where cellular companies have erected tall towers we will take them into consideration if offered access. In an effort to keep the annual recurring operating cost at a minimum, we seek tower space that does not require us to pay monthly lease fees.*

- **Wouldn't the Tactical Solution be sufficient?**

*No. Unfortunately the Tactical solution is a temporary measure that should only be used during emergencies. The Tactical Solution will connect existing radio systems together to allow agencies to talk with one another. It does not increase radio capacity, but rather increases radio traffic on existing channels. A comparison is much like the old party-line phone system where there were many users trying to use a single phone line or channel. The Tactical solution is a measure to provide basic interoperable communications until the Strategic Solution is constructed.*

- **Will local agencies be mandated to use VIPER?**

*No, there are no mandates to participate in VIPER. The VIPER project is an effort to assist in the efficiency and effectiveness of state and local public safety agencies by using a common interoperable communications system. Optimally it would be more effective if all agencies were on VIPER, however we realize that some agencies have recently invested in their own systems and have not realized a return on that investment. And we understand that there are agencies that have no desire to be a part of VIPER at all.*

- **Will the VIPER Radios cost \$5000 each?**

*Like almost all technology products, radio prices vary depending upon the number and cost of options purchased regardless of the radio system they will be used on. Radios used to access VIPER can vary in price from \$1500 to \$4000.*