



Public Safety Radio Communications

Dare County, North Carolina

September 18, 2006



INDEPENDENT

PROFESSIONAL

QUALITY DRIVEN

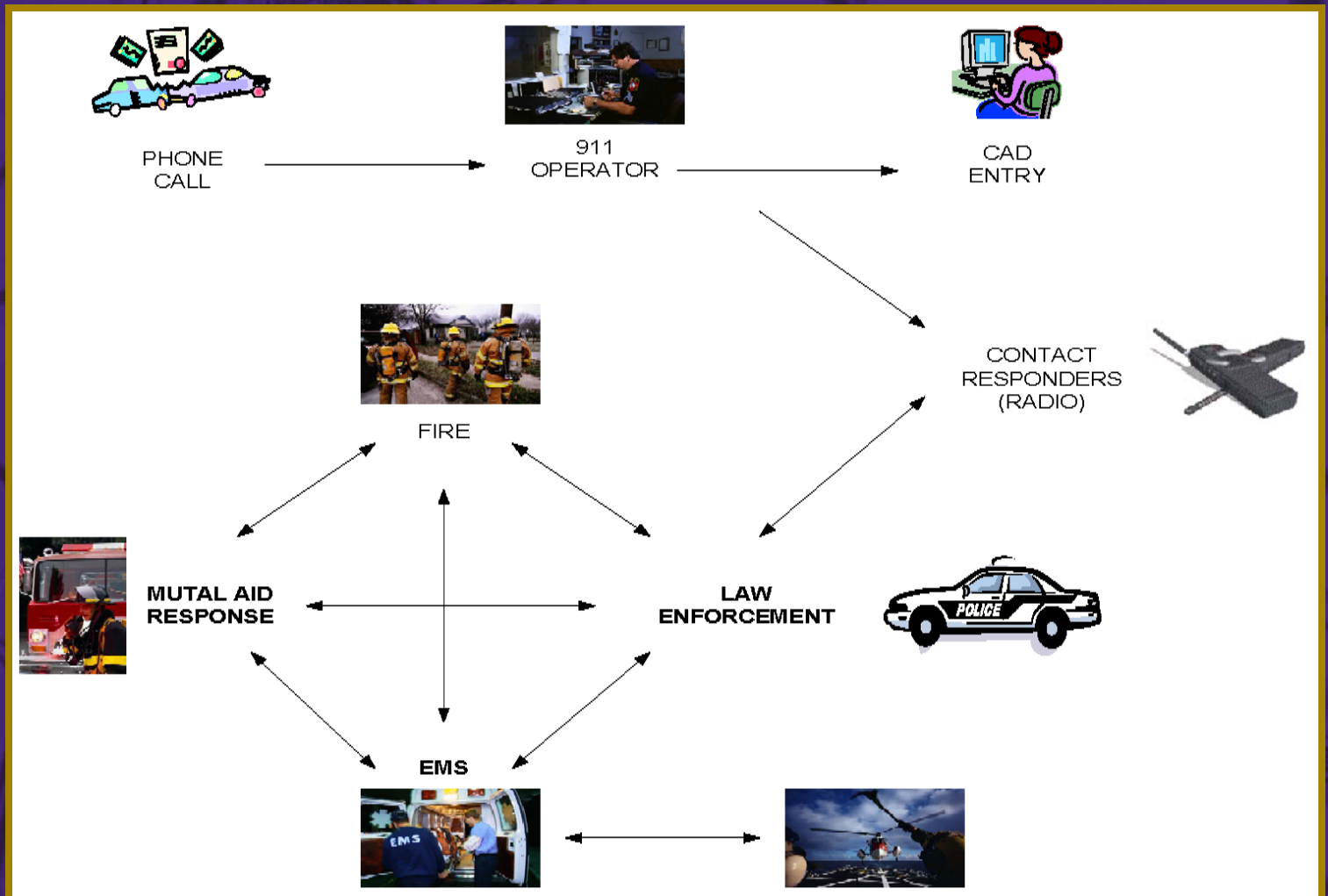
EXPERIENCED

User Organizations

- Sheriff
- County Fire Departments
- County EMS Departments
- Medflight
- Ocean Rescue
- Town Police
 - Manteo, Nags Head, Kitty Hawk, Kill Devil Hills, Duck, Southern Shores
- Public Works
- Public Schools



9-1-1 Emergency Response



Current County Radio Systems

- Sheriff South (UHF Band)
- Sheriff North (UHF Band)
- Beach Law (UHF Band)
- Fire South (VHF Band)
- Fire North (VHF Band)
- National Parks (VHF Band)
- EMS (VHF Band)
- Ocean Rescue (VHF Band)
- Public Works (Low Band)
- Commercial Service (800MHz): Schools & KDH Water
- CJIN Mobile Data (800 MHz)





Impacting Your Radio Communications:

- Seasonal Population Fluctuation
- Atlantic Hurricane Patterns
- Topography of the Barrier Islands



Communications Concerns

- Inadequate Radio Coverage
- Channel Crowding and Congestion
- Inadequate Reserve for Emergencies
- Lack of Interoperability
- Radio Interference
- Inadequate Reliability/Survivability



Public Safety Environment : 2006

- 9/11 in New York and Pentagon
- Oklahoma City
- Katrina and Rita
- Columbine
- Daily News from CNN and Fox



Regulatory and Technology Issues

- Narrowbanding
- Migration to Digital
- Sunspot Increase – 5 years
- Changing and Emerging Weather Patterns





COMMUNICATIONS, INC.

Communications Improvements (Since 1996)

- Additional Radio Sites: Sheriff and Fire
- Consolidating Communications Dispatch
- New ECC and EOC Facility – In Process
- Replacement of Outdated Equipment
- Significantly Improved Maintenance
- Improved Dispatch Training
- Improved Dispatch Procedures



Demands Have Increased (1996-2006)

- Traffic is up 300%, Staffing is up 20%
- Units are up 45%, Capacity is up 0%
- Coverage Not Support Demographics



Upgrade Options

1. Stay Where You Are,
 - Upgrade As Money Is Available
2. Join the NC 800 MHz VIPER System
3. County-Owned / Operated 800 MHz System



Options 2 and 3

- 800 MHz: Frequency Band with Capacity
- Trunked Radio: Computer Directed
 - Flexible; Efficient
- Multiple Site Configuration



Trunking Features

- Efficient Operation
- Talk-Group (Routine & Ad-Hoc)
- Emergency Alert
- Unit ID
- Centralized Alarm and Maintenance
- Digital Operation
- Telephone Interconnection
- Redundancy/Reliability
- And More Features



Multiple Site Configuration

- In-Building Coverage
- More Capacity in High Traffic Areas



800 MHz Options

- Join the State VIPER System
 - Increase State Sites by 3 (Total 6)
 - Double Kitty Hawk Capacity to 10 Channels
 - Add supporting Microwave Network
- County-Owned / Operated 800 MHz System
 - Install and Maintain All Six Sites
 - Configuration Essentially Same as VIPER
 - County Controlled System
 - Dispatch Hard-Wired Into System



Option 1: Stay Where You Are?

- Certainly the Least Cost Option
- Inadequate Capacity (no additional channels)
- Congestion (Everyone hears everyone else)
- Little Interoperability (Four Frequency Bands)
- Interference (Fact of Life on VHF, Low Band)
- Users Step on Each Other
(Some Channels are not Repeaters)
- Coverage can be Improved
(Requires Additional Equipment)
- Redundancy is Complex, Expensive
- Additional Upgrade Complicates Dispatching



Coverage for 800 MHz System



Major 800 MHz Option Components

- Six Radio Sites
- Microwave Connectivity
- ECC in Manteo
- 10 Channels at Kitty Hawk,
5 Channels elsewhere



What is VIPER?

- Statewide 800 MHz P.25 Trunked Radio
- State-Owned, Operated and Maintained
- Designed for NCHP Use – Light Density, Outside Buildings
- It Is Coming To The County Anyway
 - 3 Sites, 5 Channels
- Currently No Charge,
 - But *That Could Change*
- Regional Control Located in Farmville



What Is Needed to Join VIPER?

- Add Three Sites
 - Two on Hatteras, One at Stumpy Point
- Add 5 Channels to Kitty Hawk Site
- Add Radio Controlled Consoles at ECC
- Add Microwave
 - Supporting 3 Additional Sites
- Purchase 1500 Subscriber Radios

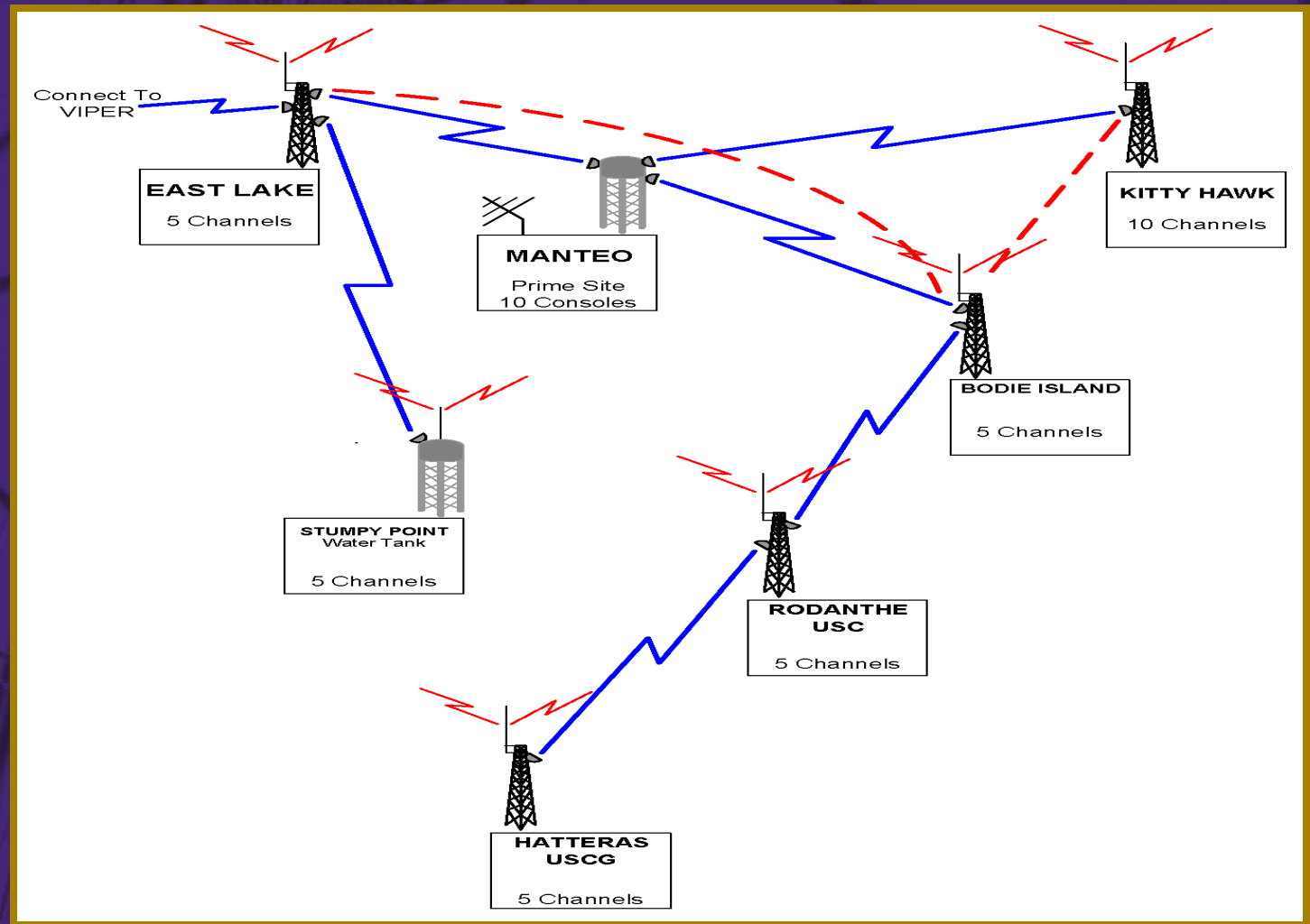


Move From VIPER to County-Owned

- Add Three More Sites (Total 6):
 - East Lake, Kitty Hawk, Bodie Island
- Add Regional Control Equipment
- Replace Radio Control Consoles with Direct Control Consoles
- Add Microwave, Supporting:
 - 3 Additional Sites and ECC at Manteo



800 MHz System Layout





Cost Summary for VIPER

	LIST COST		HIGH ESTIMATE		LOW ESTIMATE	
RADIO INFRASTRUCTURE	100%	\$ 2,994,790	85%	\$ 2,545,600	75%	\$ 2,246,100
MICROWAVE	100%	\$ 1,319,880	90%	\$ 1,187,900	90%	\$ 1,187,900
NON-FIXED EQUIPMENT	100%	\$ 6,258,300	85%	\$ 5,319,600	75%	\$ 4,693,700
PHYSICAL FACILITIES	100%	\$ 894,275	90%	\$ 804,800	90%	\$ 804,800
VENDOR SERVICES	100%	\$ 937,610	85%	\$ 797,000	75%	\$ 703,200
SPARES - NON FIXED	100%	\$ 125,166	100%	\$ 125,200	100%	\$ 125,200
SPARES - FIXED	100%	\$ 52,089	100%	\$ 52,100	100%	\$ 52,100
CONTINGENCY	100%	\$ 520,895	90%	\$ 468,800	80%	\$ 416,700
TOTAL		\$ 13,103,005		\$ 11,301,000		\$ 10,229,700





Cost Summary for County-Owned System

	LIST COST	HIGH ESTIMATE	LOW ESTIMATE
RADIO INFRASTRUCTURE	100% \$ 6,222,256	85% \$ 5,288,900	75% \$ 4,666,700
MICROWAVE	100% \$ 1,591,960	90% \$ 1,432,800	90% \$ 1,432,800
NON-FIXED EQUIPMENT	100% \$ 6,258,300	85% \$ 5,319,600	75% \$ 4,693,700
PHYSICAL FACILITIES	100% \$ 1,502,525	90% \$ 1,352,300	90% \$ 1,352,300
VENDOR SERVICES	100% \$ 1,677,013	85% \$ 1,425,500	75% \$ 1,257,800
SPARES - NON FIXED	100% \$ 125,166	100% \$ 125,200	100% \$ 125,200
SPARES - FIXED	100% \$ 93,167	100% \$ 93,200	100% \$ 93,200
CONTINGENCY	100% \$ 931,674	90% \$ 838,500	80% \$ 745,300
TOTAL	\$ 18,402,061	\$ 15,876,000	\$ 14,367,000



VIPER Pros & Cons

- VIPER Advantages
 - Free Access (For Now)
 - Statewide Access
 - Interoperability with State Agencies
 - Future Redundant South Microwave Loop
 - NC Furnishes Most Radio Channels



VIPER Pros & Cons Cont.

- VIPER Disadvantages
 - Locked Into Older Technology
 - NCHP Has Full Control of Operations & Access
 - NCHP Has Control of Maintenance
 - Coverage Needs Augmentation
 - Reliability
 - Control In Farmville
 - Control Not Redundant
 - Dispatch Consoles Limited
 - Capacity Limitations Near Manteo
 - Public Service Not Included
 - Potential for Usage Fees

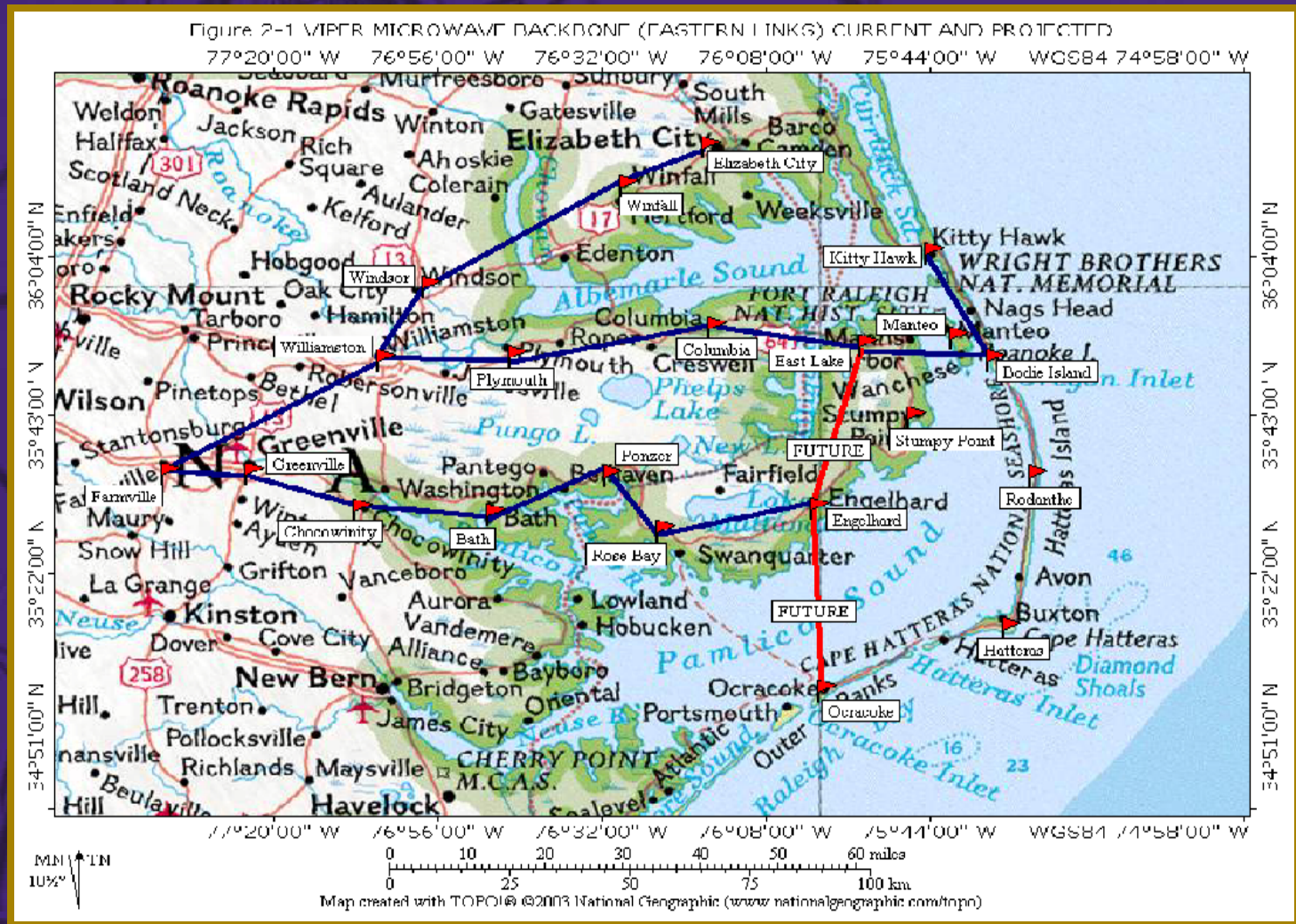


Advantages of County-Owned

- County Has Full Operational Control
- County Has Full Maintenance Control
- Reliability
 - Control Protected (Manteo)
 - Control Closer to Dare Sites
- Dispatch Consoles Full Featured
- Reliability: Improved Microwave Routing
- Survivability: Backup Dispatch Stations
- Interoperability with VIPER at County Level



VIPER Microwave Layout



Critical Issues Addressed by 800 MHz

- Coverage:
 - Designed for County-Wide In-Building
- Crowding:
 - Designed with Sufficient Capacity
- Reserve Capacity:
 - Inherent in Trunking System
- Interoperability:
 - Common Frequency Bands
- Interference:
 - Not Factor at 800 MHz
- Reliability/Survivability:
 - Designed In From The Start



Why Not Wait?

- County Is Growing *Now*
- Hurricanes are Increasing *Now*
- Homeland Security is a Concern *Now*
- Current Systems are *Not* Survivable
 - They do *Not* Provide Coverage
 - They do *Not* Have Capacity
 - They are *Not* Interoperable
- *Risk* of Inadequate Communication is *Now*

